THE

APPLICATION AND USE

OF THE

PARTOGRAM IN EVALUATING

THE SAVING MOTHERS PROGRAMME

IN SOUTH AFRICA IN 2002

SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH, IN THE DEPARTMENT OF COMMUNITY HEALTH OF NELSON R. MANDELA SCHOOL OF MEDICINE, FACULTY OF HEALTH SCIENCES, UNIVERSITY OF KWAZULU-NATAL.

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DECLARATION

I declare that this dissertation is my own work. I was given support from my supervisor Dr. Stephen Knight and technical advice from Prof. SM Ross and Dr M Ross. I acknowledge that the primary data was collected by the Centre for Health and Social Studies (CHESS) University of Natal, in particular Mrs. NC Mzolo, Dr. M Ross, Prof. SM Ross, Prof. SJ Reid, and that the data is the property of the South African National Department of Health.

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LIST OF ABBREVIATIONS AND ACRONYMS

AIDS   Acquired Immune Deficiency Syndrome

ANC   Antenatal clinic

BP   Blood Pressure

CHESS   Centre for Health and Social Studies

CPD   Cephalo-Pelvic Disproportion

CVS   Cardiovascular System

C/S   Caesarean sections

EA   Enumeration area

EFW   Estimated Foetal Weight

EOC   Emergency Obstetrical Care

EPI   Expanded Programme of Immunization

GIS   Geographical Information System

HIV   Human Immunodeficiency Virus

LQAS   Lot Quality Assurance Sampling

KEH   King Edward Hospital

KZN   KwaZulu-Natal Province

MCWH   Maternal Child Women's Health

MMR   Maternal mortality ratio

MNPI   Maternal and Neonatal Programme Effort Index

NCCEMD   National Committee on Confidential Enquiry into Maternal Deaths

PAC   Post Abortion Care

RA   Rapid Appraisal

REA   Rapid Epidemiological assessment

ROM   Rupture of membranes

SA   South Africa

SMI   Safe Motherhood Initiative

SMR   Safe Mother Report

TBA   Traditional Birth Attendant

TOP   Termination of pregnancy

UNFPA   United Nation Population Fund

UNICEF   United Nations Children's and Education Fund

WHO   World Health Organization

ABSTRACT

The SA National Department of Health made maternal deaths notifiable in 1997. It also commissioned a National Committee on Confidential Enquiries into Maternal Deaths (NCCEMD) to confidentially investigate all maternal deaths, to write the *"Saving Mothers Report"* and to make recommendations based on the findings of the study.

The Department of Health in 2003 commissioned an evaluation of the extent to which the 10 recommendations contained in the first *"Saving Mother's Report"* had been implemented. This rapid appraisal was carried out by Centre for Health and Social Studies (CHESS), University of Natal. A report *"The Progress with the Implementation of the Key Recommendations of the 1998 "Saving Mothers Report" on the Confidential Enquiry into Maternal Deaths in South Africa - A Rapid Appraisal,"* was published in 2003. The data collected on Recommendation 5 on the use of the obstetric partogram in 46 selected provincial hospitals in all the 9 provinces was only partially analysed in this report.

This study reports on a secondary analysis of the 942 questionnaires that were completed on the use and application of the partogram in hospitals in South Africa. In the rapid appraisal experienced field workers evaluated the use of the partogram using a 36-point checklist.

Provincial and national averages for each of these variables were calculated and hospitals were evaluated into how they performed according to these averages using Lot Quality Assurance Sampling methodologies. Using national and provincial averages, the hospitals in each province are compared with one another provincially and nationally. In addition, the application and use of partograms in areas and levels of hospitals are described. An attempt is made to show if there is relation between the number of deliveries and the recording of the partogram.

The main findings were that, of all the provinces KwaZulu-Natal had the lowest number variables below the national average from the 36 variables used as a checklist. Eastern Cape and Limpopo had the highest number of variables below the national average. The hospital with the highest number below the national average is in the Eastern Cape. In the recording of the chart rural and level one hospitals are low in comparison with urban and level three hospitals. There was no relation in the recording of the chart and the number of deliveries.

