"Do PMTCT programs leak by design or default?"
Examining the barriers to utilization of Prevention of Mother-to-Child Transmission of HIV services in Rift Valley Province: Kenya

BY
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KENYA

45th International Course in Health Development
September 22, 2008 – September 11, 2009

KIT (ROYAL TROPICAL INSTITUTE)
Development Policy & Practice/
Vrije Universiteit Amsterdam

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A thesis submitted in partial fulfilment of the requirement for the degree of

Master of Public Health

By
Bill Martin Osumba
Kenya

Declaration:

Where other people's work has been used (either from a printed source, internet or any other source) this has been carefully acknowledged and referenced in accordance with departmental requirements.

The thesis *"Do PMTCT programs leak by design or default?"* Examining the barriers to utilization of Prevention of Mother-to-Child Transmission of HIV services in Rift Valley Province: Kenya is my own work.

Signature:……

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Amsterdam, The Netherlands

September 2009

Organised by:

KIT (Royal Tropical Institute), Development Policy & Practice
Amsterdam, The Netherlands

In co-operation with:
Vrije Universiteit Amsterdam/ Free University of Amsterdam (VU)
Amsterdam, The Netherlands

Dedication

I dedicate this work to my wife Dr. Christine A. Mamai and our twin daughters Stephanie Apiyo and Stacy Adongo. I thank them all for the sincere support and encouragement that they showed me throughout the period that we were away from each other as I worked on in pursuit of my Master of Public Health.

Acknowledgements

I acknowledge the generosity of the Dutch Government and the hospitality of the people of The Netherlands for awarding me the fellowship that enabled me to participate in the Master of Public Health degree course at the Royal Tropical Institute.

I applaud and commend the Royal Tropical Institute (KIT) in its entirety for putting together a curriculum for training that is practical and current, for the teaching methods that are participatory and responsive to the student.

My appreciation goes to all my classmates. The experience of interacting with more than twenty nationals from all over the globe has positively changed my view of the world in many dimensions.

Abbreviations and Acronyms

AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal Care Clinic
ART	Antiretroviral Therapy
ARV	Antiretroviral
DNA	De-oxyribonucleic Acid
EID	Early Infant Diagnosis
FBO	Faith Based Organisation
GFTAM	Global Fund for Tuberculosis, AIDS and Malaria
HAART	Highly Active Antiretroviral Therapy
HCW	Health Care Workers
HIV	Human Immunodeficiency Virus
HRH	Human Resources for Health
KNASP	Kenya National AIDS Strategic Plan
KNBS	Kenya National Bureau of Statistics
MoSPA&IS	Ministry of State for Provincial Administration & Internal Security
MTEF	Medium Term Expenditure Framework
NACC	National AIDS Control Council
NASCOP	National AIDS/STI Control Programme
PCR	Polymerase Chain Reaction
PEPFAR	U.S President's Emergency Preparedness for AIDS Relief
PITC	Provider-Initiated Testing and Counselling
PMTCT	Prevention of Mother-to-Child Transmission
RVP	Rift Valley Province
STI	Sexually Transmitted Illnesses
TBA	Traditional Birth Attendants
UNGASS	United Nations General Assembly Special Session
UNICEF	United Nations Children's' Fund
VCT	Voluntary Counselling and Testing
WHO	World Health Organisation

Abstract summary

Purpose: This study has been conducted as partial fulfillment of the requirement for the degree of Master of public health.

Background: Although there are on-going efforts to scale up PMTCT services, the coverage and utilization still remains low. The enrolment into PMTCT programs is sub-optimal, the uptake of HIV counseling and testing is low and there is a high drop-out rate from follow-up. The coverage of ARV prophylaxis is low and the adherence is unknown. Overall the effectiveness of PMTCT programs in HIV transmission risk reduction is unknown at population level.

Objective: To identify and describe the factors that influence the utilization of prevention of mother-to-child HIV transmission services and the interventions that have been tried in other settings in order to improve the PMTCT program in Rift Valley province. The focus on barriers to HIV counseling, testing and uptake of ARV prophylaxis for both mother and infant.

Setting: Rift Valley Province in Kenya.

Methods: Use of literature review and presentation of PMTCT routine service delivery data from districts of Rift Valley Province.

Findings: Rift Valley province PMTCT program also suffers low utilization with high client loss to follow-up and unknown effectiveness of HIV transmission risk reduction. The barriers to access and use of PMTCT services are policy, institutional and cultural in nature. They include inadequacy of physical infrastructure and acute staff shortage to deliver services; challenges in the supply systems and unmet training needs of the health staff; Socio-cultural tendencies to stigmatize HIV positive women, lack of community awareness, involvement and participation in PMTCT programs and Health care systems' lack of responsiveness to the needs of PMTCT clients.

Conclusion: Despite the considerable constraints and challenges the PMTCT program in Rift Valley province can be improved by implementing innovative methods to address the human resource crisis, expand on its out-reach clinic services, improve on ANC coverage, institutionalize routine HIV testing, integrate PMTCT into reproductive health and mother child and newborn services, consider scaling-up use of combination ARV prophylaxis and strengthen its commodity and supply systems.

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Chapter 1: Background

1.1 Kenya

Kenya is situated in the eastern coast of Africa across the equator. It is bordered by the Indian Ocean on the east, Somalia on the North-east, Ethiopia on the North, Sudan on the North-west, Uganda on the West and Tanzania on the South (Encyclopedia of Nations). The country is divided into eight administrative provinces; Coast, Eastern, North-eastern, Central, Western, Nyanza, Rift Valley and the capital Nairobi (MoSPA&IS).

1.1.1 Demographic profile

In 2007 the population of Kenya was estimated at 37 million. Approximately 50.5 percent of the population is female. The population is young 42 percent is aged below 15 years and only 2 percent above 65 years (Population Reference Bureau, 2007). The age and sex structure of the population is 'expansive' characterized by rapid growth and the size of a birth cohort being larger than the previous one (Korenjak-Cerne et al., 2008). The crude birth rate is 39 per thousand and an estimated 1.5 million births annually (Central Bureau of Statistics, 2004).

1.1.2 HIV Epidemiology

Kenya has a mixed Human Immunodeficiency virus (HIV) epidemic characterized by a prevalence of 7.4 percent in the general adult population (15-64 years) and prevalence between fifteen (15%) and fifty (50%) percent among high-risk groups identified as commercial sex workers, same sex partners, migrant workers, prisoners, personnel of the uniformed forces, intra-venous drug users and individuals in HIV discordant relationships (NACC, 2008).

In 2007 an estimated 1.1 million people were living with HIV in Kenya, of whom 102,000 were children aged between 0-14 years. There were 250,000 adults eligible for anti-retroviral therapy and forty (40%) percent were on treatment (NACC, 2008).

Gender: Although the HIV prevalence in the general population has declined from a peak of 14 percent in the year 2000, there is a trend of 'feminization' of HIV infection (NACC, 2007). The HIV prevalence in women is higher compared to that in men in the general population 15-64 years (8.7 percent compared to 5.6 percent). The population-based survey in 2007 found the different to be statistically significant up until 34 years. In the age group

15-24 years women are four times more like to be HIV infected than men (6.1 percent compared to 1.5 percent) (NACC, 2008; NASCOP, 2008b).

Urban-Rural disparities: The HIV prevalence among adults 15-64 years is higher in the urban areas (9%) percent compared to the rural areas (7%) percent. However, the burden of disease is higher in the rural area since seventy five percent of the population are rural dwellers (NASCOP, 2008b).

1.1.3 National response

The first case of Acquired Immune Deficiency Syndrome (AIDS) death publicly reported in Kenya was in 1984. While it took the government a decade to have a coordinated national response, the religious community and civil society began their response early in the epidemic (Haddad et al., 2008). The following are the land marks of the national HIV/AIDS response since 1984:

1984 First AIDS death publicly reported.

1986 The Presbyterian Church of East Africa held a symposium on the emerging HIV crisis.

The first Catholic Bishop wrote a pastoral letter on HIV and AIDS

1990 Annual HIV antenatal Anonymous-unlinked surveillance started with 43 sites.

1997 Parliament approves Sessional paper No. 4 of 1997 on AIDS in Kenya.

1998 Formation of the Great Lake Initiative on AIDS (GLIA) to harmonize HIV response across national borders of Kenya, Uganda, Tanzania, Rwanda, Burundi and The DRC.

1999 The President declares HIV/AIDS a national disaster.

The National AIDS Control Council established.

2000 A multi-sectoral approach adopted in the development of the first Kenya National AIDS Strategic Plan (KNASP) 2000-2005.

Anti-retroviral drugs introduced into the Kenyan market available only from Private health facilities.

2002 The President launches the Total war Against AIDS (TOWA) project.

A national task force headed by NASCOP formed to address the scale-up of anti-retroviral treatment.

The first annual Joint AIDS Review Programme (JAPR) held bringing together all stakeholders at the national level.

2003 Anti-retroviral drugs available in the public health facilities through the support of GFTAM and PEPFAR.

Kenya adopts the 3 ones principle of: one coordinating authority, one framework of action and one monitoring and evaluation system.

NACC devolved to the constituencies by establishment of 210 Constituency AIDS coordinating committees.

2005 The second KNASP 2005-2010 developed.

Anti-retroviral drugs available free of charge in public health facilities.

2006 Mainstreaming HIV into national development policy documents including Economic recovery strategy, MTEF, Education, Health and Home Affairs strategic plans.

Parliament passes the Kenya HIV and AIDS prevention and control Act No 14 of 2006.

2007 The first annual JAPR process to involve all the stakeholders from district, provincial and national levels.

2008 The post-election violence, resulting in death, population dislocation and health service disruption. The effects are yet to be realized.

Source: Haddad et al., 2008; NACC, 2007; NACC, 2008; NACC, 2005.

1.1.4 Programming of HIV/AIDS activities

The programming of HIV activity is based on three broad result areas: prevention of new HIV infections; Treatment, care and improvement of the quality of life of people living with HIV and mitigating against the socio-economic impact of HIV on individuals, communities and the nation (NACC, 2005).

To address the prevention of new HIV infections, eight interventions are being implemented: voluntary counseling and testing; condom promotion; sexually transmitted illnesses (STI) prevention, diagnosis and treatment; behavior change communication and delayed sexual debut among young people; improved blood safety; post-exposure prophylaxis and prevention of mother-to-child HIV transmission (NACC, 2005).

Prevention of mother-to-child transmission (PMTCT) program was launched in 2002 with pilot sites throughout the country. The coverage target was to roll out PMTCT services to 80 percent of all health facilities and to have 80 percent of pregnant women attending antenatal care, to also receive HIV counseling, testing and antiretroviral (ARV) prophylaxis for PMTCT by 2007. The goal is to reduce infant HIV infection by 50 percent by the year 2010 in line with the UN General Assembly Special Session (UNGASS) declaration (NASCOP, 2008a).

1.2 Rift Valley province

The Rift Valley province is the largest of the eight provinces in Kenya. It extends from the north across the country, down to the southern border with Tanzania. Until 2007 the province was divided into nineteen administrative districts, however, since then these have been subdivided into sixty districts (MoSPA&IS).

1.2.1Demopraphic profile

The population was estimated at 8,728,247 in 2005 with a growth rate of 2.6 percent per year. The population is young, 52.9 percent being below the age 20 years. The dependency ratio i.e. the proportion of the population aged below 15 years and above 65 years that are dependent on the productive labor force of 15-65 years is 80.1 percent. The unemployment rates are high; fifty five (55%) percent in the rural areas and forty five (45%) percent in the urban areas (KNBS, 2008). It is estimated that half of the population are unable to satisfy their daily caloric intake requirements while 19 percent cannot meet both their daily food and non-food requirements (KNBS, 2007).

1.2.2 Geography and socio-economic profile

The Rift Valley bears one of the many scenic landscapes in the Kenya. The northern Rift is an expansive area of semi-arid and arid low land. Lake Turkana is situated in its floor at the border with Ethiopia. The Kenyan highlands are found in the central Rift. It is divided into the eastern and western highlands and the floor is dotted with a number of lakes known for the colonies of the famous lesser and greater flamingos. Rift Valley province is socioeconomically heterogeneous. The central Rift is the agricultural core of the country. Seventy percent of the households are engaged in mixed subsistence farming (KNBS, 2007). There is cash crop farming mainly in tea, coffee and horticulture carried out by private national and multinational corporations. The south Rift is also arid and semi-arid low land. The economic activity in the north and south Rift is nomadic pastoralism. Small-scale fishing is done in Lake Turkana in the north while commercial salt harvesting is done in Lake Magadi in the south (Ministry of Finance & Planning, 2001).

