BARRIERS TO SAFE OBSTETRIC PRACTICES IN PREVENTION OF MOTHER TO CHILD HIV TRANSMISSION IN KIBERA SLUMS, NAIROBI, KENYA.

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DECLARATION

CANDIDATE

This thesis is my original work and has not been presented for a degree in any other University or any other award.

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DEDICATION

This work is dedicated to my son Carl Tayo and daughter Stephanie Tayo

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ABSTRACT

Mother to child transmission of HIV accounts for 90% of pediatric HIV/AIDS cases worldwide. Prevention of mother to child transmission of HIV (PMTCT) could curb the increasing rate of pediatric HIV/AIDS. A substantial proportion of perinatally acquired HIV-1 infection occurs at or near delivery, which suggest that obstetrical factors have an important influence on transmission. PMTCT interventions should target appropriate management of HIV positive pregnant women, which could reduce transmission of HIV from mothers to their infants. Safer obstetrical practices available in the hospitals such as use of elective cesarean section have been shown to reduce the risk of transmission by 50% and by 80% when combined with antiretroviral therapy. Access to these safe obstetric services remains a big problem in resource-constrained settings. This study assessed how level of income, level of knowledge on mother to child transmission of HIV (MTCT) and PMTCT, attitude of health workers as perceived by HIV positive mothers and adequacy of information given by health workers affected hospital delivery among HIV positive mothers involved in a community based PMTCT program in Kibera. A cross sectional study was carried out in which pre-tested questionnaires were administered to 146 HIV positive mothers in Kibera. Overall, 56.2 % delivered in the hospital while 43.8 % delivered out of the hospital. Traditional birth attendants assisted 28.8 % while friends and relatives assisted 11.6 % and 5.5 % were not assisted. 69.5 % knew of their HIV status when they were pregnant, while 30.5 % knew their HIV status before pregnancy. Bivariate analysis showed that level of income, level of knowledge and attitude of health workers towards HIV positive mothers were significantly associated with hospital delivery ($p = 0.003$, $p = 0.008$ and $p = 0.024$ respectively). There was no significant association between being given information on ways of HIV transmission and prevention and hospital delivery ($p = 0.142$). Multivariate logistic regression showed that level of income was the most significant determinant and hence barrier to hospital delivery. These findings show that PMTCT programmes should focus more on addressing the financial barrier to accessing PMTCT services which includes hospital delivery. More education on ways and prevention of MTCT as well as the potential risks of home delivery should be given to HIV positive mothers. Emphasis should also be on giving adequate training to health workers aimed at improving their attitude towards HIV positive mothers. Traditional birth attendants should also be integrated in the programmes because of the crucial role they play in obstetric care in this area. This is evidenced by the big percentage (28 %) of mothers who sought their assistance during delivery.

LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
AMDD	Averting Maternal Death and Disability
ANC	Antenatal Clinic
ARM	Artificial Rupture of Membrane
ARV	Antiretroviral Therapy
CBS	Central Bureau of Statistics
ECS	Elective Caesarean Section
FHI	Family Health International
GFR	General Fertility Rate
HIV	Human immunodeficiency virus
IMC	International Medical Corps
IPT	Interpartinent treatment
KICOSHEP	Kibera Community Self Help Group
MCH	Maternal Child Health
MOH	Ministry of Health
MTCT	Mother to Child Transmission
NASCOP	National AIDS/STD Control Programme
PMTCT	Prevention of Mother to Child Transmission
TBA	Traditional Birth Attendant
UNAIDS	United Nations Programme on HIV/AIDS
UNGASS	United Nations General Special Session on HIV/AIDS
UNICEF	United Nations Children Education Fund
UNFPA	United Nations Population Fund
USAID	United States Agency for International Development
WHO	World Health Organization

OPERATIONAL DEFINITION OF TERMS

1. Safe obstetric practices: refers to hospital delivery where exposure of the infant to maternal cervicovaginal fluid during labor and delivery can be minimized.
2. Knowledge: referred to knowledge on ways of HIV transmission and prevention. Ability to state four or more known ways of HIV transmission from the mother to the infant and prevention was rated as being knowledgeable. Not knowledgeable referred to stating three or less.
3. Health workers attitude: This was as perceived by the HIV positive mother. Those who scored 21 and above of the mean score of 21 from the six item five point likert scale were rated as having perceived the health workers attitude to be positive. Those who scored less than 21 were rated as perceiving the health workers attitude to be negative towards them.
4. Income: those who earned less than 3000 kshs were rated as having less income while those who earned above 3000 kshs were rated as earning more income.
5. Peer counselors: HIV positive women who have already received PMTCT services and are able to give advice on how the infant can be protected from infection to other women.
6. Mobile Clinic: Health providers put supplies into a vehicle once it reaches the target area they set up a temporary clinic at an existing space such as a church or meeting hall, and then provide services from the temporary site.

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INTRODUCTION

1.1 Background

Human immunodeficiency virus (HIV) is a retrovirus that targets the immune cells particularly the CD4 T cells and macrophages. When a person is infected the virus multiplies and overwhelms the immune system increasing opportunistic infections causing a syndrome referred to as Acquired Immunodeficiency Syndrome (Barnett and Whiteside, 2002). HIV is transmitted through contaminated body fluids mainly blood, tissue fluids, semen, and vaginal fluid.

The major cause of pediatric HIV/AIDS infection is mother to child transmission of HIV from a HIV positive mother. Consequently, HIV infection in pregnancy has become one of the most common complications of pregnancy today (McGowan and Shah, 2000). Transmission of HIV to the infant could be during pregnancy, labor and delivery or during breast-feeding (Daniels, 1985). Mother- to-child transmission (MTCT) of HIV is an increasingly major public health problem, especially in under resourced communities and among populations with limited access to health care (McGowan and Shah, 2000).

Since a substantial proportion of perinatal HIV transmission occurs during labour and delivery when fetal exposure to maternal body fluids is most likely, this period is an important target for prevention of mother to child transmission of HIV (PMTCT) program efforts (Barnett and Whiteside, 2002). This can be achieved through implementation of safe obstetric practices, which is one of the strategic approaches to PMTCT as proposed by UNICEF/WHO in 2001 (UNAIDS 2005). These services are available in hospitals and include: shortening the period between amniotomy and delivery, elective caesarean sections before rupture of membranes,

vaginal cleansing using antiseptics, avoidance of artificial rupture of membranes and episiotomies, screening and treatment of genital ulcers and intrapartum/postpartum antiretroviral prophylaxis (WHO, 2003). Any barrier to hospital delivery is therefore seen as a hindrance to these safe practices that have evidence based benefit of reducing the risk of HIV transmission from the mother to the infant.

Infants infected with HIV at birth are more susceptible to opportunistic infections and rapid progression to AIDS by the age of 3 years and have a 90 % chance of dying by the age of 10 years (Krist, 2001). UNAIDS (2004) reports that in the year 2003 a total of 490,000 children died of AIDS- related causes while an estimated 630,000 children worldwide became infected with HIV. This trend is reversing gains made in child survival achieved earlier in the 80's as a result of successful immunization programmes, treatment and control of diarrhoea and acute respiratory infections (Gray and McIntyre, 2002). Consequently, practical and cost effective intervention to reduce perinatal transmission of HIV and associated infant and child morbidity and mortality are urgently needed (Obuekwe, 2005).

Since 1999, UNICEF has been an international leader in establishing projects to reduce mother to child transmission in low and middle-income countries (UNAIDS, 2004). Between April 1999 and July 2002, projects that were supported by UNICEF and other partner agencies in 16 countries reached about 600,000 pregnant women in antenatal clinics (UNAIDS, 2004). The Elizabeth Glaser Paediatric AIDS Foundation has also made substantial contribution to this problem through its call to Action Initiative in 17 countries in which 63% of HIV positive pregnant women received prophylaxis in Africa compared with 77% in sites outside Africa (UNAIDS, 2004). Estimates from a coverage survey done in 70 countries in the year 2003 showed that the proportion of pregnant women covered by PMTCT

services ranged from 2% in the Western Pacific to 5% in Sub-Saharan Africa, and 34% in America (UNAIDS, 2004). In Kenya, by the end of 2003 PMTCT coverage in the maternal and child health (MCH) facilities was 20%; currently the coverage is 47% (NACC, 2005).

USAID/Family Health International (2001) reported that implementing MTCT interventions is complex. Furthermore, successful implementation in resource-constrained countries requires smoothly functioning MCH services, financial resources and technical expertise to design, implement, monitor and evaluate such programmes. Most developing countries can only provide limited MCH services due to managerial, financial, and human resource constraints. Nevertheless, even where available, potential beneficiaries do not fully utilize these services as evidenced by the many births that occur outside MCH settings (USAID/ FHI, 2001). For example, in the 2003, Kenya demographic health survey (KDHS) indicated that around 42% of births in Kenya are delivered under the supervision of a health profession while the rest occur outside the hospital set up.

According to Burns and Mofenson (1999), advances in the prevention and treatment of paediatric HIV infection through widespread implementation of antiretroviral prophylaxis, increase of elective caesarean deliveries of HIV infected women have had a huge impact on the incidence and progression of HIV/AIDS in children in Europe and North America. This has consequently led to a decline in paediatric HIV/AIDS in these regions and increased child survival (Burns and Mofenson, 1999). Unfortunately, these advances have had little impact in developing countries where case fatality rates for HIV remain high due to implementation problems. For example, implementation of short course

antiretroviral regimens is hampered by availability and acceptability of antenatal care and HIV testing during pregnancy (Burns and Mofenson, 1999).

Similarly, uptake of safe obstetric services available in hospitals may be hampered by factors hindering hospital delivery such as beliefs and reliance on traditional birth attendants for home deliveries, knowledge, attitude, income levels, stigma and discrimination within hospital setup and high costs of putting up the necessary infrastructure (Asghar, 1999; Desai, 2003).

USAID/Family Health International (2001) suggests that effective implementation of PMTCT programmes requires upgrading the existing MCH services through enhancing the infrastructure; training the staff to improve obstetrical practices by instituting safer labour practices and managing sexually transmitted infections. However, because of low utilization of maternal and child health care services within health care facilities, a more innovative model for implementing PMTCT services which involves an enhanced role of TBA's, community health workers and use of mobile outreaches has been proposed (Horizons,2003). This would lead to decentralized and home based intervention strategies that are appropriate to resource poor settings such as Kibera slums (Horizons, 2003).

This was the essence of the community based PMTCT project within which this study was conducted. A baseline survey prior to the project activities revealed that majority of the mothers in Kibera did not attend ante natal clinic (ANC) during pregnancy. In addition, most of the women delivered out of the hospital set up with the assistance of traditional birth attendants, relatives and friends while others delivered on their own without any assistance. These practices were seen as being great risk factors for HIV transmission to the infant incase the pregnant mother was HIV positive. The goal of the project was to reduce HIV transmission from mother to

child in Kibera slums by increasing access and utilization of PMTCT services within the slum. The community based approaches used included an enhanced role of traditional birth attendants (TBA), peer counselors and use of a mobile clinic. These interventions were meant to overcome the physical and psychosocial barriers to accessing PMTCT services.

These interventions were aimed at reaching out to expectant and lactating mothers to sensitize them on PMTCT issues and emphasize the importance of HIV testing as well as hospital delivery. TBA's were encouraged to refer the mothers for hospital delivery while they received financial incentives for every referral they made. During the project period health service providers in the area were given PMTCT training by NASCOP supported by International Medical Corps (IMC) in which various issues including need for attitude change towards HIV positive patients was emphasized. Community awareness campaigns on PMTCT were also intensified in the project area during this period. Those who tested HIV positive during mobile ANC outreaches were recruited into the IMC formed support groups where they were given information on how they could reduce the chances of HIV transmission to their infants as well as nutritional support (IMC, 2003).

This study sought to identify the most significant barrier/s to accessing safe obstetric care (hospital delivery) in the resource constrained setting of Kibera among HIV positive women who were already in the community based PMTCT programme. One of the project objectives was to encourage the mothers to deliver in a health facility so as to minimize the risk of HIV transmission to the infant. This objective was addressed by assessing the place where the mothers delivered and factors that influenced the place they delivered. It was envisioned that the findings

of this study would assist in improving and planning for future PMTCT programmes in the area which could in the long run increase uptake of PMTCT services and reduce paediatric HIV/AIDS.

1.2. Statement of the problem and justification

Certain obstetric practices such as home delivery and invasive procedures with prolonged rupture of membranes; routine episiotomies and vaginal deliveries have been shown to increase the risk of HIV transmission from a HIV positive mother to the infant (European Collaborative Study, 1992). Lack of access to safe obstetric services available in hospitals set up such as use of elective cesarean section, vaginal cleansing, intrapartum/postpartum antiretroviral prophylaxis and proper handling of the infant at birth could increase pediatric HIV/AIDS in Kibera because of the high HIV prevalence in the area. This could be due to factors of cost, cultural beliefs and practices, infrastructure, level of knowledge and attitude of health workers. This study sought to investigate the most significant factors that hinder access to safe obstetric services.

1.3. Research Questions

1. How does level of income affect access to safe obstetric services?
2. How does level of knowledge on MTCT and PMTCT affect readiness to use safe obstetric services?
3. How does attitude of health workers (as perceived by HIV positive women) towards HIV positive women affect their readiness to use safe obstetric services?
4. How does adequacy of information given by health workers on ways of MTCT and prevention affect readiness to use safe obstetric services

1.4. Hypotheses

The study tested the following hypotheses:

1. Level of income does not affect access to safe obstetric services.
2. The level of knowledge on MTCT and PMTCT does not affect readiness to use safe obstetric services.
3. Attitude of health workers towards HIV positive mothers does not affect their readiness to use safe obstetric services.
4. Getting information on ways of MTCT and prevention does not affect readiness to use safe obstetric services.

