FACTORS INFLUENCING THE USE OF ANTI-RETROVIRAL DRUGS IN THE PREVENTION OF MOTHER-TO-CHILD TRANSMISSION OF HIV IN NAIROBI, KENYA.

A THESIS SUBMITTED IN PARTIAL FULFILMENT FOR THE DEGREE OF MASTER OF PUBLIC HEALTH AND EPIDEMIOLOGY IN THE SCHOOL OF PURE AND APPLIED SCIENCES OF KENYATTA UNIVERSITY.

APRIL 2005

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Factors influencing the use of
DECLARATION

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

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We confirm that the candidate, under our supervision, carried out the work reported in this thesis.

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DEDICATION

To my loving parents Mr. Jeremiah G. Mwichigi and Mrs. Lucy W. Gitimu who taught me the value of hard work. I am grateful to them for encouraging me to enrol for this course and being there for me throughout the entire programme.

To my sisters Sarah, Carol and brother Dominic for their love, support and encouragement throughout the study.
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ACRONYMS / ABBREVIATIONS

AIDS  Acquired Immune Deficiency Syndrome
ANC  Ante Natal Care
ARV  Ante Retroviral
ART  Ante Retroviral Therapy
AZT  Zidovudine
CED  Columbia Electronic Dictionary
GOV'T  Government
HCP  Health Care Providers
HIV  Human Immunodeficiency Virus
IEC  Information, Education and Communication
IVDU  Intra Venous Drug Users
KANCO  Kenya AIDS NGOs Consortium
MCH  Maternal and Child Health
MOH  Ministry Of Health
MTCT  Mother To Child Transmission
NACC  National AIDS Control Council
NASCOP  National STD/ AIDS Control Programme
NGO  Non-Governmental Organisation
PLWHA  People Living With HIV/AIDS
PMTCT  Prevention of Mother To Child Transmission
ROK  Republic Of Kenya
SPSS  Statistical Package for Social Sciences
STI  Sexually Transmitted Infections
UNAIDS  United Nations Programme on HIV/AIDS

VCT  Voluntary Counselling and Testing

WHO  World Health Organisation
ABSTRACT

Women represent 43% of all adults living with HIV/AIDS. The majority of these (80%) are of childbearing age. This has raised a lot of concern about perinatal transmission of HIV. Mother-to-child transmission of HIV can occur during antenatal period (10-20%), labour period and delivery (35-50%) and breastfeeding (40-50%). Anti-retroviral drugs are one element in prevention of mother-to-child transmission of HIV that is of great importance. Although anti-retroviral drugs have become common in developing countries and have been in use for over a decade, there are no systemic surveys to find out the factors that influence their usage in many countries including Kenya. A cross sectional descriptive study was carried out in Nairobi at Mbagathi District Hospital, Marie Stopes (Eastleigh Nursing Home) and Pumwani Maternity Hospital to determine the factors that influence the use of antiretroviral drugs in prevention of mother-to-child transmission of HIV. A total of 110 HIV positive pregnant women attending antenatal clinics at the health care facilities were included in the study. Data was collected using structured questionnaires, interview guides and check lists. Data was analyzed using the scientific package for social sciences (SPSS) software. Chi-square test was performed to establish the relationship between variables. The results indicate that the level of knowledge among HIV positive pregnant women on ARV was good (76%) and there was a significant statistical relationship between those who had heard of ARVs and education level of the respondents ($\chi^2 = 26.99; \text{df}=3; p=0.000$). Majority of the respondents (86.4%) were not using ARVs and there was a significant statistical relationship between those who were on ARVs and education level ($\chi^2 = 12.91; \text{df}=3; p=0.005$) and employment type ($\chi^2 = 12.564; \text{df}=2; p=0.002$). The reasons for non-usage of ARV were cost of drugs (79.1%) and inaccessibility (42.8%). There was a significant relationship between those who could purchase the drugs and employment type ($\chi^2 = 39.69; \text{df}=2; p=0.000$). In this study, antiretroviral therapy was mainly targeting the labour period due to lack of essential drugs to target the antenatal period. The results of the study suggest that there is need for health education for HIV-positive pregnant women to encourage ART in an effort to prevent mother-to-child transmission of HIV. Anti-retroviral drugs should be made accessible and affordable to HIV-positive pregnant women. VCT should be advocated among pregnant women so that they can know their serostatus early enough to start therapy. The findings of this study will be of use to HCP so that they can intensify education campaigns on ART and also to drug companies in providing affordable drugs particularly to resource-strained countries.
CHAPTER ONE: INTRODUCTION

1.1: Background Information

Acquired immune deficiency syndrome (AIDS) is a severe immunological disorder caused by the Human Immune-deficiency Virus (HIV), resulting in defect in cell-mediated immune response that is manifested by increased susceptibility to opportunistic infections and to certain rare cancers. The virus enters the CD4 cells (also called T4 or T-helper cells) of the body’s immune system that are necessary to activate B-lymphocytes and induce production of antibodies. The conditions associated with AIDS include malignancies such as Kaposi’s sarcoma, Non-Hodgkin’s lymphoma, primary lymphoma of the brain, and invasive carcinoma of the cervix. Opportunistic infection characteristic of or more virulent in AIDS include Pneumocytis carini pneumonia, herpes simplex, cytomegalovirus and diarrhoeal diseases caused by cryptosporidium or isospora. These infections cause a wide range of symptoms (coughing, diarrhoeal, fever, night sweats and headaches) and may lead to extreme weight loss, blindness, hallucinations and dementia (CED, 2005).

HIV/AIDS persists as a global public health problem of a serious magnitude requiring urgent attention (ROK, 2001a). At no time in recent history has HIV/AIDS been of great concern as it is today. At the end of 2002, 0.22 million children in Kenya were living with HIV (ROK, 2003). Currently more than 95% of the children with HIV live in developing countries. Children are still becoming infected with HIV because identifying infected mothers and delivering drugs to them are formidable tasks. The infrastructure and
economic resources to reach, test and treat pregnant women and their children are often lacking in developing countries (Connor et al., 2001).

Kenya’s population in 1999 was estimated at 28.2 million, with a birth rate of 1.2 per annum, a HIV sero-prevalence rate of 13% in mothers and MTCT of 40%. The expected number of HIV infected infants per annum in Kenya is approximately 100,000. This is a big number for a country such as Kenya to cope with (ROK, 2001a).

The first cases of HIV infection in children were reported in the USA (1982) and in Europe (1984). It was soon evident, particularly in Africa and in the Caribbean that a correlation existed between the presence of the infection in the mothers and its transmission to their children. Mother-to-child transmission of HIV is responsible for more than 80% of the paediatric cases of HIV infection worldwide (Brookmeyer and Gail, 1994).

The incidence of paediatric AIDS is closely correlated with the extent of HIV infection among women. About 30 to 40% of babies born to infected mothers will also be infected with HIV (Di Lenardo et al., 1999). Mother to child transmission of HIV occurs during the antenatal period (10-20%), labour and delivery (35-50%) and breastfeeding (40-50%) (ROK, 2001e).

There are various factors that affect mother-to-child transmission of HIV which include maternal viral load, maternal substance abuse, vaginal delivery
as compared to elective caesarean section and breast-feeding among others (ROK, 2001d).

Anti-retroviral drugs help in reducing replication of the virus and thus reduce viral load. Anti-retroviral drugs are an important element in Prevention of mother-to-child transmission of HIV. When regimens are followed, they prevent mother–to-child transmission of HIV by 50-70% in non-breastfeeding children (UNAIDS, 2000). For antiretroviral drugs to be effective, they require correct dosing, rigorous adherence to scheduling and absolute compliance (Di Lenardo et al., 1999). Recent studies have documented dramatic decreases in opportunistic infections, hospitalisations and mortality among HIV-infected persons, owing primarily to highly active antiretroviral drugs (Galpin et al., 2001).

According to Bristol-Myers Squibb (BMS) Kenya, which is a discounted proprietary drug company, ARVs are usually accompanied with supply crisis; price reduction without consistent drug supplies. This affects accessibility and usage of ARVs used in PMTCT. Knowledge on ARVs used in PMTCT is limited both to health-care providers and HIV-positive pregnant women (Owor et al., 2000). The attitude towards ARV drug usage in PMTCT in Kenya is unknown.

Prevention of mother-to-child transmission of HIV requires a standard combination of three ARVs preferably Stavudine (D4T), Lamivudine (3TC)
and Nevirapine (NVP). Effective ART remains beyond the reach of most HIV-infected persons living in third world countries (Galpin et al., 2001).

1.2 Problem statement

The rapid spread of the Human Immune-deficiency Virus (HIV) and its resultant effects on human life, has become a major issue of concern to scholars from various disciplines including medical practitioners and researchers.

Current data from sentinel surveillance sites throughout Kenya show that the virus is still spreading and that women are infected at younger ages than men (ROK, 2001b). Research indicates that most people become infected through heterosexual contact. Those most at risk of acquiring HIV are people with multiple partners, their spouses and unborn children (ROK, 2001c).

Almost all children under the age of 5 years with HIV infection acquired it through vertical transmission, at birth or post-natal (ROK, 2001c). Although studies have shown that vertical transmission can be virtually eliminated with anti-retroviral drugs, major obstacles on knowledge and attitude towards ARVs usage must be addressed before HIV in children can be successfully prevented and treated (Mofeson et al., 2001). The infrastructure and economic resources to reach, test and treat pregnant women and their children are often lacking in developing countries. Unfortunately anti-retroviral drug usage is a major challenge in many developing countries including Kenya (ROK, 2001c).
Though the rapid spread of HIV poses a threat to the survival of the entire mankind, not much research work has been carried out in Kenya to investigate the factors that influence ARV drug usage in PMTCT as an intervention strategy. Most of the HIV-positive pregnant women have little or no knowledge on ARVs; they also find them expensive and inaccessible (Owor et al., 2000).

The cost of medications remains high, many toxicities are associated with drug therapy and regimens are both complex and daunting and thus could affect attitude and usage of ARVs in PMTCT (Stringer et al., 1999). However anti-retroviral drugs are a major component in preventing mother-to-child transmission of HIV. This study was therefore carried out to investigate the factors that influence the use of ARVs in PMTCT among HIV positive pregnant women attending ANC as an intervention strategy.