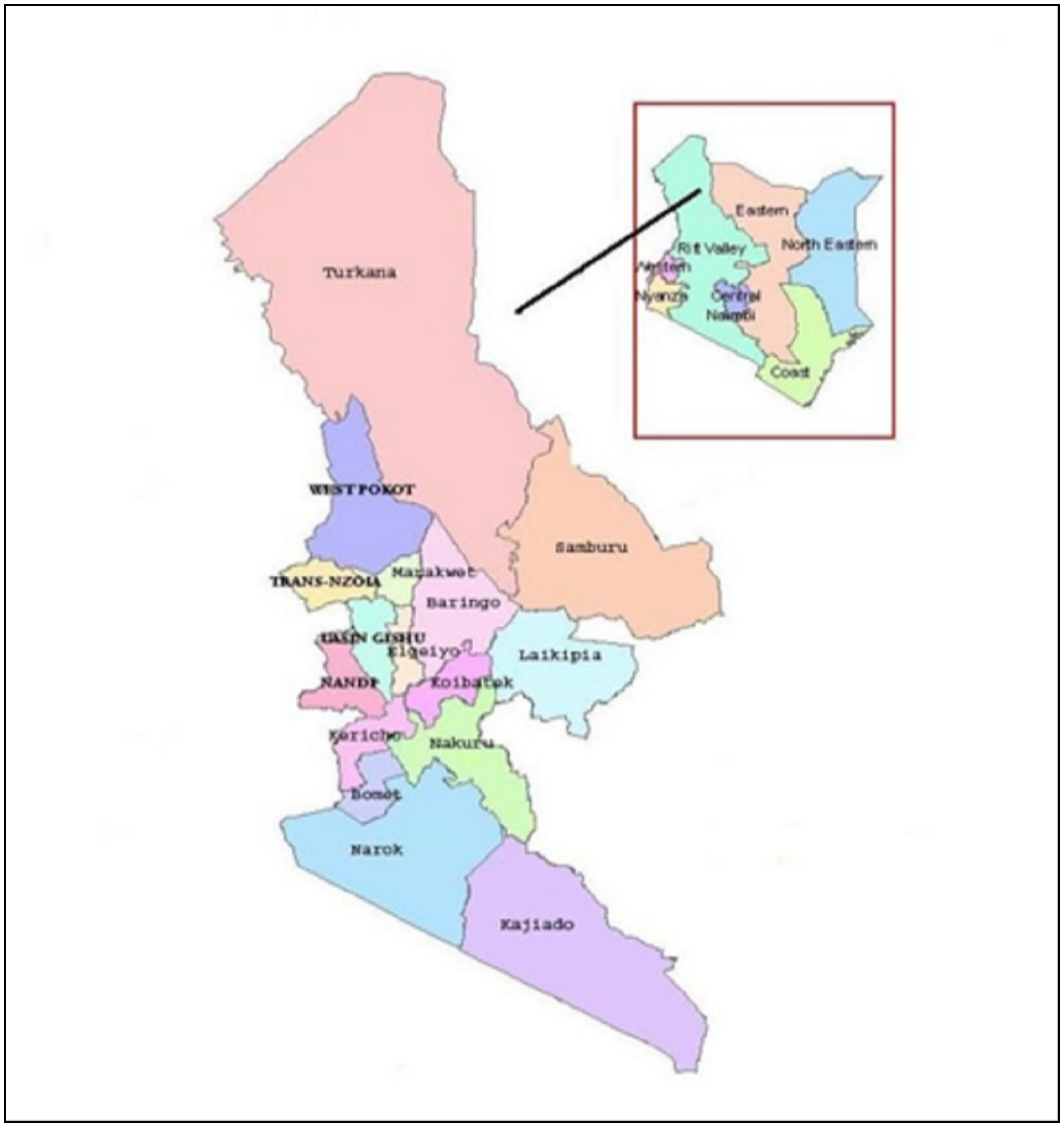
1.2.3 HIV epidemiology

The HIV epidemic profile in the Rift Valley is similar to the national picture. It is estimated that there were 322,000 people living with HIV in 2007. The prevalence in the general population is seven (7.0 %) percent. Women are

disproportionately affected, with a prevalence of 8.5 percent compared to six (6.0 %) percent in men (NASCOP, 2008b).

Annually approximately 350,000 pregnancies are expected in the Rift Valley (PMO routine data. 2008). In 2006 the HIV prevalence by sentinel surveillance among pregnant women was estimated at 6.1 percent, therefore, approximately 21,350 infant are exposed to HIV (NASCOP, 2006b). This is concurrent with a survey finding in north Rift that reported HIV prevalence of 6.7 percent among pregnant women. The inter-facility prevalence rate ranged between two (2%) percent and fifteen (15%) percent (Kiptoo et al., 2009).

Fig 1 Map of Rift Valley Province



Chapter 2: Problem statement

Kenya is one of the twelve Sub-Saharan Africa countries where 75 percent of the worlds' population of HIV positive pregnant women lives. Annually there are approximately 1.5 million pregnant women in Kenya. In the UNGASS country progress report 2008, NACC reported 630,000 pregnant women were counseled and tested for HIV in 2006, of these 57,800[1] were HIV positive and 19,000 new infections reported among children aged 0-14 years. There were approximately 102,000 children living with HIV and 1.1 million orphaned by HIV related death of one or both parents (NACC, 2008).

The transmission of HIV infection from mother to the child is possible during pregnancy, intra-partum especially with vaginal delivery (Abrams, 2004) and after birth in the breastfeeding populations (Luo et al., 2007; Fonzo et al., 2008; Kim J.Y et al., 2008). Also known as vertical transmission, the risk can be reduced considerably by services offered in the PMTCT program. The services involve a cascade that begins at the first contact with the health care system, usually the antenatal care clinic. It includes counseling of pregnant women, acceptance to HIV testing, taking the HIV test, acceptance of the HIV result, administration of anti-retroviral drugs to the mother and baby, counseling for the best infant feeding options and finally continued care for the mother-infant pair and their extended family (Bolu et al., 2007; Fonzo et al., 2008; Fonzo et al., 2008; Kim J.Y et al., 2008).

There is evidence that without intervention there is 15 to 30 percent chance of HIV transmission in the non-breast feeding population and a total of 20 to 45 percent chance in the breast feeding population (WHO, 2007; De Cock et al., 2000). In the global north the risk of transmission has been reduced to less than 2 percent by combining universal access to antenatal care services, testing all pregnant women for HIV with an option to opt-out, access to combination long course antiretroviral treatment for viral suppression, elective caesarean section and access to alternative feeding options (Fowler et al., 2007; Suksomboon et al., 2007; WHO, 2004). In Kenya meeting the above conditions still remains a challenge and the HIV transmission rate from mother-to-child remain as high as 32.8 percent in 2006 with a national anti-retroviral (ARV) prophylaxis coverage of 40 percent (NACC, 2008).

A number of clinical trials have been conducted to determine the efficacy of antiretroviral drugs used singly and in combination to reduce the risk of

[1] Calculation is based on the ANC surveillance prevalence of 9.2% as at 2003 (see Appendix A).

mother-to-child HIV transmission in resource constrained settings. Although comparison of their outcome may not be practical due to differences in the study designs, durations of follow up, populations studied and measured outcomes, a body of evidence is emerging that combination antiretroviral therapy is more efficacious than single-dose treatment, while treatment began in the early second trimester has better risk reduction outcomes than when started late in the third trimester (Leroy et al., 2008; Leroy et al., 2005; WHO, 2004).

In Kenya the national guideline on PMTCT outline options for ARV prophylaxis depending on the timing of the first contact with a HIV positive pregnant woman, distinguishing those seen between 28 and 38 weeks of pregnancy and those seen later or in labor. While the guideline recommends combination short course antiretroviral prophylaxis with Zidovudine, Nevirapine and Lamivudine for the mother and infant as standard (NASCOP, 2008a), the minimum alternative of single-dose intra-partum Nevirapine is more widely used. There has been concern of the low effectiveness and the increased risk of Nevirapine resistance to the disadvantage of the mother and infant. A hospital based study in Coast province in 2003 among a breast feeding population, reported no statistically significant difference in the HIV transmission rate between women given single-dose Nevirapine intra-partum (18.1 %) compared to transmission rate (21.7%) before any intervention was available in 1999 (Quaghebeur et al., 2004).

The national PMTCT targets and goals are adopted by the provinces. (NASCOP, 2005) In Rift Valley province routine service delivery data 2007 and 2008 show that antenatal care (ANC) coverage was sixty five (65%) and forty (40%) percent respectively. Less than half of the pregnant women were counseled for HIV and forty two (42%) percent tested in 2007. Less than two fifths counseled and a third tested in 2008. The drop in utilization in 2008 can partly be explained by the post-election violence that resulted in population dislocation and disruption of health care services, of which Rift Valley province was the worst hit of all eight provinces (Obonyo et al., 2008). An estimated 20,548 HIV positive pregnant women were expected in 2007 based on provincial prevalence (6.1%) among pregnant women. The provincial coverage for ARV prophylaxis was nineteen (19%) percent for women and fourteen (14%) percent for exposed infants.

Such findings of low utilization of PMTCT services have been documented in other settings in Africa; Uganda (Karamagi et al., 2006), Zambia (Stringer et al., 2005) and South Africa (Bassett, 2002).

In order to prevent the new HIV infections in children, the gaps and barriers in the prevention of mother-to-child transmission program should be addressed. The benefit of peri-natal anti-retroviral prophylaxis is undeniable. It is therefore of much concern that many women and children fail to benefit from the available services while the opportunity to do so exists (UNICEF et al., 2008). A better understanding of the factors that contribute to the under utilization of the PMTCT services in Rift Valley province is therefore necessary for improvement of the services.
This study will give insight into the barriers, constraints and impediments to the utilization of PMTCT services in Rift Valley province.

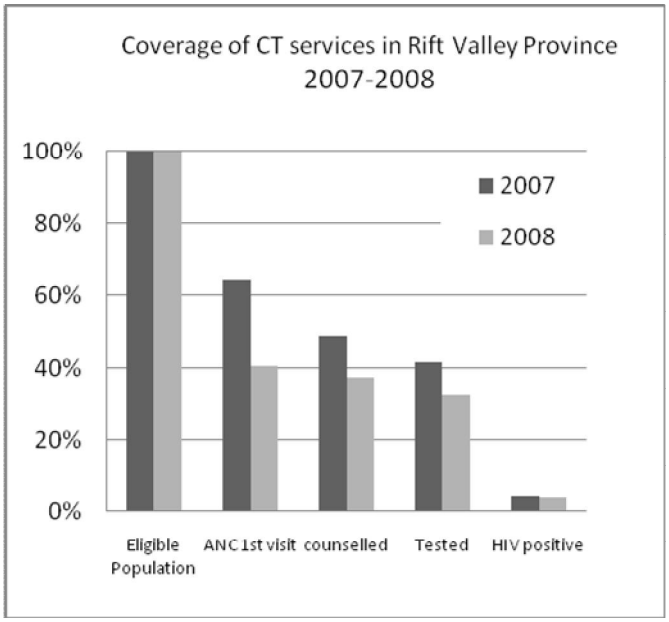
2.1 General Objective

To identify and describe the factors that influence the utilization of prevention of mother-to-child HIV transmission services and the interventions that have been tried in other settings in order to improve the PMTCT program in Rift Valley province.

2.2 Specific Objectives

1. To identify and describe the barriers to HIV counseling and testing at antenatal care clinics.
2. To identify barriers and describe the reasons for the low uptake of anti-retroviral prophylaxis for pregnant women and their infants.
3. To identify and describe the interventions that have been tried to address the barriers to HIV counseling and uptake of anti-retroviral prophylaxis in similar low-income settings.
4. To make recommendations for the improvement of the PMTCT program in Rift Valley province.

Fig 2: Graphs showing PMTCT service coverage in Rift Valley



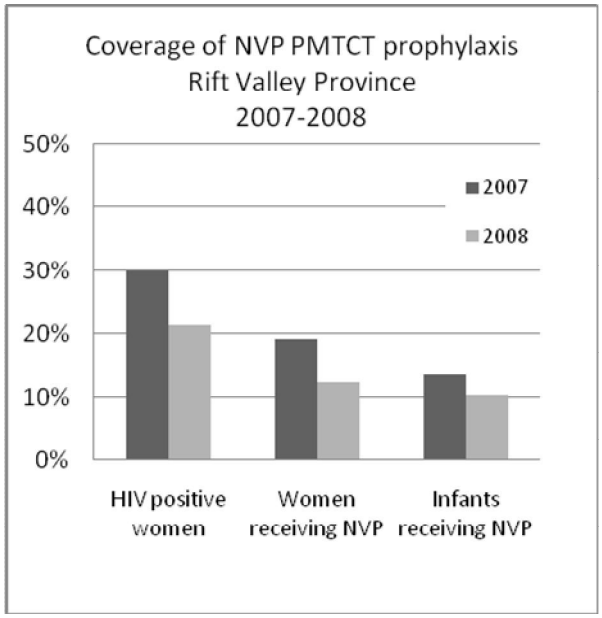


Table 1: Actual utilization for HIV counseling and testing in Rift Valley province 2007 & 2008

	2007		2008	
Eligible Population	336,854	100%	337,542	100%
ANC 1st visit	217,559	65%	136,438	40%
Women counselled	164,477	49%	126,584	38%
Women Tested	140,496	42%	109,274	32%
Women HIV positive	6,137	4%	4,421	4%

Table 2: Actual utilization of ARV prophylaxis in Rift Valley province 2007 & 2008

	2007		2008	
Eligible Population of HIV+ pregnant women	20,548	100%	20,590	100%
Women HIV positive	6,137	30%	4,421	21%
Women receiving NVP	3,950	19%	2,548	12%
Infants receiving NVP	2,794	14%	2,136	10%

2.3 Study framework

Access has been defined as the 'opportunity or freedom' to use a health service, it is a prerequisite to the actual utilization of health services (Thiede & McIntyre, 2008). Traditionally access has been viewed narrowly as; availability or physical accessibility of the health services while affordability as the financial accessibility or ability to pay for the health services (Thiede & McIntyre, 2008) representing the supply and demand ends of the health care transactions. There is a body of evidence that availability and affordability are multilayered, broad and contextual in determining actual utilization of health services (Gilson & Schneider, 2007). Availability would include; geographical location of services, timing of opening hours, the range and quality of services offered. While affordability includes the match between cost of service and ability to pay, indirect costs, opportunity costs, willingness to pay, insurance or deposit requirements (Gilson & Schneider, 2007).

