ASSESSEMENT OF PREVENTION OF MOTHER TO CHILD TRANSMISSION OF HIV AND EARLY INFANTS DIAGNOSIS IN ASOKORO DISTRICT HOSPITAL, ABUJA 2009-2010

BY

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DECLARATION

I Christiana Samuel Kwabe declare that this research work was done by me under the supervision of Dr A.U. Shehu of the Department of Community Medicine, Ahmadu Bello University, Zaria. This work has not been presented before and where other people's works have been quoted, recognition is made with references.

_____ _____

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CERTIFICATION

This work entitled "Prevention of Mother to Child Transmission of HIV and Early Infants Diagnosis in Asokoro District Hospital, Abuja" meets the regulations governing the award of a degree of Masters of Public Health of Ahmadu Bello University, Zaria. It is recommended for approval.

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DEDICATION

This work is dedicated to all HIV exposed infants, for being innocent, but yet exposed to this virus.

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To God be the glory for giving me the opportunity to pass through this vigorous programme. I give him all the praises, glory and adoration.

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SUMMARY

Prevention of mother to child transmission (PMTCT) of HIV still remains a useful tool of fight against the transmission of HIV virus from mother to child, and early infants diagnosis, confers substantial benefit to HIV infection and HIV infected infants, and also programmes providing prevention of mother to child transmission.

The aim of the study is to find out the rate of perinatal transmission in infants born to HIV positive mother, as well as to study the effect of various predisposing factors of HIV transmission and to evaluate the utility of dried blood spot (DBS) for EID of HIV.

Methodology: This study was designed to assess PMTCT and EID services in Asokoro District Hospital so as to assess the effectiveness and efficiency of this service or programme.

The study design is a quantitative descriptive cross- sectioned study, involving the selection of 98 ANC clients, 185 EID clients and 53 respondents of health care providers. Check list, questionnaire and information from site coordinator were used to obtain information.

Result: The findings were ART, drugs for PEP for EID, VCT, PMTCT and PCR were available and no user fee charged, supplies for test, plumpy Nuts, water guards, long lasting insecticide treated Net (LITN) and IPT for pregnant women at A.N.C were always available.

But obstetric care is not free, infrastructure not adequate most especially for paediatric out patient department

Of the 53 health care providers, 17%were doctors, 58.5 % were registered Nurse/midwives, and 3.8% were counselors while 18.9% were laboratory scientist/technician. The result indicated that 79.2% had knowledge that MTCT of HIV occurred during pregnancy, delivery and breastfeeding.

Of the 53 service provider, those who had no any training in PMTCT were (58)% ,those who had training of about 2-5 were 17(32%) and those with more than 5 training were 5(9%).

The perception of service providers of problems facing PMTCT services were shortage of man power 27(20%) than followed by lack of training 22(17%). 67.9% believe PMTCT and EID are very important tools/ services for pregnant women and their infants.

Of 98 (100%) of ANC respondents who return their questionnaire, 91(92.9%) were married, 5(5.1%) were single, 2(2%) were divorced.

Based on their education, 53(53.8%) have tertiary education, 35(35.5%) had secondary education, 6(6.5%) had primary education while 4(4.1%) had none. For occupation 43(44.3%) were working class women, 84.7% were aware of HIV counseling and testing before coming to health facility and 81.2% got their information through the media. 93.3% of the ANC clients were willing to continue ANC in Asokoro district hospital, 88.7% were willing to refer their sisters and/ or friends to have ANC care in Asokoro district hospital, while 91.3% believes the health care providers were friendly.

For EID services, out of 185 respondents 1.1% were tested at birth, 94.8% were tested at six weeks, while 4.0% were tested at 18 months.

Infants who were tested and have positive DNA-PCR result were 13.1%, those with negative result were 85.1% while those with in-determed results were1.7%.95.6% of infants who were HIV positive were referred to pediatric HIV clinic for further care, 1.5% absconded and 2. 9 % were referred to another health care facility.

Conclusion: PCR is very valuable in making diagnosis of HIV in exposed babies.

This will help reduce the mortality and morbidity associated with late diagnosis and management, it will also help to study the various predisposing factors of HIV transmission and to evaluate the utility of dried blood spots specimen for EID of HIV. Infants born to HIV positive mothers tested by dried blood spot for PCR at birth to 18 months of age were 185. HIV prevalence of HIV expose infants in the heath facility is 13.1%.

Recommendation: Health care facility needs more improvement in infrastructure and man power. Service providers need more training, motivation and also need feed-back from programme implementers and lastly Sero-discordant couples should have pre exposure prophylaxis.

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ACRONYMS

PMTCT	-	Prevention of mother to child transmission of HIV
MTCT	-	Mother to Child Transmission of HIV
MDGs	-	Millennium development goal
UNICEF	-	United nation children fund
UNAIDS	-	Joint united nation program on HIV/AIDS
APIN	-	AIDS prevention initiative in Nigeria
USG	-	United state government
WHO	-	World health organization
ANC	-	Antenatal care
VCT	-	Volunteering counseling and testing
BMS	-	Breast milk substitute
BF	-	Breast feeding
ARD	-	Anti retroviral drugs
ART	-	Anti retroviral therapy
STIs	-	Sexual transmitted infection
PEP	-	Post -exposure prophylaxis
AZT	-	Zidovidine
NVP	-	Nevirapine
NACA	-	National agencies for the control of AIDS
PEPFAR	-	President emergency plan for AIDS relief
PLWHA	-	People living with HIV/AIDS

HCT	-	HIV counseling and testing
NPC	-	National population commission
EID	-	Early infant diagnosis
WHO	-	World Health Organisation
IHVN	-	Institute for human virology
FCTA	-	Federal capital territory administration
TLC	-	Total lymphocyte count
DNA-PCR	-	Deoxy -Nucleic Acid-polymerase Chain reaction
PCR	-	Polymerase chain reaction
DBS	-	Dried blood sample
Pr PEP	-	Pre-exposure prophylaxis
RCT	-	Randomized control trials
HASTE	-	Highest Attainable Standard of Evidence
FSW	-	Female sex workers
MSM	-	Men sexing Men
PWID	-	People who Inject Drugs
LMIC	-	Low Middle Income Countries
HC	-	Hormonal contraceptive
NIDUS	-	None injecting drug Users

CHAPTER ONE

INTRODUCTION

1.1 Introduction of PMTCT

Prevention of Mother to Child Transmission (PMTCT) of HIV came about because of increasing figure of infants born with HIV through vertical transmission from their mothers.

Acquired Immune Deficiency Syndrome (AIDS) was first reported in 1981 and is one of the most destructive epidemics in the world. An estimation done in 2009 revealed that people living with HIV/AIDS globally was 33.3 million out of which 22.5 million were from Sub-Saharan Africa, where it is hardest hit.

Adults living with HIV/AIDS globally are 30.8 million. Deaths due to HIV/AIDS are 1.8 million out of which 1.3 million occurred in Sub-Saharan Africa. The number of Women living with HIV/AIDS in 2009 is 15.9 million, out of which 1.7 million were in Nigeria. It was also revealed that 360,000 children under the age of 15 years were living with HIV/AIDS in that year. Globally orphans (ages 0-17) due to HIV/AIDS are 16.6 million and almost 90% of them were in Sub-Sahara African. At the end of 2009, women accounted for just half of the adult living with HIV world-wide.[1]

With this high figure of people living with HIV/AIDS, therefore interventions are needed to reverse it or totally stop it by the year 2015 as recommended by the Millennium Development Goals (MDG).

Among the preventive measures taken is the implementation of PMTCT of HIV and early infant's diagnosis.

PMTCT was first implemented through the collaborative effort of UNICEF, APIN, USG Policy, Engender and WHO in the year 2000. The policy was first revised in the year 2004. The second revision was in the 2006 while the third and current version was in 2010.

Mother to child transmission (MTCT) of HIV is when an HIV infected mother passes HIV Virus to her baby and this can occur during pregnancy, labour, and delivery or during breastfeeding. Without treatment 15-30% of babies will become infected during pregnancy, labour and delivery. And a further 5-20% of infants will become infected through breast feeding.[2]

In 2009, 400,000 children became infected with HIV through mother to child transmission. About 90% of MTCT infections occur in Africa where AIDS is beginning to revise decades of steady progress in child survival.[3]

The goals of the National PMTCT programme are to reduce the proportion of infants infected by HIV virus from their mothers by 50% and to mitigate the impact of infection on women and their families.

1.2 Specific Objectives of National PMTCT

i. To reduce the prevalence of risky behaviour that produces the transmission of HIV among women and their partners by 50%.
ii. To increase demand and uptake among pregnant women by 75% of the current level.
iii. To ensure that 50% of HIV positive pregnant women and their babies access ARV.
iv. To prevent infected pregnancy among HIV positive women by 75%.
v. To increase access to obstetric practices that reduces the risk of MTCT of HIV by 50%.

vi. To ensure that 80% of HIV positive mothers, their partners and all HIV positive infants access antiretroviral drugs (ARD) and other caring and support services; and

vii. To ensure that 80% of HIV positive mothers practice infant feeding options based on their informed choice.

The national policy on HIV/AIDS contains the following provision on PMTCT:

- All antenatal care (ANC) services shall offer voluntary confidential counselling and testing (VCT) to pregnant women as part of existing integrated reproductive health care services and shall include referrals to family planning, counselling services when necessary.
- All maternal health services shall provide counselling on risk associated with the possible transmission of HIV from mother to child during pregnancy, delivery and breastfeeding and adequate instructions to limit MTCT if the mother's HIV status is known to be positive, including referral for family planning services.
- Nigeria should place the highest possible priority on ensuring nationwide access to antiretroviral drug for all pregnant women with HIV.
- All institutions offering ANC or child health care services shall direct attention to maintaining the nutritional status of pregnant women with HIV and the children born to them.
- Appropriate mechanisms shall be put in place to ensure adequate training of health care providers at all level of services.

The component of PMTCT includes ANC offering VCT, obstetric care, post delivery care for both mothers and infants for 18 months.

Following interactive small group discussion – where all new ANC attendees are informed about the need for the entire routine test, women have to agree to all the ANC testing including HIV testing. There is an active policy to test women in labour, if their HIV status is unknown.

Partner testing is actively encouraged, all accompany male partners to ANC are offered counseling and testing too. Studies have shown that VCT is a cost – effective interaction for reducing HIV related risk behavior, particularly when it serves couples at risk.[4] For women identified as HIV positive before or during pregnancy, test related counseling can also help their future and future of their family by taking special steps to maintain and ensure that they do not infect their partners. They can also be linked to support groups and services and make informed choices about their sexual behavior and plan for their children.[5]

HIV and AIDS have generated fear, anxiety and prejudice in and against people living with the disease, there is wide spread stigma and discrimination regarding people who are HIV positive. These social attitudes can adversely affect both peoples' willingness to be tested for HIV and their adherence to ART. Reducing discrimination and stigma is therefore an important factor in prevention, management and control of HIV epidemic.

PMTCT is offered to either mothers own health if viral load is high or PMTCT when the viral load is low and when women present for obstetric care. The type care includes:-

Highly active antiretroviral therapy (HAART), Zidovudine (AZT) mono-therapy and single dose Nevirapine (NVP) only to mothers who come in labour and previously tested or treated.

In Obstetric practice, the former delivery options for women with high viral load was caesarean section (CS) if viral load is not suppressed at 36 weeks of gestation. However

current practice is spontaneous virginal delivery. Countries with high rates of infection resulting to an existing high rate of infant and maternal morbidity and mortality.[6] Countries in Sub-Sahara Africa still have some of the highest maternal mortality rates in the world. A woman dying during pregnancy or child birth is greater than 1 in 10 in countries such as Mozambique, Mali, Niger, Ethiopia and Burundi, and 1 in 20 or greater in countries such as Nigeria, Kenya, Malawi, Ghana, and Zambia.[7] Infants whose mother die from delivery–related complications have a significantly lower chance of survival themselves.

Improving obstetric care has a broader benefit than just preventing MTCT of HIV. The effective way to support labour in a way that will help to keep it ‘’normal’’ is to maintain nourishment, hydration and to have a safe delivery plan including referral if the need be. Monitoring of the progression of labour by use of pathographs and support to family during labour is also important.

MTCT of HIV during intra-partum period is believed to be due to the infant’s exposure to infected blood and other fluid from the mother. Thus greater practices that may facilitate this exposure, such as artificial rupture of membrane, episiotomy and where there is no obstetric indication should not be encouraged. Because of Post-partum infant care in high income countries, MTCT has been virtually eliminated. This was facilitated as a result of effective Voluntary Counseling and Testing (VCT), access to ART, safe delivery practices and wide spread availability and safe use of breast milk substitute (BSM) . If these interventions were used world wide, they could have saved the lives of thousands of children each year.

Effective PMTCT requires a 3-fold strategy,[8,9] this includes:

- Preventing HIV infection among prospective parents making HIV testing and other preventive interventions available in services related to sexual health such as ANC and post-partum care.
- Avoiding the transmission of HIV from HIV positive mother to infants during pregnancy, labour, delivery and breastfeeding (BF).
- Integration of HIV care, treatment and support for women found to be positive and her families.

The current revised guideline of 2010 for more effective PMTCT intervention in resource limited setting will virtually eliminate the number of new paediatric HIV infection. The recommendation of new guide line on ARV drugs for treatment of pregnant HIV positive women and prevention of infants are as follows:

- Earlier ART for pregnant HIV positive women is for the benefit of both of them health and for prevention of transmission of HIV virus to child during pregnancy labour, delivery and breastfeeding.
- Longer provision of ARD prophylaxis for HIV positive women with relatively strong immune system who do not need ART for their own health but to reduce the risk of HIV transmission from mother to child.
- Provision of ARV prophylaxis to mother or child to reduce the trans- mission during the period of breastfeeding for the first time, there is enough evidence for WHO to recommend ARV while breast feeding.

The 2010 revised PMTCT refers to the following two key approaches which are:

- ART for HIV infected women in need of treatment for their own health which is also safe and effective in reducing MTCT of HIV.
- Short term ARV prophylaxis to prevent MTCT of HIV virus during pregnancy, labour, delivery and breastfeeding for HIV infected women not in need for treatment.
- Start ART as soon as feasible, regardless of gestational age and continue for life long.

WHO said that "PMTCT programmes are strongly encourage" to implement the 2010 recommendation but acknowledge that this might not be possible for all countries. In this situation there are previous regimens that have been used and might be implemented.

These options are shown in table below:

2010 Recommendation Options	**Pregnancy**	**Labour**	**After Birth For Mothers**
Option A	AZT after 14 weeks of gestation	Single dose AZT,AZT +3TC	AZT +3TC for seven days
Option B	Triple ARVs	Triple ARVs	Triple ARVs for week
2006 Recommendation			
Alternative-higher risk of drug resistance	AZT After 28 weeks of gestation	Single Dose of NVP, AZT+3TC	AZT + 3TC for Seven days AZT+3TCfor seven days
Minimum (less effective)	AZT 28 weeks	Single Dose NVP	
Minimum (less effective)	_	Single Dose NVP,AZT+3TC	
High risk of drug resistance	_	Single Dose NVP	

The most effective combination for PMTCT is triple ARDs taken during the last stage of pregnancy and delivery and whenever possible women should receive a combination of drugs to prevent HIV resistance problems and decrease MTCT rate even further.[10]

Fifty three percent (53%) of HIV positive women received treatment to prevent HIV transmission to their children in developing countries in the year 2009.[30] Infection rate among children born to mothers living with HIV have declined by 26% from the year 2001 to 15% in 2009. However there is still much need to be done to prevent mothers from dying and children getting infected with HIV. About one in three infants born to HIV infected mothers will be infected with HIV virus.[11]

In sub-Saharan Africa PMTCT more than 600,000 women prenatally transmit HIV to roughly the same number of babies. UNAIDS estimates that 90% of transmission of HIV to infant is a result of vertical transmission (mother to child) HIV/AIDS. This justifies the existence of about 80 PMTCT site; mostly in Africa. However few of these programmes have been scale up, MTCT problem in Sub-Saharan Africa is particularly severe due to mainly high birth rate (Over 23 million birth annually) comparatively among women of child bearing age (Over 15% in Africa, while averaging less than 3% in other region); large total population of women of child-bearing age (Over 140 million); and a well established HIV epidemic in the region.[12]

In Sub-Sahara Africa HIV infected mothers continue to pass the HIV to their children at the rate of 25-35% Eight countries in the region have over 15% of their adult population between the age of 15-49% infected with HIV, one out of every five adult is infected with HIV. The prevalence among women is generally higher than among men. It is not surprising

that HIV/AIDS prevalence is higher in Africa as investment in health is often low, sometimes lower than 6% of total government expenditure. On country by country basis Zambia is leading at 13%, Namibia at 8% while more than 10 countries allocate 3% budget or less to health.

By 2001, UNAIDS, USAID and other major donors were supporting 2 national and 79 sites specific PMTCT HIV/AIDS programmes reaching over 16 countries. In just also two years the programmes provided counseling to about 200,000 women, with over 130,000 were offered counseling and testing, while 45,000 HIV positive pregnant women were offered ARV treatment. The drug mostly used for PMTCT program are short-course Zidovudine and Nevirapine. Preliminary result demonstrates that most of these programs are effective, sometimes reducing transmission by 50%. A further 300,000 infants may be protected from contracting HIV infection each year. The effect of this commutative Sub-Saharan Africa GDP in the coming year would be astounding.

However the key issue that need to be answered before scaling-up includes the cost of ARDs administration, includes the efficiency, safety, cost implementation and replicability. Perhaps the transcending issues is that of cost" such as cost of ARVs in other countries, cost of caesarean section, the cost of breast milk substitute (BMS) for those that opted not to breastfeed and cost of medical care- all this are factors affecting PMTCT in Africa.

More than 2 million HIV positive women become pregnant each year. Hence PMTCT remain central to reducing the impact of HIV on maternal and child health. International policy matters have emphases the importance of linking sexual and reproductive health to maternal health, HIV/AIDS and other key services.