1.3 Justification of the study

Studies by the Ministry of Health ROK, (2001a), on strategies and interventions to slow the spread of AIDS and prevent MTCT, reported that ARV drugs taken during the last weeks of pregnancy and during labour could reduce the viral load in the mother and reduce the risk of MTCT by 50%. However, ARV drugs are of limited use in developing countries despite the high perinatal transmission rates (ROK, 2001a).

In Kenya, no studies have been carried out to determine affordability, accessibility, knowledge and attitude of ARV drug usage in PMTCT of HIV.
This study aimed at addressing these issues in the ANC and routine testing strengthened hospitals in Nairobi since they are well-equipped with trained personnel on PMTCT programmes.

1.4 Research Questions

1. What is the relationship between knowledge, attitude and use of ARV therapy in PMTCT?
2. How accessible and affordable are the ARV drugs used in PMTCT?

1.5 Null hypotheses

1. There is no relationship between knowledge, attitude and use of ARV drugs in PMTCT of HIV.
2. There is no relationship between affordability, accessibility and use of ARV drugs in PMTCT of HIV.

1.6 Study Objectives

1.6.1 General Objective
To investigate the factors that influence the use of ARV drugs in PMTCT among HIV positive pregnant women.
1.6.2 Specific objectives

1. To establish the level of knowledge on ARVs among HIV positive pregnant women.

2. To determine the attitude of HIV positive pregnant women towards ART.

3. To establish the accessibility and affordability of ARV drugs used in PMTCT.

4. To determine the usage of ARV drugs in PMTCT.
CHAPTER TWO: LITERATURE REVIEW

2.1 History of HIV/AIDS

In 1981, doctors in Los Angeles found themselves baffled by a strange disease. Apparently healthy young men were developing pneumonia caused by a microorganism *Pneumocystis carinii*, which does not usually cause the disease in normal healthy persons. Besides *Pneumocystis carinii* these men were suffering from a range of other opportunistic infections, which healthy persons should normally be able to resist. Researchers found that the young men were all homosexuals, many of who were also suffering from sexually transmitted diseases such as gonorrhoea and syphilis. It was thought likely that this new disease was also sexually transmitted. These symptoms were then found in other sections of the population who were not homosexuals, haemophiliacs and persons injecting drugs such as heroine. Haemophilia is an inherited disease where the blood lacks the essential factor needed for clotting and healing of wounds. These persons were receiving injections of a substance called Factor 8 made from blood of healthy persons without haemophilia. Many of the IVDUs did not sterilize their needles and shared them with other addicts. It became clear to the researchers that not only was AIDS a sexually transmitted disease but it could also be transmitted through blood. By 1982 the center for disease control (CDC) in Atlanta, United States decided that enough was known about the disease to produce a provisional case definition. Acquired Immune Deficiency Syndrome was defined as the presence of reliably defined diseases that are due to an underlying immune deficiency, for example *Pneumocystis carinii* pneumonia or *Kaposis’ sarcoma*
and where the immune deficiency is not due to other known causes such as congenital diseases, immuno-suppressant drugs or cancer (Lilienfeld and Stolley, 1994).

### 2.2 Disease progression following HIV Infection

When Human Immunodeficiency Virus (HIV) enters the body, it attacks the CD4 lymphocytes and starts multiplying. The body tries to defend itself against HIV by making the antibodies. However, when one has acute HIV syndrome, there are high levels of HIV RNA in the blood (Prybyiski, 1999). Some of the symptoms of acute HIV syndrome include fever, fatigue, swollen lymph nodes, swollen tonsils (also called tonsillitis), sore throat, joint and muscle aches, diarrhoea and a skin rash. The symptoms of acute HIV syndrome usually last for about 14 days after HIV exposure. However they may last for just a few days, or several months.

After a person has been infected with the virus there is a period between 3 to 12 weeks before the body responds by production of antibodies. During this period some people experience a short bout of fever that is believed to accompany the production of antibodies. Eventually all HIV antibody positive persons develop AIDS but the time taken to do this varies from person to person (Owor et al., 2000).

The factors that determine the rate of disease progression are not well understood but probably include the natural variation of the host, other host
factors including age and also pathogenicity of different strains of HIV. The time taken for infected babies to progress to AIDS is short and most will have died by five years of age. With adults it can be seven to ten years or even longer. The World Health Organisation (WHO) estimates that 50% of those infected become ill within ten years of initial infection (Owor et al., 2000).

2.3 Clinical Presentation of HIV/AIDS

Acquired Immune Deficiency Syndrome in an adult is defined by the existence of at least two major signs associated with at least one minor sign, in the absence of known causes of immuno-suppression such as cancer or severe malnutrition or other recognized etiologies (WHO, 1994). However, the presence of generalized Kaposi’s sarcoma or cryptococcal meningitis is sufficient by itself for the diagnosis of AIDS (Kaslow and Francis, 1989).

The major signs are: weight loss that is equivalent to or greater than 10% of body weight, chronic diarrhoea (for more than one month) and prolonged fever (for more than one month, intermittent or constant) whereas the minor signs are: persistent coughs (for more than one month), generalized pruritic dermatitis, recurrent herpes zoster, oropharyngeal candidiasis, chronic progressive and disseminated herpes virus infection and generalized lymphadenopathy (WHO, 1992; Kaslow and Francis et al., 1989).
2.4 Diagnosis of HIV infection.

The most specific diagnosis of HIV infection is direct identification of the virus in host tissue by virus culture and isolation. This technique is, however, laborious, expensive and not widely available. An important innovation is the polymerase chain reaction (PCR), which is used to detect HIV-DNA sequences through multiple cycles of amplification from uncultured lymphocytes of subjects infected with HIV. PCR uses a primer oligonucleotide based on any of the HIV genes, which will anneal to the specimen if the homologous HIV-DNA sequence is present. Multiplication with DNA polymerase and recombinant techniques yield an enormous amplification, and thus makes viral DNA detectable when only a few copies are present thereby ensuring high sensitivity (Holland et al., 1991).

For clinical and public health purposes, diagnosis is made by serology. Initially a sensitive screening test is used, most commonly an enzyme-linked immuno-sorbent assay (ELISA). Serum samples that test positive are tested repeatedly to eliminate laboratory errors; and those that test repeatedly positive are then confirmed by the western blot or immuno-flouresence assay (UNAIDS, 2003). The commercially available ELISA tests have been well standardized, and specificity of these tests far exceeds what is common in medical tests. Of those that are currently marketed, both sensitivity and specificity are over 99.0%. Two or more different ELISA tests in sequence may also be a good economic alternative to western blot confirmation (Holland et al., 1991; WHO, 1992).
2.5 The global picture of HIV/AIDS

In 1981, the New York Times published an article about a syndrome, which was later known as AIDS. HIV/AIDS has since become a serious problem in the whole world, Africa being the most affected (Harvard AIDS Institute, 2000).

In sub-Saharan Africa, the Human Immune-deficiency Virus (HIV) has caused a severe and generalized epidemic. In at least 16 countries, the HIV sero-prevalence in pregnant women exceeds 10% and in at least 6 countries, it is over 20%. When a mother has HIV infection, the risk of transmitting the infection to the child is reported to be 20-42%. This has reversed previous gains of child survival over the last two decades (CDC, 1998).

In 2003, the Joint United Nations Programme on HIV/AIDS (UNAIDS) estimated that the HIV/AIDS epidemic killed more than 3 million people in 2003, and an estimated 5 million acquired HIV bringing to 40 million the number of people living with HIV around the world. (UNAIDS, 2003). The HIV/AIDS pandemic is rapidly spreading through Asia, the Caribbean and Eastern Europe. HIV/AIDS cases are concentrated in the least developed countries, with 89% of the people with HIV/AIDS living in sub-Saharan Africa and Asia (Moria and Chesny, 2000)
Due to the seriousness of HIV/AIDS in the world, the United Nations has initiated a global fund for HIV/AIDS, which aims at raising between US$ 7 billion – US$ 10 billion, with the United States of America having pledged US$ 200 million to this fund to help in curbing HIV/AIDS (UNAIDS / WHO, 2001).

### 2.6 HIV/AIDS prevalence in Kenya

In Kenya one in every 10 adults in the sexually active bracket (15-49 years), which is the reproductive age group, is living with HIV/AIDS (ROK, 2001a). HIV/AIDS is a tragedy of devastating proportions affecting the lives of infected individuals, their families and communities; the companies and agencies they work for and the society as a whole (ROK, 2001b).

In 2001, HIV prevalence in urban areas ranged from 11-29% while in the rural sentinel surveillance sites, the prevalence ranged from 2-31%. Overall among the urban population, the HIV prevalence averaged 15%, while in rural populations it averaged 12%. Women were more likely to be infected than men. Heterosexual transmission accounts for nearly 90% of all HIV infections. About 10% are spread from mother to child, while less than 1% is spread intravenously (ROK, 2002). The number of HIV/AIDS orphans is projected to exceed 1.5 million by the year 2005 (ROK, 2001b).

By 2002, it was estimated that 2.52 million people in Kenya were living with HIV/AIDS. For every 8 adults aged 15-49 years, one is infected in urban
areas, a sixth of all sexually active adults are infected, most of them unaware of this fact (NASCOP, 2000).

It is estimated that the national adult HIV prevalence rate rose from 5.3% in 1990 to 13.1% in 1999. Prevalence is generally higher in urban areas (an average of 16-17%) than in rural areas where it is on average 11-12% (ROK, 2001b). The annual incidence of AIDS cases is estimated to be about 250,000 each year (NACC, 2001).

2.7 Prevalence of HIV among pregnant mothers in Kenya

The prevalence of HIV infection among pregnant women aged between 15-49 years in Kenya is currently estimated at 13%. High birth rates in Kenya translate to an estimated 50,000 to 60,000 children under 5 years of age infected with HIV per annum (ROK, 2001b). In 2000, about 10% of the reported AIDS cases in children were under 5 years of age. Among these infections in children, 90% were due to mother-to-child transmission of HIV (ROK, 2001e).

