

Part 0: Preamble  
Title

## **An Evaluation of the Quality of Antenatal Care and Patient Satisfaction in two Provinces of South Africa**

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Declaration

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## Thesis Abstract

The aim of this study was to investigate the quality of service delivery for HIV-infected women at antenatal clinics in two provinces in South Africa and to highlight areas for improvement.

### **The specific objectives were to:**

- Describe the quality of care at antenatal facilities in the context of expected standards according to national guidelines.
- Ascertain patient satisfaction with services and health education.
- Determine whether quality of care is linked to resources.
- Determine whether patient perceptions of quality of care are influenced by the resources available and services rendered.

This study was conducted as part of a larger study to determine the effectiveness of PMTCT programmes in 4 countries. In South Africa, the Western Cape and Free State provinces were selected because the researchers had access to facilities in these provinces. These provinces were also different in terms of socio-demographic make-up and resources available. Three areas which translated to health sub-districts were randomly selected in each province.

This was a cross-sectional study design with provider-patient clinical observations, structured provider interviews and patient exit interviews.

The population included all clinics with antenatal services in the Western Cape and Free State. Pregnant women attending these antenatal services and health care providers at these services were selected from these clinics to assess care at these services. The sampling frame for the facility survey consisted of the antenatal clinics that referred patients to the delivery sites where the first component of the PEARL study, a cord blood surveillance exercise had taken place. Clinics with the largest number of attendees in the three sub-districts in each province were chosen.

Five sites from the Western Cape and 13 sites from the Free State were selected for the facility survey. A convenience sample of 6 consecutive women attending the service was selected from the list of attendees at the antenatal service on that particular day and exit interviews were conducted with those women. In addition, at each of the facilities field workers observed consultations with six women other than those who participated in the exit interviews. An interview was also conducted with the health care provider in charge of the antenatal service on the day of the survey. Informed consent was obtained from both the pregnant women and the providers. Data were collected between October 2008 and May 2009 in the two provinces. Ethics approval was granted by the Health Sciences Faculty Research Ethics Committee. REC REF:038/2007

## Acknowledgements

The PMTCT Effectiveness in Africa: Research and Linkages to Care (PEARL) facility survey constituted one of three components of a larger study which sought to evaluate the effectiveness of PMTCT programmes in 4 countries, including South Africa.

Data were collected between October 2008 and May 2009, prior to the analysis and write up of the facility survey by clinically trained field workers.

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## Part A: Protocol

### Part I: Introduction

#### Problem

Global evidence suggests that there has been uneven progress made towards attaining the United Nations Millennium Development Goal 5 targets of reducing maternal mortality and improving universal access to reproductive health care by 2015. Challenges remain due to limitations in the provision of maternity services, barriers to accessing emergency obstetric care and the education of women around maternal health.<sup>1</sup> According to the fourth 'Saving Mothers' report (2005-2007) almost 60% of maternal deaths in South Africa were avoidable and over half of these deaths were attributed to health systems failures.<sup>2</sup> In addition, the 'Saving Babies' report for 2006-2007 found that the quality of perinatal care in district hospitals was poor, and over one third of perinatal deaths were due to avoidable health system failures.<sup>3</sup> The 'Saving Mothers' report attributed failures to a lack of health care facilities, poor transport to or between facilities, a lack of appropriately trained staff, non-adherence to standard operating protocols, poorly conducted initial assessment of patients and poor problem recognition.<sup>2</sup>

The report highlights the need for staff training and support from government and non-governmental agencies with an accountability system in place to ensure the quality of health services. The report further recommends that interventions be introduced to address knowledge development, quality of care, coverage, the establishment of norms and standards and community engagement. Interventions should include training in emergency care as well as screening for and treatment of the major risk factors associated with maternal mortality and the appropriate provision and management of staff, equipment and transport.<sup>2</sup>

The provisions of the South African National Health Act of 2003 and the Policy for Quality set recommendations for performance and accountability. Some of the aims set by government outlined in the Policy for Quality Health Care to improve the standard of care delivered include: assessing issues of access, increasing patient participation, a focus on preventive and promotive activities, increasing research on operational effectiveness, ensuring appropriate use of health care services and reducing adverse events in the health care setting. The four main target groups of the interventions included health professionals, patients, the community and the health service delivery system.<sup>4</sup>

Despite these recommendations, research in South Africa suggests that there are a number of factors that continue to impact on the quality of antenatal care (ANC) services. Studies have focussed on elements of service management and delivery, including the training of health professionals; staff morale; patient waiting times; as well as the privacy of patient-provider interactions and comprehensiveness of consultations. The lack of privacy at many facilities and the fact that patients often see a number of different providers during their visit adversely impacts on good communication and the fostering of a good client-provider relationship. Consequently many women find it difficult to discuss personal problems and concerns.<sup>5</sup> A study conducted in Kwazulu Natal found that in spite of women arriving early for their antenatal appointments and spending many hours at the facility, women spend a limited amount of time with the health care providers. The study showed that women spend on

average 4.5 hours in the facility, 4 of which is spent waiting to see a provider.<sup>6</sup> Despite the evidence suggesting concerns around quality of care, many studies have reported that women are generally satisfied with the quality of ANC.<sup>7</sup> This may be due to low expectations amongst users of the services, or social desirability bias.<sup>7</sup>

In a study on quality of care at contraceptive services, 20% of women reported that the provider scolded them.<sup>8</sup> Poor quality of care may be related to low morale amongst health care providers. A nursing dynamics study found that 27% of nurses reported that they did not care for patients like they used to while 60% felt a lack of motivation to work as hard.<sup>9</sup> The nurses attributed the low level of motivation to limited opportunities for promotions, poor management as well as staff shortages.<sup>9</sup> A five year review of the public sector carried out in 1999 also found that the morale amongst staff was very low, especially among nurses. Although the nurses attributed low morale to being overworked, feelings of neglect and lack of support is also believed to have contributed.<sup>10</sup> It is thought that the morale of health workers will improve by fostering a sense of purpose and personal fulfilment; this could be facilitated through the articulation of a clear vision and plan by national and provincial managers.<sup>11</sup>

Service delivery and quality of health care are contingent on a well functioning health system.<sup>12</sup> The transformation of the South African health system after 1994 including the implementation of a primary health care system has been challenged due to a wide range of factors including high rates of medical migration, health worker shortages, an inequitable distribution of resources and personnel, poor leadership and managerial capacities in the health system. Health service delivery is further challenged by a complex and evolving burden of disease. The rapid progression of the HIV epidemic has necessitated the introduction of comprehensive health services as well as widespread preventive interventions.<sup>13</sup> Consequently, the increasing demands on primary health care services and the expanding scope of practice of nurses who provide the backbone of primary health care must be managed with strong leadership and stewardship to ensure the successful implementation of proposed HIV-related policies.

According to UNAIDS, approximately 370 000 children were infected with HIV in 2007, 90% of infections being due to vertical transmission from mother to child, with 90% of these infections occurring in Sub Saharan Africa.<sup>14</sup> Over one third of childhood deaths were caused by HIV in high prevalence countries including South Africa in 2007,<sup>13</sup> severely threatening the gains made in child survival. As a response, the South African government has rapidly implemented the programme for the prevention of mother-to-child transmission of HIV (PMTCT). Through introduction of voluntary counselling and testing (VCT) and the provision of ARV regimens at antenatal services, the PMTCT programme is often the gateway to HIV care for pregnant women and their families.<sup>15</sup> PMTCT services in South Africa began as a pilot service in early 1999.<sup>16,17</sup> before being rolled out nationally in 2001.

PMTCT programmes have reduced transmission rates from 40% to less than 5% in research settings in sub Saharan Africa.<sup>8</sup> National governments, following the United Nations General Assembly in 2001, committed themselves to reducing the proportion of infants infected with HIV in half by 2010 by ensuring that 80% of women in need access PMTCT services.<sup>18</sup> Operational data collected for 2008 have shown that approximately 50% of HIV-infected women had access to PMTCT services in South Africa<sup>19</sup> while global coverage was as low as 33%.<sup>8</sup>

PMTCT requires a number of steps including voluntary HIV counselling and testing during antenatal care. Basic obstetric services need to deliver antiretroviral therapy to HIV-infected pregnant women, ensure safe deliveries and provide counselling on infant feeding. Post partum care includes infant feeding support, growth monitoring, family planning, the screening of children for HIV and long term support to infected mothers and their families. This is known as the PMTCT cascade and process indicators can be collected at each point. Many studies assessing programme coverage have documented attrition along each step of the cascade.<sup>20</sup> Reasons for non-acceptance of testing or prophylaxis vary across settings, but may be related to poor understanding amongst pregnant women, denial or fear of stigma.<sup>21</sup> Other factors include service-related barriers to care. A study conducted to assess the operational effectiveness of PMTCT programmes across three districts in South Africa found the overall quality of a particular health service explained some of the differences seen in HIV transmission rates and death across the sites. Although utilisation of antenatal services was high across the sites, syphilis testing and the uptake of nevirapine was poor.<sup>22</sup> Programme evaluations from a number of countries in Africa found failures at each point along the PMTCT cascade including uptake of antenatal testing,<sup>23, 24</sup> receipt of test results,<sup>25</sup> uptake of ARVs<sup>26, 27, 28</sup> and postnatal follow up.<sup>22</sup> In 2006-2007, South African antenatal service coverage was 90%<sup>5</sup> yet HIV testing rates were 69%<sup>29</sup>. Furthermore, one third of HIV-infected women did not receive nevirapine at delivery,<sup>2</sup> although 84% of all births were assisted by trained health personnel.<sup>5</sup>

According to the 'Saving Mothers' report, 59% of mothers who died had been tested for HIV with 79% testing HIV-positive from 2005-2007, an increase from 46% in the previous triennium when 78% tested HIV-positive. Where antenatal care status was known, 76% of those who died during or within 6 weeks of pregnancy had attended antenatal clinics. This was lower than the overall coverage of 95%.<sup>2</sup> This highlights the need to focus on health system interventions to improve maternal mortality. The report also highlights the notable shift in cause of maternal deaths to non-pregnancy related infection, in particular due to AIDS<sup>2</sup>; many of these deaths could have been avoided through PMTCT interventions.