In March, 2006 the UN interagency task team on MTCT of HIV, involve UNICEF, UNFPA, WHO, the World Bank and UNAIDS launched a global strategy focusing on country level effort to scale up PMTCT. Although the new strategies has the potential to turn international commitment into action, progress in scaling up services for HIV positive pregnant women has been slower than hoped for. In 2005, PMTCT reached just 11% of HIV positive pregnant women in Africa, less than half the coverage of ART programmes for adult, although recent figure are more encouraging. Barriers to scaling up include:

- Weak health system
- Limited human resources
- Lack of supplies including drugs
- Low level of male involvement
- Weak community mobilisation
- Failing donors financing for sexual and reproductive health (S/RH) and maternal health services relative funding.

A researcher look at a review of success stories in a number of African countries, these studies identify, decentralization approaches, strong national leadership and comprehensive approach to integrate PMTCT into maternal health services as factors leading to success. These example shows that financing and institutional constraints can be overcome. To achieve such success the author recommends strength routine:

- Maternal, neonatal and child care: Re-enforcing system for basic service delivery, including human resources, commodity supplies and infrastructure.
- Increasing access to screening and treatment for sexually transmitted infection (STIs).
    - Improving post–partum care and post-partum-follow-up for mother and child.

- Enhancing access for pregnant women and mothers in need for ongoing ART. Addressing the health workers shortage especially at the peripheral level. Funding for integrating programmes, national effort to developing strategies and proposals and better guidance from technical and implementing agencies are also needed.[13]

PMTCT services commenced in Nigeria in 2001 in six tertiary health facilities. However, PMTCT services outlet have increased to 677 in 2010 across the country, with services including VCT, treatment with ARD ,delivery care ,post-partum care and follow-up, linking mothers to family-planning, immunization for tetanus and linking infants to paediatric care for post exposure prophylaxis (PEP),breastfeeding counseling, DNA-PCR for early infants diagnosis, growth development and monitoring, psychosocial support and if child turns out to be HIV positive, he is been linked to paediatric HIV care.

Undoubtedly, the news about the battle against paediatric AIDS is that mothers can now breastfeed their infants without passing the virus. Before mothers who failed to breastfeed their infants were ridiculed and stigmatized in their countries .Some were forced by mockery of others to breast feed their babies with dire consequences but now UNICEF continue to urge health professional to encourage new mothers to breastfeed their babies exclusively for first six months.

The 2010, WHO guideline for PMTCT includes two options both of which start earlier in pregnancy at 14th weeks of gestation or associated as soon as possible thereafter. The two options provide significant reduction in MTCT of HIV virus with equal efficacy in these groups of women who are not eligible for ART. The first option is twice daily Zidovudine

(AZT) for the women and infants prophylaxis with either AZT or Nevirapine (NVP) for six weeks after birth if infants are not breastfeeding. If infant is breastfeeding daily NVP prophylaxis should be continued for one week after the end of breastfeeding period.

The second option is the three- drug prophylaxis regiment for mothers to take during pregnancy and throughout the breastfeeding period as well as infants prophylaxis for six weeks after birth whether or not the infant is breastfeeding. But with no less than 56, 000 babies in Nigeria born with HIV and estimated 360,000 children living with HIV in the country, infected from their mothers, government most move fast to reverse the weak health structure, majority of PMTCT centers are donor driven. In 2010 National agencies for control of AIDS (NACA) launched it's comprehensive National strategic framework to cover 2010-2015, which requires an estimated #756 billion (around $5 billion) to implement. Some of these includes frame work to reach 80% of sexually active adult and 80% of most at risk population with HIV counseling and testing 2015, ensure 80 % of eligible adult and 100% of eligible children are receiving ART by 2015 and improving access to quality care and supportive services to at least 50% of people living with HIV by 2015.

PMTCT services in Abuja (in Asokoro General Hospital, Maitama General Hospital and National hospital) are free. Parents only pay when they come with opportunistic infections and this is what government should try to stop. If PMTCT services are free then why should mothers pay for treatment of malaria?

A large number of experts believe that a HIV free generation is an integral for developing country like Nigeria to make progress for the control of spread of HIV /AIDS should therefore pursue to achieve the Millennium Development Goals (MDGs).

Director General of the National Agency for the control AIDS (NACA) John Idoko said "when I assume office the PMTCT was 7%, it is now 23% after 18 months. The coming year will be ramped up because we have resources coming from global fund, PEPFAR and government of Nigeria. We hope to reach the target 30% of the people living with HIV /AIDS (PLWHA) this year and 50% end of next year". Nigeria is confident to reach the target as work of up-grading Primary Health Care (PHC) facilities and training of health workers (HCW) in various states have started by all partners mention above. This will shift services to rural communities where 70%of Nigeria lives. For many experts however until the rural dwellers are fully catered for, government will only be scratching the surface as far as it concerns the control of AIDS especially with regards to PMTCT services[14].On the whole, coverage of PMTCT in Nigeria is 12.5%, with patient on ART at 33%. HIV counseling and testing is 8% according to NACA DG, Professor John Idoko. He further stated that "for us to achieve the desire courage, health system must be strengthen to deliver sustainable integrated HIV and AIDS services with PHC and community health system". Women who are HIV positive and are not on any form of intervention, if they breastfeeding their babies, have 40% of transmission risk.

National programme office, UNAIDS, representing UN agencies joint team implementing programmes on HIV /AIDS, Mrs Modupe Oduwale, pointed out that Nigeria represent 30% gap of PMTCT of HIV /AIDS globally. She warned that although PMTCT is cost effective means of preventing HIV transmission, if nothing is done by 2012, there will be a large pool of children infection. The joint UN team is hoping that by 2012, 80% of pregnant women will access free PMTCT and all exposed children will be adequately taken care of and 30% of children will have access to ART.

1.3 Introduction of Early Infants Diagnosis (EID)

Women living with HIV /AIDS in 2009 globally were 15.9 million and 1,700,000 million are living in Nigeria. In sub-Saharan Africa more than 600,000 women transmit HIV to roughly to the same number of babies.[1] UNAIDS estimated that 90% of transmission is as a result of vertical transmission, In sub-Saharan Africa the transmission is as a result of high birth rate which is over 33 million birth annually among women of child bearing age.[12] MTCT of HIV occurs during pregnancy, labour, delivery and breast feeding. Without treatment 15-30% of babies will become infected during pregnancy and 15-20% during breastfeeding.

The risk of mother to child transmission of HIV during first, Second and third trimester is 15% and from the period of labour and delivery is 13%. Cumulative risk from pregnancy to delivery is 20%. Infection during 24 months of breastfeeding is 15%. Cumulative risk by 2 years is 35% and uninfected is 65%.[15]

MTCT of HIV is made worse by increasing prevalence among young people particularly women. According to UNAIDS (2007) young women and girls aged 15-24 years are three times more likely to be infected than male in the same age group in sub–Saharan Africa, with median HIV infection rate of 4.4%. An estimated MTCT of HIV was 24-35% between 65,000 -117,500 children would be infected with HIV by their mothers in Nigeria yearly. This estimate was based on population of 140million (NPC 2006) and the crude birth rate of 42 birth per 1000 people (NPC and ORC MACRO 2004).[16] Without intervention half of these children will die before their second birth day.

The goals of EID among other things are to establish a system of care and linkages that will facilitate early inclusion of HIV exposed infants and HIV positive infants to quality care and

treatment. EID of HIV exposed infants provides a critical opportunity to strengthen follow-up of HIV exposed infants. EID should also assure early access to ARV treatment for infected children, providing reassuring information to families of uninfected children, aid evaluation of PMTCT programs and increases capacity to use Laboratory technology.

EID about 1000 babies were infected with HIV every day during pregnancy, birth or breast-feeding. Globally there are 1.4 million pregnant women living with HIV in low and middle income countries and only 26% received HIV testing. In eastern and southern Africa the region hit hardest by the epidemics, only half of pregnant women were tested for HIV. An estimated 53% of pregnant women living with HIV in the developing countries/ world received ARD to prevent them from transmitting the virus to their babies.

1.4 National Objective for EID

- To determine the prevalence of HIV infection among a cohort of HIV exposed infants.
- To determine the number of HIV exposed infants whose mothers had PMTCT and infants whose mothers did not attend PMTCT and infants who had post exposure prophylaxis.

1.5 Specific Objective for EID

- To describe the package of care for HIV exposed infants (EID including follow up).
- Increasing diagnosis and treatment rate of a HIV exposed infants through an improved comprehensive pediatric HIV care.
- To explain the importance of early identification of HIV positive babies.
- Providing comprehensive follow-up care for infants up to 18 months-when the status is been known as either negative or positive.

- To build the capacity of health worker to provide quality care and treatment for HIV exposed infants and infected infants.

To achieve the above objectives, pregnant women across the developing world must be tested and the PMTCT program has to be scale-up to include all mother and infants who need them no matter how impoverished or geographically isolated they may be. Any where PMTCT is accessible it must be delivered consistently and with most effective drugs available.

1.6 EID in Asokoro Hospital

EID in Asokoro general Hospital is been managed by Paediatric department which provides care for HIV exposed infants by giving them PEP, EID by doing dried blood sampling for DNA PCR, breastfeeding counseling, nutritional counseling, adherence and counseling, growth development and monitoring, maintaining and ensuring follow-up, linking infants immunization unit and laboratories. Asokoro district Hospital (ADH) has three laboratories for different organizations (ADH, PEPFAR, and Institute of Human Virology of Nigeria (IHVN). Other units that are involved in management of HIV-Exposed infants are Pharmacy department, Nutrition Unit, Radiology department and Support groups. Drug used in PMTCT and EID are free and is been used based on WHO guidelines.

In the hospital, New born infants are referred to Pediatrics Department for further care, such giving post-exposure prophylaxis like NVP and ZDV.

For Infants feeding counseling, mothers choose the breast option she want and supported for the option she chooses.

HIV testing for infants whose mothers opts not to breastfeed and opt BMS, should have their first DNA-PCR at six weeks after birth, while awaiting Laboratory result infants should be placed on cotrimaxazole.

For infants whose mothers opt to breast feed should have first DNA-PCR at six weeks and second DNA-PCR should be after four to six cessation of breastfeeding. As this is going on the child will continue with immunization, clinical growth and development monitoring and Nutritional counseling, placing the infant on cotrimazaxole pending the outcome of laboratory result. For infants that are infected with HIV virus they are enrolled in Paediatric HIV clinic for further care and are offered HIV staging, CD4 counts, total lymphocytes count (TLC), viral load, electrolyte urea and creatinine, hepatitis B and C surface antigen, and Liver Function Test (LFT). Also ARD treatment, cotrimazaxole for prevention of opportunistic infections is given. In addition, monitoring children taking ARD, psychological and adherence and counseling for care givers are offered. Tuberculosis assessment and looking for sign and symptoms of HIV, HIV support and linking parents and guidance to support groups are also administered. Training of health workers and their supervision are vital and make definitive diagnosis.

1.7 Institutional Framework of Asokoro District Hospital

The following bodies are involved in PMTCT programme at Asokoro District Hospital are stakeholders, central laboratories (ADH for FCTA, IHVN and PEPFAR) Health Care Provider, and Implementing partners/expertise (IHVN and PEPFAR).

1.8 Challenges of EID Asokoro District Hospital

- Lack of adequate manpower
- Lack of adequate training for health workers
- Lack of staff motivation
- Long waiting time at pharmacy
- Long booking time for laboratory testing
- Viral load testing for children not been done, reason for that not known
- Laboratory result not coming in time (thus in spite of existence of three laboratories in the hospital). The explanation to this may be due to the centre attending to other states like Adamawa, Taraba and National Institute for Pharmaceutical Research and Development (NIPRD) e.t.c.

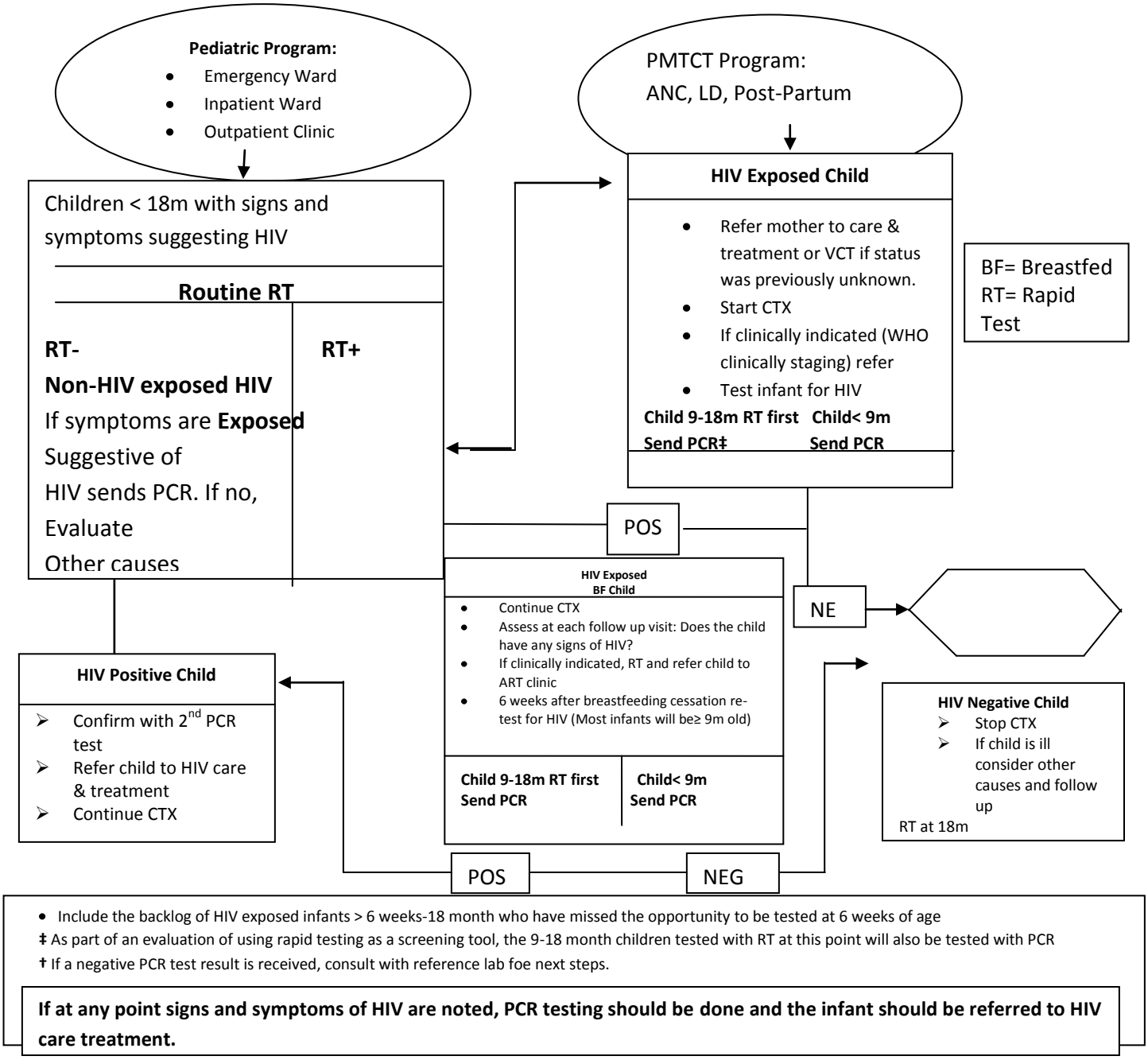


Table 1: NIGERIA'S EARLY INFANTS TESTING ALGORITHM

Early infants diagnosis for infants who have not been breast-fed in the past six weeks for pre-test information for parents/Guardians of infants needing HIV PCR testing are:-Include the backlog of HIV exposed infants > 6 weeks-18 month who have missed the opportunity to be tested at 6 weeks of age

‡ As part of an evaluation of using rapid testing as a screening tool, the 9-18 month children tested with RT at this point will also be tested with PCR

† If a negative PCR test result is received, consult with reference lab for next steps. If at any point signs and symptoms of HIV are noted, PCR testing should be done and the infant should be referred to HIV care treatment.

Early infants diagnosis for infants who have not been breast-fed in the past six weeks for pre-test information for parents/Guardians of infants needing HIV PCR testing are:

- Introduce the need for a test.
- Remain them of the importance of PCR-Testing and that it is routine.
- Inform the parent/guardian of the need for further HIV care if their infants test PCR-positive.
- Inform them also that cotrimaxazole can be stopped if PCR is negative.
- But for infants whose mother opted for breastfeeding should have their first DNA-PCR at six weeks.
- Inform parent/guardian about how blood sample will be collected and when result will be available, which could be in 4-6 weeks.
- Inform parents of ongoing risk from continued breastfeeding, if their infant is PCR-negative, and the 2nd DNA-PCR is after 6 weeks of east feeding cessations.

The DNA- PCR is an investigation that is been done to infants of HIV positive mother who is less than 18 months, by the use of dried blood spot (DBS).Dried blood sampling is when whole blood dried on a filter paper usually obtained from pricking skin not from phlebotomy, it require only a small amount of blood, easy to store and easy to transport.

After taking your DBS, you label specimen correctly, label and store appropriately until transported for testing.

1.9 Statement of Problem

The burden of HIV infection globally is a burning issue which results to the death of many people including children. An estimated figure of 33.3 million people were infected with

HIV/AIDS in 2010 and that of 2008 was 32.8 million, this slight increase may be due to largely people living longer due to ARV therapy.

HIV rate has been rising among pregnant women and infants, with the risk of transmission from mother to child being significant during pregnancy, delivery and labour and there is an additional risk of post-partum transmission via the breast feeding. The Nigerian prevalence of HIV infection in 2005 was 4.4%. According to UNAIDS, in 2007 the HIV infection from developed countries ranged from 13-32%, while that of developing countries is 25-45% and this due to breast feeding, as during the period in Nigeria between 65,000-117,000 infants were infected by their mothers yearly and globally.

In 2009, around 370,000 infants were born with HIV infection. Without ART treatment it is estimated that 50% of these children will die before their second birth day.

Problems hindering successes:

PMTCT program must provide counseling and testing services to determine which women need assistance. And even if clinics offer counselling and testing not all of them will accept. Some will even fail to return to receive their test result. There are series of steps that lead to a reduced risk of transmission. At each step; some women have been seen to dropout. By the end, it is possible that only minority will remain.[17]

Of more than half a million women who attended clinics in twelve countries only 71% received counseling. Of those who were counseled only 70% took HIV testing and women who tested positive only 4% received preventive drugs.[18]

Many studies in very poor resource centers have showed that women have many responsibilities. Thus besides caring for their children, they are expected to work hard

preparing food, fetching water or tending crops. Many live faraway from their nearest health facility and have little access to transport. It is hardly surprising therefore that a third of the world's pregnant women do not attend ANC.[19] many women visit clinic once and two-third gives birth at home unattended to by skilled health workers. This greatly reduces the number of women who can be reached by PMTCT program.