2.7 Impact of HIV/AIDS in Kenya

Analytical reports on the 1999 Kenyan population projections show that the HIV/AIDS pandemic is having significant effects on both the demographic composition and the social and economic structures. The average life expectancy for Kenyans has dropped by 12 years in duration of five years
Analysis of several Kenyan firms shows that HIV/AIDS increases labour costs through: increased absenteeism, labour turnover, health care costs, burial fees, recruitment and retraining by 4% by the year 2005 (NACC, 2001). The economic loss incurred by the country is close to KShs. 210 million daily (NACC, 2001). Within the next ten years, the impact of HIV/AIDS is expected to reduce Kenya’s Gross Domestic Product (GDP) by 14.5% (ROK, 2001a). That is to say that, not only will the economy lose valuable members of its workforce, but the resources will also shrink (ROK, 2001a).

2.9 Impact of HIV/AIDS on the economy in sub-Saharan-Africa

It remains exceptionally difficult to gauge the macro-economic impact of the epidemic. Many factors apart from AIDS affect economic performance and complicate the task of economic forecasting – drought, internal and external conflict, corruption, economic mismanagement. Moreover, economies tend to react more dramatically to economic restructuring measures, a sudden fuel shortage, or unexpected change in government, than to long, slow corrosions such as those brought about by AIDS (UNAIDS, 2001; Obbo, 1999).

Despite incomplete data, there is growing evidence that as HIV prevalence rates rise, both total and growth in national income – gross domestic product, or GDP fall significantly. African countries where less than 5% of the adult
population is affected will experience a modest impact on GDP growth rate.

As the HIV prevalence rate rises to 20% or more (as it already has in a number of countries in southern Africa such as Swaziland), GDP growth may decline up to 2% a year. With adult prevalence rates of around 20% and 36% respectively, South Africa and Botswana are already feeling the impact of the epidemic. The worst is yet to come: in both countries, today’s 15-year olds have a greater than 50% chance of dying of HIV-related causes if the current infection rates are not cut dramatically. The skill shortage is acute in Botswana, which is already importing white-collar workers. One recent study predicts that wages among skilled workers will be pushed up to between 12% and 17% because of AIDS deaths (UNAIDS, 2001).

At US$ 3240, Botswana has the highest per capita GDP in sub-Saharan Africa. By investing its income wisely, the country has achieved high levels of literacy, good coverage on basic health services, and a reduction on the number of poor households. These gains will be eroded by the epidemic (UNAIDS, 2001).

A study by the United Nations AIDS programme in Botswana in 1999 on the effects of AIDS suggests that the number of destitute households (those earning less than US 1$ per person per month) will rise over the next 10 years (UNAIDS, 2001). Over the same period, the poorest households will experience a 13% drop in income and expand in size, as wage earners take on extra dependants because of AIDS. These economic projections assume that prevention programmes will not bring about any drastic changes in HIV
infection rates in the immediate future. Since a large proportion of the people projected to be infected and die over the next 10-15 years are already infected, this assumption seems reasonable (UNAIDS, 2001).

2.10 Impact of HIV/AIDS on Education in sub-Saharan Africa

The better-educated segments of the population in the industrialized countries were the first to adopt health-conscious lifestyles featuring exercises, non-smoking and a healthy diet. A similar pattern seems to be emerging in sub-Saharan Africa with respect to HIV (UNAIDS, 2001). This was not the initial scenario on HIV/AIDS in Africa. At that stage education tended to go hand in hand with more disposable income and higher mobility, both of which increased casual sex and the risk of contracting HIV. But as information about HIV became more widely available, education has switched from being a liability to being a shield. Because more educated people are better equipped to act on prevention information, and have more options in life in general, they are now exposing themselves less to the risk of HIV (UNAIDS, 2001). An analysis focusing on 15-19-year olds in Uganda found that teenagers with more education were far more likely to use condoms than their peers with lower education, as well as less likely to engage in casual sex, particularly in countries with severe epidemics (UNAIDS, 2001).

Acquired Immune Deficiency Syndrome now threatens the coverage and quality of education; HIV is reducing the number of children in school. HIV-positive women have fewer babies, in part because they may die before the end of their child bearing years, and up to a third of their children are infected
and may not survive to school-going age. Many children who have lost their parents to AIDS, or are living in households which have taken in AIDS orphans, may be forced to drop out of school to start earning money, or simply because school fees has became unaffordable (UNAIDS, 2001). Teacher shortages are looming in many African countries. In Zambia teachers are increasingly dying of AIDS and many more show up to teach sporadically because they are sick (UNAIDS, 2001).

Swaziland estimates that it will have to train more than twice as many teachers as usual over the next 17 years just to keep services at their 1997 levels. Without this extra teacher training, class size would rise up to over 50 pupils for every teacher (UNAIDS, 2001).

Together with sickness and death benefits for teachers, Swaziland's extra hiring and training costs are expected to drain the treasury of some US$ 233 million by 2016, more than the 1998-1999 total government budget for all goods and services (UNAIDS, 2001).

2.11 Childhood mortality

Acquired Immune Deficiency Syndrome affects child survival. About 30 to 40% of babies born to HIV-infected mothers will also be infected. Most of these babies will develop AIDS and die within two years and few will survive past the age of five. The increasing number of child deaths caused by AIDS threatens to reverse gains of child survival programmes (CDC, 1998).
The infant mortality rate is the number of children who die during the first year of life per 1000 life births. In Kenya the rate is currently around 74. Without HIV/AIDS, the infant mortality rate might have been expected to decline to about 55-60. Child mortality rate is the number of children who die before reaching their 5th birthday per 1000 life births. This is currently around 112 in Kenya. Without HIV/AIDS, it might have been expected to decline to around 70 by the year 2005. However, with HIV/AIDS, it is likely to remain constant or rise significantly to 120-125 deaths per 1000 life births (ROK, 2001c).

2.12 Prevention of mother-to-child transmission (PMTCT) of HIV

Human immune deficiency virus (HIV) infection and AIDS threatens to reverse the gains made in child survival through the wide-spread use of childhood vaccines and improved management of diarrhoeal and acute respiratory infections (Andiman et al., 1990).

For Women who have not received prior antenatal care, an enzyme-linked immunosorbent assay test should be done as early as possible in labour, with informed consent. Although chemoprophylaxis given solely in labour has been found to reduce the risk of transmission, these interventions are not as effective as regimens began earlier in pregnancy (O’connor and Macdonald 2002).
Elective caesarean section can reduce the risk of transmission by half but it is not yet a realistic option for poor countries. Alternative approaches to reducing transmission, such as vitamin A supplementation and chlorohexidine cleansing of the birth canal, have not showed success. For poor countries, the two most cost-effective interventions are ARV prophylaxis and modification of infant feeding (Bamberger et al., 2001).

Prevention of MTCT has a three-fold strategy, which includes preventing women and girls of child-bearing age from becoming infected with HIV, avoidance of unwanted pregnancies among HIV positive women and preventing the transmission of HIV from HIV positive mothers to their infants by providing ARV drugs, safe delivery practices and breast milk substitutes (UNAIDS, 2003).

2.13 Risk factors for MTCT of HIV

Human immune deficiency Virus can be transmitted to an infant during pregnancy, labour and delivery or breastfeeding. The risk of transmission varies between 15-30% among infants who are not breastfed (Hames, 2001). Many factors are known or suspected to increase the risk of transmitting HIV from the mother to the child. The most important is the HIV viral load in the mother, though many of the other maternal, obstetrical, viral and infant factors may contribute to increasing an infant’s exposure or susceptibility to acquiring HIV (KANCO, 1993).
Transmission during labour and delivery occurs when the infant sucks, imbibes or aspirates maternal blood or cervical secretions that contain HIV or has other mucous membrane exposures. Breastfeeding is another mode of transmission of HIV from the mother to the child. Other factors that may cause a breakdown in the protection offered to the foetus by the placenta, which in normal circumstances would not allow HIV to cross the placenta from the mother to the foetus, are also important in MTCT (UNAIDS, 2003). In developed countries mother-to-child transmission has been virtually eliminated due to effective VCT, access to ART, safe delivery practices (including elective caesarean sections), and a wide spread availability and safe use of breast milk substitutes (UNAIDS, 2003).

2.14 Anti retroviral therapy

Anti retroviral drugs administered orally and/or intravenously are effective in controlling the progression of HIV/AIDS and preventing transmission of HIV infection to a baby perinatally. ARVs increase helper T lymphocyte numbers and improve survival rates and quality of life of PLWHA. In PMTCT, reduction of the viral load in the mother lowers the chance of perinatal transmission (Hames, 2001).

Anti-retroviral drugs are of three types: Nucleoside Reverse Transcriptase Inhibitors (NRTIS), which include abacavir, didanosine, lamivudine, stavudine and zidovudine among others. Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTIS) include efavirenz and nevirapine. The third type of ARV drugs are, protease inhibitors, which include saquinavir,
ritonavir, indinavir, nelfinavir, lopinavir and ritonavir. The most commonly prescribed drugs in pregnancy are zidovudine, stavudine, lamivudine, nevirapine and nelfinavir (ROK, 2001d). Pregnant women should be offered standard combination anti-retroviral therapy, usually including two nucleoside reverse transcriptase inhibitors and a protease inhibitor (Kiessling, 1999), or two nucleoside reverse transcriptase inhibitors and a non-nucleoside reverse transcriptase inhibitor (ROK 2001d).

The baseline rate of perinatal HIV transmission without prophylactic therapy is approximately 25%. Zidovudine reduces MTCT by 68% (infection status at 18 months); Nevirapine reduces by 47% (infection status at 6 weeks of age). The two can be considered as single dose effective since their administration is for a short time and therefore has low chances of resistance (ROK, 2001d).

Prevention of mother-to-child transmission is important as it reduces childhood illness and death. Drugs are only one element in the continuum care but they are an essential element especially in PMTCT of already infected mothers. Short courses of ARV drugs such as Nevirapine and Zidovudine have been shown to lower transmission rates by nearly half. Longer courses of ARVs and routine HIV-testing of pregnant women has dramatically lowered the rate of MTCT to 2-5% in some developed countries and has made paediatric HIV infection a rare occurrence (ROK, 2001a). The benefits of ARV therapy include a reduction of mother-to-child transmission of HIV infection, reduction of the cost of caring for HIV positive infants by the health
care system and family structure and reduction of the viral load in the mother that prolongs the onset of AIDS (Dorn et al., 1992).