The integration of PMTCT programmes into health systems that are overburdened and under resourced may have contributed to the sub-optimal outcomes seen.<sup>30</sup> In order to minimize attrition along the PMTCT cascade, compassionate staff within well functioning antenatal, intrapartum and postpartum services with good laboratory support and referral services are required. In addition the services need to be well resourced and have a reliable source of tests and medications such as ARVs as well as a monitoring system to continuously evaluate outputs, outcomes and impact.<sup>31</sup>

## Justification

The Women's Health and Genetics Directorate is responsible for the antenatal care programme in South Africa. A set of guidelines and policy documents were produced by the Department of Health and include the maternal health policy outlining the minimum set of requirements for rendering maternal health care services. The guidelines discuss the management of pregnant women and the service provision to be rendered at each level of care. In addition, the guidelines define the levels of care, the staffing requirements at each level, the services to be provided and the referral systems to be put in place. While the National Maternity Guidelines outline how maternity services should be provided, each province is expected to adapt the guidelines according to local conditions and needs. A system in place to assess whether all the facilities have and are using the guidelines is lacking, however. An assessment

of 141 public sector PHC facilities nationally found that the national guidelines could only be found in 46% of the facilities.<sup>32</sup>

The maternity guidelines outline the elements of care and procedures to be provided during the first and subsequent visits. The main components of antenatal care include: registration, group counselling, urine testing, blood pressure and weight measurements, pre-test counselling and testing for HIV, full history taking, blood sample collection, an examination, and the provision of medication.<sup>33</sup> In 2000, the National Primary Health Care Facility Survey found that only 87.4% of clinics provided antenatal care, and the services were not provided daily.<sup>34</sup> Subsequent to these findings, the National Health Act stipulates that the delivery of all health services is the responsibility of the provincial health department and antenatal care should be routinely provided to low risk women at all primary health care facilities. Yet other research has shown that many facilities still restrict visits to certain days of the week.<sup>6</sup> Antenatal services rendered should be recorded so as to ensure adherence to guidelines, although a number of studies have found that this is not the case.<sup>35, 6, 7</sup>

Surveys have commonly been used to evaluate health services. The eight main facility-based assessment tools currently used at both national and programme levels worldwide include the Service Provision Assessment (SPA), Facility Audit of Service Quality (FASQ), Health Facility Census (HFC), Service Availability Mapping (SAM), Health Facility based survey of Human Resource for Health Services (HRHS), Rapid Health Facility Assessment in Child Health (Rapid HFA), Access, Quality, and Use in Reproductive Health (ACQUIRE) Evaluation of LAPM Services (ELMS); and Population Council Health Facility Assessment (PCHFA).<sup>36</sup>

The tools allow for the evaluation of a wide range of elements related to service provision so as to inform policy and planning at the national, provincial and district level worldwide in order to improve the delivery of care. Information collected includes the documentation of resource systems and practices in place, the quality of care delivered, information on the functionality of the physical assets of the health sector including infrastructure and equipment, and the state of the health workforce including the workforce profiles and projections of need. Some tools have been developed to specifically target particular services, including the ACQUIRE Evaluation of LAPM Services (ELMS) focusing on Family Planning/Long Acting and Permanent Methods (FP/LAPM) services, the Population Council HFA (PCHFA) focusing on reproductive health services and the R-HFA focusing on maternal newborn and child health services at the primary health care level. This R-HFA tool has been used for the piloting of interventions for service quality improvement in Africa and Asia.<sup>36</sup>

Despite the availability of a wide range of measurement tools, few evaluations of antenatal care services have been conducted in South African settings. A national HIV prevalence population survey from 2008 conducted by the Human Sciences Resource Council found that 97% of women had access to antenatal care while pregnant with 71.4% attending at least five antenatal visits. In addition, the study found that the majority of pregnant women were attended to by a skilled birth attendant during labour.<sup>37</sup> Despite this, maternal mortality remains high according to the Saving the Mothers Report, which suggests that challenges to delivering high quality care still subsist and that the quality of ANC services needs further evaluation.

The PMTCT Effectiveness in Africa: Research and Linkages to Care (PEARL) facility survey was based on a

modified version of the above mentioned “Rapid Health Facility Assessment Tool: To Enhance Quality and Access at the Primary Health Care Level.” The PEARL Facility Survey, on which this analysis is based, was conducted in two provinces in South Africa, as well as in 3 other African countries. It constituted one of three components of a study which sought to evaluate the effectiveness of PMTCT programmes by measuring coverage of PMTCT services and evaluating clinic level factors impacting on this coverage, including the quality of antenatal care. The PEARL facility survey aimed to monitor adherence to national and provincial antenatal guidelines as a means to assess operational effectiveness and gaps in the provision and quality of services, including the PMTCT service. Assessments of the quality of health services are essential for the strengthening of health systems.

### Aim and Objectives

The aim of this study was to investigate the quality of service delivery for pregnant women at antenatal clinics in two provinces in South Africa and to highlight areas for improvement.

#### **The specific objectives were to:**

- Describe the quality of care at antenatal facilities in the context of expected standards according to national guidelines.
- Ascertain patient satisfaction with services and health education.
- Determine whether quality of care is linked to resources.
- Determine whether patient perceptions of quality of care are influenced by the resources available and services rendered.

### Part II: Methods

As described above, this study was conducted as part of a larger study to determine the effectiveness of PMTCT programmes in 4 countries. In South Africa, the Western Cape and Free State provinces were selected because the researchers had access to facilities in these provinces. These provinces were also different in terms of socio-demographic make-up and resources available. Three areas which translated to health sub-districts were randomly selected in each province.

#### Study design

This was a cross-sectional study design with provider-patient clinical observations, structured provider interviews and patient exit interviews.

#### Population and sampling

The population included all clinics with antenatal services in the Western Cape and Free State. Pregnant women attending these antenatal services and health care providers at these services were selected from these clinics to assess care at these services.

#### Method of sampling

The sampling frame for the facility survey consisted of the antenatal clinics that referred patients to the

delivery sites where the first component of the PEARL study, a cord blood surveillance exercise had taken place.<sup>38</sup> Clinics with the largest number of attendees in the three sub-districts in each province were chosen.

Five sites from the Western Cape and 13 sites from the Free State were selected for the facility survey. A convenience sample of 6 consecutive women attending the service was selected from the list of attendees at the antenatal service on that particular day and exit interviews were conducted with those women. In addition, at each of the facilities field workers observed consultations with six women other than those who participated in the exit interviews. An interview was also conducted with the health care provider in charge of the antenatal service on the day of the survey. Informed consent was obtained from both the pregnant women and the providers. Data were collected between October 2008 and May 2009 in the two provinces.

## Measurement

### Instruments

The facility survey collected a range of information on antenatal services and the PMTCT programme. This included the type of facility, catchment area and location. The survey was divided into 4 modules. The first module constituted the direct observation of a consultation of the quality of clinical care. The second was an exit interview with women attending the facility, in order to measure perceptions and knowledge of care. The third was a health facility assessment using a checklist to document infrastructure, equipment and drugs. Finally an interview with the health facility manager regarding services provided at the health facility and the human resources involved in the services was conducted. All components of the survey were conducted by clinically trained field workers. Exit interviews with patients were carried out in the patient's mother tongue, while health care provider interviews were carried out in English or another African language (isiXhosa, Afrikaans, or SeSotho) where applicable.

### Validity and reliability of instruments.

The survey instrument was pretested prior to data collection.

## Part III: Analysis

### Data management

All data were entered electronically into a Microsoft Access database. Data were cleaned in Access through cross checking a 10% sample of electronic entries against the hard copy version. Consistency checks were run to ensure accuracy of the data entered. The database was imported to STATA statistical software for analysis.

### Analysis

For the purposes of this analysis, the facility survey content will be divided into three analytical domains, defined by the investigators as structure, process and outcome attributes. The structure domain will include physical attributes of health facility, availability of equipment, stock outs, human resources and

supervision, peer review, training and organizational structure. The process domain will include the health care worker conduct and competence. Outcome attributes will include patient satisfaction and understanding of their drug prescription. This framework for the analysis drew from Donabedian, who developed the principle of quality in health care and operationalized quality evaluation in health service settings.<sup>39</sup> This approach has subsequently been more widely adopted in other developing contexts.<sup>40, 41, 42, 43</sup>

Since the facility survey tool was designed to be used across four different country service settings, it contains some variables which are not pertinent to the South African ANC service context. Hence the choice of variables to be included for analysis will be based on an extensive literature review on the quality care in antenatal services including the minimum basic requirements for rendering care, as well as advice from local experts working in maternity services or PMTCT research. Certain variables deemed irrelevant will be omitted, for example the provision of anti-malarials which is not applicable in the Western Cape and Free State provinces. Furthermore, because some of the facilities had a labour ward while others were Basic Antenatal Care (BANC) sites which referred to larger establishments for delivery, items relating to delivery and newborn care including immunisation will also be omitted.

Most variables were binary; however a few variables were continuous. Patient satisfaction was measured on a Likert scale from 1 to 5.

### Describing the data

A univariate and bivariate analysis will be performed to assess the distribution of variables and how they differ across the provinces. Provinces will be compared using point and confidence interval estimates of the prevalence of facility attributes and activities conducted. For the purposes of comparison, variables that are patient specific, such as tests performed on the individual women during the consultation, will be aggregated by facility and proportions will be used to compare the provinces.

### Deriving an outcome score

The outcome variable is patient satisfaction. Patient satisfaction will be measured from an average score for each facility from a number of different Likert items. The patient scores will be derived from the exit interviews in which the women attending the facilities were asked to respond on a Likert scale of 1-5 ranging from 'strongly disagree' to 'strongly agree' how they felt about a series of statements concerning the care they received on the day the survey was conducted. In order to derive a patient satisfaction score, scores obtained on each of the 16 questions will be added up, and averaged across the 6 women from each facility, to get an average satisfaction score for each site. The ordering for the positively loaded statements will be reversed relative to the negative ones, so that a higher score will reflect a higher level of satisfaction.

### Regression

In order to identify relationships between predictor variables and the outcome, multiple linear regression will be used because the outcome score is a continuous variable. The rationale behind the selection of the variables to be included in the regression analysis will either be based on a significant

difference in their values across the provinces or elements that have come through in the literature as influential contributors to quality of antenatal care and patient satisfaction.

## Part IV: Ethics And Communication

### Ethics

#### Ethical Consideration

Ethical approval for this study was obtained from the UCT Human Research Ethics Committee in September, 2008 (REC Ref 038/2007). This study will be conducted according to Good Clinical Practice (GCP) guidelines, the 2000 Declaration of Helsinki, local rules and South African ethical regulations (World Medical Association 2000).

#### Quantitative Data Collection- Protection of privacy and confidentiality

No personal identifiers were attached to any data collected. The only identifier collected was the name of the facility surveyed. All data collected is kept in secure and confidential files in the Centre for Infectious Disease Epidemiology and Research, School of Public Health and Family Medicine, UCT. No individual facility identifying information will be disclosed in reports, publications, or presentations.

#### Qualitative data collection – Consent Procedures

Written informed consent was obtained from all clinic attendees and health care providers involved in the qualitative data collection. The informed consent explained:

- ☐ the purpose of the study;
- ☐ the voluntary nature of participation;
- ☐ what was involved in participation, including the duration of the interview;
- ☐ the risks and benefits of participation;
- ☐ protection of participant privacy (ie, that all information provided will be completely confidential and will only be viewed and used by the researchers on this project, and that participants' names will not be recorded to ensure anonymity); and,
- ☐ the participant's right to decide not to participate, to refuse to answer any question, or to withdraw from the interview at any time without any penalty.

Informed consent documents are presented in the Appendix.

#### Risks and benefits of participation

The only risk of participation for clinic attendees and providers in the semi-structured in-depth interviews and clinic observations was the potential risk of loss of privacy. Steps were taken to ensure the protection of confidentiality in order to minimize this possibility. There were no guaranteed benefits to individual participants for their participation; however, it was expected that participation in this study could help to inform and improve the quality of both antenatal and ongoing health care services for pregnant women receiving antenatal care, and HIV-infected pregnant women in the Western Cape and Free State.

## Stakeholders

The results of this study will be communicated to the Department of Health and the Women's Health and Genetics Directorate, community based or non-governmental organisations working in the area of maternal and child health, health care workers providing maternal and child health related services including PMTCT services, and women attending antenatal clinics.

## Reporting and implementation

This study will be submitted for publication in a peer-reviewed journal.

## Part V: Logistics

### Timetable

The study has already been completed and therefore this section is not applicable.

### Budget

The study has already been completed and therefore this section is not applicable.

## Part VI: References

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## Part B: Literature Review

### Objectives

The objective of this literature review was to summarise research that has evaluated ANC services and quality of maternal health care, as well as studies relating to patient satisfaction. Accessibility and utilisation of PMTCT programmes were also reviewed. Since the quality of maternal health care influences maternal and child health outcomes; trends and predictors of maternal and child mortality were also reviewed.