To increase access to health facilities for women in poor countries, the following should be taken into consideration:

- Travelling services like motorable roads, ambulances and other means of transport should be improve upon and made available.
- Changing opening hours of ANC to accommodate all classes of women. This is what India used to boost the attendance of its women by opening ANC clinic on Saturday. [20] Another problem hindering the success of PMTCT women who are HIV positive even when given Nevirapine pills in advance to keep at home and take at the start of the labour may not guarantee that every pill will be swallowed. [21] and to be fully effective, drugs need to meet the new born.[22]

PMTCT program can be more effective by working with Traditional Birth Attendance (TBA) who attends to the majority of home delivery. With sufficient training, traditional midwives might also be able to provide services such as HIV education, counseling and testing and advice on infant feeding.[23]

Lack of sufficient clinical resources, such as shortage of HIV test kit, preventive drugs and other supplies can limit the efficiency of PMTCT program. It is very important to have reliable supply chains that are integrated into the system serving maternal and child health

clinics. Staff shortage and lack of staff motivation can also be very serious problem. UNICEF report explains that PMTCT programs are suffering in developing countries as a result of outflow of trained providers to private institutions or other countries that offer higher salaries.

It further stated that PMTCT intervention, although designed to be part of routine services, it creates significant additional work for staff already discouraged by long standing problems, such as low payment and inadequate medical supply.[24]

Testing method (VCT) - The problem with VCT are fear, and distrust, disclosure of result and discrimination, the best way to overcome them is through better training of health workers, midwives and clinic layout designed to ensure privacy.

Drug's effectiveness and adherence - HIV positive women should be given triple ARVS for their own health and for PMTCT of HIV to reduce risk to her infant. By testing the mother for her own health reduces children becoming orphans by keeping their mother alive for longer period. This is provided in treatment clinic even if it is in the same health facility but PMTCT is provided at health talk services.

Male involvement in ANC is very important for it will reduce the risk of vertical transmission and infant mortality. Offer services (VCT) to both men and women and if there is problem women will stick to ANC and it will reduce a lot of problems, that women encounter from their facilities for example dangerous practices like forced breast feeding or forced early weaning are less likely, if both parents are involved in this decision making.

Sub-Saharan Africa is struggling with fourth MDG goal of reducing child mortality by two third by the year 2015, with great access to PMTCT services and access to ARD, some countries are slowly meeting up to this target.

Sub-Saharan African accounts for about half of global figure of child mortality under the age of five and the region also had slowest rate of decline in death, which might be partly due to high HIV prevalence level. According to UNAIDS Sub-Saharan African still has most of the worlds HIV infection while a regional prevalence of about 5% accounted for almost 70% of all new HIV infection in 2008.

With these large new HIV infection in paediatric age group, there is need to intensify the implementation of PMTCT in area that are yet to have and to scale-up PMTCT in areas that are implementing PMTCT. For PMTCT still remains the best way of intervention for the transmission of HIV virus.

1.10 Justification for Study

With high global figure of people living with HIV/AIDS of up to 33.8 million (2010) and with high death rate of 1.8 million of which 1.3 million are living in sub-Saharan African, with more than 600,000 women annually infect the same number of babies perinatally with HIV virus.

In Nigeria women living with HIV/AIDS were 1,700,000 with not less than 56,000 babies born with HIV infection .It is estimated overall that 360,000 children are living with HIV. Almost 90% of global 16.6 million children orphaned by AIDS are living in Sub-Saharan Africa, out of which 2,500,000 orphans are in Nigeria.

PMTCT program can be more effective by working with Traditional Birth Attendance (TBA) who attends to the majority of home delivery. With sufficient training, traditional midwives might also be able to provide services such as HIV education, counseling and testing and advice on infant feeding.[23]

Lack of sufficient clinical resources, such as shortage of HIV test kit, preventive drugs and other supplies can limit the efficiency of PMTCT program. It is very important to have reliable supply chains that are integrated into the system serving maternal and child health clinics. Staff shortage and lack of staff motivation can also be very serious problem. UNICEF report explains that PMTCT programs are suffering in developing countries as a result of outflow of trained providers to private institutions or other countries that offer higher salaries.

It further stated that PMTCT intervention, although designed to be part of routine services, it creates significant additional work for staff already discouraged by long- standing problems, such as low payment and inadequate medical supply.[24]

Testing method (VCT) - The problem with VCT are fear, and distrust, disclosure of result and discrimination, even when offer VCT not all will agree to be tested, even when tested, not all will come to collect their result, even when they collected result not all will access ART (the best way to overcome these is through better training of health workers, midwives and clinic layout designed to ensure privacy).

Drug's effectiveness and adherence - HIV positive women should be given triple ARVS for their own health and for PMTCT of HIV to reduce risk to her infant. By testing the mother

for her own health reduces children becoming orphans by keeping their mother alive for longer period.

Male involvement in ANC - is very important for it will reduce the risk of vertical transmission and infant mortality. Offer services (VCT) to both men and women and if there is problem, women will stick to ANC and it will reduce a lot of problems that women encounter from their facilities for example dangerous practices like forced breast feeding or forced early weaning are less likely, if both parents are involved in this decision making.

In 2010 the National Agency for the control of AIDS (NACA) launched a National Strategic Framework of care for AIDS victims up to 2015; this strategy will require N 756 billion, which is equivalent to 5 billion dollars. With the above bad indices problems and lack of funding a study like this is necessary to identify the gaps and problems that need to be addressed urgently in order to reduce or achieve the target of the MDGs more especially the health related goals (four, five and six).

1.11 Objectives

1.11.1 General objective

The aim of this study is to assess the level of progress of implementation of prevention of mother to child transmission of HIV and early infant diagnosis in Asokoro District Hospital.

1.11.2 Specific objectives

1) To determine the prevalence of HIV infection among a cohort of HIV exposed infants.
2) To determine the status of HIV exposed infants whose mother had PMTCT.
3) To assess the package of care given to HIV exposed infants.

4) To determine the relevant health care providers qualification and training.

CHAPTER TWO

LITERATURE REVIEW

Globally in the year 2009, newly infected people with HIV/AIDS were estimated to be 2.6 million, and the number of children leaving with HIV was estimated to be 2.5 million. The 90% rate ranges from 13 – 32% in developed nations to 25-45% in developing nations. In Nigeria it is estimated that65,000 – 117,500 people got this infection through their infected mother despite all the international and national effort to avert new HIV infection. The figure is still by far short of the universal access target. The sero-prevalence of national HIV in 2005 was 4.4% but in the Federal Capital Territory (FCT), it was 6.4%.

Studies done in sub-Saharan Africa showed that VCT and the programme of PMTCT of HIV have remained crucial in the prevention of paediatric HIV, and for improving PMTCT of HIV, even though the dropout rate is common. Studies show that large proportion of women referred to PMTCT services are not receiving pretest counseling in Nigeria. In Ghana and Tanzania roughly one half of women received counseling while in Nigeria only a quarter did. In Burkina Faso, the proportion was mere 18% and in Zambia just 13%. In Rwanda, South Africa, Uganda and Zimbabwe the figure was up to 70%. PMTCT of HIV is seen to be improving in many countries.[25]

The National Demographic Health Survey (NDHS) of Nigeria (2008) carried out a survey on awareness among women and men of age 15-49, who have heard of HIV/AIDS. The Study revealed 88% of women and 94% of men heard of HIV/AIDS. Awareness based on background of women and men who have never been married and have never had sex is 97% and 98% (are most likely to have HIV/AIDS), respectively. While women currently married

are 86%, men not married who have never had sex is 86% (and least likely to have HIV/AIDS).[26]

A study carried out in Tanzania, that assessed male attitude regarding partners involved in ANC/PMTCT of HIV services revealed that all respondents supported PMTCT of HIV interventions but mentioned barriers to ANC/PMTCT of HIV as lack of knowledge/ information, lack of time, (neglected importance). The ANC/PMTCT service is looked at as a female responsibility and also fear of HIV test results. Only few perceived couple HIV counseling and testing as disadvantage.[27]

The work by NDHS (2008) had done in Nigeria assessed the knowledge on MTCT of HIV by Breast feeding. The result showed that 52% of women and 59% of men knew that HIV could be transmitted through breast feeding. That was an increase from NDHS of 2003 which showed women have 46% and men 56%.Although there is knowledge of the disease been transmitted through breast feeding there is limited knowledge on how to prevent it as the study revealed that 28% of women and 39% of men were aware that HIV transmission from mother to child can be reduced by drugs.[28]

A study was carried out among 345 pregnant women attending ANC at 2 health facilities in Lagos - Nigeria. The study was to assess the knowledge and acceptability of HIV, VCT in pregnant women as a strategy for PMTCT of HIV. The result reveals that majority of the women (89.9%) had good knowledge of mode of transmission of HIV but however knowledge of the other aspect of PMTCT of HIV was poor. About 41.7% of these women were not aware of the association between breast milk and HIV transmission. Almost all women (96.1%) are willing to undergo HIV testing in pregnancy if it will help in the

reduction of MTCT of HIV to their infants' babies but only few would undergo the test if the result would be shared with relatives.[29]

In a study done in rural Zambezi province, Mozambique, to determined follow-up rates for EID and age at first testing in a retrospective cohort of 443 HIV infected mothers and their infants, it was found that only 110 (25%) of infants were brought for early infants diagnosis. Meaning that (3/4) of HIV infected women in rural Mozambique did not bring their children for early infants diagnosis.[30]

In a 3 year Hospital based retrospective study was done in Auchi, Uromi and St. Catholic hospital and central hospital Benin, those included in the study were 406 HIV positive mothers who assessed PMTCT from November 2005 and November 2008. Out of 406 women, only 347(85%).Of these 347; 314 (90.5 %) mother-infant pairs were followed up till 18 months. 294 women received ARV prophylaxis while 20 received no intervention. The rate of MTCT of HIV transmission was 3.1% (9/294) in those with ARV prophylaxis and 15.5% (3/20) in those with no intervention (Fisher's Exact = 0.034). Transmission rate amongst women delivery in a health facility was 3% (9 /296) compared to 16.7% (3 /16) for delivering outside hospital (Fisher's Exact = 0.025). The HIV transmission rate amongst those who practiced exclusive breastfeeding and mixed feeding are the same at 4.8%, exclusive infant formula had lowest rate of HIV-positive infants at 3.1% (p = 0.935).

In conclusion MTCT transmission of women who accessed PMTCT services in these facilities was 3.1%. Delivery in health facilities was with a lower MTCT rate. Women who practiced replacement feeding had lower MTCT rate than those practicing either mixed or EBF.[31]

Study was done by NDHS in 2008 to assess the knowledge about HIV transmission by those using ARD before delivery and also to assess MTCT through BF. The study revealed that 52% of women and 59% of men knew that HIV can be transmitted through breastfeeding this increase from 2003 NDHS in which 46% of women and 56% of men reported that HIV can be transmitted by BF. Although knowledge about PMTCT has increased, knowledge about how this can be reduced is still limited. 28% of women and 39% of men know that the risk of PMTCT can be reduced by taking special drugs. 26% of women and 33% of men were aware that HIV can be transmitted through BF and that the risk of MTCT can be reduced in taking special drugs.[32]

Knowledge of PMTCT of HIV increases with high level of education and it is higher in urban areas than in rural areas.

A study and report done by NDHS in the year 2008, on attitude towards negotiating safer sexual relationship with husbands (This is especially the case in marital union where women status is compromised by societal expectation, thereby increasing their vulnerability by HIV infection) reveals 81% of women and 87% of men in Nigeria believe that if a husband has sexually transmitted disease his wife is justified in refusing to have sexual intercourse with him.

A lower proportion of women and men believe it would be justified for women to ask their husband or partners to use condom (70 and 83%). Overall 86% of women and 92% of men believe that a wife is justified in taking source action to protect her self from HIV either by refusing to have sexual intercourse or by requesting that her husband or partner use a condom.[33]

Sites assessment were carried out at 33 sites in Ethiopia and looked at pharmacy and Laboratory services, supply systems, and the availability of pharmacy and Laboratory commodities required for comprehensive PMTCT services. The findings were that supplies were through three main channels namely regional budget allocation, Ethiopia Ministry of Health and from World Bank funds. The assessment revealed that some of the problems related to pharmacy, Laboratory services in PMTCT include shortage and high attrition rate of professional staff, limited quality assurance of imported or locally manufactured drugs due to shortage of human resources, weak information system, and lack of quality control equipment, periodic shortage of essential drugs due to lack of reliable consumption data for procurement, inadequate storage, equipment, and handling capacity in pharmacies and laboratories, compromising product security and safety, lack of standard operating procedure, current reference materials, and manuals for use at health facilities and lack of space in the facilities to ensure confidentiality for testing, counseling and treatment.[34]

A work done by Supriya et al on Early Infant Diagnosis (EID) confers substantial benefit to HIV infected and HIV uninfected infants and to programmes providing prevention of mother to child transmission (MTCT), but has been challenging to implement in resource limited settings. The study's objectives: To find out the rate of perinatal transmission in infants born to HIV positive mothers, to study the effect of various predisposing factors on HIV transmission and to evaluate the utility of dried blood spot (DBS) specimen for EID of HIV. Methods used included the testing of Infants born to HIV positive mothers according to National AIDS Control Organization (NACO) guidelines. Infants of 6 weeks to 6 months of age (n = 84) were diagnosed by DBS PCR; DBS positive results were confirmed by whole blood PCR. Infants 6 - 18 months (n = 47) were subjected to antibody test and if positive

were confirmed by DNA PCR. Detailed history including type of delivery, single dose Nevirapine (SDN) and breast feeding was taken. Results of study indicated that the HIV transmission rate was 10.69%. In children ≤ 6 months, who did not receive SDN the positivity was 44.44% (4/9) whereas in those who received SDN it was 6.66% (5/75), (P = 0.0063). In children > 6 months the positivity rate was significantly higher in breast fed 42.85% (3/7) as compared to non breast fed 5% (2/40) children (P = 0.0187). There was 100% concordance between DBS and whole blood PCR. The study conclusions were that in resource limited settings, though HAART should be considered to further reduce MTCT during pregnancy and to prevent the emergence of resistance, single dose Niverapine should be kept as an option for mothers coming directly in labour. Also, extended ART should be provided to mothers who want to breast feed their children. Early infant diagnosis using DBS specimens will further reduce the morbidity and mortality in this children.[35]

Abstract Work done by researchers on "They have already thrown away their chicken": barriers affecting participation by HIV-infected women in care and treatment programs for their infants in Blantyre, Malawi that HIV-infected infants and young children are at high risk of serious illness and death. Morbidity and mortality can be greatly reduced through early infant diagnosis (EID) of HIV and timely initiation of antiretroviral therapy (ART). Despite global efforts to scale-up EID and infant ART uptake of these services in resource poor, high HIV burden countries remain low. The authors conducted a qualitative study of 59 HIV-infected women to identify and explore barriers women face in accessing HIV testing and care for their infants. To capture different perspectives, they included mothers whose infants were known positive (n=9) or known negative (n=14), mothers of infants with unknown HIV status (n=13), and pregnant HIV-infected women (n=20). Five important

themes emerged from the study as follows lack of knowledge regarding EID and infant ART, the perception of health care workers as authority figures, fear of disclosure of own and/or child's HIV status, lack of psychosocial support, and intent to shorten the life of the child. A complex array of cultural, economic, and psychosocial factors creates barriers for HIV-infected women to participate in early infant HIV testing and care programs. For optimal impact of EID and infant ART, reasons for poor uptake should be better understood and addressed in a culturally sensitive manner.[36]

In 2008 women and men who heard of HIV and AIDS were asked a number of questions to assess the level of stigma associated with HIV and AIDS.

