NON ADHERENCE TO PMTCT TREATMENT AND LOSS TO FOLLOW UP OF HIV POSITIVE MOTHERS AND BABIES IN MOMBASA COUNTY, KENYA

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF PUBLIC HEALTH (EPIDEMIOLOGY AND DISEASE CONTROL) IN THE SCHOOL OF PUBLIC HEALTH, KENYATTA UNIVERSITY

NOVEMBER, 2016
DECLARATION

This thesis is my original work and has not been presented for degree or other awards in any other university.

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Department of Zoological Sciences
Kenyatta University
DEDICATION

I dedicate this work to my family. They patiently supported me during the many hours put into the thesis.
ACKNOWLEDGEMENTS

I take this opportunity to express my heartfelt gratitude to all those who supported me through this course. Kenyatta University lecturers, especially my supervisors Professor B. M. Okello Agina, Professor Michael M. Gicheru and Dr. Joshua Mutiso, who patiently guided me through the proposal and thesis. School of public health and Graduate school for their time and support.

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I also appreciate my employer, K.M.T.C who allowed me time to pursue this course.

God bless you abundantly.

Last but not least, I give thanks to Almighty God for the knowledge and skills gained while undertaking this course.
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## DEFINITION OF TERMS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Non-adherence to PMTCT Treatment</td>
<td>In this study, non-adherence was defined as mother and/or infant not ingesting single-dose nevirapine at the recommended time or not at all and adherence as mother–infant pairs who ingested it as recommended.</td>
</tr>
<tr>
<td>Disclosure</td>
<td>Revealing HIV positive status to family and friends</td>
</tr>
<tr>
<td>EMCT of HIV</td>
<td>Reduction of transmission to such a low level that it no longer constitutes a public health problem.</td>
</tr>
<tr>
<td>Largely married</td>
<td>This includes mothers who are married, are co-habiting or have a single steady sexual partner.</td>
</tr>
<tr>
<td>Non Disclosure</td>
<td>Not having revealed HIV positive status to family and friends.</td>
</tr>
<tr>
<td>Postnatal Mother</td>
<td>A mother who gave birth to a baby within the last two years.</td>
</tr>
<tr>
<td>Single mother</td>
<td>Includes not married, separated, divorced and widows.</td>
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</table>
# ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>3TC</td>
<td>Lamivudine</td>
</tr>
<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>ART</td>
<td>Antiretroviral Therapy</td>
</tr>
<tr>
<td>ARV</td>
<td>Antiretroviral drugs</td>
</tr>
<tr>
<td>AZT</td>
<td>Zidovudine</td>
</tr>
<tr>
<td>CDC</td>
<td>Center for disease prevention and control</td>
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<tr>
<td>CD4 cells</td>
<td>Lymphocytes that protect the body from infection</td>
</tr>
<tr>
<td>EMCT</td>
<td>Elimination of Mother to Child Transmission</td>
</tr>
<tr>
<td>EFV</td>
<td>Efavirenz</td>
</tr>
<tr>
<td>FANC</td>
<td>Focused Antenatal Care</td>
</tr>
<tr>
<td>FTC</td>
<td>Emtricitabine</td>
</tr>
<tr>
<td>GoU</td>
<td>Government of Uganda</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immune Deficiency Virus</td>
</tr>
<tr>
<td>KDHS</td>
<td>Kenya Demographic health Survey</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goals</td>
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<tr>
<td>MoH</td>
<td>Ministry of Health</td>
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<tr>
<td>NASCOP</td>
<td>National AIDS Control Council</td>
</tr>
<tr>
<td>NVP</td>
<td>Nevirapine</td>
</tr>
<tr>
<td>PCR</td>
<td>Polymerase Chain Reaction</td>
</tr>
<tr>
<td>PMTCT</td>
<td>Prevention of Mother To child transmission</td>
</tr>
<tr>
<td>TDF</td>
<td>Tedinofor</td>
</tr>
<tr>
<td>UNAIDS</td>
<td>Joint United Nations Programme on HIV/AIDS</td>
</tr>
<tr>
<td>VCT</td>
<td>Voluntary Counseling and Testing</td>
</tr>
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<td>WHO</td>
<td>World Health Organization</td>
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ABSTRACT

Kenya has more than 2.5 million people living with HIV and AIDS. Mombasa County had a prevalence rate of 7.8% in the year 2009. Globally 390,000 babies were infected with HIV in the year 2010 through mother to child transmission. In Kenya an estimated 37,000 to 40,000 infants are infected annually in utero. This could be due to loss to follow up and non-adherence to ARVs and Prevention of Mother to Child Transmission (PMTCT) guidelines. The World Health Organization (WHO) recommends Option B triple therapy ART regimens for pregnant women who test HIV positive. The HIV positive mother is given ART for life regardless of the CD4 count or WHO clinical staging. The infant is given AZT or NVP for six weeks after birth if not breastfeeding. In coast province Kenya, only 45.6% of women were delivered by a skilled health worker in the year 2009. One way to attain high coverage is to give Nevirapine pill to each HIV positive woman in advance to be kept at home and taken at the start of labour and NVP syrup for the baby. The current study investigated factors that contribute to loss to follow up among 322 HIV positive mothers and babies on PMTCT treatment in Mombasa County. A descriptive cross sectional survey was carried out, purposive sampling was done. Of the respondents who were tested 40%, were not aware that they had been tested for HIV in the antenatal clinic. Majority (61%) of mothers were given the ARVs to keep at home antenatally. Minority of the mothers (41%) did not take the prescribed antiretroviral pills when they gave birth, while 69.9% of babies were not given the prescribed ARV syrup due to fear of stigma and discrimination. Non adherence was associated with socio demographic characteristic of youth aged below 35 years, (88.2%) no high school education (64.3%) and home deliveries (26.4%). Only 34.8% were given correct postnatal clinic return dates. In conclusion, some of the respondents did not adhere to PMTCT treatment due to fear of stigma and discrimination, home delivery, young age and no high school education. The study recommends that health workers should do HIV pretest and PMTCT adherence counseling to all antenatal mothers individually, to include importance of hospital delivery, postnatal and comprehensive clinic appointment dates and education of traditional birth attendants to improve adherence rates.
CHAPTER ONE: INTRODUCTION

1.1 Background information

The National Acquired Immune Deficiency Syndrome and Sexually Transmitted Infection Control Programme (NASCOP) in Kenya through its Prevention of Mother to Child Transmission (PMTCT) initiative, tests antenatal mothers routinely for the presence of HIV as part of the antenatal profile requirements (MoH, 2012). The PMTCT prongs are: Prevention of HIV in women, prevention of unwanted pregnancy, reduction of HIV transmission antenatally, in labour and during breast feeding period and finally support to the HIV positive woman and her family.

HIV testing methods used include Voluntary Testing and Counseling (VCT), Provider initiated testing and counseling (PITC), and Diagnostic testing and counseling (DTC). Mothers who test HIV positive are started on antiretroviral medication either up to the end of the breastfeeding period (Option B) or option B+ where the HIV positive mother is given antiretroviral medication for life regardless of the CD4 count or clinical staging (WHO, 2010). Once they have taken the Nevirapine during labour, most mothers are lost to follow up (McIntyre, 2005).

Prevention of Mother to Child Transmission (PMTCT) guidelines released by World Health Organization (WHO) in 2015 recommend Option B+ Antiretroviral Therapy (ART) regimens for pregnant women who test HIV positive: Zidovudine (AZT) + Lamivudine (3TC) + Nevirapine (NVP) or AZT +3TC + Efavirenz (EFV) (WHO, 2012). The infant is given AZT or NVP for six weeks after birth if not breastfeeding. If
the baby is breastfeeding, once daily NVP should be given from birth to six weeks when early infant diagnosis for HIV is done. The Final infant diagnosis test for HIV is repeated at 18 months and or when breastfeeding ends. In option B+ the HIV positive mother is given antiretroviral medication for life regardless of the WHO clinical staging or CD4 count.

The tablets are to be taken until the woman goes into labour. During labour, she takes both the Nevirapine and AZT. After delivery of the baby, she takes AZT and 3TC every 12 hours for 7 days. The baby is given a single dose of Nevirapine syrup at a dose of 2mg /kg body weight. This is followed by AZT syrup for four to six weeks. Dosage for AZT and Nevirapine syrup is calculated at a dose of 4mgs/kg body weight. Early infant diagnosis for presence of HIV is done Polymerase Chain reaction (PCR) test at 4 to 6 weeks. The test is repeated at 18 months or at the end of the breastfeeding period.

The World Health Organization (WHO) agreed on eight Millennium Development Goals (MDGs) to be achieved by the year 2015. Target 6 in the 5th MDGs objectives were to reduce maternal mortality rate by three quarters, identify and manage HIV positive mothers early, discourage home deliveries and provide antiretroviral therapy and adherence counseling to ensure a good outcome for mother and baby. Through advocacy for behavior change, the prevalence of HIV in Kenya has fallen from 14% in 1998 to 7% in 2012 (KAIS, 2012). The reduction is attributed to improvement in linkage to care and the roll out of anti-retroviral therapy in Kenya. Globally 390,000 babies were infected with HIV in the year 2010 through mother to child transmission
(Plessis et al., 2014). In Kenya an estimated 38,900 infants are infected annually in utero (MoH, 2012). This could be due to loss to follow up, non adherence to ARVs and inconsistent implementation of PMTCT guidelines. The objective of the present study was to identify factors that lead to HIV positive mothers and their babies not adhere to PMTCT treatment in Mombasa County, Kenya.