CHAPTER ONE

1. BACKGROUND AND INFORMATION

1.1 Introduction

Since the democratic election of 1994, South Africa (SA) has been through a period of great social and political transformation. One of the sectors most urgently needing transformations was the health sector. Several studies were conducted to assess the health needs of the society, these included investigations into equity, access, financing and other issues of vital health importance to the people. [1]

The death of a mother is a tragedy. It is the loss of a life full of promise and it has an immense impact on the well being of all family members especially infants. The tragedy is more heartbreaking because maternal deaths are often preventable. Maternal mortality is an important health status indicator and a critical measure of human development that is internationally comparable. [2]

In 1997, the SA National Department of Health regulated that maternal deaths be made notifiable in terms of the Health Act, 1977 (Act No. 63 of 1977) and published in the Government Gazette of the 3rd October 1997.[1] At the same time it also set up a National Committee on Confidential Enquiries into Maternal Deaths (NCCEMD) to study all maternal deaths, write a report ("*Saving Mothers Report*")[1] and to make recommendations based on the confidential study such that the implementation of the recommendations will result in a decrease in maternal deaths.

The enquiry into a maternal death is confidential, so information regarding the identity of the patient or health personnel is not available to anyone. The members of the NCCEMD are appointed in their individual capacity and none of the members are to be involved in any medico-legal case involving a maternal death. After a maternal death, the Maternal Death Notification Form needs to be completed within 7 days by staff of the institution where the death occurred. The information is then referred to the Maternal Death group of the province for review and possible further action. [1,3]

1.2 Maternal Mortality in South Africa

It is estimated that the Maternal Mortality Rate (MMR) in South Africa is about 150 / 100 000 live births. [1,2,4] This is approximately twelve times higher than in developed countries. However there is gross disparity within South Africa where the MMR in some communities approximates that of developed countries while in other communities death rates are very high. The high MMR in SA is usually not due to a lack of knowledge on how to manage severely ill pregnant women, but due to maternity services in South Africa not implementing available knowledge. [1,3]

There are many reasons for this, including inappropriate education of health care staff, lack of resources and socio-economic problems of mothers.[1] The establishment of the Confidential Enquiry makes it possible to determine at what level there is a breakdown in the health system and this in turn allows for remedial action to be taken.

Information for the first *"Saving Mothers Report"* came from analysis of data on women who died in South Africa during pregnancy, labour, or the peurperium during 1998 and which were reported to the NCCEMD [1]. In 1998, 676 maternal deaths were reported. By the 15th May 1999 cut off date for data collection, 602 notification forms had been received and the primary or underlying cause of death was given in a further 17 deaths. Data was entered for analysis on this 585 maternal deaths.[1,3]

The system for reporting of maternal deaths functions well in most provinces. In some areas, no maternal deaths were reported during some months even though deaths were known to have occurred. The poor reporting in some provinces does not allow for a reliable estimation of the MMR for the whole country. However, reliable estimates can be obtained for the Free State, Gauteng, and Western Cape provinces.[1] The Demographic and Health Survey estimates a MMR of 150 / 100 000 live births for the whole country.[1] This is in keeping with the findings of the Confidential Enquiry.

1.3 Aims and objectives of the NCCEMD

The aims of the NCCEMD is to "guide activities, which serve to reduce maternal mortality by collecting, analysing and interpreting data, reporting findings and making recommendations for evidence based decision-making". [1,3]
The objectives are to:

- To collect data on the number and causes of maternal deaths in SA.

- To analyse collected data in order to monitor trends in maternal deaths, causes of deaths, avoidability of deaths, and risk factors.
- To make informed recommendations for action to decrease maternal mortality.

In 1998, the NCCEMD *"Saving Mother's Report"* indicated that the key recommendations must involve conditions that would make a major contribution to decrease maternal deaths; their implementation must be measurable and feasible in the South African context within three years. [1,3]

*"**Recommendation 1**: Guidelines on managing conditions, which commonly result in maternal death, must be developed, distributed and implemented throughout the country by 2002.*

*"**Recommendation 2**: Referral routes and criteria for referral must be established and implemented by 2001.*

*"**Recommendation 3**: Establishing staffing and equipment norms per level of care must be performed in every health institution concerned with the care of pregnant women by 2001.*

*"**Recommendation 4**: The distribution of the Termination of Pregnancy (TOP) services (especially with respect to second trimester TOPs) must be expanded and the sites must be advertised to the public.*

*"**Recommendation 5**: The partogram must be used for monitoring labour in every pregnant woman and problems detected on the partogram must be managed accordingly:*

*"**Recommendation 6**: Blood must be available at every institution where caesarean sections are performed.*

*"**Recommendation 7**: Medical Obstetric Clinics must be established to ensure the optimal management of women with pre-existing medical conditions, especially women with heart disease and diabetes mellitus.*

*"**Recommendation 8**: Regional anaesthesia should be promoted in all sites performing caesarean sections.*

