UPTAKE OF THE PREVENTION OF MOTHER-TO-CHILD-TRANSMISSION PROGRAMME AT A PRIMARY CARE LEVEL IN SEDIBENG DISTRICT

A Research Report Submitted to the Faculty of Health Sciences, University of the Witwatersrand in Partial Fulfilment of the Requirements for the Degree of Master of Public Health

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Candidate declaration

I, Mrs Emilie Berthet, do hereby solemnly declare that this work is as a result of my efforts and has never been presented by any body or appeared any where for any qualification, certificate or publication.

Signature: .....

Date: .....

Dedication

To Simon for his love and support.

To my parents

Acknowledgment

Thank you to Dr Mary Kawonga for her advice and support. She has been a great supervisor.

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Abstract

Introduction:

Prevention of mother-to-child-transmission of HIV is a priority public health problem in Africa as pregnant women and their children are the most vulnerable. In South Africa, a prevention of mother to child transmission of HIV (PMTCT) programme has been implemented in antenatal clinics to reduce paediatric HIV/AIDS. It is necessary to assess the uptake of this programme by pregnant women.

Objectives

The purpose of this study was to determine the uptake of the PMTCT programme in the antenatal clinics of Sedibeng district. Using data coming from all the antenatal clinics (ANC) at a primary health care levelin Sedibeng for 2005 and 2006, we determined the proportion of ANC attendees who accepted to be counselled, the proportion of these who accepted to be tested for HIV, the proportion of these who came back for results and the proportion who were HIV positive. Nevirapine (NVP) uptake was determined as well among HIV positive women and babies born to HIV positive women.

Methods

Data collection was by a record review of PMTCT records from all antenatal clinics in the district. To determine maternal uptake of PMTCT, data were extracted from antenatal clinics monthly collation sheets for 2005 and 2006. Nevirapine uptake for the babies born to HIV positive mothers was determined in one facility: data were

collected in the midwife obstetric unit of the community health centre from both the Nevirapine register and the mothers' delivery records.

Results

A total of 8010 women attended in Sedibeng antenatal clinics in 2005 and 10217 in 2006. In 2005 95 % of attendee women accepted to be counselled among whom 91% accepted to be tested for HIV. In 2006 93% women accepted to be counselled among whom 91% accepted to be tested. Almost all tested women came back for results: 99% came back for results in 2005 and 98% in 2006. The proportion of HIV positive women in the attendees population was 23% in 2005 and 24% in 2006. Nevirapine was dispensed to only 600 per 1000 HIV positive women in 2005 and 539 per 1000 HIV positive women in 2006. From June 2005 to May 2006 only 59% of babies born to an HIV positive mother received NVP.

Discussion and conclusion

The study showed a good uptake of voluntary counselling and HIV testing in Sedibeng district antenatal clinics. But a low proportion of HIV positive women and HIV-exposed babies received NVP. There was probably a loss of follow up of women between ANC visits and delivery. Nevirapine uptake must be improved in Sedibeng antenatal clinics and further investigations need to be done to understand the factors influencing uptake.

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Abbreviations

HIV: Human Immunodeficiency Virus

AIDS: Acquired Immunodeficiency Syndrome

MTCT: Mother to Child Transmission of HIV

PMTCT: Prevention of Mother to Child Transmission of HIV

VCT: Voluntary Counselling and Testing

NVP: Nevirapine

AZT: Azidothymine = Zidovudine

ANC: Ante Natal Clinic

CHC: Community Health Centre

MOU: Mid-wife Obstetric Unit

DHIS: District Health Information System

UAT: Unlinked-Anonymous Testing

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1/ Introduction

1.1 Background

HIV/AIDS is an important public Health problem in the world today, especially in Africa (1). In 2007, the number of people living with HIV/AIDS in Sub-Saharan Africa was estimated at 22 million persons (2). In sub-Saharan Africa HIV prevalence decreased from 5.8% in 2001 to 5% in 2007, but it is still by far the highest in the world. In 2005, there was 5.5 of people living with HIV/AIDS in South Africa (1). Women are the most affected by the epidemic, representing 61% of the HIV positive adults (2). Antenatal HIV surveillance in South Africa estimates that 28% of pregnant women were HIV positive in 2007 (3). The prevention of paediatric HIV is therefore a priority.

Worldwide there were 2.5 million HIV positive children in 2007 (2), most of them from Sub-Saharan Africa (2). Mother-to-child-transmission (MTCT) of HIV is considered to be responsible for 90% of childhood HIV (4). The risk of MTCT of HIV without any interventions is 5-10% during pregnancy 10- 20% during delivery and 5-20% during breast feeding (4). This risk can be reduced to 2% with an adequate intervention (4). Different treatments have been tested around the world to define how to prevent the mother-to-child-transmission of HIV (5-8). It appears that this transmission could be reduced significantly with better detection of HIV during pregnancy, better care of HIV positive pregnant women, prophylactic antiretroviral therapy and avoiding breast-feeding (8, 9). In 2005 the MTCT of HIV was under 2% in the developed countries while it was up to 20% in Africa (10, 11). In Africa,

PMTCT rates vary between countries: in Nigeria, a transmission rate was found at 45% (12), In Cameroon and Uganda, lower transmission rates were found at 11% and 18.3% with a treatment (13, 14). In South Africa, the national transmission rate of HIV to infant was estimated at 21% in 2006 (15). A Study in Abidjan shows that this rate could be reduces to 2-4% with adequate PMTCT programme (16).

The HIV positive patient's care, and the improvement of maternal and child care have become priorities in South Africa, and the government has developed guidelines for a comprehensive HIV and AIDS programme, with specific action on children's care and HIV prevention (17). The National Department of Health has also developed guidelines to implement a specific Prevention of mother-to-child-transmission (PMTCT) programme for South Africa (8). This programme includes the detection of HIV positive women at the antenatal clinics through voluntary counselling and testing (VCT) for HIV; and HIV positive mothers who accept to be in the programme receive Nevirapine which they are required to self-administer at the onset of labour. Children born from HIV positive women are given Nevirapine after birth (8). At the time of this study, the provision of HAART to pregnant women had recently been recommended as the primary strategy for all eligible HIV positive pregnant women, to ensure the health of the pregnant women as well as her baby (18).

This Nevirapine protocol has been shown in different studies to reduce transmission of HIV from the mother to baby by almost 50% (11, 19-22) and is cost effective (19, 23, 24). In South Africa this NVP protocol has recently be replaced by a combination

of AZT and NVP in the national recommendations (18). The PMTCT programme in South Africa also includes specific protocols for safe delivery practices, the mother‘s education about safe infant feeding options and risks, and the provision of free milk formula to women who choose this option. Current guidelines require children exposed to HIV to be tested at 6 weeks with PCR, and to be followed up until 12 months of age (18).

1.2 Statement of the problem.

PMTCT programmes have been implemented in many settings around the world. South Africa PMTCT implementation started with two pilot sites in each of the nine provinces in 2001 (25). From those sites, there was a great development of PMTCT services, with 22% of all health facilities in the public sector providing PMTCT services by 2004 (4, 26). These sites are financed by a conditional grant each year, but the regions also utilise their own budget to develop the PMTCT programme (27).
PMTCT programmes have been shown to be effective to decrease perinatal transmission of HIV and to improve children’s outcomes (11, 28-30). But, wide coverage of PMTCT programme, and high uptake of the programme are important to achieve success (31, 32). Therefore it is important to ensure wide availability of PMTCT services and to ensure women’s acceptance of the programme and their consent to participate in VCT, which is the entry point of PMTCT programme.

However, there are a number of challenges to the provision of PMTCT services, particularly in Africa. The lack of trained and skilled staff in the PMTCT sites, due to

human resources constraints, threatens availability of PMTCT services in many countries in Africa (32, 33). The main problems faced to implement the PMTCT policy in South Africa were lack of personnel and unsuitable infrastructures (25).

Many factors could influence the uptake of PMTCT services where these are available (31-35). The quality of voluntary counselling has an influence on the women's acceptance of the test (33, 36, 37), and using a rapid test and giving HIV results on the same day improves PMTCT uptake (33, 38). Socioeconomic status, community beliefs and availability of community support structures for HIV positive women can determine women acceptance of the programme (32, 33, 35, 39). Additionally the role of the partner may sometimes plays an important role in women's choices about PMTCT use. For example women can be afraid to be tested without a partner's consent (33, 35). It has been shown that couple counselling and partner's involvement can improve HIV testing uptake (33). In some countries, like South Africa, fears and taboos around HIV are important, and can compromise a good uptake of PMTCT programmes (34, 40).