### Search strategy and quality criteria

The literature review focused on health systems evaluation of ANC and PMTCT programmes and services. This review included observational studies as randomized control trials (RCTs) are rarely used to assess outcomes such as patient satisfaction, following the introduction of new models of antenatal care. Data from systematic reviews of factors associated with patient satisfaction and patient outcomes were also assessed. The review was restricted to articles and documents published in English since 1990. PubMed, Embase, and Google Scholar were searched in addition to hand searching the bibliographies of selected peer reviewed articles. Key words for the search criteria included 'Quality', 'Antenatal Care', 'South Africa', 'Maternal and Child mortality', 'PMTCT', 'Coverage', and 'Patient Satisfaction'. Abstracts of retrieved articles were read and if they were pertinent to the research question, full texts were then retrieved. Due to the dearth of information related to the topic, inclusion criteria were broad so as to ensure a comprehensive understanding of quality of antenatal care. As the fields of antenatal care and specifically PMTCT interventions are rapidly changing, data were drawn from national policy and treatment guidelines as well as health information systems. Since data for the study were collected between October 2008 and May 2009 in two provinces in South Africa, data reviews of primary health care and antenatal services focused on that period and prior so as to describe changing trends in the quality of care. In order to assess adherence to national and provincial antenatal and PMTCT guidelines and quality of care recommendations, the Department of Health website was accessed to retrieve appropriate resources, in addition to conducting a targeted web-based search of reported literature from select sites including Health Systems Trust, the World Health Organization (WHO) and the Joint United Nations Programme on HIV AIDS (UNAIDS) to retrieve information from health management information systems.

### Summary

#### Maternal and Child Health

Global evidence suggests that there has been uneven progress towards attaining the United Nations Millennium Development Goals (MDGs) of reducing maternal and child mortality and improving universal access to reproductive health care by 2015.<sup>1</sup> Global mortality of children under the age of 5 years has fallen from 12.5 million deaths in 1990 to 8.8 million in 2008.<sup>2</sup> Despite this, neonatal mortality

still accounts for 41% of deaths in children under the age of 5 years<sup>1</sup>. In 2008, 342 900 maternal deaths occurred worldwide ; 50% of these occurring in six countries, 3 of which were in Africa.<sup>3</sup> An analysis of progress made towards the Millennium Development Goals concluded that HIV is one of the main reasons for not reaching targets.<sup>4</sup> Furthermore, it is estimated that maternal mortality would be 20% lower in the absence of HIV/AIDS.<sup>5</sup> In 2001, the United Nations General Assembly Special Session (UNGASS) clearly emphasised the detrimental effects of HIV/AIDS on maternal and child health.<sup>6</sup> In the final declaration national governments committed themselves to reducing the proportion of infants infected with HIV by half by 2010 by ensuring that 80% of women in need access PMTCT services.<sup>6</sup>

The need for HIV related services is of particular concern in South Africa which has the highest number of infections worldwide. As a response, the South African government has rapidly implemented the programme for the prevention of mother-to-child transmission of HIV (PMTCT). The introduction of voluntary counselling and testing (VCT) and the provision of ARV regimens at antenatal services as part of the PMTCT programme provides a gateway to HIV care for pregnant women and their families.<sup>7</sup> PMTCT services in South Africa began as a pilot service in early 1999<sup>8,9</sup> before being rolled out nationally in 2002.

The quality of antenatal care services and the successful integration of the PMTCT programme are important contributors to better maternal and child health outcomes. According to the fourth 'Saving Mothers' report (2005-2007) almost 60% of maternal deaths in South Africa were avoidable and over half of these deaths were attributed to health systems failures.<sup>10</sup> In addition, the 'Saving Babies' report for 2006-2007 found that the quality of perinatal care in district hospitals was poor, and over one third of perinatal deaths were due to avoidable health system failures<sup>11</sup>. The 'Saving Mothers' report attributed failures to a lack of health care facilities, poor transport to or between facilities, a lack of appropriately trained staff, non-adherence to standard operating protocols, poorly conducted initial assessment of patients and poor problem recognition.<sup>10</sup>

The 'Saving Mothers' report also found that 59% of mothers who died had been tested for HIV with 79% testing HIV-positive from 2005-2007. Where antenatal care status was known, 76% of those who died during or within 6 weeks of pregnancy had attended antenatal clinics.<sup>10</sup> This was lower than the overall coverage of 95%.<sup>10</sup> This highlights the need to focus on health system interventions to improve maternal mortality. The report also highlights the notable shift in cause of deaths to non-pregnancy related infection, in particular due to HIV infection. Many of these deaths could have been avoided through PMTCT interventions that allow the provision of ARVs to pregnant mothers and contribute to reductions in the vertical transmission of HIV<sup>10</sup>. Coverage indicators for maternal health interventions including skilled birth attendance, antenatal care and contraceptive prevalence further highlighted the magnitude of efforts needed to meet the Millennium Development Goals. Challenges still persist due to limitations in the provision of maternity services, barriers to accessing emergency obstetric care, the education of women around maternal health<sup>1</sup>, in addition to the burden of HIV.

### Organizational Structure of Maternity Services in South Africa

The Women's Health and Genetics Directorate of the National Department of Health is responsible for the co-ordination of the antenatal care programme in South Africa. A set of guidelines and policy documents was produced by this Directorate and include the maternal health policy outlining the

minimum set of requirements for rendering maternal health care services. The guidelines describe the recommended management of pregnant women and the services to be rendered at each level of care. In addition, the guidelines define the levels of care, the staffing requirements at each level, the services to be provided and the referral systems to be put in place. While the National Maternity Guidelines outline how maternity services should be provided, each province is expected to adapt the guidelines according to local conditions and needs. The maternity guidelines outline the elements of care and procedures to be provided. The main components of antenatal care include: registration, group counselling, urine testing, blood pressure and weight measurements, pre-test counselling and testing for HIV, full history taking, blood sample collection, a clinical examination, and the provision of medication.<sup>12</sup>

### The PMTCT programme

PMTCT services are integrated with ANC care. PMTCT requires a number of steps including voluntary HIV counselling and testing during antenatal care. Antenatal and obstetric services need to diagnose and treat opportunistic infections, deliver antiretroviral therapy to HIV-infected pregnant women, ensure safe deliveries and provide counselling on infant feeding. Post partum care includes infant feeding support, growth monitoring, family planning, the screening of children for HIV and long term support to infected mothers and their families. This is known as the PMTCT cascade and process indicators can be collected at each point.<sup>13</sup>

### Framework for the Quality of Care

It is recognized that a national focus on the quality of health care is imperative.<sup>14</sup> The Institute of Medicine in the United States developed the now widely accepted definition of quality: “Quality of care is the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.”<sup>14</sup>

A framework used in this analysis of the quality of health services drew from Donabedian, who developed the principle of quality in health care and operationalized quality evaluation in health service settings.<sup>15</sup> This approach has subsequently been more widely adopted in other developing contexts.<sup>16-19</sup> Donabedian developed three analytical domains, which include structure, process and outcome attributes. The structure domain comprises the physical attributes of health facility, availability of equipment, stock outs, human resources and supervision, peer review, training and organizational structure. The process domain includes an assessment of the appropriateness and completeness of the physical examination and diagnostic tests applied as well as the clinic history taken, the evidence of preventive management of health conditions, and the continuity of care.<sup>20</sup> Outcome attributes include the effects of the health care service delivery on patients and populations and may include elements such as patient satisfaction.<sup>15</sup>

### Patient Satisfaction

Assessment tools that have examined the quality of care from the perspective of the client have also been developed as a means to ascertain patient satisfaction.<sup>21-24</sup> Initially, a framework was developed to measure the quality of family planning services as perceived by respondents.<sup>21</sup> This framework was later

adapted by Lule et al. in 2000<sup>22</sup>, to appraise the quality of a broader spectrum of maternity services. The elements that went into the framework included the provider-patient relationship, the technical capacity of the providers including aspects of information exchange and the thoroughness of the examination, the women's rating of the physical infrastructure of the facilities, the availability of services and supplies, and aspects of organizational management including working hours and waiting times.<sup>22</sup>

Different theories exist as to how individuals attach importance values to different elements of care. It has been argued that if personal experiences have been negative with regards to certain aspects of health service delivery, then they are deemed more valuable. In contrast, however, some have argued that in countries with low variations in negative experiences, people's expectations are generally low. This suggests that the institutional management of the health care system provides a mechanism through which individual value is attached to elements of service delivery.<sup>23</sup> Studies have found that service users have ranked elements of the provider-patient relationship as well as service accessibility higher than other elements of the service such as waiting times.<sup>23,24</sup>

Other studies assessing patient perception of care found that biomedical knowledge and the medical interventions provided were considered by patients as less indicative of the provider having a personal interest in the women in comparison to health care workers taking their time during the consultation and listening to their concerns.<sup>24</sup> Data from other studies have pointed to several factors that influence women's decision to seek care. A study of Xhosa women in South Africa found that women needed to be assured of access to health care in labour.<sup>25</sup> Evidence from India found that complicated or serious conditions, fear of condemnation by health care providers for failure to comply with treatment advice<sup>25</sup>, and satisfaction with care during previous visits were all associated with health seeking behaviour.<sup>26,27</sup> Other concerns that have arisen include provider-patient power dynamics where women feel that their knowledge is not respected while care provided has been described as 'abusive, humiliating, uncaring and negligent'.<sup>28-31</sup> These perceptions have critical implications on the acceptance and use of services.<sup>32-34</sup>

In an assessment of the perceptions of quality of care by women attending an antenatal facility in Malawi, women discussed concerns around the limited interaction time they had with providers as well as issues around privacy. There was some satisfaction amongst the women with regards to other aspects of the quality of care, however, the selectivity in satisfaction points to the potential impacts of expectations of care as a result of levels of knowledge obtained from health education and media sources. Experiences from the prior use of health services and perceptions of the health system were also thought to influence patient satisfaction. The authors noted that high variability amongst the responses of users of the service further highlighted that women pay attention to and are affected by the quality of care they receive.<sup>22</sup>

## The evaluation of health services

Surveys have commonly been used to evaluate health services. The eight main facility-based assessment tools currently used at both national and programme levels worldwide include the Service Provision Assessment (SPA), Facility Audit of Service Quality (FASQ), Health Facility Census (HFC), Service Availability Mapping (SAM), Health Facility based survey of Human Resource for Health Services (HRHS),

Rapid Health Facility Assessment in Child Health (Rapid HFA), Access, Quality, and Use in Reproductive Health (ACQUIRE) Evaluation of LAPM Services (ELMS); and Population Council Health Facility Assessment (PCHFA).<sup>35</sup>

The tools allow for the evaluation of a wide range of elements related to service provision so as to inform policy and planning from district to national level worldwide, in order to improve the delivery of care. Some tools have been developed to specifically target particular services, including the ACQUIRE Evaluation of LAPM Services (ELMS) focusing on Family Planning/Long Acting and Permanent Methods (FP/LAPM) services, the Population Council HFA (PCHFA) focusing on reproductive health services and the R-HFA focusing on maternal newborn and child health services at the primary health care level. This R-HFA tool has been used for the piloting of interventions for service quality improvement in Africa and Asia.<sup>35</sup>

### Impact of quality of Antenatal Care

Shortcomings in the delivery of high quality antenatal care have repercussions on maternal and child health and place an additional cost burden on the health care system.<sup>36</sup> Countdown was an MDG-related initiative that was developed in 2005 to track coverage data on interventions addressing maternal, newborn and child health in 68 countries that account for approximately 95% of maternal and child mortality worldwide.<sup>37</sup> The interventions and approaches that have been assessed by Countdown have had proven effectiveness for the reduction of mortality. Implementing evidence-based policies through investments in equipment, medical supplies and infrastructure are beginning to take place, although more is required for successful health systems development. Factors including shortages in the availability of human resources and the HIV burden have impeded the implementation of these interventions, and contributed to the slow progress towards reduction of mortality in women, newborn babies, and children. Only 22% of the countries have met the minimum threshold deemed necessary by the WHO to deliver essential health services.<sup>38,39</sup> The availability of emergency obstetric care remains low with data on 20 of the Countdown countries reflecting an availability of less than 50% of the required facilities.<sup>1</sup>

The 'Saving Mothers' report highlights the need for support from government and non-governmental agencies and an accountability system in place to ensure the quality of health services.<sup>10</sup> Provisions of the South African National Health Act of 2003 and the Policy for Quality set recommendations for performance and accountability. Some of the aims set by government outlined in the Policy for Quality Health Care to improve the standard of all health services delivered include: assessing issues of access, increasing patient participation, a focus on preventive and promotive activities, increasing research on operational effectiveness, ensuring appropriate use of health care services and reducing adverse events in the health care setting. The four main target areas of the interventions included health professionals, patients, the community and the health service delivery system.<sup>36</sup> Despite the recommendations, operations research in South Africa suggests that there are a number of factors that continue to impact on the quality of ANC services. Studies have focussed on elements of service management and delivery, including the training of health professionals; staff morale; patient waiting times; as well as the privacy of patient-provider interactions and comprehensiveness of consultations.