1.5. Purpose of the study

The purpose of the study was to identify the most significant barriers to safe obstetric care among HIV positive mothers in Kibera.

1.6. Objectives of the study

1. To investigate how level of income affects access to safe obstetric services.
2. To investigate how level of knowledge on ways of transmission and prevention of mother to child HIV transmission affects readiness to use safe obstetric services.
3. To investigate if health workers attitude as perceived by HIV positive mothers affects their readiness to seek safe obstetric services in the hospital.
4. To find out if being given information on ways of HIV transmission and prevention by health workers affects their readiness to use safe obstetric services.

1.7. Significance of this Study (Rationale)

During labour and delivery the risk of HIV transmission from the mother to the infant is higher than at any other stage. Access to safer obstetric services available in the hospital for the mother is therefore crucial at this time as this immensely reduces the risk of HIV transmission to the infant during labor and delivery. Identification of the most significant barriers to safe obstetric services in Kibera would help improve access and acceptability of this important intervention through development of appropriate programmes and policies.

Findings from this study would be useful to organizations both governmental and non-governmental that are implementing PMTCT programmes in Kibera at the facility and community levels. The information obtained would help these organizations to focus on addressing the most urgent issues that are hindering HIV positive women from accessing and seeking hospital delivery which is crucial as far as prevention of HIV transmission to the infant is concerned. This could in the long run increase uptake of hospital delivery and hence reduce the increasing pediatric HIV/AIDS cases in Kibera and improve maternal and child health.

1.8. Limitation of the Study

The study was only restricted to those living within Kibera and involved in the community based PMTCT program. In addition, financial constraints were also a limiting factor in this study.

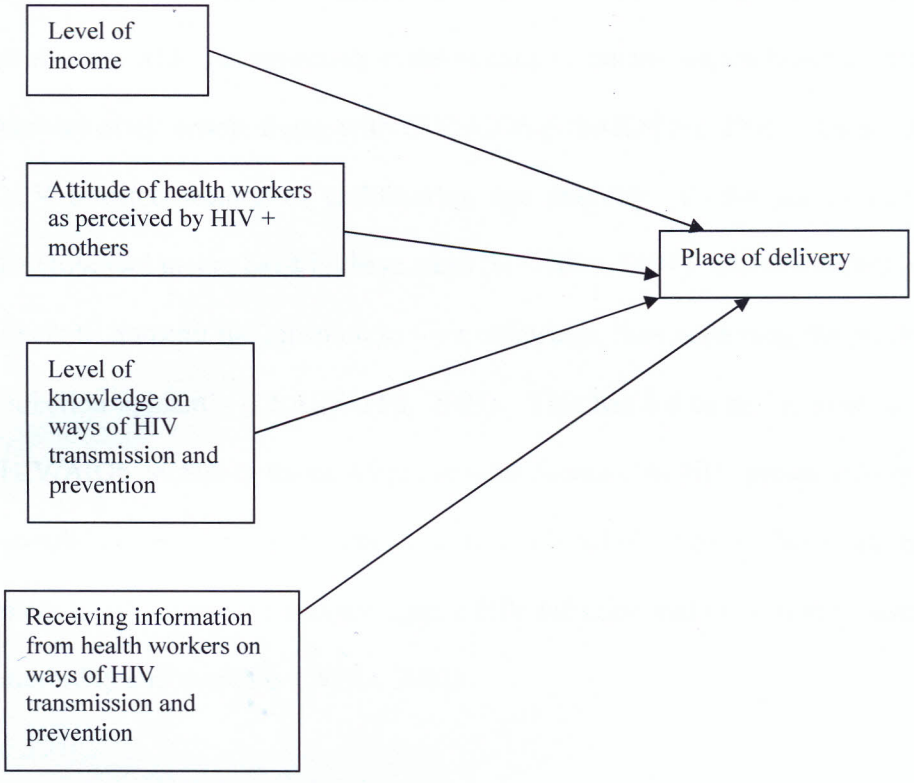
1.9. Assumptions

It was assumed that the study subjects would be available for the study and recall the facts accurately.

1.10. Conceptual Framework

In this study it was envisioned that the relationship between the dependent and independent variables would be as follows.

Independent variables Dependent variable



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Mother to child transmission of HIV infection remains a major public health problem worldwide, especially in developing countries that are home to more than 95 percent of all people living with HIV/AIDS (USAID/FHI, 2001). Large numbers of HIV infected women of childbearing age majority of who got infected through heterosexual means exist in these areas (UNAIDS, 2004). These infected women are likely to transmit the infection to their offsprings, thus sustaining the paediatric HIV infection epidemic (USAID/ FHI, 2001). This has led to an increase in Paediatric HIV/AIDS in Sub-Saharan Africa despite decrease in HIV prevalence in the adult population as reported in some countries (UNAIDS, 2004). This is alarming since there is still no cure or vaccine against HIV infection and as such this increases child morbidity and mortality (WHO, 2002).

2.2 Epidemiology of Mother to Child Transmission

MTCT of HIV is the main cause of the spread of HIV/AIDS epidemic in the pediatric population (Barnett and Whiteside, 2002). Since the beginning of the epidemic an estimated 5.1 million children worldwide have been infected with HIV while an estimated 19.2 million women worldwide were living with HIV in 2002 (UNAIDS, 2002). According to UNAIDS (2004), in the year 2003 an estimated 630,000 children worldwide became infected with HIV and 430,000 died worldwide as a result of HIV/AIDS related causes while in 2005, 700,000 were infected (UNAIDS, 2005); ninety percent of these children were born in Africa. Majority of

these children got infected during their mothers' pregnancy, labour and delivery or as result of breast-feeding (UNAIDS 2004). Limited data from countries in Sub-Saharan Africa show that HIV-1 seroprevalence rates among women of childbearing age have exceeded 25% in many urban populations (US Bureau of Census, 1999). With an estimated 2.4 million infected women giving birth annually, more than 1,600 infants become infected each day (UNAIDS, 2000).

In Kenya, HIV prevalence among pregnant women was 13% in the year 2002 while in 2003 it was 11 %. Due to high birth rates this translated to an estimated 50,000 to 60,000 infants infected with HIV annually with 270 new pediatric HIV infections occurring each day (NASCOP, 2002). Over 90% of these infections are due to MTCT (NASCOP, 2002). The current national HIV prevalence in Kenya is 6.4 % based on the 2004 sentinel surveillance (NACC, 2005). The severity of MTCT and resulting high incidence of HIV among children in Kenya is attributed to: high rates of HIV infections in women, a large total population of women of reproductive age, notable infection rates among young women, high birth rate, and weak MTCT prevention strategies (Rutenberg et al., 2003).

In Uganda, HIV prevalence among women aged 15-19-years who attended antenatal clinics have declined from 32.2% in 1991 to 10.3% in 1997 (Kilian et al., 1999). This decline occurred during the period when behavioral change was promoted together with the social marketing of condoms and other behavioral interventions throughout the country (Kilian et al., 1999).

In Tanzania, the GTZ PMTCT project in Mbozi district with a catchment's population of 2.2 million people reported a HIV prevalence of 15% among pregnant women (Harm et al., 2003). This is comparatively higher than the prevalence in Kenya and Uganda.

Ninety - five percent of the worlds HIV/AIDS infected women are living in developing countries where there is at least 30% likelihood that a HIV positive breastfeeding mother will pass the virus to her newborn baby (UNAIDS, 2003). This is in contrast to industrialized countries where HIV transmission to infants is rare due to readily available antiretroviral prophylaxis, caesarean delivery and alternatives to breast feeding (UNAIDS, 2003). For example, in the United States of America perinatally acquired HIV infection is a disappearing disease (with low transmission rates of 2%) as more people can gain access to appropriate treatment and interventions aimed at reducing the risk of HIV transmission from mother to the infant (Gray and McIntyre, 2002).

2.3 Prevention of Mother to Child Transmission (PMTCT)

There are various international initiatives to prevent mother to child transmission of HIV. These include: President Bush's International Mother and Child HIV prevention Initiative, USAID's Efforts to prevent MTCT of HIV, The Elizabeth Glaser Paediatric AIDS foundation call to action project and The UN Interagency Task Team on MTCT (Kuhn and Peterson, 2002).

The UN Interagency Task Team on MTCT involves UNICEF, UNFPA, WHO, The World Bank and the UNAIDS Secretariat. This team works with the governments of various developing countries to set up MTCT programmes (UNAIDS, 2004). By the year 2004, support was being given to 226 programme sites in 16 countries, with Kenya being one of the benefiting countries (UNAIDS, 2004).

The United Nations strategic approach to prevention of HIV transmission in pregnant women, mothers and their children has four parts: primary prevention of HIV infection in young women, and pregnant women; prevention of unintended

pregnancies among HIV-infected women; prevention of HIV transmission from HIV-infected women to their infants (PMTCT); and provision of care, treatment and support to HIV- infected women, their infants and families (WHO, 2003).

The focus to date has been on strategies to prevent transmission to the infant though the challenge remains in their implementation. Prevention of mother to child transmission of HIV is an essential element of the worldwide HIV/AIDS control strategy with an objective of reducing paediatric HIV/AIDS and improving maternal and child health (UNAIDS, 2003). The full package of PMTCT services include:

1. Voluntary HIV counseling and testing of pregnant women, which is the entry points to a PMTCT programme. The objective is to identify which pregnant woman is HIV-positive so that she can be counseled on the available interventions that can reduce the chances of HIV transmission to the infant (Rutenburg et al., 2003). Currently, HIV counseling and testing is routinely offered in all ANC/MCH clinics as part of the antenatal care package even though mothers have the option to opt out (NASCOP, 2002).
2. Safe obstetric practices that involve practices that have the potential to minimize contact of the infant to HIV infected cervicovaginal fluid from the mother. These include avoidance of invasive procedures such as unnecessary episiotomies, elective caeserean section, vaginal cleansing, reducing the amount of time between rupture of membranes and delivery among others (Read, 1999).
3. Use of antiretroviral therapy which has been shown to significantly reduce the risk of HIV transmission during pregnancy and delivery as it aims at reducing the viral load in the mother to undetectable levels (Guay et al., 1999). Currently in Kenya a single dose nevirapine which has a 50 % chance

of reducing HIV transmission from the mother to the child is widely used. (NASCOP, 2002).

4. Family planning among HIV positive women is also seen as an important component of PMTCT. According to World Health Organization, a moderate reduction in the number of pregnancies among HIV-infected women would yield an equivalent reduction in the number of infections among infants of HIV-positive pregnant women (Rutenberg et al., 2003). However a literature review of attitudes and practices about childbearing among HIV- positive women in Sub-Saharan Africa revealed that they have powerful motivations to have children (WHO, 2002).
5. Counseling and support for safer infant feeding practices. This is important because of the risk of HIV transmission that breastfeeding poses to infants of HIV positive mothers (De Cock et al., 2000). International health organizations such as WHO, UNICEF and UNAIDS have set out several infant feeding alternatives for consideration by HIV positive mothers (WHO, 1999). Choices include replacement feeding with commercial infant formula or exclusive breast-feeding for the first months of life and stopping early (WHO, 1999). UNICEF currently provides a number of centers in Sub-Saharan Africa with free artificial milk for infants below six months (Ogundele and Coulter, 2003).

2.4 Prevention of Mother to Child HIV Transmission (PMTCT) in Kenya

The government of Kenya recognizes PMTCT as a core strategy to minimize transmission of HIV from an infected mother to the infant. The ministry of health has developed evidence based national guidelines for PMTCT which places

emphasis on obstetric and infant care to all mothers irrespective of their HIV status within antenatal clinics (NASCOP, 2002). The purpose of the guideline is to provide a national standard for antenatal management of HIV-positive women and prevention of mother to child transmission of HIV/AIDS in Kenya (NASCOP, 2002).

The Kenyan PMTCT program has adopted the United Nations General Special Session on HIV/AIDS (UNGASS) goal, which is to reduce the proportion of infants infected with HIV by 20% by 2005 and 50% by 2010 (NASCOP,2003). This goal was to be reached by ensuring that 80% of pregnant women who receive antenatal care have access to HIV prevention services (NASCOP, 2003). The goal of the Kenyan program is to increase access of PMTCT services so as to reach at least 20% of all health facilities by the end of the year 2005 and reach at least 80% by the year 2007 (NASCOP, 2003).

PMTCT Programme was first launched in three pilot sites at Homabay District Hospital, Karatina District Hospital, and Kenyatta National Hospital in the year 2000. This was during a four-year intervention study to assess the feasibility and effectiveness of key PMTCT program components with the support of USAID (Rutenberg et al., 2003). The national programme begun in the year 2001 with a facility coverage of 5% by the end of 2003 (NACC, 2005). Currently, there are 600 sites (47%) offering PMTCT services in all provincial hospitals, high volume district hospitals and some private hospitals (NACC, 2005). This implies that certain areas are not yet covered with this Programme hence there could be less emphasis on safer obstetric practices that could minimize HIV transmission to infants. National HIV prevalence derived from women participating in 2003-sentinel surveillance was estimated at 9.4%, with regional differences ranging from 6% to 17%, the most

affected being those in informal settlements like Kibera (Central Bureau of Statistics, 2003). The proportion of mothers in such settings who do not seek qualified professional services during delivery probably because of lack of infrastructure, finances and cultural issues is also very high. This in turn leads to an increase in the risk of HIV transmission to infants and consequently paediatric HIV/AIDS in these areas (Bulterys et al., 2002).