Although there are special considerations in using anti-retroviral drugs during pregnancy, the basic principle is that therapies of known or possible benefit to the woman and her baby should not be withheld during pregnancy unless there are known adverse effects on the mother, foetus or infant that outweigh the potential benefits (Mofeson et al., 2001).

Strategies of anti-retroviral therapy have evolved to prevent the development of viral resistance. Although mono-therapy with any of the anti retroviral agents will increase CD4 count, the clinical benefit of such an increase is very limited, largely because of the development of viral resistance. Combination anti-retroviral therapy has been shown to have superior effectiveness in controlling viral replication and in limiting the emergence of resistant viruses. These effects translate into greater clinical benefits; combination therapy reduces the risk of HIV progression (Yerly et al., 2000).

Anti-retroviral drugs are able to achieve profound suppression of viral replication when combined in varying regimens. Costs of medications remain high, many toxicities are associated with drug therapy and regimens are both complex and daunting. In spite of many difficulties associated with highly active anti retroviral therapy (HAART), many patients are able to achieve improved quality of life and longer survival (Stringer et al., 1999).
2.15 The use of ARV drugs

In 1994 a drug regime using Zidovudine (AZT) was shown to reduce MTCT by about two-thirds in the absence of breastfeeding. But at an average cost of US$1000 per pregnancy, this regime was far too expensive for use in resource poor countries. Then in 1998 studies in Thailand showed that a simpler drug regime, a one-month course of Zidovudine late in pregnancy, would half the rate of HIV transmission so long as the women also avoided breastfeeding. Other studies showed that even if women breastfed their infants, the rate of MTCT was still cut by a third (UNAIDS, 2003).

In 1999, a study in Uganda showed that MTCT could be reduced by half by giving a dose of nevirapine to the mother at the onset of labour and to the newborn after delivery dose given to the infant after delivery. This short course regimen costs about US$4 and yet it is still unaffordable to many in resource-constrained countries (UNAIDS, 2003).

Combination ART has dramatically improved the survival of PLWHA in industrialised countries of the world. Access to ARV drugs is an important component of a strategy to support PLWHA as well as preventing transmission of the infection. People may be more willing to undergo VCT and disclose their HIV status if there is possibility of getting effective treatment. Sick people would be able to return to work and parents would stay alive longer, thus delaying the time when the children become orphans. The rate of MTCT would also be reduced (Hames, 2001).
CHAPTER THREE: MATERIALS AND METHODS

3.1 Study area

The study was carried out in Nairobi, the capital city of Kenya and the main commercial centre (Appendix v). Nairobi is a cosmopolitan town, with a large population of the urban poor living in slums. Nairobi’s situation analysis of 2001 indicates that 88.3% of the population lives in slums (ROK, 2001f).

Nairobi province has an area of 696.1 Km² and is divided into 8 administrative divisions. It has a population of 2,143,254 of which 54% are males and 46% females and a density of 3,075 per Km² (KDHS, 1998). The population of women of childbearing age (15-49 years) is 28% with an overall illiteracy rate of 2%. Nairobi is served by health facilities run by the Nairobi City Council. The Ministry of Health has two referral hospitals in Nairobi, which are Mbagathi District Hospital and Kenyatta National Hospital. Being the main commercial centre, it is also served by numerous private health-care-facilities.

3.2 Study population

The study was carried out at Pumwani Maternity Hospital, Marie Stopes Kenya (Eastleigh Nursing Home) and Mbagathi District Hospital. The hospitals offer antenatal care and also carry out routine testing of HIV to pregnant women. Health-Care-Providers in the PMTCT programmes and HIV positive pregnant women were recruited into the study as respondents.
3.3 Study design

A descriptive cross-sectional study was carried out whose purpose was to provide information on the factors that influence the use of anti-retroviral drugs in prevention of mother-to-child transmission of HIV among HIV positive pregnant women in Nairobi.

3.4 Inclusion criteria

3.4.1 Health Care Facilities (H. C. F.)

Three hospitals in Nairobi offering ANC were included in the study; Pumwani, Marie Stopes and Mbagathi. The three hospitals offer extensive ANC and carry out routine testing of HIV to pregnant women and have PMTCT programmes.

3.4.2 Health care providers

The health care providers working in the PMTCT programmes were included in the study as key informants if they gave consent to participate.

3.4.3 Patient

Pregnant women who tested positive during routine HIV testing or were referred from local clinics after testing HIV-positive were recruited into the study if they gave consent to participate.

3.5 Exclusion criteria

3.5.1 Health care facilities

Health care facilities not offering ANC, were excluded from the study
3.5.2 Health care providers

Health care providers who were not in the PMTCT programmes were excluded. Those who did not consent were also excluded.

3.5.3 Patients

Pregnant women who were HIV-negative and those who were HIV-positive and did not consent were excluded from the study.

3.6 Health care facility assessment

A standard checklist (Appendix iii) was used to obtain an inventory of drugs, flow-charts, equipment and literature on PMTCT. Assessment of whether PMTCT programmes were included in antenatal care was also carried out. The resulting clinic profile was used to provide quantitative and qualitative assessment of adequacy of health-care provision to HIV positive pregnant women.

3.7 Interview of the health care providers

Health care providers were interviewed as key informants to find out more about ART and the ARV drugs they were prescribing in the HCF they were working in the by use of an interview schedule (Appendix ii). Information obtained was recorded qualitatively.
3.8 Patient exit interview

The purpose of the patient exit interview was to assess the knowledge, attitude, accessibility and affordability of ARV drugs usage in PMTCT of HIV. Information obtained was recorded on a structured questionnaire (Appendix i).

3.9 Sampling

Nairobi was purposively sampled as HIV is pandemic and therefore any province could be picked. Mbagathi District Hospital (Kibera Division), Marie Stopes Kenya (Eastleigh Nursing Home) and Pumwani Maternity Hospital both in Pumwani Division were conveniently picked. This is because they all offer ANC. Mbagathi has a HIV clinic and is a referral hospital in Nairobi while Marie Stopes clinic and Pumwani Maternity Hospital carry out routine testing of HIV to pregnant mothers. All the three hospitals have PMTCT programmes in antenatal care.

3.10 Sample size determination

The sample size was calculated according to the formula as used by Fisher et al., (1998) thus:

\[ n = \frac{Z^2 \cdot P \cdot Q \cdot d}{d^2} \]

\( n \) = required sample size

\( Z \) = Standard normal deviation (1.96) which corresponds to 95\% confidence limit

\( P \) = Proportion of pregnant women with HIV which is 13\% or
0.13
hence q=1-p
=1-0.13
= 0.87
D= design effect=1
d=degree of accuracy desired and chosen to be (0.05)
The required sample size was:
\[ \frac{1.96^2 \times 0.13 \times 0.87 \times 1}{0.05^2} \]
= 173.79
= 174
Since the study population is less than 10,000 then sample size was determined as follows:
\[ n_r = \frac{n}{1 + (n/N)} \]
Where:
\[ n = \text{Sample size} \]
\[ N = \text{population size} \]
Average per month:
Pumwani = 15
Marie Stopes = 10
Mbagathi = 8
33pts X 4 months of data collection
= 132
\[ \frac{174}{1 + 174/132} \]
A sample size of 110 was taken to cater for attrition.

Probability Proportion-to-size sampling was used whereby in Mbagathi District Hospital 27 respondents were taken, in Marie Stopes Hospital, 33 and in Pumwani Maternity Hospital 50 respondents were interviewed.

3.11 Ethical considerations

Clearance for the research was sought from the Board of Postgraduate studies, Kenyatta University, Ministry of Education, Science and Technology, Nairobi’s Provincial Medical Officer of Health and the various medical superintendents in the HCFs. The purpose of the study was explained by the researcher to all potential participants so as to get an informed verbal consent from the health care facility personnel, health care providers and patients. All information obtained was treated with confidentiality to protect the source and participants were at liberty to leave or terminate the interview at will.

3.12 Data collection tools

Data was collected using structured questionnaires (Appendix i). The questionnaires included information on demographic data and the various variables being researched on. Interviews were also conducted with Health Care Providers and information was recorded qualitatively (Appendix ii).
A checklist was also used in each hospital to assess availability and accessibility of the various materials and equipment needed in PMTCT (Appendix iii).

3.13 Data management and analysis

The raw data from questionnaires were coded and entry done using SPSS data entry programme. Data analysis was done using SPSS statistical computer package. Both descriptive and analytical statistics were used. Frequencies and percentages were calculated and presented in tabular form. Measures of central tendency such as mean and median were also computed. Cross tabulation was done to establish the relationships between the variables and chi-square was used to test for associations. Other information from in-depth interviews was analyzed manually using qualitative methods. The findings were presented using tables, and bar charts.

3.14 Calculation of respondents knowledge level on ARV drugs

Knowledge indices were calculated as set out in (Appendix iv). Knowledge index of ARV drug usage in PMTCT among HIV positive pregnant women was based on their ability to respond to specific questions on knowledge of ARVs, benefits of ARV drugs, outlets of ARV drugs, timing and administration. The knowledge was categorized as good, average or poor.
A good knowledge index was equated to a score of 75-100% (6-13 points) while average knowledge was equal to a score of 50-74% (4-5 points) and poor knowledge was a score of 0-49% (0-3 points).
4.1 RESULTS

4.1.1 Socio-demographic characteristics of the study population

4.1.1.1 Respondents age distribution

A total of 110 HIV-positive women were enrolled from Pumwani Maternity Hospital, Marie Stopes (Eastleigh Nursing Home) and Mbagathi District Hospital. The respondents' ages ranged from 15 to 39 years, with a peak at 20-29 years. Most of the respondents were within the reproductive age group of 15-49 years. Majority of the respondents were in the age group of 20-29 years, which accounted for 58.2%, followed by 30-39 years with 23.6%. There were only 20 respondents aged 15-19, which accounted for 18.2% of the respondents (Figure 4.1).

![Figure 4.1 Age distribution of HIV positive pregnant women](image-url)
4.1.1.2 Marital status of the respondents

Out of the 110 HIV-positive pregnant women enrolled, 47 (42.7%) were married, 44 (40.0%) were single, 13 (11.8%) were widowed and 6 (5.5%) were divorced (Figure 4.2).
4.1.1.3 Occupation of the respondents

Among the respondents (44.5%) were in informal employment as casual workers. The others were permanently employed (27.3%) in the formal sector and (28.2%) were unemployed (Table 1).