In 2000, the National Primary Health Care Facility Survey found that only 87.4% of clinics provided

antenatal care, and the services were not provided daily.<sup>40</sup> Subsequent to these findings, the National Health Act of 2003 stipulates that the delivery of all health services is the responsibility of the provincial health department and antenatal care should be routinely provided to low risk women at all primary health care facilities. Research has shown that many facilities still restrict visits to certain days of the week.<sup>41</sup> Antenatal services rendered in the facilities should be recorded and reported so as to ensure adherence to guidelines, although a number of studies have found that this is not the case.<sup>41-43</sup> Antenatal guidelines provide a means by which services and interventions that have proven positive impacts are translated into practice and the mechanism by which the gap between standards of care and actual practice can be measured.

An analysis of the services provided during antenatal care has highlighted the detection of particular risk factors and the implementation of specific interventions that have been shown to be effective in preventing maternal mortality and morbidity, including screening for anaemia, high blood pressure, infections and STDs and the provision of appropriate treatment.<sup>44</sup> While the South African government has provided national antenatal guidelines that have been adapted to suit localized conditions in the individual provinces, there is no system in place to assess whether facilities are adhering to these guidelines. An assessment of 141 public sector PHC facilities nationally found that the national guidelines could only be found in 46% of the facilities.<sup>45</sup>

The PMTCT programme, by being integrated with antenatal services, ensures the provision of comprehensive health services. Data collected for 2008 have shown that approximately 50% of HIV-infected women had access to PMTCT services in South Africa.<sup>47</sup> Many studies assessing PMTCT programme coverage have documented attrition along each step of the PMTCT cascade.<sup>48</sup> Reasons for non-acceptance of testing or prophylaxis vary across settings, but may be related to poor understanding amongst pregnant women, denial or fear of stigma.<sup>49</sup> Other factors include service-related barriers to care. A study conducted to assess the operational effectiveness of PMTCT programmes across three districts in South Africa found the overall quality of a particular health service explained some of the differences in HIV transmission rates and mortality across the sites. Although utilisation of antenatal services was high, syphilis testing and the uptake of nevirapine was poor.<sup>50</sup> Programme evaluations from a number of countries in Africa found failures at each point along the PMTCT cascade including uptake of antenatal testing<sup>51,52</sup>, receipt of test results,<sup>53</sup> uptake of ARVs<sup>54-56</sup> and postnatal follow up.<sup>50</sup> In 2006-2007, South African antenatal service coverage was 90%<sup>12</sup> yet HIV testing rates were 69%<sup>57</sup>. Furthermore two other studies at the time showed that one third of HIV-infected women did not receive nevirapine at delivery,<sup>10</sup> although 84% of all births were assisted by trained health personnel.<sup>12</sup> The integration of PMTCT programmes into health systems that are overburdened and under resourced may have contributed to the sub-optimal outcomes seen.<sup>58</sup> In order to minimize attrition along the PMTCT cascade, compassionate staff within well functioning antenatal, intrapartum and postpartum services with good laboratory support and referral services are required. In addition the services need to be well resourced and have a reliable source of tests and medications such as ARVs as well as a monitoring system to continuously evaluate outputs outcomes and impact.<sup>59</sup>

Documented shortages and inequitable distributions of human resources in the Countdown Report led to recommendations for workforce management. Capacity building initiatives included the need for investments in the education and training of health care workers, in addition to task shifting. Furthermore, strategies to keep personnel motivated so as to enhance staff retention were also

required.<sup>1</sup> The lack of privacy at many facilities and the fact that patients often see a number of different providers during their visit adversely impacts on good communication and the fostering of a good client-provider relationship. Consequently many women find it difficult to discuss personal problems and concerns.<sup>60</sup> A study conducted in Kwazulu Natal found that in spite of arriving early for their antenatal appointments and spending many hours at the facility, women spend on average 4.5 hours in the facility, 4 of which is spent waiting to see a provider.<sup>41</sup> In a study undertaken to explore service providers' perspectives on challenges in the work place in the Western Cape, several quality concerns arose related to the provider-patient relationship. The most notable theme that emerged related to nurses' abuse of patients. Patients reported having been victims of verbal abuse, felt that their autonomy was not respected and described acts of unkindness, violence and neglect by health providers.<sup>61</sup> In another study on quality of care at contraceptive services, 20% of women reported that the provider scolded them.<sup>62</sup> These concerns are indicative of organisational challenges and a lack of a system of accountability, workplace concerns amongst nurses and uneven power dynamics between users and health care personnel.<sup>61</sup>

Low morale amongst health care providers may explain some of the dynamics seen during patient consultations. A nursing dynamics study found that 27% of nurses reported that they did not care for patients like they used to while 60% felt a lack of motivation to work as hard.<sup>63</sup> The nurses attributed the low level of motivation to limited opportunities for promotions, poor management as well as staff shortages.<sup>63</sup> A five year review of the public sector carried out in 1999 also found that the morale amongst staff was very low, especially among nurses. Although the nurses attributed low morale to being overworked, feelings of neglect and lack of support is also believed to have contributed.<sup>64</sup> It is thought that the morale of health workers will improve by fostering a sense of purpose and personal fulfilment; this could be facilitated through the articulation of a clear vision and plan by national and provincial managers.<sup>65</sup>

Beyond the economic, logistic and provider related challenges to access to antenatal and emergency obstetric care, a lack of awareness amongst women of the danger signs for complications during pregnancy and delivery is related to delays in health seeking behaviour.<sup>66-73</sup> The Safe Motherhood Initiative recommends the provision of education around pregnancy related complications and access to seek care. Antenatal visits provide the opportunity for the delivery of health education. In a 2009 study by Nikiema et al.<sup>74</sup>, 15 of 19 sub-Saharan African countries including South Africa reported that health information was not routinely provided to over 50% women at antenatal visits.<sup>74</sup> Furthermore, it was speculated that such study findings extend beyond these 19 countries and represent a widespread challenge to providing reproductive health information in Africa.<sup>69, 71</sup>

### Areas for future Research

Despite the availability of a wide range of measurement tools, few evaluations of antenatal care services have been conducted in South Africa. A national HIV prevalence population survey from 2008 conducted by the Human Sciences Resource Council found that 97% of women had access to antenatal care while pregnant with approximately 71% attending at least five antenatal visits. In addition, the study found that the majority of pregnant women were attended by a skilled birth attendant during labour.<sup>75</sup> Despite this, maternal mortality remains high according to the Saving Mothers Report, which

suggests that challenges to delivering high quality care still persist and that the quality of ANC services needs further evaluation<sup>10</sup>.

Antenatal care provides the opportunity for the early detection of high-risk pregnancies as a means of reducing maternal mortality.<sup>76,77</sup> The provision of free maternal care in public health facilities in South Africa is an integral step towards improving access to essential health services, although the provision of quality care must be ensured. Costs saving calculations have shown that for every dollar spent on antenatal care on high-risk women, over 3 dollars are saved on the management of complications arising during pregnancy.<sup>78</sup> Furthermore, the provision of PMTCT and ARVs for HIV positive pregnant mothers is an important reason to seek out antenatal care.

In order to gain insight into factors associated with patient satisfaction and the values service users attach to different elements of care, better understanding of the mechanisms through which performance and importance ratings are associated is required. This may in turn include a comparison of individual experiences with other users as well as an analysis of the institutional makeup of the health system in South Africa.

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## Part C: Manuscript

# An Evaluation of the Quality of Antenatal Care and Patient Satisfaction in two Provinces of South Africa

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## Abstract

### **Background**

Investigations into maternal and child deaths in South Africa and assessments of PMTCT programs have found poor quality of perinatal care in district hospitals. A substantial portion of perinatal deaths have been attributed to avoidable health system failures. Despite this, many studies have reported that women are satisfied with the quality of antenatal care (ANC). A facility survey of ANC services in two South African provinces evaluated adherence to antenatal guidelines, levels of patient satisfaction and linkages between perceptions of quality, the structural and organizational attributes of ANC services, and the care delivered by health providers.

### **Methods**

This cross sectional facility survey included clinical observations, structured provider interviews and patient exit interviews to assess the quality of health services as well as patient perceptions in the Western Cape and Free State provinces. Regression analysis was conducted to determine whether there were significant predictors of patient satisfaction.

### **Results**

The assessment showed high overall quality of care delivered in both provinces and a high level of adherence to standard operating protocol. Women attending facilities in the Free State had higher levels of satisfaction, with a score of 88% compared to 76% in the Western Cape on a 100% satisfaction scale, with no overlap between the confidence intervals of the scores. The regression analysis did not demonstrate any factors significantly associated with patient satisfaction.

### **Conclusion**

There was a high level of adherence to protocols indicating good quality of care in both provinces. Health facility and patient satisfaction assessments provide useful insight into the quality of patient care. However, it is difficult to determine whether patient satisfaction correlates with good quality of care, despite some indication in this study of a trend towards increased satisfaction with the provision of services. Satisfaction may be dependent on predetermined expectations rather than the actual quality of care received. Ongoing assessment of the quality of health services is essential for health systems strengthening and further inquiry into factors associated with satisfaction is needed to optimise service uptake.

## Introduction

Global evidence suggests that there has been uneven progress towards attaining the targets of the 5<sup>th</sup> United Nations Millennium Development Goal to reduce maternal mortality and improve universal access to reproductive health care by 2015. Challenges remain due to limitations in the provision of maternity services, barriers to accessing emergency obstetric care, and the education of women around maternal health.<sup>1</sup> Maternal and child health is further challenged as a result of the HIV epidemic. According to UNAIDS, approximately 370 000 children were infected with HIV in 2007, 90% of infections being due to vertical transmission from mother- to- child (MTCT), with the majority of these infections occurring in Sub Saharan Africa.<sup>2</sup> Over one third of childhood deaths were caused by HIV in high prevalence countries including South Africa in 2007,<sup>3</sup> severely threatening the gains made in child survival.

In South Africa, despite near universal ANC uptake and access to obstetric care, HIV has been found to impact considerably on maternal mortality, which remains high according to the Report on Confidential Enquiries into Maternal Deaths (The 'Saving Mothers' Report, 2005-2007).<sup>4</sup> A national HIV sero-prevalence population survey in 2008 found that 97% of women had accessed antenatal care with 71.4% attending at least five antenatal visits. In addition, the study found that the majority of deliveries were attended to by a skilled birth attendant.<sup>5</sup> According to the Saving Mothers Report among mothers who died during or within 6 weeks of pregnancy and had been tested for HIV, 79% tested HIV-positive<sup>4</sup>. This suggests that challenges to delivering high quality care still subsist and that the quality of ANC services is poor.