2.5 Risk Factors for Mother to Child Transmission of HIV

The actual timing and quantification of prenatal and postnatal MTCT are not known with any degree of certainty but several rough estimates have been made. Kourtis et al. (2000) postulates that MTCT most frequently occurs *in utero* between the 38th week of gestation and delivery and this accounts for 50% of all pediatric HIV infection. Thirty percent (30%) occurs during labour and only 20% before the 38th week of pregnancy. UNAIDS (2003) estimates that labour and delivery is responsible for 50% of all pediatric infection.

Factors associated with MTCT can be broadly categorized into obstetric, maternal and neonatal factors. Obstetric factors include; prolonged rupture of membranes, episiotomies, artificial rupture of membranes, intrapartum hemorrhage, invasive foetal monitoring procedures such as penetrating scalp electrodes and foetal blood sampling, vaginal delivery and instrumental delivery such as vacuum extraction as well as twin deliveries where the first twin has a higher risk of being infected than the second twin (Burns et al.,1994). Increased duration between amniotomy and delivery (> 4hrs) has been consistently associated with increased HIV transmission in women not receiving antiretroviral therapy (Burns et al., 1994).

Maternal factors that seem to increase the risk of a HIV infected mother transmitting the virus to her infant are; high viral load, HIV infection during pregnancy, advanced HIV infection (AIDS) and vitamin A deficiency (Ogundele and Coulter, 2003). Vitamin A plays an important role in maintaining the integrity of the epithelial tissues such as the skin and mucous membranes and its deficiency has been associated with increased MTCT and higher concentration of HIV in breast milk of HIV infected women (Ogundele and Coulter, 2003). Several studies have also shown a direct correlation between viral load and rate of vertical transmission, however, there is no threshold value of viral load to discriminate between transmitters and nontransmitters (Garcia et al., 1999). For example, in New York City a Perinatal HIV Transmission Collaborative Study showed that women who had a measurable viral load were nearly six times more likely to transmit HIV to their infants than those who had undetectable viral load (Garcia et al., 1999).

The gestational age of the newborn is an important neonatal factor in HIV transmission. Premature birth and low birth weight (less than 37 weeks/<2500g) has been shown to increase the chance of MTCT since the skin and mucous membrane is delicate and immature and may not provide intact barrier to prevent HIV transmission (Bertolli et al., 1996). A preterm baby may not have a fully developed immune system and as such may be more susceptible to infections than a full term baby. Disruption of the epithelial integrity of the oral mucosa or the gastrointestinal tract has been associated with increased risk of HIV transmission during breastfeeding (Garcia et al., 1999).

Table 1. Summary of factors associated with risk of perinatal HIV transmission

Ante-partum	Maternal HIV viral load, use of ARV therapy, Vit A deficiency, illicit drug use, amniocentesis, chorionic villus sampling.
Intra-partum	Maternal cervicovaginal HIV levels, mode of delivery, prolonged amniotomy, episiotomy, placental abruption, artificial rupture of membranes, chorioamnionitis, intrapartum hemorrhage, active genital ulcer disease, vaginal lacerations, premature delivery
Post-partum	Breast feeding, mastitis

(Source: McGowan and Shah, 2000)

Table 2. Transmission patterns in breastfeeding and non-breastfeeding populations

	Transmission rate %		
Timing	No breastfeeding	Breast feeding through 6 months	Breastfeeding through 18 to 24 months
During pregnancy	5 to 10	5 to 10	5 to 10
During labour	10 to 20	10 to 20	10 to 20
Through breastfeeding Early (first 2 months) Late (after 2 months)		1 to 5 5 to 10	5 to 10 5 to 10
Overall	15 to 30	25 to 35	30 to 45

(Source: De Cock K M 2000)

2.6 HIV Transmission during Labour and Delivery

Infants of HIV infected mothers are at great risk of becoming infected with HIV during childbirth. During this time the risk of transmission is between 10 and 20 percent if no steps are taken to prevent transmission (De Cock et al., 2002). According to Giles et al., (2004), approximately 70% MTCT of HIV occur during labour and delivery. In a study done in Kinshasa, Zaire, to estimate the timing of MTCT of HIV 65 % was found to occur during labor and delivery, 23 % occurred in utero while 12 % postnatally through breastfeeding (Bertolli et al., 1996).

Labour contractions facilitate micro-transfusion of blood from the mother to fetus, with an average of 3ccs transfused (Anderson, 1999). Most infants acquire HIV by sucking or imbibing maternal blood or cervical secretions that contain HIV (Anderson, 1997). Interventions to minimize infant's contact with maternal vaginal secretions and infected blood during passage through the birth canal are therefore important to reduce the risk of MTCT of HIV (Giles et al., 2004).

2.7 Safe Obstetric Practices as a Component of PMTCT Program

Obstetric care refers to care of a woman and her offspring during pregnancy, childbirth and the puerperium (the period shortly after birth- six weeks) (Landesman et al., 1996). Safe obstetric care during these three phases is crucial if the overall risk of HIV transmission from mother to infant is to be reduced. Consequently, integration of improved obstetric practices to support PMTCT in the existing MCH setup is necessary in the care of HIV positive pregnant women (USAID, FHI, 2001). Similarly, improved obstetric practices entails working closely with safe motherhood programs to develop, disseminate and implement appropriate guidelines that address HIV and MTCT of HIV (UNICEF, 2003).

Various obstetric practices have been proposed by the UN interagency team on prevention of mother to child transmission of HIV based on results from various studies. These include:

- Delivery by elective caesarean section (ECS) before labor and rupture of membranes: - This is associated with decreased exposure of the infant to HIV infected cervicovaginal secretions during passage through the birth canal (Semprini et al., 1995). ECS has been shown to reduce the risk of HIV transmission by 50% if it is done before onset of labour and rupture of membranes and 80% if it is done in combination with antiretroviral therapy

(Read, 1999). The benefit of ECS may be limited where maternal viral load is high and more so where there has been prolonged rupture of membranes for more than 4 hours (Landesman et al., 1996). This is because the impaired immune function of HIV infected women is likely to put them at higher risk of complications and post operative morbidity than uninfected women (Landesman et al., 1996). Giles et al (2004) observe that maternal viral load is strongly associated with HIV transmission and should always be considered when assessing the benefits of CS in HIV infected women. All the potential risks of post operative morbidity and benefits of reduced risk of HIV transmission should be taken into account when counseling HIV positive mothers on the appropriate mode of delivery (Semprini et al., 1995). While some developed countries are able to perform routine ECS on HIV positive pregnant women, it nonetheless has very limited application in resource-constrained settings due to lack of capacity, resources and infrastructure (Landesman et al., 1996). Gray and McIntyre (2002) states that ECS may reduce the risk of transmission by half but may not be a realistic option for poor countries and proposes that the two most effective interventions are ARV prophylaxis and modification of infant feeding.

- Antiretroviral prophylaxis: - administration of ARV drugs during pregnancy and the time around delivery has been shown to significantly reduce the risk of HIV transmission from mother to child mostly in a non-breast feeding populations (USAID, FHI,2001). In 1994 the AIDS Clinical Trials Group Protocol 076 (ACTG 076) in Puerto Rico showed that administration of short course AZT to the mother from 14 weeks of gestation and to the child during the first seven days after birth reduced MTCT by two-thirds. This protocol was however found to be expensive and called for more studies which could come up with less expensive

and uncomplicated regimes (Hashimoto et al., 2002). In 1998, a study conducted in Thailand to evaluate the efficacy of a short, easily administered AZT during the last four weeks of gestation showed a 50 % reduction (Hashimoto et al ., 2002). In 1999 results from a study in Uganda (HIVNET 012) demonstrated a 47 % reduction in MTCT in a breast feeding population following a single dose nevirapine (NVP) treatment to the mother at the onset of labor and to the baby within 72 hours after birth (Guay et al., 1999). This protocol was found to be less expensive hence the HIVNET 012 study trial, prescribed nevirapine as the best available option for resource-constrained nations due to its cost effectiveness (Marleen et al., 2004).

- Vaginal cleansing during labor: - The use of antiseptic vaginal and cervical washes has been shown to reduce the potential of viral exposure to newborns during delivery, for example, use of chlorhexidine at concentrations of 0.25% in cases where membranes are ruptured for more than four hours have been shown to reduce the risk of MTCT of HIV (NASCOP, 2002). However, the same benefit has not been seen where membranes are ruptured for shorter duration (Miotti et al., 1996).
- Artificial rupture of membranes (ARM), episiotomies and prolonged rupture of membranes (for more than 4 hours) before delivery among HIV positive women has been associated with increased risk of HIV transmission and hence should be avoided. Studies show that when the duration of ruptured membranes is limited to four hours or less, HIV-1 transmission is reduced from 18.7% to 13.9% (Landesman et al., 1996).
- Handling of the newborn in the first hours after delivery: This should include thorough drying to remove any remaining maternal blood and amniotic fluid as

well as avoiding vigorous suctioning of the infant's mouth and pharynx as this may create trauma to the mucous membranes (Preble and Piwoz, 2001). Umblical cord cutting and care should be handled in a way that minimizes the infant's exposure to the mother's infected blood and fluid (Preble and Piwoz, 2001).

- Screening and treatment of sexually transmitted infections such as syphilis and genital ulcers during pregnancy should be intensified as these increase risk of HIV transmission to the infant (McGowan and Shah, 2000). In addition, interpartinent treatment (IPT) for malaria is important especially because placental malaria has been shown to increase the risk of *inutero* transmission of HIV through the placental route (Brahmbhatt et al., 2003). This is due to placental abruption, which weakens the placental barrier increasing the chances of HIV transmission *in utero* (Brahmbhatt et al., 2003). IPT for malaria in Sub-Saharan Africa is important because of malaria endemicity and high HIV prevalence among women in the reproductive age (Brahmbhatt et al., 2003).

These safe practices should be introduced as a routine part of the management of all women in high HIV prevalence areas (WHO, 1999). However, these practices may be inconsistent with the training and practices of some obstetricians and midwives who may still be encouraging artificial rupture of membranes to hasten labour and routine episiotomy for all primagravidas, thus exposing the infants to risk of HIV infection (WHO, 1999).

Apart from the above, antenatal management of HIV positive pregnant women should include provision of relevant information as a component of HIV counseling in the antenatal clinic. This can be provided to a group or individually and core of which should be the various ways of HIV transmission from the mother to the

infant and ways of prevention (NASCOP, 2005). This information is important in helping the mother make informed decisions on her delivery plan and specifically give her insight of the importance of hospital delivery as one of the means of protecting the forthcoming infant from being infected. Hence, the amount of information given by the health worker to the HIV positive mother during antenatal visits is crucial and to some extent lack of it can be a barrier factor to the mother seeking hospital delivery. Similarly, various barriers to access to these safe obstetric services available in MCH setting have been identified. These include lack of infrastructure, cultural practices, costs, knowledge and health workers attitude towards people living with HIV/AIDS.

2.8 Barriers to Safe Obstetric Practices

Safe obstetric practices have been associated with reduced risk of transmission of HIV from the mother to the child. However, not all HIV positive pregnant women have access to these services. Various barriers to access to these practices have been identified, these include:

2.8.1 Knowledge

The knowledge of the possible ways of HIV transmission from the mother to the infant and the possible ways of minimizing the transmission is important to HIV positive women. This could greatly determine their readiness to use safer modes of delivery as a preventive measure for HIV transmission (Besser et al., 2002). Today, there has been an increasing trend of the number of HIV positive women using elective caesarean deliveries (Besser et al., 2002). This could point to the fact that there is an increase in the general knowledge about the safety of ECS as far as HIV transmission is concerned. However, this trend is most notable among women of the

higher socio-economic class who can afford ECS and at the same time are reluctant to go through the stress of vaginal deliveries (Dominguez et al., 2003).

In a study to examine recent trends in factors associated with caesarean section deliveries among HIV- infected women in the United States in which a multisite pediatric medical record review (n=6467) was conducted, the proportion of deliveries by ECS was steady at about 20% from 1994 to June 1998. From July 1998 through December 2000, this proportion increased to 44%. This was attributed to increased knowledge on the fact that ECS was associated with a 50% reduction in the risk of perinatal HIV transmission based on Pediatric Spectrum HIV disease Cohort study results in 1998 (Dominguez et al., 2003).

In a study to assess the level of knowledge of mother to child transmission and breast milk alternatives for HIV positive mothers in Homabay district, Kenya, showed that those who had high knowledge of mother to child transmission of HIV tended to be more receptive in considering feeding alternative for the infants exposed to HIV (P=0.001; OR=1.41; 95 % CI, 1.04 -3.86). This is implicative of the fact that knowledge on the various ways of HIV transmission and prevention from the mother to the infant may influence her readiness to use a safe delivery option that may minimize the risk of HIV infection to the infant.

In an assessment on awareness s and level of knowledge about mother-to-child transmission of HIV and preventive measures conducted in the target and general population in Uganda and Tanzania, 67.1% of females in Uganda and 93.1% of females in Tanzania affirmed that HIV transmission is possible during pregnancy and delivery (Harm et al., 2003). When health workers were directly asked whether CS might reduce MTCT, 44% of health workers in Uganda and 39% of health workers in Tanzania affirmed that CS might reduce MTCT. However, this study did

not assess the knowledge of HIV positive mothers on preventive measures such as cesarean section (Harm et al., 2003).