The health care transactions occur in a socio-cultural context and are therefore influenced by the prevailing health belief systems, the perception of health and ill health and the fit between the lay and professional understanding of the health interventions options (Gilson & Schneider, 2007; Thiede, 2005). This brings about the importance of the factor, acceptability. Gilson et al defines acceptability as "the social and cultural distance between health care systems and their users". Acceptability is also multi-dimensional in influencing health care utilization, including the individual and community characteristics, provider characteristics, patient-provider relationship, gender roles etc (Gilson & Schneider, 2007; Thiede, 2005).

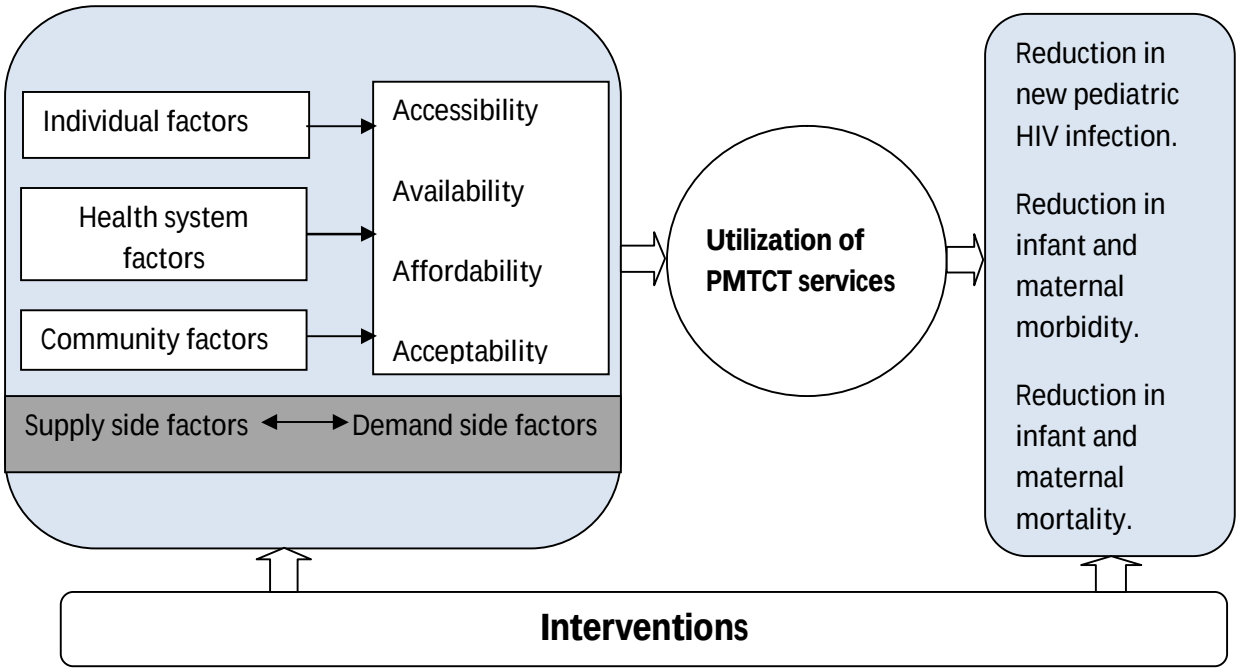
However, acceptability does not automatically translate to utilization of health services, awareness of the possibility to use and empowerment or support to make the decision to use the health service is equally important (Gilson & Schneider, 2007; Thiede & McIntyre, 2008). This is facilitated by the quality of information and communication between the health care systems and the users, and the level of trust between the two (Thiede & McIntyre, 2008).

The consequences of acceptability problems would include among others; patient unwillingness to accept diagnosis, low utilization of health interventions, delay in referral, poor adherence to treatment and advice,

loss to follow up and low rate of health status disclosure (Gilson & Schneider, 2007).

In this study the author will use the conceptual framework developed by Thiede but as adapted by Gilson and Schneider, to discuss how the quality of information together with a fit between the demand and supply factors of availability, affordability and acceptability influence the subjective choice to utilize the prevention of mother-to-child HIV transmission services in Rift Valley province.

Fig 3: scheme of study framework. Adapted from Thiede



2.4 Methodology of Study

This study reviewed literature from journals articles, reports, grey literature and textbooks. These were carefully searched from the internet databases; Pub med, Scopus, Medscape and Royal Tropical Institute and Vrije University library catalogues. Routine data from PMTCT programs in five districts; Laikipia, Samburu, Turkana, Kericho and Nakuru purposively selected to represent the heterogeneity of the province was analyzed. The routine data was sourced from the Provincial Medical Office health management information system, Ministry of Health regional office in Nakuru.

Keywords were used singly and in combination to search for literature. These included:

Prevention mother-to-child, Perinatal transmission, Human immunodeficiency virus, Antenatal care, pregnant women, Voluntary counseling and testing, opt-out approach, couple counseling, Single-dose, Short-course, Antiretroviral, Nevirapine, Zidovudine, Africa, Sub-Saharan, East-Africa, Kenya, Low income countries, Rift Valley province, Developing countries, uptake, utilization, access, acceptability, affordability, Scaling-up, willingness to pay, rural, urban, stigma, barrier, treatment outcome, effectiveness, human resource for health, PMTCT cascade, male involvement, community participation.

2.5 Study Limitations

- The literature search for journal articles was limited to the journal subscriptions at the Royal Tropical Institute and Vrije University libraries.
- Only literature written in English was reviewed therefore the experienced documented in other languages may have been missed.
- Most of the literature found documented experience with single-dose Nevirapine programs, the findings should be cautiously applied for the short-course combination ART regimen for PMTCT.
- Routine data from Rift Valley Province for 2006 was not accessible, while that for 2008 not representative of normal operating environment (due to post-election unrest). Therefore the presented data (2007) misses the benefit of year to year comparison of trends.

Chapter 3: Barriers to utilization of HIV counseling and testing for PMTCT services as described in low-income settings.

An estimated 33.2 million [30.6-36.1 million] people were living with HIV infection in 2007, of whom 2.1 million [1.9-2.9 million] were children. An estimated 2.5 million [1.9-4.1 million] new infections and 2.1 million [1.9-2.4 million] deaths were projected globally (WHO, 2008).

Two thirds of the people living with HIV are in Sub-Saharan Africa, of whom 60 percent are women. Ninety five percent of the children infected worldwide are in the same region, majority of infection being through mother to child transmission (WHO, 2008).

Low utilization of PMTCT services is a phenomenon that characterizes low and middle income countries (Abrams et al., 2007). While acknowledging wide country variation, only 33 percent of HIV pregnant women received anti-retroviral prophylaxis for PMTCT and even fewer received ARVs for their own health in Sub-Saharan Africa in 2007 (UNICEF et al., 2008).

PMTCT as currently designed is a facility based intervention and the opportunity to use it is only realized when a pregnant woman interacts with the health system usually through the antenatal clinic. This presents the first bottleneck to utilization of PMTCT services, as not all pregnant women use antenatal care services; Simkhada et al (2008) in their systematic review put together factors that affect the utilization of antenatal care in Africa, Asia, Latin America and the Caribbean documented in twenty eight (28) studies. Some of the barriers to use of ANC include: Low level of education for both the men and women, high parity, Short periods (less than 2 years) between pregnancies, being unmarried, age below and above the thirties, lack of village health care workers and antenatal care services nearby, long waiting times at the clinics, long distances to the ANC facilities with physical barriers such as uncomfortable means of transport, poor roads or big rivers, unaffordable transport costs and costs of other laboratory tests, poverty, household economic insecurity and gender disparities, negative attitudes of the health care workers, and perceived lack of direct benefit from ANC especially when not experiencing any problems (Simkhada et al., 2008), other work in Tanzania also corroborate most of these factors (Mrisho et al., 2009) which affect utilization of PMTCT as women who do not attend ANC are automatically excluded from the benefits of the services.

Antenatal care as an aggregate package of various health intervention is important and recommended for all pregnant mothers. It is an important

entry point to the health intervention aimed at prevention of mother-to-child HIV transmission. However, this study will not look into the barriers to the utilization of ANC services.

The next bottleneck to utilization of PMTCT services is acceptance of HIV counseling and testing at the ANC clinics. The number of people taking HIV counseling and testing is increasing globally, however the coverage for counseling and testing unknown due lack of data and technical difficulties in collecting the data (UNICEF et al., 2008). Population surveys show that the proportion of people that have ever had a HIV test range between two (2%) and forty five (45%) percent in 2007 (UNICEF et al., 2008).

HIV infection in most low-income settings is driven by heterosexual social relationships, which may be consensual or forced. The decision to take a HIV test is usually ambivalent, involving lengthy dialogue between an individual and her social circumstances (Obermeyer & Osborn, 2007). Msellati (2009) posits that the women's mental preparedness at the time they are offered a HIV test for PMTCT is totally different, and many times absent as compared to the preparedness seen and expected during voluntary counseling and testing (Msellati, 2009). This is because the primary purpose for the visit in the two scenarios is different. Therefore, HIV testing is never 'that' straightforward medical procedure even in the PMTCT setting. There is evidence of discrepancies between intention to be tested, being tested and receiving the test result, in a study of Rwanda antenatal clinics approximately one third of the clients failing to return for results, about half in a Ugandan study and only twelve (12%) percent returning in a Zambian study (Obermeyer & Osborn, 2007).

3.1 Availability

To deliver PMTCT services resources are required to offer a range of service that include: HIV counseling and testing; anti-retroviral prophylaxis; maternal care ante-partum, during labor, delivery and post-partum; family planning services, treatment of sexually transmitted illness and continuity of HIV care and treatment. Governments are struggling to make available resources to implement PMTCT programs (UNICEF et al., 2008). Mozambique in the draft UNGASS progress report, reported a shortfall in the number of required service delivery sites for voluntary counseling and testing (VCT), PMTCT and anti-retroviral therapy (ART) (Government of Mozambique, 2006). In 2003 Uganda had rolled out PMTCT service to 38 of its 56 districts (Karamagi et al., 2006). In the northern districts fifteen (15) of the planned thirty four (34) PMTCT sites were in place in 2007 (Chamla et

al., 2007). The ratio of population per VCT site range between 3900 in Guyana to 110,000 in Nigeria (UNICEF et al., 2008). Lack of counseling and testing services close to the users is a barrier to utilization of PMTCT (Karamagi et al., 2006; Skinner et al., 2005).

Location

VCT sites can be stand-alone or facility-based, while HIV counseling and testing for PMTCT is mostly facility-based (Painter, 2001). In many settings these services are located in urban areas or trading centers (UNICEF et al., 2008). In northern Uganda 60 percent of the PMTCT sites were located in a municipal centre, while the rural areas with more than 30 camps of internally displaced persons had none (Chamla et al., 2007). This distribution and location of VCT sites means that the rural and vulnerable populations like refugees have difficulty accessing the services.

Many studies reveal that long distances covered to health facilities is a barrier. Molesworth, 2005 assessed the impact of transportation and mobility on access to health services. Consensus in a focused group discussion in Nepal was that 5 kilometers walk to a health facility was reasonable; however, 77 percent of the participants lived more than 20 kilometers from a health facility (Molesworth, 2005). Such scenarios are reported in rural South Africa (Skinner et al., 2005); Cote d'Ivoire (Painter et al., 2004) Malawi (Chinkonde et al., 2009).

Transport and communication

Poor road infrastructure, lack and unreliability of means of transport and geographical features like mountainous terrains, rivers and lakes are barriers to the accessibility of the health services (Skinner et al., 2005; Molesworth, 2005). The effect of these is compounded by insecurity and conflict (Chamla et al., 2007).

Opening time

The fit between the opening times of the health system and it's conveniences to the user is critical in determining access and utilization of the services (Penchansky & Thomas, 1981). Most health facilities are open from eight o'clock to five o'clock in the evening. The Health care workers (HCW) attend to the ANC clients as they arrive. In Malawi ANC clients report being turned away by HCW citing work overload and unwillingness to extend opening hours. Without proper appointment systems such practice frustrates and bars clients from using PMTCT services (Chinkonde et al., 2009).

Range of services

A number of national HIV prevention programs offer only ARV prophylaxis as the strategy for reduction of pediatric HIV infection. Data from Malawi, Nigeria and Zambia showed that only seven (7%) percent of women who received ARV prophylaxis for PMTCT were assessed for eligibility ART (Attawel, 2008). This compares poorly with data from sites integrating highly active anti-retroviral therapy (HAART) and PMTCT that indicate approximately thirty (30%) percent of pregnant women seen are eligible for HAART (Abrams et al., 2007). Lack of available treatment for the benefit of the mother has been cited as a barrier to the use of HIV testing for PMTCT services (Bassett, 2002). Some respondents in a study in Botswana said they were unwilling to take medicine that only benefits the baby (Creek et al., 2009).

VCT alone is not sufficient to optimize uptake of HIV testing. Programs that offer provider-initiated counseling and testing (PITC) have recorded significant increase in uptake of HIV testing (Attawel, 2008) and the same for couple counseling (Painter, 2001).