1.2 Statement of the problem

NASCOP estimates that 97,272 HIV exposed babies were born in Kenya in the year 2011 and at least 38,900 babies were born HIV positive (MoH, 2012). The use of antiretrovirals in the prevention of mother to child transmission (PMTCT) of HIV poses many challenges. In public hospitals in Mombasa County, antenatal mothers are counselled for HIV through group counseling, after which they undergo the HIV test either in the laboratory or by a counselor. Mothers are then given laboratory results to take back to the nurse in the antenatal clinic. The HIV negative ones are told to go home while the positive ones go through post test counseling and are started on antiretroviral regimens. This is done without privacy.

Most mothers comply with antenatal clinic visits and ARV treatment up to the end of the labour period. In coast province, majority (53.4 %) of mothers deliver their babies at home due to cultural reasons (Mazrui, 2011) while 56% of Kenyan mothers and 50% from coast province do not seek postnatal care and may not adhere to PMTCT treatment (KDHS, 2008). Scheduled appointments to postnatal clinic should be at: 48 hours, 2 weeks and 6 weeks. Most mothers go to the health facility at 6 weeks for the baby’s
immunization schedule without attending postnatal clinic where adherence counseling
continues (MoH, 2008). Very few mothers attend postnatal clinic or continue with
antiretroviral medication post-delivery. They are lost to follow up thus running the risk
of drug resistance and poor infant and maternal health. Adherence levels of less than
90% lead to an increased risk of drug resistance, inadequate viral suppression and
increased risk of HIV transmission to the partner which is a major public health concern
(Hiko et al., 2012).

1.3 Justification for the study
The Center for disease control and prevention (CDC, 2016) estimates that every year 2
million people get newly infected with HIV worldwide with an estimated 100,000 in
Kenya. Kenya had 1.5 million people living with HIV and AIDS in 2013, ranking it 4th
worldwide (Avert, 2016). An estimated 37,000 HIV infected babies were born in Kenya
in the year 2013 with 1.1 million children orphaned by AIDS. In the year 2012, 69% of
women in Kenya were living with HIV, 5% of them being antenatal mothers. In sub
Saharan Africa including Kenya women are not able to negotiate and practice safer sex
due to discrimination in terms of access to education, employment and healthcare.

The 2014 Demographic Health Survey found that only 54% of young women had
correct knowledge of methods of prevention of HIV acquisition through sex. In the
Census done in the year 2009 in Kenya, Mother-to-child transmission of HIV
prevalence in Mombasa was 7.8%. Hence the need to study why HIV positive mothers
and their babies in Mombasa County do not adhere to PMTCT guidelines and are lost to
follow up. A Study by Cohen et al., (2016) concluded that early identification of HIV infection allows individuals to start taking treatment early thus substantially reducing their risk of transmitting infection to their partners or unborn baby. HIV/AIDS is one of the top 10 causes of disease burden worldwide in young adults, the number one cause of burden for women from ages 25–44 years and 11th for children below the age of 5 years. This is due to the nature of HIV/AIDS transmission and the timing of sexual contact. The concentration of HIV/AIDS in young adults makes the large HIV epidemic an overwhelming public health problem due to the debilitating chronic diseases associated with it.

This reduces the quality of life of the person living with HIV. In 2010, Years of Life Lost due to premature deaths contributed to 94.7% of global HIV/AIDS Disability Adjusted Life Years (DALYs) Ortblad et al., (2010). Adherence to ART is an essential component of PMTCT treatment success. Adherence means taking the correct dose of drugs at the right time and observing dietary restrictions (NASCOP, 2005). Adherence involves timely taking of maternal and newborn ARV antenatally and during the labour period to improve virological, immunological and clinical outcomes. The PMTCT programme needs adequate clinic resources to succeed.

HIV testing is core to both prevention and care efforts (CDC, 2016). Inadequate pre and post HIV test counselling and the stigma of disclosing their HIV status to friends and family especially in home delivery of babies, may contribute to non-adherence to ARVs especially intrapartal drugs for mother and baby. Staff shortage may lead to
antenatal mothers not getting individualized care and specific instructions to continue with postnatal clinic and comprehensive HIV care appointments. The study aimed at identifying the reasons for this situation and will attempt to come up with possible solutions to this problem.

### 1.4 Research questions

i. What proportion of HIV positive mothers and babies does not adhere to PMTCT treatment?

ii. What are the most common factors that lead to HIV positive mothers and babies not to adhere to treatment?

iv. What is the knowledge level of HIV positive mothers on the effects of non-adherence to ARVs?

v. What is the knowledge and practice of HIV positive mothers towards postnatal clinic appointment?

### 1.5 Hypotheses

i. HIV positive mothers do not adhere to PMTCT treatment

ii. Knowledge and practice of HIV positive mothers regarding HIV care treatment and postnatal care does not contribute to non-adherence to PMTCT treatment.
1.6 Objectives

1.6.1 General objective

To identify factors that lead to HIV positive mothers and babies not adhere to PMTCT treatment in Mombasa County, Kenya.

1.6.2 Specific objectives

i. To determine the proportion of HIV positive mothers and babies who do not adhere to PMTCT treatment in Mombasa County.

ii. To determine the common factors leading to HIV positive mothers and babies not adhering to ARV treatment.

iii. To determine the level of knowledge of the HIV positive mother on effect of non adherence to ARVs.

iv. To determine the knowledge and practice of HIV positive mothers towards postnatal clinic appointments.

1.7 Significance and anticipated output

The findings will be utilized by health managers to improve methods used in providing PMTCT services. Findings will also assist in strengthening postnatal care services for HIV positive mothers thus reducing default rates. Public health bodies will use the results to demystify antiretroviral drug therapy and adherence counseling through education of the general public since people living with HIV and AIDS (PLWHV) need social support to adhere to treatment.
1.8 Limitation of the study

Data was collected in three public health facilities in Mombasa County, namely Tudor, Port Reitz and Likoni sub county hospitals. The three health facilities cover the catchment area for Mombasa County.

1.9 Delimitation of the study

HIV positive postnatal mothers were not willing to accept having not followed instructions and may have given wrong answers.
1.10 Conceptual Framework

The conceptual framework below (Fig 1.1) illustrates the relationship between the independent and dependent variables in the utilization of health services.

**NON ADHERENCE TO PMTCT TREATMENT AND LOSS TO FOLLOW UP OF HIV POSITIVE MOTHERS AND BABIES IN MOMBASA COUNTY, KENYA**

**Independent Variables**
- **Socio demographic**
  - Age, marital status, level of education, income, place of delivery
- **Adherence to Medication**
  - HIV Testing methods, pill burden, Taking of ARVs in labour, giving baby ARVs, missed doses, home births, disclosure and discrimination.
- **Nutrition**
  - Adherence to prescribed diet
- **Postnatal clinic:**
  - importance of, care, services return dates, knowledge, and practice

**Health Facility**
- Accessibility, staff shortage, availability of ARVs, clinic resources, health workers knowledge on postnatal clinic return dates

**Dependent Variables**
- Adherence to PMTCT treatment

*Figure 1.1: Conceptual Framework* (Adopted and modified from Andersen and Newman, 2005)
CHAPTER TWO: LITERATURE REVIEW

2.1 Human immunodeficiency virus

Human immunodeficiency virus (HIV) belongs to the genus Lentivirus of the family Retroviridae. It has been divided into HIV type-1 (which is responsible for the global pandemic affecting most countries including Kenya) and HIV type -2 (mostly found in West Africa) (NASCOP, 2005). In the year 2004, four point nine million people were newly infected with HIV worldwide. Swaziland has the highest HIV infection rate of the world with Kenya coming 4th with an estimated 100,000 new infections in 2013. (UNICEF, 2016). Kenya has more than 2.5 million people living with HIV and AIDS (KDHS, 2009). Data from sentinel sites where antenatal mothers are routinely tested indicate that Mombasa County had a prevalence rate of 7.8% in the year 2009 (NASCOP, 2010).

Infection with HIV results in a progressive destruction of the CD4-T lymphocytes. The destruction of the T- cells is mainly due to active viral replication. The rate of CD4 T-cell decline is determined by viral load which consequently determines the rate of immunodeficiency and subsequent development of HIV related opportunistic infections. Patients are grouped into four clinical stages according to the World Health Organization (WHO). In WHO stage 1, the CD4 levels are above 400 and the patient has no signs of AIDS. In stage 2, the CD4 levels are at 300, the patient may present with skin disease and fatigue. In WHO Stage 3, CD4 levels are at 200, the patient losses weight, may have oral thrush and pulmonary tuberculosis. In WHO stage 4, the CD4
levels decline progressively below 200 and the patient presents with Kaposi’s sarcoma, *Pneumocystis carinii* pneumonia, chronic herpes and other opportunistic infections. If untreated, these stages may take up to 13 years (NASCOP, 2010). The WHO (2015) Guidelines recommend the following first line ART regimens for pregnant women: The WHO (2015) Guidelines recommend the following first line ART regimens for pregnant women: Zidovudine (AZT)+ Lamivudine (3TC) + Nevirapine (NVP) or Zidovudine (AZT)+ Lamivudine (3TC)+ Efavirenz (EFV) , or Tedinofor ( TDF) + (3TC) or ( Emtricitabine ( FTC) + Nevirapine ( NVP) or Tedinofor ( TDF) + Lamivudine (3TC) (or FTC) +Efavirenz (EFV).