The study revealed that more male (74%) than Female (60%) were willing to take care of a family member with HIV at home. This represent a substantial increase when compared with that of 2003 NDHs (44% of women and 40% of men receptively). The study also reveals that about 37% of women and 48% of men said that they would buy fresh vegetable from a shopkeeper who has HIV, whereas in 2003, 20% women and 28% men said they would buy fresh vegetable from a shopkeeper with HIV.[37]

Another study suggested that fear of violence, physical beating, breakups of relationship and abandonment among women who are found to be HIV infected is not uncommon.[38]

A randomized controlled trial carried out by WHO at five study sites in Burkina Faso, Kenya, and South Africa, study was done to assess the efficiency and safety of triple antiretroviral treatment (ART) compared to the standard prophylactic combination of zidovudine and single-dose nevirapine for pregnant women living with HIV. Enrolled 882 relatively healthy women living with HIV with CD4 cell counts of 200 to 500 cells per mm^3;

824 women were randomized, to whom 805 infants were born. The mothers and infants were provided with either triple antiretroviral prophylaxis from approximately 28 to 36 weeks gestation to cessation of breastfeeding, or daily doses of zidovudine for a few weeks prior to labour and single-dose nevirapine at birth for both the mother and infant, in addition to two drugs for a week following birth. The researchers found that the cumulative HIV transmission rate at 12 months of age was 43 percent lower for the triple combination treatment than for the standard treatment. Based on preliminary findings from this trial, the World Health Organization (WHO) issued revised guidelines that now recommend antiretroviral prophylaxis for either the mother or infant during breastfeeding if the mother is not already receiving ART. The authors concluded that full-scale ART is safe and reduces the risk of HIV transmission to infants.[39]

A systematic review done on 19 articles (16 about sub-Saharan Africa) provides data on the cost-effectiveness of interventions to prevent mother-to-child transmission (MTCT) of HIV in low- and middle-income countries (LMICs). Measures of effectiveness were used to examine infant HIV infections averted (most common), benefits of MTCT interventions on horizontal transmission, costs per life year gained, and cost per quality-adjusted life years (QALY) or disability-adjusted life years (DALY). Overall, the authors found that interventions to prevent pediatric infections can be cost-effective in a majority of LMICs. However, MTCT efforts based on universal or targeted testing of pregnant women do not fare as well in concentrated epidemics, where HIV prevalence in the general population is lower. They also may not compare well to competing interventions to improve population health. To realize the full potential of prevention of mother-to-child transmission (PMTCT) programming, the authors advocated for future cost-effectiveness studies and operations

research to concentrate on unanswered questions in four areas: the most effective PMTCT strategies in a given local context; strategies to improve coverage and reach of PMTCT programs in LMICs, with a particular focus on underserved populations; evaluation of an increasingly complex set of PMTCT interventions (going beyond perinatal transmission to include primary HIV prevention and reproductive counseling); and strengthening linkages to and integration with maternal, newborn, and child health programs.[40]

A study done to determine the cost effectiveness of the new World Health Organization (WHO) recommendations for long-course triple antiretroviral therapy (ART) prophylaxis for the mother and infant ART prophylaxis, compared to short-course strategies, for prevention of mother-to-child transmission (PMTCT) in Nigeria. Using a decision-analysis model to calculate cost and effects, the authors provided data for policy decisions on PMTCT regimen selections at different levels of program coverage. The authors found that if PMTCT was scaled up to reach 58 percent of HIV-positive mothers, HIV transmission in Nigeria can be reduced to 12.8 percent with the long-course ART regimen and 16.1 percent with short-course ART regimens/minimal standard of care. If PMTCT services are scaled up to reach all HIV-positive pregnant women, the long-course intervention reduces PMTCT to just 3 percent, compared to 9 percent if women receive the short-course ART regimen. Overall, the long-course ART regimen could avert 7,680 infant HIV cases and 230 to 400 disability-adjusted life years (DALY) among all pregnant Nigerian women who are living with HIV. According to the authors, the WHO-recommended regimen is associated with incremental cost-effectiveness ratios of US$113 per DALY averted and is a highly cost-effective intervention compared to short-course regimens. The authors strongly suggested that the Government of Nigeria should consider these cost savings and implement the WHO-

recommended long-course regimen in its effort to expand and scale-up its PMTCT program.[41]

A study done on investigating the relationship between male involvement in PMTCT and infant HIV acquisition and mortality among 456 HIV-positive female participants and 140 partners. The study revealed that Including male partners in antenatal prevention of mother-to-child HIV transmission (PMTCT) services with associated HIV testing has a positive health outcome on the infant and may represent an underutilized public health intervention, the researchers also found that HIV-uninfected infants of participants with male partner involvement had a 63 percent lower mortality risk than those whose partners did not attend. The study also demonstrated that infants of participants with male partner involvement demonstrated a significantly lower risk of HIV infection and greater HIV-free survival. Participants whose partners had been previously tested for HIV demonstrated better adherence to zidovudine treatment and were significantly more likely to formula feed their infants, thus possibly contributing to lower risk of vertical transmission. The lower risk may also be attributed to increased financial, physical, and/or psychosocial support for the HIV-infected pregnant woman and her infant. The authors also observed a disturbing trend: greater mortality risk among HIV-infected infants born to women with partner attendance. According to the authors, although male involvement has been proven effective in lowering risk of HIV infection, obstacles within health systems still inhibit male participation, and these barriers should be addressed before increasing outreach to male partners.[42]

A study done on combining sexual and reproductive health (SRH) services with routine HIV clinical visits. The systematic review examines nine studies of current practices and presents evidence of effective programming of sexual and reproductive health (SRH) services

targeted to people living with HIV in both resource-limited settings and resource-rich environments. The study revealed creating a strong provider-client rapport will lead to improved SRH services for people living with HIV. All nine studies examined HIV clinics that added SRH services to meet their clients' needs, as opposed to reproductive health clinics that added services for people living with HIV. The clinical services included family planning, maternal and child health, and STI prevention and management services. Interventions offering family planning and/or STI services to people living with HIV led to improvements in such behavioral outcomes as increased condom and contraceptive use, as well as lower indices of such health issues as unplanned pregnancies and STIs. The authors found that it was important to combine information on potential side effects of contraception with adequate follow-up, as well as offering alternative methods that require minimal client knowledge for correct use, such as Norplant. Including men in decision-making about safe sex and contraception and in proactive rescheduling of missed clinic visits were also reported as important factors in improving SRH services for people living with HIV.[43]

A Kisimu Breastfeeding Study done in Kenya, of a single-arm, open-label trial conducted between July 2003 and February 2009, examines the safety and effectiveness of providing HIV-positive women with a maternal triple-antiretroviral regimen from late pregnancy through six months. Participants in this study were given zidovudine, lamivudine, and either nevirapine or the protease inhibitor nelfinavir from 34 to 36 weeks of pregnancy to six months postpartum. All of the infants born to HIV-positive participants also received single-dose nevirapine at birth. The women were advised to rapidly wean their children just before six months. Using a Kaplan-Meier statistical method, the researchers found that this trial regimen achieved 6-week and 18-month HIV transmission rates of 4.2 percent and 6.7

percent respectively. HIV transmission rose from 2.5 percent at birth to 7 percent at 24 months. At 24 months, 3 percent of infants born to HIV-positive women with a low viral load were HIV-positive, compared to 8.7 percent of babies born to mothers with a high viral load. According to the authors, these findings are consistent with other studies and demonstrated that providing women with a triple-antiretroviral regimen from late pregnancy to six months, regardless of their baseline CD4 cell count, is a safe, effective, and feasible way to reduce mother-to-child HIV transmission in resource-limited settings. The findings support recent World Health Organization guidelines that recommend either the mother receive triple antiretroviral therapy or the infant receive antiretroviral prophylaxis.[44]

In a study done between October 2007 and February 2008, the researchers conducted focus groups, in-depth interviews, and a cross-sectional survey among mothers, fathers, and health care workers in five reproductive and child health clinics, creating male-friendly spaces within PMTCT programming, while continuing to provide empowerment programming for women, must be a priority in creating quality PMTCT programs. These results were based on a mixed-methods study exploring the structural and cultural challenges (e.g., men's attitudes toward testing procedures, partner disclosure, condom use, and infant feeding recommendations) to male involvement in PMTCT programs. The result of the study revealed that ingrained ideas about gender roles and hierarchy played a major role in inhibiting male involvement in prevention of mother-to-child transmission (PMTCT) programming. The authors found those participants' male partners strongly supported women's participation in the PMTCT programs and routine testing for pregnant women. However, they were much more resistant to certain program components such as partner testing, condom use, and infant feeding recommendations. The main barriers to partner

testing were female participants' reluctance to ask their husbands to be tested and the view among men that antenatal clinic settings are a woman's domain. The authors indicated that rather than focusing on the attitudes of men, programs should explore such options as setting aside "men-friendly" spaces in PMTCT clinics, providing facilities for men or specifically for pregnant couples and developing condom use messaging directed towards men.[45]

In a retrospective cohort analysis of 1,813 HIV-infected pregnant women in Lusaka, Zambia, it was found that women who received highly active antiretroviral therapy (HAART) for at least 13 weeks prior to delivery experience a 5.5-fold decreased risk of transmitting HIV to their infants compared to women on HAART for four or fewer weeks prior to delivery. According to the authors, these results confirm that mother-to-child transmission can be reduced to below 5 percent in African settings with the use of HAART. To achieve this, they encourage that HAART be initiated in eligible pregnant women at least 13 weeks prior to delivery, and in settings where this is not possible, at least four weeks prior to delivery. The study also found that a positive syphilis screen during pregnancy can also lead to increased risk of vertical transmission. The authors stressed the importance of encouraging women to seek antenatal care early in pregnancy, and urged medical staff to determine eligibility for HAART and provide linkages to appropriate treatment and care services. The authors also urge an increased focus on improving clinical and laboratory services and the integration of HAART services into antenatal clinic settings. Moreover, they urge antenatal clinics to increase the screening and treatment of syphilis, and to provide credentials for nurses and midwives to prescribe HAART.[46]

A Mathematical modeling study was used to estimate the epidemiological impact and cost-effectiveness of these types of interventions in a hyper-endemic setting such as KwaZulu-

Natal, South Africa. The authors tested 16 different implementation scenarios that combined or staggered PrEP, early ART, and such non-ARV-based HIV prevention approaches as medical male circumcision, or that tested each intervention alone. The study revealed that Antiretroviral (ARV)-based HIV prevention strategies, such as pre-exposure prophylaxis (PrEP) and early antiretroviral therapy (ART) to lower viral load, are unlikely to have a major impact on HIV incidence as stand-alone interventions, according to these analysis (i.e. they found that PrEP is too costly to offer widely to non-infected individuals and thus, by itself, has little potential for achieving a population-level prevention effect). On the other hand, the authors found that, while early ART for infected individuals alone is less expensive; it is also less effective in decreasing HIV incidence to low levels. The authors concluded that ARV-based prevention approaches work best and most affordably as part of a larger combination HIV prevention strategy that achieves an optimal balance between cost and effectiveness in providing ARVs for infected and uninfected individuals. They suggested that implementing PrEP and early ART together with medical male circumcision and other prevention interventions at high coverage could achieve a dramatic and cost-effective drop in HIV incidence at the population level.[47]

In this systematic review done on 19 articles published between January 2001 and May 2010 on behavioral HIV prevention interventions for heterosexual men in 12 lower-and middle-income countries with a high burden of HIV. These articles report on a variety of interventions focusing on condom use, numbers of sexual partners, alcohol use alone or associated with sexual acts, and intimate partner violence (IPV). Overall, the majority of interventions led to positive behavior change in condom use, reduced IPV, and mixed results in behavior change in alcohol use, but had little effect on reducing the number of sexual

partners. The authors argued that, as shown by how few studies they were able to identify for review, heterosexual men are an underserved population for prevention programming, particularly interventions to address multiple sex partnerships and alcohol use. The authors also offered other tentative conclusions: interventions to improve condom use would benefit from individual-level counseling strategies, peer education may not be an appropriate strategy for increasing condom use among people who inject drugs, and the information-motivation-behavioral (IMB) skills model in group settings is a promising approach for reducing the number of sexual partners as well as alcohol consumption. The authors further recommended the inclusion of biological measures-HIV prevalence or incidence-in research designs.[48]

In a study done in South Africa revealed that receiving a HIV-positive test result can prompt individuals to cut back on unprotected sex, especially after they became aware that they're in an HIV-discordant relationship, according to this study? The authors reported on an analysis of data derived from the Partners in Prevention HSV/HIV Transmission Study, a four-year randomized trial of the effectiveness of acyclovir in preventing sexual transmission of herpes simplex virus 2 and HIV-1. That study gathered self-reported behavioral data from 508 HIV-infected study participants at three sites in South Africa; including information collected at baseline on the timing of sexual behavior change after one partner received a positive HIV test result. Comparing the behaviors of participants at baseline and at months one, six, and twelve, the authors found that HIV testing and counseling (HTC), particularly HTC for couples, helps HIV-discordant stable couples decide to adopt consistent condom use, with increased condom uptake beginning in the first week after couples HTC. For example, 71 percent of HIV-infected partners in discordant relationships reported unprotected sex at the

time of their diagnosis, which dropped significantly to 8 percent after only one month. The authors concluded that mutual awareness of discordancy within a relationship results in more HIV-protective behaviors than individual awareness of one's HIV-positive sero-status.[49]

In a reported study on the results of a qualitative study of men who had sex with men (MSM) and of female sex workers (FSWs) participating in a four-month trial of pre-exposure prophylaxis (PrEP) in two Kenyan cities. Ten focus group discussions and seven in-depth discussions were held with a sub-population of 51: 46 MSM and 5 FSWs representing a sample of "good", "moderate" and "low" adherers. Discussion topics included the pros and cons of the pill being used for the study, dosing scheduling and adherence measures, and issues experienced by the participants during the study. The authors found that these key populations at high risk of HIV infection find PrEP to be highly acceptable, although dosing, social and adherence issues present challenges to successful implementation. Several FSWs compared PrEP favorably to condoms as a prevention strategy, since client consent is not required. A number of participants reported side effects, including diarrhea and headaches, but overall, these were not perceived as too severe to inhibit adherence. One widespread experience was fear of stigma should others learn that a participant was taking PrEP, so many participants took their PrEP medications secretly or lied about what kind of pills they were taking.[50]

A qualitative study done on examination of the role of property rights violations, in playing an increasing role in increasing sexual transmission of HIV in two rural areas of Kenya with high HIV prevalence. The authors interviewed 50 people-legal professionals, community leaders, and other implementers-involved in a community-based program to help women protect themselves from property rights violations, disinheritance, asset stripping, and related

HIV risk. They asked these implementers to explain how they perceive the loss of property rights as influencing primary and secondary HIV transmission in the region. Many reported that the program's home-based caregivers discovered that some women clients "disappeared" suddenly, usually after a husband died and in-laws evicted her from the home. Nearly every implementer said that in-laws justify these actions by blaming women for infecting their sons or brothers. Another widely shared perception is that these violations exacerbate the epidemic by driving newly impoverished widows and often their children into migration, food insecurity, and sometimes commercial or transactional sex work. The study also queried implementers about such cultural practices as wife inheritance and "sexual cleansing" that can increase risk of HIV infection. The authors recommended that research continue on property rights violations to devise more effective responses and informed policy initiatives to counter this structural challenge to HIV prevention for women.[51]

A qualitative study done to examined the social, cultural, and economic factors that drive concurrent sexual partnerships in Khayelitsha, a township in Cape Town, South Africa. The authors conducted small-group discussions and focus groups with men and women who had participated in the Khayelitsha Panel Study on sexual partnerships. All participants expressed the belief that concurrent partnerships are very common in their community, as research showed was the case across South Africa. The two primary reasons given for the practice of concurrent relationships were monetary gain in the form of financial or material exchange, with men expected to provide for female partners, and sexual frustration with a main or secondary partner; both explanations are in line with findings from earlier research. Separation from a main partner and alcohol use were also cited as reasons for having concurrent partnerships. Despite widespread awareness about the increased risk of HIV,

most respondents said this does not deter most people from multiple partnerships. Concluding that concurrent partnerships are in fact a social norm in this community, the authors opined that the practice may be difficult to curtail. They suggested that individual-level interventions such as improving economic status and increasing sexual satisfaction within relationships could contribute to reducing concurrency. Prevention messaging that focuses on protecting a primary partner by using condoms with other partners may also be beneficial.[52]

In recent years, more demanding standards for developing public health policy and programming called for decisions based on evidence. While randomized controlled trials (RCTs) are considered the gold standard for gathering evidence, they are very costly, may not be feasible because they require large study populations, and often present ethical challenges, particularly in HIV-related studies. The researchers discussed an affordable new method they developed to build evidence, the Highest Attainable Standard of Evidence (HASTE) system, which uses data from existing studies and program implementation to assess HIV interventions specifically for men who have sex with men (MSM). The HASTE process—which was a modification of several evaluation tools-triangulates efficacy data, implementation data, and biological and public health plausibility to assess interventions for MSM, using a multidisciplinary team to review these data. HASTE then applies four grades to classify the evidence: Strong, Conditional, Insufficient, and Inappropriate. The authors argued that HASTE is an appropriate method for assessing evidence on MSM because much of the data about key populations comes not from RCTs but from the programming experience of small-scale organizations that implement interventions. The authors

recommended that HASTE be used to develop an evidence base for advocacy for MSM programming in low- and middle-income settings.[53]

Research on forced sexual initiation and sexual intimate partner violence (IPV) showed that these practices contribute significantly to HIV infection risk for women in low- and middle-income countries, according to this systematic review. The authors analyzed 21 studies published since 2000 that examine a broad and complex set of correlations between HIV risk and sexual violence against women in six countries. The authors found that these associations vary by studied population; for example, one study in Uganda found that women 20 to 44 years old had significantly elevated HIV risk if they had experienced forced or coerced first sex before they were 18. Different studies set in different parts of the world show that women's experienced violence has also significantly increased such high-risk behaviors as low condom use, involvement in multiple partnerships, and injection drug use, as well as having a history of sexually transmitted infections. The authors pointed out several barriers to gathering data to develop anti-violence strategies for women, including very low reporting to law enforcement and a lack of precise terminology to use in this field, as well as different cultural perceptions of what constitutes IPV. They recommended the use of culturally tailored screening to identify victims of sexual IPV at health clinics, law enforcement settings and shelters, and HIV program settings.[54]

In his introduction to a special issue of the journal "Current Opinion in HIV and AIDS 2012, Mayer presents an overview of recent research on the use of antiretroviral (ARV) drugs for HIV prevention. He points out that, despite the remarkable proof of concept achieved in results from trials of vaginal microbicides containing ARVs (CAPRISA 004), pre-exposure ARV prophylaxis or PrEP (iPrEX), and early initiation of treatment for sero-discordant

couples (HPTN052), other studies of the same ARVs (FEMPrEP and VOICE) have not shown efficacy for prevention. As research continues, Mayer urges close examination of these contradictory results to move the field forward. The 15 additional articles in the issue review a wide range of studies and propose next steps for research. Hendrix addresses complex pharmacological issues related to dosing that could explain differences between trial results. Aspects of acceptability and adherence are covered by Van Damme and Szpir, Amico, Paxton, and others. Baral, Poynten, and their co-authors focus on research targeting key populations such as men who have sex with men and people who inject drugs, while McGowan describes progress toward Phase 2 trials for rectal microbicides. An article by Schackman and Eggman recommended cost-effectiveness studies to improve PrEP implementation and lessen the impact on health budgets. Abraham and Gulick discuss the potential for using ARVs other than the standard tenofovir and emtricitabine for prevention.[55]

An ethnographic study done explored the gender and relationship dynamics behind women's rejection of condom use initiated by their male partners. Over the course of 14 months, the author followed a sample of 25 HIV-positive South African men participating in HIV support groups. Encouraged within their groups to change behaviors and adopt safer sex practices, many of the men attempted to use condoms with their female partners. However, not all disclosed their HIV-positive status to each partner for multiple reasons, including fear of abandonment and of stigmatization. According to the author, several of the female partners, most of them unaware of their partners' positive sero-status, rejected condom use. The author interpreted the women's refusal to accept condoms as one way to challenge male authority over sexual decision-making, pointing out that many South African women felt

their social value is determined by their childbearing capacity, so they may reject condoms as contraception. While the men were often willing to abandon more casual partners who refused condom use, they did not leave wives or long-term girlfriends who did the same. The author concluded that it's important for interventions to promote better interpersonal communications about sex to facilitate disclosure of HIV status and encourage joint decision-making on condom use to protect HIV-negative partners.[56]

A study done on the consistent condom use still remains a difficult goal for most men to achieve, especially those in casual sexual relationships, according to the authors. These findings are based on an analysis of interview data from four African countries with generalized epidemics-Namibia, Swaziland, Tanzania, and Zambia-on the effect of marital status and number of partners on consistent condom use. The research team limited the sample population of 6,800 men to those who in the previous year had any casual (non-marital, non-cohabiting) sex partners. The data revealed that 41 percent of study participants in Zambia and 70 percent in Namibia used a condom every time with at least one partner; most were unmarried and non-cohabiting. Multivariate results in Swaziland and Zambia show that unmarried/non-cohabiting men with one casual partner were significantly less likely to use condoms consistently than were married/cohabiting men with casual partners. According to the authors, these results indicate that prevention programming should concentrate on increasing condom use by men in casual or multiple partnerships and similar risky sexual relationships. In general, higher education, religious affiliation, knowing one's HIV status, having an STI, having a single lifetime partner, and positive attitudes about condoms were significantly associated with using a condom every time with any partner. The

authors recommended that condom use messaging be targeted to men according to the number and types of relationships they have.[57]

A systematic review done to examines epidemiological evidence of the effects of hormonal contraception (HC) on the risk of HIV transmission from an HIV-positive woman to an HIV-negative man. The authors reviewed 12 studies with both direct evidence on HC use and HIV transmission and indirect evidence based on such proxy measures for infectivity in women as genital shedding or plasma viral load. The review identified only one study with direct evidence that both oral contraceptive pills and injectable HCs raise HIV risk (although only the estimates for injectables are significant). The 11 studies that yielded indirect evidence were very heterogeneous in size and approach, using different methods and providing a wide range of largely inconclusive results. For example, evidence of association with genital viral shedding was inconsistent for oral contraceptives and limited for injectables. The authors strongly recommended that, given how little direct evidence is available, more research be conducted on different HCs to determine their impact on HIV transmission. They noted that understanding the effect of HCs on HIV transmission is especially important to support programmatic efforts to expand contraceptive choice for women in developing countries while simultaneously promoting HIV prevention efforts.[58]

A study done in South Africa on monitory of success in implementing of PMTCT programme and also to identify gaps for early intervention, South Africa had progress from prevention to elimination of HIV infection in children.