2.8.2 Attitude of health workers

According to Horizons (2006), stigma and discrimination in the hospital setting can lead to denial of care, differential treatment, and disregard for the right to patient confidentiality. Fear of such treatment may cause many people living with HIV to avoid seeking critical health care. Negative attitude of health care providers towards HIV positive pregnant women could also discourage these women from hospital delivery causing them to opt for other alternatives such as home deliveries with or without the assistance of a skilled birth attendant (Mbanya et al., 2001).

In a study to assess knowledge, attitude and practices of nursing staff in a rural hospital in Cameroon (Metet hospital) in which 107 nursing staff and 62 HIV/AIDS patients were interviewed, 15 % of the patients indicated that they were attended to with signs of disgust and/or hatred (Mbanya et al.,2001).

In certain health settings, HIV positive mothers continue to experience discrimination and stigma from the health workers. For example, in a workshop held in Zambia, one participant told of an HIV positive woman in labour who wanted to take her labour dose of antiretroviral tablet and asked for water. The midwife asked her why she wanted water and the woman explained. The midwife immediately refused to provide further care for the woman, calling for a student nurse to take her place (Rutenberg et al., 2002).

In India AIDS –related stigma and discrimination among health workers in the hospital setting has been documented. A study conducted in Bangalore and Mumbai in India found that many health providers denied care to HIV infected patients, labeled admitted patients as HIV-positive, disclosed their HIV status to

family members and others without their permission, and excessively used barrier precautions when working with them (UNAIDS, 2001).

In the Dominican Republic, interviews carried out by the human rights watch among HIV positive women revealed that the care they received depended on the attitude of the health care personnel who attended to them. They reported that medical personnel withheld or postponed medical procedures, for example, in certain cases they were denied access to medical procedures requiring surgery such as caesarean sections (Human Rights Watch, 2004).

However, recent findings from a comprehensive study, conducted in India from 2000-2004 showed that tailored interventions to protect the well being of both patients with HIV and health workers contributed to a safer and less stigmatizing and discriminatory hospital environment in which improvement in health workers attitudes toward people living with HIV was reported (Horizons, 2006).

2.8.3 Cost and level of income

The costs associated with the provision of routine cesarean section to all HIV positive pregnant women as is the case in some developed countries have been shown to be enormous. According to Borghi (2003) a study of costs of spontaneous vaginal delivery and five types of obstetric complications in Benin and Ghana indicated that the high cost associated with hospital based delivery care are likely to deter women's use of these health services. In Benin the cost of vaginal delivery is around Ksh. 1200 while a cesarean section cost Ksh. 19,000. In Ghana, the cost ranges from Ksh. 1,350 for a spontaneous vaginal delivery to Ksh 8625 for a cesarean section. Within Kibera a normal delivery costs between Ksh. 500 and Ksh.1000, while a cesarean delivery, which is mostly referred to Kenyatta National Hospital or Pumwani Maternity Hospital, costs between Ksh. 6,000 and Ksh. 10,000

and about Ksh. 80,000 in private hospitals. These costs may not be affordable to HIV positive pregnant women in Kibera who may want to have an ECS to minimize the risk of HIV transmission.

These high costs can deter HIV positive women from seeking cesarean delivery as a means of protecting their infants from infection with HIV virus, as they may have devastating effect on household budgets. In resource - constrained nations the cost of equipping the health facilities with the necessary machinery needed to carry out caesarean section and other safe services may be difficult to meet. Besides, some facilities may lack skilled personnel to carry out this (Desai, 2003).

In a study to investigate barriers to the use of antenatal and obstetric care services in rural Kano, Nigeria, in which 107 pregnant women were interviewed, 88 % of the women were not receiving antenatal care and 46% of these women cited limited financial resources as one of their reasons for non use of antenatal services (Adamu and Salihu, 2002). Because of these findings the study suggested that in order to improve utilization of antenatal care services (which is crucial in case of HIV infection) efforts to relieve poverty and empower women economically are needed (Adamu and Salihu, 2002).

A study carried out in Britain which related low income and poor health showed that poor health was one of the problems associated with low income (Benzeval et al., 2000). Similarly, a study in Canada by Forsyth et al (2000), showed that there is a significant relationship between income distribution and mortality.

2.8.4 Cultural practices

Certain cultural practices have been shown to affect the readiness to use modern and safe means of delivery. Practices such as use of traditional birth

attendants who allow traditional birthing practices and who often have the trust of the community has been shown to affect women's use of safer modes of delivery, which may offer more protection to their infants as far as HIV transmission is concerned (Asghar, 1999). Majority of births in developing countries, particularly in the rural areas, takes place at home usually assisted by relatives or traditional birth attendants (TBA) under unhygienic conditions increasing the risk of HIV transmission (Asghar, 1999).

Bergstrom and Goodburn (2001) observe that traditional birth attendants play a significant role in offering cultural competence, consolation and psychological support to women during childbirth in many cultures. As a result majority of women in such cultural settings tend to seek the help of TBAs during child birth.

In Sub-Saharan Africa a professional healthcare worker at delivery attends to only 42% of pregnant women (Bulterys et al., 2002). High quality maternity care is often unavailable and home deliveries remain a strong preference and the only option for many. World wide, more than one million women infected with HIV are estimated to deliver their babies without the help of professional healthcare workers (Bulterys et al., 2002). According to the demographic health survey in Kenya in 2003, 59% of women delivered at home, out of this 28% delivered by the help of TBA (CBS, 2003).

2.8.5 Availability of the Services

Facilities that can offer safe obstetric care to HIV positive pregnant mothers are limited in the developing countries. One of the most significant findings of the assessments of emergency obstetric care services (which includes caesarean section) carried out by Averting Maternal Death and Disability (AMDD) was the lack of basic and comprehensive emergency obstetric care facilities in most developing

countries (Paxton, 2004). The guidelines for monitoring the availability and Use of Obstetric Services, issued by UNICEF, WHO and UNFPA in 1997, suggests a minimum of 4 basic facilities offering emergency obstetric care per 500,000 population. In most developing countries the ratio was found to be 1:500,000 meaning that women needing services like blood transfusion and/ or CS may not have access to them especially those in rural communities (Paxton, 2004). The availability of qualified staff that can perform caesarean section and other safe obstetrical practices within the peripheral facility in developing countries is also limited (Paxton, 2004).

CHAPTER THREE

METHODOLOGY

3.1. Location of the study area

The study area was Kibera, a slum which is found in the southern part of Nairobi province in Kenya and is considered the largest urban slum in Sub-Saharan Africa. It is located in Kibera division in Nairobi and has 7 locations. The population of Kibera slums is approximately 700,000 (Hyman, 2003). The literacy levels are low and majority of the individuals are not employed. This is where IMC was carrying out a community based PMTCT project from which HIV positive mothers could be easily accessed for the study. Multi stage and purposive sampling techniques were used to sample Kibera slum for the community based PMTCT project. Kibera slum was purposively chosen for the project due to the general poor infrastructure leading to limited access and utilization of PMTCT services.

3.2. Research Design

This was a cross-sectional study carried out among HIV positive mothers who were involved in a Community Based PMTCT Project in Kibera. HIV positive mothers who had recently given birth were purposively selected for the study.

3.3. Variables of study

- The dependent (outcome) variable was place of delivery. This was a dichotomous variable having 'hospital' and 'out of hospital' categories. The category of interest was hospital delivery.
- The independent variables were:

1. Level of knowledge on ways of MTCT and PMTCT: This was a composite variable derived from summing up of individual knowledge questions which were then dichotomized into "knowledgeable" (≥4); "not knowledge" (≤ 3) with the cut off being the mean score which was 4. Seven (7) questions used for constructing the knowledge variable were adapted from KDHS 2003 knowledge questions on ways of HIV transmission from mother to the infant and ways of prevention. They were analyzed for internal consistency reliability and had a Cronbach's alpha of 0.6, which is appropriate according to literature (Andy, 2000).

2. Health workers attitude as perceived by the respondents: This was also a composite variable derived from summing up scores from individual attitude statements of a six-item 5 point Likert scale (see questionnaire), then dichotomized into "negative"(≤21); "positive" (>21) using the mean score as the cutoff. The six-item five point likert scale had three positive and three negative statements. The five points were strongly agree (SA), agree (A), Neutral (N), disagree (D) and strongly disagree (SD). The items had an internal consistency reliability coefficient (Cronbach's alpha) of 0.8. Parts of the items were adapted from a study on attitudes towards people living with HIV/AIDS carried out in Cameroon (Mbanya et al., 2001).

3. Receiving information on HIV from health workers: This was dichotomous variable. It was derived from respondents' response to the question "did the health worker give you information on ways of HIV transmission and prevention" with "yes" or "no" response options.

4. Level of income: This was initially categorized into three, those who earned below three thousand, between three and five thousands and those who earned more than five thousands. However, this was later adjusted due to the skewed distribution of the categories into two main categories of those who earned 3000 kshs and less and those who earned more than 3000 kshs.

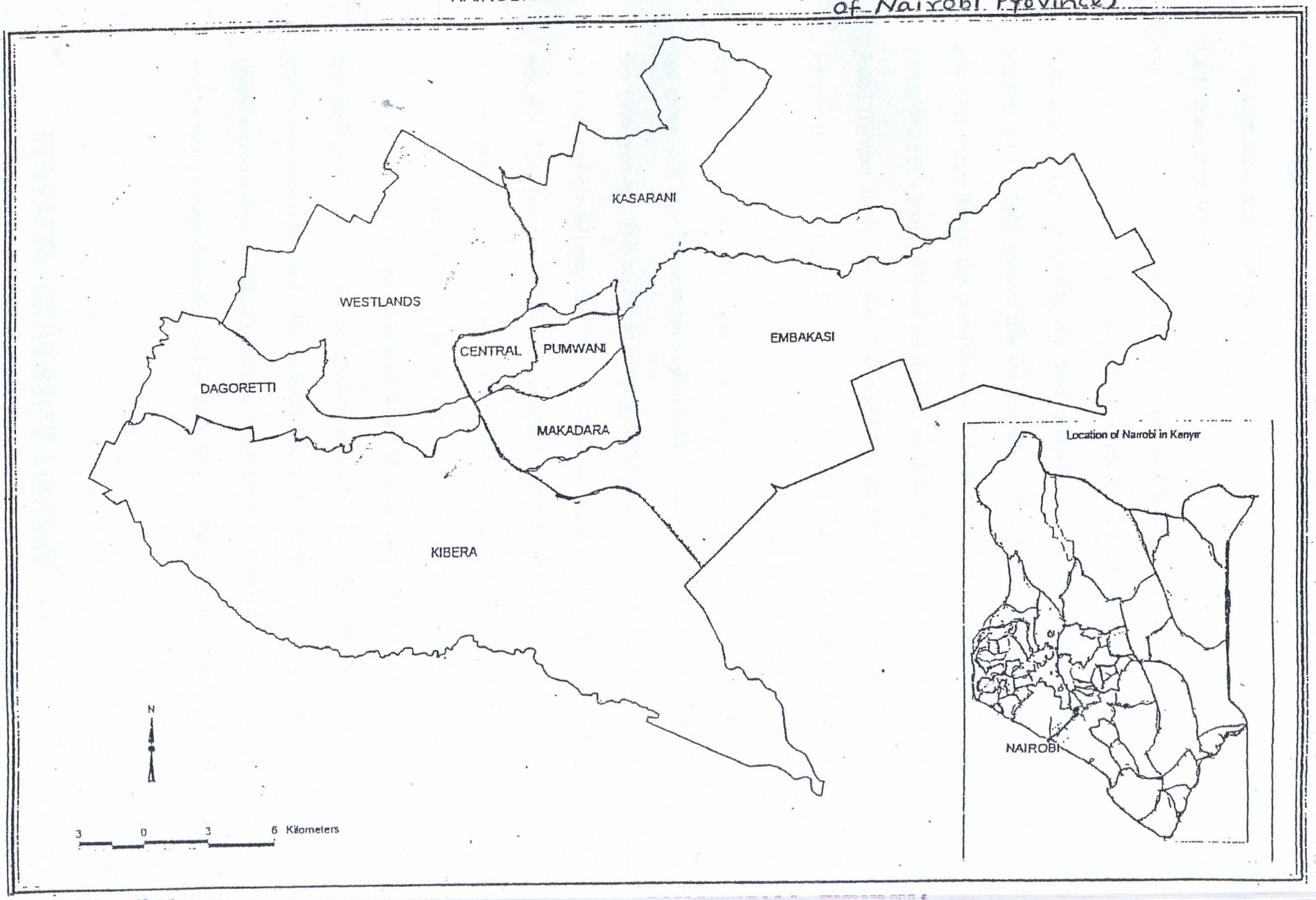


Figure 1: Map of Nairobi showing Kibera slums

3.4. Target Population

The target population was all HIV positive mothers delivering within a year in the slum settlement of Kibera.

3.4.1. Study Population

The study population or the accessible population for the study was composed of HIV positive mothers who were in the Community Based PMTCT project in Kibera . According to Hyman (2003), the total population of Kibera is approximately 700,000. KDHS 2003 showed that the general population comprises 51% females and 49% males hence the population of females in Kibera is roughly 357,000 (700000*0.51). Close to 65% of the females are in the reproductive age group (15-49 years) (Hyman 2003). This therefore means that the total female population in the reproductive age is about 232,050 (357,000*0.65). Central Bureau of Statistics (2003) reported that the general fertility rate for Nairobi is 106 births per 1000 women while Hyman (2003) reports that one out of seven women in the reproductive age group in Kibera are expected to give birth annually giving a GFR of about 143 per 1000 women. This results in roughly 33183 births in a year. According to the 2004 sentinel surveillance the HIV prevalence among pregnant women in Nairobi was 9%. This prevalence was used to approximate the number of HIV positive mothers delivering in a year within Kibera. This gave a figure of 2986 (33183*0.09) HIV positive mothers delivering in the year.