Table 1: Distribution of respondents according to occupation

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Frequency</th>
<th>Proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casual/informal</td>
<td>49</td>
<td>44.5%</td>
</tr>
<tr>
<td>Permanent/Formal</td>
<td>30</td>
<td>27.3%</td>
</tr>
<tr>
<td>Not employed</td>
<td>31</td>
<td>28.2%</td>
</tr>
</tbody>
</table>

4.1.1.4 Distribution of respondents by level of education

Most respondents had attained primary school education and secondary school education, 37 (33.6%) and 37 (33.6%) respectively. Among the women, 29 (26.4%) had attained college and 7 (6.4%) had no formal education (Figure 4.3)
4.1.1.5 Parity of respondents

Primegravidae women constituted 24 (21.8%) of the respondents. This was followed by second parity 18 (16.4%), third 27 (24.5%), fourth 27 (24.5%) and fifth and above parity had 14 (12.8%) mothers (Figure 4.4)
4.1.2 Distribution of the respondents among the health-care facilities.

An average of seven women per week were recruited and interviewed from each HCF in a period of 4 months giving a total of 110 respondents. Mbagathi District Hospital provided 27, Marie Stopes clinic, (Eastleigh Nursing Home) 33 and Pumwani Maternity Hospital 50 HIV-positive pregnant women (Table 2).
Table 2: Distribution of respondents among HCF

<table>
<thead>
<tr>
<th>Administrative Divisions</th>
<th>Health Care Facility</th>
<th>No. of women</th>
<th>(%) of women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kibera</td>
<td>Mbagathi</td>
<td>27</td>
<td>24.5</td>
</tr>
<tr>
<td>Pumwani</td>
<td>Marie Stopes</td>
<td>33</td>
<td>30.0</td>
</tr>
<tr>
<td>Pumwani</td>
<td>Pumwani</td>
<td>50</td>
<td>45.5</td>
</tr>
</tbody>
</table>

### 4.1.3 Knowledge of ART in PMTCT among HIV-positive pregnant women

#### 4.1.3.1 Respondents who had heard of ARVs

This was carried out to establish the proportion of pregnant women who had heard of ARVs. Majority 81 (73.6%) had heard of ARV drugs. The remaining 29 (26.4%) had never heard of ARV (Table 3). The proportion of those who had heard of ARVs was significantly higher among women aged below 30 years (92.6%) than among women aged above 30 years (7.4%); ($\chi^2=21.27; df=2; p=0.00$). Chi-square tests revealed a significant statistical relationship between those who had heard of ARVs and education level ($\chi^2=26.99; df=3; p=0.00$) whereby majority (73.1%) of those who had heard of ARVs had attained secondary and college/university education.
Table 3: Respondents who had heard of ARVs

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>81</td>
<td>73.6</td>
</tr>
<tr>
<td>No</td>
<td>29</td>
<td>26.4</td>
</tr>
</tbody>
</table>

![Graph showing education level and ARV knowledge]

Figure 4. 5 Respondents who had heard of ARVs by educational level.

4.1.3.2 Respondents’ source of information

The study showed that 26.4% of the respondents had heard of ARVs from media, which included print and electronic forms. All (100%) the respondents whose source of information was the media were aged above 20 years and there was a significant statistical relationship between media and
Chi-square test also revealed a significant statistical relationship between media as a source of information and marital status ($\chi^2=10.19; df=3; p=0.02$) with (55%) of those whose source of information was the media being married women. Friends had informed only 9.1% of the respondents. Health-Care Providers had informed majority of the respondents (71.8%). There was a significant statistical relationship between HCPs as a source of information and level of education ($\chi^2=39.99; df=3; p=0.00$). Other sources of information accounted for 10.9% only (Table 4).

### Table 4: Respondents source of information

<table>
<thead>
<tr>
<th></th>
<th>Media</th>
<th>Friends</th>
<th>HCP</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>26.4</td>
<td>9.1</td>
<td>71.8</td>
<td>10.9</td>
</tr>
<tr>
<td>No</td>
<td>73.6</td>
<td>90.9</td>
<td>28.2</td>
<td>89.1</td>
</tr>
</tbody>
</table>

#### 4.1.3.3 Benefits of ARVs

Majority (64.5%) of the women were aware that anti-retroviral drugs are used to prevent mother-to-child transmission of HIV (Table 5). There was a significant statistical relationship between those who were aware that ARVs are used for PMTCT and education level ($\chi^2=39.08; df=3; p=0.00$) with the majority (79.5%) having attained secondary and college/university education. However a large number were unaware that ARVs reduce progression of HIV/AIDS (60.9%). Chi-square tests on respondents who knew that ARVs reduce progression of HIV/AIDS and education level revealed a significant statistical relationship ($\chi^2=43.34; df=3; p=0.00$).
Table 5: Knowledge of ART benefits among HIV + pregnant women

<table>
<thead>
<tr>
<th>Knowledge of ART benefits</th>
<th>Respondents</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aware</td>
<td>Unaware</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number (%)</td>
<td>Number (%)</td>
<td></td>
</tr>
<tr>
<td>What are ARVs for:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not for curing HIV/AIDS</td>
<td>93 (84.5%)</td>
<td>17 (15.5%)</td>
<td></td>
</tr>
<tr>
<td>Not painkillers</td>
<td>90 (81.8%)</td>
<td>20 (18.8%)</td>
<td></td>
</tr>
<tr>
<td>Reducing progression of HIV</td>
<td>43 (39.1%)</td>
<td>67 (60.9%)</td>
<td></td>
</tr>
<tr>
<td>PMTCT of HIV</td>
<td>71 (64.5%)</td>
<td>39 (36.5%)</td>
<td></td>
</tr>
</tbody>
</table>

4.1.3.4: Outlets of ARV drugs

Majority (53.6%) of the HIV-positive women said that ARV drugs could be obtained from government health facilities. Among the respondents (37.3%), said that ARVs could be obtained from private hospitals/clinics. Respondents who said that ARV drugs could be obtained from chemists, friends and mission hospitals were 10.0%, 1.8% and 23.6% respectively (Table 6). The proportion of women who chose gov’t health centres (93.4%), private hospitals (100%) and mission hospitals(97.6%) was significantly higher among those aged 20 years and above than among those below 20 years of age. Chi-square tests between outlet and age revealed a significant statistical relationship; private hospitals ($\chi^2 = 20.09; df=2; p=0.000$), government hospitals ($\chi^2 = 13.26; df=2; p=0.001$) and mission hospitals ($\chi^2 = 16.59; df=2; p=0.001$). Chi-square tests revealed a significant relationship between education and government hospitals as an outlet ($\chi^2 = 20.507; df=3; p=0.000$), private hospitals ($\chi^2 = 20.09; df=2; p=0.000$) and mission hospitals ($\chi^2 = 16.59; df=2; p=0.000$).
df=2; p=0.000). The proportion (94.5%) of women who mentioned government health centres, private hospitals and mission hospitals was significant higher among the women who had attained secondary and university education than among women (22.7%) with primary or no formal education.

Table 6: Outlets of ARV drugs

<table>
<thead>
<tr>
<th>Outlet of ARV drugs</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Aware</td>
</tr>
<tr>
<td></td>
<td>Number (%)</td>
</tr>
<tr>
<td>Where can they be obtained</td>
<td></td>
</tr>
<tr>
<td>Gov’t health centers</td>
<td>59 (53.6%)</td>
</tr>
<tr>
<td>Chemists/Pharmacy</td>
<td>11 (10.0%)</td>
</tr>
<tr>
<td>Friends/Relatives</td>
<td>2 (1.8%)</td>
</tr>
<tr>
<td>Mission hospitals/ clinics</td>
<td>26 (23.6%)</td>
</tr>
<tr>
<td>Private hospital/ clinics</td>
<td>41 (37.3%)</td>
</tr>
</tbody>
</table>

4.1.4 Attitude towards ART among HIV-positive pregnant women

Majority 69 (62.7%) of the respondents approved ART while 40 (36.4%) were undecided on ARV use. Only one respondent disapproved (0.9%) (Table 7). The proportion of those who approved was significantly higher among the married women (55.1%) than among the divorced (5.8%), widowed (10.2%) and single women (28.9%). \( \chi^2 = 24.82; \text{df}=9; p=0.024 \).
Table 7: Attitude towards ART among HIV-positive pregnant women

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approved</td>
<td>69</td>
</tr>
<tr>
<td>Undecided</td>
<td>40</td>
</tr>
<tr>
<td>Disapproved</td>
<td>1</td>
</tr>
</tbody>
</table>

4.1.5 Usage of ARVs among HIV-positive pregnant women

Out of the 110 HIV-positive pregnant women recruited in the study, it was found that only 16 (14.5%) were on ART. Fifty six point three percent (56.3%) of the 16 women on ART were from one HCF that was offering ARVs for the antenatal period while the 7 (43.7%) had sought medication from other hospitals (Table 8). The proportion of those who were on ARVs was significantly higher among those who had attained secondary and college/university education (75%) than those with primary and no formal education (25%). ($\chi^2=18.54; \text{ df}=3; \text{ p}=0.000$). Chi-square test revealed a significant statistical relationship between those who were on ARVs and employment type ($\chi^2=17.83; \text{ df}=2; \text{ p}=0.000$) whereby (68.8%) were permanently employed, (31.2%) were casual workers and none of those who were not employed.
Table 8: Usage of ARV drugs

<table>
<thead>
<tr>
<th>Response</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
</tr>
<tr>
<td>Yes</td>
<td>16</td>
</tr>
<tr>
<td>No</td>
<td>94</td>
</tr>
<tr>
<td>If no, why</td>
<td></td>
</tr>
<tr>
<td>To take during labour</td>
<td>84</td>
</tr>
<tr>
<td>No response</td>
<td>10</td>
</tr>
</tbody>
</table>

4.1.6 Respondents’ openness towards ART

Majority of the respondents, 78 (70.9%) had never discussed ARV therapy with anyone while 31 (28.2%) had discussed with husband, health-care provider or friend (Table 9). The proportion of those who had discussed ARVs was significantly higher among the married women (54.6%) than among those who were single (24.2%), divorced (12.1%) or widowed (9.1%). ($\chi^2=12.57; \text{df}=3; p=0.006$). One person did not answer that question.