The management of commodities and supplies has an impact on the range of services offered, their reliability and sustainability. This aspect of ensuring service availability is weak and inefficient in many low-income countries including South Africa (Skinner et al., 2005); Tanzania (Allers et al., 2003), Cameroon (Labhardt et al., 2009) and Uganda (Chamla et al., 2007). The lack of services attributed to stock-out of medical supplies has been cited as a barrier to use of PMTCT services (Rutenberg et al., 2003).

Quality and quantity of service

The quality and quantity of the resource inputs in part determine the quality and quantity of the output of services delivered. The constraint of human resource for health (HRH) in scaling up priority interventions for HIV and other diseases is not in doubt, especially for Sub-Saharan Africa. There are marked disparities between countries and also within countries where the distribution of HRH is to the disadvantage of rural populations (Liese et al., 2003). Schneider, reports that South Africa will require an additional 13,000 health care workers to meet her HIV priority interventions (Schneider et al., 2006), while an analysis of Tanzania's HRH stock pile reveal that only 45 percent of the required number is available to deliver priority interventions (Kurowski et al., 2007). In Uganda all VCT sites in the Northern district had only one health care worker (HCW) each (Chamla et al., 2007).

The inadequacy in numbers may compromise the quality of counseling offered (Obermeyer & Osborn, 2007). The time spent with clients during counseling is too short to cover all the important topics. Experience from a peer-counseling program in South Africa is that one session is never enough to ensure support for the PMTCT clients to take the test, yet this is a common feature of many PMTCT programs in Africa (Baek et al., 2007). An evaluation in Tanzania reported that nurses provided counseling and performed HIV rapid test, however they had no knowledge of quality assurance (Kurowski et al., 2007).

The HRH shortage and lack of relevant training is a barrier to uptake of HIV counseling and testing, respondents in a study in South Africa reported that the HCW are committed to service and quality but are concerned of their capacity due to the overburden of additional services (Skinner et al., 2005).

Health staff absenteeism

There are direct and indirect causes of staff absenteeism in the context of HIV; on one hand HCW are directly affected by the burden of HIV infection, either living with the virus or taking care of relatives with the virus. In South Africa a survey reported a HIV prevalence of sixteen (16%) percent among HCW (Shisana et al., 2004). In Zambia the HIV/AIDS related mortality in 1991 among HCW had risen from 2 per 1000 to 26.7 per 1000 in a decade (Dovlo, 2005). On the other hand the extra burden placed upon HCW in implementing the HIV prevention, care and treatment programs often with poor remuneration and no incentives both lead to absenteeism (Dieleman et al., 2007; Evans & Ndirangu, 2009; McPake et al., 1999). Whatever the cause may be, in a study in Cote d'Ivoire 33 percent of respondents had dropped out of PMTCT program citing staff absenteeism from program sites (Painter et al., 2004).

3.2 Affordability

In many of the low-income countries PMTCT and other HIV interventions are free of charge to the user at the point of service. The cost is met by international donor agencies with limited government budget allocation (Campbell & Stilwell., 2008). However, the poverty levels impact negatively on the prospects of access to the services. Skinner et al, state "Poverty impacts on the infrastructure of the health services, on the communities themselves and on the quality and amount of health information released; it affects relationships between people and it undermines the individual pregnant woman's sense of capacity to act" (Skinner et al., 2005).

Charges for auxiliary services

Majority of the poor population are barred from using health care services including HIV counseling and testing by marginal costs of auxiliary services like laboratory tests or ultrasound scans (Painter et al., 2004). This is more so when the HCW attitude is not empathetic.

Sherman et al, in accessing the affordability of early infant diagnosis (EID) in South Africa, found that an early diagnostic protocol at 6 weeks would save up to 25 percent of cost to society compared to the traditional protocol of HIV DNA PCR test at 12 and 18 months. The saving to society is accrued from sparing predominantly HIV negative infants unnecessary visit to the clinic. The early confirmation of the HIV status to the parents improved the uptake of PMTCT services (Sherman et al., 2005).

Opportunity cost

In many of the low-income settings, women play a key role in taking care of the family and providing for their daily subsistence. The benefits of health care visits that would pull the women off their daily chores is weighed against the potential disruption of their lives, for example, one of the children failing to attend school to care for the siblings, the woman losing sales from her small-trade enterprise, at times disapproval and quarrel from the husband for the disruption (Chinkonde et al., 2009; Molesworth, 2005).

3.3 Acceptability

Acceptability as a concept that influences health service utilization will be discussed in the different aspects of individual, community, provider characteristics; patient-provider relationships and gender roles. However, it is understood that the aggregate interaction of these factors and the fit with other factors of availability and affordability in sum determine the actual utilization of PMTCT services.

3.3.1 Individual characteristics

Literature shows that acceptance or rejection of HIV counseling and testing is determined by a number of individual characteristics. It is also acknowledged that these characteristics are shaped by the social contexts (Obermeyer & Osborn, 2007). The characteristic described include the following:

Mixed knowledge about HIV and PMTCT

The level of knowledge about HIV and PMTCT is varied in many settings. A survey study in Uganda showed that the overall knowledge regarding mother-to-child HIV transmission was high (80%), however, the mechanism of transmission and the role of breast milk in HIV transmission confounded many (Bajunirwe & Muzoora, 2005). This is illustrated by the response of a respondent in an in-depth interview in Cote d'Ivoire (Painter et al., 2004);

> "We *are told that the virus passes in the blood and my infant shares my blood. The contamination between me and my infant had already happened, so no hope of saving it. We have always been told that you can't cure AIDS, so the medication that I heard about are nothing but an illusion for me*".

The lack of clarity in the understanding of the need for ARV prophylaxis and the conflicts of information that women receive, prevents some women from using PMTCT services (Skinner et al., 2005).

Fear for knowing HIV status

Many pregnant women fail to use the PMTCT services fearing to learn about their HIV status. Literature shows that a lot of this fear is linked to an inherent feeling of inability to cope a HIV positive diagnosis. (Creek et al., 2009; Ekouevi et al., 2004; Kebaabetswe, 2007).

Unexplained difficulty in acknowledging risk of infection

Literature suggests that there are persons who will not accept HIV testing due to a conviction of not being at risk of infection. This conviction whether real or perceived is not shaken by counseling (Obermeyer & Osborn, 2007). A respondent who had dropped out of PMTCT program in Cote d'Ivoire said (Painter et al., 2004);

> *"I'm sure that I am negative and my baby is fine, it's not sick…I told the midwife that I would participate because I wanted to get away from her*".

Perceived Stigma

Goffman defined stigma as "an attribute that is significantly discrediting... an attribute used to set the affected person or groups apart from the normalized social order, and this separation implies devaluation" (as cited in Bond et al., 2002). The fear of blame, isolation and social exclusion is a barrier to acceptance of HIV counseling and testing for PMTCT in South Africa (Skinner et al., 2005); Tanzania, Zimbabwe and Thailand (Maman et al., 2009) Nigeria (Letamo, 2005) and Malawi (Chinkonde et al., 2009).

Level of Education

An individual's level of education has been found to be associated with likelihood of acceptance of HIV counseling and testing. A survey in Uganda showed that women educated beyond seventh grade and literate women were three and two times more likely to accept testing respectively (Bajunirwe & Muzoora, 2005), this was also found in a Malawian study (Creek et al., 2009) and Botswana (Kuhlmann et al., 2008). These findings suggest that low education and illiteracy may be a barrier to the access and use of counseling and testing services in PMTCT programs.

Lack of awareness about types of services available

Potential PMTCT users may not be aware of the range of services available to them. In Uganda a survey study found that forty (40%) percent of pregnant women were not aware of the existence of HIV rapid test services. Yet 88 percent of the same study group preferred same day results as condition for acceptability of HIV testing (Bajunirwe & Muzoora, 2005). In Tanzania women who were not aware of the available services were twice likely to refuse HIV testing than those who were aware (Kominami et al., 2007).

3.3.2 Community characteristics

Enacted stigma

Evidence abound that in many societies there is labeling, discrediting, othering and singling-out of people living with HIV (Maman et al., 2009). These social constructs are sometimes enacted as blame, discrimination, exclusion, anger, violence and abuse directed towards the HIV positive person. The social devaluation may lead to depression and incapacitation of the victims to make lifesaving decisions (Obermeyer & Osborn, 2007). Stigma has been reported in many studies as a barrier to HIV counseling and testing (Bond et al., 2002; Chinkonde et al., 2009; Medley et al., 2004; Msellati, 2009; Painter et al., 2004; Semrau et al., 2005).

Cultural relationships

Cultural dynamics continue to shape the context in which the PMTCT programs and other HIV interventions are implemented. Some of these cultural values define power, social support structures and dictate the expected codes of conduct. For example older women have authority over young girls and processes such as pregnancy are supervised by them. Such situations as described in South Africa may contract the personal space for

women and couples in taking independent decisions such as HIV testing, health facility delivery, or not breastfeeding (Skinner et al., 2005).

3.3.3 Provider characteristics

Lack of staff motivation

The crisis of the HRH has been described earlier. The nurse in the peripheral health facility is no longer just a primary health care nurse (Dieleman et al., 2007). They have taken on additional duties aimed at HIV prevention, care and treatment (Evans & Ndirangu, 2009). The overburdening, burnout and poor motivation of HCW have been documented in many settings (Schneider et al., 2006; McPake et al., 1999; Kurowski et al., 2007; Skinner et al., 2005). The lack of motivation translates to low enthusiasm in exerting oneself in achieving the goals of the program. The manifestation is seen in low output, negative attitudes towards work and clients and absenteeism.

Negative attitudes of the Health care workers

The staffing crisis notwithstanding, incidences of clients failing to take a HIV test or dropping out of a PMTCT program due to unacceptable staff attitudes are documented in studies in Malawi (Chinkonde et al., 2009), South Africa (Skinner et al., 2005), Zambia and Cote d'Ivoire (Painter et al., 2004). The negative attitude is partly explained by lack of training, insufficient resources, materials and managerial support, poor remuneration and lack of workplace incentives (Evans & Ndirangu, 2009).

Informal charges are manifestations of the uncaring attitudes that the HCW may adopt. By exploiting the patient-provider power relationship and clients' anticipation of faster and better care HCW levy unofficial charges to the clients or redirect them to their private clinics (McPake et al., 1999). This practice locks out the needy poor who cannot afford to pay from accessing health care including HIV counseling and testing.

Favoritism has been reported in some studies as reasons for not utilizing HIV counseling and testing services for PMTCT. Health care workers disregard the queue of clients and attend to their acquaintances while the rest wait (Chinkonde et al., 2009).

Long waiting times

The overwhelming number of clients, the limited workforce and non-existent appointment systems result in long waiting times in health facilities. Studies in Malawi (Chinkonde et al., 2009), South Africa (Skinner et al., 2005) and

Cote d'Ivoire (Painter et al., 2004) have documented waiting time ranging between 1 and 4 hours. Although this affects all ANC attendants, PMTCT clients who require extra services and support report frustration which prevents them from using facility based counseling and testing services and from follow up visit before ARV prophylaxis.

Lack of confidentiality

The fear of involuntary disclosure of one's HIV status is a major concern for many (Obermeyer & Osborn, 2007). The large numbers of clients and the sub-optimal physical facilities available pose a challenge to the extent to which HCW can uphold confidentiality (Evans & Ndirangu, 2009). Shared office space and inappropriate layout of many health facilities compromise privacy and leads to inadvertent disclosure of clients HIV status (Allers et al., 2003; Chinkonde et al., 2009; Skinner et al., 2005).

In some setting HCW may not view upholding confidentiality positively, especially after passing moral judgment on the clients. In a comparative study in Thailand, India and Philippines 34 percent of the respondents reported breach of confidentiality by the HCW (Obermeyer & Osborn, 2007).

Delay in releasing HIV results

There is anxiety associated with taking a HIV test and this is heightened while waiting for the results. A significant number of client attrition occurs between taking HIV test and receipt of test result (Obermeyer & Osborn, 2007). Majority of women interviewed in Uganda report preference of same day results (Bajunirwe & Muzoora, 2005). This finding imply that use of first generation HIV test that took two weeks to get results or other programmatic delays is a barrier to acceptance of HIV counseling and testing.

3.3.4 Patient-Provider relationships

Level of trust

Trust is a construct that determine staff performance and patient responsiveness. It is built upon workplace characteristics such as commitment to organizational goals, nature of human resource management practices, culture of fairness and level of staff autonomy that influence HCW behavior. The client's evaluation of the HCW behavior, technical competence and organizational mechanisms of accountability determines the patient-provider trust. It is upon the level of this trust that the patient judges the extent to which the provider can act in his/her best interest, thus

determining patient responsiveness (Gilson et al., 2005). In an interview study in Cote d'Ivoire a respondent who had declined HIV testing said she did not believe that prophylaxis was effective, while another said she believed the doctors can make mistakes with the blood during testing (Painter et al., 2004). Such mistrust is a barrier to uptake of HIV test and PMTCT programs.

3.3.5 Gender roles

Gender based violence

A review of literature shows that between sixteen (16%) and eighty six (86%) percent of women do not disclose their HIV status. Among women who do, four (4%) to twenty eight (28%) percent report adverse outcomes and three (3%) to fourteen (14%) percent of these report physical abuse. The lowest rate of disclosure is among ANC attendants. This finding has implications on PMTCT services as the women fail to take HIV tests, drop out of follow up or fail to adhere to ARV prophylaxis for fear of involuntary disclosure and possible adverse outcomes (Medley et al., 2004).