In Gauteng province, the HIV prevalence among antenatal clinic users was estimated at 30,3% in 2007 (3). PMTCT services were first introduced in Gauteng in two pilot sites in 2001. After these pilot sites, many sites have been developed in Gauteng and PMTCT is now available in most health centres, including in the Sedibeng district in Region B of Gauteng where this study was done (25, 26). However, focusing on availability of PMTCT service is not enough. Ensuring high uptake of available

services is important but very little is really known about the uptake of PMTCT services by pregnant women. This study intends to determine PMTCT uptake in Sedibeng districts, in Gauteng, by determining the proportion of eligible women's who utilise the different components of the PMTCT programme.

1.3 Justification for the study

To improve the implementation of the PMTCT programme, the Department of Health needs information about PMTCT coverage and PMTCT uptake by pregnant women. It is important to document service uptake, but the PMTCT programme sometimes suffers from the lack of data to allow a good analysis of the programme and its implementation in antenatal services (41). In Sedibeng, PMTCT data are routinely collected at antenatal clinics and submitted to the district, and then to the provincial health department where all health information is centralised. The data is often not analysed at the district level, and therefore there are missed opportunities to use it for programme review.

It is important to ensure good quality of the data collected and collated at clinic and district level. Nurses at a clinic level also need to be motivated to collect and transmit complete and accurate data to the district health department (41). This will then improves the knowledge about service provision of the PMTCT programme. It is an important part of the fight against mother to child transmission of HIV (8). The uptake of counselling, HIV testing and Nevirapine use is not well known and documented for the Sedibeng as a whole and for Gauteng in general. Data that have

been routinely collected at health centres and are available, but need to be collated and analysed to give useful information for monitoring programme implementation.

1.4 Literature review

HIV is a global burden, and the MTCT is a priority for HIV programmes everywhere. In developing countries, MTCT remains a major problem (42), especially in Sub Saharan where nearly 90% of the 2,5 millions of HIV positive children live (2). In 2007 330 000 children in the world died because of HIV (2). This number could be drastically reduced by implementing effective PMTCT programmes.

1.4.1 Elements of a PMTCT programme

It is recommended that a PMTCT programme should include voluntary counselling and testing for HIV, antiretroviral therapy for the mother and the baby, and safe infant feeding (5-8). In South Africa, the PMTCT guidelines include more specifically (43):

- A voluntary Counselling and testing (VCT) service
- HIV test with Rapid HIV testing kit, which has shown its efficiency to improve the rate of women coming back for test results(33, 38)
- Nutritional supplements for HIV positive women during pregnancy.
- Single dose Nevirapine for mother in labour and child at the time of birth. (replaced recently by a dual therapy AZT+NVP (18))
- Management of labour of HIV positive mothers in accordance with protocols.
- Free breast milk substitute for six months for mothers choosing this option.

- Cotrimoxazole for babies of HIV positive mothers for six months after birth.
- Periodic follow-up of mother and baby to ensure well being.
- Testing of the baby at one year to establish HIV-status.

Counselling for HIV testing has two parts: Pre-test counselling and post-test counselling. During pre-test counselling, the counsellor gives information about HIV, propose an HIV test and explain the benefit of the PMTCT programme for a child's outcome when the mother is HIV positive (7). During post-test counselling HIV results are given back and the counsellor emphasises the benefit of Nevirapine to decrease the risk of HIV transmission to the baby, explains how to use it and explains the benefits and risks of different infant feeding options, and the alternative feedings available to avoid MTCT after birth. (8)

1.4.2 Prophylactic antiretroviral therapy against MTCT of HIV

Prophylactic antiretroviral therapy is an important part of the PMTCT programme. The first study showing the efficacy of AZT to significantly reduce HIV transmission by 67% was published in 1994 (9). In the developed countries, a long term AZT protocol has been used with really good results (9, 11). According to WHO if there is an indication for an antiretroviral therapy in pregnancy, this must be the priority to secure the woman's health. According to guidelines, clinical staging and CD4 counts must be done during pregnancy to assess the HIV positive woman's eligibility for HAART (10, 18). Currently the standard of care in many developed countries is to provide HAART to all HIV positive pregnant women. As a result of these

interventions, MTCT rates are now less than 2% in these countries (10). South African guidelines indicate that women with CD4 of less than 200 or a clinical stage IV will receive HAART (18).

In the absence of HAART, WHO recommends azidothymine (AZT) from 28 weeks of pregnancy, AZT and lamivudine (3TC) and a single dose of Nevirapine during delivery, and AZT and 3TC for 7 days in postpartum, while the baby receive NVP and AZT for one week after birth (10).

HAART is not widely available in many developing countries, and the more complex PMTCT protocols are expensive and require good follow-up and health system support (10). It has therefore been difficult to implement these in the developing countries and so cheaper regimens such as a single dose Nevirapine (NVP) which is less demanding on women and health service resources have been used (10). NVP allows an easier implementation of the PMTCT programme compared to other antiretroviral protocols, and can be realistically used in resources limited settings (44, 45). It is relatively cheap, and thus allows the South African government to deliver it for free in the public sector (23, 24, 27). Single dose Nevirapine has proven its efficacy to prevent mother-to-child transmission of HIV. Clinical trials have shown that single-dose of NVP can reduce transmission from mother to child by almost 50% (11, 19, 20). It reaches a high blood concentration with a single oral dose, allowing a good protection during delivery, and it has a long half time, having a detectable level in maternal blood and breast milk 3 weeks after delivery (46).

Resistance to Nevirapine can appear after this short regimen (47, 48), but studies show that it neither compromises a future antiretroviral therapy for the mother, nor prevention of mother to child transmission of HIV during a further pregnancy (45, 49, 50). Single dose of Nevirapine presents no significant toxicity, and can be safely used (46). NVP is however not as efficient as other short course regimens combining AZT +/- 3TC +/- NVP (6, 51, 52). In South Africa, NVP was the standard of care at the time of the study, however at the beginning of 2008 the NVP protocol was replaced by dual therapy combining AZT and NVP to the mother and the baby (18). This dual therapy regimen, which is now the standard care for PMTCT in all public sector health facilities shows a better efficacy than NVP alone (10).

1.4.3 Experience of PMTCT in the developing countries

In Africa, PMTCT implementation has faced many challenges, because countries have less information, infrastructural and human resources and money. For example in South Africa, PMTCT implementation was constrained by a lack of skilled staff and inadequate infrastructure (25). To ensure PMTCT success, it is therefore important to consider factors that influence availability of PMTCT as well as those that influence women's willingness to participate to PMTCT programmes. While the former is key, this literature focuses on the latter, as this has the most relevance for this study.

Where PMTCT programmes are available, uptake of these services has not been as high as anticipated (25, 39, 53). Cultural and socio-economical factors, such as the

level of education or socio-economical status, influence women's willingness to be part of the PMTCT programme (35, 39, 53), as do traditional beliefs and stigma around HIV (34, 40). The lack of knowledge about HIV and pregnancy is also an important barrier to uptake (53). Gender also plays a role as women may be barred from participating in PMTCT due to gender norms and their subordinate role in society or due to fear of disclosure to their partner as a result of unequal power relations (30, 39, 53).

Voluntary counselling and testing uptake in PMTCT settings

VCT is the entry-point to the PMTCT programme. Therefore, it is important to ensure high utilisation of VCT by pregnant women, in order to optimise PMTCT uptake. Evaluation of the first 18 PMTCT sites in South Africa in 2001 and 2002 showed a lot of differences in VCT uptake among provinces among provinces (25). The country's average acceptance rate for HIV testing was 51% in 2001 varying among facilities from 17% to 90%, and 56% in 2002 varying from 14 to 92% (25, 26, 54). In Gauteng, the first PMTCT pilot sites were in Natalspruit and Kalafong hospitals. In these sites HIV prevalence among ANC pregnant women was 29.4%. The VCT acceptance rates were there respectively 68% and 23% in 2001, and 80 % and 61% in 2002. These data highlight variations in uptake between PMTCT sites within provinces. These intra-provincial variations are further highlighted by a study conducted in Gauteng at the Coronation women and children's hospital in February 2002. which showed that 95% of women attending to ANC services were tested for HIV (55).

The quality of counselling is an important factor and is linked to HIV testing uptake (7, 8). Pre-test counselling needs enough staff and well-trained counsellors and a physical space which allows privacy (26). Staff shortages are an important barrier to provision of good counselling. In Gauteng province, to avoid the adverse consequences of the lack of personnel on the availability and quality of counselling, lay counsellors were trained to complement existing staff (26). These measures improved the availability and quality of pre-test counselling, by providing more staff available with good counselling skills (26, 54). The importance of counselling was further highlighted in the South African pilots sites evaluation; a 90% HIV test acceptance rate in Kwazulu natal, almost twice the country's average was attributed to good counselling (54).