The study was stratified according to the geographical location, age of the patient and testing result over 10 years, demonstrated the utility of laboratory data for monitoring the trend in

EID coverage of early vertical transmission rate by extracting from National Health Laboratory Services (NHLS) cooperate data ware house, the result of infants who had PCR at the age of 6/52.

The result reveled a rapid scale up of EID over the 1st decade of PMTCT programme, was evident from the 100-fold increase in PCR test to 350,000 by 2012.

The author concluded that by 2012, 73% of the estimated 270,000 HIV exposed infant to requiring an early PCR was tested and early vertical transmission rate had fallen to 2.4% as a result of successful implementation of PMTCT programme.[59]

A retrospective study done in six health facilities in cross river and Akwa Ibom states, south-south Nigeria, describes the finding from an EID programme and the effectiveness of PMTCT intervention.

Record of 702 perinatally exposed infant age 6 weeks to 18month who had PCR testing from November 2007-July 2009 were reviewed. Detailed of ARV regime received for PMTCT, BF choice, HIV test result turnaround time for result and post test ART enrolment status of the infant were analyzed also.

The result revealed transmission rate for mother-infants pair who received ARVs was 4.8 % (CT 1.3, 8.3) at 0-6/52.

Those who neither baby nor mother received any intervention 19.5 %(CI3.0-35.5) Regardless of the intervention, transmission rate for infants aged 6/52-6/12 who had mixed feeling was 25.6% (CI 29.5, 47.1).

Vertical transmission was 8 times more likely in sub-group of mother-infants pair who did not receive ARVs compared with mothers infants that received ARVs. HMP of 125 HIV positive babies found that 31(25%) were enrolled into paediatric ART programme, 9(7%) died before return for their PCR result and 85(65%) could not be traced and were presumed to be lost to follow-up.[60]

Key populations that are at high risk for HIV - men who have sex with men, people who inject drugs, sex workers - get special focus in this latest guidance from the Office of the Global AIDS Coordinator. The guidance for writing country operational plans (COPs) reflects goals for the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) to be met by the end of 2013, as elucidated by President Obama, who called this era "the beginning of the end of AIDS" on World AIDS Day 2011. In addition to key populations, the guidance also puts greater focus on programming for HIV-related tuberculosis and specifically directs PEPFAR teams in countries with severe epidemics to increase budgetary allocations to HIV treatment. Other goals include treating more than 1.5 million HIV-positive pregnant women with antiretroviral drugs (ARD) to prevent mother-to-child transmission, supporting more than 4.7 million voluntary medical male circumcisions in Africa, supporting more than 6 million HIV-positive people on ARDs, and distributing more than 1 billion condoms. The contents include preparing COPs, setting priorities, meeting earmarks, following reporting requirements, preparing budgets to conduct activities, and managing operations. COPs for each of 31 countries require preparing one reflects the input of all U.S. Government agencies working in HIV activities in that country and thus encourage teamwork in planning and achieving goals.[61]

Using data from 25 countries with the highest numbers of pregnant women living with HIV, this study assessed the reduction in new child HIV infections resulting from prevention of mother-to-child transmission (PMTCT) during the past 10 years and projected the impact of new World Health Organization PMTCT guidelines between 2010 and 2015. In all 25 countries, the authors found a 24 percent reduction in the estimated annual number of new infant infections, of which one-third occurred in 2009 alone. Moreover, one million new child infections will be averted by 2015 if 90 percent of pregnant women living with HIV receive the recommended antiretroviral drug prophylaxis. Additionally, the authors found that these gains will be limited as long as prolonged breastfeeding is in place; they endorse the call for limiting breastfeeding to 12 months. This will require more effort to educate women about the risks and benefits of breastfeeding, particularly over long periods, and to improve the safety of infant feeding. The authors called for a significant investment in and commitment to PMTCT and reducing new HIV infections among women of reproductive age over the next five years. They also note the importance of strengthening linkages and access to family planning services to meet the goal of virtual elimination over the next five years.[62]

A two clinical trial teams, of Partners PrEP and TDF2 study was done, the Partners PrEP did double-blinded randomized trial, was led by the University of Washington's International Clinical Research Center, enrolled 4,758 HIV sero-discordant couples from Kenya and Uganda. One-third of the HIV uninfected partners received tenofovir (TDF), one-third tenofovir with emtricitabine (FTC/TDF, also known as Truvada), and one-third a matching placebo. During a mid-study review, the result was determined that those who received TDF had an average of 62 percent fewer HIV infections and those who received FTC/TDF had 73

percent fewer HIV infections, compared to those who received a placebo. Based on these positive results, the Partners PrEP study data and safety monitoring board recommended publicizing the study results, discontinuing the placebo arm, and providing placebo recipients with either TDF or FTC/TDF PrEP.

In the second trial of TDF2 led by the U.S. Centers for Disease Control and Prevention (CDC), 1,200 study participants not living with HIV received either a placebo or a daily oral dose of Truvada. Primary analysis showed that those receiving Truvada were 62 percent more likely to be protected against HIV than those in the placebo arm. In late 2010, findings from the Pre-Exposure Prophylaxis Initiative (iPREX) trial showed that FTC/TDF was also effective in preventing HIV among men who have sex with men. However, the FEM-PrEP trial failed to show that Truvada was more effective than a placebo protecting high-risk heterosexual women. As a next step, the CDC will begin reviewing all heterosexual trials with an eye to developing guidelines for PrEP use among heterosexual men and women in the United States.[63]

A Retrospective study done in Malawi on the estimation of efficacy of Post-Exposure Prophylaxis of Infants from the 2009, analysis compared outcomes in 3,126 infants uninfected at birth in three groups: 1,071 who received extended nevirapine (NVP); 1,051 who received NVP plus zidovudine (ZDV); and 1,004 in the control arm. After 24 months, the rates of HIV infection rose to 11 percent in the extended arms compared to 15.6 percent in the control arm. Breastfeeding in all of the study arms ranged from 88 to 100 percent. Approximately 96 percent of the women practiced exclusive breastfeeding for up to six months postpartum. Finally study showed that providing an extended antiretroviral prophylaxis for all uninfected breastfeeding infants of HIV-positive women can reduce the

risk of infant HIV exposure by 70 percent during the period of prophylaxis. Africa, early cessation of breastfeeding may lead to infant death due to other water-borne illnesses; breastfeeding is crucial to infant's survival even if the mother is HIV-positive. The authors concluded that this study highlighted a safe and reliable way to breastfeed while still preventing mother-to-child transmission.[64]

A randomized controlled trial study was conducted in Zambia in 12 antenatal clinics to assess the effectiveness of integrated perinatal prevention of mother-to-child transmission (PMTCT) programs (consisting of HIV testing, antiretroviral prophylaxis or therapy, safe obstetric practices, and infant feeding counseling) on increasing PMTCT service uptake, compared to non-integrated and partially integrated programming. A scan of 28,654 references and ongoing trials conducted between January 1990 and July 2010 found that only one study suggested that integrating perinatal PMTCT programs with other health care services leads to a higher proportion of pregnant women, mothers, and infants receiving PMTCT services in the labour ward. The authors concluded that additional studies are urgently needed to measure the effects of integrated perinatal PMTCT on coverage, service uptake, quality of care, and health outcomes, as well as to determine the best integration strategies.[65]

Early results from the HIV Prevention Trials Network (HPTN)-046 (South Africa, Tanzania, Uganda, and Zimbabwe) demonstrated a reduction in postnatal HIV transmission at age six months with extended once-daily infant nevirapine (NVP) prophylaxis among breastfed HIV-exposed infants whose mothers were counseled to stop breastfeeding at six months. Eligible HIV-uninfected infants, who received standard of care NVP for the first six weeks, were then randomized to receive extended daily NVP or placebo, from age six weeks to six

months. The authors analyzed longer-term safety and efficacy at eighteen months after prophylaxis had ended (759 infants in the NVP arm; 763 in the control arm). While there was a statistically significant reduction in transmission risk in the NVP group from age six weeks to six months, no differences were found in postnatal transmission rates between six and eighteen months. These results suggested that infant NVP is effective during the first six months of breastfeeding, but its effectiveness weakens after prophylaxis ends. However, cumulative transmission rates between six weeks and eighteen months were low. The authors concluded that the finding of early, but not late differences, in postnatal transmission between the NVP and control groups highlights the importance of continued prophylaxis throughout breastfeeding.[66]

HIV partner services-wherein trained staff interview persons diagnosed with HIV about their sexual partners in an effort to notify and test partners are uncommon in low-income countries. The authors evaluated a HIV partner services program implemented in Cameroon since 2007. The findings showed that the HIV partner services implemented in various testing facilities were feasible, can identify many HIV-positive persons and link them to care, and offer an avenue for reaching HIV-positive men. Health providers interviewed 1,462 index cases during the study (73 percent female), receiving information on 1,607 partners. A notification plan was developed for 93 percent of partners; 60 percent of clients chose to have providers notify their partners. In total, 1,347 (84 percent) of partners were successfully notified; partners of married index cases were more likely to be informed. Nine hundred partners (67 percent) were tested for HIV; 50 percent were positive (and most were linked to HIV care and treatment). The program has expanded into prevention of mother-to-child transmission programs. Future research should evaluate the effect of HIV partner services on

partnerships, and the program's cost-effectiveness, potential negative consequences, and impact on perinatal transmission and sexual risk behavior in discordant couples; operational studies should investigate populations where partner services programs can be most effective.[67]

CHAPTER THREE

METHODOLOGY

3.1 Background of Study Area

Asokoro District Hospital, Abuja, FCT is a planned city as it was mainly built in 1980s and officially became Nigeria capital on 25th December, 1991 replacing the previous capital Lagos. As of the 2006 census, the FCT has a population of 776,298 making it the tenth populous city in Nigeria.

Geographically, it has a land area of 8,000 square kilometers, and is bounded on the North by Kaduna state, on the west by Niger state, on the East & south east by Plateau state and on the south west by Kogi state. It falls between latitude, $7^0$25' North and $9^0$20 North of the equator and longitude $5^0$45' and $7^0$39'.

Its inhabitants are representatives of the federation as per religion, Education and ethnicity and social status. Asokoro District Hospital, Abuja is one of the 11hospitals of FCT and one with the highest number of patient's attendees and offers quality health care for FCT residents and those of its adjoining states.

Asokoro District Hospital is located in Asokoro District which is east of Garki District and south of Central District. It is one of the exclusive districts of Abuja and houses virtually all the federal cabinet ministers. In addition the president's residence (Aso Rock Villa) is also in Asokoro District.

The hospital has various departments and offers secondary health care services. Currently there are 15 consultants, 38 medical officers, 91 Nurses, 51Technical staff. Made up of Pharmacists, Physiotherapists, and laboratory technician and laboratory scientists. 22

account staff and 13 administrative staff and some security officers & Cleaners. The hospital offers medical, surgical, obstetric and gynecological services, paediatric services, maternal & child services, family planning care and comprehensive HIV/AIDS care.

The department of Obstetrics & Gynecology in collaboration with Paediatric Department, with the laboratories works together in the care given to mothers and their HIV expose Infants. The O&G Department have 2 Consultants, 7 Medical Officers and 37 nurses, out of this, 8 nurses offer ANC services and out of the 8, 2 are counselors. The ANC clinics have a monthly average attendance of 311 and about 3,732 attendees annually.

PMTCT programme started in the hospital on 14th march, 2006 with the support of FCTA and collaboration with the President Emergency Plan for AIDS Relief (PEPFAR) and Institute of Human Virology (IHVN).The scope of PMTCT of HIV services was deep and expanded. Service providers' capacity was developed, necessary infrastructures were improved and all core interventions were introduced and are in place.

3.2 Study Design

The study design is a quantitative descriptive cross sectional study to assess PMTCT and EID Asokoro district Hospital, Abuja. Three hundred and thirty six respondents were randomly selected

3.3 Study Population

The study population includes HIV positive mothers with their infants having inclusion criteria, all relevant health providers involved in PMTCT and infants care.

3.3.1 Eligibility criteria

Two eligible criteria were used for both mothers and infants; they include the Inclusive and Exclusive criteria.

The inclusion criteria for mothers:

1. Confirm pregnant woman.
2. Woman who have been counselled and tested for HIV and have positive result.
3. Who has attainted ANC /PMTCT in the health facility for atleast two times

The Exclusion criteria were:

1. Woman who was confirmed not pregnant.
2. Woman who have not been counselled and tested for HIV or without positive HIV result.
3. ANC attendees with less than two ANC visit

The inclusion criteria for infants were:

1. Infants whose mother's HIV status is confirm positive.
2. Infants whose mother had PMTCT.
3. Infants who had Post-Exposure Prophylaxis.

While the Exclusion criteria were:

1. Infants whose mothers HIV status is negative.
2. Infants whose mother did not have PMTCT.
3. Infants who did not have Post-Exposure Prophylaxis.

3.4 Sample Size Determination

3.4.1 Sample size for ANC

Sample sizes were arrived as follows:

For PMTCT: The p-value for PMTCT, base on study done on Central Hospital Benin, Auchi uroma and Saint catholic hospital in November 2006 with a prevalence of 0.935 another study done in Ethiopia by Lynette D., in 2012 on PMTCT: addressing attrition and loss to follow-up the study revealed attrition rate of about 10% .

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

$P = 0.935 \approx 0.94$

$q = 1-p = 1- 0.94$

$q = 0.06$

$d = 0.05$

$Z = 1.96$

Therefore $$n = \frac{(1.96)^2 \times 0.94 \times 0.06}{(0.05)^2}$$

$$n = \frac{0.2256}{0.0025}$$

$n = 90.24$

$= 98$

3.4.2 Sample size for early infants diagnosis (EID)

(HIV exposed Infants who attained paediatric outpatient clinic).

For population of more than 10,000

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

n = sample size

z = national standard deviation = 1.96

p = 0.5

q = 1-p = 1-0.5 = 0.5

d = sampling error (0.05)

$$= \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)}$$

$$\frac{4 \times 0.25}{0.0025}$$

$$\frac{1}{0.0025} = 400$$

Where n is when the population is greater than 10,000

But the population of clients at paediatric HIV Outpatient clinic from2011 is less than 10,000

(i.e. 345)

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

Where N is the total number of clients at paediatric HIV out patient clinic.

$$nf = \frac{400}{1 + 400/345} = \frac{400}{1 + 0.2965204236} = \frac{400}{2.1594202}$$

nf = 185

The sample size to study is 185 out of 345 clients.

3.5 Sampling Method

A systematic sampling method was used for selection of ANC clients as follows:

Sampling interval=Total population/Sampling size

311/98=3

Sampling Interval picked by balloting between numbers 1,2,3 and 2 was picked

2, 5, 8, 11, 14, 17, 20 ……..98

Sampling method for EID

A systematic sampling method was used for selection of subjects as follows:

$$\text{Sampling interval} = \frac{\text{Total population}}{\text{Sample size}}$$

$$\text{Sampling interval} = \frac{345}{185} = 1.8648648$$

Sampling interval is therefore = 2

Then numbers 0 to 2 were randomly pick as follows:

1, 3, 5, 7, 9,11,13,15 ------ -----185 etc

3.6 Data Collection

3.6.1 Data Collection Instruments

Three structured questionnaires were used, the first questionnaire was administered to the ANC attendees, the second was for EID and the third questionnaire was for the health care providers and all contained both open and close ended questions.

Two assistants were recruited and trained on how to administer & distribute questionnaire. The essence of training was to standardize the data collection and to reduce interviewers' bias. Health care providers were also involved in data collection; they included staff of the record office of the hospital as well as assessment guides who provided relevant information on PMTCT and site coordinators.

The ANC, EID clients and healthcare providers were briefed on confidentiality concern before administering the various questionnaires.

3.7 Data Analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 21, and result represented in tables and charts. The data were processed base on the objectives of the study and statistical Chi-Square test was tested.