*"**Recommendation 9**: Family Planning services must intensively educate women 30 years and older or with five or more children about the dangers of pregnancy. Contraceptive use should be actively promoted in this group of women.*

*"**Recommendation 10**: A National HIV/AIDS policy geared towards managing these women and dealing with the ethical considerations must be available by 2001"*.[1]

1.4 Background to this research

The information gathered in the national Maternal Child and Women's Health (MCWH) quarterly meetings and annual workshops with NCCEMD members, provincial assessors and MCWH coordinators does not present a clear picture of how provinces are progressing with the implementation of the recommendations from the "*Saving Mothers Report.*" As a result, the National Department of Health commissioned an evaluation of this programme in 2003. This was carried out by the Centre for Health and Social Studies (CHESS), University of Natal.[5] The output was a report, "*The Progress with the Implementation of the Key Recommendations of the 1998 "Saving Mothers Report" on the Confidential Enquiry into Maternal Deaths in South Africa - A Rapid Appraisal*". [3]

1.4.1 The Rapid Appraisal

The "*Rapid Appraisal*" was an attempt to get a quick but reliable snapshot of the extent to which the ten recommendations of the 1998 "*Saving Mothers Report*" had been implemented in South Africa. Its purpose was not to provide an in-depth analysis but rather to identify areas where implementation of the recommendations was falling short, to make suggestions as to how the shortfall could be made up and to provide a baseline for future research.[5]

1.4.1.1 Aim of rapid appraisal

The aim of the rapid appraisal was to determine the progress of the implementation of the key recommendations of the 1998 "*Saving Mother's Report on the Confidential Enquiry into Maternal Death in the Nine Provinces of South Africa.*" [5, 9]

1.4.1.2 Methods of the study

The "*Rapid Appraisal*" study had two sections: one was the collection of data from 19 hospitals providing a maternity service in each province (13 in the Northern Cape). These hospitals were selected by proportional random sampling and the data was collected telephonically. This part of the study aimed to collect information which would help determine the extent to which recommendations one to four and six to 10 had been implemented in the 19 study hospitals, and to be generalisable to other hospitals in the provinces. The second part of the study was to visit five purposively selected hospitals in each province and to select randomly 19 maternity records from each hospital in order to be able to assess the implementation of the fifth recommendation (the use of the

partogram for monitoring labour in every pregnant woman). In addition to analysing maternity records, the hospital visits were also used to collect data in an attempt to validate the telephonic interviews. [5]

The major limitations of the "Rapid Appraisal" are that the telephone interviews only produce information that was reported by the interviewee and the hospitals were not homogeneous (some were referring and some were referral hospitals).[5]

1.4.1.3 Findings and analysis

Lack of previous baseline data made it difficult to review progress objectively, but the findings of the "Rapid Appraisal" suggested that progress had been made in some of the ten recommendations of the 1998 "Saving Mother Report." Of the 50 indicators used in the evaluation, Eastern Cape was below average in 22 of the indicators; Northern Cape in $^{20}/_{50}$; Mpumalanga in $^{19}/_{50}$; Free State in $^{17}/_{50}$; Limpopo in $^{15}/_{50}$; Gauteng in $^{14}/_{50}$; KwaZulu-Natal in $^{10}/_{50}$; North West in $^{4}/_{50}$ and Western Cape in $^{2}/_{50}$. The results indicated where resources should be spent to improve progress towards achieving the key recommendations of the "Saving Mothers Report".[1] (Appendix I - Summary of findings of Rapid Appraisal)

The full analysis of results for "Recommendation 5" in the "Rapid Appraisal" is shown in Appendix II.

1.4.1.4 Recommendations

Specific recommendations of the "Rapid Appraisal" were made based on the findings. It was indicated how the shortcomings in the implementation of the key recommendations might be addressed and gave ideas for further research.[5]

1.4.1.5 Conclusion

"Recommendation 5" of the "Saving Mothers Report", states, "the partogram must be used for monitoring labour in every pregnant woman and problems detected on the partogram must be managed accordingly." The use of the partogram allows for early identification of prolonged labour and timely intervention. Lack of use of the partogram may contribute to avoidable factor such as women dying because of puerperal sepsis and postpartum haemorrhage..

1.5 Aim of this Research Project

The aim of this study was to evaluate the use and application of partogram in South Africa and to provide useful feedback to those involved with the implementation of "Recommendation 5" of the "*Saving Mothers Report*" of 1998.