The infant is given once daily Nevirapine from birth for six weeks if the baby is breastfeeding. Infants on replacement feeding are given once daily Nevirapine or twice daily zidovudine from birth for 4 to 6 weeks. For mothers who are HIV positive, in a concerted effort to prevent HIV transmission to the unborn baby, WHO (2015) recommends Option B+, this involves lifelong antiretroviral treatment antenatally and after delivery of the baby without missing a dose regardless of the CD4 count or WHO clinical staging (WHO, 2015). The mother is advised to take Nevirapine at the onset of labour and give the baby syrup of Nevirapine within the recommended 72 hours of birth. She should be given the single dose Nevirapine at first contact with the health worker in the Antenatal clinic (MoH, 2012).
2.2 Adherence to PMTCT treatment

The Kenya government has provided free antenatal and maternity services, all pregnant women in all public health facilities are tested for presence of HIV through the PMTCT initiative (MoH, 2011). The free maternity services are provided to encourage mothers to deliver their babies in the hands of a skilled health worker. The Prevention of mother to child transmission of HIV initiative (PMTCT) includes appropriate infant feeding, infant HIV testing at four to six weeks and at eighteen months, and postnatal healthcare services. This also includes providing appropriate treatment for opportunistic infections and observing any dietary restriction. One way to attain high coverage is to give Nevirapine pill to each HIV positive woman in advance to be kept at home and taken at the start of labour. A study by Kuonza et al. (2008) in Zimbabwe associated this with improved maternal adherence to Nevirapine in labour. In contrast, one study in Zambia found that one third of those given the drug never ingested it (UNAIDS, 2007).

The maternal mortality rate in Kenya is estimated at 414 per 100,000 live births, while the neonatal mortality rate is 33 per 1000 live births. In Kenya, 88% of pregnant women attend antenatal clinic (KDHS, 2008) where Focused Antenatal care (FANC) strategy attempts to integrate malaria, TB and PMTCT services. The health worker is expected to monitor the HIV infection and treat other infections, do nutritional counseling and give supplements, counsel on infant feeding, and danger signs of pregnancy labour and postpartum periods, condom use and contraceptive option.
2.3 Methods used in HIV testing of antenatal mothers

Antenatal mothers undergo routine HIV testing as part of the PMTCT initiative. Other methods of testing for HIV used are Diagnostic Testing and Counseling (DTC), Voluntary Testing and Counseling (VCT) and Provider Initiated Testing and Counseling (PITC).

Majority of women have never been tested for HIV and do not know their status. This means that effective PMTCT programs must provide counseling and testing services and not all women accept willingly to be tested for HIV. Some women refuse HIV testing because they perceive few benefits of testing either to their unborn babies (due to poor counseling, distrust or misunderstanding) or to themselves. Some see HIV as a life threatening disease. Some do not want to take part in follow-up visit because they have had bad experiences with health workers (MoH, 2008).

Studies in Botswana found that switching from VCT to routine testing for HIV as a standard part of antenatal care increased testing rate from 75% - 90% (UNAIDS, 2007). In Kenya, this method has been adopted and individual post test counseling then follows. If sent to the laboratory, some women do not go back for their results. Rapid testing kits which give results in 20 minutes have been introduced in Mombasa County. This gives the women less time to consider wider implications of knowing whether they are infected with HIV (UNAIDS/WHO, 2007).
2.4 Prevalence of HIV in pregnancy

Sexual contact continues to be the major mode of HIV transmission leading to high prevalence of HIV infection in women (Schmidt et al., 2004). In East, West and Central Africa, HIV prevalence in pregnant women reaches up to 7% in urban areas with generally lower rates in the rural areas. In Southern Africa, antenatal sero prevalence rates of between 16% - 39% have been reported compared to 1% in Central and South America (UNAIDS, 2007). Studies in Kenya have revealed that 44% of married or cohabiting HIV infected persons had an HIV uninfected partner, while in 77% of all partnerships, respondents did not know their partner’s HIV status (KAIS, 2007). KDHS (2009) identified that half of all new HIV infections occur among young people aged 15-24 years. By the age of 19 almost half of adolescents in Kenya had begun childbearing. This means the health service providers should strive to provide a youth friendly environment to attract the young and motivate them to utilize the services. The WHO describes Youth friendly services as ‘services that are accessible, acceptable and appropriate for adolescents. They are in the right place at the right price (free where necessary) and delivered in the right style to be acceptable to young people. They are effective, safe and affordable. They meet the individual needs of young people who return when they need to and recommend these services to friends (MOH, 2005).

2.5 Elimination of mother-to-child transmission of HIV and syphilis

Cuba became the first country in the world to be validated as having eliminated mother to child transmission of HIV and syphilis with Thailand, Belarus, Armenia and the Republic of Moldova joining in June 2016 (WHO, 2016).
The WHO (2014) validation process for elimination of mother-to-child transmission of HIV and syphilis has indicators which must be met for at least 1 year for HIV and syphilis. New pediatric HIV infections due to MTCT of HIV should be less than 50 cases per 100,000 live births; and MTCT rate of HIV should reduce to less than 5% in breastfeeding populations or less than 2% in non-breastfeeding populations. Rate of MTCT syphilis must be less than 50 cases per 100,000 live births while evidence of more than 95% of pregnant women receiving at least one antenatal visit must be produced. More than 95% of pregnant women should have been tested for syphilis and the same percentage should be on treatment.

2.6 Home births

In Kenya, many women visit clinics once during pregnancy and nearly two thirds give birth unattended by a skilled health worker. In the year 2008 in coast province Kenya, only 45.6% of women were delivered by a skilled health worker and 54.4% gave birth at home (KDHS, 2009). Research conducted by the Division of Reproductive Health in the year 2006 to establish uptake of PMTCT services in Kenya found inadequate numbers of health workers to cope with the workload. The community had limited access to health care in general, poor community involvement, reluctant partners, harmful sociocultural practices which encourage mothers to prefer home deliveries instead of seeking a skilled birth attendant.

Lack of innovation and creativity in PMTCT services, stigma and discrimination, lack of programs for marginalized groups, inadequacy of information, education and
communication (IEC) intervention materials, poor collaboration and insufficient equipment and supplies. Data from pilot PMTCT programs supported by UNICEF between January 2000 and June 2002 studied more than 500,000 women in 12 countries. Only 71% received counseling and of these only 70% took an HIV test. Of the women who tested positive, 49% received anti-retroviral therapy. This means that less than 1 in 4 HIV infected women received the drug they needed (UNAIDS, 2007). PMTCT programs are being introduced into already seriously understaffed health care systems. Staff shortages and motivational issues affect the quality of the counseling (MoH, 2006). In Kenya, lay counselors have lightened the workload of the trained medical counselors in the VCT but nurses are still left to counsel pregnant mothers in groups in the antenatal clinic.

2.7 Disclosure of HIV status

Many women are concerned that if found HIV positive, their status will not remain secret (WHO, 2010). HIV related stigma and discrimination is found in all societies and can lead to social isolation and even loss of family support. An HIV positive woman who has not disclosed her status to her partner is less likely to accept antiretroviral drugs and to practice unconventional methods of infant feeding for fear of revealing her status. Breast milk provides all the nutrients a baby requires for the first few months of life. It is cheap, easily available, at the correct temperature and strengthens the emotional bond between mother and baby (WHO, 2006). Unfortunately, breastfeeding can also transmit HIV from mother to the child. In Africa, between one third and half of
infant HIV infections are due to breastfeeding. The dangers of an HIV positive mother not breastfeeding lead to a painful dilemma (WHO, 2007).

The mother has the option of exclusively breastfeeding the baby for six months or giving the baby commercial infant formula (replacement feeding). By choosing not to breastfeed, the mother risks revealing that she is HIV positive and becoming a target for stigma and discrimination. The World Health Organization (2010) recommends that counselors talk with women and assess individual circumstances before giving guidance about the risk and benefits of different modes of feeding. The replacement feeding must also meet the five criteria: It must be affordable, feasible, and acceptable, sustainable and safe. A Kisumu breastfeeding study in Kenya (Thomas et al., 2011) followed up a cohort of children of lactating mothers taking antiretroviral treatment to prevent mother to child transmission of HIV. Overall transmission rates were 3.9% at 6 weeks, 5% at 6 months, 5.9% at 12 months and 6.7% at 18 months. There was no difference in HIV transmission by baseline maternal CD4 count (WHO, 2007).