Elsewhere in Africa, studies show often a good VCT uptake. An international survey done on 13 sites, 12 of them in Africa, in the late 1990s showed that the VCT acceptance rates were over 70% in 12 of 13 sites (30). Others studies showed acceptance rates over 70% or sometimes over 90% (30, 56-60). In Zimbabwe a recent study showed a low VCT acceptance rate at 55% (36). It appeared that 79% of the interviewed women would have accepted the test in an opt-out strategy (36). In an opt-out strategy the HIV test is routinely part of a standard package with usually no separate written consent, but the patient has the right to refuse it (opt-out), whereas an opt-in strategy is a client initiated testing or counselling, with a written consent provided (33).

HIV results uptake

A good counselling intends not only to encourage women to test for HIV, but also to come back for results and enter the PMTCT programme if they are HIV positive. However many counselled and tested women do not return for their HIV results. In South Africa, only 53% women received their results in the Natalspruit pilot site in 2002. In Kalafong, the return rate was good at 93% in 2002 (26). In Coronation Women and Children's hospital all HIV positive women received their results back (55). Elsewhere in Africa, a study aggregating results from 13 countries found that the overall rate of return for HIV was 92% (61). In Nairobi a study comparing the HIV rapid test to HIV Elisa test found that 96% of women had their results back with a rapid test whereas the return rate was 73.3% with the Elisa test (38). Factors that increase the rate of women coming back for results include: results being given on the same day, using HIV rapid test (24, 38, 53) and availability of well-skilled staff to provide pre test counselling (33, 36, 37).

Nevirapine uptake during delivery

In PMTCT programmes every HIV positive woman should be dispensed an appropriate medication such as NVP to prevent mother-to-child-transmission of HIV. PMTCT coverage is important to ensure a good NVP uptake. In Malawi this was highlighted in as study where only 45% of HIV positive women and 34% of their babies received NVP. Many women delivered in a facility without any PMTCT programme implemented (59); 63% of HIV positive women were missed because PMTCT programme was not implemented everywhere (59). If their state of disease

doesn't need to be treated by HAART, they will be provided NVP to be taken just before delivery. Their baby will receive NVP after birth. A good NVP uptake is essential to allow a significant decrease of mother-to-child-transmission of HIV in resources limited settings (16). However the proportion of exposed babies who receive NVP is low (less than 50%) in several settings outside South Africa (56, 61).

Identifying the determinants of PMTCT uptake is important to inform the development of appropriate interventions. A comprehensive analysis of the factors affecting PMTCT uptake is however beyond the scope of this proposed study. But as a starting point, this study intends to describe available PMTCT services in Sedibeng district of Gauteng province and to determine pregnant women's uptake of the PMTCT programme in primary health care facilities. The study will use data that has been collected routinely at antenatal clinics and midwife obstetric units located within all the primary health care facilities.

1.5 Aim

This study will assess PMTCT uptake by pregnant women at primary care level (community health centres and clinics) in the Sedibeng district of region B in Gauteng, for the period 2005-2006. The PMTCT sites include antenatal clinics and midwife obstetric units, thus allowing analysis of data from antenatal period up to delivery.

1.6 Objectives

With respect to primary care facilities in Sedibeng district, the objectives were to:

1. Determine the proportion of women attending ANC that accepted voluntary counselling for HIV testing during 2005 and 2006.

2. Determine the uptake of HIV testing after the pre-test counselling in ANC during 2005 and 2006.

3. Determine the proportion of women coming back to post-test counselling and collecting HIV test results.

4. Determine the proportion of women with a positive HIV result who were dispensed Nevirapine during the antenatal period.

5. Determine the proportion of babies of HIV positive women that received Nevirapine after birth.

2/ Methodology

In this chapter, the methodology is described, including the study design, the study population and the variables and indicators chosen to determine the five study objectives. It also describes challenges encountered during data collection and the limitations of using retrospective review of facility records for data collection for research.

2.1 Study design

It was a cross sectional descriptive study involving a retrospective review of records. Collated data had been collected from antenatal clinics and midwife obstetrics units located within all community health centres and clinics in Sedibeng district during two years (2005 and 2006) for the first four objectives, and from one community health centre for the period from June 2005 to May 2006 for the fifth objective. These data were analysed to determine the uptake of PMTCT services in the district.

2.2 Setting

There are 38 antenatal clinics in Sedibeng providing PMTCT services, 33 of these are at the primary care level. Only facilities providing PMTCT at a primary care level were selected for this study. The facilities were a mix of small clinics, located sometimes in really poor areas and bigger clinics in urban areas (Annexure A). PMTCT was implemented in all these sites following the recommendations from the South African Health department and they all use rapid HIV tests (8). The first part (objectives 1 to 4) of the study included all primary care facilities in the district

(community health centres and clinics). The second part of the study (objective 5) included PMTCT data from Johan Heyns community centre, an urban facility with a mid-wife obstetric unit where deliveries are performed.

According to key informants at the health facilities, women enter the PMTCT programme through VCT at antenatal clinics. A woman coming for antenatal visits is counselled and tested for HIV during the first visit (usually during the first trimester) or during the following visits if she refuses to be tested. All facilities use rapid tests. After being tested, women get their results back the same day and have a post test counselling. If they are HIV positive, they are offered the opportunity to be part of the PMTCT programme. This includes physical examination for clinical staging of their disease, assessment of CD4 count, and HIV triple therapy (HAART) if they are eligible (CD4 count less than 200 cells/mm3 or WHO stage IV) Women who are not eligible for HAARTfor their own health AZT at 28 weeks and are dispensed Nevirapine during the 28th week ANC visit and are counselled about how and to take NVP at the onset of labour. Nevirapine dispensed to women in the ANC is recorded on a Nevirapine register. There is a time lag between the diagnosis of an HIV positive status and dispensing of NVP; while HIV testing results are given at various times during pregnancy, usually after the first ANC visit, Nevirapine is always given at the 28th week visit. Thus a woman who tests HIV positive during the first trimester visit will only be given NVP three months later.

Patients' data are captured by nurses during the antenatal visits on a consultation sheet (Annexure B). At the end of each month the nurses collated all this information on a monthly collation sheet which is submitted to the district manager to be included in district health information system office (Annexure C).

Women usually deliver in a different facility, as only hospitals and community health centres with a MOU unit conduct deliveries. In Johan Heyns mid-wife obstetric unit (MOU), nurses ask the women who come in labour whether they had VCT during their ANC visits, whether they accepted the HIV test, and what is their HIV status. They record this information on the patient held card, which is retained by the MOU after the delivery. If the woman doesn't know her HIV status, she is offered VCT, and NVP is dispensed to her if she tests HIV positive. Nevirapine is taken by the women herself, but nurses give Nevirapine to the baby after delivery and record it in the Nevirapine register.

2.3 Study population

No sampling was done, so all the clinics and community health centres that provide ANC were included (Annexure A). All routinely collected PMTCT records at the ANC facilities for 2005 and 2006 were included in the analysis. To determine the first three objectives, all monthly collated PMTCT records for 2005 and 2006 obtained from the district health information system (DHIS) were included in the analysis.

The fourth objective was to determine the uptake of Nevirapine during labour among HIV positive pregnant women. The study population was supposed to be all entries in the MOU delivery register. However because of a poor record-keeping in the labour ward, we instead used the PMTCT registers from the antenatal clinics as the study population to determine the NVP dispensed to women at antenatal visits during 2005 and 2006.

For the fifth objective, we choose to work only in Johan Heyns CHC because it was not possible to link women who tested HIV positive at ANC to delivery records. The study population for this objective included all MOU files (delivery ward records) which were filled in for all women who delivered in the MOU in Johan Heyns community health centre from June 2005 to May 2006, as well as the patient held cards which were kept by the MOU department after delivery.

2.4 Measurement

For the first three objectives data were extracted from the DHIS monthly collation sheets (Annexure C) using data extraction sheets that were developed for this study (Annexure D). There were some missing data as not all the facilities submitted data to the DHIS every month. It was not relevant to study each facility separately, so individual facility data were aggregated for the whole district for each month. Data were missing for April, July, August and December 2005, and January and part of February 2006.

The following variables were extracted from the data sheets using a data extraction sheet (Annexure D) for each year to determine objectives 1, 2 and 3 for Sedibeng district:

-Number of new ANC attendees

-Number of women consenting to voluntary counselling.