1.6 Objectives of the Research

- To quantify the use of the partogram in monitoring labour in hospitals in South Africa.
- To compare the use of the partogram in different levels of hospitals and in rural, semi-urban and urban hospitals.
- To compare the use of the partogram in different provinces in South Africa in 2002.
- To assess the implementation of the "Recommendation 5" of the "*Saving Mothers Report.*"
- To inform and develop recommendations on the findings to all relevant health parties.

1.7 Implementation of Recommendation Number Five

"*The partogram must be used for monitoring labour in every pregnant woman and problems detected on the partogram must be managed accordingly.*" This recommendation was modified in the 1999-2001 "*Saving Mothers Report*" to read "*Correct use of the partogram should become the norm in each institution conducting births. A quality assurance programme should be implemented using an appropriate tool.*"[5]

One of the limitations of the "*Rapid Appraisal*" report is that the data collected on the partograms from the 46 hospitals is only partially analysed (See Appendix III).

"Recommendation 5" of the 1998 "*Saving Mothers Report*" and the evaluation of this recommendation in the "*Rapid Appraisal*" report" is the focus of this research project.

The partogram, a structured graphical representation of the progress of labour, (See Appendix III)[a] has been adopted in many units throughout the world and is considered by many as a necessary tool in the management of labour. In addition to the graph depicting cervical dilatation and descent of the presenting part in relation to time, space is provided

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[a] In many of the provinces and hospitals within each province this may not have been the partograph used. This is a relatively new versions of the partograph.

for notes on the frequency of contractions, degree of moulding, medications given, the foetal heart rate, and other important events. With the use of a partogram, the progress of labour can be seen at a glance on one sheet of paper. Failure to progress can be recognized readily, and the writing of lengthy descriptions can be avoided. It is simple to use, a practical teaching aid, and is an efficient means of exchange of technical information about labour progress between teams of caregivers. [7]

The data on the application and use of the partogram collected in the "Rapid Appraisal" was re-analysed quantitatively.

Data from 942 delivery records selected randomly from 46 hospitals scattered throughout the country were collected as described in the methodology chapter. This data was collected four years after the publication and nation-wide distribution of the recommendations of the NCCEMD thus giving adequate time for their implementation.[5]

In the "Saving Mothers Report," problems were classified under three headings: Patient related[b], administrative problems [c] and standards of health care.[d] Each of these may impinge on the use of the partogram.

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[b] "**Patient related problem:** Patients not attending antenatal care may delay admission for whatever reasons and thus arrive too late for proper use of the partogram. It is envisaged that the partogram is used from the onset of labour".

[c] "**Administrative problems**: Administrative problems such as increased number of assessors and deteriorating services, transport barriers to access to health care facilities, lack of accessibility to health care facilities, lack of personnel and appropriately trained staff, communication and transport barriers which prevent or delay access to use of the partogram. Lack of personnel and training may be reflected in failure to use the partogram or in it not being used properly".

[d] "**Standard of health care:** The assessment of the standard of care given to the woman includes the initial assessment (history, examination and special investigations, problem identification or diagnosis, management plan or management protocol to be followed) and follow-up monitoring performed with a checklist, which covers all aspects of the case as described above. The checklist is used to ensure a uniform approach to case assessment".

1.8 Significance of the Study

The South African maternal mortality ratio is estimated at between 175-220 / 100 000 maternal deaths for every live birth.[2]. This has increased since the 1998 report largely due to the Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) pandemic. Implementation of the use of the partogram is one of the recommendations of the NCCEMD to reduce maternal deaths. Appropriate use of the partogram is recognized as a tool to improve obstetrical care. This study will inform managers of the extent to which the recommendation concerning use of the partogram has been implemented in each province and in the whole of South Africa.[1, 2, 3]

1.9 Scope and Limitations of the Study

This study was a secondary analysis of data. The quality of the primary study was not being evaluated. There are however possible limitations in the quality of the data due to the limitations in the primary data set.

Owing to time and resource constraints, the selection of hospitals in the "*Rapid Appraisal*" was convenience and purposive rather than random, however the selection of the charts in each hospital was randomly done.

It should be emphasized that in the primary study there were: clear selection criteria for inclusion or exclusion of records; records were randomly selected in the 46 provincial hospitals; field work was completed by experienced obstetricians and midwifes, who had significant experience in labour ward and research; these field workers were thoroughly briefed in the questionnaires and were all integrally involved in the design and conduct of the research; All data was collected by three researchers; internal reliability was assured by this small group of dedicated researchers; the instrument itself had been tested for reliability and validity prior to usage and was based on previous survey tools used.