Lack of male participation

Evidence show that approval from male partners is a critical consideration in the decision women make to take HIV test or enroll in PMTCT programs (Obermeyer & Osborn, 2007). In a survey in Uganda the odds of accepting a HIV test was six times higher among women who thought their partners would approve of the testing compared to those who did not (Bajunirwe & Muzoora, 2005). In yet another survey more than half of the women said they would need to seek the husband's consent before taking the test (Homsy et al., 2007). While the need is clear few PMTCT programs involve men (Painter, 2001).

Women are disadvantaged in many cultural positions. While this is so they are the target for PMTCT messages and interventions. It is left up to them to update their partners of the plans and progress made during the clinic visits. In some societies a woman discussing HIV and condoms with men is culturally unacceptable (Obermeyer & Osborn, 2007). In a Malawi study, frustrated women stopped PMTCT follow up visits because of inability to translate their acquired knowledge into risk reduction practices like condom use with their partners (Chinkonde et al., 2009).

Chapter 4: Barriers to the utilization of anti-retroviral prophylaxis for PMTCT as described in low-income settings.

To realize the benefit of HIV transmission risk reduction, PMTCT programs have to achieve adherence to antiretroviral drug prophylaxis. Evaluation of many PMTCT programs, however reveal that adherence is still a challenge thus compromising effectiveness of the programs (Sripipatana et al., 2007). This chapter will describe the factors that contribute to the non-adherence to ARV prophylaxis for both the pregnant women and their infants in low-income settings. It is noted that some of the factors described in the previous chapter that influence utilization of HIV counseling and testing also play a role in influencing use of ARV prophylaxis.

4.1 Barriers to maternal utilization and non-adherence to anti-retroviral prophylaxis for PMTCT

WHO recommends the use of combination ARV regimen taken for longer periods for prophylaxis in PMTCT programs (WHO, 2004). However, in 2007 half of HIV positive pregnant women in low income countries received the single-dose Nevirapine regimen and 8 percent received combination of three ARV drugs (UNICEF et al., 2008; WHO, 2008). There is a paucity of literature addressing the barriers to the use and adherence to combination ARV regimens for PMTCT in low-income settings.

4.1.1 Availability

Time of ARV prescription

The timing for Nevirapine prescription has changed over time. Initially Nevirapine was prescribed only in the delivery rooms (Karcher et al., 2006), then at 28 weeks of gestation in ANC clinics (Stringer et al., 2003a) and currently many programs prescribe Nevirapine at diagnosis in ANC clinics. These changes have been informed by operational research that showed many women did not deliver in health facilities, arrived late or did not return for the prescription at 28 weeks. In Cameroon uptake of Nevirapine improved from forty (40%) percent to eighty seven (87%) percent after making this operational policy transition (Sripipatana et al., 2007; UNICEF et al., 2008).

Poor case management

HIV positive pregnant women fail to receive counseling, HIV testing and ARV prophylaxis prescriptions despite making ANC visits. A case-control study in Rwanda showed that women missing HIV counseling and test at the first

ANC visit were significantly more likely to miss a Nevirapine prescription and not to adhere to prophylaxis (Delvaux et al., 2009). A program audit in South Africa attributed the missed opportunity to HCW factors described earlier and including lack of awareness (Urban & Chersich, 2004).

Questionable quality of counseling

Inappropriate counseling on ARV use and adherence, leave women unclear on the instructions on when to ingest the Nevirapine tablet (Nguyen et al., 2008). In the Rwanda study a half of the non-adherent women ingested the tablet incorrectly (Delvaux et al., 2009), while in South Africa a third of women in a PMTCT program ingested the Nevirapine tablet more than 48 hours or less than 2 hours before delivery (Urban & Chersich, 2004). As reasons for the confusion, two in five women in Rwanda said the instructions were not clear and one in four reported that the labor progressed quickly.

Interrupted supply of anti-retroviral drugs.

Systemic weaknesses fail to ensure an uninterrupted supply of ARV drugs in many PMTCT programs (Sripipatana et al., 2007; Rutenberg et al., 2003). The resulting stock-outs lead to missed opportunities in PMTCT programs (Doherty et al., 2007; Nguyen et al., 2008).

Inability to correctly estimate gestational age

Many women in low-income countries cannot correctly determine their last menstrual period. Many facilities do not have the technological capacity to estimate the gestational age of pregnancy. Therefore, some women present very late when combination ARV prophylaxis regimen is not feasible (Nguyen et al., 2008) or deliver before receiving a prescription for Nevirapine (Delva et al., 2006).

4.1.2 Affordability

The affordability of PMTCT programs has been described earlier. However, barriers due to indirect costs for ARV use include:

Maternity charges

Cost recovery or cost sharing charges for maternity services is a barrier to many poor women who cannot afford and contribute in part to the high rates of home delivery. The implication of this exclusion on the PMTCT program is the ineffective supervision of the intra-partum dosing of AVR prophylaxis. Experience from Malawi show that delivery at health facilities can improve with the abolition of these charges (Kasenga et al., 2009).

However, the change in fee policy must be supported with a commitment to sustainable provision of supplies and equipment. In Tanzania where charges were abolished as well, the services are still inaccessible due to requirements of the patients to make available consumables such as gloves, sutures, razors and cotton wool (Mrisho et al., 2007).

4.1.3 Acceptability

One out of four women who receive Nevirapine for PMTCT does not ingest the tablet while a significant proportion does so incorrectly (Stringer et al., 2003b). Some of the reasons associated with non-adherence to ARV prophylaxis include:

Individual Characteristics

Level of education

Low level of education has been associated with non-adherence to ARV prophylaxis (Delvaux et al., 2009). In Zambia women with less than secondary school education were twice likely not to adhere to protocol (Albrecht et al., 2006). Stringer et al, 2003 found an association between non-adherence and primary language illiteracy (Stringer et al., 2003b). This association could be due to the ability to comprehend the logic of prophylaxis and ease of understanding the prophylaxis instructions.

Home delivery

In low-income settings the proportion of women delivering at home is high. In Tanzania more than fifty (50%) percent of women deliver at home (Mrisho et al., 2007). In Malawi only half of HIV positive women enrolled in a PMTCT program delivered at the facility in 2007 (Chinkonde et al., 2009).

Women who deliver at home are four times more likely not to adhere to ARV prophylaxis protocol compared to those who deliver at health facilities (Albrecht et al., 2006; Delvaux et al., 2009). Reasons given for the non-adherence include lack of money, long distances to the health facility, illness among others (Kasenga et al., 2007).

Lack of Disclosure.

Disclosure of HIV status is a major obstacle to the utilization of PMTCT services. Women who have not disclosed their status to anyone are less likely to adhere to ARV prophylaxis (Delvaux et al., 2009) and the likelihood is stronger if they deliver at home (Albrecht et al., 2006). These finding are consistent with the attempts to avoid involuntary disclosure at all costs.

Forgetfulness

Non-adherent women on the Nevirapine regimen simply forget to ingest the tablet. In the Rwanda study seventeen (17%) percent of women who adhered but mistimed the dosing said they forgot, while thirty (30%) percent of the non-adherent women simply forgot to ingest the tablet (Delvaux et al., 2009).

Maternal anemia

Anemia among women enrolled in PMTCT programs using the Zidovudine regimen poses technical dilemmas. Programs in India had to stop Zidovudine due to anemia with unknown implications. Most of the barriers described above are also encountered in with the Zidovudine programs (Rutenberg et al., 2003).

Patient-provider relationship

Lack of trust

Non-adherent women were more likely to report lack of trust in HCW than the adherent women (Delvaux et al., 2009). Women fail to disclose their HIV positive status in delivery rooms giving reasons such as; lack of privacy and discomfort having HCW who were not involved in their antenatal care (Doherty et al., 2005). The mistrust compromises PMTCT effectiveness as the infants fail to get prophylactic ARV doses and the women are not captured in service delivery data if they secretly ingest Nevirapine (Karcher et al., 2006; Urban & Chersich, 2004).

Gender roles

Lack of support from male partners

In the Rwanda study two of every three respondents, said they required approval from their partners to participate in the program. The non-adherent women were twice more likely to report lack of support from the partners (Delvaux et al., 2009).

4.2 Barriers to the infants' utilization of antiretroviral drugs prophylaxis for PMTCT

Major concerns about the utilization of infant ARV prophylaxis globally is the low coverage (20% in 2007) and more so the increasing disparity between the coverage ARV prophylaxis for the mothers and for the infants (WHO, 2008). This section will describe the neonatal, maternal and health systems factors that influence the use to ARV prophylaxis for the infants exposed to HIV.

Neonatal factors.

Babies with low birth weight and those with poor physical conditions at birth as determined by a low APGAR[2] score were found to miss ARV prophylaxis in Zambia. Interestingly also babies born at referral tertiary facilities in Zambia were more likely to fail to receive the ARV prophylaxis compared to those born in peripheral health facilities (Albrecht et al., 2006). Some of the reasons put forth are that the HCW concentrate to restore the physical well being of the newborns forgetting the ARV prophylactic requirements and probably the lack of operational guidelines on how to deal with critically ill newborns as far as ARV prophylaxis is concerned. Neonatal death was also a barrier to the uptake of ARV prophylaxis.

Maternal factors

In Rwanda only fifteen (15%) percent of home delivered infants were brought to the health facilities for ARV prophylaxis. Sixty five (65%) of these presented later than the recommended 72 hours after birth (Delvaux et al., 2009).

Maternal non-adherence is a major predictor to infants' adherence to ARV prophylaxis. Only seven (7%) of the infants born to non-adherent pregnant women in the Rwanda study ingested Nevirapine.

The level of maternal knowledge about perinatal HIV transmission is a key determinant of infants' ARV prophylaxis adherence. Karcher et al. reported their findings in Uganda and Tanzania where women above 25 years and educated women were more likely to give Nevirapine to their infants (Karcher et al., 2006). In Rwanda one out of four women who did not

[2] APGAR score is quick system of evaluating a newborn's physical condition immediately after birth

adhere to infant ARV prophylaxis did not acknowledge the risk of HIV transmission and were more likely to be poorly educated (Delvaux et al., 2009).

Health system factors

Long distance from health facilities discourages women from returning their babies for Nevirapine especially after home delivery (Sripipatana et al., 2007). Thirty (30%) percent of non-adherent women in the Rwanda study were not aware of the need for infant prophylaxis. This finding puts to question the quality of counseling during ANC visits.

Interrupted supply of Nevirapine syrup is a barrier to the uptake of infant ARV prophylaxis in many PMTCT programs (Nguyen et al., 2008) and so is the timing of the prescription. Sripipatana et al, evaluating PMTCT programs in thirteen countries found an improvement in the uptake of Nevirapine prophylaxis for the infants when it was prescribed and dispensed to the mother at the time of HIV diagnosis (Sripipatana et al., 2007).

It is acknowledged that cultural barriers, lack of community involvement and stigma also prevent women from giving their infants ARV prophylaxis (Delvaux et al., 2009; Sripipatana et al., 2007).

Chapter 5: Findings in Rift Valley Province

This chapter will present the findings in Rift Valley province on the utilization of PMTCT services. The five districts presented; Laikipia, Samburu, Turkana, Kericho and Nakuru represent the socioeconomic heterogeneity of the districts in the province. Nakuru is the least poor district with a rural poverty rate of thirty four (34%) percent, comparable to Kericho. Turkana is the poorest district with a rural poverty rate of sixty four (64%) percent comparable to Samburu while Laikipia lies in between the two extremes (Central Bureau of Statistics, 2003).

5.1 Service delivery

Antenatal care

A significant proportion of pregnant women are not reached by PMTCT services simply because they do not use the ANC services. Thirty (30%) to fifty (50%) percent of pregnant women do not use ANC services. In 2007 Kericho district missed twenty six (26%) percent, Laikipia and Samburu missed half of the pregnant women eligible for PMTCT services but never used services.

Table 3: Table showing coverage of HIV counseling and testing for PMTCT in five districts of Rift Valley province in 2007[3]

	District	Eligible population of pregnant women§	No of women attending at least 1 ANC visit	% Pregnant women attending at least 1 ANC visit	Number of women counselled	% of pregnant women counselled	Number of women tested	% of pregnant women tested for HIV	Number of women HIV positive	% of pregnant women HIV positive
1	Kericho	22,434	16,669	74%	14,182	63%	11,349	51%	542	4.8%
2	Laikipia	15,207	7,390	49%	4,437	29%	3,709	24%	175	4.7%
3	Nakuru	60,784	32,093	53%	19,634	32%	16,708	27%	1,174	7.0%
4	Samburu	7,519	3,612	48%	2,057	27%	1,826	24%	50	2.7%
5	Turkana	17,981	11,450	64%	5,468	30%	4,495	25%	196	4.4%

§Eligible population data from Annual Operational Plan III 2007/08

[3] Data from PMO routine data 2007

HIV counseling

Pregnant women attending ANC either decline or are not offered HIV counseling. Kericho district lost ten (10%) percent, Turkana thirty (30%) percent while Laikipia, Nakuru and Samburu lost twenty (20%) percent each of pregnant women who attended ANC at least once but failed to get HIV counseling and testing.

Acceptance of HIV test

All districts lost fifty (50%) percent of the pregnant women at HIV testing, with the exception of Kericho and Turkana districts which lost thirty (30%) and sixty (60%) percent respectively.