Residents in Kibera have poor access to social services such as clean water and sanitation coverage. As an informal settlement, housing is of extremely low quality and is overcrowded. The majority live below the poverty line and can only afford a meal a day. Resident's work as casual laborers in industrial establishments and women perform domestic work in neighboring affluent estates. Literacy levels

are very low with 50% (men) and 26 %(women) who have completed primary schooling (Hyman, 2003).

3.4.2. Inclusion Criteria

- HIV positive women who were in the project and had delivered within one year and knew their HIV status either before pregnancy or during pregnancy.

3.4.3. Exclusion Criteria

- Women who were in the project and knew of their HIV positive status after delivery.

3.5. Sampling Technique

Purposive sampling technique was used to sample the subjects for the study within the project whereas convenient sampling technique was used to sample the mothers into the community based PMTCT project as they became available. The HIV positive status was established before enrolling the mothers into the project. This was through HIV testing during the mobile ANC outreach services carried out all over the slum or from institutions carrying out counseling and testing.

Multi stage and purposive sampling techniques were used to sample Kibera slum for the community based PMTCT project. Out of the eight divisions in Nairobi District, Kibera division was purposively sampled for the project because of the vast slum settlement within the division. Out of the seven locations within Kibera division, four sub locations were purposively sampled since they have slum settlements; these were Laini Saba, Sera Ngombe, Mugumoini and Kibera. From the four sub - locations, the following villages were purposively sampled because they are slum settlements, Makina (include Kichinjio and Makongeni), Silanga, Lindi, Laini Saba, Gatwikira

(include Raila), Mugumoini, and Kibera (include Kisumu Ndogo, Kambi Muru, and Mashimoni).

3.5.1. Sample size determination

A sample size representative of the population of HIV positive mothers delivering within a year in Kibera was arrived at using the formula as used by Fisher et al., (1998) as shown, $N = Z^2 pq/d^2 D$ Where,

N = the sample size

Z = the standard normal deviate (1.96), 95% confidence interval

P = the proportion of the target population estimated to have a particular characteristic (in this case, HIV positive mothers). From the 2004 sentinel surveillance done in Nairobi a HIV prevalence of 9 % was reported. This was used to estimate the sample size.

d = level of statistical significance

D = Design effect – this was 1. (Mugenda and Mugenda, 2003).

Sample size at a confidence level of 95% (Z =1.96) and level of statistical significance set of 0.05 was

$$\frac{(1.96)^2 (0.09) (0.91)}{(0.05)^2} = 130.$$ However, because the target population is less than 10,000 (2986) the following formula was used to calculate the sample size

$nf = n/1+n/N$

where: nf = the desired sample size (when the population is less than 10,000)

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

N = the estimate of the population size (2986 – total deliveries from HIV positive women in a year)

Sample size = 130/1+ (130/2986) = 140

During the Community based PMTCT project period a total of 188 HIV positive women voluntarily enrolled in the project. These were conveniently sampled from the villages included in the project as they became available in the following distribution:

Village	Number in the program	Number interviewed (number in the study)
1. Makina	**40**	**31**
2. Silanga	**24**	**19**
3. Lindi	**27**	**23**
4. Kibera	**26**	**22**
5. Laini Saba	**21**	**19**
6. Mugumoini	**15**	**11**
7. Gatwikira	**35**	**21**
Total	**188**	**146**

Out of the total number in the project, 159 subjects were eligible for the study out of which 146 were interviewed. The others were not available for the study due to the following reasons; lost to follow up (4), died (3), moved out (2) and not willing to give information (4).

3.6. Construction of research instruments

A questionnaire capable of capturing data on various variables was constructed through developing relevant questions based on the study objectives. The questionnaire was composed of both open and closed ended questions.

3.7. Pilot study

The data collection tool was pre-tested among HIV positive mothers involved in PMTCT in Medesens Frontiers in Kibera. This site was selected because they were at that time offering PMTCT services to about 10 women who had young babies and were living in Kibera and were not involved in the IMC PMTCT program.

3.7.1 Validity

The validity of the instrument was established during the pilot study when it was noted that the instrument was able to collect the required information on the various variables earlier described.

3.7.2 Reliability

The reliability of the instrument was established from the pilot study as the responses given by the respondents on the questions were consistent. The items that showed lack of consistence were reconstructed accordingly.

3.8. Data collection technique

Data was collected using interviewer-administered questionnaires. This was done after the subjects consented to be interviewed.

3.9. Logistical and ethical considerations

Permission to carry out the research was granted by Kenyatta University, the Ministry of Education Science and Technology and the Ministry of Health. Participants were informed about the study after which informed consent of their participation was sought from them. They were not forced to give information; they were free to withdraw from the study without any penalty or loss of benefits. The information they gave was handled confidentially at all levels. No name was attached to the questionnaires and completed questionnaires were kept safely.

3.10. Method of data analysis

A total of 146 HIV positive women with children below one year were interviewed using a pre-tested questionnaire.

The information obtained from the questionnaire was checked and verified. Data entry, cleaning and analysis was done using SPSS statistical software version 12 for Microsoft windows. The distribution was checked for normality of distribution using kurtosis and skewness values for all the variables. There was none normally distributed hence all the tests performed were nonparametric.

Descriptive analysis was performed to give the frequency distribution of all the variables. In order to examine the association of individual factors with place of delivery, bivariate analyses were used. The Pearson Chi-Square statistic with its corresponding odd ratio (OR), and 95% confidence interval were computed to examine the magnitude and significance of the bivariate associations between each of the categorical independent variables with the dependent variable.

To assess the independent contribution of each independent variable in predicting likelihood of hospital delivery, the independent variables together with the dependent variable were entered into the multivariate logistic regression analysis. All the independent variables were introduced simultaneously in the model. The corresponding p values, odd ratio and confidence intervals were computed.

CHAPTER FOUR

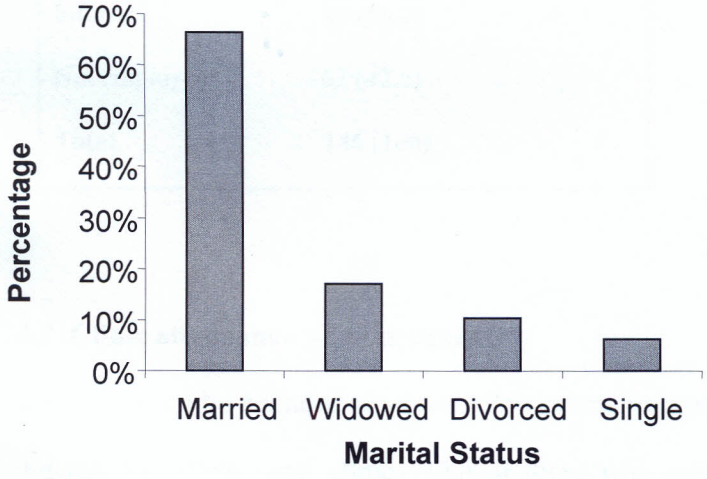
RESULTS

4.1 Socio-demographic characteristics of the study population

The results showed that out of all the respondents interviewed, 99.3 % were within the reproductive age of 15-49 yrs. Only one respondent was below 15 years while the oldest was 40 years old. The ages of their babies showed that 43% were below 3 months, 37% were between 4 and 7 months while 20% were between 8 and 12 months. 69.5 % of the mothers learnt of their HIV status when they were pregnant while 30.5 % knew of their HIV status before pregnancy.

The distribution of marital status showed that 66.4 % were married, 17.1 % were widowed, 10.3 % divorced while 6.2 % were single.

Figure 2. Distribution of respondents by marital status



Out of the respondents interviewed, 87% had primary level of education, 11.6% had secondary education and 1.4% did not have any formal education. None of the

respondents had post secondary education. 56.2 % had informal employment while 42.5 % were not employed while 1.4 % had formal employment.

Table 3. Distribution of respondents by level of education

Education level	*Number*	*(%)*
None	2	(1.4)
Primary	127	(87)
Secondary	16	(11.6)
Total	**146**	**(100)**

Table 4. Distribution of respondents by occupation

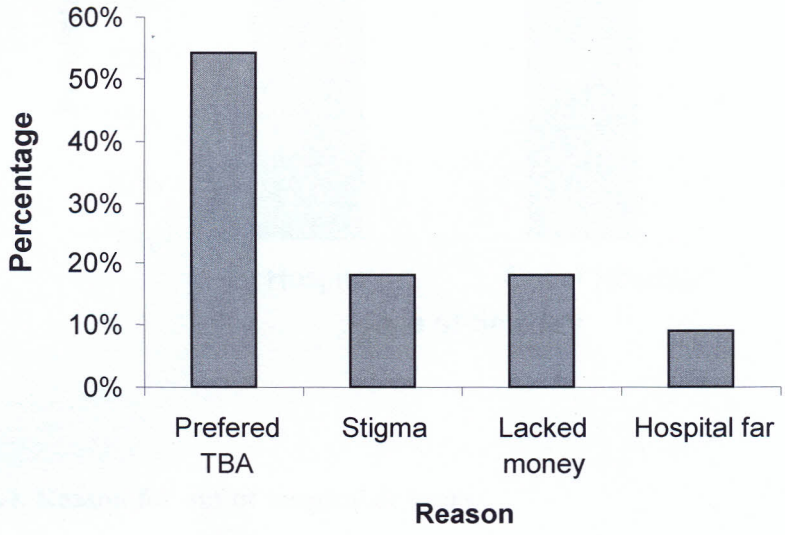
Occupation	*Number*	*(%)*
Formal	2	(1.4)
Informal	82	(56.2)
Not employed	62	(42.5)
Total	**146**	**(100)**

4.2. Clinic attendance when pregnant

The mothers who attended antenatal clinic when pregnant were 92.5 % while 7.5 % did not attend antenatal clinic. Out of those who attended ANC, 62 % attended because it is the normal practice, 21 % attended so as to know their HIV status, while 17 % attended because they were sick. Out of the 11 respondents who did not attend ante natal clinic 54 % reported that they preferred to see traditional birth attendants,18 % reported that they did not attend due to lack of clinic fee, 18.1 % did

not attend due to fear of stigma and discrimination from the health workers while 9.1 % reported that hospital was too far for them.

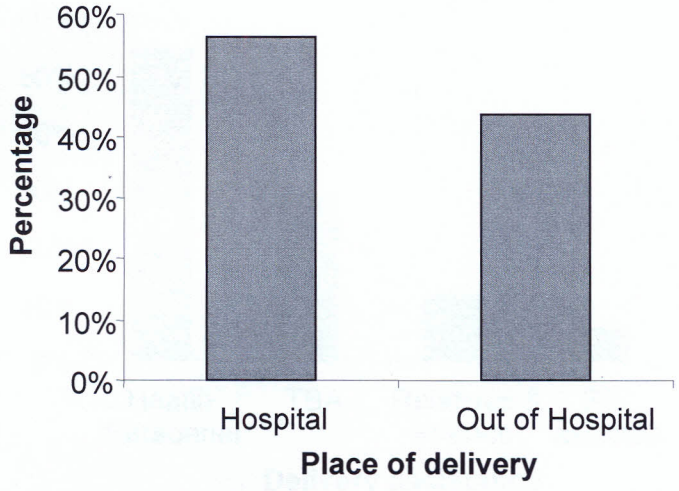
Figure 3. Distribution of respondents by reason for not attending ANC



4.3. Place of delivery

Out of the mothers interviewed, 87 % planned to deliver in the hospital, 9.6 % planned to deliver at home while 3.4 % did not have any delivery plans. On assessing their actual place of delivery 56.2 % delivered in the hospital while 43.8 % delivered out of the hospital. 95.9 % of the women interviewed had vaginal deliveries while 4.1 % had caesarean section deliveries. Out of the eight (8) mothers who had caesarean section two (2) of them chose to have CS to protect the child from HIV infection while six (6) had caesarean section due to complications during delivery.

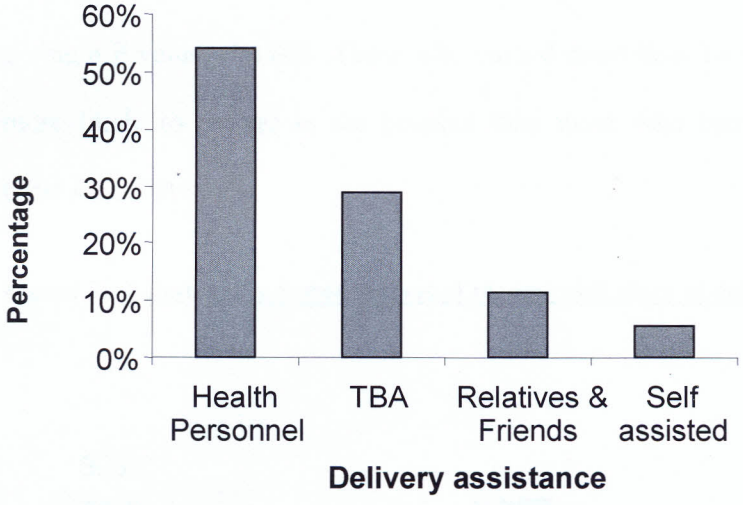
Figure 4. Distribution of respondents by place of delivery



4.4. Reason for out of hospital delivery

Out of those who did not deliver in the hospital, 55.9 % reported that it was an emergency, 35.3 % cited lack of money, 5.9 % said it was their normal practice to deliver at home, while 2.9 % reported that the hospital was far and so had to deliver at home. From the study population health professionals delivered 54.1 %, 28.8 % were assisted by TBA's, 11.6 % by relatives and friends while 5.5 % were not assisted.