3.8 Ethical Issues

An introduction letter was obtained from the Department of Community Medicine of Ahmadu Bello University, Zaria, to the chairman of Asokoro District Hospital. This is because the committee on Ethical Issues of Asokoro District Hospital needed to give the approval to conduct the study.

Before the ANC, EID were given health talk, verbal permission was obtained, a chance to ask questions before administering the questionnaire was given, clients answered without undue influence, induction and coercion.

3.9 Limitations

This study may have been affected in one way or the other by the following factors: shortage of workforce in Asokoro Hospital did not allow enough time for the study as one would have wished. The author still took her normal work load including call duty, e.t.c. Also most of the health care providers are not fully trained. This led to less than 100% response rate. It also affected the clarity of responses. Funding is also a problem.

CHAPTER FOUR

RESULTS

4.1 ANC Clients Assessment

Table 2: Socio-demographic Variables

Variables	Frequency (n=98)	Percent (%)
Age		
15-19	0	0
20-24	12	12
25-29	43	43
30-34	29	29
35-39	9	9
40-44	5	5
45-49	0	0
Marital status		
Single	5	5.1
Married	91	92.9
Divorce	2	2.0
Widow	0	0
Occupation		
House wives	30	30.9
Unemployed	24	24.7
Working	43	44.3
Missing	1	1
Education		
None	4	4.1
Primary	6	6.1
Secondary	33	33.7
Tertiary	50	5.1
Missing	5	5.1

From the table above, the total ANC clients were 98, those of age 25-29 years 43(43%) while those that were married are 91(92.9%) while 53(53.8%) attained tertiary education and 43(44.3%)were working class women.

Table 3: Distribution of satisfaction of ANC clients of services rendered to them by educational status in Cross-Tabulation

Educational Level	Frequency (n =96)	Percent (%)
None	4	100
Primary	6	100
Secondary	34	99%
Tertiary	52	99%

Base on the levels of their education, those with No education 4(100%) and 6(100%) those with primary education, were those that were most satisfied then followed by those with both secondary and tertiary education with 99%.

The statistical Chi-Square test revealed that there is no association between the levels of satisfaction of services rendered with the level of education of ANC attendees.

Table 4: Distribution of perception of time spent at ANC by the respondents

Variables	Frequency (n=98)	Percent (%)
Too much	30	30.6
Reasonable	63	64.3
Too short	5	5.1

Among 98 of ANC clients 63(64.3%) felt that the time spent at ANC clinic is reasonable.

Table 5: The Distribution of ANC Client's Levels of Awareness of HIV Counseling and Testing Services before Coming to the Health Facility?

Variable	Frequency (n=98)	Percent (%)
Yes	83	84.7
No	15	15.3

Of the 98 ANC clients 83(84.7%) knew about HIV counseling and testing prior to ANC attendance while 15(15.3%) had no idea about HIV counseling and testing.

Table 6: Distribution of ANC Clients Sources of Information about HIV Counseling and Testing

Variables	Frequency (n=98)	Percent (%)
From the mass media	80	81.2
Family	10	10.6
Friends	1	1.2
Others	7	7.1

Of 98 ANC clients, 83(84.7%) responded Yes for been aware of HIV counseling and testing and 80(81.2%) got their information through the mass media while 10(10.6%) got their information from families.

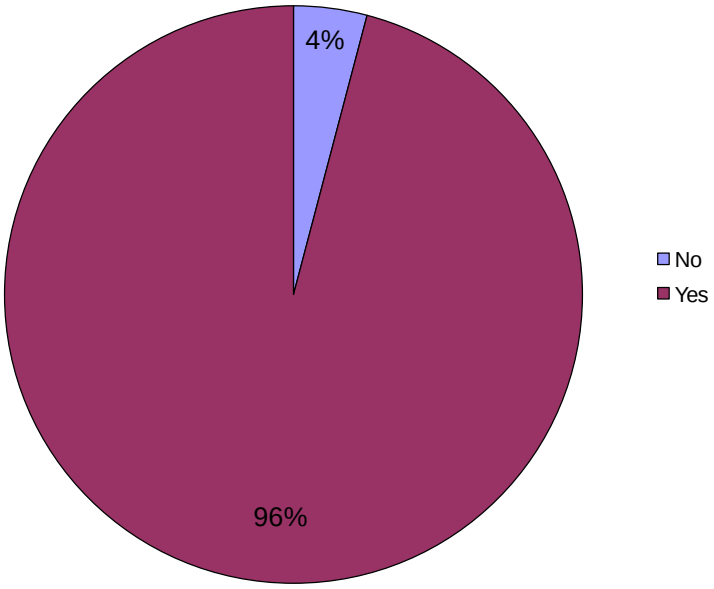


Figure 1: ANC client's level of satisfaction and the percentage

4.2 Distribution of Clients Accessing VCT Services

Table 7: Showing Distribution of clients assessing VCT services

Year	2007	2008	2009	2010	2011
Counseled and tested (Total)	4015	3486	3066	2233	3304
Collected result	3946	3230	2809	2233	3035
Not collected result	69	216	257	None	269
HIV serology positive	302	218	216	135	411
HIV serology negative	3644	3012	2593	2098	2624

For the year 2010 those who were pre- and post counseled were 2233 and all collected their result (i.e. 2233) but for year 2011, 3304 clients were counseled and tested, and 3035 collected their results (92%) while 269(8%) did not collect theirs.

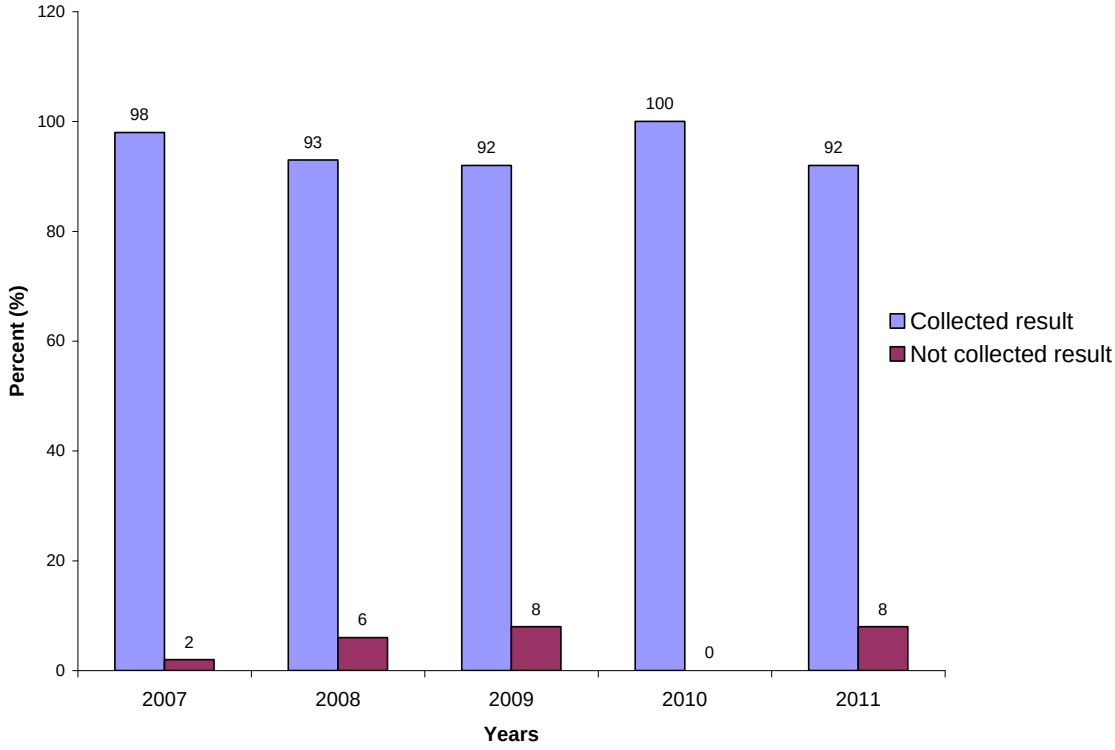


Figure 2: Percentage of those who collected and not collected result after being counseled and tested

In the year 2010 all ANC clients that were counseled and tested , all collected their 100% while in year 2011 3304 were counseled and tested , 3035(92%) collected their result and only269(8%) did not collected their result.

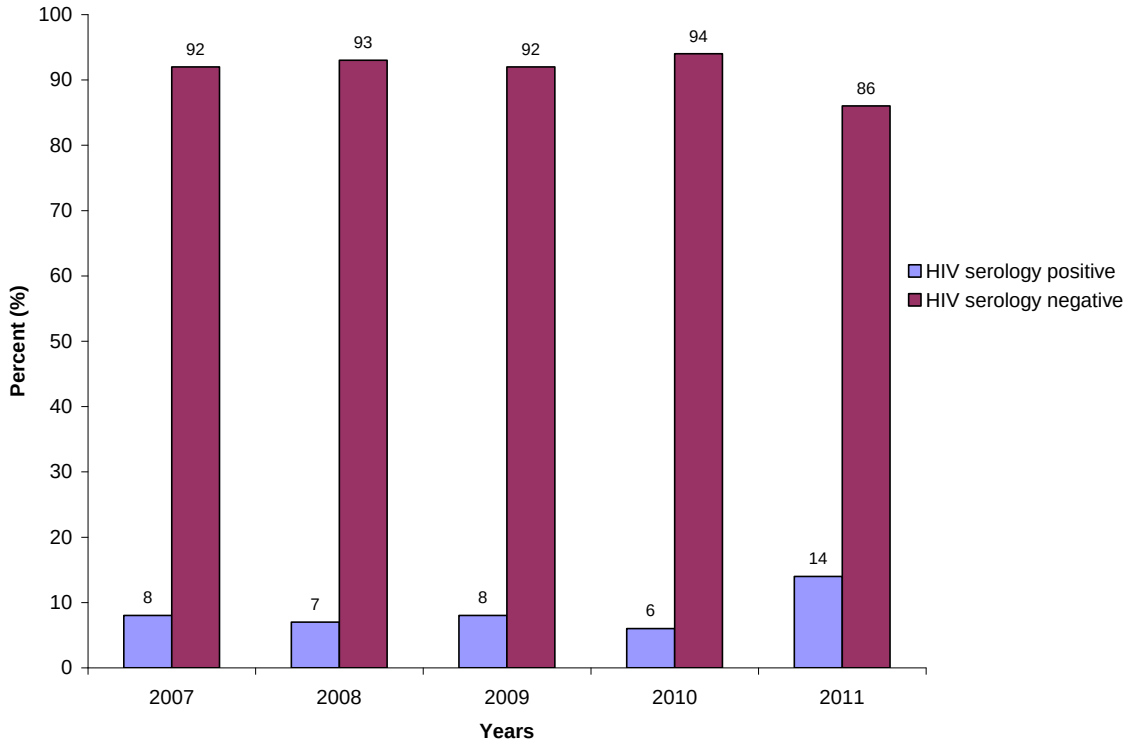


Figure 3: HIV sero- prevalence

HIV Sero- prevalence of 2011 for PMTCT this health facility is 14%, that FCT in 2005 was 6.5% while the national average was 4.4%.

Table 8: Couple counseling and testing and sero discordant clients

MONTHS from January-December	Total no. of patients	Females HIV positive	Female HIV negative	Partners sero-discordant Yes	Partner sero-discordant No	Post- test counseled Yes	Post- test counseled No
2010 Total	79	43	34	31	38	57	1
2011 Total	149	66	80	77	67	118	2

The total number of couples counseled and tested for 2010 and 2011 were 226; those that were positive were 109, while those that were negative are 114 while 3 are missing. Of 226 couples that were counseled and tested are 104 couples Sero discordant

4.3 Early Infants Diagnosis Clients Assessment

Table 9: Distribution of where mothers attended ANC

Variables	Frequency (n=185)	Percent (%)
Public Health Facility	176	95.1
Private Health Facility	9	4.9

Of the 185 HIV positive mothers of the HIV exposed infants, 176 (95.1%) attended ANC at Public Health facilities and only 9(4.9%) attended the private clinics.

Table 10: Distribution HIV Exposed infants have PEP (NVP)?

Variable	Frequency (n=185)	Percent (%)
Yes	175	94.5
No	10	5.5

Out of 185 HIV exposed infants, 175 (94.5%) had PEP, while 10 (5.5%) did not have.

Table 11: Distribution of when Infants Have DNA-PCR

Variable	Frequency (n=185)	Percent (%)
At birth	2	1.1
At 6/52	175	94.8
At >=18	7	4.0

Of the 185 EID clients, only 2 (1.1%) were tested at birth, 175 (94.8%) were tested at the age of six weeks, while 7(4.0%) were tested at 18 months and above.

Table 12: Distribution of the outcome of DNA-PCR testing

Variables	Frequency (n=185)	Percent (%)
Positives	24	13.1
Negatives	158	85.1
In determinants	3	1.7

Of the 185 HIV exposed infants, 158 (85.1%) had negative DNA-PCR, 24 (13.1%) tested positive while 3 (1.6%) had in determinant results.

Table 13: Showing Linkage of HIV Positive Infants to Further Care in Paediatric HIV clinic

Variable	Frequency (n=185)	Percent (%)
Yes	177	95.6
Absconded	3	1.5
Referred to another health facility	5	2.9

This table shows that 177 (95.6%) HIV exposed infants with positive PCR were referred to paediatric HIV clinic for further care while 5 (2.9%) were referred to another health facility and 3 (1.5%) absconded.

4.4 Health Care Providers Assessment

Table 14: Basic Qualification of Health Care Providers, Their Work Station in providing PMTCT services

Variable	Frequency (n=53)	Percent (%)
Basic training		
Medical Doctors	9	17
Registered Nurses/Midwives	31	58.4
Counselors	2	3.8
Laboratory Scientists	10	18.9
Others	1	1.9
Work station		
Variable		
Side Laboratory	9	17.6
VCT	2	3.9
Maternity	14	25.5
ANC nurses + Doctors (others)	28	52.9

Table 14 provides information on basic training and current job station of health care providers that are involved in PMTCT services. The staff predisposition as shown in table 9 comprised of medical doctors, registered nurses/midwives, counselors etc accounting to 17%, 58.4% and 3.8% respectively.

Table 15: Distribution of the knowledge of risk of transmission of MTCT of HIV among health care providers

Period	Frequency (n=53)	Percent (%)
During delivery	2	3.8
During delivery and through breast feeding	9	17
During pregnancy, delivery and through breast feeding	42	79.2

Among the 53 health care providers that responded, 2(3.8%) knew that MTCT HIV occurred during delivery, 9(17%) had knowledge that HIV can be transmitted via delivery and breast feeding while most of them i.e., 42(79.2%) knew that transmission can occur through pregnancy, delivery and breast feeding.

Table 16: Distribution of the knowledge of the health care providers on the estimation of risk of MTCT of HIV

Route	Correct	Incorrect	Do not know
During pregnancy	17(34 %)	28(56%	5(10%)
During delivery	19(41.3%)	16(34 .7%)	11(23.9%)
Through breast Milk	20(40.8%)	25(51.1%)	4(8.2%)

Its only 17(34%), 19(41.3%) and 20(40.8%) of respondents could correctly estimate the risk of MTCT of HIV during pregnancy, delivery and breast feeding.

Table 17: Distribution of the knowledge of factors that increase the risk of MTCT of HIV

Factor	Frequency (n=53)	Percent (%)
Recent infection with HIV	7	13.2
Severity of HIV infection	6	11.3
Obstetric procedures	10	18.9
Mixed feeding	4	7.5
Condition of the breast	8	15.1
Duration of BF and EBF	14	26.4
Others	4	7.5

It shows that 14 (26.4%) have knowledge on the risk of MTCT of HIV occurring duration breast feeding and exclusive breastfeeding, while 4 (7.5%) have least knowledge on mixed feeding.

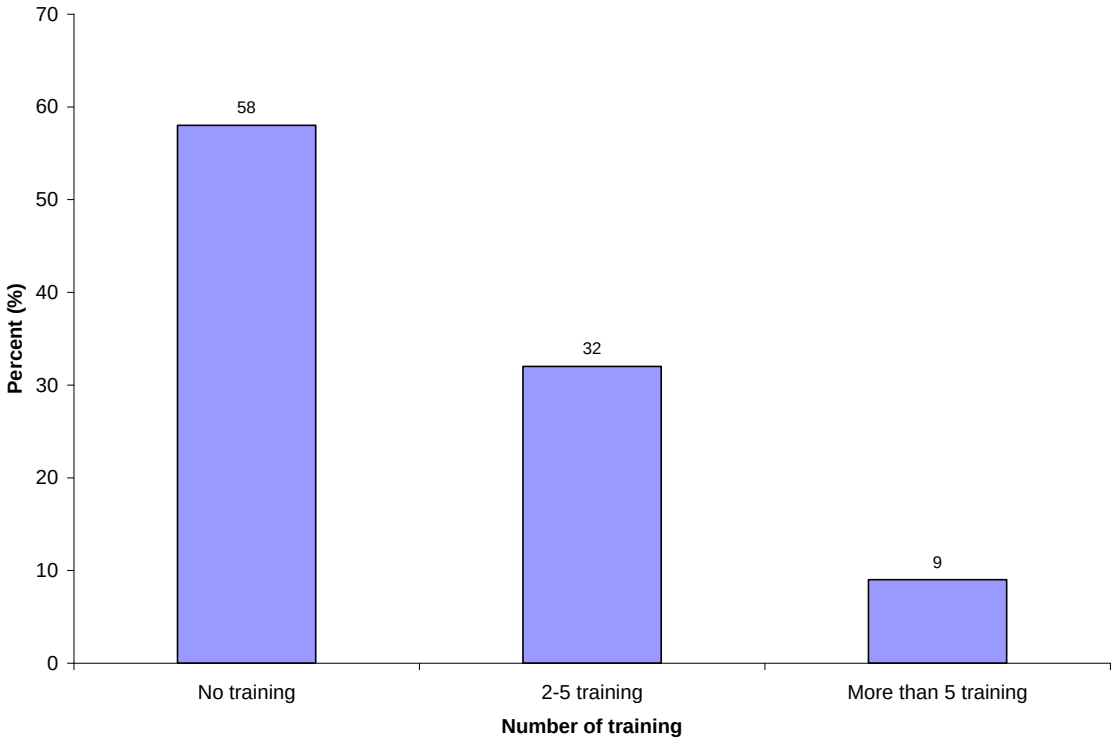


Figure 4: Distribution of those trained in PMTCT programme

Out of the 53 HCP that were involved in PMTCT and EID services, only 5 (9%) had more than 5 trainings, 17 (32%) had about 2-5 trainings and 31 (58%) had no training.