Table 9: Respondents’ openness towards ART

<table>
<thead>
<tr>
<th>Parameter assessed</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussed ARV:</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>31</td>
</tr>
<tr>
<td>No</td>
<td>78</td>
</tr>
<tr>
<td>If yes, with whom:</td>
<td></td>
</tr>
<tr>
<td>Husband</td>
<td>12</td>
</tr>
<tr>
<td>Friend(s)</td>
<td>6</td>
</tr>
<tr>
<td>Relatives</td>
<td>13</td>
</tr>
</tbody>
</table>
4.1.7 Respondents' affordability of ARV drugs

When respondents were asked whether they could afford ARV drugs, 23 (20.9%) said they could while 87 (79.1%) said they could not. Only 16 (14.5%) could afford a standard combination of the drugs. The proportion of those who could afford the ARVs was significantly higher among those who were permanently employed (86.9%) than among the casuals workers (13.1%). None of the unemployed respondents could afford the drugs. \( \chi^2 = 39.69; \ df = 2; \ p = 0.00 \). However there was no significant relationship between those who could afford and their marital status \( \chi^2 = 6.139; \ df = 3; \ p = 0.12 \).

4.1.8 Respondents' accessibility to the ARV drugs

Mbagathi District Hospital provided the recommended combination drug therapy while Pumwani Maternity Hospital had Nevirapine only. The most commonly prescribed ARV drugs in HIV-positive pregnant women are Zidovudine, Stavudine, Lamivudine, Nevirapine and Nelfinavir (Table 10).

Table 10: Drugs available at ANC clinics

<table>
<thead>
<tr>
<th>Drugs</th>
<th>Clinics stocking drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
</tr>
<tr>
<td>Stavudine</td>
<td>1</td>
</tr>
<tr>
<td>Lamivudine</td>
<td>1</td>
</tr>
<tr>
<td>Nevirapine</td>
<td>3</td>
</tr>
<tr>
<td>Nelfinavir</td>
<td>0</td>
</tr>
</tbody>
</table>
4.1.9 Attitude of health-care providers towards ART in PMTCT

The attitude of HCP on ARV in PMTCT of HIV in pregnant women was also assessed. The HCP were used as key informants on what was happening in the ANC clinics regarding PMTCT of HIV. One nurse (16.7%) out of the 6 interviewees had a different view that ART is too complicated for resource-constrained nations like Kenya. On how ART can be improved in the management of HIV-positive pregnant women, 3 (50%) of the nurses said that drugs and testing kits should be delivered in time, the syrup ARV for the newborn should also be made available. They also recommend in-service training of HCPs on PMTCT of HIV.

It was also suggested by 5 (83.3%) of the nurses that PMTCT health education be given to all mothers attending ANC and 2 (33.3%) suggested that couple testing of HIV be made mandatory so that the women can carry the drugs home freely.

4.1.11 Availability of other materials in the health facility

A checklist (Appendix iii) was used to find out which materials were available in the health-care facilities used in the study. Record cards and record diaries were found in all the three hospitals, while counseling rooms were only found in Pumwani Maternity Hospital and Mbagathi District Hospital (66.7%). Mbagathi District Hospital (33.3%) had a constant supply of HIV testing kits, examination gloves, spirits and swabs. Regarding literature on PMTCT at the
literature on PMTCT at the health care facility it was termed as inadequate based on the observational checklist (66.7%). However the drugs storage facilities were termed as adequate in all the health-care facilities.

4.1.12 Knowledge index of ART among HIV-positive pregnant women

Overall, majority of the respondents 76% (84) had high knowledge on ART. Women who had average knowledge accounted for 14% (15), whereas 10% (11) was termed as poor knowledge (Figure 4.6)

![Knowledge level assessment on ARVs](image)

**Figure 4.6 Knowledge level assessment on ARVs**
4.2 DISCUSSION

4.2.1 Socio demographic characteristics of the respondents

This study evaluated knowledge, attitude, affordability, accessibility and usage of anti-retroviral drugs among HIV positive pregnant women in Nairobi, Kenya. Findings from the respondents’ demographic characteristics indicated that the majority (58.2%) of the respondents were aged 20 to 29 years. This is the sexually active age group where HIV/AIDS is most prevalent (NASCOP, 2000). Majority (93.6%) of the respondents had formal education. These results suggest that if the respondents were given basic information on PMTCT and use of ART they would be in a position to understand. Most of the respondents were employed (71.8%) and therefore had a source of income. The respondents of this study ranged from 15-39 years and were therefore among the reproductive age group in the country. Majority of the respondents were either married (42.7%) or single (40%). From the above characteristics of the respondents it is worth noting that PMTCT is vital for this group because its important to reduce child mortality and the pressure put on the family structure and health-care system in looking after HIV infected orphans.

4.2.2 Knowledge of ART among HIV-positive pregnant women

The overall knowledge of ARVs among HIV-positive pregnant women attending ANC was good (76%) based on their knowledge level assessment. This suggests that the majority of the respondents had access to ART information. This means that with availability of ARVs, the information could
be utilized to reduce MTCT of HIV. The results also suggest that the respondents’ source of information on PMTCT was reliable because they were well informed on anti-retroviral drugs. These results agree with the findings of Sowell et al., (2001) in their study in 2000 on factors influencing women’s intentions towards zidovudine therapy in south-eastern states of America-Georgia, North Carolina and South Carolina. The study found out that the HIV positive women had high knowledge on anti-retroviral therapy in prevention of mother-to-child transmission of HIV.

In this study, the majority (71.8%) of the respondents reported to have obtained ART information from HCP’s. These results suggest that the healthcare providers were a good source of ART information. The results also suggest that most of the respondents had been attending ANC and were attentive during the health talks. Prevention of MTCT of HIV was a component of the various maternal and child health issues taught in the sampled ANC’s. The results agree with the findings of Armstrong and Hewitt (1990) in their study on the effect of education on nurses’ perception of HIV/AIDS that found HCPs to be a good source of information.

Media (both electronic and print) were the second main source of information to 26.4% of the respondents. These results suggest that messages on ARVs were not being adequately conveyed through this channel. Media as a communication channel can be used to educate HIV positive pregnant women on PMTCT of HIV this is because in findings of the Kenya National IEC
survey 65% of the men and 50% of the women rated media as a major source of health care information (NCPD/CBS/JHU, 1998).

The results of this study indicate a significant statistical relationship between knowledge of ARVs and education level ($\chi^2 = 26.99; df=3; p=0.00$). These results suggest that the more educated respondents had a higher access to information on ART. The results of this study show that majority (73.1%) of the respondents who were aware of ARVs had either attained university/college education or secondary education. According to the Kenya Demographic Health Survey (1998) women with the no formal education were six times less likely to have received ANC and 28% less likely to have received care from a doctor. Educated people acquire knowledge, skills and attitudes throughout the education system necessary for sustainable economic growth and general development (World Bank, 1995).

Majority of the respondents reported that ARVs could be obtained from the government hospitals (53.6%) and (37.3%) from private hospitals with a mere (1.8%) mentioning friends as an outlet. The proportion (94.5%) of women who mentioned government health centres, private hospitals and mission hospitals was significant higher among the women who had attained secondary and university education than among women (22.7%) with primary or no formal education. This results suggest that the more educated respondents knew about the reliable outlets of ARVs as compared to the 1.8% who identified friends as an outlet of the drugs.
4.2.2 Attitude of HIV-positive women towards ART

Majority (62.7%) of the respondents approved ART. These results suggest that ART was an acceptable intervention for the majority of the HIV positive pregnant women. The other reason is that 39.1% of the respondents had identified ‘reducing the progression of HIV/AIDS’ as a benefit of ART. These results agree with the findings of Sowell et al. (2001) in their study on factors influencing women’s intentions toward zidovudine therapy, in south-eastern States of America who found out that majority of the women reported that they believed zidovudine was effective in preventing progression of HIV/AIDS and preventing MTCT of HIV. In the above study women rated controlling the progression of HIV as 3.5 and effectiveness of zidovudine in PMTCT as 3.8 on a 5-point scale.

A good number (62.7%) of the respondents approved of ARV drug use. These results suggest that with affordability and accessibility of the drugs the women would have been on ART. According to Sowell et al., (2001) in their study on factors influencing women’s intentions towards zidovudine therapy, they found out that the likelihood of taking AZT in pregnancy and giving it to the newborn was greater in women who approved of anti-retroviral drugs. Only (0.9%) mentioned about the side effects of the ARV drugs. These results suggest that most of the respondents did not know much about the side effects of ARV drugs. This consequently means that the HIV positive pregnant women need to be educated on the side effects of ARVs because they need them for consequent pregnancies and might decide not to use them due to past unexpected experiences with the drugs. However these results contradict the
report by O’connor and Macdonald (2002) who reported that one of the most significant barriers to acceptance of ART in developed countries is their side effects. In this study the indecision towards ART could be attributed to the fact that most of the women had known of their serostatus during ANC and had not had enough time to internalize information on ART. Most people in Africa do not know their serostatus (MSF, 2003).

When respondents were asked whether they had discussed ARV usage with anyone, the majority had never (70.9%). These results suggest that discussing HIV/AIDS and ART was a difficult topic for the majority of the respondents. Anti-retroviral therapy and HIV/AIDS needs to be destigmatised so that HIV-positive pregnant women are able to open up to their families and friends about ART because they need their support as ARVs are regarded as complex. In the qualitative interview, the health care providers explained that the HIV-positive pregnant women did not want to be the first to break the news to the family lest they are implicated for bringing the disease home. These results concur with the findings of Misener and Sowell (2000) in Australia on the use of ARVs and attitude towards them and their impact on personal relationships and work-related issues. The study revealed that 61% of the married women respondents did not approve of discussing ART with their spouses. HIV/AIDS is highly stigmatized in Kenya (KANCO, 2003). These results are unlike those reported by Boyle, (2003) on a cross-sectional study that had assessed HIV and ART knowledge, attitude, beliefs and practices in a HIV clinic in Soweto, South Africa in 2002 which found out that 90.5% of the respondents had disclosed their HIV status to more than one person. This could be
explained by the fact that stigmatization on HIV/AIDS is slowly dying out in countries where medication is accessible (Boyle, 2003).