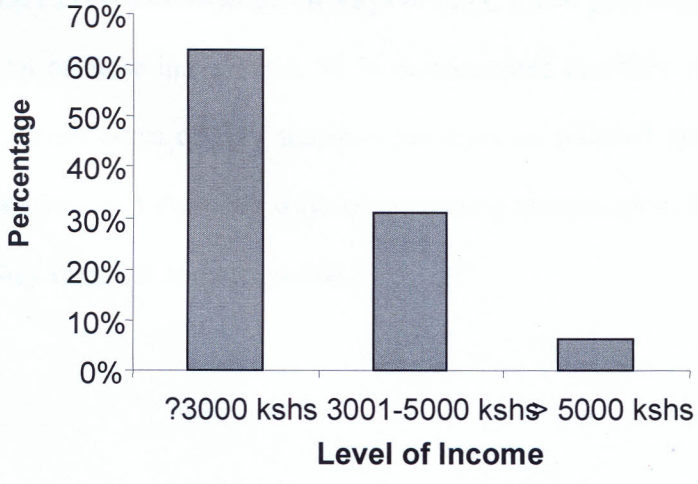
Figure 5. Distribution of respondents by who assisted at delivery



4.5 Monthly income

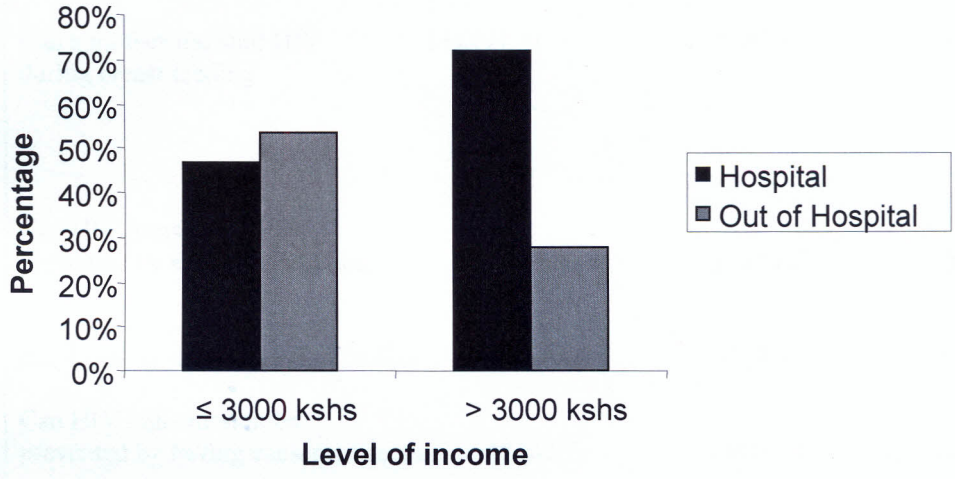
The monthly income distribution showed that 63.0 % had a monthly income below 3000 KShs, 30.8 % had incomes between 3001-5000 Kshs while 6.2 % earned over 5000Kshs. For analysis purposes this was subsequently divided into two broad categories of those earning below 3000kshs (63%) and those earning more than 3000 kshs (37%).

Figure 6. Distribution of respondents by income levels



An analysis of the bivariate relationship between level of income and place of delivery showed that level of income was significantly related to place of delivery giving a P value of 0.003. Those who earned more than 3000 kshs were three times more likely to deliver in the hospital than those who earned less (OR=2.9, 95% CI=1.44-6.10).

Figure 7. Relationship between level of income and place of delivery



4.6 Level of knowledge on ways of MTCT and prevention

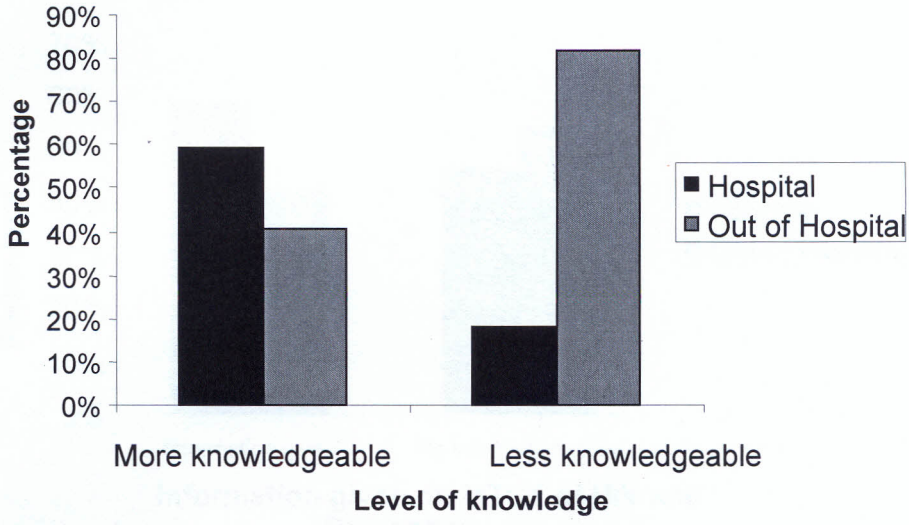
Out of those interviewed, 92 % demonstrated that they were knowledgeable on the possible ways of HIV transmission from an infected mother to the infant and the possible and available ways of preventing transmission. However, 8 % showed that they were not knowledgeable.

Table 5 Percent distribution of respondents by level of awareness to ways of HIV transmission to the infant and ways of prevention

Area of knowledge	*Knowledgeable*	*Not knowledgeable*	*Total %*
	n (%)		
Can a mother transmit HIV to her infant	136 (93.2)	10 (6.8)	100
Can a mother transmit HIV during pregnancy	61 (41.8)	85 (58.2)	100
Can a mother transmit HIV during delivery	126 (86.3)	20 (13.7)	100
Can a mother transmit HIV during breast feeding	134 (91.8)	12 (8.3)	100
Can HIV transmission be prevented by taking certain drugs	125 (85.6)	21 (14.4)	100
Can HIV transmission be prevented by avoiding breastfeeding	132 (90.4)	14 (9.5)	100
Can HIV transmission be prevented by having caesarean section	48 (32.9)	98 (67.1)	100

A bivariate analysis of the relationship between level of knowledge and place of delivery showed a significant relationship (P value= 0.008), those who had more knowledge were six times more likely to deliver in the hospital than those who had less knowledge (OR=6.5, 95% CI=1.36-31.46).

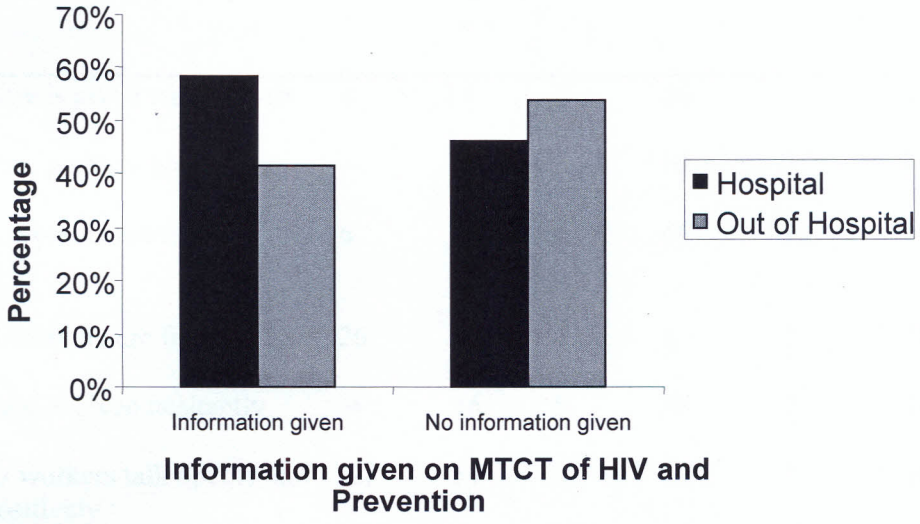
Figure 8. Relationship between level of knowledge and place of delivery



4.7 Information given by health workers

An assessment of whether health workers gave the mothers information on ways of HIV transmission from the mother to the infant and possible ways of prevention showed that 82.2 % of the respondents reported that they were given information while 17.8 % reported that they were not given any information. Out of those who reported that they were given information, 63.7 % were able to recall and correctly state a maximum of 3 facts on ways of MTCT and prevention while 36.3 % were able to correctly recall 4 facts and above. A bivariate analysis of the relationship between having been given information on ways of HIV transmission and prevention and place of delivery did not show any significant relationship (P Value = 0.256, OR=1.6, 95 % CI = 0.697 – 3.830).

Figure 9. Relationship between having received information on ways of HIV transmission and prevention and place of delivery



4.8 Health workers attitude as perceived by the respondent

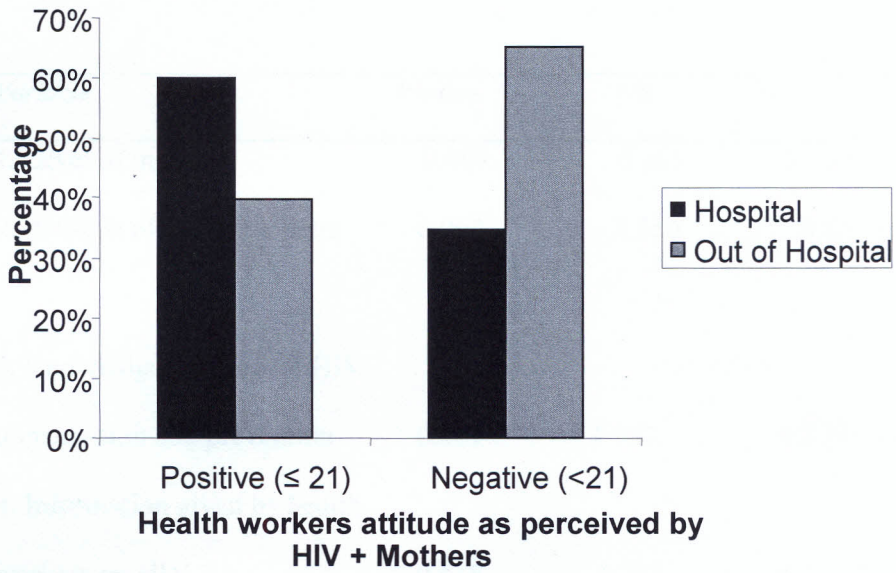
An analysis of the responses to the items showed that 84 % who scored above the mean score perceived the health workers as having a positive attitude towards them while 16 % who scored below the mean score perceived the health workers attitude as being negative towards them. A percent distribution of respondents to the attitude statements has been shown in the table 6.

Table 6. Percent distribution of respondents by response to attitude statements

Attitude statement	*SA*	*A*	*N*	*D*	*SD*	*Total %*
Care is given with disgust	6	14	3	56	21	100
Care given is good	21	66	3	10	0	100
H/workers are fearful	6	15	4	65	10	100
H/workers are friendly	20	67	3	8	2	100
Care is given hesitantly	4	16	5	70	5	100
H/ workers talk openly and positively	27	59	1	11	2	100

A bivariate analysis of the relationship between attitude of health workers as perceived by the HIV positive mothers and place of delivery showed a significant relationship, P value = 0.024 (OR=2.8, 95% CI = 1.116-7.183).

Figure 10. Relationship between attitude and place of Delivery



4.9 Overall effect of variables in determining place of delivery

An analysis of the individual contribution of the independent variables in determining the place of delivery using multiple logistic regressions showed that level of income was the most significant factor in determining place of delivery (P = 0.007, OR = 0.3 58, 95 % CI 0.169 – 0.758). The value of odds ratio and confidence interval which was less than one indicated that higher income was protective in that it increased the chances of one seeking hospital delivery which is important in reducing the risk of HIV transmission from the infected mother to the infant compared to home delivery.

Table 7. Multiple logistic regression

Variable	*P value*	*OR*	*95 % CI for OR*
1. Level of income	0.007	0.358	0.169 – 0.758
2. Attitude of health workers	0.060	2.550	0.962-6.759
3. Knowledge on ways of HIV transmission and prevention	0.071	4.537	0.879-23.423
4. Information given by health workers on HIV	0.438	1.228	0.731-2.063

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion

The findings of this study refute the following hypotheses: that level of income does not affect access to safe obstetric services, that attitude of health workers as perceived by HIV positive mothers does not affect readiness to use safe obstetric services and that the level of knowledge on MTCT and prevention does not affect readiness to use safe obstetric services. However, it confirmed the hypothesis that receiving information on ways of MTCT HIV transmission and ways of prevention from health workers does not affect readiness to use safe obstetric services.

Most of the respondents were within the reproductive age group between 15-49 years (98%) with a general low level of education as majority had primary level of education and none had post secondary education. This could have been the reason for the high number that did not have formal employment. Majority of the women were married with only a few who were single and widowed. The question that comes up is how much the husbands knew of their HIV status as well as their involvement in PMTCT and how this affected their uptake of PMTCT services. Partner support is important as this may increase a mother's willingness to take up crucial PMTCT services without fear of being discriminated against by her partner. This support should start by the mother disclosing her HIV status to her husband.