-Number of women voluntary testing for HIV.

-Number of HIV positive women.

-Number of post counselled women.

-Number of women who were dispensed with Nevirapine during ANC.

The original intention for objective 4 was to determine the proportion of HIV positive women who took NVP during labour, but this variable couldn't be determined from the mid-wife obstetric unit records because women that came to deliver with their Nevirapine already with them were not routinely recorded in the register. No information was available about Nevirapine taken in most of the individual patient files, and so it was possible to determine the Nevirapine use only for a few HIV positive women. A NVP register was used by MOU nurses to record HIV positive women who were given NVP when arriving for delivery. But the same Nevirapine register was used by the antenatal clinic as well, so both populations from the ANC clinic (those to whom NVP were dispensed during ANC) and MOU (those who were given NVP during labour) were collated in one list. So, due to the limitation of the data recording system, this indicator could not be determined. Therefore, the variable used in this study as a proxy for NVP uptake was: Nevirapine dispensed during

antenatal visits. This variable is routinely recorded in the DHIS, although it is acknowledged that this indicator does not measure actual use of NVP by HIV positive women. This represents the number of ANC attendees who tested HIV to whom Nevirapine was dispensed at the 28th week ANC visit. This indicator was measured as an aggregate for all facilities (Annexure D). However the limitation is that there is a time lag between HIV test results and NVP dispensing and so for a given month it was not the same population of women who tested HIV positive that month and who received NVP. So to estimate NVP use in this study, the ratio women who received NVP to women who tested HIV positive was determined for 2005 and 2006 (not calculating a proportion as it is not possible to link the NVP doses dispensed to the denominator).

The fifth objective was studied in a single midwife obstetric unit to allow assessment of activities at delivery. To determine the fifth objective, two variables were measured using data from the mothers' files from the MOU and the register of babies receiving NVP in the labour ward:

-number of HIV positive women delivering in the MOU

-number of babies who were given Nevirapine

In the MOU at Johan Heyns community health centre there wasn't any register of HIV positive women who had delivered in the mid wife obstetric unit. HIV status is recorded on the patient held card which is kept with the patient record after delivery. A coding system is used to preserve anonymity. To determine the number of HIV

positive women, all patient held cards were reviewed and HIV status was confirmed by means of the clinic's coding system. As there were a lot of incomplete records at the beginning of 2005, prior to implementation of the coding system, this review included the period June 2005 to May 2006 to cover twelve calendar months. Babies who received Nevirapine were listed in the Nevirapine register. They were registered under their mother's record number, and it was possible to link them to their mother. For each women found positive in her files, we checked in the NVP register if the baby had received Nevirapine.

2.5 Data processing and analysis

Data were entered and processed using Excel. Descriptive statistics (proportions and ratios) were used to determine all the indicators. Data were summarised using descriptive statistics: mean and standard deviation for numerical data and proportion and ratios for categorical data. The uptake of PMTCT was analysed by three different levels, through the following indicators, which were calculated per month and aggregated at a district level:

2.5.1 Uptake of counselling and testing

1. Percentage of women antenatal attendees who accepted to be pre-test counselled

$$\frac{\text{Number of women accepting pre-test counselling}}{\text{Number of women attending to the antenatal clinic}} \times 100$$

2. Percentage of pre test counselled women who accepted to be tested for HIV

$$\frac{\text{Number of women accepting to be tested for HIV}}{\text{Number of women who had pre-test counselling}} \times 100$$

3.a Percentage of women tested for HIV who came back for results

$$\frac{\text{Number of women coming back for result and post-test counselling}}{\text{Number of women who had an HIV test}} \times 100$$

3.b Percentage of women counselled who came back in post-test counselling

$$\frac{\text{Number of women coming back for result and post-test counselling}}{\text{Number of women pre-test counselled}} \times 100$$

4. HIV prevalence among women who accepted to be tested for HIV

$$\frac{\text{Number of HIV positive women}}{\text{Number of women who had an HIV test}} \times 100$$

These indicators allowed the researcher to determine the uptake of various components of the PMTCT service.

2.5.2 Uptake of Nevirapine by pregnant women

The use of Nevirapine by HIV positive women attending ANC could not e determined directly (as described above). However, the following indicator was estimated for the whole district for one year period:

$$\frac{\text{Number of women who were dispensed NVP}}{\text{Number of HIV positive ante-natal clinics attendees}} \times 1000$$

This indicator allowed the researcher to determine the Nevirapine dispensed to HIV positive women in Sedibeng, as a proxy from NVP uptake.

2.5.3 Uptake of Nevirapine in babies born to HIV positive mothers

Descriptive statistics were used to summarise data, and one indicator only was studied in Johan Heyns mid-wife obstetric unit:

$$\frac{\text{Number of babies receiving Nevirapine}}{\text{Number of babies born from HIV positive mothers}} \times 100$$

This indicator allowed the researcher to determine the uptake of Nevirapine among babies exposed to known HIV positive women in this mid-wife obstetric unit.

2.6 Ethical considerations

This research protocol was submitted to the committee for research on human subjects (medical) of the University of the Witwatersrand and approved. The study began after the approval by the ethics committee. Authorisation to undertake the study in Sedibeng was also obtained from the Health Department. Data used to determine objectives 1, 2, 3 and 4 came from the district health information system and were anonymous. To determine objective 5 no names and only records numbers were used to identify HIV positive women and link HIV positive mother to their babies. A coding system was used in these records to denote HIV status. Results were then aggregated for each month and only the number of HIV positive women and the number babies receiving NVP were used in the study data. No individual clinic names are included in this report.

3/ Results

This chapter presents the results of the study. Results from different facilities in Sedibeng are aggregated and presented here in line with the study objectives. The results presented in this report need to be interpreted regarding the limitations of the data sources. However these are useful results for management as they are based on the best available routine health data available in the district.

Table 1 below presents the data that were available for analysis in this study.

Table 1: data available for analysis in 2005 and 2006 in Sedibeng antenatal clinics

2005	Number of sites	Numbers of ANC attendees (first time visit)	2006	Number of sites	Numbers of ANC attendees (first time visit)
January	25	818	**January**	**N/A**	**N/A**
February	20	990	February	20	762
March	24	1007	March	27	1329
April	**N/A**	**N/A**	April	24	917
May	25	1014	May	24	995
June	27	1138	June	24	1017
July	**N/A**	**N/A**	July	25	1135
August	**N/A**	**N/A**	August	29	1205
September	22	1217	September	27	993
October	27	1217	October	20	1016
November	17	609	November	11	425
December	**N/A**	**N/A**	December	14	423

N/A: Not Available (missing data)

3.1 ANC attendees and uptake of pre test counselling

With a varied number of facilities participating every month, the denominator (number of ANC attendees) was variable during the year. The number of antenatal clinics participating was between 11 and 29 with ANC attendees ranging from 423 attendees in December 2006 to 1329 attendees in March 2006.

The percentage of women accepting to be counselled was high among the ANC attendees, with few variations during the year. The proportion of ANC attendees accepting counselling per month varied between 91% and 99% (Table 2). Over-all, across the district in 2005, 95% of antenatal clinic attendees accepted to be pre test counselled, and in 2006 96% accepted to be pre test counselled (table 2).

Table 2: Women who accepted pre-test counselling among the antenatal clinic attendees in Sedibeng antenatal clinics: 2005-2006

	Numbers of ANC attendees (first time visit)	Number of women who had pre-test counselling	% of women accepting pre-test counselling
Jan-05	818	762	93
Feb-05	990	930	94
Mar-05	1007	985	98
May-05	1014	938	93
Jun-05	1138	1109	97
Sep-05	1217	1192	98
Oct-05	1217	1129	93
Nov-05	609	599	98
total 2005	**8010**	**7644**	**95**
Feb-06	762	725	95
Mar-06	1329	1301	98
Apr-06	917	888	97
May-06	995	981	99
Jun-06	1017	1001	98
Jul-06	1135	1084	96
Aug-06	1205	1182	98
Sep-06	993	947	95
Oct-06	1016	922	91
Nov-06	425	408	96
Dec-06	423	414	98
Total 2006	**10217**	**9853**	**96**

3.2 Uptake of HIV testing

The percentage of women who accepted to be tested is high with few variations during the two years studied: ranging from 88% to 97% (table 3). As shown in table 3, 91% of pre test counselled women accepted to be tested in 2005, and 93% in 2006.

Table 3: Women who accepted to be tested for HIV after pre-test counselling in Sedibeng antenatal clinics: 2005-2006.