2.8 Postnatal visits

Upon delivery of her baby, the postnatal mother is advised to visit the postnatal clinic within 48 hours, at 2 weeks and at 6 weeks (WHO, 2010). Activities carried out during each postnatal visit are expected to be specific to the timing of the visit. They include: screening for sexually transmitted infections, maternal health checks, counseling for self care (breast care, clean perineum, maternal nutrition), vitamin A supplementation, newborn checks and counseling on basic newborn care (exclusive breastfeeding, clean
cord care, warmth, infant feeding, hygiene, infant growth monitoring and immunization, and early infant diagnosis for HIV. The mother and birth partner are given information on danger signs for the mother and newborn during the postnatal period. Family planning information and services are provided. The PMTCT guidelines in Kenya (2012) stress the need for counselling the mother antenatally on a contraception plan. Plessis et al., (2014) study in Kenya found that only 33% of mothers reported receiving contraception counselling. Postnatal services include HIV counselling and testing for the partner, nutritional and other supportive advice for HIV positive women. Antiretroviral therapy is provided, comprehensive follow up consultations regarding reproductive health, child spacing and baby care is done in the postnatal clinic. This care and support should be extended to the children and family of the women living with HIV to help them adhere to the PMTCT counseling especially the antiretroviral treatment.

The family planning handbook for providers (2007) recommends a Dual Protection Strategy to assist with the prevention and treatment of HIV and AIDS and other reproductive tract infections. This includes safer sexual intimacy without intercourse or use of condoms along with another contraceptive method. The incidence of HIV among women during the postpartum period is high in Africa. A study in Rwanda in 1990 found an HIV incidence rate of 3.5/100 women years. Which has since reduced to 0.11% by the year 2013 (UNICEF, 2015). By the year 2014, ninety five percent of the HIV positive mothers in Rwanda were on antiretrovirals to prevent transmission of HIV to the unborn child.
2.9 Non adherence to ARV medication and its effects

In Kenya adherence to antiretroviral treatment is graded as satisfactory if the patient misses less than three doses in a month or unsatisfactory if she misses more than three doses in a month (NASCOP/MoH, 2011) Forms of non-adherence include: missing one dose of a given drug, missing a dose of all the drugs, missing multiple doses, not observing the time intervals or dietary restrictions, not taking the correct dose of any drug and missing clinic appointments. Side effects of the antiretroviral drugs may contribute to non-adherence (MoH, 2011). The proper education of patients by well trained and committed staff, before the initiation of and during ART is vital for the success of adherence strategies. The education should cover basic information about HIV and its manifestations, the benefits and side effects of ARV medications, how the medications should be taken and the importance of not missing any dose. The patient should not be rushed into starting ARVs and the health facility must have a continuous, sustainable supply of drugs. The patients should be introduced to support groups and the records department should keep a proper diary to detect defaulters easily.

Consequences of non-adherence are: Incomplete viral suppression, continued destruction of the immune system and decrease of CD4 count, emergence of resistant strains, limited future therapeutic options, higher costs of individual treatment and disease progression. Chesney (2000) found non adherence to antiretroviral drugs of between 50 to 70 % due to patient factors and pill burden. Methods used to check adherence include self-report, pill counts, attendance and pharmacy records, clinical and laboratory test results indicating treatment failure (NASCOP, 2005).
Chacker et al., (2008) did a study in 24 health care systems in Ethiopia, Kenya, Rwanda, Tanzania and Uganda to examine current practices in monitoring rates of treatment adherence and defaulting. Less than half the facilities reported poor monitoring of individual PMTCT treatment adherence and defaulting. They concluded that there was a pressing need to determine which parameters are feasible and reliable to collect, which ones will be useful for clinical counseling and most useful for patient management. Studies in Italy have shown that low family and community support, low self efficacy, depression, uncertainty about the positive effects of antiretroviral therapy and disbelief about drug resistance predispose patients to abscond treatment (Starace et al., 2000). In another study, Honghu et al. (2001) compared different measures of adherence to antiretroviral drugs and found that adherence may be underestimated by Medication Event Monitoring System (63%) (MEMS) and overestimated by pill count (83%) and interview (93%) in the same patient.

In the USA 11% of patients reported non- adherence. The same patients reported lower self efficacy and were not sure of the link between non adherence and development of drug resistance (Chesney et al., 2009). According to CDC (2016), the percentage of HIV positive patients who do not adhere to ARVS has risen to 50%.

2.10 ARV drug toxicity

Treatment with highly active antiretroviral therapy (HAART) have benefits which outweigh the side effects. Antiretrovirals improve quality of life and life span of an individual. Toxicity can lead to discontinuation or modification of therapy (Spengler,
Clinical features of ARV drug toxicity include dizziness, anxiety, nightmares, end stage liver disease, hepatotoxicity peripheral neuropathy, rash, pancreatitis, anaemia, jaundice, fat redistribution, hypersensitivity and depression (MoH, 2011).

**2.11 Health facility factors**

One of the National Reproductive Health Policy (2007) objectives of the Kenya Government is to contribute to reduction of the HIV and AIDS burden and improve the reproductive health status of the affected and infected persons. It acknowledges that there is an unmet need for reproductive health services among HIV-infected persons. The government needs to address stigma, negative attitudes of service providers, knowledge gaps regarding interactions of antiretroviral drugs and contraceptive methods (MoH, 2007). The Division of reproductive health in the year 2006 identified the following weaknesses in Kenya: Inadequate space, insufficient training and inadequate numbers of health workers to cope with the PMTCT workload. A study done by the Ministry of health at one hospital and 4 health centers in Embu, eastern province, Kenya in the year 2006, observed that health care providers’ knowledge on postnatal care was weak in several components of maternal and newborn care and they needed training on a comprehensive package of skills.

In the year 2001, member states of the United Nations set targets as part of the UNGASS declaration “to reduce the proportion of infants infected with HIV by 50% by 2010. This was by ensuring that 80% of pregnant women accessing antenatal care have information, counseling and other HIV prevention services available to them. Currently,
the programme has faced challenges mainly because the services are not enough and existing services do not reach many women in need due to poor resources and infrastructure. Plessis et al., (2014) study in Nairobi Kenya found that only 20% of antenatal mothers had been given single dose Nevirapine at the first clinic visit, 31% receiving contraception counselling while there was high coverage (88%) of PMTCT counselling since the study focused on sending text messages reminding mothers on the same. Improving efficiency of PMTCT programs means addressing certain issues: Accessibility, clinic resources especially well trained human resource, testing methods, fear and distrust of health workers, disclosure and discrimination, drug effectiveness, treatment of mothers and feasibility of replacement feeding (UNICEF/UNAID, 2003). At each clinic visit, the health workers are expected to continue with adherence counseling. Adherence counseling should be an ongoing process carried out by all health care workers to reinforce the messages (NASCOP, 2005).
CHAPTER THREE: MATERIALS AND METHODS

3.1 Study area

This study was done in Mombasa County which lies within the south eastern Kenyan coast. The altitude rises gradually from sea level to over 76 meters above sea level on the mainland. It’s warm, humid weather and beaches have made it a popular tourist destination. Mombasa was one of the districts of Kenya until the year 2013. It is the smallest of the 47 counties covering an area of 229.7 km\(^2\) excluding 65 km\(^2\) of water mass with its capital city also named Mombasa. It borders Kilifi County to the north, Kwale County to the south west and the Indian Ocean to the east. It has 4 administrative divisions: Mombasa Island, Changamwe, Likoni and Kisauni. The literacy rate is 85.8\%, with only 53.3 \% of children aged 15-18 years old attending school, while the poverty rate is 37.6\% (Kenya open data survey, 2014). The sub county hospitals are Port Reitz, Likoni and Tudor with Coast County Referral hospital on the Island (Appendix I).

Tourism is a major industry. It is seasonal depending on the weather changes in the western world. Clearing and forwarding of goods through the port of Mombasa creates jobs and has led to an influx of migrant truck drivers from Central and East African countries. The northern corridor starts from Mombasa through Kampala-Kigali-Bujumbura to Goma. Tourism and migrant workers have contributed to making residents of Mombasa more vulnerable to STI/HIV and AIDS. The HIV prevalence rate for truck drivers is 18\% (Global fund, 2010). Truck drivers may have multiple sexual
partners thus increasing the vulnerability of their spouses. According to the Census of the year 2009, Mombasa County had a population of 939,370 with a total female population of 481,492. Mother-to-child transmission of HIV prevalence was 7.8%. Births delivered at health facilities were 44% of the total (Kenya open data survey, 2014). In the year 2008, records at the Coast county referral hospital show that out of 2896 antenatal mothers who got PMTCT services, 226 tested HIV positive. A total of 3684 newborn babies were immunized for the first time during the same year reflecting a high number of home deliveries.

3.2 Study population
The study involved HIV positive postnatal mothers who had given consent.

3.3 Study design
This study was a descriptive cross sectional survey. Purposive sampling was done. HIV positive postnatal mothers in the Comprehensive care clinics were deliberately selected. The study utilized data collected during the routine functioning of clinical and HIV diagnostic services in the health facilities in Mombasa County. A total of 350 HIV positive postnatal mothers who had babies aged two years and below, were sampled, as per sample size determination. After data cleaning, three hundred and twenty two structured interview schedules were found to be duly filled and complete. They were distributed in three (3) health facilities: Port Reitz, Likoni and Tudor based on the patient population in each site. The study was explained to patients using English or Swahili before a patient was asked to volunteer. Written informed consent was obtained (Appendix II and III).
A structured interview schedule was used to collect data between January and July 2013 (Appendix IV). Collection of additional information was done without interfering with the routine services.

3.3.1 Inclusion criteria

The study involved HIV positive postnatal mothers who had given consent. Guardians of mothers who were below 18 years were asked to give consent. Mothers who were given antiretroviral medication either Zidovudine (AZT) from 14 weeks gestation, Option B triple therapy or Nevirapine to take when in labour and syrup Nevirapine to give the newborn at birth and mothers who were on cotrimoxazole preventive therapy were recruited for the study.