In Lot Quality Assurance Sampling (LQAS), the researcher calculates the sample size (accept/reject levels) and decides the "upper threshold" of performance and what is the "lower threshold." This is a limitation of this sampling procedure. In addition, the smallness of the sample size and the allocation of the area may give biased values.[5 6]

Assessment of the use of the partogram proved relatively easy in hospitals where the labour graph was an integral part of the labour record but in hospitals where this is not the

practice, absence of a labour graph could mean that it had been used but was then lost or discarded, or that it had never been used.

1.10 Organization of the Report

The dissertation starts with an introduction to the original study and includes a background of "*safe motherhood* " in South Africa, the introduction of NCCEMD, comment on the "*Saving Mothers Report*" and the "*Rapid Appraisal*" as this is where the data was obtained. The second part of the introduction contains the background of the secondary analysis.

Chapter two contains the literature review on the "*safe motherhood initiative*", from its initiation to the indicators used to evaluate it, as well as an initiative to reduce maternal death. Other literature reviewed is around the history, use, application and studies that were conducted on the partogram. The literature review includes Rapid Appraisal (RA) and Rapid Epidemiological Assessment (REA) methodologies including Lot Quality Assurance Sampling (LQAS) techniques.

Chapter three has two parts. The methodology used for the original data and the methodology used to analyses the data. Chapter 4 includes the results of the secondary analysis of data. Chapter five discusses these results. The final chapter contains recommendations that arise form the study as well as the conclusions.

1.11 Summary

There are differences in maternal deaths in SA provinces but the national maternal mortality is about 150 / 100 000 live births.[1] The high MMR in SA is not due to a lack of knowledge on how to manage severely ill pregnant women, but due to maternity services in South Africa not implementing available knowledge. In order to reduce the maternal death, maternal deaths have been made notifiable and a National Committee on Confidential Enquiries into Maternal Deaths has been established. A "*Rapid Appraisal*" undertaken to evaluate the "*Saving Mothers Report*" was commissioned but did not fully analyse the data collected on "Recommendation 5" in this report.

This research focuses on the fifth recommendation "*The partogram must be used for monitoring labour in every pregnant woman and problems detected on the partogram must be managed accordingly.*"[3] The secondary analysis of the data on the application

and use of this chart will help identify avoidable factor that may lead to maternal death and allows for early identification of prolonged labour and timely intervention, in hospitals in South Africa.

CHAPTER TWO

2. LITERATURE REVIEW

2.1 Introduction

The focus of this dissertation is to perform a secondary analysis of raw data on the use of the obstetric partogram in South Africa. In order to be able to understand the current use of the partogram it is important to review the history of the partogram, evaluation of the partogram and its contribution in the reduction of maternal death. This literature review also covers safe motherhood and the *"Safe Motherhood Initiative*, Rapid Appraisal (RA) and Rapid Epidemiological Assessment (REA) and Lot Quality Assurance Sampling (LQAS) methodology.

2.2 Safe Motherhood

"Safe Motherhood" means ensuring that all women receive the care they need to be safe and healthy throughout pregnancy and childbirth.[7] The International Classification of Diseases, Injuries and Causes of Death (10th Revision) defines a maternal death as *"the death of a woman while pregnant or within 42 days of termination of pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes."* [6,7]

2.2.1 Principles of Safe Motherhood

1. Successful strategies to achieve *"Safe motherhood"* depend on leadership and political commitment at the national level based on a good understanding of the demographic, epidemiological and socio- cultural situations, which effect women's health. *"Safe Motherhood"* strategies should be an integral part of the national health policy and governments should conduct research directed towards reducing maternal deaths.[8,10]

2. Health education and communication strategies are needed to strengthen public involvement in" *Safe motherhood"* through discussions with government officials, legislators, women's associations, local interest groups, professional health associations and community groups. Organizational processes can be modified to establish *"Safe motherhood"* committees and persuade government officials to translate their commitment to national and local budgetary support for programs and to generate community interest and demand for *"Safe Motherhood"* services. [8]

3. Monitoring and evaluation must provide input for program decision-makers. Governments and donors need to invest in the local research capacity to willingly provide support for the health institutions. The effective use of service statistics and research data should be emphasized at the district and facility level, particularly by those directly responsible for clinical and management decisions.[8]

4. In Africa, international aid contributes an average of 15% of national health spending. Donor assistance in many instances does not reflect the priorities of the country or the capacity of a government to sustain these programs. Due to this nations need to develop their own national health policies and strategies to direct donor assistance, examine opportunities for collaboration in programme development and co-financing of "Safe motherhood" activities. [8]