The 'Saving Mothers' Report, approximates that almost 60% of maternal deaths in South Africa were avoidable and over half of these deaths were attributed to health systems failures.<sup>4</sup> In addition, the 'Saving Babies' report for 2006-2007 found that the quality of perinatal care in district hospitals was poor, and over one third of perinatal deaths were due to avoidable health system failures.<sup>6</sup> The 'Saving Mothers' report attributed failures to a lack of health care facilities, poor transport to or between facilities, a lack of appropriately trained staff, non-adherence to standard operating procedures, poorly conducted initial assessment of patients and poor problem recognition.<sup>4</sup>

The Guidelines for Maternity Care in South Africa,<sup>7</sup> outline the essential elements of antenatal care. Basic Antenatal Care (BANC) offered at primary health care clinics includes monitoring for and treating pregnancy-related complications, providing micronutrient supplements, and counselling on preventive care and treating sexually transmitted infections (STIs). Education on the process of pregnancy and childbirth, the recognition of complications; and appropriate health behaviour, including nutrition, personal hygiene, exercise and feeding options should be conducted. Women should also be encouraged to test for HIV and other sexually transmitted. Prevention of mother-to-child transmission of HIV (PMTCT) program are integrated with antenatal services, and ensure the provision of counselling and testing and antiretroviral (ARV) therapy to HIV positive women in pregnancy.

Little is known about the effectiveness of antenatal care in preventing maternal mortality<sup>8</sup> A review by Carolli et al.<sup>8</sup> on the outcomes of antenatal services in developing countries has highlighted the detection of particular risk factors and the implementation of specific interventions that have been shown to be effective in preventing maternal mortality and morbidity. These interventions have

included screening for anaemia, high blood pressure, infections and STDs and the provision of appropriate treatment by trained staff.<sup>8</sup> In addition, improvements in the coverage of ANC services, the education of women and quality of care have been linked with a decline in maternal mortality and improved MDG 5 indicators.<sup>9</sup>

Despite the evidence suggesting concerns around quality of care, research has shown that women are generally satisfied with the quality of care in South Africa. An assessment of reproductive health services in Kwazulu-Natal found clients reporting that they were satisfied with services. The study suggested that clients received the services and information they sought and would even encourage others to attend.<sup>10</sup> Despite a high level of overall satisfaction, clients made note of long waiting times and being turned away from services as a result of overcrowding and limited hours. Positive responses with regards to client satisfaction with services are often believed to be influenced by low expectations amongst users of the services, or social desirability bias.<sup>10</sup>

As referred to above, research into the quality of care can be conceptualized from the point of view of service users, as perceived quality, or by objective technical standards defined by professionals in the field. Objective standards may either focus on the care delivered to patients or on their health outcomes. The first approach concerns whether medical practices that have proven positive outcomes have been applied, while the latter concerns maternal and child morbidity and mortality.<sup>11</sup> A framework for analysis is drawn from Donabedian, who developed the principle of quality in health care and operationalized quality evaluation in health service settings.<sup>12</sup> This approach has been widely adopted in other developing contexts.<sup>13-16</sup> Donabedian developed three analytical domains for assessing quality, including structure, process and outcome attributes. The structure domain includes the physical attributes of health facility, availability of equipment, stock outs, human resources and supervision, peer review, training and organizational structure. The process domain includes the health care worker conduct and competence. The process evaluation will include an assessment of the appropriateness and completeness of the physical examination and diagnostic tests applied as well as the clinic history taken, the evidence of preventive management of health conditions, and the continuity of care. Outcome attributes include the effects of the health care service delivery on patients and populations and may include elements such as patient satisfaction.

In light of the documented lack of quality of antenatal care observed in developing country settings, although not always supported by the perceptions of users of the services, and its implications on maternal and child mortality, the study aims to describe and compare antenatal service delivery in two provinces in South Africa. It also aims to assess patient satisfaction regarding the quality of antenatal care using Donabedian's analytical framework.<sup>12</sup>

## Methods

### Study setting and sampling

This study was part of a larger study to determine the effectiveness of PMTCT programmes in 4 African countries (The PEARL Study).<sup>17</sup> In South Africa, the Western Cape and Free State provinces were selected because the researchers had access to facilities in these provinces. These provinces were also different in terms of socio-demographic make-up and resources available. The sampling frame for the facility

survey consisted of the antenatal clinics that referred patients to the delivery sites where cord blood surveillance had taken place, the first component of the PEARL study.<sup>17</sup> A non random sampling technique was applied in order to ensure that the clinics with the largest number of attendees in the three randomly selected sub-districts in each province were chosen. Selected sites in the Western Cape included two midwife obstetric units (MOUs) which offered both ANC and delivery services, and three BANC sites which offered ANC only, with referral on to a local hospital, while 13 sites in the Free State were selected. A convenience sample of 6 consecutive women attending the service was selected for exit interviews. In addition, field workers observed consultations with six women other than those who participated in the exit interviews. An interview was also conducted with the health care provider in charge of the antenatal service on the day of the survey. Informed consent was obtained from both the pregnant women and the providers. Data were collected between October 2008 and May 2009. All data were entered electronically into a Microsoft Access database. Data were cleaned in Access through cross checking a 10% sample of electronic entries against the hard copy version. Consistency checks were run to ensure accuracy of the data entered. The database was imported to STATA statistical software ( Stata Corporation, College Station, Texas) for analysis.

### Operational definition of quality of care, data collection and analysis

The facility survey was divided into 4 modules. The first module constituted the direct observation of the quality of clinical care of a consultation. The second was an exit interview with women attending the facility, in order to measure perceptions and knowledge of care. The third was a health facility assessment using a checklist to document infrastructure, equipment and drugs. Finally an interview with the health facility manager regarding services provided at the health facility and the human resources involved in the services was conducted. All components of the survey were conducted by clinically trained field workers. Exit interviews with patients were carried out in the patient's mother tongue, while health care provider interviews were carried out in English or isiXhosa, Afrikaans, or SeSotho.

This study analysed the quality of care from service and patient perspective based on a framework developed by Donabedian.<sup>12</sup> The facility survey content was divided into three analytical domains, defined by the investigators as structure, process and outcome attributes (See Table 1-for elements included in survey)

Descriptive statistics for both provinces were compared using point and confidence interval estimates of the prevalence of facility attributes and activities conducted. Median scores and interquartile ranges were used as the data was non- parametric. Confidence Intervals were used to reflect the uncertainty in the estimates due to the small sample sizes of the facility survey. While the degree of overlap of the confidence intervals served to compare the facilities, it is important to note that this approach suffers from the lack of power associated with the wide confidence intervals due to the small sample sizes. Variables that were patient specific within the process domain, such as tests performed on the individual women during the consultation, were aggregated by facility and proportions were used to compare the provinces.

The primary element analysed for Donabedian's outcome domain was patient satisfaction. Patient satisfaction was measured from an average score for each facility from a number of different Likert items. The patient scores were derived from the exit interviews in which the women attending the

facilities were asked to respond to how they felt about a series of statements concerning the care they received on the day the survey was conducted. Responses were scored using a Likert scale of 1-5 ranging from 'strongly disagree' to 'strongly agree'. In order to derive a patient satisfaction score, scores obtained on each of the 16 questions were added up, and averaged across the 6 women from each facility to get an average satisfaction score for each site. The ordering for the positively loaded statements was reversed relative to the negative ones, so that a higher score reflected a higher level of satisfaction. Differences in the median scores between statements pertaining to patient satisfaction were compared using the Rank-Sum test, a non-parametric test for independent samples.

In order to identify relationships between predictor variables and the outcome, multiple linear regression was used. The design effect was accounted for in the regression analysis through the use of the survey command by stratifying by province; the primary sampling unit was the individual facility. Variables selected to be included in the regression analysis were either based on a significant difference in their values across the provinces or elements that were highlighted in the literature as influential contributors to quality of antenatal care and patient satisfaction.

## Results

### Structure

Table 2 reflects the structural attributes of the facilities in the two provinces. All of the sites in the Free State had HIV testing kits available and provided both visual and auditory privacy during the consultation. Furthermore, 100% of the sites in the Free State had both maternal nevirapine and AZT available. In the Western Cape, 100% of the facilities had maternal AZT available and provided HIV testing within the ANC building. In order to compare the Provinces with regards to the structural attributes of their facilities, the degree of overlap between the confidence intervals of the variable responses was analyzed. Provinces were comparable with respect to the location of HIV testing, soap availability and the availability of maternal AZT as can be seen from the large degree of overlap in the confidence intervals. Differences between the provinces were reflected in the quality of the location women are seen for privacy, the availability of nevirapine and the availability of HIV testing kits, although the latter to a lesser degree.

Table 3 reflects the distribution of health care workers in the two provinces. Both the Western Cape and the Free State had a median of 4 nurses trained in HIV testing per site. Since it was reported that a median of 11 nurses and midwives were hired across the facilities in the Western Cape, this reflected an overall 36% of mid-level providers trained in HIV testing for the Western Cape. There was a median of 7 nurses and midwives hired in the Free State, indicating that 57% of mid-level providers were trained in HIV testing in the Free State. In the Western Cape a median of 1 nurse was trained in PMTCT dispensing per site, while in the Free State a median of 3 nurses were trained. This indicates that 9% of mid-level providers in the Western Cape and 43% of providers in the Free State trained in PMTCT dispensing. The provinces were different with respect to the number of midwives hired, with no overlap between the interquartile ranges of the two provinces, although comparable with respect to the number of nurses hired. This could be as a result of the numbers of women using the services, although such data is not reported here. The provinces were also comparable in terms of the number of nurses/midwives trained in HIV testing, reflected in the large degree of overlap between the interquartile ranges but different

with respect to the numbers of nurses/midwives trained in PMTCT dispensing.

Table 4 reflects the organizational structure of the two provinces. In the Free State more than 90% of the facilities reported there was pre/in-service training within the past 3 years, technical support within the past 4-6 months, training on topics such as prophylactic drugs to pregnant women and breastfeeding, the availability of guidelines on select topics, and husbands/partners being offered HIV testing. However comprehensive training on all of the topics was low in the Free State, with 15% of sites offering training on all of the topics. In the Western Cape between 80 and 100% of facilities reported pre- service training, technical support, training in rapid HIV testing, prophylactic drugs to pregnant women, breastfeeding and newborn care, the availability of guidelines on select topics, husbands/partners being offered testing and availability of HIV support groups to women in their communities. The facility survey also assessed the provision of ART to pregnant women in the facility as a means of ascertaining the integration of PMTCT services within antenatal care. Approximately 46% of the facilities in the Free State and 60% of the facilities in the Western Cape were offering ART to pregnant women.

Comparing the degree of overlap in the confidence intervals from table 4, it was shown that the provinces were different with respect to attributes including the training on all of the topics covering prophylactic drugs to pregnant women, breastfeeding and newborn care, the availability of guidelines on immunisation, the offering of HIV testing to partners, and the availability of HIV support groups. A higher proportion of the Free State facilities provided training on prophylactic drugs to pregnant women and breastfeeding, as well as HV testing services to partners/husbands, while a higher proportion of the Western Cape facilities provided the remaining above mentioned services . Most strikingly, almost double the number of the facilities in the Western Cape provided HIV support groups in the communities in comparison to the Free State. The provinces were comparable on all of the other organisational attributes as reflected from the large degree of overlap between the confidence intervals.

## Process

Table 5 describes elements of the provider-patient interaction at the antenatal facilities. All women in both the Western Cape and Free State were examined by nurses. The educational talks included topics such as HIV, nutrition, good antenatal care, safe delivery, breastfeeding, family planning, and PMTCT. The BANC sites, reflecting 3 of the 5 sites included in the study in the Western Cape were the ones which gave educational talks. Breastfeeding and PMTCT were covered at all sites, while antenatal care, safe delivery and family planning were not covered on the day the survey was conducted in the Western Cape across all the facilities. There was much more variability in the Free State concerning the topics covered for educational talks, with HIV being covered the most consistently in the sites. The provinces were different with respect to the provision of health education covering topics including HIV, Good Antenatal Care, and Safe Delivery, but comparable on all other topics, reflected in the degree of overlap of the interquartile ranges.