3.3.2 Exclusion criteria

Postnatal mothers who were not HIV positive and those HIV positive with babies older than two years were excluded from the study.

3.3.3 Independent variables

The independent variables were: Socio-economic and demographic characteristics, adherence to antiretroviral medication, nutrition counseling and postnatal clinic appointments, knowledge, attitude and practice.
### 3.3.4 Dependent variable

Adherence to PMTCT guidelines HIV testing, Taking of the antiretroviral medication, and comprehensive HIV management of both mother and baby.

### 3.4 Sample size determination

In order to provide a representative sample, the Sample size was determined using the formula developed by Fisher et al., (1998)

\[
N = \frac{Z^2P(1-P)}{D^2}
\]

Where: 
- \(N\) = minimum sample size required
- \(Z\) = 1.96 Standard error
- \(P\) = 0.078 (that is 7.8 % prevalence rate) a demonstrated percentage of antenatal women who tested HIV positive at sentinel surveillance site in Kenya (NASCOP, 2005)
- \(D\) = 0.05 the inverse 0.95 confidence limit (the allowable error).

Therefore;

\[
N = \frac{1.96^2(0.078)(0.922)}{(0.05)^2}
\]

\[= 110.5 \text{ samples}\]

The total HIV positive postnatal mothers sampled were 322. This increase in sample size was due to the fact that the respondents were available in large numbers and were willing to participate in the study. The sampling was distributed in three facilities in
Mombasa County based on the proportion of antenatal mothers who tested HIV positive.

3.5 Research instruments

A structured interview schedule was used to interview the respondents. Mothers with babies younger than two years who were HIV positive were interviewed on: ever missing to take or give the baby antiretroviral treatment, Cotrimoxazole preventive therapy, missing postnatal clinic and comprehensive care clinic appointment days. Pretesting was done on 32 HIV positive postnatal mothers at Kilifi county hospital. The data collection tool was administered, pretested and corrected on subjects with similar characteristics. A research assistant was recruited and trained for every study area to assist in interviewing the respondents.

3.6 Data Analysis

Data was analyzed using the Statistical Package for Social Scientists (SPSS version 18) software to assemble, classify and compute, dependent and independent variables (Lwanga, 2007). Statistics used to analyze descriptive variables were: frequencies, percentage, mean, and standard deviations. Chi square test of association were used to compare variables of interest. Regression analysis was used to condense data and Analysis of variance (ANOVA) was performed to quantify the strength of association between variables. The level of significance was set at p<0.05.
3.7 Ethical considerations

The proposal was reviewed by the Kenyatta University Ethical review committee. Permit for data collection was issued by the National Commission for Science Technology and Innovation. Permission was also given by the Chief administrator, Coast provincial General Hospital (Appendix V). Respondents gave written informed consent before being interviewed. Every respondent had the right to refuse the interview, or to refuse to answer specific survey questions.
CHAPTER FOUR: RESULTS

4.1 Socio demographic and economic characteristics

A total of 322 HIV positive postnatal mothers who had given birth less than two years prior to the study were interviewed between January and July 2013 in three health facilities in Mombasa County. The majority (65.8%) were aged 26-35 years while, 11.8% were between 36-45 years. Most (64.3%) had primary level of education, 73.9% were married while a minority (26.1%) were single. Most of the mothers (64.3%) were gainfully employed. Majority (46.9%) had a monthly income of between Ksh 25,001-45,000 per month (Table 4.1).

**Table 4.1: Socio Demographic and economic characteristics of the HIV positive postnatal mothers**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Category</th>
<th>Frequency (n=322)</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age in years</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-25</td>
<td></td>
<td>72</td>
<td>22.4</td>
</tr>
<tr>
<td>26-35</td>
<td></td>
<td>212</td>
<td>65.8</td>
</tr>
<tr>
<td>36-45</td>
<td></td>
<td>38</td>
<td>11.8</td>
</tr>
<tr>
<td><strong>Level of education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school</td>
<td></td>
<td>207</td>
<td>64.3</td>
</tr>
<tr>
<td>High school</td>
<td></td>
<td>84</td>
<td>26.1</td>
</tr>
<tr>
<td>College</td>
<td></td>
<td>16</td>
<td>5.0</td>
</tr>
<tr>
<td>University</td>
<td></td>
<td>15</td>
<td>4.7</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Largely married</td>
<td></td>
<td>238</td>
<td>73.9</td>
</tr>
<tr>
<td>Single</td>
<td></td>
<td>84</td>
<td>26.1</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td></td>
<td>207</td>
<td>64.3</td>
</tr>
<tr>
<td>Not employed</td>
<td></td>
<td>115</td>
<td>35.7</td>
</tr>
<tr>
<td><strong>Income per month in Ksh</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2500-25000</td>
<td></td>
<td>98</td>
<td>30.4</td>
</tr>
<tr>
<td>25001-45000</td>
<td></td>
<td>151</td>
<td>46.9</td>
</tr>
<tr>
<td>Above 45000</td>
<td></td>
<td>73</td>
<td>22.6</td>
</tr>
</tbody>
</table>
4.2 PMTCT services accessed by mothers

The study sought to find out PMTCT services accessed by mothers. Most (60.2%) of the respondents indicated that they had a HIV test while 39.8% were not aware when they were tested for HIV. Majority (72.2%) of the HIV tested respondents were tested as a result of Provider initiated counseling and testing, 18.3%, V. C. T. while 9% were through Diagnostic Testing and Counseling (DTC). Majority (60%) of the respondents indicated that they were given antiretroviral pills to swallow in labour and syrup to give the baby at birth. The majority (67.1%) had no nutrition counselling while 32.9% had access to nutrition counselling. Findings on return to postnatal clinic was that 56.8% were not given return dates while 43.2% were informed to attend postnatal clinic (Table 4.2).

Table 4.2: PMTCT services accessed by HIV positive postnatal mothers

<table>
<thead>
<tr>
<th>PMTCT Service</th>
<th>Accessed % (n)</th>
<th>Not accessed % (n)</th>
<th>Total % (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV testing</td>
<td>60.2 (194)</td>
<td>39.8 (128)</td>
<td>100 (322)</td>
</tr>
<tr>
<td>Antiretroviral medication given to mother to be taken</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>when in labour together with baby’s syrup</td>
<td>40 (129)</td>
<td>60 (193)</td>
<td>100 (322)</td>
</tr>
<tr>
<td>Nutrition and adherence counselling</td>
<td>32.9 (106)</td>
<td>67.1 (216)</td>
<td>100 (322)</td>
</tr>
</tbody>
</table>

4.3 Adherence to PMTCT treatment

In present study, non-adherence was identified as mother and/or infant not taking the prescribed PMTCT drugs at the recommended time or not at all. On the other hand,
adherence was defined as mother–infant pairs who took the drugs as recommended. The proportion of mothers who were categorized as adherent was 59.0% (95% confidence interval (CI) 53.6% - 0.64.2%) while adherence in infants was 30.1% (95% CI 25.4% – 35.4%). The mother–infant pairs adherence was 29.5% (24.8% - 34.7%) (Table 4.3).

Table 4.3 Adherence to PMTCT treatment

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No (n=322)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother-child pair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adherent</td>
<td>95</td>
<td>29.5</td>
</tr>
<tr>
<td>Non-adherent</td>
<td>227</td>
<td>70.5</td>
</tr>
<tr>
<td>Mother</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>190</td>
<td>59.0</td>
</tr>
<tr>
<td>No</td>
<td>132</td>
<td>41.0</td>
</tr>
<tr>
<td>Infant</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>97</td>
<td>30.1</td>
</tr>
<tr>
<td>No</td>
<td>225</td>
<td>69.9</td>
</tr>
</tbody>
</table>

**4.4 Relationship between demographic and Socioeconomic characteristics and adherence to PMTCT treatment**

The level of education was associated significantly with adherence to PMTCT treatment. In particular, a participant with primary school education was 55% less likely to be adherent as compared to her counterpart who had post-secondary qualifications (odds ratio (OR) (95% confidence interval (CI) 0.453(0.247-0.831), p=0.009).

A higher level of adherence was observed among the employed women as compared to their unemployed counterparts (35.7% versus 18.3% respectively). Indeed, the odds of an employed person being adherent were 2.5 times higher when evaluated against those of an unemployed individual (OR =2.491 (95% CI 1.434-4.325), p=0.001). Other variables
including age, marital status and household income per month failed to show significant associations with adherence to PMTCT treatment (Table 4.4).