HIV prevalence

The client attrition could be reflected in the HIV prevalence rates that are lower than the estimates from the ANC sentinel surveillance rates. In 2006 ANC sentinel surveillance rates for the five districts were; Kericho (5.4%), Nakuru (10.8), Samburu (7.2%) and Turkana (9%) (NASCOP., 2006b). Data for Laikipia district was missing.

Table 4: Table showing coverage of ARV prophylaxis for PMTCT in five districts of Rift Valley province in 2007

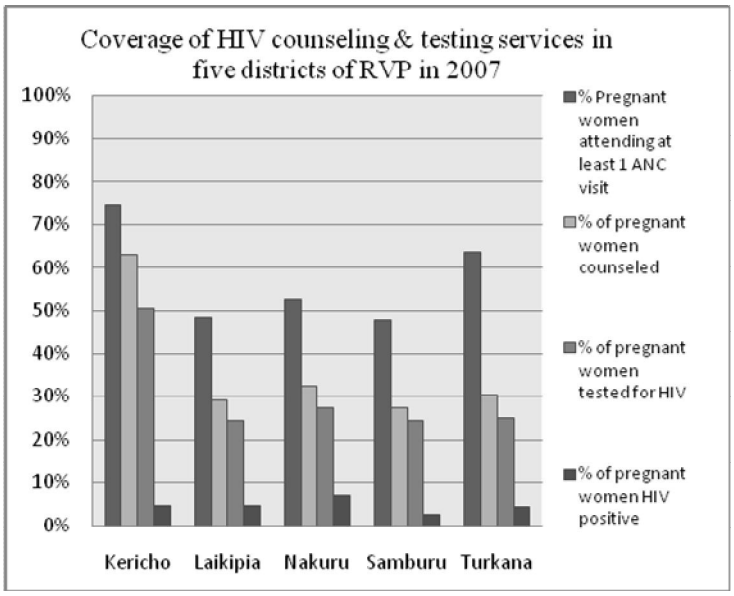
District	Eligible population of HIV+ pregnant women§	Number of women HIV positive	% of HIV+ pregnant women indentified at PMTCT	Number of HIV+ pregnant women given Nevirapine	Proportion of HIV+ pregnant women accessing ARV prophylaxis	Number of infant receiving Nevirapine	Proportion of HIV exposed infants accessing ARV prophylaxis
Kericho	1,211	542	44.7%	416	34.3%	249	20.6%
Laikipia	1,019	175	17.2%	103	10.1%	84	8.2%
Nakuru	6,565	1,174	17.9%	659	10.0%	575	8.8%
Samburu	541	50	9.2%	25	4.6%	10	1.8%
Turkana	1,618	196	12.1%	58	3.6%	107	6.6%

§Calculated from the district specific ANC prevalence rate. Source: 2006 ANC sentinel surveillance report

Detection rate for HIV positive pregnant women

The detection rate of HIV positive pregnant women range between ten (10%) and forty five (45%) percent. Samburu district program identified nine (9%) percent and Kericho forty five (45%) percent of the eligible HIV positive pregnant women in 2007.

Graph 3: Graph showing the coverage of HIV counseling and testing in five districts of Rift Valley province in 2007.



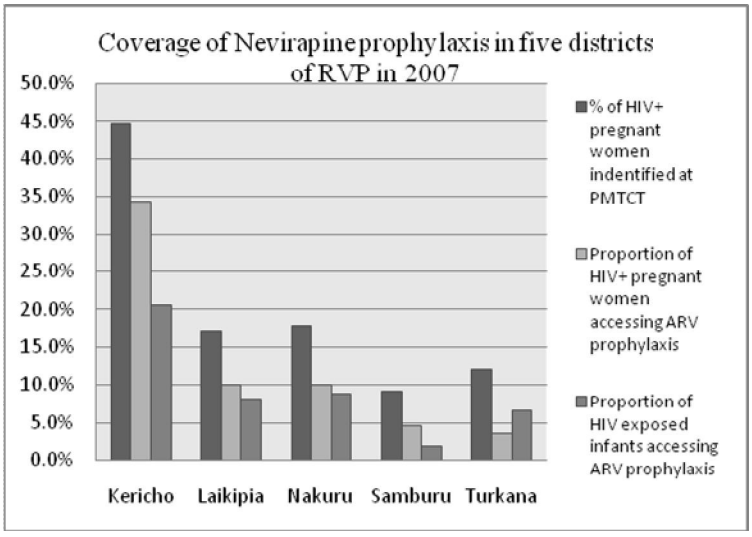
Anti-retroviral prophylaxis for pregnant women

In all the five districts less than one third of HIV positive pregnant women enrolled in the PMTCT program used Nevirapine. The client attrition between HIV diagnosis and receipt of Nevirapine ranges between twenty three (23%) percent in Kericho to seventy (70%) percent in Turkana.

Anti-retroviral prophylaxis for the infants

In all the five districts, less than one fifth of infants born to HIV positive women received Nevirapine prophylaxis in 2007. The coverage ranged from two (2%) in Samburu to twenty (20%) in Kericho. More than half of the infants identified to be HIV exposed in the PMTCT programs failed to get Nevirapine prophylaxis.

Graph 4:Graph showing the coverage of Nevirapine prophylaxis in five districts of RVP in 2007



5.2 Availability

Rift Valley province has a total of 1,243 health facilities of various levels (see appendix B). A HIV service provision assessment survey done in 2004 showed that 30 percent of the facilities offered HIV counseling and testing

services, 10 percent offered PMTCT and only 7 percent offered PMTCT-plus[4] services (Muga et al., 2005). This position will have changed by now as there has been an effort to scale up. In RVP the number of hospitals may be adequate, but their distribution is skewed in favor of urban centers. The rural population is underserved, sixty (60%) percent of the required 290 health centers are available (see appendix C) (MoH, 2006). The nomadic pastoralist communities in sparsely populated areas are most affected. They have to contend with long distances to health facilities (see appendix D) (MoH, 2007)

The HRH crisis also affects RVP. In Laikipia west district[5] where the author has experience of work, there was one (1) medical doctor; four (4) clinical officers and forty eight (48) nurses working in different health facilities in 2007. The district had six (6) health centers and eighteen (18) dispensaries serving a population of 260,000 people. According to the ministry of health norms and standards (see appendix E) such a setting should have a minimum of twelve (12) clinical officers and 152 nurses. Such acute deficits of human resources have been documented in other districts in the country (Chankova et al., 2006; Campbell & Stilwell, 2008). RVP like the rest of the country suffers mal-distribution of HCW, most of the workforce is in urban centers and tertiary hospitals (Ndetei et al., 2008). The peripheral primary facilities in the rural areas are understaffed and a national survey showed that the personnel are more likely not to have been trained in HIV prevention and management compared to those in tertiary facilities (NASCOP.,2006a)

The authors experience is that interrupted supply of HIV test kits especially the aqueous buffer for the HIV rapid test, Nevirapine tablets but more so the syrup preparation and blotting paper for dry blood spot sampling were frequently out of stock. This is consistent with findings of a national survey in 2004 (Muga et al., 2005). An evaluation of Elizabeth Glaser Pediatric AIDS Foundation (EGPAF[6]) supported PMTCT sites in 2005 documented supply stock-out, inadequacy of office space and staff shortage as limiting the scaling up of PMTCT services (Sripipatana et al., 2007).

In Rift Valley like the rest of the country access to HAART is limited to hospitals and assessment of pregnant women for eligibility of HAART is

[4] PMTCT-plus offers Highly active antiretroviral therapy (HAART) to the eligible pregnant women.

[5] Laikipia District was divided into 3 districts; East, West and North in 2007

[6] EGPAF has been supporting PMTCT programs in Rift Valley province since 2001.

seldom done (Muga et al., 2005). A survey in the north Rift Valley established that twenty five (25%) percent of PMTCT enrolled women had CD4 counts[7] below 350 cell/mm^3 but none had been assessed for HAART eligibility (Kiptoo et al., 2009). A survey that included Nakuru provincial hospital showed that women were less likely to use counseling and testing services for PMTCT without access to treatment for themselves (Reynolds et al., 2006).

The quality of counseling and the preparedness of HCW to deliver effective service is still a concern. A national survey in 2005 found that one in four of the HCW involved in counseling and testing were not trained. In RVP twenty five (25%) percent of the HCW interviewed did not know what 'couple counseling' in HIV was about (NASCOP, 2006a).

5.3 Affordability

In RVP like the rest of the country the full range of PMTCT services are free at the point of delivery in government health facilities. However, the cost is shared for auxiliary services such as laboratory tests and ultrasound scans. Maternity services are chargeable, the cost depending on the ownership of the facility, the cheapest being government, not-for-profit FBO and private facilities in that order (Izugbara et al., 2009). The opportunity costs and indirect costs remain a barrier to access of services (Reynolds et al., 2006).

5.4 Acceptability

The mixed level of knowledge of HIV and PMTCT is a challenge in RVP. Oxfam and Merlin (2005) found in a survey in Turkana thirty one (31%) percent had heard about VCT, sixteen (16%) percent correctly knew the services offered and only two (2.2%) percent had been tested for HIV (as cited in Okal & Bergmann, 2007). In a study that assessed the patterns of use of PMTCT services among young adults and adolescents found that the adolescents were most vulnerable to misinformation. In a focused group discussion respondents in Nakuru said (Reynolds et al., 2006);

> *"HIV cannot be cured because the baby eats the same food as the mother"*

> *"AIDS has no cure. So when you take those drugs how come it prevents the child from being infected? It's a story!"*

Reluctance and fear of knowing ones HIV status is a barrier to use of counseling and testing services both for the clients and HCW (NASCOP,

[7] A hematological test for assessing the extent of immune cell depletion caused by HIV infection.

2006a). The reasons given for this include; uncertainty of how to cope with a positive result, fear of breach of confidentiality and stigma (NASCOP, 2006a; Okal & Bergmann, 2007; Reynolds et al., 2006). In a national survey three out of four HCW who knew his/her HIV status self-tested as a means avoiding involuntary disclosure and stigma (NASCOP, 2006a).

Negative attitude of HCW towards HIV positive clients is a barrier to PMTCT services. Ten (10%) to fifteen (15%) percent of HCW feel that they reserve the right not to attend to HIV positive clients, while some show stigmatizing actions such as patient isolation, inappropriate referral to colleagues and inappropriate use of gloves (NASCOP, 2006a).

In RVP two thirds of births are conducted at home (Central Bureau of Statistics, 2004). No studies were found that have looked into the determinants of this finding in RVP. However, in neighboring Nyanza province, negative staff attitude, fear of coercion into HIV testing, financial constraints and distance from health facilities were some of the reasons given (Turan et al., 2008). The national HCW survey found that twenty (20%) percent of respondents in RVP felt it was acceptable to test clients for HIV without their consent (NASCOP, 2006a). Turan et al hypothesize that failure to obtain consent, in ability to uphold confidentiality and poor quality of counseling makes the women choose to deliver at home (Turan et al., 2008).

Breast milk HIV transmission is a big concern in many low-income countries. A study in Nakuru found that the adherence to exclusive breastfeeding among HIV positive women wanes quickly after the first four weeks. Some of the reasons for this finding were; lack of effective sustained postnatal counseling and support, need for the mother to return to work, perceptions of infants not getting enough feeds, cultural and peer pressure to introduce other foods (Kamau-Mbuthia et al., 2008).

Chapter 6: Interventions and Discussion

6.1 Interventions.

The united Nations recommend a comprehensive strategic approach to prevention of HIV infection among infants and children. The four prong strategy include; primary prevention of HIV infection among women in the reproductive age, prevention of unintended pregnancy among HIV positive women, prevention of HIV transmission from HIV positive women to their infants and provision of continued care, treatment and support to the HIV positive women, children and their families (WHO., 2008).

From literature low-income countries in Africa pay more attention to the third strategy of prevention of mother-to-child HIV transmission. Programming of the other three strategies remain weak, uncoordinated and with unknown impact in the reduction of pediatric HIV infection.

The prevention of mother-to-child HIV transmission has evolved a lot since the turn of the millennium. Since the breakthrough trials on HIV transmission risk reduction benefits of anti-retroviral drugs and the combinations, the technical aspect of PMTCT is not much of the problem. Health system weaknesses, lack of population awareness and cultural belief systems have been the greatest impediment to the full scale implementation of PMTCT interventions in low-income countries.

PMTCT programs across the African continent have been plagued with sub-optimal enrolment rates into the programs, very low identification rates of HIV positive pregnant women and a characteristic high loss to follow-up of the pregnant women enrolled. This has led to very low effective coverage of ARV prophylaxis and an unknown impact on the prevention of pediatric HIV transmission at population level.

The barriers to utilization of PMTCT services have been described in the previous chapters. Table 5 below summarizes some of the interventions that PMTCT programs in low-income countries have implemented to address the ‘cracks’ through which PMTCT clients ‘leak’ through. The author acknowledges that the table is a simplified summary because from the various experiences cited a single intervention employed would address more than one bottleneck. For example; couple counseling would not only improve acceptance of HIV counseling and testing but also receipt and adherence to Nevirapine prophylaxis to mother and infant.

Table 5: Table summary of interventions tried to address the programmatic bottlenecks in PMTCT and the outcome.