In the Free State, CD4 results were received within 7 days whereas the Western Cape took between 7-14 days to report back results. All of the sites in the Western Cape only provided nevirapine at delivery, while most of the sites in the Free State provided nevirapine most commonly from 28 weeks gestation and some between 30-36 weeks gestation. The differences between the provinces were further

reflected in the limited degree of overlap between the interquartile ranges of the responses, with no overlap at all for the response pertaining to the provision of nevirapine.

The patient specific elements listed in Table 5 were transformed to reflect facility specific elements by averaging the patient responses for each facility. All of the activities for both the Free State and Western Cape had a median of 100% with the exception of providing ferrous sulphate to patients. There was a substantial difference in the range of responses across the facilities in the Western Cape in comparison to the Free State. The monitoring of the foetal heart conducted during the patient visits in the Western Cape had the largest interquartile range, which varied between 33% to 100% of the facilities, while several of the other variables, including taking the patient's blood pressure and palpating them had much less variability, ranging from approximately 83% to 100% of the facilities. Ferrous sulphate was provided at 33% of sites in the Free State while it was provided at 66% of the sites in the Western Cape

All patients tested for HIV were informed of their result on the same day. The only exception to this was patients from a site in the Free State that did not provide rapid tests for HIV. All of the women in the Western Cape and 95% of the women in the Free State who tested positive, had their blood drawn for a CD4 test. Over 87% of women in the Free State and 90% in the Western Cape who presented for the first time at ANC had blood drawn for a syphilis and haemoglobin test.

## Outcome

Table 6 summarizes patient levels of agreement on a series of statements relating to their levels of satisfaction with different elements of the ANC facilities attended and care received. Table 6a summarizes patient responses to positively worded statements; where a high score indicates agreement and hence high levels of satisfaction. Table 6b summarizes patient responses to negatively worded statements and here a high score indicates disagreement with the statement, and hence satisfaction.

Over 90% of the women in the Free State and the Western Cape were highly satisfied with the service provided, although women in the Free State had higher levels of satisfaction. There was less satisfaction in terms of the health facility having everything required for complete care. There was some dissatisfaction with respect to the amount of time patients felt the doctors and nurses spent with them, with only 90% in the Free State and less than 80% of women in the Western Cape feeling that the health care worker had spent enough time with them. Approximately 15% of women in the Free State and 27% of women in the Western Cape felt that the doctors and nurses hurried through care. There was some dissatisfaction with patients feeling that the health care workers ignored what they said, especially in the Western Cape, in addition to large proportions of the women in the Free State and Western Cape who were either unsure or agreed with the statement that the doctors and nurses were rude and impersonal. Approximately 13% of women in the Free State had doubts about the abilities of the doctors and nurses, while a larger proportion of women in the Western Cape were unsure (17%). Approximately 50% of women in the Western Cape agreed with the statement that they were unsure if the information they received during their visit was correct, while another 33% were uncertain. A little over 20% of women in the Free State and the Western Cape agreed that they were dissatisfied with some aspects of care they received. The median scores between the Free State and Western Cape for the series of statements provided to the women, except those concerning the time spent with the patient and dissatisfaction about some aspects of care, were significantly different ( $P < 0.05$ ), with the

median score in the Free State consistently higher.

Women attending facilities in the Free State had on average higher levels of satisfaction, but satisfaction was generally high (>75%) in all of the facilities. In the Free State the average level of satisfaction was 88%, while in the Western Cape, the average level of satisfaction was 76%, with no overlap between the confidence intervals of the scores between the provinces.

All patients in the Free State had a correct understanding for the reason they were prescribed their medication as well as the dosing requirements, while approximately 72% of the patients in the Western Cape had a correct understanding of their medication requirements. As there was no overlap in the confidence intervals, patient comprehension was significantly different between the provinces.

Table 7 presents the results from the regression analysis relating patient satisfaction to the structural and process attributes of the antenatal facilities in the two provinces.

No variables were significantly associated with patient satisfaction in the regression analysis. Despite this, the confidence intervals for all the variables were positively skewed, with the exception of the length of time to receive CD4 results, suggesting a positive association with patient satisfaction. When guidelines were observed, patient satisfaction went up by 8.75 percentage points. When the provider listened for the fetal heart tone, patient satisfaction went up by 17.16 percentage points. When there was both auditory and visual privacy, patient satisfaction went up by 20.67 percentage points. When the health care workers were trained within the last 3 years, patient satisfaction went up by 4.25 percentage points. CD4 results had a negative association with patient satisfaction; where when it took longer for patients to get their CD4 results, patient satisfaction went down by 5% percentage points.

## Discussion

The facility survey showed that the quality of antenatal care was generally high in both Provinces with strong adherence to antenatal and PMTCT guidelines as reflected in the responses of the variables previously categorized according to Donabedian's structural and process attributes.<sup>12</sup>

Similar to other studies that have demonstrated attrition along the PMTCT cascade<sup>18</sup> the facility survey shows that not all of the women received the required care which includes voluntary HIV counselling and testing during antenatal visits, and the delivery of antiretroviral therapy to HIV-infected pregnant women. Over 10% of the women attending facilities in the Free State for their first antenatal visits did not get tested, while 5% of women in the Western Cape were not tested. All of the sites in the Western Cape and 84% in the Free State conducted HIV testing at the ANC site. Privacy during the counselling session in the Western Cape was a problem with sites lacking auditory privacy. The lack of privacy at many facilities and the fact that patients often saw a number of different providers during their visit adversely impacts on good communication and the fostering of a good client-provider relationship. Consequently many women find it difficult to discuss personal problems and concerns.<sup>19</sup>

As the majority of the sites conducted rapid HIV tests, all the women received their results on the same day. This is highly effective, as losses to follow up occur often when women have to come back at a later date for their blood results, including HIV and CD4 testing. The high levels of testing reflect the

successful integration of PMTCT programs into antenatal care. Testing for syphilis and haemoglobin were also relatively good, with over 90% of the women in both the Western Cape and the Free State being tested.

Furthermore, studies have demonstrated that the provision of a single-dose nevirapine regimen at the onset of labor is an easy and affordable intervention to reduce the vertical transmission of HIV. Many women commence labour a long time before arriving at a delivery facility and thus many services provide nevirapine to women from 28 weeks gestation so that they can take it as soon as labour commences. In the Western Cape, women were only provided with nevirapine at the facilities during labour, but in the Free State, 11 of the 13 facilities provided women with nevirapine to take home with them. As a result, all of the facilities in the Free State had nevirapine available on location, while only the facilities in the Western Cape that had labour wards, had nevirapine available.<sup>20,21</sup>

The rapidly evolving health sector and technological innovations pose a great challenge to health professionals. Advances in the screening, prevention and treatment of diseases make it essential for health care workers to keep up to date with training.<sup>22</sup> Furthermore, the large volume of information available often feels daunting for health professionals. The 2007 National Policy on Quality in Health Care<sup>20</sup> recognizes the important role that the ongoing training of skilled health care workers plays in promoting the provision of high quality, evidence-based health care practices. This can be facilitated by making clinical literature and guidelines available to health care workers. These best practice guidelines can be adapted in local contexts and help facilitate the provision of care. Furthermore, the policy<sup>22</sup> recognizes that the training of health care workers will require a focus on quality improvement skills supported through mentorship and supervision.

The majority of the facilities in both provinces had guidelines covering topics including immunisation, antenatal care and PMTCT available. All of the sites in the Western Cape, while over 90% of the sites in the Free State received pre-service training related to maternal, child and newborn health in the past 3 years. All the sites in both provinces received technical support and supervision in the past 6 months. A low number of mid-level providers in both the Free State and Western Cape were trained in HIV testing. With respect to training in PMTCT dispensing, even fewer mid-level providers were trained. Facilities in the Free State provided training to more of their mid-level providers than the Western Cape did, but this could be partly attributed to most of the facilities in the Western Cape having hired more midwives. Refresher training on selected topics was much more variable in the Provinces. In the Free State over 75% of the facilities had received training within the past 3 years in rapid HIV testing, breastfeeding and prophylactic drugs to pregnant women. Training in newborn care was much less frequent with approximately 15% of the sites having received training. Training in the Western Cape was better with no less than 80% of the sites having received training on the above mentioned topics.

There is an increasing recognition of the importance of male involvement in the reproductive health issues of their partners.<sup>23</sup> Many men do not accompany their partners to family planning, antenatal and postnatal services.<sup>23</sup> Research has highlighted that women want their partners to become more involved in such decision making.<sup>24</sup> Furthermore, men are becoming more aware of the integral role they play in reproductive health decisions and would like to become more involved. Over 90% of the facilities in the Free State offered HIV testing to the husbands/partners of the pregnant women as part of the program, while in the Western Cape, 80% of the facilities offered the service, which highlights an important move

towards the greater involvement of men in antenatal services, and more specifically sexual and reproductive health. The involvement of men in decision making around pregnancy and reproductive health issues is associated with health benefits for their children and families. The involvement of men may help modify risk behaviours and the uptake of antenatal services. It has become widely recognized that pregnancy in South Africa faces high risk when men, both as partners and decision makers, are not informed about the reproductive health issues of their partners and their own health. The involvement of men may help modify risk behaviours and the uptake of antenatal and PMTCT services.<sup>25</sup>

Community involvement has also been recognized as an integral to fostering a link between primary health care services and the users<sup>26-28</sup>, in addition to improving service quality.<sup>29-31</sup> While there is a dearth of evidence on the effectiveness of community participation<sup>32,33</sup> some studies have demonstrated that community groups for pregnant women have had an effect on reducing neonatal mortality rates, reducing maternal depression and improving decision-making.<sup>34,35</sup> All of the sites in the Western Cape were noted to have HIV support groups in the communities that the facilities served, while only about half of the sites in the Free State had support groups in the communities.

The provision of educational talks on the range of recommended topics was found to be poor. The topics covered the most consistently in the Western Cape were breastfeeding and PMTCT, while in the Free State, HIV was covered the most consistently, reflecting 62% of the sites. In the Western Cape, the BANC sites provided educational talks, and as a result, only 3 of the 5 surveyed sites were expected to do so. Furthermore, caution must be taken with the generalisation of these results as the questionnaire was only able to capture the provision of educational talks on the day of the survey, hence the talks may have not have been observed at other sites. The provision of educational talks is expected to take place during group counselling sessions; however, it is possible that further counselling occurs during the private individual consultations.

Facilities in both provinces performed well with respect to taking patients' blood pressure, palpating them, listening for a fetal heart tone and conducting a urine dip stick, with those tests conducted on almost all of the patients. Variability existed with respect to listening for a fetal heart tone, however. The provision of iron supplementation varied between the provinces, however, this may be due to extraneous factors including the eligibility of the women participating. However, the questionnaire did not allow for patients to be categorized according to their haemoglobin status, and there is a lack of consensus as to whether ferrous sulphate should be prescribed to non-anaemic pregnant women.<sup>36,37</sup> Furthermore, issues have been raised concerning the possibility of adverse effects such as oxidative damage arising following the administration of iron supplements.<sup>38</sup>

Different theories exist as to how individuals attach importance values to different elements of care. It has been argued that if personal experiences have been negative with regards to certain aspects of health service delivery, then they are deemed more valuable. In contrast however, some have argued that in countries with low variations in negative experiences, people's expectations are generally low.<sup>39</sup> The facility survey reflects a high level of satisfaction by users of the services in both provinces, with an (overall) 87.8% satisfaction level in the Free State and a 76% satisfaction level in the Western Cape. Satisfaction levels related to the different elements of care were often higher for the Free State than they were for the Western Cape. This trend supports theories that expectation levels are poorer in lower resourced areas, and hence satisfaction with the provision of care will be higher. The statements

addressing patient satisfaction centred on some common themes which included the perception of the quality of care received, the time spent with providers and the availability of care, the quality of the patient-provider interaction, the medical knowledge received from providers, as well as the financial and physical accessibility of care. The antenatal services are free, and that is reflected in the responses by the women in both provinces in which they feel that financial restrictions to accessing care do not apply. Patients felt more strongly about the explanations provided for their antenatal visits and the quality of the medical care received in the Free State in comparison to the Western Cape, while more women in the Western Cape had doubts about some of the information they received. Women in the Free State also felt that the checkups were more thorough and the time spent with them by the health providers was much more adequate as compared to women in the Western Cape. Variability in responses in both provinces existed with regards to the health facility being equipped to provide through care. These findings highlight that the interpersonal nature of the provider-patient relationship is deemed more valuable to patients as compared to the structural attributes of the health facilities, and dictate perceptions of quality.