5. Empowering women is essential to improving their health and that of their families. This can be achieved through the elevation of female education and literacy, which positively affects children's chances of surviving. Removing gender discrimination can boost women's earnings and financial security. In addition, women need to be healthy themselves to fulfill their roles as mothers and household managers. [8], [21]

2.2.2 The History of Safe Motherhood Initiative

In 1987, the World Bank, in collaboration with World Health Organisation (WHO) and United Nations Population Fund (UNFPA), sponsored a conference to launch the "Safe motherhood Initiative" (SMI). There was an international call to action to reduce maternal mortality and morbidity by one half by the year 2000. The SMI has subsequently been adopted by most developing countries.[10] The SMI emerged as a powerful campaign for women's health. It highlighted the potential for improved care for pregnant women and better functioning health services to reduce the burden of maternal and newborn ill health. The Initiative has spearheaded advocacy and brought maternal mortality to the international public health agenda.[11]

The SMI mobilized resources, identified the individual and societal costs of maternal deaths, and highlighted the human rights perspective. It also increased awareness among governments, international agencies, donors, nongovernmental organizations and professional associations about maternal mortality. This SMI has been active in South Africa ever since its inception but has seen more integrated action since the creation of NCCEMD[2].

2.2.3 Indicators of "*Safe Motherhood*" and program impact

The difficulty of collecting reliable data on maternal mortality and the debate over which indicators to use are challenges for "*safe motherhood*" efforts. Data on maternal mortality are lacking because of inadequacies in technology, leadership and resources.

The usual indicators for measuring "*Safe Motherhood* "are through the availability, use, access and quality of obstetric care.[16] The most promising indicators for measuring access to and use of services include met needs for essential obstetric care; unmet obstetric need; caesarean section rate; who delivers the woman, and where the delivery takes place. Other indicators include:

- Maternal mortality ratio
- Annual number of maternal deaths
- Proportion of women attended at least once during pregnancy by the trained health personnel for reasons related to the pregnancy
- Number of health centres providing Emergency Obstetrical Care per 500,000 populations
- Proportion of complicated cases managed at health centres and district hospitals providing Emergency Obstetrical Care (EOC) facilities[13, 16, 22]

Measuring maternal mortality ratios is full of problems and prone to underestimates. Therefore, process indicators have been proposed for monitoring the availability and use of obstetrics services.[22]

Recently a number of Rapid Epidemiological Assessment methodologies have been proposed in order to improve the measurement of "*safe motherhood.*"

The Maternal and Neonatal Programme Effort Index (MNPI) rates various components of national programs to reduce maternal and neonatal mortality. The index offers a tool for diagnosing and managing programs, and could allow comparisons between countries and regions over time.[13]

Verbal autopsy (VA) is a technique whereby surviving family members or other informants are interviewed to elicit the decedent's cause of death, to identify risk factors for the death, and to assess the accessibility and quality of the health care received by the decedent. This review focuses on the use of verbal autopsy interviews to identify women who died from pregnancy-related causes[33]

The purpose of verbal autopsy are to promote and understand the relative burden of maternal deaths in a population and providing key information for maternal health advocacy by evaluating the magnitude of maternal mortality and other causes of death among women of reproductive age. It will also identify populations of women at higher risk for maternal death so that health care and social services programs can be designed to help prevent deaths and improved access.

Verbal autopsy is a retrospective review of deaths ideally conducted with the person or persons who were with the deceased at the time of their death. Due to this relatively low cost it can help determine and quantify maternal deaths in many places where health records and death certificates are unavailable, but its accuracy for determining medical causes of death is limited [33]

The "Sisterhood" method is an indirect measurement technique frequently used to measure a variety of demographic parameters (such as child or adult mortality), which has been adapted for the measurement of maternal mortality. The method reduces sample size requirements because it obtains information by interviewing respondents about the survival of all their adult sisters. Because such reports cover deaths occurring over a large interval time, the results generate an overall estimate of maternal mortality for a point centred around 10-12 years before the survey.[25, 26]

The "sisterhood" method of determining maternal mortality often provides data that are more comprehensive than facility-based records. Community-based studies of maternal deaths yield useful data for prioritising program interventions and for evaluating existing monitoring systems.

Clinical audit is a quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change. [32] Aspects of the structure, processes and outcomes of care are selected and systematically evaluated against explicit criteria. Where indicated, changes are implemented at an individual, team or service level and further monitoring is used to confirm improvement in healthcare delivery. [19, 32]

The aims of Clinical Audit activity are to deliver demonstrable improvements in patient care, to encourage evidence-based practice, and to contribute to the process of continuing clinical education. Criterion-based clinical audits can also be useful tools for measuring and improving the quality of obstetric care in developing countries. The use of process indicators and relevant proxies, such as maternal morbidity surveys to target and

assess programs designed to improve maternal health have also been suggested. Among the set of process indicators proposed are indicators of unmet need for family planning and obstetric services; utilization, coverage, and access; and quality of care.