Programmatic bottlenecks	Interventions tried	Country	Author	Description of study	outcome
Shortage of HCW especially HIV counsellors	Peer Counsellors	Malawi	Shetty et al, 2008	Trained HIV positive women to offer peer education, psychosocial support on disclosure and infant feeding to ANC clients and community mobilization	The HIV CT acceptance was sub-optimal (56%), the adherence to Nevirapine prophylaxis not impressive (35%) for mothers and (31%) for the infants. However the acceptance of HIV results was high (92%).
	Use of off-duty nursing staff	Zambia	Chi et al., 2005	A case report of negotiated overtime rates with off-duty nurses to take up extra shifts in a PMTCT program.	Highly acceptable to nurses. Rapid integration of PMTCT into routine obstetric care. Continuity of care for patients. Comparably cheaper than hiring new staff.
	Use of Traditional birth attendants	Cameroon	Wanyu et al, 2007	Program evaluation after 3 years of training TBA to provide full range of PMTCT services in rural Cameroon	Acceptance of HIV CT by women seen at the TBA was 92 %, Nevirapine uptake by women 88% and by infants 85%.
		Zimbabwe	Perez et al, 2008	A community based cross-sectional survey assessing the acceptability of TBA participation in PMTCT	45% of TBA knew about PMTCT. 75% of TBA would accept to participate in all activities of PMTCT while 85% of women would agree to TBA participation, except in performing blood tests.
		Kenya	Khan et al, 2007	Combined use of Trained TBA and HIV positive peer counsellors as PMTCT 'promoters' and compared impact HIV CT uptake with non-intervention sites in a slum area	Disappointing impact, there was minimal contact of ANC clients with peer counsellors and PMTCT promoters. This was attributed to lack of dedication and fear of disclosure of HIV status of the 'promoters' to their ANC clients.
Low uptake of HIV CT	Couple counselling	Kenya	Farquhar et al, 2004	Cohort study followed up 2,836 women. Determined the effect of couple counselling on the HIV CT acceptance and Nevirapine adherence	The couple counselled women were significantly more likely to accept HIV CT, receive and adhere to Nevirapine. A higher proportion avoided breastfeeding but difference not statistically significant compared to women not couple counselled.

Programmatic bottlenecks	Interventions tried	Country	Author	Description of study	outcome
		Zambia	Semrau et al, 2005	Compared the HIV CT acceptance and Nevirapine uptake between couple-counselled and individually-counselled women	Acceptance of HIV CT was significantly higher in the couple-counselled group. There was no difference in the Nevirapine uptake. There was no difference in the adverse events after disclosure of HIV status.
	Routine 'opt-out' Testing	Botswana	Creek et al, 2007	An analysis of HIV CT uptake before and after a presidential declaration of "routine but non-compulsory" HIV testing	Proportion of women knowing their HIV status at delivery increased from 47% to 78%, while those receiving PMTCT intervention from 29% to 56%
		Zimbabwe	Perez et al, 2006	A cross-sectional survey exploring the preferences of pregnant women choosing between 'opt-in' and 'opt-out' HIV CT approaches	79% of women who had declined HIV test at ANC would accept an 'opt-out' approach compared to 97% of women who had accepted HIV test
		Zimbabwe	Chandisarewa et al., 2007	Compared the HIV CT uptake 6 months before and after implementation of 'opt-out' approach	There was statistically significant increase in the acceptance rates for HIV CT (99%) and HIV result collection (98%) after change of strategy.
		Malawi	Manzi, et al 2005	A cohort study that followed up 3136 pregnant women to determine acceptability of 'opt-out' HIV CT and adherence to follow up PMTCT visits	Acceptance of HIV CT was high (95%) but the attrition was high with 75% of HIV positive women and infants failing to receive prophylactic Nevirapine.
		Malawi	Moses et al., 2008	Evaluating effects of PMTCT program changes over a 5 year period. First the rapid testing then 'opt-out' HIV CT approach	HIV CT acceptance increased from 45% to 73% after starting rapid tests then to 99% with addition of 'opt-out' approach.
Low return for HIV test results	Rapid HIV test with same day results	See Moses et al, 2005			
Low uptake of Nevirapine for mother	Prescription and dispensing Nevirapine at HIV diagnosis.	Multi-country evaluation EGPAF PMTCT programs	Spensley et al., 2009 (Abstract)	Documented the performance of EGPAF PMTCT sites performance globally over 6 years	Attributed the achievement of 82% HIV CT acceptance, 75% maternal and 45% infant Nevirapine adherence to; 'opt-out' approach, early prescription of Nevirapine to mother and infant after HIV diagnosis

Programmatic bottlenecks	Interventions tried	Country	Author	Description of study	outcome
		Kenya	van't Hoog et al, 2005	Before and after hospital based study reorganising client flow by integrating HIV CT and Nevirapine dispensing into routine ANC	There was statistically significant improvement in the acceptance of HIV CT and uptake of Nevirapine prophylaxis.
	Rescreening and routine HIV CT at Maternity units.	Uganda	Homsy et al, 2006	Assessed the feasibility and acceptability of 'opt-out' HIV CT approach by comparing uptake in ANC and maternity unit	HIV CT uptake of 98% and 88% in ANC and Maternity respectively. Maternal Nevirapine prophylaxis increased by 33%
Low uptake of Nevirapine for infant	Prescription and dispensing Nevirapine syrup at HIV diagnosis	No article was found that addressed this intervention in isolation but rather implemented together with the prescription and dispensation of Nevirapine to the mother as described above.			
	Early HIV status determination	South Africa	Sherman et al, 2005	Analysis of cost to the provider and society in determining infants HIV status early at 6 weeks compared to the current 18 months	The cost to provider is marginally increased but a 25% saving is made to society by preventing unnecessary clinic visits of HIV negative babies. The author posits that this would farther improve uptake of PMTCT services
	Community mobilization and awareness campaigns	South Africa	Baek et al, 2007	Before & after study evaluating a community based education and mentoring program that employs HIV positive women as peer educators and 'mentor-mothers'	High number of contact visits to PMTCT clients for psychosocial support. Significantly higher rates of disclosure and Nevirapine ingestion for both mother and infant.

HIV CT = HIV counseling and testing

6.2 Discussion

The success of scaling up PMTCT services lies upon the extent to which the policy, institutional and cultural barriers are addressed. From the literature it is clear that a holistic approach is required. To prevent the mother-to-child HIV transmission, the first requirement is to identify those at risk. It is of concern that in RVP one in three of the women miss this opportunity because they do not utilize the antenatal care services. This is a huge hole in the campaign against prevention of pediatric HIV infection that cannot be plugged by PMTCT service. Studies are needed to look into the factors that lead to the low utilization of ANC services in RVP.

This study has found that in the Rift valley province the HRH crisis is an impediment to the availability and acceptability of PMTCT services. While the

numbers required to offer the services is acutely inadequate, there is a disparity in the distribution and level of training of HCW, between urban and rural settings; and between hospitals and peripheral health facilities. There is evidence for the need to train HCW and provide support supervision to improve the provider skills in counseling and continuously evaluate the PMTCT service responsiveness to the needs of its clients.

Distances to health facilities, the indirect and opportunity costs incurred are important factors influencing the accessibility and utilization of health care services generally. However, pregnant women are especially most vulnerable to exclusion due physical and financial constraints when the distances are long and the cost high. PMTCT services are particularly affected by such exclusion because women who fail to make follow up visits are more likely to not to receive and not to adhere to ARV prophylaxis. The concentration of PMTCT services in urban and peri-urban areas locks out the rural and poor populations from access. In RVP the nomadic pastoralists in the sparsely populated arid and semi-arid areas are poorly served by the skewed distribution of health facilities.

The availability of PMTCT services and its reliability in RVP is affected by the frequent interruption of commodities and supplies. While this can be attributed to the logistical constraints of procurement, distribution and storage, there is evidence that the commodity and supply management system is currently weak, fragmented and inefficient.

In RVP and as in other low-income settings, the need for service integration is key in addressing some of the barriers to use of PMTCT services. One-point service delivery, provider-initiated testing and counseling and integration of PMTCT into reproductive health and mother-child and newborn services improve acceptability and uptake. The focus should shift from the baby alone to the health of the HIV positive mother. Assessing HIV positive pregnant women for HAART eligibility and offering them treatment is complementary to the ARV prophylaxis given to non-eligible HIV positive pregnant women and the two interventions contribute to the prevention of mother-to-child HIV transmission.

The role of the community is important in the acceptability of PMTCT services. There is little literature from RVP that document community engagement and the impact of community participation in PMTCT programs. However, experiences from other sites show that the mobilization of community awareness and involvement in programming yields ownership, acceptance, service utilization and reduces stigma.

Chapter 7: Conclusion and recommendation

Prevention of mother-to-child transmission remains the key to addressing the incidence of new pediatric HIV infections. From the literature it is clear that while the scaling up of PMTCT services is on-going, the programs are faced with challenges of low enrolment, high loss to follow up, non-adherence to ARV prophylaxis and an unknown effectiveness at population level.

RVP PMTCT program fails to reach one third of the target population because they do not use ANC services. ANC is one of the important entry points to PMTCT services; there is need for operational research to look into the reasons for low utilization of ANC services in RVP. The proportion of pregnant women accepting HIV testing in RVP is low. Routine HIV testing with an 'opt-out' option and couple-counseling have proved to be effective in improving uptake of HIV testing and should be considered for scaling up in RVP.

The numbers of available sites offering services are inadequate and their distribution skewed. This picture that is also reflected in the availability and distribution of HCW responsible for the delivery of services. There is evidence that engagement of non-medical personnel as lay counselors, peer educators, and mentor-mothers offers the psychosocial support required for women to go through the cascade of PMTCT service.

The inefficiencies of the commodity and supplies systems fail to support the PMTCT program in delivery of reliable and quality services. There is need for the harmonization and strengthening of the systems that are currently weak, fragmented and at times parallel.

Negative experiences in the patient-provider relationship are important barriers to the delivery and use of PMTCT services. This reflects the need for orientation of HCW towards more client responsive attitudes and practices while also mobilizing community awareness, involvement and support for PMTCT programs.

The PMTCT program in RVP province offers the minimum ARV prophylaxis option of single-dose Nevirapine. In the prevailing circumstances of low coverage, unknown adherence to prophylaxis and significant risk of drug resistance, the programs needs to evaluate the effectiveness of HIV transmission risk reduction at population level and consider transition to a short-course combination regimen.

Opportunity is lost at maternity and delivery units where a significant proportion of women deliver with unknown HIV status. There is evidence that offering HIV counseling and testing to pregnant women of unknown HIV status and re-screening those who were HIV negative early in their pregnancy at these units improves the uptake of PMTCT services and seizes the opportunity for intervention.

Integration of PMTCT services into reproductive health and mother-child and newborn services is important in improving uptake. Maternal assessment for eligibility and treatment with HAART reduces HIV transmission and improves both maternal and infant survival outcomes.

Postnatal transmission of HIV is a challenge in a predominantly breastfeeding population like in RVP. Early evidence is emerging for the role of extended HAART to the mother for HIV transmission risk reduction during the period of breastfeeding irrespective of clinical and immunologic eligibility. This option should be piloted for purposes of evaluating efficacy in RVP. The quality of counseling and postnatal care should be improved to encourage mothers to exclusively breastfeed as this has confirmed benefits of transmission risk reduction.

In Rift Valley province the documentation of the operational experience of implementing PMTCT programs is scanty. There is little literature that looks into the impact of the policy, institutional and cultural barriers on the utilization of PMTCT programs in the province.

Recommendation

From the findings of this study the author recommends the following for the improvement of PMTCT services in Rift Valley Province:

- Operational research to look into the barriers to ANC service utilization with an aim of improving uptake ANC care as an entry to PMTCT services.
- Establish mobile outreach clinics to offer services to the hard to reach areas that are poorly serviced by static PMTCT sites.
- Train HCW and supplement the human resource capacity with lay counselors trained in HIV counseling to offer psychosocial support and mentoring to the PMTCT clients on disclosure, hospital delivery and best infant feeding practices.
- Adopt and scale up routine HIV testing with an option to ‘opt-out’ and encourage couple counseling at all health facilities.

- Harmonize the different supply chains from different health services into one and strengthen the commodities and supplies management system.
- Train HCW on clinical assessment and build laboratory capacity to evaluate eligibility for HAART and monitoring of treatment for PMTCT clients.
- Introduce HIV counseling and testing at delivery units with an aim of offering intra-partum ARV prophylaxis for the women found HIV positive.
- Engage and orient TBA and community health workers in monitoring ARV prophylaxis, early referral of mothers to health facilities and community-based health information management.
- Strengthen supportive supervision and implement exit interviews to continuously evaluate the level of service responsiveness to clients needs.
- Consider transition to short-course combination ARV prophylaxis regimen based on the prevailing evidence of greater efficacy and benefit when extended during breastfeeding.
- Integrate PMTCT services into reproductive health and mother child and newborn health services.
- Conduct and document operational research from the experience of implementation of the PMTCT program in the province.