While the regression analysis did not point to any significant associations between the structural of the facility and the process elements of the provider-patient consultation, some trends were observed. The observance of guidelines and having trained health care workers increased the levels of satisfaction amongst women as did the quality of the location women had their consultations and whether providers listened for a fetal heart tone. The length of time it took for women to receive their CD4 results were inversely related to their levels of satisfaction. These study findings, while not significant point to trends which agree with what would be expected. The lack of significance in the study findings can be partly attributed to the very small sample size used for the facility survey. Furthermore, although all patients in the Free State understood their medication requirements correctly, while approximately 72% of patients in the Western Cape did, it is possible that this is dependent on the number of drugs that the women are prescribed; it is therefore important that levels of comprehension and accuracy of information is not solely attributed to the quality of the explanations provider by health care personnel.

Generalizing the survey's findings must be viewed in light of some of the limitations of the study. The study included 5 sites in the Western Cape and 13 sites in the Free State. As stated earlier, the clinics with the largest number of attendees were those sampled for the survey. While this approach aimed to obtain a random sample from a large pool of women while eliminating the need to sample each clinic in the two provinces, some important elements of antenatal care in other facilities may have been missed. Furthermore, the women were selected for the study consecutively. This sampling technique adequately represents the population from which the sample was derived when a large enough sample size is selected. This was attempted by selecting 6 women for the clinic consultation and 6 different women for the exit interview; although the sample size for the study was still relatively small. In addition to describing the quality of care in the antenatal facilities studied, the survey attempted to determine what elements of care influenced patient satisfaction. The small sample size may have influenced the strength of the associations found in the regression analysis as none of the variables evaluated were significantly associated with patient satisfaction, although trends were observed. Elements that were captured by the survey included structural and organizational elements of the facilities as well as the process of the clinical examination. Other elements that have been thought to influence patient satisfaction that were not captured by the facility survey included the socio-economic conditions of the women including their educational status, income, amongst other factors.

Furthermore, the survey was adapted in order to be carried out in 4 countries in Africa, and as a result, some country specific conditions may have been overlooked in an attempt to cover elements of antenatal care that were common across all settings. In addition, the survey was cross-sectional in nature and documented the provision of care in the facilities during a single clinic observation. As a result, some variables including the number of health care personnel working during the particular day may not be stable across the working days. The survey attempted to control for the time dependent nature of some of the variables by asking about clinic practices such as the provision of training to staff and drug availability and stock outs for a period of 6 months preceding the day the survey was conducted. Lastly, it is important to recognize the possibility of social desirability bias by the women being interviewed and the conduct of the health care providers being interviewed. The potential for women to provide positive feedback concerning their satisfaction with care, regardless of the quality of health care services provided, may have biased the study's findings; this has been seen in other studies.<sup>14</sup> The survey attempted to minimize this by asking the participants to respond to statements that alluded to similar elements of care received, such as references to having received a thorough check up and having the health care provider spend sufficient time with the patient. Furthermore, the influence of direct observation on the health care provider's practice was mitigated by the fact that the field workers were clinically trained, introduced themselves as such and were as discrete and unobstructive as possible; however, the Hawthorne effect remains a limitation on studies involving direct observation.

## Conclusion

Concerns about the quality of health care and the performance of service providers has led to the development of strategies for the measurement of quality and improvement in health care provider performance as well as the promotion of best health care practices. Strategies include the supervision and regulation of medical practice, the development of national guidelines and standards, and the use of information systems.<sup>40</sup> National leadership has been recognized as integral to the response to concerns about the quality of health care and stems from the influence of government, doctor's groups and the private sector on the health care system. Furthermore, it has been recognized that professional performance improvement can be facilitated through the creation of evidence-based guidelines and standards to guide clinical care. Such tools serve as a means to assess the quality of clinical practice. What many countries are challenged with is the creation of acceptable standards of measurement to assess the performance of health care workers.<sup>40</sup> Concerns with the methodology used to assess health care worker performance include inadequate risk adjustment strategies and difficulties in teasing out individual performance when several health care workers are involved in a patient's care.<sup>41</sup> A point of contention lies in the extent to which performance related information should be made public in light of pressures towards increased levels of accountability. It is felt that such information has to be interpreted with caution with appropriate consideration of contextual factors and risk adjustment.<sup>40</sup>

In light of increased demands on health care workers, poor quality of care is often affected by low levels of morale. This study did not focus on staff morale, however, other studies in the setting have highlighted the impact of poor staff morale on quality of care. Low levels of motivation have been attributed to limited opportunities for promotions, poor management as well as staff shortages.<sup>42</sup> In addition to feelings of neglect and lack of support.<sup>43</sup> It is thought that the morale of health workers will

improve by fostering a sense of purpose and personal fulfilment; this could be facilitated through the articulation of a clear vision and plan by national and provincial managers.<sup>43</sup>

The need for HIV related services is of particular concern in South Africa with the highest number of infections worldwide.<sup>2</sup>This has led to the increasing demands on primary health care services for chronic services. The scope of practice of nurses who provide the backbone of the primary health care service have expanded with the need to provide chronic care. Antenatal care provides an access point for HIV related care for pregnant women and their families, and PMTCT programmes need to be strengthened for this purpose. Task shifting has allowed the reorganization of the workforce in order to make more efficient use of human resources available in order to address the workforce shortage crisis.<sup>44</sup>Strong leadership and stewardship is required to ensure the successful implementation of proposed HIV-related policies.

The identification of weaknesses in the health system and quality concerns can go to inform interventions that would target gaps in the provision of care so as to improve service delivery. The Policy for Quality Health Care has highlighted the need to assess issues of access, increase patient participation, focus on preventive and promotive activities, increase research on operational effectiveness, ensure appropriate use of health care services and reduce adverse events in the health care setting. The four main target areas of the interventions included health professionals, patients, the community and the health service delivery system.<sup>22</sup> The health care system requires an ongoing process of monitoring and evaluation a constant evaluation in order to improve quality. Quality improvement can be achieved through the capacity building and the sensitization of health care workers, and individual and community participation so as to foster a sense of empowerment in addition to ensuring that services are catered to the needs of the users. Improved communication between health care workers and patients while ensuring that users receive clear and understandable health related information has positive effects on the health status of individuals.

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Part D: Appendices

**UNIVERSITY OF CAPE TOWN**



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**Head of School:** Prof. Leslie London

28 Sept 2008  
The Chair Ethic  
Faculty of Health Sciences  
University of Cape Town

Dear Prof Blockman

**Re: Request for amendment to Protocol "*PMTCT Effectiveness in Africa: Research and Linkages to Care; PART 1 Version 1*"**  
**REC REF: 038/2007**

We request the Ethics Committee review for approval the following amendment to this protocol. We request that the approval letter include the following information:

- 1) The Title of protocol: Change from Version 1 to Version 2
- 2) A statement of approval of the amendment to include within the Facility Survey additional structured observations and exit interviews, after informed consent is obtained in order to evaluate the quality of antenatal care.

**The amendment to the protocol has already been approved by the CDC and the University of Alabama.**

Enclosed herewith is a copy of the amended protocol in track changes, the tools to be used for the observations and interviews and the informed consent forms. (list attached).

Regards

Dr David Coetzee  
Principal Investigator from UCT  
*Director: Infectious Disease Epidemiology Unit, Falmouth Building, Level 1*  
*Tel: 021406 6262 or Cell: 0824512699*

Email: [david.coetzee@uct.ac.za](mailto:david.coetzee@uct.ac.za)

List of attachments:

1. Face Sheet – Facility survey
2. Module 1: Clinical observation of six consecutive pregnant women consultations
3. Module 1: Informed consent service provider
4. Module 1: Informed consent patient
5. Module 2: Exit interviews
6. Module 2: Informed consent
7. Module 3: Health facility checklist
8. Module 4 Health provider interview
9. Module 3 and 4: Informed consent



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13 October 2008

REC REF: 038/2007

Dr D Coetzee  
School of Public Health & Family Medicine

Dear Dr Coetzee

**PROJECT TITLE: PMTCT EFFECTIVENESS IN AFRICA: RESEARCH AND LINKAGES TO CARE PART1: CORD BLOOD SURVEILLANCE PROTOCOL VERSION 2.0**

Thank you for your letter to the Research Ethics Committee dated 28 September 2008.

It is a pleasure to inform you that the Ethics Committee has **approved** the following with reference to the above-mentioned study:-

- Title change to version 2:
- Protocol amended to include within the Facility Survey additional structured observations and exit interviews after informed consent is obtained in order to evaluate the quality of antenatal care.
- Approved the following list of attachments: (as listed 1-9)
  1. Face Sheet- Facility survey
  2. Module 1: Clinical observation of six consecutive pregnant women consultations
  3. Module1: Informed consent service provider
  4. Module 1: Informed consent patient
  5. Module 2: Exit interviews
  6. Module 2: Informed consent
  7. Module 3: Health facility checklist
  8. Module 4 :Health provider interview
  9. Module 3 & 4 : Informed consent

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

**Please quote the REC. REF in all your correspondence.**

lemjedi

Yours sincerely

**PROFESSOR M BLOCKMAN**  
**CHAIRPERSON, HSE HUMAN ETHICS**

**Module 3 & 4: Health care provider interview**

**INFORMED CONSENT: service provider**

**Facility Code:**

**Interviewer Code:**

Hello. My name is \_\_\_\_\_. I am from the School of Public Health and Family Medicine, University of Cape Town. I am carrying out a facility-based survey concerning Prevention of Mother-to-Child Transmission (PMTCT) services. The aim of this research is to assist the Provincial Government of the Western Cape in the provision of improved maternal and child health services, particularly for pregnant women infected with HIV. This survey is part of a larger study of PMTCT programmes in the Free State, South Africa, as well as programmes operating in Zambia, Cameroon and the Ivory Coast.

This facility has been selected to participate in the survey and I wish to ask you questions about the health services provided here. The data collected will be used for research purposes. The results of this study will be presented to the Provincial Government and other organizations supporting health services, in order to aid in the planning of further service provision and future research in PMTCT.

Your name and all information that you give me will be kept strictly confidential.

No patient names will be reviewed, recorded, or shared.

You may refuse to answer any question or choose to stop the interview at any time.

Your participation is voluntary. Should you decline the interview or any questions therein, it will not prejudice your employment at this or any other health service.

Do you have any questions about the survey?