Table 4.4 Socioeconomic and demographic characteristics and adherence to PMTCT treatment

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Adherent</th>
<th>Non-adherent</th>
<th>OR (95% CI)</th>
<th>$\chi^2$, df, P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-25</td>
<td>21(27.3)</td>
<td>56(72.7)</td>
<td>1.688(0.337-8.461)</td>
<td>$\chi^2=0.412$, df=1, P=0.521</td>
</tr>
<tr>
<td>26-35</td>
<td>72(30.8)</td>
<td>162(69.2)</td>
<td>2.000(0.421-9.490)</td>
<td>$\chi^2=0.790$, df=1, P=0.374</td>
</tr>
<tr>
<td>36-45</td>
<td>2(18.2)</td>
<td>9(81.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Level of education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>5(25.0)</td>
<td>15(75.0)</td>
<td>0.417(0.133-1.310)</td>
<td>$\chi^2=2.315$, df=1, P=0.128</td>
</tr>
<tr>
<td>College/University</td>
<td>66(26.6)</td>
<td>182(73.4)</td>
<td>0.453(0.247-0.831)</td>
<td>$\chi^2=6.740$, df=1, P=0.009</td>
</tr>
<tr>
<td>Primary</td>
<td>24(44.4)</td>
<td>30(55.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Largely married</td>
<td>69(29.1)</td>
<td>168(70.9)</td>
<td>0.932(0.543-1.599)</td>
<td>$\chi^2=0.065$, df=1, P=0.798</td>
</tr>
<tr>
<td>Single</td>
<td>26(30.6)</td>
<td>59(69.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Employment status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>74(35.7)</td>
<td>133(64.3)</td>
<td>2.491(1.434-4.325)</td>
<td>$\chi^2=10.871$, df=1, P=0.001</td>
</tr>
<tr>
<td>Not employed</td>
<td>21(18.3)</td>
<td>94(81.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Household income per month (KSh)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2500-25000</td>
<td>24(24.7)</td>
<td>73(75.3)</td>
<td>0.986(0.487-1.996)</td>
<td>$\chi^2=0.001$, df=1, P=0.969</td>
</tr>
<tr>
<td>25001-45000</td>
<td>53(34.6)</td>
<td>100(65.4)</td>
<td>1.590(0.848-2.982)</td>
<td>$\chi^2=2.107$, df=1, P=0.147</td>
</tr>
<tr>
<td>45001-50000</td>
<td>18(34.6)</td>
<td>54(75.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.5 Maternal and newborn practices in relation to PMTCT guidelines

The findings on the relationship between adherence to PMTCT therapy and maternal and new-born practices are as shown in Table 4.5. Clients who received nutrition counselling as well as those who complied with nutrition counselling were less likely to adhere to the PMTCT therapy (OR (95% CI 0.189(0.095-0.373) p=0.016) and OR 0.189(0.095-0.373) (95% CI), p<0.001, respectively). On the other hand, postnatal compliance to ARVs therapy was associated with a 11-fold increment in the likelihood of adherence to PMTCT therapy (OR 11.190 (95% CI 6.043-20.719), p<0.001). Having given the infant, the PMTCT medications at birth and also having taken the PMTCT drug during labour was associated significantly with adherence (P<0.001 in both cases). The venue of delivery was also associated with adherence (p<0.001) while disclosure of the HIV status was not associated with adherence to PMTCT therapy (p=0.191).
Table 4.5 Maternal and new-born practices in relation to PMTCT guidelines

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Adherent</th>
<th>Non-adherent</th>
<th>OR (95% CI)</th>
<th>$\chi^2$, df, P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received nutrition counselling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>22(20.8)</td>
<td>84(79.2)</td>
<td>0.513(0.297-0.887)</td>
<td>$\chi^2=5.815$, df=1, P=0.016</td>
</tr>
<tr>
<td>No</td>
<td>73(33.8)</td>
<td>143(66.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compliance to nutrition counselling</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11(10.6)</td>
<td>93(89.4)</td>
<td>0.189(0.095-0.373)</td>
<td>$\chi^2=26.456$, df=1, P&lt;0.001</td>
</tr>
<tr>
<td>No</td>
<td>84(38.5)</td>
<td>134(61.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compliance to ARVs postnatally</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>77(53.5)</td>
<td>67(46.5)</td>
<td></td>
<td>$\chi^2=71.956$, df=1, P&lt;0.001</td>
</tr>
<tr>
<td>No</td>
<td>18(10.1)</td>
<td>160(89.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Took PMTCT drug provided during labour</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>95(50.0)</td>
<td>95(50.0)</td>
<td>0.500(0.434-0.576)</td>
<td>$\chi^2=93.621$, df=1, P&lt;0.001</td>
</tr>
<tr>
<td>No</td>
<td>0(0.0)</td>
<td>132(100.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gave baby PMTCT drug at birth</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>95(97.9)</td>
<td>2(2.1)</td>
<td>0.021 (0.005-0.081)</td>
<td>$\chi^2=312.582$, df=1, P&lt;0.001</td>
</tr>
<tr>
<td>No</td>
<td>0(0.0)</td>
<td>225(100.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received PMTCT drugs to keep at home</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>31(24.2)</td>
<td>97(75.8)</td>
<td>0.649 (0.393 - 1.074)</td>
<td>$\chi^2=2.852$, df=1, P=0.091</td>
</tr>
<tr>
<td>No</td>
<td>64(33.0)</td>
<td>130(67.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venue of delivery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health facility</td>
<td>95(40.1)</td>
<td>142(59.9)</td>
<td>0.599(0.540-0.665)</td>
<td>$\chi^2=48.331$, df=1, P&lt;0.001</td>
</tr>
<tr>
<td>Home</td>
<td>0(0.0)</td>
<td>85(100.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disclosure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Done</td>
<td>36(25.7)</td>
<td>104(74.3)</td>
<td>0.722(0.442-1.178)</td>
<td>$\chi^2=1.710$, df=1, P=0.191</td>
</tr>
<tr>
<td>Not done</td>
<td>59(32.4)</td>
<td>123(67.6)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.6 Factors associated with maternal and newborn non adherence to ARV

The study further investigated reasons for 41% of mothers not taking the prescribed ARVs in labour. The majority (63.4%) had fear of stigma and discrimination, 3.7% had denial on the need for treatment, while a minority (1.6%) were advised not to take by relatives (Table 4.6).
Table 4.6: Reasons for not taking ARV in labour

<table>
<thead>
<tr>
<th>Reasons for not taking ARV in labour</th>
<th>Frequency (n=132)</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forgot to take ARVs</td>
<td>41</td>
<td>31.4</td>
<td>31.4</td>
<td>31.4</td>
</tr>
<tr>
<td>Fear of stigma and discrimination</td>
<td>84</td>
<td>63.4</td>
<td>63.4</td>
<td>94.7</td>
</tr>
<tr>
<td>ARVs were not necessary</td>
<td>5</td>
<td>3.7</td>
<td>3.7</td>
<td>98.4</td>
</tr>
<tr>
<td>Advised not to take ARVs by relatives</td>
<td>2</td>
<td>1.6</td>
<td>1.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>132</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

4.7 Postnatal clinic appointments

The study investigated whether respondents were given appointment dates to return to postnatal clinic (PNC) after the birth of the baby. From the findings, 43.2% of the respondents were given dates to return to postnatal clinic after the birth of the baby while the majority (56.8%) were not given appointments. Only 36.6% of the respondents indicated that the health worker explained the importance of PNC attendance while (34.8%) were given correct return dates at 48 hours, 2 weeks, and then 6 weeks (Table 4.7).
Table 4.7: Postnatal clinic appointments

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Yes %</th>
<th>No %</th>
<th>Total%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mothers informed to attend Postnatal clinic</td>
<td>43.2 (139)</td>
<td>56.8(183)</td>
<td>100(322)</td>
</tr>
<tr>
<td>Mothers advised on importance of postnatal clinic attendance</td>
<td>36.6(118)</td>
<td>63.4(204)</td>
<td>100(322)</td>
</tr>
<tr>
<td>Correct return dates for postnatal clinic appointments</td>
<td>34.8 (47)</td>
<td>65.2(92)</td>
<td>100(139)</td>
</tr>
</tbody>
</table>

4.8 Access to ARVs

Most of the respondents (73%) were able to access the ARVs when required. Reasons for 27% not accessing included lack of transport (57%), clinic too far (19%), lack of fare (7%), while 17% indicated that there was no mobile outreach center nearby (Table 4.8). The study further investigated whether there was a time respondents went to the health facility to collect Antiretroviral medication and failed to get it. Majority (69%) had missed while 31% had never missed. Reasons given by the mothers for missing ARVs included shortage of staff (50%) and lack of stock (41%) among others (Table 4.8).
Table 4.8: Access to ARVs

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access to ARVs when required</td>
<td>Yes</td>
<td>235</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>87</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>n=322</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Reason given for not accessing ARVs when required</td>
<td>Lack of transport</td>
<td>49</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>Clinic too far</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>Lack of fare</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>No mobile outreach center nearby</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Ever missed ARVs at health facility</td>
<td>Yes</td>
<td>222</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>100</td>
<td>31</td>
</tr>
<tr>
<td>Reasons for missing ARVs at health facility</td>
<td>Shortage of staff</td>
<td>111</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>Stock out</td>
<td>91</td>
<td>41</td>
</tr>
<tr>
<td></td>
<td>Opening hours too short</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Queue too long</td>
<td>7</td>
<td>3</td>
</tr>
</tbody>
</table>

4.9 Knowledge of effects of not taking the antiretroviral medication

The knowledge of HIV positive mothers on effects of not taking the antiretroviral medication as prescribed was assessed; 45% indicated development of oral thrush, 32% severe pneumonia and 23% severe sepsis, none of the respondents mentioned the risk of drug resistance (Figure 4.1).
Figure 4.1: Knowledge of effects of not taking the antiretroviral medication as prescribed
CHAPTER FIVE: DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussions

Youth and primary level of education were found to be statistically significant and contributed to non-adherence to PMTCT. The study found that majority of the respondents were youth aged 15-35 years having primary school level of education. This concurs with studies done by Kuonza et al. (2008) and Chesney (2000). This implies that maturity and high levels of education above primary school increase adherence to PMTCT treatment.