The results of this study reveal a significant statistical relationship between approval of ART and education level ($\chi^2 = 31.68; \text{df}=9; p=0.00$). These results suggest that the highly educated respondents knew of the significance of ART and this had influenced their perception towards ART. Education develops skills, raises aspirations, accepts change, facilitates good planning and is associated with high private and social returns particularly for women (World Bank, 1995)

### 4.2.3 Affordability and accessibility of ARV drugs among HIV-positive pregnant women

From the results, it is evident that the majority of the respondents 87 (79.1%) could not afford the drugs: whether as monotherapy or as a combination. The findings of this study suggest that ARVs were expensive for HIV-positive pregnant women. It can henceforth be deduced that as long as the ARV drugs were unaffordable, MTCT of HIV was not being effectively addressed. Though there was free nevirapine drug, it only targeted the labour period. There is need to save many babies by targeting the ante-natal period which means that the HIV positive pregnant women have to bear the cost of the long-course drugs. These results agree with the findings of Bowie et al., (1996) who reported that ARVs were expensive for PLWHA. India and Brazil provide generic ARVs to countries unable to manufacture them but even then, the laboratory tests that are needed to decide when to start ART, monitoring
of patients’ on-going health and spot drug toxicities are often out of reach because of the price. Price reductions on ARVs depend on existing competition from generic productions (MSF, 2003). Effective ART remains beyond the reach of most PLWHA in the third world countries because of its tremendous cost (Smego, 2000).

Only 23 (20.9%) of the respondents could afford the drugs without having to rely on the free single dose (nevirapine). There was significant statistical relationship between those who could afford and employment type ($\chi^2 = 39.69; df=2; p=0.000$) and education level ($\chi^2 = 55.14; df=3; p=0.000$). These results suggest that the more educated and the employed respondents had more income at their disposal and could therefore afford the drugs. These results concur with a report by UNAIDS (2001) that education tends to go alongside more disposable income while employment increases ones purchasing power. These results mean that encouraging HIV positive pregnant women to generate income and also accessing information to them would be important factors to consider in reducing the rate of MTCT.

On accessibility of the ARV drugs, 24.5% of the respondents who were all from Mbagathi hospital had access to the drugs including the combination therapy. This was because Mbagathi Hospital had a HIV clinic, which was run by the Medicins Sans Frontiers (MSF). The respondents from Pumwani Maternity Hospital had access to nevirapine tablets only and sometimes the nevirapine syrup for the baby was unavailable. Marie Stopes was providing nevirapine drug whenever it was available and when not the HCP referred the
HIV-positive pregnant woman to another HCFs. These results suggest that inaccessibility of the drugs to the HIV positive pregnant women limited provision of quality care by the health-care providers. Health-care providers should be in a position to advice the client where they can get the combination therapy if they can afford it and it is not available at the health care facility. This is in regard to the Medicines Control Council (MCC), which reported that it is important to save many babies not just a few (MSF, 2003). Overall, the findings of this study concur with the report by MSF (Medicins Sans Frontiers, 2003) on access to essential medicines, which described ARV drugs to be both inaccessible and unaffordable.

4.2.4 Usage of ARV drugs

Anti-retroviral drug usage was low (14.5%) considering the fact that ART in PMTCT is an essential component of antenatal care in HIV-positive pregnant women. This results suggest that ARVs as an intervention was not being fully utilised. Elective caesarean can reduce the risk of transmission by half but it is not yet a realistic option for poor countries. The two most cost-effective interventions for poor countries are ARV prophylaxis and modification of infant feeding (Stradthee, 2000).

The findings of the study revealed that there was no significant association between those who were aware of ARVs and usage of the drugs ($\chi^2= 3.64; \text{df}=1; p=0.06$). These results suggest that knowledge on ART was not enough as a determining factor for the respondents to be on ARV drugs. The high prevalence in non-use from the respondents was mainly due to other factors
such as lack of adequate health infrastructure and the cost of ARV drugs. This may in turn be due to little time for patient-HCP interaction because of the large number of patients in relation to the number of HCPs, poor utilization of VCT services and lack of subsidized ARV drugs. The main objection to the use of ARVs in developing countries is their high cost and lack of infrastructure necessary to deliver them (UNAIDS, 2001). These results concur with a report by Nachege (2003) on knowledge, attitude and beliefs and practices regarding ART in Soweto, South Africa that high knowledge on ARVs did not influence the use of anti-retroviral drugs. Similar studies carried out in Thailand on knowledge of HIV-positive pregnant women on ART reported women’s knowledge to be high while their usage was low (Stringer et al., 1999).

There was a significant statistical relationship between those who were on ARVs and education level ($\chi^2=12.91; df=3; p=0.00$) and employment type ($\chi^2=12.56; df=2; p=0.000$). The results suggest that the highly educated had more access to information on ART and could afford the drugs. Employment had increased the purchasing power and therefore affordability. India developed low cost formulations of ARVs, the monthly cost of three drugs going as low as US$ 83 as compared with the US$ 768 per month from manufacturers in the USA. Despite the price reductions and the passing of a legislation to allow the importation of cheaper ARV drugs, the average HIV-positive Kenyan is still not able to be on ART (MSF, 2003).
The findings of this study indicated that the major factors that hindered the use of ARVs among the respondents were their high cost and inadequate health infrastructure. Adequate health infrastructure was lacking because in Pumwani Maternity Hospital and Marie Stopes the HCPs were overwhelmed by the work in the ANC and would postpone routine testing which is critical because it is the entry point to care and support. Very few health-care providers were involved in the PMTCT programmes because there were inadequate HCPs trained in PMTCT. It was observed that there were inadequate drug supplies, which kept running out in Pumwani Maternity Hospital and Marie Stopes. Late testing of the mothers was also observed in the study. This did not give the HIV positive pregnant women a chance to internalize the results of their status and also make important decisions regarding their health and that of their babies. These results agree with the report by (Nahega, 2003) that indicated that the two main objections to the use of ARVs in poor communities have been the high costs of medications and lack of health infrastructure, necessary to deliver them effectively.
CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

1. Majority of the pregnant women attending ANC had high knowledge on ART.

2. A large proportion of women approved the use of anti-retroviral drugs in the prevention of mother-to-child transmission of HIV.

3. Majority of the women were not on ARV drugs because of their high cost, inaccessibility, and lack of early voluntary counselling and testing.

4. Anti-retroviral drug use in the prevention of mother-to-child transmission of HIV was found to be low.
5.2 RECOMMENDATIONS

1. There is need for continuous health education by HCP to HIV positive pregnant mothers in order to sensitise them on ART as an intervention strategy.

2. In-service training, refresher courses and supervision systems should be put in place to keep HCP updated in their practice of PMTCT by the use of ART.

3. Updated ARV prophylactic recommendations should be provided by drug companies to inform both HCPs and HIV-positive pregnant women.

4. Communication messages on ART in PMTCT must be designed to suit the needs of their target group(s).

5. There is need to normalise testing and increase the number of people who know their serostatus as an important strategy for reducing stigma and discrimination for being in the PMTCT programme. Couple testing is also highly recommended.
6. PMTCT programmes should be linked to support services. These may include; linkages with women living with HIV/AIDS support groups, involvement of and support from religious groups that advocate a holistic approach to AIDS prevention and care.

7. There is need to increase ART messages in the media.
REFERENCES


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UNAIDS (2000). AIDS Epidemic update; Genava Switzerland

UNAIDS (2001). AIDS Epidemic update; Genava Switzerland

UNAIDS (2003). AIDS Epidemic update; Genava Switzerland


APPENDICES

APPENDIX I: QUANTITATIVE DATA COLLECTION TOOL
(QUESTIONNAIRE)

INTRODUCTION

Hello, My name is Anne Gitimu. I am a Master of Public Health and Epidemiology student at Kenyatta University, Nairobi. I am here to carry out a study on ARV therapy in PMTCT among pregnant women. The information you give is important and therefore be sincere in your responses. I assure you that information received will be treated in total confidence. Thank you and welcome.
EXIT QUESTIONNAIRES FOR THE PREGNANT WOMEN WITH HIV/AIDS

1. Date of Interview
2. Code of Interviewee

DEMOGRAPHIC INFORMATION

4. Name of Health Care Facility (HCF)

5. Age in years
   (1) 10-19 Years [ ]
   (2) 20-29 years [ ]
   (3) 30-39 years [ ]
   (4) 40-49 years [ ]

6. Marital status
   (1) Single [ ]
   (2) Married [ ]
   (3) Divorced [ ]
   (4) Widowed [ ]

7. Highest level of education
   (1) Std. 1 – Std. 8 } Primary [ ]
   (2) Form 1 – From IV} secondary [ ]
   (3) College and University [ ]
   (4) None [ ]

8. Parity
9. Gestation Period

10. Type of employment

- (1) Casual / Informal [ ]
- (2) Permanent / Formal [ ]
- (3) Not employed [ ]

KNOWLEDGE

11. Have you ever heard of Anti-retroviral drugs?

- (1) Yes [ ]
- (2) No [ ]

12. Where did you first hear of Antiretroviral drugs?

- (1) From the media (specify) [ ]
- (2) From friends [ ]
- (3) Health Care Providers [ ]
- (4) Others (specify) [ ]
- (5) Never heard of them [ ]

13. In your view, what are ARV drugs for?

- (1) Curing HIV/AIDS [ ]
- (2) Reducing pain [ ]
- (3) Reducing progression of HIV [ ]
- (4) Prevention of Mother to Child Transmission of HIV [ ]
- (5) I don’t know [ ]

NB: You can choose more than one answer
14. What are some of the types of Antiretroviral drugs you know?