Majority of the mothers (69.5%) learnt of their HIV status when they were pregnant while 30.5 % knew of their HIV status before pregnancy. In addition, great number reported attending ANC clinic when pregnant (92%) in which 19% cited that

their main reason for attending ANC was to know their HIV status. This could have been attributed to the intensive PMTCT awareness and education campaigns on the importance of HIV testing at pregnancy during the project period within Kibera slums. Knowledge of HIV infection during pregnancy is important since it has the potential benefit of reducing the risk of HIV transmission to the infant as necessary precautions can be taken during pregnancy and delivery (USAID/FHI, 2001). Consequently, voluntary HIV counseling and testing is a vital component of MTCT interventions and has been proposed as an important point of entry to HIV prevention and care (USAID/FHI, 2001).

Appropriate delivery plan for a HIV positive mother is important especially because of the increased HIV transmission risk during delivery (Besser et al., 2002). This risk can be reduced if appropriate safe practices such as vaginal cleansing when there is prolonged rupture of membranes, avoidance of episiotomies and ECS before rupture of membranes available in a hospital set up are implemented (Besser et al., 2002). Hence, early and appropriate delivery plan to deliver in the hospital especially for a HIV infected pregnant woman is important.

Although majority of the mothers (87 %) planned to deliver in the hospitals, only 56.2 % delivered in the hospital while 43.8 % delivered out of the hospital. This could be implicative of the need in the mothers to deliver within a hospital set up but are not able to do so due factors of cost and availability of services. An exploration on reasons for home delivery showed that lack of finances, preference for TBA,s and lack of proper infrastructure(roads) hindered the mothers from delivering in the hospitals. There is need to consider these factors if the uptake of hospital delivery is to improve.

The distribution of place of delivery among the respondents which showed that 43.8 % delivered at home was found to be consistent with earlier findings by African Population and Health Research Centre (APHRC) which stated that, only about half of deliveries in the slums of Nairobi take place in the hospital (APHRC, 2002). Asghar (1999), states "a majority of births in most developing countries, particularly in the rural areas take place at home usually assisted by TBA's and friends".

A key finding from this study was the fact that 28.8 % of the mothers were assisted by TBAs during delivery. This was found to be similar to the figure given on those assisted by TBA's during delivery by KDHS (2003) of 28%. This shows that TBA's play an important role in the obstetric care of these women despite their positive serostatus. Majority of them still have strong belief and trust on TBA's calling for an exploration of reasons behind this trend. In addition, the question of whether they know that their clients are HIV infected and if they take the necessary precaution is still not known. This is alarming because of the risk of HIV infection that they (TBA's) are exposed to; hence there is an urgent need to educate them on the same and involve them in PMTCT programmes. A study on role and acceptability of TBA's in a rural community in south India showed that 82% of the women stated that the services of TBA's were very useful to them (Sundaram et al., 1996).

The implementation of cost sharing policy in public hospitals in most African countries means that medical care which includes hospital delivery and ANC care has some cost implications (Henderson et al., 1994). This may imply that level of income is a key determinant of financial access to health services especially in resource-constrained set up. This study showed that majority of the respondents were

not in any form of employment and among those who were employed a good number were in informal employment. Consequently, most of them cited low income levels which may explain why some of them sort the services of TBAs who may be relatively cheaper as compared to delivering within the hospital.

A multivariate analysis of the individual contribution of the independent variables to hospital delivery showed that level of income was the most significant factor in determining the place of delivery. This finding was found to be similar to findings of a study that sought to investigate barriers to the use of antenatal and obstetric care services in rural Kano, Nigeria, in which 107 pregnant women were interviewed, 88 % of the women were not receiving antenatal care and 46% of these women cited limited financial resources as one of their reasons for non use of antenatal services (Adamu and Salihu, 2002). Because of these findings the study suggested that in order to improve utilization of antenatal care services (which is crucial in case of HIV infection) efforts to relieve poverty and empower women economically were needed (Adamu and Salihu, 2002). In a similar study in Canada by Forsyth et al (2001) a significant relationship between income distribution and mortality was seen. The implications for these findings is that those mothers who have low income levels have an indirect increased risk of infecting their infants with HIV as they may not afford hospital delivery which may provide protection as far as HIV transmission is concerned.

Therefore, in as much as PMTCT programs in such set-ups put emphasis on the importance of hospital delivery there is need for financial assistance for HIV positive mothers to facilitate hospital delivery. The financial support may be in the form of paying up of hospital delivery bills or development of income generating activities. The financial input and increased awareness of the importance of hospital

delivery in PMTCT programs may increase utilization of hospital delivery among HIV positive mothers in low-income set-ups like Kibera. This may in the long run help reduce the number of infants infected with HIV at delivery due to the increased risk of HIV transmission at this time.

Majority of the respondents had more knowledge on the possible ways of transmitting HIV from an already infected mother and ways of protecting the infant from being infected. The high knowledge reported in this study could have been due to increased education and awareness campaigns on PMTCT in Kibera by IMC and other organizations carrying out HIV programs in the area. Majority of those who had more knowledge delivered in the hospital as was reflected in the significant association between level of knowledge and place of delivery (P = 0.008). This was found to be consistent with findings from a study carried out in Kenya in Homabay District in which HIV positive mothers who had high knowledge on ways of MTCT were more receptive to consider taking up an infant feeding alternative to protect the child from HIV infection (P = 0.001, OR = 1.41, 95% CI= 1.04-3.86).

This is implicative of the impact increased knowledge on MTCT and PMTCT would have in improving rates of hospital delivery and uptake of other PMTCT services which is crucial in preventing HIV infection in children in an area with high HIV prevalence rate like Kibera.

Awareness on possibility of transmission during pregnancy seemed low, in addition, majority of the women were not aware that caesarean section could reduce the risk of HIV transmission if done safely before rupture of membranes according to results from various studies. However, two mothers reported having ECS to protect their babies from HIV infection. These possible ways of transmission and prevention

need to be emphasized during educational and awareness campaigns on PMTCT in the community and at the facility level.

Majority of the mothers reported that they could agree to have ECS so as to protect the child from infection. This could be a good indication although widespread application of ECS in poor settings like Kibera may not be appropriate because of the postoperative complications which may not be easy to manage given their immunocompromised state (Landesman et al., 1996). In developed countries use of ECS among HIV positive mothers is high and common due to readily available highly active antiretroviral therapy and infrastructure within the hospitals. However, even in such settings the benefits of ECS and dangers of postoperative complications should be carefully weighed especially if the viral load is high and the mother is presenting with signs of AIDS (Semprini et al., 1995).

The national PMTCT guideline developed by NASCOP indicates that provision of information is an essential component of HIV counseling in the ANC (NASCOP, 2002). In the case of a HIV positive mother the information given include the available MTCT interventions such as ARVs, safer obstetrical practices, safer sexual practices among others. The information health providers give to HIV positive mothers during ANC visits on HIV is important as it would assist them to decide on taking up a PMTCT intervention or not (Preble and Piwoz,2001). This should be exhaustive and should include aspects of how HIV can be transmitted from the mother to the infant and the possible ways through which this can be prevented. Majority of the respondents reported that health workers gave them information on ways of transmission and prevention. This was found to be consistent with the Ministry of Health (Kenya) requirement that mothers visiting ANC whether HIV positive or not be given information on HIV, aspects of maternal HIV transmission

and ways of prevention (NASCOP, 2003). However, of importance is the amount of information given to the mothers and it's adequacy in helping them make crucial decisions such as taking up an infant feeding option, place of delivery and mode of delivery.

There was no significant relationship between having received information on MTCT interventions and place of delivery (P value = 0.142). The information they received was probably not enough to influence their decision on place of delivery given their HIV serostatus. A further analysis of how much information they received showed that majority could only recall a maximum of three facts against a myriad of information that they should be given. However this was subjective and based purely on what one was able to remember. Some of them may have forgotten some of the information they were given by the health providers during their ANC visit.

Hence this may not imply that receiving information on HIV is not relevant in determining whether a mother would deliver in the hospital or not. A more objective method of knowing just how much information is given to the mothers should be employed before making such a conclusion. This could be done through an observation checklist at the facility during ANC visit of HIV positive women. Otherwise, it remains important that HIV positive mothers presenting at the ANC, for delivery and for postnatal care be given enough information so that they can take up PMTCT services.

Majority of the respondents (84%) reported that health workers had a positive attitude towards them. These findings were contrary to findings from previous studies which have indicated that health workers have a negative attitude towards HIV positive patients. For example, results of a study conducted in Metet hospital in

Cameroon indicated that attitude of health providers towards people living with HIV/AIDS was very poor: 15% of the patients interviewed in this hospital indicated that they were attended to with signs of disgust and/ or hatred while 12% of the service providers indicated that they would treat HIV/AIDS patients with scorn (Mbanya et al., 2001). Similarly, a human rights watch report from the Dominican Republic reported gross mismanagement of HIV positive pregnant women by health personnel during delivery (Human Rights Watch, 2004). Several women living with HIV reported that medical personnel either withheld or postponed medical procedures such as caeserean section because of their positive HIV status, thus pointing out the negative attitude most of the health care personnel had towards HIV positive mothers (Human Rights Watch, 2004).

Findings of positive attitude of health workers as perceived by HIV positive mothers may have been due to the health environment existing in Kibera at the time of this study. IMC and other organizations carried out various trainings on PMTCT and VCT which included aspects of counseling of HIV positive women. Hence, these findings may have been a true reflection of the change in the attitude of health personnel. In addition, increased education awareness campaigns on HIV/AIDS and more specifically on PMTCT at facility and community levels may have also contributed to this. One of the strategies of the community based PMTCT project by IMC in Kibera was to train and sensitize health workers from all health centres within Kibera and its environs on PMTCT with an aim of increasing uptake of PMTCT services within this area. This was done by NASCOP with the support of IMC, in which the importance of positive attitude towards HIV positive mothers was emphasized as an important ingredient to the acceptability of MTCT interventions.

This finding was similar to findings from a comprehensive study, conducted in India from 2000-2004 which found that tailored interventions to protect the well being of both patients with HIV and health workers contributed to a safer and less stigmatizing and discriminatory hospital environment in which improvement in health workers attitudes toward people living with HIV was reported (Horizons, 2006).

A Bivariate analysis of the association between attitude and place of delivery showed a significant association ($p = 0.024$, OR = 2.8, 95% CI = 1.116-7.183). Those respondents who perceived that the health workers had a positive attitude towards them were more likely to deliver in the hospital. This finding shows the importance of positive attitude of health workers towards HIV positive mothers which would lead most of them to seek hospital delivery which is crucial in reducing the risk of HIV transmission from infected mother to the infant.

5.2 Conclusions

- This study showed that income level was the most significant barrier to hospital delivery followed by knowledge on ways of HIV transmission and prevention and attitude of health workers and. Majority of the women earned less than 3000kshs which is below the minimum wage in Kenya.
- Awareness on PMTCT among HIV positive mothers in Kibera seemed high; this could be attributed to the community awareness campaigns on PMTCT in the area by IMC and other organizations. Specific knowledge on certain ways of transmission such as during pregnancy and use of ECS as one of the preventive interventions was lacking. More information should therefore be given in these areas by health workers and those implementing PMTCT programs.

- Despite a lot of awareness on PMTCT and knowledge of their HIV serostatus many women still preferred to deliver with the help of TBA's oblivious of the increased risk of HIV transmission they exposed their children to. Low income levels among majority of the women may have contributed to the high number of women who sought delivery services from TBAs.
- Attitude of health workers influenced the mothers' readiness to utilize hospital delivery hence the need for health workers to have a more positive attitude towards HIV positive mothers.
- Majority of the mothers received some information from the health workers on MTCT and PMTCT. There was no significant relationship between receiving information and readiness to have hospital delivery.

5.3 Recommendations and further research

- In general, because level of income was found to be the most important determinant of hospital delivery, PMTCT programs in Kibera should address this factor because of its importance in determining uptake of hospital delivery. Components of financial support should be included in these programs.
- Traditional birth attendants should be integrated within PMTCT programs as most women in resource constrained settings still seek their services (probably due to economic reasons) despite government directive to get rid of them.
- The level of knowledge on MTCT and prevention should also be increased through educational activities aimed at providing information on PMTCT. This should be supplemented by relevant information, educational and

communication (IEC) materials and behavior change campaigns to mobilize the community on the importance of hospital delivery.

- PMTCT programmes should integrate educational training for health workers focused on the need for a more positive attitude towards HIV positive mothers since this has proved to influence their willingness and readiness to deliver in the hospital.
- Health workers should also be trained on effective communication; this can assist them in passing information to HIV positive mothers effectively.
- More education should be given to HIV positive mothers on the increased risk of HIV transmission they expose their children to when they deliver at home with the help of TBA's or relatives and friends.
- A more objective way of determining how much information is given to the mothers at the facility level is recommended. This can be done through an observation checklist during ANC visit.

Areas of further research include:

- How to effectively integrate TBA's in PMTCT programmes.
- An assessment of the impact of PMTCT trainings on the attitude of health workers.
- Level of male involvement in PMTCT.
- An assessment of the amount of information given by health workers using observation checklist.