	Number of women who had pre-test counselling	Number of voluntary HIV testing	% of women accepting to be tested in the population of women counselled
Jan-05	762	717	94
Feb-05	930	848	91
Mar-05	985	911	92
May-05	938	838	89
Jun-05	1109	972	88
Sep-05	1192	1085	91
Oct-05	1129	1026	91
Nov-05	599	543	91
total 2005	**7644**	**6940**	**91**
Feb-06	725	672	93
Mar-06	1301	1214	93
Apr-06	888	834	94
May-06	981	872	89
Jun-06	1001	906	91
Jul-06	1084	1000	92
Aug-06	1182	1091	92
Sep-06	947	907	96
Oct-06	922	889	96
Nov-06	408	396	97
Dec-06	414	382	92
Total 2006	**9853**	**9163**	**93**

3.3 Uptake of Post test counselling

The percentage of women coming back for post test counselling and collection of HIV results after voluntary testing is very high, ranging from 93% to 100%. The total number of tested women coming back for result was 99% in 2005 and 98 % in 2006 and 89% and 85% of counselled women came back for post-test counselling and HIV results (table 4).

Table 4: Women coming back for results after counselling and testing in Sedibeng antenatal clinics: 2005-2006

	Number of women who had pre-test counselling	Number of voluntary HIV testing	Number women who had post-test counselling	% of women coming back for results after testing	% of women coming back for results after counselling
Jan-05	762	717	696	97	91
Feb-05	930	848	830	98	89
Mar-05	985	911	911	100	92
May-05	938	838	838	100	89
Jun-05	1109	972	960	99	87
Sep-05	1192	1085	1081	100	91
Oct-05	1129	1026	998	97	88
Nov-05	599	543	524	97	87
total 2005	**7644**	**6940**	**6838**	**99**	**89**
Feb-06	725		Missing		
Mar-06	1301	1214	1208	100	93
Apr-06	888	834	833	100	94
May-06	981	872	872	100	89
Jun-06	1001	906	892	98	89
Jul-06	1084	1000	927	93	86
Aug-06	1182	1091	1054	97	89
Sep-06	947	907	901	99	95
Oct-06	922	889	889	100	96
Nov-06	408	396	396	100	97
Dec-06	414	382	373	98	90
Total 2006	**9853**	**8491**	**8345**	**98**	**85**

** February 2006: number of women post test counselled and number of women who were dispensed NVP were missing*

3.4 Percentage of HIV positive women

The percentage of HIV positive women among first time ANC attendees ranged between 19% and 26% during 2005 and 2006 (Figure 1). The total number of ANC attendee women who tested HIV positive in 2005 and 2006 was respectively 23% and 24%. Using the counselled women as the denominator, the percentage of HIV positive women among HIV tested women was included between 23% and 30% (Figure 2); and the annual figure was the same in 28% 2005 and 27% in 2006.

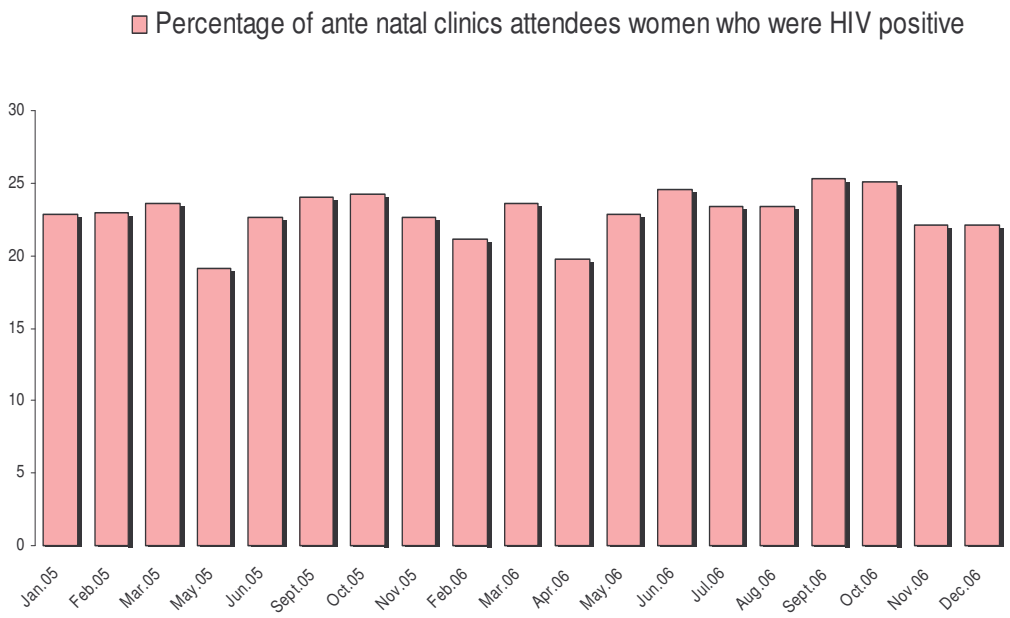

Figure 1: Representation of the percentage of HIV positive women among all women who attended to Sedibeng antenatal clinics in 2005 and 2006.

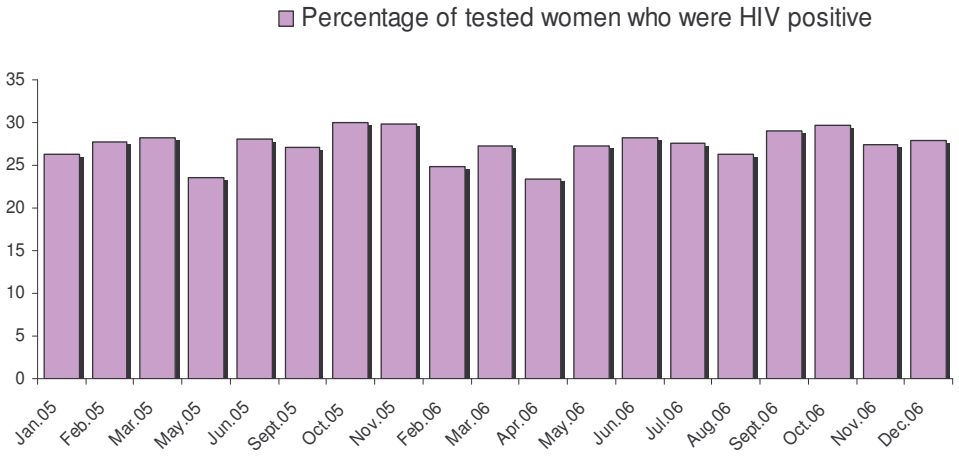

Figure 2: Representation of the percentage of HIV positive women among the women who were tested for HIV in Sedibeng antenatal clinics in 2005 and 2006.

3.5 Uptake of Nevirapine

3.5.1 Nevirapine dispensed compared to the number of HIV positive women

Figure 3 shows that the amount of Nevirapine dispensed and the number of women who tested HIV positive at ANC visits don't follow the same variations. The Nevirapine dispensed is always lower than the number of HIV positive women over the whole 2 years period. For the reasons explained in the methodology it was not possible to determine on a monthly basis the percentage of women testing HIV positive who were dispensed with NVP. Therefore we instead determined for each one year period the number of NVP doses dispensed to the number of women who tested HIV positive at ANC. As shown in table 5, a ratio of 600 per 1000 HIV positive women received NVP in total in 2005, and 539/1000 in 2006.

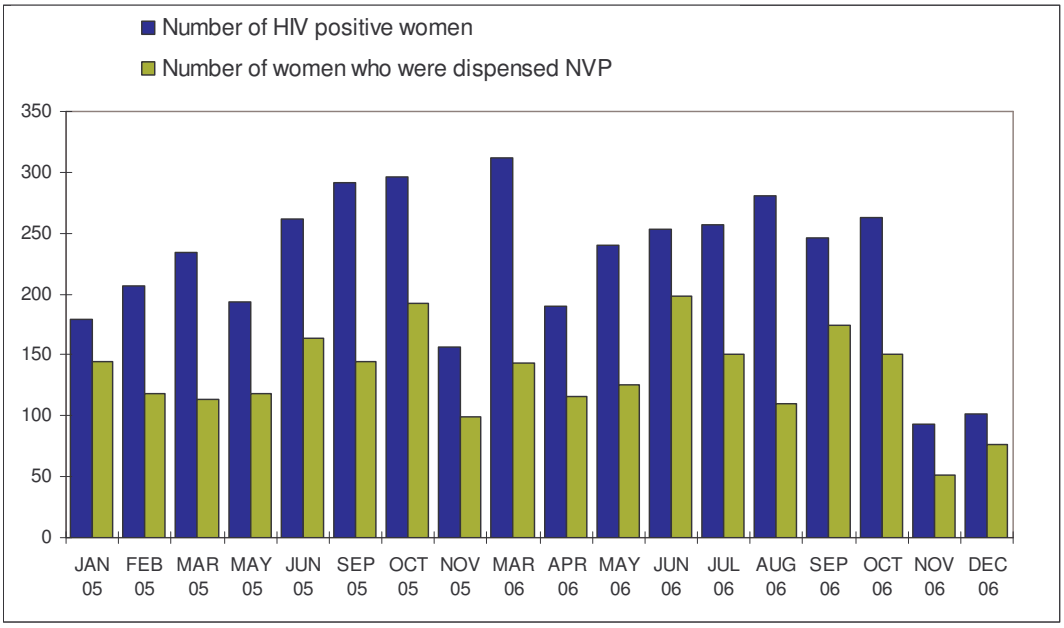

Figure 3: Representation of the numbers of women who received Nevirapine and those who tested positive to HIV in 2005 and 2006 in Sedibeng antenatal clinics.