16. Where can ARV drugs be obtained?
   
   (1) Chemists / Pharmacy [ ]
   (2) Friends / Relatives [ ]
   (3) Government health centre, hospitals and clinics [ ]
   (4) Mission hospitals / clinics [ ]
   (5) Private hospitals / clinics [ ]
   (6) Don’t know [ ]
   (7) Others (specify) [ ]

PRACTICE

17. Are you currently on ARV drugs?
   
   (1) Yes [ ]
   (2) No [ ]

18. If no, give reasons

19. Are you able to follow ARV therapy regimes? (Answer if you are already on them)

20. The interviewer should request to be shown the prescription / drugs

   Write down the name of the drugs as per:
Patients’ prescription

1.

2.

3.

21. Were you told the importance of completing the full course of treatment?
   (1) Yes [ ]
   (2) No [ ]

22. Were you told when to take the drugs / drug given?
   (1) Yes [ ]
   (2) No [ ]

23. Was privacy maintained during consultations?
   (1) Yes [ ]
   (2) No [ ]

24. What are the main constraints you have encountered in seeking consultation and treatment / do you have any comments or questions?

25. If no, which barriers prevent you from following regime?

ATTITUDES / PERCEPTIONS

26. What is your opinion of ARV therapy?
   (1) Approve [ ]
27. If you disapprove, what are the reasons? 

28. Have you ever discussed ARV therapy with someone else? 
   (1) Yes [ ]  
   (2) No [ ]  

29. If yes, who?  

30. Do you think that Antiretroviral drugs can prevent your child from getting HIV infection?  
   (1) Yes [ ]  
   (2) No [ ]  

31. Are there benefits that are gained from using ARV rugs?  
   (1) Yes [ ]  
   (2) No [ ]  

32. Do you think that ARV drugs will have a positive effect on your pregnancy?  
   (1) Yes [ ]  
   (2) No [ ]  

33. If no, why?
AFFORDABILITY AND ACCESSIBILITY

34. Are you able to cater for all expenses of ARV therapy? (Those already on ARVs and are not issued with free of charge)

35. Are ARV drugs available in the clinic / hospital you are attending?

   (1) Yes [ ]
   (2) No [ ]

36. If not, do you know of any drugs outlet you can get ARVs from?

37. If you were not issued with ARV drugs without having to pay would you be in a position to cover the expenses?

38. If yes for question 35 (For a single dose or combination therapy)?

39. Thank you very much for your time. Everything you have told me will be kept strictly confidential. Your answer will greatly help in improving ARV therapy in PMTCT.
APPENDIX II: QUALITATIVE DATA COLLECTION TOOL (KEY INFORMANT INTERVIEW GUIDE)

HEALTH CARE PROVIDERS

1. Are ARVs a major component in PMTCT of HIV?
2. Are they readily available at the HCF?
3. What is your own view on ARVs?
4. What are the constraints you encounter while administering ARV drugs for PMTCT?
5. What would you like improved in the PMTCT programmes?
## APPENDIX III: CHECKLIST MATERIALS

Name of health care facility (HCF) ...........................................
Date of interview ...............................................................

(Materials should be shown to the investigator)

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Record cards</td>
<td>Available</td>
<td>☐</td>
<td>Not available</td>
</tr>
<tr>
<td>2. Record diary</td>
<td>Available</td>
<td>☐</td>
<td>Not available</td>
</tr>
<tr>
<td>3. Counselling room</td>
<td>Available</td>
<td>☐</td>
<td>Not available</td>
</tr>
<tr>
<td>4. HIV testing kits</td>
<td>Available</td>
<td>☐</td>
<td>Not available</td>
</tr>
<tr>
<td>5. Examination gloves</td>
<td>Available</td>
<td>☐</td>
<td>Not available</td>
</tr>
<tr>
<td>6. Sprits and alcohol swabs</td>
<td>Available</td>
<td>☐</td>
<td>Not available</td>
</tr>
<tr>
<td>7. Literature on PMTCT at the (HCF)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leaflets</td>
<td>Available</td>
<td>☐</td>
<td>Not available</td>
</tr>
<tr>
<td>Booklets</td>
<td>Available</td>
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<td>MOH flow charts</td>
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<td>Flip charts</td>
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</tr>
<tr>
<td>Newsletter for clinic provider</td>
<td>Available</td>
<td>☐</td>
<td>Not available</td>
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</tbody>
</table>

8. Available drugs

- Nevirapine
- Stavudine
- Zidovudine
- Nelfinavir
9. Drugs for the new-born

10. Good storage facilities for the drugs

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are they kept cool?</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Are they kept dark?</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>
## APPENDIX IV: KNOWLEDGE INDEX

<table>
<thead>
<tr>
<th>Question</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Knowledge of ARVs</td>
<td>2</td>
</tr>
<tr>
<td>2. Knowledge of benefits</td>
<td>4</td>
</tr>
<tr>
<td>3. Knowledge of the ARVs outlets</td>
<td>4</td>
</tr>
<tr>
<td>4. Knowledge of ARV in PMTCT</td>
<td>3</td>
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</tbody>
</table>

**Total score** = 13 points

- **Good knowledge**: 8 - 13 points, 75 - 100%
- **Average knowledge**: 4 - 7 points, 50 - 74%
- **Poor knowledge**: 0 - 3 points, 00 - 49%
APPENDIX V: NAIROBI ADMINISTRATIVE DIVISIONS (Inset, the map of Kenya showing the position of Nairobi)

Key
A - Marie Stopes Kenya (ENH)
B - Pumwani Maternity Hospital
C - Mbagathi district Hospital
FACTORS INFLUENCING THE USE OF ANTIRETROVIRAL DRUGS IN THE PREVENTION OF MOTHER TO CHILD TRANSMISSION OF HIV IN NAIROBI, KENYA.

GITIMU ANNE MUTHONI
157/7767/2002
ABSTRACT

Women represent 43% of all adults living with HIV/AIDS. The majority of these (80%) are of childbearing age. This has raised a lot of concern about perinatal transmission of HIV. Mother to child transmission of HIV can occur during antenatal period (10-20%), labour period and delivery (35-50%) and breastfeeding (40-50%). Antiretroviral drugs are one element in prevention of mother to child transmission of HIV that is of great importance. Although antiretroviral drugs have become common in developing countries and have been in use for over a decade, there are no systemic surveys to find out the factors that influence their usage in many countries including Kenya. A cross sectional descriptive study was carried out in Nairobi at Mbagathi Hospital, Marie Stopes (Eastleigh Nursing Home) and Pumwani Maternity Hospital to determine the factors that influence the use of antiretroviral drugs in prevention of mother to child transmission of HIV. A total of 110 HIV positive pregnant women attending Antenatal clinics at the health care facilities were included in the study. Data was collected using structured questionnaires, interview guides and check lists. Data was analyzed using the scientific package for social sciences (SPSS) software. Chi square test was performed to establish relation between variables. The results indicate that the level of knowledge among HIV positive pregnant women on ARV was good (76%) and there was a significant statistical relationship between those who were aware of ARVs and education level of the respondents ($\chi^2 = 26.99; df=3; p=0.000$). Majority of the respondents (86.4%) were not using ARVs and there was a significant statistical relationship between usage and education level ($\chi^2 = 12.91; df=3; p=0.005$) and employment type ($\chi^2 = 12.56; df=2; p=0.002$). The reasons for non-usage of ARV were cost of drugs (79.1%) and inaccessibility (42.8%). There was a significant relationship between affordability and employment type ($\chi^2 = 39.69; df=2; p=0.000$). In this study, antiretroviral therapy was mainly targeting the labour period due to lack of essential drugs to target the antenatal period. The results of the study suggest that there is need for health education for HIV positive pregnant women to encourage ART in an effort to prevent mother to child transmission of HIV. Antiretroviral drugs should be made accessible and affordable to HIV positive pregnant women. VCT should be advocated among pregnant women so that they can know their serostatus early enough to start therapy. The findings of this study will be of use to HCP so that they can intensify education campaigns on ART and also to drug companies in providing affordable drugs particularly to resource strapped countries.
INSTITUTIONAL RESEARCH AND ETHICAL REVIEW COMMITTEE

(PROPOSAL APPROVAL FORM)

Dear Ms Ann Muthoni Gitimu

It is our pleasure to inform you that your proposal entitled "Factors that Influence The Use of Antiretrovirals in the Prevention of Mother to Child Transmission of HIV in Nairobi" in collaboration with .................................., has been reviewed by the Institutional Research Committee.

The IRERC held a meeting on 8th October 2003. The proposal has been reviewed on the research merit, ethical considerations, sampling, methodology and relevance to the care. The Committee is guided by the institutional guidelines (e.g., S.O.Ps) as well as international regulations, including those of WHO, NIH, KNH, the National Council for Science and Technology for scientific purposes.

The proposal has been approved unconditionally by the above named Committee and further to that, please refer to the guidelines from the institutional Medical Superintendent.

SIGNED:

MEDICAL SUPERINTENDENT...........................................DATE 15/10/03

CHAIRMAN IRERC..................................................DATE 8/10/03

JOSEPHINE OJIAMBO
Dear Madam

RE: RESEARCH AUTHORISATION

Please refer to your application for authority to conduct research on "Factors that influence the use of Antiretroviral Drugs in the prevention of Mother to child Transmission of HIV in Nairobi, I am pleased to inform you that you have been authorised to conduct research in Nairobi for a period ending 30th April, 2004.

You are advised to report to the Provincial Commissioner, the Provincial Director of Education and the Provincial Medical Officer of Health, Nairobi before embarking on your research project.

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

Yours faithfully,

A. G. KAARIA
FOR: PERMANENT SECRETARY/ EDUCATION

CC
The Provincial Commissioner
Nairobi

The Provincial Medical Officer of Health
Nairobi
Our Ref: 157/7767/2002

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION:

I write to introduce Ms. Anne Muthoni Gitimu who is a Postgraduate Student of this University. She is registered for a Master of Public Health and Epidemiology (M.P.H.E) degree programme in the Department of Zoology.

Ms. Gitimu intends to conduct research for a project entitled, "Factors that Influence the Use of Antiretroviral Drugs in Prevention of Mother to Child Transmission of HIV in Nairobi."

Any assistance given to her will be highly appreciated.

Yours faithfully,

J. K. LANGAT
FOR DIRECTOR, BOARD OF POSTGRADUATE STUDIES

C.C. Registrar (Academic)

Director, BPS - to sec. on file

Dean, School of Pure & Applied Sciences

Chairman, Zoology Dept.