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APPENDIX A

QUESTIONNAIRE

Socio-demographic characteristics

001. Age of respondent (*Umri wa mhojiwa*)	1.Below 15 years ☐ 2.15-20 years ☐ --- 3. 21-30 years ☐ 4. Above 30 years ☐
002 Age of baby (*umri wa mtoto)*	1. Below 3 months 2. 4 - 8 months 3. 9 – 12 months
003. Time of knowing HIV status	1.When pregnant 2.Before pregnancy 3. After delivery
004. Marital status (*umeolewa*)	1. Single/(*sijaolewa*) ☐ 2. Married/(*nimeolewa*) ☐ 3. Divorced/separated/(*nimetalakiana/nimetengana*) ☐ 4. Widowed/(*mjane/nimefiwa*) ☐ 5. Other----------
005. Level of education (*Kiwango cha elimu*)	1. Primary level ☐ 2. Secondary level ☐ 3. College level ☐ 4. University level ☐ 5. Other----------
006. Occupation (*uhikimu*)	1.Formal employment ☐ 2. Informal employment ☐ 3. Other (specify)----------
007. Occupation of spouse(if married) or dependant	1. Formal employment ☐ 2. Informal employment ☐ 3. Other ----------

008. How much does your family earn in a month? (*Ni kiwango gani ya pesa familia yako upata kwa mwezi?*)	1. Less than kshs.3000 2. Between kshs.3000-5000 3. Between kshs.5000-10, 000 4. Over kshs.10, 000
009. How much do you spend on rent in a month? (*Ni kiwango gani ya pesa mnatumia kulipa nyumba?*)	_____
010. How much do you spend on food in a month? (*Ni kiwango gani ya pesa mnatumia kwa chakula kila mwezi?*)	_____

011. Did you go to the clinic when you were pregnant with this baby?
(*Ulipokuwa na mimba ya huyu mtoto, ulienda kliniki au hospitali ili kupata huduma za uja uzito?*)

1. Yes ☐ 2. No ☐ **(go to 013)**

012. What are some of the reasons that made you decide to go to the clinic?
(*Ni sababu zipi zilizokufanya uamue kutembelea kliniki?*)

a. To know HIV status
b. For normal checkup and immunization
c. Was sick
d. Others

013. What are some of the reasons that made you not to go to the clinic?
(*Ni sababu zipi zilikukufanya uamue kutoenda kliniki?*)

1. Lack of clinic fee/ (*ukosefu wa pesa*) ☐
2. Preferred to go to TBA/ (*nilitaka kuona mkunga*) ☐
3. Feared stigma and discrimination from H/worker ☐
   (*uoga ya kubaguliwa na mtoa huduma*)
4. Hospital is far/ *(hospitali iko mbali)* ☐
5. Other (specify)/ (*nyingine(taja)*_____

014. Did the health worker talk to you about how an HIV positive mother may transmit HIV to her baby?
(*Je, mtoa huduma alizungumza na wewe kuhusu vile mama aliye na virusi vya ukimwi anaweza kumwambukiza mtoto wake virusi hivyo?*)

1. Yes ☐ **(go to 015)** 2. No ☐

015. Name some of the ways mentioned to you **(LIST DOWN)**
(*Taja baadhi ya njia ulizoelezwa*)

---

016. Did the health worker give you any information on how the infant could be protected from being infected with HIV by the mother?
(*Je, mtoa huduma alikupa habari jinsi ambavyo mtoto anaweza kuzuiwa ili asipate kuambukizwa na virusi kutoka kwa mama?*)

1. Yes/ (*ndi*) ☐ **(go to 017)** 2.No/ (*la*) ☐

017. Mention the ways you were informed about.**(LIST DOWN)**
(*Taja njia za kuzuia uambukizaji wa mtoto ambazo alikufahamisha.*)

---

018. Where did you plan to deliver your baby?
(*Ulipanga kuzalia mtoto wako wapi?*)

1. Hospital(*hospitali*) ☐
2. At home/TBA (*nyumbani/kwa mkunga*) ☐
3. Other (specify)_____

019. Where did you actually deliver your baby?
(*Ulizaa wapi?*)

1. Hospital ☐ **(go to 022)**
2. At home/TBA ☐ **(go to 020 & 021)**
3. Other (specify)_____

020. If you delivered at home,what was your reason for delivering at home?
(*Ni sababu zipi zilizokufanya uzalie nyumbani?*)

1. Lack of money to go to hospital/ (*ukosefu wa pesa za hospitali*)☐

☐

2. It was an emergency/(*ilikuwa ni ghafla*)

3. It is the normal practice/ (*ndiyo kawaida*) ☐

4. Other (specify)_____

021. If you delivered at home,who assisted you with the delivery?
(*Nani alikusaidia kuzaa nyumbani?*)

1. Traditional birth attendant/ (*mkunga*) ☐
2. Relative/friend / (*rafiki*) ☐
3. Not assisted/ (*nilijizalisha*) ☐
4. Other (specify)_____

022. What was the mode of delivery?
Ulizaa kwa njia gani?

1. Caesarean section/ (*kwa kufanyiwa upasuaji*) ☐ **(go to 024)**
2. Vaginal delivery/ (*kwa njia ya kawaida)* ☐

023. Did you choose to have a cesarean section?
(*Je, ulichagua kufanyiwa upasuaji?*)

1. YES (elective) ☐ **(go to 024)**
2. NO (emergency) ☐

024. What was your reason for choosing to have a cesarean section?
(*Sababu yako ya kuchangua kufanyiwa upasuaji ilikuwa nini?*)

1. To protect the child from being infected with HIV ☐
(*Kuzuia mtoto asiambukizwe na virusi vya ukimwi*)
2. To avoid a lot of pain
(*Kuepuka uchungu wa kuzaa*) ☐
3. Others (specify)-(*nyingine(taja)*_____

025. Did you have the caesarean section done within Kibera?
(*Ulifanyiwa upasuaji Kibera?*)

1. Yes/(*ndio*) ☐ 2. No(*Hapana*) ☐ **(go to 026)**

026. Where did you have it done?
(*Ulifanyiwa upasuaji wapi?*)

027. In your opinion, do you think that facilities that can offer safe delivery are easily accessible by the women in Kibera?
(Je, kwa maoni yako, unafikiri wanawake wa kibera wako na makadarati za kuzalia karibu nao?)

1. Yes (*ndio*) ☐ 2. No (*la*) ☐ 3. Do not know (*sijui*)

028. If no what is the greatest obstacle

1. Money ☐
2. Roads ☐
3. Few or lack of facilities ☐
4. Others ----------

029. **(For those who attended ANC or delivered in hospital)**
For each of the following statements below please indicate the extent of your agreement or disagreement.

	Strongly agree	agree	Neither agree nor disagree	disagree	Strongly disagree
Care provider attend to HIV positive mothers with disgust (*wagonjwa wanahudumiwa kwa kuchukiwa)*	1	2	3	4	5
Care given to HIV positive mothers is very good (*wagonjwa hupewa huduma nzuri)*	5	4	3	2	1
Care provider attend to HIV positive mothers with a lot of fear (*wagonjwa wanahudumiwa kwa uoga mno)*	1	2	3	4	5
Care provider are very friendly to HIV positive mothers (*wagonjwa wanaonyeshwa upendo*)	5	4	3	2	1
Care provider attend to HIV positive mothers hesitantly (*wagonjwa wanahudumiwa kwa kusitasita)*	1	2	3	4	5
Care provider talk openly and positively to HIV positive mothers *(wagonjwa wanaongeleshwa vizuri)*	5	4	3	2	1

030. Can the virus that causes AIDS be transmitted from mother to child?
(Je, akina mama wajaa wazito na wana virusi vya ukimwi wanaweza kuambukiza watoto wao?)

1. Yes(*ndio*) ☐ 2. No (*la*) ☐ 3. Don't know (*sijui*) ☐

031. Can a HIV positive mother infect her baby with HIV
(Je, mama aliye na virusi vya ukimwi anaweza kumuambukiza mtoto wake virusi vya ukimwi wakati wa)

	1.Yes/ (*ndio*)	2. No/ (*la*)	3. Don't know
1.During pregnancy *wakati wa uja uzito*			
2. During delivery *wakati wa kuzaa*			
3. During breastfeeding *wakati wa kunyonyesha*			

032. Can a mother who is infected with HIV reduce the risk of giving the virus to the baby by?
(Je, mtoto anaweza kuzuiwa asiambukizwe na virusi vya ukimwi kwa njia zifuatazo?)

	1. Yes/*ndio*	2. No/*la*	3. Don't know/*sijui*
1. Taking certain drugs when pregnant *(kwa kumeza tembe)*			
2. Avoiding to breastfeed *(Kutonyonyesha mtoto)*			
3. By having a caeserean section *(Kwa upasuaji)*			

033. Would you agree to have elective caeserean section to protect the child from HIV infection?

1. Agree ☐
2. Not agree ☐ **(go to 034)**

034. Give reason

1. Fear ☐
2. Can not afford ☐
3. Others ----------

APPENDIX B

INFORMED CONSENT FORM

I confirm that the purpose of this study (including the risks and benefits) has been explained to me; and that I have understood the same.
I hereby agree to take part in this research on PMTCT. I agree that all the information I give will be confidential and the filled questionnaire will be kept under lock and key. I will not receive any money for participating in this research. I agree that my participation is on a voluntary basis and I may choose not to answer some of the questions. I also agree that I may choose to stop the interview and this will not affect my benefiting from any PMTCT Program.

_____ _____

Signature of interviewee Date
Certifying that written informed consent has been given
By respondent

APPENDIX C

RESEARCH AUTHORISATION FORM

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

Telegrams: "EDUCATION", Nairobi
Telephone: Nairobi 334411
When replying please quote

Ref. No. MOEST 13/001/35C 22/2

JOGOO HOUSE "B"
HARAMBEE AVENUE
P.O. Box 30040-00100
NAIROBI

26th January, 2005

Lize Ojowi Apondi
Kenyatta University
P.O. BOX 43844
NAIROBI

Dear Madam

RE: RESEARCH AUTHORISATION

Following your application for authority to conduct research on "Barriers to safe obsteric practices among HIV positive mothers" I am pleased to inform you that you have been authorised to carry out your research in Kibera slums, Nairobi for a period ending 30th April, 2005.

You are advised to report to the Provincial Commissioner Nairobi, the Provincial Director of Education Nairobi, the Provincial Medical Officer of Health Nairobi and the District Officer, Kibera Division before commencing your research project.

You are further advised to deposit two copies of your research report to this Office upon completion of your research project.

Yours faithfully

B. O. ADEWA
FOR: PERMANENT SECRETARY

Cc
The Provincial Commissioner
Nairobi

The Provincial Medical Officer of Health
Nairobi

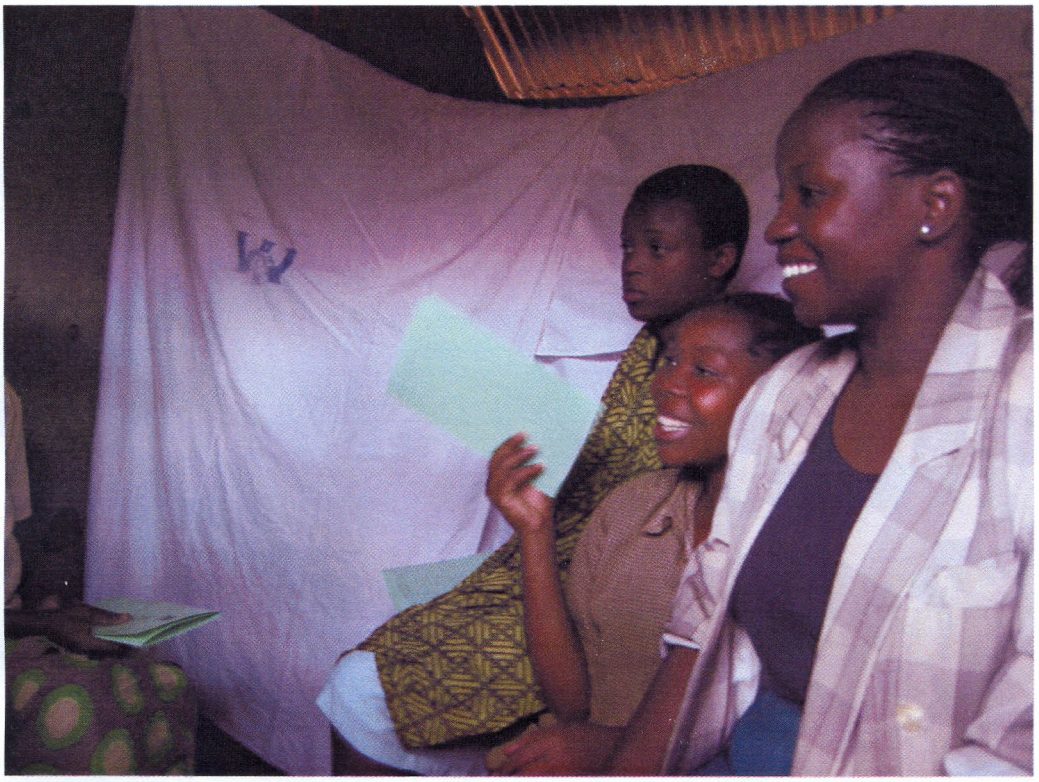
The Provincial Director of Education
Nairobi

The District Officer
Kibera Division
Nairobi

APPENDIX C

IMAGES FROM THE FIELD

Support group session at Great Langata women group at Gatwikera, Kibera



Counselling session for ANC Mothers on PMTCT during mobile clinic at Lindi,Kibera