Table 5: Ratio of the number of HIV positive women to number of women who were dispensed Nevirapine during ANC visits in Sedibeng antenatal clinics: 2005 and 2006.

	Number of HIV positive women	Number of NVP dispensed	Women receiving NVP per 1000 women who tested HIV positive per year
Total 2005	1821	1094	**600/1000**
total 2006	2402	1295	**539/1000**

3.5.2 Uptake of NVP in HIV-exposed babies

This objective was studied only in the Johan Heyns community health centre's MOU, and thus focuses only on the women who delivered in this facility. This data is not related to the data presented in previous sections which focuses on ANC attendees. Table 6 shows that based on labour ward records, amongst the population of women who delivered in this MOU during the period from June 2005 to May 2006, 32 % of women delivered with an unknown HIV status during the twelve months of the study and 15% refused the HIV test at the MOU. Women were categorised as with an unknown status when there was no information about their HIV status and HIV testing in their records or the patient held card. Women were categorised as having refusing the test when it was specified on their patient held card, meaning that MOU nurses proposed them an HIV test before delivery and they refused it.

Table 6: HIV status of women who delivered in Johan Heyns mid-wife obstetric unit from June 2005 to May 2006.

	Number of women delivering in the MOU	% that are HIV positive	% that are HIV negative	% who refused HIV testing	% with no information on HIV status and testing	total
Jun-05	83	8	17	6	69	100
Jul-05	78	13	30	6	51	100
Aug-05	47	11	36	0	53	100
Sept-05	93	17	38	26	19	100
Oct-05	93	11	38	20	31	100
Nov-05	77	17	51	15	17	100
Dec-05	95	16	44	22	18	100
Janv.-06	43	19	43	19	19	100
Feb-06	90	14	44	16		26
Mar-06	90	21	38	18		23
Apr-06	99	15	39	10		36
May-06	50	20	44	8		28
Total	938	15	38	15		32

The percentage of babies born to known HIV positive women delivering in Johan Heyns MOU that received Nevirapine varied during the year, ranging from 20% in August 2005, to 85% in February 2006 (table 7). A total of 56% of babies were given NVP during the one year period studied.

Table 7: Babies born to HIV positive women who received Nevirapine Johan Heyns mid-wife obstetric unit: 2005-2006.

	Number of HIV positive women who delivered	Number of babies given Nevirapine	% of babies who were given Nevirapine
Jun-05	7	3	43
Jul-05	10	7	70
Aug-05	5	1	20
Sep-05	16	9	56
Oct-05	10	6	60
Nov-05	13	6	46
Dec-05	15	12	80
Jan-06	8	5	63
Feb-06	13	11	85
Mar-06	19	12	63
Apr-06	15	4	27
May-06	10	7	70
total	141	83	**59**

4/Discussion

The aim of the study was to assess the PMTCT programme implemented in Sedibeng district in Gauteng: specifically its uptake by pregnant women attending ANC facilities at primary health care in the district.

Voluntary counselling and testing uptake

This study showed that the proportion of women accepting to be counselled was high in Sedibeng around 95% and 96% in 2005 and 2006. The proportion of women accepting to be tested among those who have been counselled was high as well, 91% and 93% for 2005 and 2006, respectively. HIV testing is essential to identify as many HIV positive pregnant women as possible. The quality of pre-test counselling is essential to convince women of the importance of testing for HIV, and being treated in case they are HIV positive (62). In Sedibeng during 2005 and 2006, almost all pregnant women attending ANC accepted to be tested for HIV. These results are an improvement compared to the pilots sites in 2002 in Gauteng, which showed 80% and 61% of women accepting to be tested for HIV respectively in Natalspruit and Kalafong (26).

Other studies show similar results like in Cameroon and Zimbabwe where 100% of women were counselled (57, 63). In these studies 92.9% and 91.6% accepted to be tested respectively (63, 64). In Uganda, the proportion of women who accepted to be tested varied from really high (96%) in a rural hospital (65), to really low (25%) in another rural region (32, 61). One explanation of this really low acceptance rate was that only 56% of pregnant women attended facilities that provided PMTCT, as this

programme wasn't implemented in all the ANC clinics (32). A good uptake of pre-test counselling in one facility is not sufficient to make an impact if the PMTCT programme coverage is low. In Sedibeng PMTCT is implemented in all the antenatal clinics in the public sector, indicating a good service coverage. In these facilities most women agreed to have a pre-test counselling for HIV.

A good VCT implementation is important for a good PMTCT programme uptake. Pre-test counselling helps women to be aware of the importance of HIV testing for them and for their children. It fights the fears and stigmas which could prevent pregnant women from HIV testing (34, 62). Pre-test counselling needs to be done in good conditions, with adequately trained staff. It is essential for the PMTCT programme to reach as many women as possible. In a study comparing the proportion of HIV positive women who participate in the PMTCT programme to the ANC sentinel surveillance of HIV done in the same facilities, the percentage of HIV positive women who were not tested for HIV was estimated at 57% in Ethiopia and 59% in Zimbabwe (66). It was then estimated that 618 child infections by HIV in Ethiopia and 1747 in Zimbabwe could have been averted if all HIV positive women had participated to the PMTCT programme.

The percentage of first time ANC attendees who tested HIV positive in this study were 23% and 24% in 2005 and 2006 respectively. The proportion of HIV positive women identified through antenatal VCT is dependent on the HIV prevalence in the area studied. For example, a very high proportion of HIV positive women was found

in the western Kenyan region (47%) which is known to have one of the most highest HIV prevalence rates in Africa (57). A low proportion was found in Mombasa where only 14% of pregnant women were HIV positive (58). It was found to be 20% in Zambia (56) and Zimbabwe (63); and lower in Ivory Coast and Cameroon at 11.1% and 8.7% respectively (60, 64). In South Africa, a study done in Gauteng at the Coronation women and children's Hospital in 2002 found a lower proportion at 18% than that found in our study (55). But pilot studies done in Kalafong and Natalspruit found a higher proportion at 29% in 2002 (26). The proportion of HIV positive pregnant women in our results is lower than the prevalence of HIV positive women reported by the Department of Health in Gauteng: 32.4% in 2005 and 30.8% in 2006 (3).

The percentage of women coming back for results was very high in this study at 98%. Quality of pre-test counselling and use of HIV rapid test are associated with good return rate (60, 62). Return rates were also high in other studies done in Africa. In Zambia and Zimbabwe they were at almost 100% (56, 63, 67). In the study assessing the South African pilots sites in 2002, the percentage of women who accepted HIV testing was high in some province like in Kwasulu Natal where it was around 90% or in the Western Cape, thanks to a good pre-test counselling (26). In other sites HIV testing uptake was much lower (around 50%), like in Mpumalanga or Northern Cape due essentially to a lack of counsellor (26). The percentage of women who received their results in this study in Sedibeng is higher than that observed in the initial PMTCT pilots sites in Gauteng in 2001 and 2002 (26). In Natalspruit pilot site only

53 % of tested women came back for results, due to a lack of good staff training and high workload (26).This study shows that a big proportion of women who attended ANC in Sedibeng primary health care facilities participated in the first important step of the PMTCT programme; that they were tested for HIV and returned for their results.

Nevirapine uptake

The data indicates that 600 pregnant women were dispensed NVP during 2005 per 1000 HIV pregnant women who tested HIV positive during the same period; and in 2006 this was 539 per 1000 HIV positive women. These data suggest that a significant number of women who tested positive during ANC weren't dispensed NVP during ANC. This study also shows that only 59% of babies born to women known to be HIV positive at delivery at Johan Heyns MOU received NVP after birth. However, true NVP uptake is propably lower than this as only women with known HIV status were included in the determination of uptake. In actual fact, only 83 babies out of 938 women (8.8%) who delivered at Johan Heyns CHC received NVP. A significant proportion of babies therefore should have, but did not, receive NVP to prevent MTCT, as the HIV prevalence amongst ANC attendees in this district was found to be 26%.