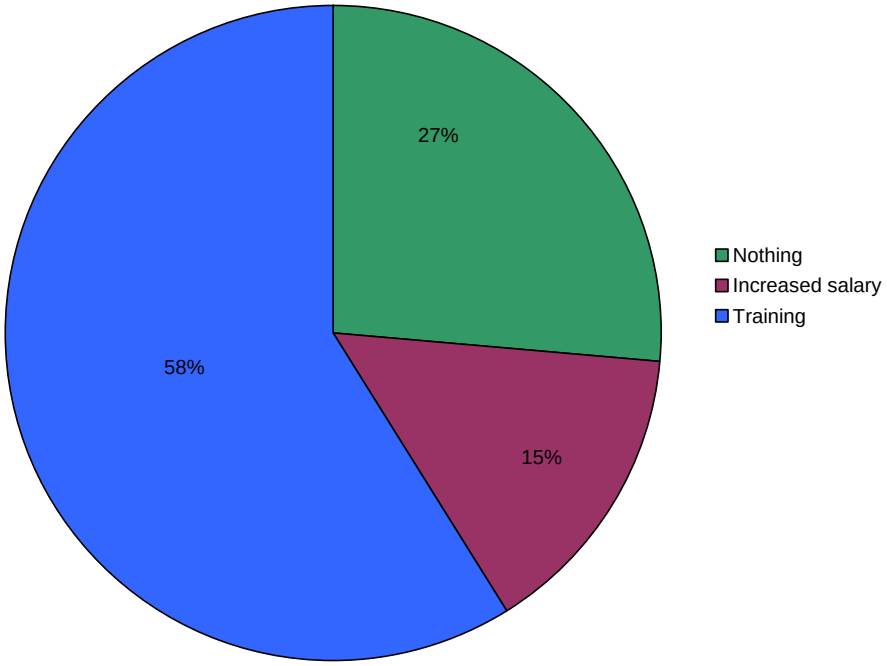


Figure 5: The percentage of incentive health care providers gets for PMTCT services

Only 25(73.5%) of Health care providers had incentives for been involved in PMTCT programme.

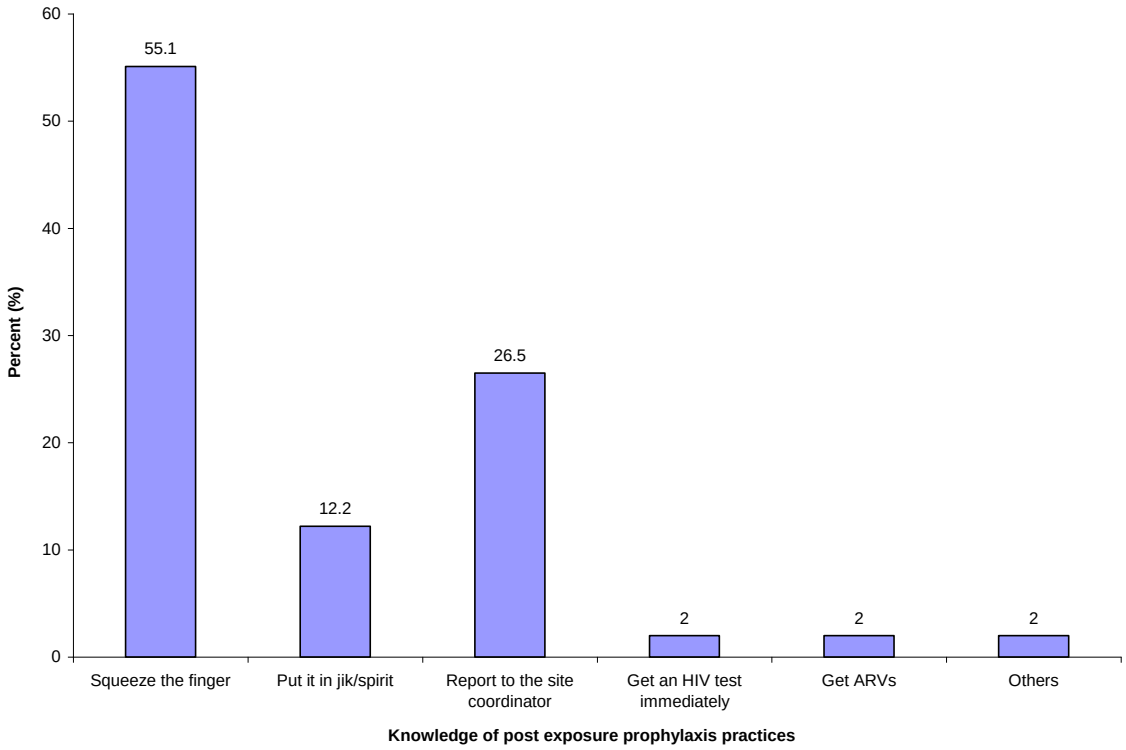


Figure 6: The distribution of the knowledge of post exposure prophylaxis practices

Most of respondents 27(55.1%) responded that they will squeeze the finger while 13(26.5%) will report to site coordinator.

Table 18: The distribution of health care provider's perception of problems facing the PMTCT services

Perception	Frequency (n=53)	Percent (%)
Lack of supervision	0	0
Lack of training	22	17
Lack of feedback on job performance	11	8
Lack of supplies	8	6
Inadequate facilities	15	11
Staff shortage	27	20
Too many patients	18	14
Poor working environment	17	13
Demoralized staff	9	7
Lack of time to do the job	6	5
People don't use the facility	0	0

Twenty percent of health care providers identified staff shortage as the major problem in service delivery followed by lack of training and too many patients.

CHAPTER FIVE

DISCUSSION

5.1 Socio-demographic Variable/Characteristics of ANC Clients

The age distribution of ANC respondents was from women of reproductive age 15-49 years. Tables 2 of the socio-demographic variable revealed that the largest groups of women who attained ANC was between the ages of 25-29 were 43 (43.9%) while the least were age 15-19 and 45-49. And based on their educational status, about 50 (53.8%) have tertiary education and this made administration of questionnaire better, while 43 (44.3%) were working class and 91(92.95) were married.

Table 3 revealed the level of satisfaction based on their educational status. Those most satisfied were those with no education and primary education.

Table 4 showed that out of 98 respondents, 63 (64.3%) believed that time spent at ANC was quite reasonable; 30 (30 .6%) believed that the time spent is too much, while 5 (5.1%) said the time spent is too short.

Table 5 and 6: reveal that ANC clients that are aware of HIV counseling and testing before coming to the Asokoro District Hospital Health Facility were 88(84.7%) while 15(15.3%) have no idea of VCT. For the 83(84.7%) that responded YES, 69(80.0%) said their source of information is the mass media, while 10(10.6%) heard it from the families. While 7(7.1%) from other sources e.g. ANC, Newspaper etc. One respondent1 (1.2%) heard it from friends.

5.2 VCT Clients Assessment

VCT – Services

Figure 3 and table 7 shows that in 2010, ANC clients were counseled and tested and all collected their result, and the HIV prevalence was 6%. While for 2011, those that were counseled and tested were 3,304, and those that collected their results were 3,035 (92%) and those who did not collect result are 269 (8%) and the HIV prevalence for that year was 14% with this high prevalence when compared with that of FCT 2005 which was 6.4%, HIV scourge is on the increase in Asokoro Hospital and PMTCT program need to be scale-up.

As shown in Table 8 the number of couples counseled and tested in 2010 and 2011 were 226,108 couples were Sero-discordant. In Kwazulu, South Africa Pr-EP been give to sero-discordant negative partner causesa drop in HIV incidence at the population level .[47] And also as suggested by Aluisio and co-researchers that male involvement in antenatal attendance and HIV testing will help decrease infants HIV infection and improve infant Health outcome and increased HIV-Free survival[53] The core interventions of PMTCT of HIV include VCT, improving obstetric care and taking of ART. The Sero-prevalence level of FCT in the year 2005 was 6.4% while that of the nation was 4.4%.This study is a vital tool of assessing, improving and up-scaling PMTCT of HIV in Asokoro District Hospital, FCT and the nation. The HIV Sero-prevalence of ANC attendees in 2010 and 2011 were 6% and 14% respectively, which 6% of 2010 is lower than that of FCT 2005, but higher than that of the national which was 4.4%, that of the 2011 was 14% higher than that of FCT 6.4% and national 4.4%. The National guideline and UNAIDS 2005 on PMTCT implementation advocate testing of all ANC attendees for syphilis which the center had adapted.

The infrastructure was satisfactory in terms of privacy but obstetric care lacked auditory and visual privacy just as what was obtained in four of the Kenyan hospital.[35] In any standard health facility there must be high level of confidentiality, which was found in the facility, where by folders had codes and names which were under lock and keys (in drawers). VCT for primes are on separate days, with the non premeds and their ANC days are also different.

A written protocol on VCT and obstetrics care is available and is been adhered to regardless of one's HIV status. National AIDS Council recommends that doctors were supposed to be central to a well-functioning obstetric service, proving clinical leadership, quality control and training role which supports and sustains the program.

In the center there are about 53 health care providers that are involved in PMTCT. VCT is done free, user fee not applicable but is applicable for VDRL testing of syphilis and obstetric care. The major source of PMTCT suppliers are Government and donor agencies and supplies in ADH are never run out. In improving obstetric care artificial rupture of membrane, episiotomies, and compulsory C/S isolation of HIV women were all stopped. ART (NVP) was been given to women who are HIV positive while in labour with also their infants. VCT services are offered to women and their infants with their partners (father) but obstetric care are offered to the women in labour and their infants after delivery.

Doctors are involved in obstetric and EID care. This contrasts with what was obtainable in South Africa's National AIDS Council recommendation where doctors were suppose to be central to a well-functioning obstetric service, providing clinical leadership, quality control and training role which supported and sustained the program.

EID: The objectives is to find out perinatal infection, transmission of HIV virus to infants born to HIV positive mother and to assess linkage to paediatric HIV clinic.

Table 9 revealed that of 185 mothers of HIV exposed infants 176(94.1%) had PMTCT/ANC at public clinic, 9(4.8%) had it private clinics.

Table 10 showed 175(94.5%) had PEP (NVP) while 10(5.5%) did not

Table 11 revealed that of 185 HIV expose infants, 175(94.8%) were tested at six weeks while 2(1.1%) were tested at birth and 7(4.0%) were tested at 18 month.

In Table 12, of 185 Children,158 (85.1%) had negative result and 24(13.1%) positive, in determinant 3 (1.7 %) just as the study done by Fowler and co- researchers in South Africa, Tanzania and Uganda revealed that PEP for HIV-exposed infants is effective and safe for reducing postnatal infection.[66]

Table 13 showed out of 185 HIV exposed infants who had positive results, 177(95.6%) were referred paediatric HIV clinic, 3(1.5%)absconded while 5(2.9%) were referred to other health facilities.

The conclusion that can be drawn is that PCR is very valuable in making early diagnosis of HIV in expose babies. This will help reduce the mortality and morbidity associated with late diagnosis and management. It will also help to study the various predisposing factors of HIV transmission and to evaluate the utility of dried blood spots specimen for EID of HIV. Infants born to HIV positive mothers tested by dried blood spot for PCR at birth to 18 months of age are 185 ,while 2(1.1%) were tested at birth .Those at 6 weeks are 175

(94.8%), those tested at 18 months and above are 7(4.0%), and those missing are 11(5.9%). HIV prevalence of HIV exposed infants in Asokoro District Hospital is 13.1%.

Table 14 provides information on basic training and current job station of health care providers that are involved in PMTCT services. The staff predisposition as shown in table 9 comprised of medical doctors, registered nurses/midwives, counselors etc accounting to 17%, 58.4% and 3.8% respectively. This finding is similar to that of South African recommendation which states that the correct PMTCT implementation depends on the general staffing expertise, experience and capacity of doctors and midwives within the site. This study therefore conforms with this assertion.

Table 15: With regards to the knowledge on MTCT of HIV table15, shows a gross inadequate knowledge of the risk of transmission during pregnancy, delivery and breastfeeding. Only 2(3.8) of Health care providers had knowledge of risk of HIV transmission during delivery, 9(17%) during delivery and through breastfeeding and 42 (79.2%) had knowledge of transmission during pregnancy, delivery and through breastfeeding. Thus, health care providers generally knew that HIV could be transmitted during delivery, pregnancy and breastfeeding respectively. This result tallies with the work done by NDHS 2008 of Nigeria.[26]

Table 16 shows the distribution of health care provider's knowledge on the estimation of risk of MTCT of HIV. From the table, those that correctly estimated the risk during pregnancy were 17 (34%) while those that gave incorrect responses were 28 (56%) and those that responded they didn't know are 5 (10%).There was generally knowledge gap as regard

adequate knowledge of risk estimation of transmission during pregnancy, delivery or through breast feeding.

Table 17 as for the factors that increases the risk of MTCT of HIV among heath care providers, the knowledge was quite similar to the risk estimation, as low proportion of respondents could provider satisfactory responses as depicted in table 17.

There was generally inadequate and lack of training on PMTCT program among the respondents with very few respondents satisfactorily trained on the programme see Figure 4. With the above health Care providers need training, retaining and ongoing training, which is very important in the successful implementation of PMTCT programme.

Figure 5 shows the percentage and distribution of incentives received by health care providers from their involvement in PMTCT. The result reveals 14.7% received increase salary, 58.8% received training and 26.5% had no motivation. Being that PMTCT programme is an added program to the primary responsibility of health providers; they all need motivation for good implantation of PMTCT programme in any setting.

Knowledge of post-exposure prophylaxis is a very important component of MTCT. This aspect of PMTCT was generally lacking because very few respondents mentioned the right thing to do as shown in Fig.6. Health care providers' perceptions on challenges facing the PMTCT services were also sought as shown in table 18. This finding is comparable to a study carried out in Tanzania on barriers to PMTCT of HIV as lack of knowledge/ information and time.[27]

In assessing PMTCT services 11(20.8%) said the work is very stressful while 1(1.9%) believe that environment is very stressful while 30 (56.6%) believe that PMTCT services is

very rewarding for HIV infected women and their HIV expose infants, 22 (41.5%) lack technical support and 27 (50.9%) believe that they do not get emotional support when they need it.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

After assessing PMTCT and EID in Asokoro District Hospital, this study revealed a lot of challenges and constraints being faced and successes that were achieved. The services offered are in line with the standard written protocols. The state of the infrastructure was commendable and supplies of ART, drugs for post exposure prophylaxis, OIs are always available. Based on the ANC respondents, they acknowledged that health care providers are friendly, despite the overwhelming work load and coupled with inadequate motivation. Most of the ANC clients believe that PCR is very valuable in making diagnosis of HIV for HIV exposed infants, and this will reduce mortality and morbidity that are associated with late presentation, diagnosis and management of late infected babies.

The study has helped in assessing the various predisposing factors of HIV transmission and evaluated the use of dried blood spots specimen for EID of HIV in the centre. Infants born to HIV positive mothers tested by dried blood spots for PCR at birth to 18 months of age were 185. Of this figure, 2(1.1%) are tested at birth, those at 6 weeks were 175(94.8%), those tested at 18 months and above were 7(4%). HIV prevalence of HIV exposed infants in Asokoro District Hospital is 13.1%, which is higher than that of sub Saharan Africa with about 5%[12] and that of South Africa the vertical transmission rate was 2.4% which was due to a successful PMTCT Programme.[59] Also when comparing MTCT rate of HIV of Asokoro District Hospital with her other sisters hospital in Nigeria for example in the study done in Cross- River, Akwa Ibom and South-South of Nigeria MTCT rate was 4.8% .[60] while that of

Benin, Edo state was 3.1%.[31] The 13.1% prevalence rate accounted for about 95.6% of all new paediatric HIV infection cared for in ADH.

PMTCT service can be said to be successful when EID CI interval is 95% and above, but for this study CI interval of Asokoro District Hospital is 86%. It can therefore be concluded that PMTCT services at ADH cannot be said to be successful and therefore PMTCT programme need to be scale-up.

5.2 Recommendations

In order to provide:

1. For efficient and effective PMTCT and EID services, there must be a need to increase the number basic infrastructure, extend STI testing in labour ward, and also scale up the VCT in labour ward.
2. PMTCT services should be extended to involve the private clinics
3. Improvement on both visual and auditory privacy which is presently lacking in labour ward, while user fee should be eradicated.
4. Based on what was seen on table 18 and figure 5, there is need for training of health care providers, and also there is need for motivation and to employ more hands.
5. For EID, all infants whose mothers had PMTCT at private or public health clinics should be cared for and tested for DNA-PCR. EID programme should be integrated into maternal, neonatal and child health programmes.
6. Return visit to receive EID test result of PCR should be scheduled along side with routine immunization visit to reduce the rate of frequenting health clinic and cost of transportation to the parents of the children.
7. Sero discordant couples, the negative partners should be cared for by giving them Pre PEP. Been that the Confident Interval (C.I) of this study is 80.5% PMTCT/EID need to be scale-up Asokoro District Hospital.