Do I have your agreement to proceed?      **YES**    **NO**    (circle response)

Name of interviewer:

Initials of interviewee:

Title of interviewee (Please specify TYPE of service provider):

Date:

## Results Tables

**Table 1:**  
**Elements of the facility survey**

<b>Attribute</b>	<b>Variable</b>
<b>Structure</b>	Location of HIV testing Soap availability Availability of HIV testing kit Quality of location where women are seen for privacy Availability of Maternal Nevirapine & AZT Number of nurses/midwives hired Number of nurses/midwives trained in HIV testing/PMTCT dispensing
<b>Organizational Structure</b>	Training on range of topics Availability of guidelines on range of topics Provision of technical support to staff Provision of ART at clinic Partner HIV testing Availability of community support groups
<b>Process</b>	Type of health care provider attending to women Length of time to get CD4 results Gestational age(weeks) when nevirapine given Educational talks given on range of topics <u>Activities done and recorded:</u> Blood Pressure Palpate Listen for fetal heart tone Urine dip stick Give patients ferrous sulphate
<b>Outcome</b>	Patient satisfaction Patient understanding of medication requirements

**Table 2**  
**Structural Attribute**

Attribute	Free State (n=13)			Western Cape (n=5)		
	N	%	CI	N	%	CI
<b>Location of HIV testing (ANC building vs. other location)</b>	11	84.62	54.55-98.18	5	100.00	47.82-100.00
<b>Soap visible at water sources (All or Some vs. None)</b>	8	61.54	31.58-86.14	4	80.00	28.36-99.50
<b>Items for ANC-HIV testing kit (Yes observed vs. not observed)</b>	13	100.00	75.29-100.00	4	80.00	28.36-99.50
<b>Quality of location where women are seen for privacy (Visual&amp;Auditory vs. Visual/Not Auditory)</b>	13	100.00	75.29-100.00	3	60.00	14.66-94.73
<b>Maternal Nevirapine available</b>	13	100.00	75.29-100.00	2	40.00	5.27-85.33
<b>Maternal AZT available</b>	13	100.00	75.29-100.00	5	100.00	47.82-100.00

\*Binomial Exact CI

**Table 3**  
**Human Resources**

Attribute	Free State			Western Cape		
	N	Median	IQR	N	Median	IQR
<b>Number of Nurses Hired</b>	13	4	3-11	5	4	3-6
<b>Number of Midwives Hired</b>	13	3	3-4	5	7	6-13
<b>Number of nurses/midwives trained in HIV testing</b>	13	4	3-6	3	4	0-11
<b>Number of nurses/midwives trained in PMTCT dispensing</b>	13	3	2-5	3	1	0-4

**Table 4**  
**Organisational Structure**

Attribute	Free State (n=13)			Western Cape (n=5)		
	N	%	CI	N	%	CI
<b>Pre/in-service training related to maternal, child, newborn health or illness during past 3 years?</b>	12	92.31	63.97-99.81	5	100.00	47.82-100.00
<b>Received technical support or supervision in past 4-6 months</b>	13	100.00	75.29-100.00	5	100.00	47.82-100.00
<b>Training Topics (within past 12 months/2-3 years vs. no training)</b>						
<b>Rapid HIV testing</b>	10	76.92	46.19-94.96	5	100.00	47.81-100.00
<b>Prophylactic drugs to pregnant women</b>	13	100.00	75.29-100.00	4	80.00	28.36-99.50
<b>Breastfeeding</b>	12	92.31	63.97-99.81	4	80.00	28.36-99.50
<b>New Born Care</b>	2	15.38	1.92-45.45	5	100.00	47.82-100.00
<b>Composite Training</b> (Training in all of the above topics within past 3 years)	2	15.38	1.92-45.45	3	60.00	14.66-94.73
<b>Guidelines (observed/reported vs. not available)</b>						
<b>Immunisation</b>	12	92.31	63.97-99.81	5	100.00	47.82-100.00
<b>Antenatal Care</b>	13	100.00	75.29-100.00	4	80.00	39.76-100.00
<b>PMTCT</b>	13	100.00	75.29-100.00	5	100.00	47.82-100.00
<b>Composite Guidelines</b> (reported or observed on all of the topics including immunisation, antenatal care and PMTCT)	12	92.31	63.97-99.81	4	80.00	39.76-100.00
<b>Pregnant women offered ART at clinic</b>	6	46.15	19.22-74.87	3	60.00	14.66-94.73
<b>Husbands/ partners offered HIV testing as part of the program</b>	12	92.31	63.97-99.81	4	80.00	28.36-99.50
<b>HIV support groups for pregnant women active in community that facility serves</b>	7	53.85	25.13-80.78	5	100.00	47.82-100.00

\*Binomial exact CI

**Table 5**  
**Process Attributes**

Attribute	Free State (n=13)			Western Cape (n=5)		
	N	%	(1)CI	N	%	(1)CI
<b>Facility Specific Elements</b>						
Type of Health provider attending to women (Nurse vs. Doctor)	13	100.00	75.29-100.00	5	100.00	47.82-100
Length of time to get CD4 results (within 1 week vs. between 1-2 weeks)	12	92.31	63.97-99.81	2	40.00	5.27-85.34
Gestation (weeks) when nevirapine given (28-36 weeks vs. at birth)	11	84.62	54.55-98.08	0	0.00	0.00-52.18
Educational Talks given to all women						
HIV	8	61.54	31.58-86.14	1	20.00	0.51-71.64
Good Antenatal Care	1	7.69	0.19-36.03	1	20.00	0.51-71.64
Safe Delivery	1	7.69	0.19-36.03	1	20.00	0.51-71.64
Breastfeeding	6	46.15	19.22-74.87	2	40.00	5.27-85.34
PMTCT	6	46.15	19.22-74.87	2	40.00	5.27-85.34
Family Planning	4	30.77	9.09-61.42	1	20.00	0.51-71.64
<b>Patient Specific Elements</b>		<b>P50</b>	<b>IQR</b>		<b>P50</b>	<b>IQR</b>
Activities done and recorded						
Blood Pressure		100.00	100.00-100.00		100.00	83.33-100.00
Palpate		100.00	100.00-100.00		100.00	83.33-100.00
Listen for fetal heart tone		100.00	100.00-100.00		100.00	33.33-100.00
Urine dip stick		100.00	100.00-100.00		100.00	100.00-100.00
Give patients ferrous sulphate		33.33	0.00-100.00		66.67	0.00-100.00

1) Binomial Exact CI

**Patient satisfaction**  
**Table 6a**

Statement	% of women who					P50	IQR
	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree		
Darker shading-FS (N=78)/Lighter shading-WC(N=30)	5	4	3	2	1		
<b>Good Explanation for reason for visit</b>	97.57	2.56	0.00	0.00	2.56	5	5-5
<b>Health Facility has everything needed for complete care</b>	30.00	66.76	3.33	0.00	0.00	4	4-5
<b>Medical care received was perfect</b>	28.21	24.36	7.69	21.79	17.95	4	2-5
<b>Can afford to come to the health facility</b>	23.33	50.00	20.00	6.67	0.00	4	3-4
<b>The check up was thorough</b>	76.92	16.67	1.28	2.56	2.56	5	5-5
<b>It is easy to come to the health facility</b>	20.00	70.00	10.00	0.00	0.00	4	4-4
<b>The doctors and nurses are friendly and courteous</b>	82.05	8.97	0.00	1.28	7.69	5	5-5
<b>The doctors and nurses spend plenty of time with me</b>	16.67	83.33	0.00	0.00	0.00	4	4-4
<b>I can get care whenever I need it</b>	79.49	10.26	2.56	6.41	1.28	5	5-5
	33.33	56.67	6.67	3.33	0.00	4	4-4
	84.62	8.97	0.00	3.85	2.56	5	5-5
	23.33	70.00	0.00	6.67	0.00	4	4-4
	85.90	12.82	0.00	1.28	0.00	5	5-5
	33.33	66.67	0.00	0.00	0.00	4	4-5
	60.26	23.08	3.85	10.26	2.56	5	4-5
	10.00	56.67	10.00	23.33	0.00	4	3-4
	76.92	8.97	5.13	7.69	1.28	5	5-5
	30.00	53.33	10.00	6.67	0.00	4	4-5

**Table 6b**

Statement	% of women who					P50	IQR
	Strongly Agree 1	Agree 2	Uncertain 3	Disagree 4	Strongly Disagree 5		
Darker shading- FS(N=79)/Lighter shading- WC(N=30)							
<b>Unsure if information received was correct</b>	3.85	10.26	2.56	24.36	58.97	5	4-5
<b>I pay more than is affordable</b>	23.33	26.67	33.33	6.67	10.00	2.5	2-3
<b>The doctors are rude and impersonal</b>	0.00	0.00	0.00	5.13	94.87	5	5-5
<b>The doctors and nurses hurry through care</b>	3.45	13.79	0.00	68.97	13.79	4	4-4
<b>The doctors and nurses ignore what I say</b>	2.56	8.97	15.38	12.82	60.26	5	3-5
<b>I have doubts about the abilities of the doctors and nurses</b>	6.67	6.67	6.67	73.33	6.67	4	4-4
<b>I am dissatisfied about some aspects of care</b>	5.13	15.38	1.28	24.36	53.85	5	4-5
	0.00	26.67	6.67	63.33	3.33	4	2-4
	2.56	8.97	2.56	21.79	64.10	5	4-5
	3.45	10.34	17.24	55.17	13.79	4	3-4
	2.56	12.82	2.56	19.23	62.82	5	4-5
	0.00	6.67	16.67	76.67	0.00	4	4-4
	8.97	12.82	0.00	29.49	48.72	4	4-5
	3.33	20.00	10.00	66.67	0.00	4	3-4

**Table 7**  
**Patient understanding**

Attribute	Free State (n=78)			Western Cape (n=30)		
	N	%	CI	N	%	CI
<b>Correct understanding of meds</b>	23	100.00	100.00-100.00	25	72.00	53.08-90.92

\*Binomial Exact CI

**Table 8**  
**Regression**

<b>Attribute</b>	<b>Effect Size</b>	<b>P-value</b>	<b>Confidence Interval</b>
<b>Composite Guidelines</b>	8.75	.324	-9.92-27.43
<b>Composite Training</b>	4.25	0.457	-7.87-16.36
<b>Fetal Heart</b>	17.16	0.204	-10.82-45.15
<b>CD4 results</b>	-5.00	0.568	-23.67-13.68
<b>Quality of location</b>	20.67	0.070	-2.00-43.33
<b>Constant</b>	45.29	0.022	7.87-82.72

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- [Authors' contributions](#)
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### *In press article*

3. Kharitonov SA, Barnes PJ: **Clinical aspects of exhaled nitric oxide.** *Eur Respir J*, in press.

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9. Margulis L: *Origin of Eukaryotic Cells*. New Haven: Yale University Press; 1970.

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10. Hunninghake GW, Gadek JE: **The alveolar macrophage**. In *Cultured Human Cells and Tissues*. Edited by Harris TJR. New York: Academic Press; 1995:54-56. [Stoner G (Series Editor): *Methods and Perspectives in Cell Biology*, vol 1.]

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11. Advisory Committee on Genetic Modification: *Annual Report*. London; 1999.

*PhD thesis*

12. Kohavi R: **Wrappers for performance enhancement and oblivious**

**decision graphs.** *PhD thesis.* Stanford University, Computer Science Department; 1995.

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## Help and advice on scientific writing

The abstract is one of the most important parts of a manuscript. For guidance, please visit our page on ["Writing titles and abstracts for scientific articles"](#)

Tim Albert has produced for BioMed Central a [list of tips](#) for writing a scientific manuscript. [MedBioWorld](#) also provides a list of resources for science writing.

## Abbreviations

Abbreviations should be used as sparingly as possible. They can be defined when first used or a list of abbreviations can be provided preceding the acknowledgements and references.

## Typography

- Please use double line spacing.
- Type the text unjustified, without hyphenating words at line breaks.
- Use hard returns only to end headings and paragraphs, not to rearrange lines.
- Capitalize only the first word, and proper nouns, in the title.
- All pages should be numbered.
- Use the *BMC Women's Health* reference format.
- Footnotes to text should not be used.
- Greek and other special characters may be included. If you are unable to reproduce a particular special character, please type out the name of the symbol in full.

**Please ensure that all special characters used are embedded in the text, otherwise they will be lost during conversion to PDF.**

- Genes, mutations, genotypes, and alleles should be indicated in italics, and authors are required to use approved gene symbols, names, and formatting. Protein products should be in plain type.

## Units

SI Units should be used throughout (liter and molar are permitted, however).