Uptake of NVP by HIV positive women is the most essential step in PMTCT: unless a large proportion of HIV positive women utilise NVP during labour and NVP is given to their babies, there will be no impact on paediatric HIV. Despite the availability of counselling, uptake of NVP is not always optimal. In the South African

pilot sites in 2002, the percentage of women who took Nevirapine during labour as prescribed varied within regions. It was 51% and 93% respectively in Natalspruit and Kalafong. At a national level 55% of women took NVP. This rate varied a lot within province and within month. In Northern Cape, for example, NVP delivered varied from 25% to 400% in one site. A poor quality of data was suspected to be responsible for this result (26). The proportion of babies who received Nevirapine was high in all facilities, with an overall at 99% (26). In Coronation Women and Children's hospital in South Africa, 92% of HIV positive women received Nevirapine, among whom 77% took it between 2 to 48 hours before delivery; and 79% of babies received Nevirapine (55). NVP uptake varies in different sites in Africa. In Zimbabwe, Kenya and Uganda studies found that over 70% of HIV positive women were given NVP (57, 63, 65). But in studies in Nairobi and Monbasa this percentage was lower at 15% and 20% respectively (29, 58).

The uptake of NVP by HIV-exposed babies seen in this study is higher than that observed in other countries in Africa. For example, in Zambia only 40% of babies received NVP, and in a study collating six years of experience with PMTCT in 11 countries only 44% of babies received NVP (56, 61). Among those sites, one site in Kenya showed an improvement in NVP uptake in babies by dispensing the Nevirapine syrup to the mothers at the same time that they were given Nevirapine tablets for themselves, and instructing them to give the syrup to their child within three days following delivery. As a result of this intervention, the percentage of babies receiving NVP in this site increased from 41% in 2003 to 76.5% in 2005 (61).

The purpose of the PMTCT programme is not only to detect HIV positive women, but to decrease the transmission of HIV from mother to child. This study shows that in Sedibeng, HIV positive pregnant women are well detected during the antenatal period, but Nevirapine uptake amongst these women is poor, meaning that the changes of the PMTCT programme being fully effective and reducing MTCT in this district are low. VCT acceptance is really good in this area, but it is useless if NVP is not delivered because HIV positive children will continue to be born despite a good VCT uptake and a good detection of HIV positive women during pregnancy.

Similar experiences have been reported in other countries: for example, in Zambia and Malawi, a good VCT uptake was followed by a low NVP uptake by HIV positive women and their babies (56, 59). Loss to follow up could explain these observations; as observed in Malawi where an estimated 63% of HIV positive deliveries were missed (59). Women were followed well during ANC visits, and HIV testing and counselling were done, but there was a loss of follow up until delivery, as women usually delivered in another facility (59). In this study in Seidbeng, 93% women accepted to be tested, but more than a third of women arriving for delivery at the MOU unit had an unknown HIV status. Reasons for this observation need to be investigated through further research. However, in this setting it could have been due to a high workload with nurses forgetting to record the HIV status even though they had asked women about it. Stigmas and fears around HIV could also be a reason for them not to report HIV status on the file, as nurses could have been reluctant to ask

women about their HIV status and write it on their records or patient held card (34, 40). Despite the use of a coding system nurses may be afraid of stigmatization and prefer not to write anything on the patients' records or held card to protect anonymity (54).

A high PMTCT coverage is important to ensure a good NVP uptake. In Malawi this was highlighted in a study where only 45% of HIV positive women and 34% of their babies received NVP. It was explained by the fact that many women delivered in a facility without any PMTCT programme implemented (59). This study went further by evaluating that 63% of HIV positive women were missed by the PMTCT programme because it was not implemented everywhere. Other reasons for a low NVP uptake were suggested: a time lag between the HIV test made at the beginning of the pregnancy and the dispensing of NVP to women later can partly explain a low NVP uptake, especially if it is associated with a loss of follow up (57, 58). Women who had received their HIV positive results didn't come back to the antenatal clinic and were not dispensed NVP (57, 58).

In our study time lag could explain a low NVP uptake; in the study clinics, HIV results are given early in the pregnancy, but NVP is given during the last ANC visit before delivery. If an HIV positive woman does not come back to the ANC later during her pregnancy she may not receive NVP even though she was tested in the ANC clinic. This is an important missed opportunity for prevention of MTCT. Further opportunities to prevent MTCT were missed in this study as 47% of women

arrived at the MOU for delivery with an unknown HIV status - 32% with no information on their records, and 15% because they refused the HIV test. All babies born to women with no HIV status information on their record did not receive NVP, and yet it is possible that many HIV positive women may have been misclassified as "unknown HIV status".

To ensure that HIV positive women who come in labour and their babies are given NVP some combined programmes offer NVP to all women who tested HIV positive and to all women with unknown status and to all these women's babies (61). This method ensures that all HIV positive women and their babies receive NVP. But there is a small risk of toxicity, even though single dose of NVP has never been proven to have a high toxicity (46, 49). This method has two other disadvantages; it increases the cost of PMTCT by increasing NVP use, and it can undermine the promotion of VCT in the PMTCT programme. If women receive NVP, with small risk for them and their babies, HIV testing can appear useless as they will have prevention anyway. It can decrease the good acceptance rate of HIV testing in Sedibeng and the benefit of counselling not only in the PMTCT programme but for a more comprehensive HIV prevention (67).

Another way to improve NVP uptake is to give the mother NVP tablet for her and NVP syrup for the baby at the time when delivering HIV positive results. In Western Kenya NVP was given to the mother at the same time as the HIV positive results, avoiding time lag and the risk of loss of follow up. It significantly increased the

percentage HIV positive women who were given NVP from 72.5% to 94.4% (61). Using the same method, this percentage was increased from 40.8% to 87.4% in a site in Cameroon (61). By giving the medication with the HIV results a bigger proportion of HIV positive women may be dispensed NVP.

However, women who are given NVP do not always take it before delivery. There is no way to assess if pregnant women fully understand the NVP protocol and whether NVP is actually taken before delivery (57, 61). A study which tested the level of NVP in umbilical cord blood after delivery found that only 68% of women who were given NVP actually had taken it, as evidenced by presence of NVP in the cord blood (64). In some facilities, mothers are encouraged to take their NVP in the delivery ward in front of the staff to be sure that NVP was taken (66). In Sedibeng as well there is no way of knowing if the NVP was actually taken by women who received it during ANC visits and of evaluating HIV positive pregnant women's knowledge of NVP and its use and benefits. Thus, strategies to improve the proportion of women who received NVP, should also improve the supervision of women around delivery, to ensure actual use.

Factors influencing women's uptake of available PMTCT programmes

Various factors could influence women's willingness to continue their participation in PMTCT programmes after being tested for HIV. In a study in Ivory Coast only 26.2% of HIV positive women followed the PMTCT programme (free PMTCT package including a NVP+ZDV prophylaxis) (60). In this study the VCT uptake was high

with almost 90% of women being tested and 73% post counselled. Among the HIV positive women who knew their status, only 35.8% accepted to be part of the PMTCT programme and receive a free medication (combination of Zidovudine and Nevirapine from 36 weeks to the birth). The main factors influencing women's willingness to take AZT+NVP were the socio economical status, even though the medication was free, the education level, and the stigma and fears around HIV (60).

The fear of disclosure to a partner has also a strong influence as single women were more likely to enter the PMTCT programme (53). Different studies showed that these factors are responsible for the lack of involvement of women in the PMTCT programme (30, 60). The situation can be improved by involving partners in the PMTCT programme or with couple counselling. These measures increase the HIV testing uptake, and women are more likely to enter the PMTCT programme and take their medication while their partner is involved (33). The woman can fear stigmatization at a community level as well, where there are still stigmas, fears and taboos around HIV and prefer not to know about her HIV status, or hide it to nurses during delivery (34, 40).