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APPENDICES

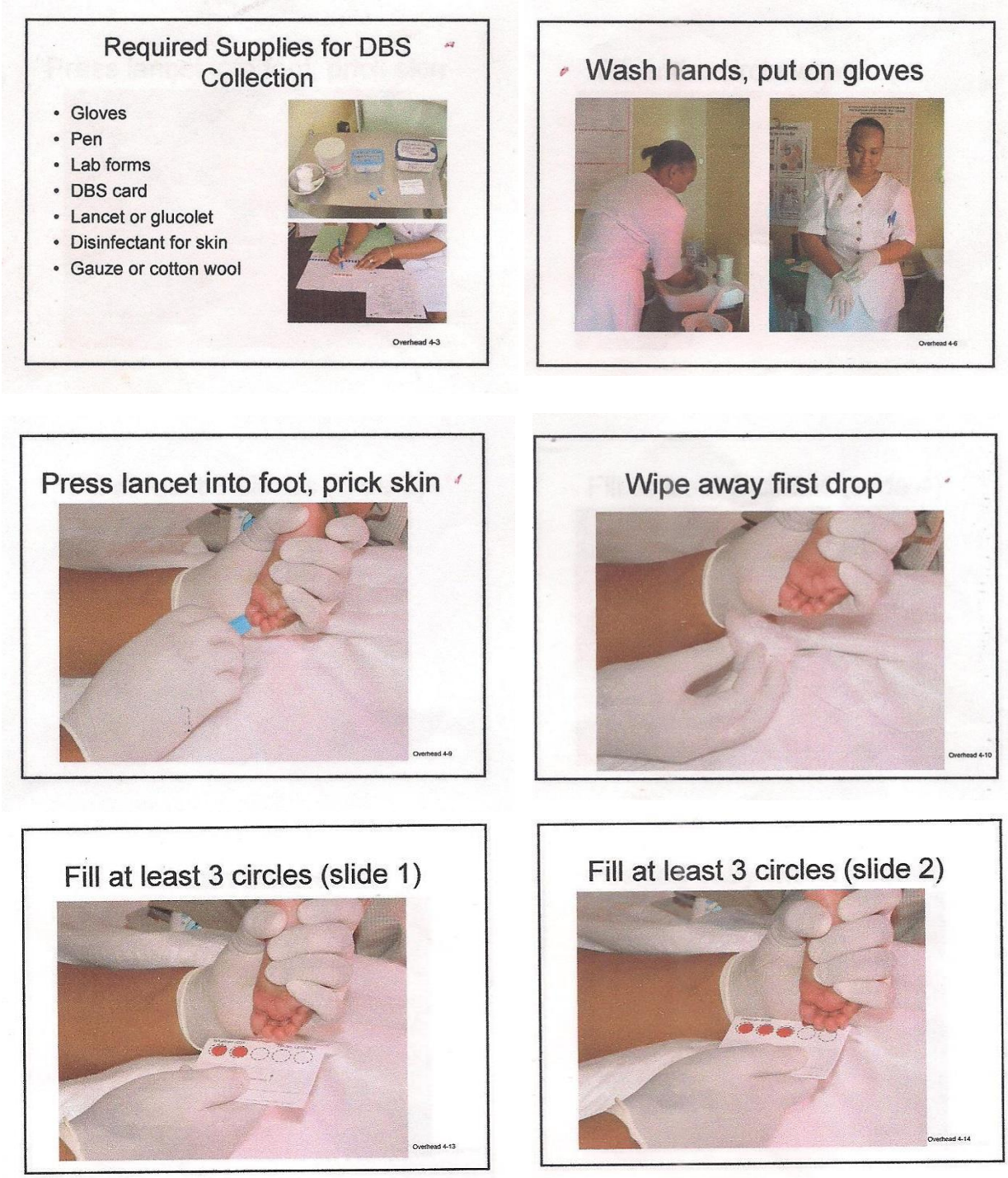
Appendix 1 - Checklist

1. **Checklists/Inventory**
   HAART
   Drugs for post exposure prophylaxis
   Drugs for opportunistic infections
   Multivitamins
   ACT (Anti- malaria)
   Long lasting Insecticides treated Net
   Water guide
   Plumpy Nuts
   Intermittent prevention treatment for malaria (IPT)
   Antiseptics (Purit, Jik)
   Safety box for sharp objects (Needles and syringes)
   Disposable Needle and syringes
   Disposable gloves
   Elbow length gloves
   Three standard laboratories: - 1. Asokoro Laboratory- FCTA (Does chemistry test, viral load, CD4, FBC, MP)

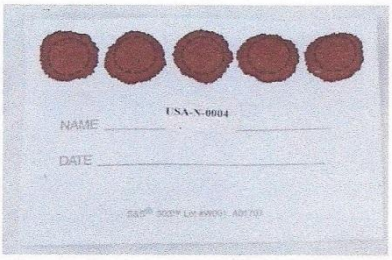
2. **Pepfar Laboratory**: (VCT for ANC CLIENTS, in and out patients, couples counseling and testing).

3. **IHVN Laboratory**: (Does PCR for HIV exposed infants)
4. **Infrastructure**: (Have obstetrics and Gynecology Department, paediatric Department, Surgery Department, Medicine Department, Family Medicine Department, Pharmacy Department, Radiology Department, VCT unit and Adherence unit. Running water Tap

Appendix 2- Procedure for Performing Dried Blood Sampling

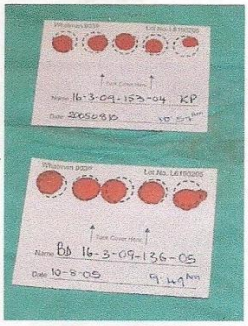


Valid DBS Specimen



Overhead 4-33

Valid DBS specimen



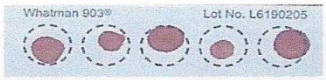
Overhead 4-34

Invalid DBS specimen: clotted/layered



Overhead 4-41

Invalid DBS specimen: circles not filled



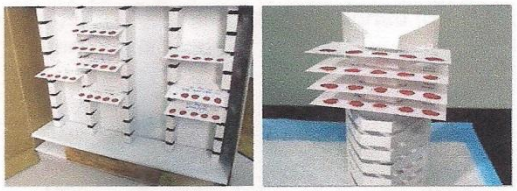
Overhead 4-39

How to Dry DBS

- Don't touch or smear the blood spots.
- Allow the specimen to air dry horizontally for at least 3 hours.
- Keep away from direct sunlight, dust, and bugs.
- Do not heat, stack or allow DBS to touch anything during the drying process. Lay them on a flat surface or drying rack.

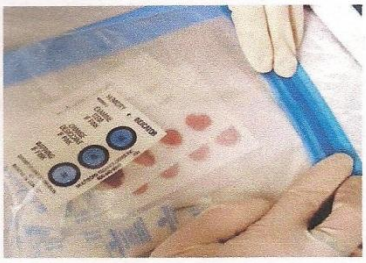
Overhead 4-49

Dry Completely before Packaging



Overhead 4-50

Add Humidity Card, Press Air Out of Bag, and Seal Bag



Overhead 4-55

How to Store DBS

Keep packaged DBS (in sealable plastic bags) refrigerated until transported to reference laboratory.

Avoid leaving in vehicle, as sun and heat will deteriorate DBS.



Overhead 4-56

Appendix 3 – QUESTIONNAIRE

Questionnaire 1

A. FOR ANC CLIENTS

1. Bio-data

1.1 Age _____

1.2 Parity 1.1.1. 0 ☐ 1.1.2 1 – 3 ☐ 1.1.3 > 3 ☐

1.3 Marital status

1.2.1 Single ☐ 1.2.2 Married ☐

1.2.3 Divorced ☐ 1.2.4 Widower ☐

1.2.5 Others (specify) _____

1.4 Educational status

1.4.1 None ☐ 1.4.2 primary ☐

1.4.3 Secondary ☐ 1.4.4 tertiary ☐

1.5 Occupation

1.5.1 House wife ☐ 1.5.2 unemployed ☐

1.5.3 Working ☐

2. **Services**

2.1 Was the amount of time spent in antenatal too much?

2.1.1 Too much ☐ 2.1.2 reasonable ☐ 2.1.3 too short ☐

2.2 When were you offered HIV counseling?

2.2.1 First visit ☐ 1.2.2 second visit ☐

2.2.3 others (specify) _____

2.3 How long did the counselor talk to you about HIV counseling? ____

2.4 Is there anything you did not like during the discussion about HIV/AIDS.

2.4.1 Yes ☐ 2.4.2 No. ☐

2.5 If yes, what is it?

2.5.1 HIV testing ☐ 2.5.2 Partner involvement ☐

2.5.3 Others (specify) _____

2.6 Would you have preferred that HIV/AIDS not be discussed during your antenatal Visit?

2.6.1 Yes ☐ 2.6.2 No. ☐

2.7 Were you aware of HIV counseling and testing service before coming to the facility?

2.7.1 Yes ☐ 2.7.2 No. ☐

2.8 If yes, how did you know about it?

2.8.1 from the media ☐ 2.8.2 family ☐

2.8.3 Friends ☐ 2.8.4 others (specify) _____

2.9 Would you refer a pregnant friend or sister to this clinic for antenatal care?

2.9.1 Yes ☐ 2.9.2 No. ☐

2.10 Would you continue coming to this facility for your antenatal care?

2.10.1 Yes ☐ 2.10.2 No. ☐

2.11 Were the providers friendly? 2.11.1 Yes ☐ 2.10.2 No. ☐

2.12 Were you satisfied with the service you received?

2.12.1 Yes ☐ 2.12.2 No. ☐

2.13 Could you suggest ways to improve the services?

B. **QUESTIONAIREFOR EID NO. 2**

1. Are EID services available in the health facility?

   1.1 Yes [ ] 1.2 No [ ]

2. Did mother have PMTCT?

   2.1 Yes [ ] 2.2 No [ ]

3. Where did mother have PMTCT?

   3.1 Public Health facility [ ] 3.2Private [ ]

4. What mode of delivery did mother have?

   4.1 SVD [ ] 4.2 C/S [ ] 4.3 Assisted vaginal delivery [

5. Did child have NVP at birth?

   5.1 Yes [ ] 5.2 No [ ]

6. Did child have ZDV?

   6.1 Yes [ ] 6.2 No [ ]

7. For how long did the CHILD have NVP?

   7.1 1/52 [ ] 7.2 6/52[ ] 7.3 Others-Specify_____

8. When did child have DNA- PCR?

   8.1 At birth [ ] 8.2at 6/52 [ ] 8.3 at ≥ 18 [ ]

9. What is the lab Result?

   9.1 Positive [ ] 9.2 Negative [ ] 9.3 In-determinant [ ]

10. Is the child referred to Paediatric HIV Clinic? After Lab result is positive? 10.1Yes [ ] 10.2 Absconded [ ] 10.3 Referred to another Health Facility [ ]

11. Is mother alive or dead?

    11.1 Alive [ ] 11 .2 Dead [ ]

12. What is father's HIV status?

    12.1 Positive [ ] 12. 2 Negative [ ]

QUESTIONNAIRE 3: FOR HEALTH CARE PROVIDERS

A. HIV COUNSELING

(1) SERVICES

1.1 Any designated V C T unit

1.1.1 Yes ☐ 1.1.2 No ☐

1.2 Are there trained counselors

1.2.1 Yes ☐ 1.2.2 No ☐

1.3 If Yes, how many _____

1.4 What nature of counseling do they do?

1.4.1 Fulltime ☐ 1.4.2 volunteer ☐

1.4.3 Other (specify) _____

1.5 Who benefits from the service?

1.5.1 Pregnant women ☐ 1.5.2 HIV positive women ☐

1.5.3 HIV Negative women ☐ 1.5.4 others (specify) _____

1.6 Types of counseling offered

	Yes	No
1.6.1 group pre-test counseling		
1.6.2 group post-test counseling		
1.6.3 individual post-test counseling		
1.6.4 couple pre-test counseling		
1.6.6 couple post-test counseling		
1.6.7 ongoing HIV counseling		
1.6.8 Nutrition counseling		

1.7 Is there a written HIV protocol

1.7.1 Yes ☐ 1.7.2 No ☐

1.8 If yes, can it be seen?

1.8.1 Yes ☐ 1.8.2 No ☐

1.9 How is confidentiality guaranteed?

1.9.1 Clients identified by codes ☐

1.9.2 clients identified by names and files kept locked ☐

1.9.3 Others (specify) _____

1.10 Is the V C T unit located within the hospital premises?

1.10.1 Yes ☐ 1.10 No ☐

(2) INFRASTRUCTURE

2.1 How many counseling rooms are available?_____

2.2 How many tables are in each room?_____

2.3 Is there

	Yes	No
2.3.1 visual privacy		
2.3.2 auditory privacy		

2.4 Are the rooms comfortably furnished?

2.4.1 Yes ☐ 2.4.2 No ☐

QUESTIONNAIRE 4

B Health Provider Assessment

(1) QUALIFICATION

1.1 What is your basic training? [ ]

1.1.1 Medical Doctor [ ]

1.1.2 Registered Nurse [ ]

1.1.3 Registered Midwife [ ]

1.1.4 Counselor [ ]

1.1.5 Laboratory Scientist [ ]

1.1.6 Laboratory Technician [ ]

1.1.7 Others (specify)_____

1.2 What is your current job in this facility?

1.2.1 Physician [ ]

1.2.2 Surgeon [ ]

1.2.3 Nurse [ ]

1.2.4 Midwife [ ]

1.2.5 Trained Counselor [ ]

1.2.6 Lay Counselor [ ]

1.2.7 Laboratory Scientist [ ]

1.2.8 Laboratory Technician [ ]

1.2.9 Others (specify) _____

1.3 Where are you working? [ ]

1.3.1 Main Laboratory [ ]

1.3.2 Side Laboratory [ ]

1.3.3 V C T [ ]

1.3.4 Maternity [ ]

1.3.5 Others (specify) _____

(2) Knowledge of HIV Transmission.

2.1 When can HIV are passed from a mother to her child.

2.1.1 During pregnancy [ ] 2.1.2 during delivery [ ]

2.1.3 Through breast feeding [ ] 2.1.4 others (specify) _____

2.2 What are the chances of an HIV –positive woman transmitting HIV to her baby?

2.2.1 Nil [ ] 22 < 20% [ ] 2.2.3 < 50% [ ] 2.2.4 100% [ ]

2.3 What are the chances of an HIV positive breast feeding woman transmitting HIV to her baby through breast feeding?

2.3.1 Nil [ ] 2.3.2 < 20% [ ] 2.3.3 <50% [ ] 2.3.4 100% [ ]

2.4 What are the chances of HIV+ woman transmitting HIV to her baby during delivery?

2.4.1 Nil [ ] 2.4.2 < 20% [ ] 2.4.3 < 50% [ ] 2.4.4 100% [ ]

2.5 What are factors that increase the risk of a woman transmitting HIV to her baby?

2.5.1 Recent infection with HIV 2.5.2 Severity of HIV infection [ ]

2.5.3 Obstetric procedures [ ] 2.5.4 Duration of breast feeding [ ]

2.5.5 Exclusive breast feeding [ ] 2.5.6 Mixed feeding [ ]

2.5.7 Condition of the breast [ ] 2.5.8 Others (specify)_____

2.6 What can a woman do to reduce the risk of HIV transmission during pregnancy?

2.6.1 Take medicine [ ] 2.6.2 Use condom [ ]

2.6.3 Abstain from sex [ ] 2.6.4 Eat better [ ] 2.6.5 Nothing

2.6.6 Seek antenatal care [ ] 2.6.7others(specify) _____

2.7 What would you do if you got a dirty needle injury?

2.7.1 Squeeze the finger [ ] 2.7.2 Put it in Jik/spirit [ ]

2.7.3 Report to the site coordinator [ ] 2.7.4 get an HIV test immediately [ ]

2.7.5 Get ARVs [ ] 2.7.6 doesn't know [ ]

2.7.7 Others (specify) _____

(3) **Capacity**

3.1 Assessing training, its timing, adequacy

	Year first trained	Year last trained	Length of training			
			Very good	good	Not so good	inadequate

3.2 Which of these PMTCT related services do you provide personally?

3.2.1 Pre-test/post-test counseling [ ] 3.2.2 HIV testing [ ]

3.2.3 On going counseling [ ] 3.2.4 Nutrition counseling [ ]

3.2.5 Obstetric care [ ] 3.2.6 ARV for mother [ ]

3.2.7 ARV for infant [ ]

3.3 Were you involved in the

	Yes	No
3.3.1 Planning of the PMTCT intervention 3.3.2 Design of the PMTCT intervention 3.3.3 Implementation of the PMTCT intervention 3.3.4 Monitoring of the PMTCT intervention		

3.4 For how long have you been providing PMTCT services?

3.4.1 0 – 6 months [ ] 3.4.2 6 months - 1 year [ ]

3.3.3 More than 1 year.

(4) **Service Delivery**

4.1 Are you meeting your client's needs? 4.1.1 Yes ☐ 4.1.2 No ☐

4.2 Has your work load increased since the introduction of the PMTCT Services?

4.2.1 Yes ☐ 4.2.2 No ☐

4.3 Do you receive support from the hospital administration?

4.3.1 Yes ☐ 4.3.2 No ☐

4.4 What types of incentives do you get for PMTCT services?

4.4.1 Increased salary ☐ 4.4.2 Training ☐ 4.4.3 status ☐

4.4.4 Nothing ☐ 4.4.5 others (specify) _____

4.5 What are the most difficult problems you encounter in providing PMTCT related service.

4.5.1 Lack of supervision ☐ 4.5.2 Lack of training ☐

4.5.3 Lack of feed back on job performance ☐

4.5.4 Lack of supplies ☐

4.5.5 Inadequate facilities ☐ 4.5.6 Staff shortage ☐

4.5.7 Too many patients ☐ 4.5.8 poor working environment ☐

4.5.9 Demoralized staff ☐ 4.5.10 lack of time to do the job ☐

4.5.11 People don't use the facility ☐ 4.5.12 Security ☐

4.5.13 inadequate transport for patients' ☐

4.5.14 inadequate salary ☐

4.5.15 others (specify) _____

4.6 How do you feel about your work?

4.6.1 Very stressful ☐ 4.6.2 rewarding ☐

4.6.3 Environment is stressful ☐

4.6.4 I am isolated ☐ 6.5.1 I can help my clients ☐

4.6.6 I lack the required skill. ☐

4.7 Is there provision for technical support in carrying out your duty.

4.7.1 Yes ☐ 4.7.2 No ☐

4.8 Is there provision for emotional support if you need?

4.8.1 Yes ☐ 4.8.2 No ☐

4.9 tick as appropriate

4.9.1 The PMTCT/EID programme is a very important service for pregnant women. Yes ☐ No ☐

4.9.2 There is enough time for PMTCT/EID services. Yes ☐ No ☐

4.9.3 Providing PMTCT/EID services stops us from providing our routine duties well

Yes ☐ No ☐

4.9.4 I do not like working with HIV+ women because I worry about getting infected from them. Yes ☐ No ☐

Appendix 4 – Map showing Asokoro General Hospital in Abuja FCT