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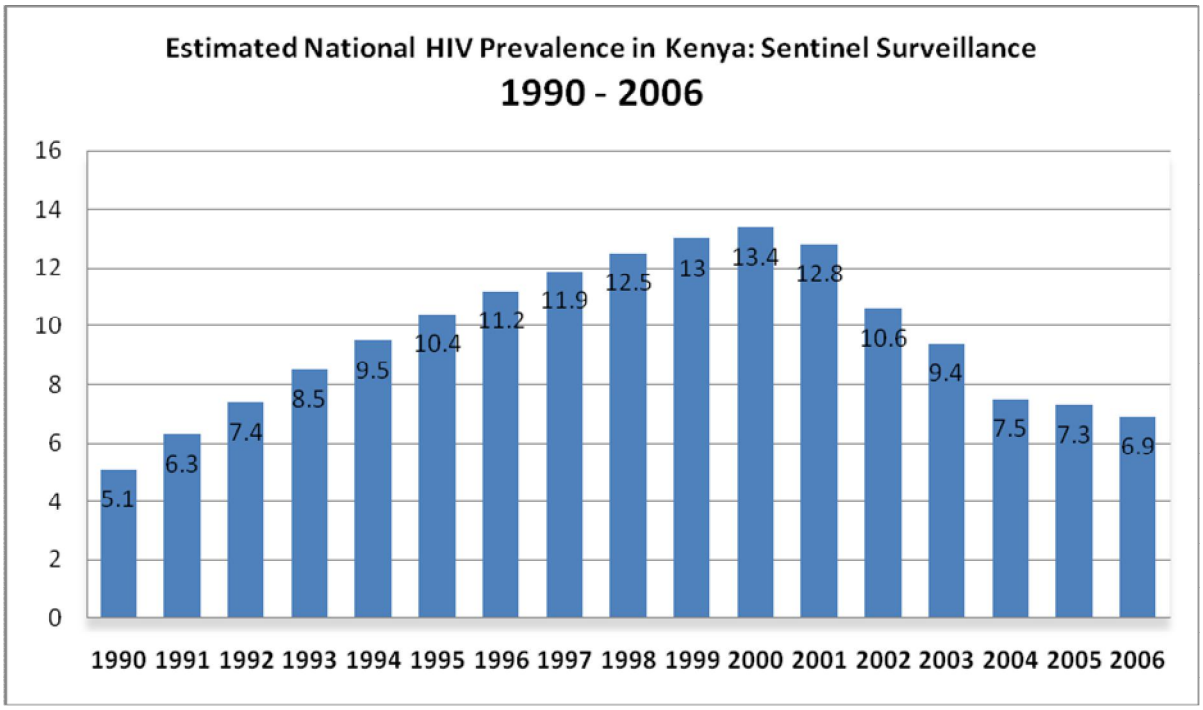
Appendix A

Trends of HIV infection among ANC respondents in Kenya 1990 - 2006



Source: Adapted from Sentinel Surveillance of HIV & STD in Kenya Report 2006

Appendix B

B1: Number of health facilities type and province in Kenya as at 2004

Province	HOSPITALS				HEALTH CENTRES				DISPENSARIES				OTHER			
	Public	Private	Non-profit	Private for Profit	Public	Private	Non-profit	Private for Profit	Public	Private	Non-profit	Private for Profit	clinics	Voluntary counselling & testing sites	Sub-district	Nursing Homes
Nyanza	13	9		13	72	48		7	183	45		12	79	0	20	35
Rift Valley	21	15		19	138	40		5	489	184		84	211	0	13	24
Eastern	15	16		4	70	11		2	302	117		16	301	0	14	26
Western	10	10		1	65	16		0	74	20		17	160	0	5	27
Central	8	15		10	51	5		3	222	98		8	487	0	8	26
Coast	9	2		10	32	2		1	152	55		9	294	0	7	23
North Eastern	4	0		0	8	0		0	63	1		0	61	0	6	3
Nairobi	5	7		11	23	50		3	18	26		57	141	41	0	27
Total	**85**	**74**		**68**	**459**	**172**		**21**	**1503**	**546**		**203**	**1734**	**41**	**73**	**191**

B2. Number of hospitals and health facilities per 100 000 population by province in Kenya as at 2004

Province	Population*	Hospitals	Hospitals per 100 000 population	Other health facilities	Health facilities per 100 000 population
Nyanza	5 719 977	55	1.0	481	8.4
Rift Valley	8 115 768	68	0.8	1175	14.5
Eastern	4 498 324	49	1.1	845	18.8
Western	3 986 340	26	0.7	379	9.5
Central	4 003 742	41	1.0	900	22.5
Coast	2 891 741	28	1.0	568	19.6
North Eastern	1 148 262	10	0.9	136	11.8
Nairobi	2 721 933	23	0.8	386	14.2
National	**33 086 087**	**300**	**0.9**	**4870**	**14.7**

Source: MoH, 2007 Service Availability Mapping

Appendix C

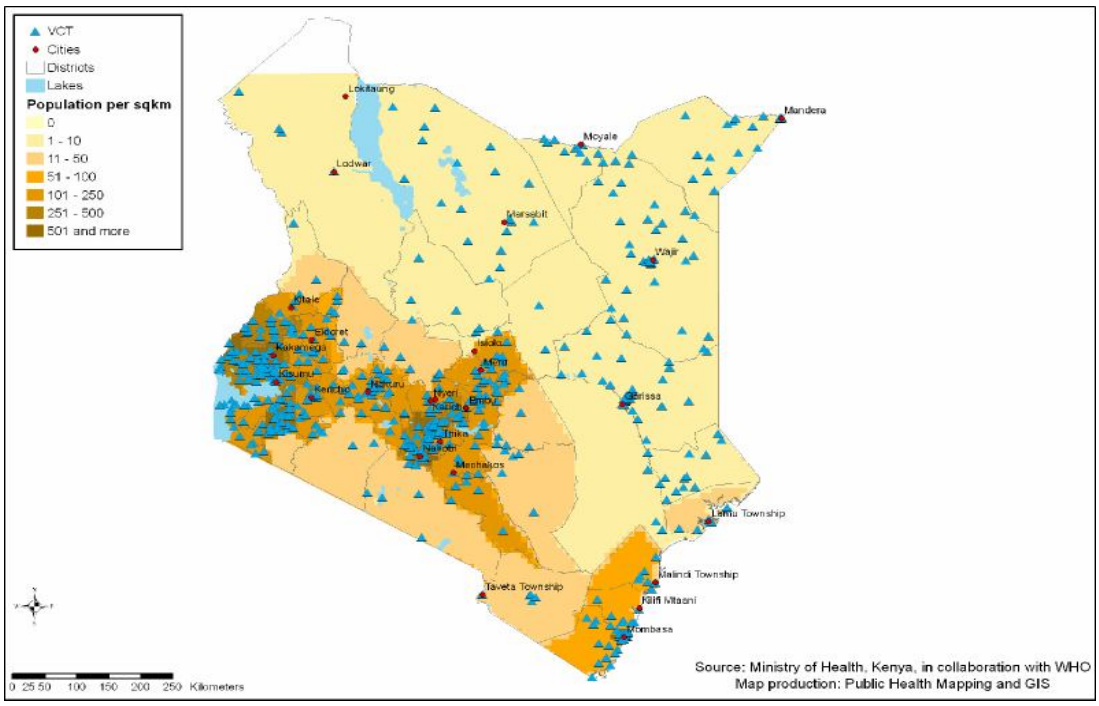
Number of health facilities required and available by level of care and province in Kenya as at 2006

Province	Population		Service delivery units				
			Level 1	Level 2	Level 3	Level 4	Level 5
Central	3,909,728	Required service delivery units	782	391	130	39	4
		Existing health facilities	-	372	89	65	
		Gaps in service delivery units	**-**	**19**	**41**	**-26**	**4**
Coast	2,801,356	Required service delivery units	560	280	93	28	3
		Existing health facilities	-	334	42	64	
		Gaps in service delivery units	**-**	**-54**	**51**	**-36**	**3**
Eastern	5,103,110	Required service delivery units	1,021	510	170	51	5
		Existing health facilities	-	692	80	65	
		Gaps in service delivery units	**-**	**-182**	**90**	**-14**	**5**
Nairobi	2,563,297	Required service delivery units	513	256	85	26	3
		Existing health facilities	-	381	54	58	
		Gaps in service delivery units	**-**	**-125**	**31**	**-32**	**3**
North Eastern	1,187,767	Required service delivery units	238	119	40	12	1
		Existing health facilities	-	68	12	8	
		Gaps in service delivery units	**-**	**51**	**28**	**4**	**1**
Nyanza	4,804,078	Required service delivery units	961	480	160	48	5
		Existing health facilities	-	333	117	98	
		Gaps in service delivery units	**-**	**147**	**43**	**-50**	**5**
Rift Valley	7,902,033	Required service delivery units	1,580	790	263	79	8
		Existing health facilities	-	1,006	161	100	
		Gaps in service delivery units	**-**	**-216**	**102**	**-21**	**8**
Western	3,853,936	Required service delivery units	771	385	128	39	4
		Existing health facilities	-	196	94	68	
		Gaps in service delivery units	**-**	**189**	**34**	**-29**	**4**
National Total	32,125,305	Required service delivery units	6,425	3,213	1,071	321	32
		Existing health facilities	-	3,382	649	526	20
		Gaps in service delivery units	**-**	**-169**	**422**	**-205**	**12**

Source: MoH, 2006. Norms & Standards for health service delivery

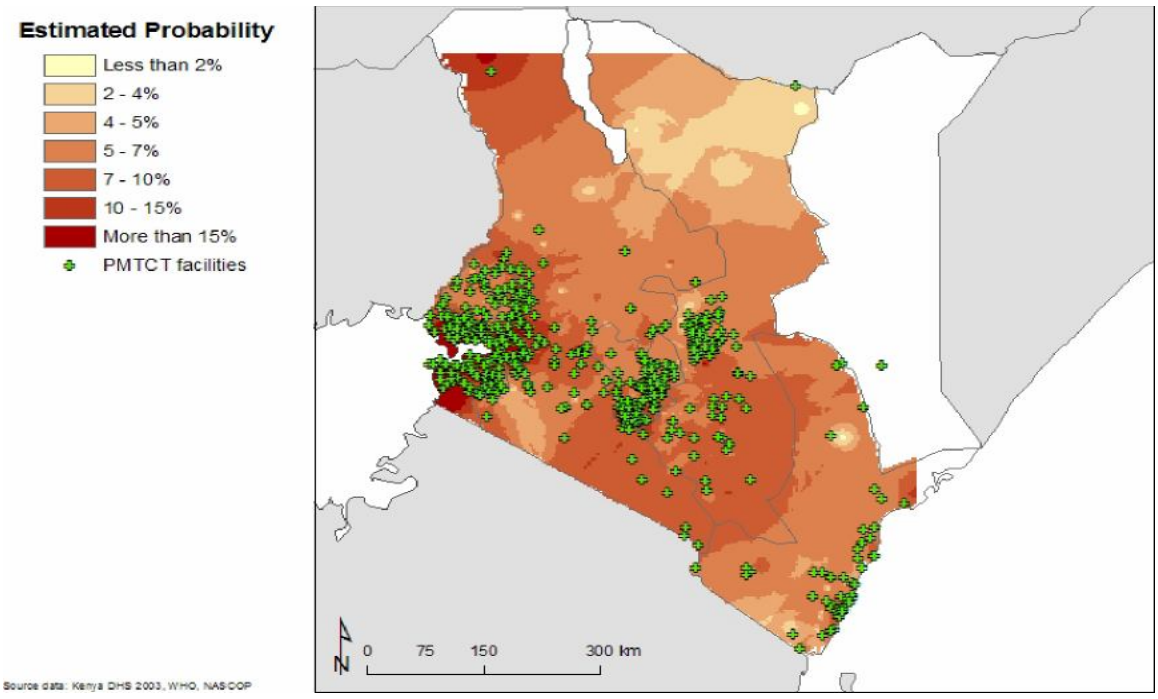
Appendix D

D1 Distribution of VCT sites as at 2006



Source: MoH, 2007 Service availability mapping

D2 Distribution of health facilities offering PMTCT services as at 2003



Source: Montana et al, 2007

Appendix E

Minimum requirements for human resources by cadre and level of care

Level	Population	Level of function	Service delivery staff	Number	Support staff	Number
1	5,000	Level 1	CORPs	50		
2	10,000	Level 2	Nursing staff (RCNs)	2	General attendants	2
			Community Health Extension Worker	2	Watchman	1
3	30,000	Level 3	Clinical officers	2	Statistical clerks	2
			Outpatient support	*1*	Clerk/cashier	1
			Management support	*1*	General attendants	2
			Nursing staff	14	Cook	1
			Outpatients	*3*	Watchmen	2
			Delivery/inpatients	*4*		
			MCH activities	*4*		
			Dressing room	*2*		
			Overall coordination	*1*		
			Community oral health officer	1		
			Laboratory technician	1		
			Pharmaceutical technologist	1		
4	100,000	Level 3	Clinical officers (outpatient filtering)	2		
		function	Nursing staff	8		
			General outpatients	*2*		
			Delivery/MCH activities	*6*		
			Laboratory technician	2		
			Pharmaceutical technologist	2		
		Level 4	Medical Officers	6	Statistical clerks	
		(core)	Outpatients	*2*	Clerk/cashier	2
		function	*Inpatients*	*3*	General attendants	1
			Management	*1*	Drivers	10
			Dentist	1	Cooks	2
			Pharmacist	1	Watchmen	4
			Clinical officers	5	Store attendant	3
			Specialized clinics	*4*	Health Administrative	1
			Anaesthesiologist	*2*	Officer	1
			Nursing staff	60		
			In charge	*1*		
			Specialized outpatient clinics	*8*		
			Wards	*30*		
			Theatre	*10*		
			Nursery	*3*		
			Radiographer	1		
			Dental technologist	1		
			Laboratory technologists	1		

Source: MoH, 2006 Norms & standards for health service delivery