On HIV testing methods, some respondents in the present study, indicated that they were not tested for HIV but were given ARVs and placed on the PMTCT regimen. This indicates poor communication between healthcare provider and Antenatal mothers leading to HIV testing without pretest counseling. Majority of the HIV tested respondents were tested as a result of Provider initiated testing and counseling. Urban and Chersich (2004) found that only 74% of pregnant women tested for HIV received their results with the implication that the rest may not get adequate PMTCT treatment. A study by Chesney (2000) also found that poor relations with healthcare providers led to non-adherence to treatment.

Almost half of the respondents indicated that they never took the prescribed antiretroviral pills when they gave birth to the baby nor did they give the baby the infant ARV medication. This can lead to drug resistance and as Sethi et al, (2003) study
concluded, the patient either takes all prescribed antiretroviral medications or nothing to fully adhere to treatment. Majority did not take the ARVs in labour due to non-disclosure of HIV status, fear of stigma and discrimination, forgetfulness, others felt that ARVs were not necessary, while some were advised by relatives not to ingest the ARVs; Home delivery of the baby was also a contributing factor. Non adherence to Maternal and infant dose of Nevirapine during labour was associated with maternal non-disclosure of HIV results and home deliveries in a study by Kuonza et al (2008). Findings concurs to Albrecht et al’s (2006) study which found that failure to administer Nevirapine to the newborn at birth was associated with delivery at a tertiary hospital. In a study in South Africa, Urban and Chersich (2004) also found that only 56 % of HIV positive mothers and 16% of their infants received Nevirapine in labour.

For those who took the prescribed antiretroviral pills when they gave birth to the baby the findings shows that they swallowed them and gave the baby within the prescribed time. Chalker et al, (2008) found that facilities routinely gather potentially useful data on antiretroviral therapy adherence but the frequency is varied and unreliable.

Of those who disclosed their HIV positive status and were discriminated The Kenya government condemnns HIV and AIDS stigma and discrimination and has released the Public Sector Workplace Policy. Guideline 3.2, fights HIV related stigma and discrimination in the workplace thus upholding fundamental rights of the citizen (GoK, 2010). In Uganda as well a non-discriminatory policy on the basis of known or perceived HIV status was released in July 2007, it lays emphasis on promotion and
protection of human rights. It further states that HIV and AIDS should be treated like any other serious illness (GoU, 2007). Non adherence to ARV medication pre and post delivery concurs with a study by Chesney (2000) in which factors such as pill burden, dose frequency of more than twice a day, inability to take medication when away from home and side effects were found to be significant. It was found that only 50% of people living with HIV in the United States of America, remain in care and continue taking their antiretroviral treatment (CDC, 2016).

In a study in Malawi, Tenthani (2013) found that 17% of HIV positive mothers on Option B plus Antiretroviral regimen (WHO, 2013) were lost to follow up within 6 months of initiation of treatment. Mothers whose CD4 cell count was above 350cells/mm³ or in WHO clinical stage 1 or 2 were 5 times more likely to be lost to follow up. The risk of drug resistance and toxicity in the use of antiretroviral therapy is real. Toxicity can lead to discontinuation or modification of the therapy. Follow up of the patient is important (Spengler, 2002) There is a need to educate the public on importance of medication adherence.

The study also found out that health care system factors contributed to mothers missing ARVs. Respondents reported going to the health facility to collect ARV’s and missing, Shortage of staff, short opening hours, stock outs and long queues were reasons given. Some respondents indicated that there was a time when they avoided diet restriction and ate what they wanted contrary to the recommendation of the nutritionist. Postnatal clinic appointment defaulters do so for a many reasons ranging from lack of knowledge
on the importance of attending follow up, ignorance of the availability of the service
after the birth of the child, with an implication of mothers being lost to follow up due to
communication breakdown between the health worker and HIV positive mother.

A study done by Namara (2013) in Uganda found that 82% of HIV positive postnatal
mothers started on ARVs in the antenatal clinic returned for postnatal clinic
appointment and care compared to only 12% who had been initiated on ARVs in the
labour ward. Health workers need regular updates. In a study in Swaziland, Mazia et al
(2009) found that the competence of the health workers related to postnatal
examinations, and neonatal care increased with a 20 fold increase of postnatal visits
within the first three days. This was after they were trained in promoting and providing
early postnatal care.

The World Health Organization (2010) recommends improved communication between
the health worker, the mother, her reluctant partner and the community. There is need to
encourage disclosure of HIV status; discourage harmful sociocultural practices which
courage mothers to prefer home deliveries instead of seeking a skilled birth attendant.
This will improve adherence to PMTCT and postnatal clinic attendance. In March 2015,
Cuba successfully met WHO (2014) criteria for eliminating MTCT of HIV and syphilis
‘In 2013, only two babies were born with HIV in Cuba, and only 3 babies were born
with congenital syphilis.’
5.2 Conclusions

i) The proportion of HIV positive postnatal mothers not adhering to PMTCT treatment was found to be 41%.

ii) Common factors leading to HIV positive postnatal mothers not adhering to treatment were that: Some of the HIV positive respondents did not know when they were tested antenatally for HIV during provider initiated HIV testing and counseling; Some did not take the prescribed Antiretroviral pills when they gave birth to the baby nor did they give the baby the prescribed antiretroviral syrup due to non-disclosure of their HIV seropositive status to their partners; fear of stigma and discrimination; home delivery; young age and no high school education. Majority of the respondents were able to access the ARV’s when required, those who didn’t manage to access ARV’s gave reasons as lack of transport, clinic being too far, lack of fare, lack of mobile outreach center nearby, shortage of staff, stock out, opening hours too short as well as queue being too long.

iii) On the effects of non-adherence to antiretroviral medication, majority of the respondents admitted that they were given antiretroviral medication or Cotrimoxazole preventive therapy during their antenatal clinic visits; majority had knowledge of effects of non-adherence to ARVs such as development of oral thrush, severe pneumonia, severe sepsis as well as the risk of drug resistance when they missed taking ARVs.

iv) Majority (56.8%) of the respondents were not given appointment dates to return to postnatal clinic after the birth of the child. Among those given clinic
appointment dates, only 34.8% were given correct PNC appointment dates: at 48 hours, 2 weeks, then 6 weeks. Majority of the respondents (63.5%) indicated that the health worker did not explain the importance of postnatal clinic attendance which may contribute to non attendance and subsequent loss to follow up.

### 5.3 Recommendations

i) Each Pregnant woman accessing antenatal care should have individual pre and post test counseling and other information on HIV prevention services available to her. Counseling on danger signs of pregnancy, labor and postpartum period to include the importance of hospital delivery, importance of taking and giving the baby prescribed ARV medication within 72 hours of birth should be stressed (MoH, 2007). A birth partner should be involved in enforcing the ingestion of the ARV medication.

ii) Effective PMTCT programs should be accessible and have drugs equipment, infrastructure, funding and skilled manpower. Improved communication between the health worker, mother, her partner and the community will reassure mothers concerning antiretroviral drug effectiveness, reduce fear and distrust of health workers, encourage disclosure of seropositive status, discourage sociocultural practices which encourage mothers to prefer home deliveries instead of seeking a skilled birth attendant, thus improving adherence to PMTCT and postnatal clinic attendance.
iii) The health workers knowledge of Focused Antenatal care, PMTCT and communication skills should be regularly updated to enable them to do effective HIV testing, adherence and postnatal counseling. There is a need for continuous medical education for health workers with special emphasis on their area of work.

iv) The following weaknesses should be addressed to improve PMTCT services: Inadequate space, insufficient training, and inadequate numbers of health workers to cope with the workload. HIV related stigma and discrimination, inadequacy of information, education and communication (IEC) intervention materials, and insufficient equipment and supplies.

5.3.1 Recommendations for further research

Further research should be conducted to determine challenges faced by HIV positive pregnant mothers leading to non adherence to PMTCT treatment in Mombasa County, Kenya.
REFERENCES


Kenya Demographic and Health Survey (2009) KDHS Calverton, Maryland. KNBS and ICF Macro.


APPENDICES

APENDIX I: Map of Mombasa County showing study area
APPENDIX II: Place of delivery of the baby

- Home, 26.4%
- Hospital, 67.4%
- Health centre, 6.2%

Place of delivery of the baby
APPENDIX III: Consent form in English

Title: NON ADHERENCE TO PMTCT TREATMENT AND LOSS TO FOLLOW UP OF HIV POSITIVE MOTHERS AND BABIES IN MOMBASA COUNTY, KENYA

Participation: Participation in the study is voluntary. Refusal to participate will involve no loss of benefits. You may withdraw from the study unconditionally.

Purpose: We are interested in finding out why patients on antiretroviral and cotrimoxazole preventive therapy do not take the medicine as prescribed and fail to go for postnatal care and comprehensive care clinic on the appointment dates. This knowledge will assist in improving services.

Data collection: If you agree to participate or act as a legal representative for an adult to participate, we will ask you questions about your pregnancy and how you have been taking medication after delivery of your baby. No medicines will be given or any other invasive procedure.