Challenges in evaluating PMTCT programmes

Many African countries have begun to implement PMTCT programmes but face many challenges both in programme implementation as well as monitoring progress and evaluating impact of these programmes. Assessing the uptake of PMTCT by pregnant women is a good way of monitoring progress with implementation. It is

important to find out the factors affecting uptake of PMTCT so that correct intervention can be put in place. Measuring the PMTCT programme effectiveness may however be challenging (68). Data used are collected from different registers which are not usually linked (68). It may be difficult to have the same denominator to compute different indicators such as the proportion of women accepting to be tested, the proportion of HIV positive women receiving Nevirapine, or the proportion of HIV positive women's babies who received Nevirapine (68). PMTCT data could be used to determine the HIV prevalence among pregnant women, with a bias known that only women who accepted to be tested are included in the denominator population. But these data, coming from all the antenatal clinics, have the advantage to be available widely in all African countries (69). Another challenge faced in evaluating PMTCT programme is that most of the time only the number of NVP tablets dispensed to women is recorded, with no guarantee that the mother took it during labour at the right moment to allow a full efficacy of the treatment (68).

5/Limitations

These results must be interpreted in the context of limitation of the study. The main limitation of this study was a poor quality of data. First of all, it was a record review, so the quality of data was directly linked to the way records were filled in. Monthly collation sheets were filled in by nurses at the end of each month in each facility. These data are completely dependant on the way nurses perceive them. If nurses don't perceive these monthly collation sheets as a part of the district health information system and a way to improve their work, they will not fill them in as

seriously as they should, and the quality of data will be poor. Furthermore all the facilities didn't report their sheets every month so there were various numbers of facilities participating in the study along the years. In the district health information system itself, data were missing for some entire months. We couldn't have completed data for a whole year, bringing limitations to the results.

The poor quality of data was a big limitation particularly in the determination of the fourth and fifth objective. For objective four, it is possible that some women may have not receive NVP during their ANC visit because they were already on HAART- it was not possible to ascertain this as this data is not recorded in the ANC clinic records. For onjective five, unfortunately 32% of the delivery records didn't have information on the HIV status of the women who came for delivery. This affected the quality of our data, as in reality the percentage of babies exposed to HIV who received NVP may be lower as some women with unknown HIV status should have been included in the denominator; and some babies may have been born to HIV positive women but were not included in the study.

The poor quality of data implies that we didn't work on the whole population of HIV positive women at deliveyr, but only on those whose HIV status was reported on the files, which was around 70 %, with a possible selection bias. In Johan Heyns community health centre, nurses are responsible for giving NVP to HIV-exposed babies just after delivery. Again, poor quality data could partly explain the low NVP

uptake amongst HIV-exposed babies in this site as it is possible that NVP was given but not recorded.

6/ Conclusion

This study found that uptake of HIV voluntary counselling and testing was high in the antenatal clinics in Sedibeng. Almost all the women attending antenatal clinics at a primary care level were counselled and tested in Sedibeng district. A problem still remains in the NVP delivery to the mothers and the babies, which this study suggests is low. The quality of data is very poor but it seems that NVP is not given to all HIV positive women as it should be and is not given to all the babies born to HIV positive mothers who delivered in Johan Heyns Community Health Centre. The study also found that the district health information system has limitations that do not allow a good and accurate determination of the uptake of PMTCT at primary care level in Sedibeng district.

7/Recommendations

Low NVP uptake amongst HIV positive pregnant women and their babies is an important problem in the Sedibeng PMTCT programme. A number of measures are recommended to address some problems identified in this study.

Loss of follow up seems to be an important problem: women's follow up during pregnancy could be improved by linking MOU and ANC records in the district. This will allow health workers to identify women who tested HIV positive at ANC, and

who therefore need to take NVP during labour- this could reduce missed opportunities for preventing paediatric HIV.

The proportion of women with a known HIV status at delivery could also be improved by strategies to fight stigma and fears around HIV testing and disclosure. This would increase pregnant women's disclosure of their HIV status when they arrive in the MOU unit for delivery. Communities could be involved to promote PMTCT outside the ANC. Partners and/or family should also be more involved in the PMTCT programme. They could receive information about this programme and its importance within their community or they could be more involved in the pre-test counselling. This could then increase the HIV positive women's compliance to PMTCT by decreasing their fear of disclosure, and through the possible support from their relatives (30, 35, 60, 70).

NVP uptake needs to be improved and further investigations must be done to test and understand possible mechanism for delivering NVP to pregnant women. It can be improved by giving NVP at the same time as HIV positive results. For example, giving NVP to women at the same time as the HIV positive results would improve the proportion of HIV positive women dispensed NVP. This method could then offer NVP to both women who deliver in Sedibeng facilities and who deliver at home.

Dispensing however does not mean the women will take the NVP during labour. Research is required to identify reasons why women may not take NVP when needed.

But ensuring women are sufficiently educated and informed about when they have to take it and why is an important intervention that should be implemented.

Training and information must be provided to nurses to make them understand the importance of asking all women their HIV status and reporting it systematically on the record. A third of the women records don't have any information on the HIV status. An investigation must be done to understand. An investigation must be done in the MOU involving nurses to understand why they have difficulties to report HIV status even with an anonymous coding system.

An improvement of the NVP management around delivery should also be done. Having to report it on the record, nurses would be less inclined to forget to ask about HIV status and to give NVP, even in high workload situations. After delivery nurses have to give NVP to the HIV positive mothers' babies, and report it on the records. This indicator is dependant only on the nurses' skills and willingness to follow the protocol. The percentage of NVP given to the babies and reported on the NVP register can be easily improved by improving skills and training of the MOU nurses.

There is poor quality of data and this must be improved. ANC and MOU staff needs to be aware of the fact that good data is essential and records and registers should always be filled in correctly even during high workload situation. An improvement of the district health information system must also be done through investigation the data collection and collating process to understand its failures and improve it. A good

quality data allows a good analysis of the PMTCT programme and an improvement in the quality of service provided.

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Annexures

Annexure A

List of the facilities including an antenatal clinic in Sedibeng district at a primary health care level

SUBREGION EMFULENI	
Albertina Sisulu	clinic
Beverly hills	clinic
Boipatong clinic	community health centre
Boitumelo clinic	clinic
Bophelong clinic	clinic
Drieshoek	clinic
Empilisweni	community health centre
Evanton Main	clinic
helga khun	clinic
Johan Deo	clinic
Johan Heyns	community health centre
Levai Mbatha	community health centre
Market avenue	Clinic
Mpumelelo Clinic	Clinic
Quik shop	Mobile
Retswelapele	Clinic
Rustervaal clinic	Clinic
Sebei Z12	Clinic
Sharpville	community health centre
Tshepiso	Clinic
Zone 13	Clinic
Zone 3	Clinic
SUBREGION LESEDI	
ext 7	Clinic
Rathanda	Clinic
Rensburg C	Clinic
Ueckerman	Clinic
Usizolwethu	Clinic
Viscckhuil 14	Clinic
SUBREGION MIDVAAL	
groedene	Mobile
Koorus	Clinic
Midvaal CHC	community health centre
Pontshong	Clinic
Rand vaal	Clinic

Annexure B
Consultation sheet

VCT (voluntary counselling and testing)
Please tick the box provided

NAME OF THE CLINIC					
DATE OF BIRTH					
OCCUPATION					
MARITAL STATUS					
PRE-TEST COUNSELLING Yes/No			POST-TEST COUNSELLING Yes/No		
DATE COUNSELLED			DATE COUNSELLED		
RAPID					
CONFIRMATION TEST					
ELIZA					
RESULT	REACTIVE		NON-REACTIVE		
REMARKS					
I HEREBY GIVE PERMISSION FOR BLOOD TO BE TAKENFROM ME WITH PURPOSE OF TESTING FOR HIV VIRUS					
SIGNATURE		DATE			
NAME OF THE COUNCELLOR					

Annexure C
Monthly collation sheet

NAME OF THE REGION:_____.

NAME OF THE SITE:_____.

DATE/YEAR/MONTH: _____.

Week date	No of ANC Attendees	No of HIV women counselled	No of women tested	Number of Women HIV positive	Number of women HIV negative	NVP dispensed
Total						

Annexure D
Data extraction sheet

Year	Number of ANC attendees	Number of women consenting to voluntary counselling	Number of women voluntary testing for HIV	Number of HIV positive women	Number of post counselled women	Number of women who were dispensed NVP
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

Annexure E
Ethics clearance certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Berthet

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER M070111**
PROJECT	Uptake of the Prevention of Mother-to-Child Transmision Programme at a Primary Health Care Level in Sedibeng
INVESTIGATORS	Mrs E Berthet
DEPARTMENT	School of Public Health
DATE CONSIDERED	07.01.26
DECISION OF THE COMMITTEE*	APPROVED UNCONDITIONALLY

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 07.03.27 **CHAIRPERSON** .....
(Professors PE Cleaton-Jones, A Dhai, M Vorster, C Feldman, A Woodiwiss)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Dr M Kawonga

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

07.04.03