Benefits: Participation in this study will not change your medication. The information will be given to the health managers to help in patient management and treatment.

Risks: There are no risks at all.

Compensation: There is no compensation to volunteer to participate.

Duration of participation: This study only requires filling a questionnaire. There is no follow up or further information needed.

Confidentiality: The information you give and records related to this study will remain confidential. Your name will not be used in any report resulting from this study. Computerized records will have codes for identification and not names.
Declaration Form

I…………………………………… (Name) of (age)……………, do hereby accept to participate in this research study. The study has been explained to me and I agree to volunteer to answer questions. I may withdraw or stop my participation in the study without victimization.

Subjects: Name……………..Signature/Thumbprint ……………Date……………………
Study Number…………………………………………
In-charge/Guardian/witness Name (If subject is under eighteen years old)…………………………
Signature………………………………………………..Date……………………
APPENDIX IV: Consent Form In Kiswahili

**Kichwa** Utafiti kuchunguza sababu zinazofanya akina mama ambao wana virusi vya HIV kutoendelea na kliniki au madawa ya kuzuia makali ya ukimwi baada ya kujifungua Mjini Mombasa nchini Kenya

**Kushiriki:** Kushiriki kwa utaﬁtí huu ni kwa hiari. Ukitataa kushiriki hautapoteza nafasi ya kuonekana na daktari au kutopata huduma yeyote vile Waweza kusitisha kutoshiriki bila masharti yoyote.

**Lengo la utaﬁtí:** Nia ya utaﬁtí huu ni kuchunguza wagonjwa wangapi wanaomeza dawa za kuzuia makali ya ukimwi mwilini wanatumia dawa kinyume na mashauri ya daktari pia tunachunguza sababu za kutoenda kliniki baada ya kupata mtoto. Majibu yako yatasaidia kuboresha huduma ambazo akina mama wajawazito na wanazo virusi za ukimwi wanapata.

**Kuuizwa maswali:** Ukitubali kushiriki katika utaﬁtí huu au kupatiana idhini kwa mtu mwingine (ukiwa una umri chini ya miaka kumi na minane) utaulizwa maswali kuhusu dawa uliopata wakati ulikuwa mja mzito na utaratibu wako wa kumeza dawa baada ya kupata mtoto.

**Manufaa:** Kushiriki kwa utaﬁtí huu hautababidilisha dawa ambazo unapata. Matokeo ya utaﬁtí huu utakuwa wa manufaa kwa kuchagua na kuboresha huduma kwa akina mama waja wazito amabo wan virusi vya ukimwi.

**Madhara.** Hakuna hatari au madhara yoyote kwa mshiriki

**Malipo ya kushiriki:** Hakuna malipo yoyote yanayotolewa kwa kushiriki katika utaﬁtí huu. Kushiriki ni kwa hiari
Muda wa kushiriki  Utafiti huu yahusu kujibu maswali pekee. Baadaye hautaambiwa urudi kounana na mtafiti

Siri: Kushiriki kwako na majibu utakayotupatia itakuwa ni wa siri. Jina lako halitatumika katika ripoti yoyote kuhusiana na hii utafiti. Matokeo ya utafiti itarekodiwa na nambari pekee

Mkataba ya makubaliano

Mimi………………………………… (Jina) mwenye (umri)……………, nakubali kushiriki kwene utafiti huu. Nimeelezwa vyema kuhusu lengo la utafiti huu Na nimekubali kujibu maswali . Naweza kujiondoa katika utafiti huu bila dhuluma yoyote.

Jina la mshiriki…………………………………………………………

Sahihi/alama ya kidole……………………………………………………

Tarehe……………… Nambari ya mshiriki……………………………

Jina la msimamizi (ikiwa mshiriki ana umri chini ya kumi na nane) ……

Sahihi……………………………………Tarehe……………………
APPENDIX V: Structured Interview Schedule For Mothers
Non adherence to PMTCT treatment and loss to follow up of mothers and babies in HIV positive postnatal mothers in Mombasa County, Kenya

This is a study being conducted by Florence F. Adhiambo Obonyo, who is a post graduate student at Kenyatta University pursuing Masters in Public Health.

Questionnaire No.……………. Date of interview……………………………
Code…………………………..

Supervisor to fill

Are all areas filled? YES…NO….

Instructions: -place a tick (√) in the appropriate box

A) Socio demographic information

Q 1) How old are you?
   i. 15 -25
   ii. 26 – 35
   iii. 36 – 45
   iv. 46 - 55

Q 2) What is your marital status?
   i. Single
   ii. Married
   iii. Divorced
   iv. Widowed
Q 3) What is your educational level?

   i. University
   ii. College
   iii. High School
   iv. Primary School

Q 4 ) What is your occupation?

   i. House wife
   ii. Peasant farmer
   iii. Employed
   iv. Business woman

Others specify……………………………………………………………………………………..

Q5) How much do you earn/income per month?

   i. Between Ksh 2500 - 25000
   ii. Between Ksh 25000 - 45000
   iii. Between Ksh 45000 - 60000
   iv. Above Ksh 60000

Q 6) What is the date of the last delivery?

   i. Less than a month
   ii. More than five months ago
   iii. More than a year
   iv. Two years

Q 7) Is the child alive?

   Yes/ No
If No, what was the cause of death………………………………………………………………………

Q 8) Where did you give birth?

Home
Hospital
Health center
Other………………………………………………………………………

B) Testing Methods

Q 1) Were you tested for HIV?

Yes/ No

If yes, which method was used?

Voluntary Counseling and Testing
Provider initiated Testing and counseling
Diagnostic testing and counseling
Others………………………………………………………………………

C) Adherence to medication

Q1) Were you given antiretroviral medication to take when in labour during your Antenatal clinic visits?

Yes /No

Q2) Did you take the prescribed Antiretroviral pills when you gave birth to the baby?

Yes /No

If No please explain …………………………………………………………………………

i. Forgot

ii. Fear of stigma
iii. They were not necessary
iv. Advised not to take by relatives
v. Drugs not available
vi. Others specify…………………………………………………………

Q5) If Yes , after what duration?
   i.  Same day of giving birth
   ii. Second day
   iii. Third day
   iv. Fourth day
   v. Others specify ……………………………………………………………

Q6) Did you give the baby the prescribed antiretroviral syrup?

   Yes /No

   If No please explain…………………………………………………………

Q7) Was there a time that you ever missed taking the ARV pills:
   i. Took half of the medication Yes /No
   ii. Did not take medication at the correct time Yes/ No
   iii. Did not complete the dose Yes/ No
   iv. Missed taking the pill Yes /No

   Others specify…………………………………………………………

Q8) Do you know the effects of not taking the antiretroviral medication?

   Oral thrush,
   Severe pneumonia,
   Severe sepsis
Any other please explain

Q9) Are you able to access the ARV’s when required?
Yes/ No

If No Explain,

i. Lack of transport

ii. Clinic too far

iii. Lack of fare

iv. No mobile out reach center nearby

Others specify……………………………………………………………………………..

Q10) Is there a time that you went to the health facility to collect ARV’s and missed?
Yes / No

Explain,

a) Shortage of staff

b) Stock out

c) Opening hours too short

d) Queue too long

Others specify……………………………………………………………………………..

D) NUTRITION

Q 1) What types of foods were you advised to be taking with the medication?…………

Q 2) Have you had problems obtaining the recommended foods?…………………………

Q 3) Have you been collecting food supplements from the hospital?
If yes, which one…………………………………………………………………………….
E) Postnatal clinic attendance

Q 1) Were you given dates to return to the postnatal clinic?
Yes / No
If yes when did you return to the postnatal clinic?
   a) At 48 hours, 2 weeks, then 6 weeks
   b) At 48 hours, then 6 weeks
   c) At 2 weeks then 6 weeks
   d) At 6 weeks

Q 2) Did the health worker explain the importance of postnatal clinic attendance?
Yes/ No
If yes please explain………………………………………………………………………………………..

F) DISCLOSURE

Q1) When did you first share you HIV status with your sexual partner?
   a) On the same day after testing positive.
   b) After a month
   c) Never

Q2) When did you first share your HIV status with the extended family members?
   a) On the same day after testing positive.
   b) After a month
   c) Never

Q3) Were you stigmatized or discriminated after disclosure ? if so by who?
   a) Parent
   b) Partner
c) Church member

d) Friends

e) Neighbors

f) Relatives

THANK YOU
APPENDIX VI: Research Authorization

Florence Fibi Adhiambo Obonyo
Kenyatta University
P.O.Box 43844-00100
Nairobi.
Cellphone 0735295198

RE: RESEARCH AUTHORIZATION

Following your application dated 24th November, 2012 for authority to carry out research on “Factors contributing to HIV Positive mothers not adhering to treatment in Mombasa County, Coast Province, Kenya,” I am pleased to inform you that you have been authorized to undertake research in Mombasa County for a period ending 30th September, 2013.

You are advised to report to the District Commissioners, the District Education Officers and the District Medical Officers of Health, Mombasa County before embarking on the research project.

On completion of the research, you are expected to submit two hard copies and one soft copy in pdf of the research report/thesis to our office.

DR M.K. RUGUTT, PhD, MSC.
DEPUTY COUNCIL SECRETARY

Copy to:

The District Commissioners
The District Education Officers
The District Medical Officers of Health
Mombasa County.