2.2.4 Causes of high maternal mortality

Women die in childbirth for many reasons, most of them preventable or treatable. The main causes of maternal deaths are severe bleeding, infection, eclampsia, obstructed labour and unsafe abortion. There are other indirect causes associated with maternal deaths. Nutrition is an important indirect cause of maternal mortality in many areas of the world. Women whose health already is compromised by poor nutrition and disease are more likely to die during an obstetric emergency.[11, 14]

In addition to medical and hospital factors, community-based or socio-cultural factors such as attitudes and practices also influence maternal mortality. One of the major (socio-cultural factor) underlying problems contributing to high rate of maternal mortality is generally poor educational and socio economic standing of women. Low literacy rates among females, keeps them ignorant about their reproductive rights and health facilities. Another contributing factor for maternal death is delay in seeking help due to cultural factors like non-availability of males or hesitancy to go to hospital without attendants or without their permission.[14]

Maternal mortality increases with increasing age, high parity, lower socio-economic status, illiteracy, socio-cultural factors and poor access to health facility. It is evident that there is great need for equity in gender relations and reproductive rights and this only comes with improving literacy in females.[11]

2.2.5 Preventing maternal mortality

A comprehensive package of services for safe motherhood and to prevent maternal death should include preventive measures during pregnancy, during childbirth, after delivery, before and after pregnancy throughout the reproductive life span during adolescence, and for women and families.[23, 27] Specifically measures should include:

- Reduce the number of pregnancies: Family planning can reduce maternal mortality and morbidity by reducing the total number of pregnancies, the proportion of high-risk births, and the proportion of pregnancies that end in unsafe abortions.

- Antenatal care and counseling: Health workers should educate women about how to stay healthy during pregnancy and raise awareness about possible pregnancy complications and how to recognise and treat them.
- Prevent complications during pregnancy and childbirth: Inadequate nutrition, unsafe sex, and poor health care during pregnancy increase the risk of health crises during pregnancy and childbirth.[8]
- Prevent deaths when complications arise: Complications during pregnancy and delivery must be quickly diagnosed and treated in suitable health care facilities. However, broader government action is often needed to improve the policies that affect the lives of women and the capacity of the health system.
- Postpartum care: Following childbirth, women should be seen by a health worker, preferably within three days, so that any problems (such as infection) can be detected and managed early.[8]
- Ensure access: *"Safe motherhood"* can be achieved by providing high-quality maternal health services to all women during pregnancy, childbirth, and the postpartum period. The importance of adequate and accessible obstetric services at the community, health centres, and hospital levels has become clear. One study estimates that antenatal care and community-based interventions can prevent 26 percent of maternal deaths, and another 48 percent can be avoided by ensuring access to quality essential obstetric care.

By strengthening four pillars of safe motherhood including family planning, antenatal care, clean safe delivery and essential obstetrical care the increase in maternal mortality can come to a halt. The following are also conditions that reduce maternal mortality

- Training traditional birth attendants (TBAs) are found to have reduced maternal morbidity and mortality.[11]
- The role of midwives including training health care personnel (nurses, midwives, or laywomen) -- during labour and delivery reduced the duration of labour, the likelihood of medication for pain relief, and the likelihood of Caesarean delivery.
- Antenatal care and risk assessment: WHO study clarifies that screening women for risk factors (obstetric history, age, parity, and height) on antenatal care reduce maternal mortality by minimizing complications especially in developing-country women.
- Most life-threatening obstetric complications are the "three-delays" model that outline the factors that delay

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- o   The decision to seek emergency obstetric care,
- o   A woman's arrival at a health care facility, and
- o   Her treatment at that facility. This conditions can be solved though ensuring access to essential and comprehensive essential obstetric care at district level is important in reducing maternal deaths
- Deaths due to abortion-related complications are preventable if they are identified early and treated appropriately. Although 13 percent of maternal deaths worldwide are estimated to be due to complications from unsafe abortions, where abortion is illegal or very restricted, Post Abortion Care (PAC) has been endorsed as an effective strategy to reduce maternal mortality caused by unsafe abortions.[8, 29, 30, 31]

2.2.6 Key lessons learned about the SMI

From the global experience, efforts to make motherhood safe include:

- Strong political commitment at the national and/or local level can help facilitate the implementation of "*safe motherhood*" interventions and ensure their integration into the health care system. [12, 19]
- Involving national and local leaders and other key parties (including donors and both public and private health sectors) in the planning and implementation of safe motherhood activities helps facilitate the delivery of maternal health services and ensure sustainability.[20]
- Involving community members (particularly women and their families, health care providers, and local leaders) in efforts to improve maternal health helps ensure program success.
- Training and deploying a range of health care providers at appropriate service delivery levels help increase access to maternal health services, especially life-saving services.
- Effective communication between health care providers at both the community level and the district (first-referral) level is essential for management of obstetric emergencies and for ensuring continuity of care. [18, 19]

In spite of all efforts, maternal and neonatal deaths and morbidity and stillbirth rates have remained high. The reasons vary by country and region but generally reflect a combination of interrelated factors. The Safe Motherhood Technical Consultation held in Colombo, Sri Lanka, in 1997, ten years after the start of the Safe Motherhood Initiative, cited some key factors:

- Lack of clearly defined priorities and inclusion of interventions in safe motherhood programmes that were not always the most focused and effective

- Some "*Safe motherhood*" strategies took too broad an approach, giving equal emphasis to raising women's status, improving family planning, strengthening basic maternal health services, and expanding emergency care. This resulted in programmes that were too ambitious and expensive for many governments and donors to implement.
- Programmes that specifically focused on maternal health services were also not always strategically sound (research findings later proved some of the strategies recommended during the 1987 Safe Motherhood Conference to be ineffective). These included risk-screening during antenatal care, and large-scale training of traditional birth attendants
- Omissions of some interventions known to be effective, such as the management of abortion complications from "*Safe motherhood*" programmes, are largely due to political sensitivity about the issue.
- Inadequate political commitment and resources. While financial investments in "*Safe motherhood*" programmes have increased dramatically over the past ten years, they have remained far below the levels required for significant change.
- Lack of awareness and commitment between both donor and government decision-makers have contributed to the problem, as well as a lack of a clear high-level commitment to a joint programme of action by the United Nations agencies.
- Within the WHO, key departments were not sufficiently coordinated, especially those with the expertise to reduce maternal and neonatal deaths and morbidity, e.g. blood safety, infection control and health systems.
- At the country level, economic difficulties, heavy indebtment and structural adjustment programmes frequently aggravated the already precarious situation of the health care system.
- Until recently the "*Safe motherhood*" *Initiative* paid inadequate attention to reducing the risk of HIV/AIDS infection among women and their babies as well as to the management of HIV-infected women and their newborns
- Finally, technical and programming guidelines, training curricula, and other resources to guide effective programmes were not made widely available. [8, 12, 13, 15]

2.2.7 Human rights approach to "Safe Motherhood"

"*Safe motherhood*" is recognized as a basic human right, protected by a range of international human rights treaties and laws. Approaching "*Safe motherhood*" from a human-rights perspective emphasizes that women have the right to receive comprehensive reproductive health care, including family planning, education, nutrition,

and basic health services. Ensuring women's rights to life, liberty, and security of the person, health, maternity protection, and non-discrimination would facilitate safe motherhood. Human-rights principles can be incorporated into programs at the clinical, facility-management, and national-policy levels. [24]

The role of men regarding knowledge and use of contraceptive measures should be encouraged and socio-economic status of community needs to be improved to avoid hindrance of high cost of care and poverty. There is a need for community education targeting men in culturally conservative areas to improve men's consciousness about females' rights over health facilities, their reproductive rights and promoting increase use of contraceptives in both sexes.[2, 29]

Gender discrimination should be discouraged, so that females can make important decisions regarding reproduction and literacy rate should be improved so that awareness about reproductive health and use of available health resources could be optimised

2.2.8 Summary

The principles of the *"Safe Motherhood initiative"* have been around for more than 20 years. It is directed at reducing maternal death. The SMI gives directions, recommendations and in some occasion rules to protect women's right in deliveries and other social inequalities that may expose her to unsafe practices.

2.3 The Partogram

2.3.1 History of the partogram

Friedman's partogram devised in 1954 was based on plotting cervical dilatation and foetal station against time elapsed in hours from the onset of labour. The time of onset of labour was based on the patient's subjective perception of uterine contractions. Plotting cervical dilatation against time yielded the typical sigmoid shaped curve and station against time gave rise to the hyperbolic curve. Limits of normal were defined.[36]

There is a greater propensity for dysfunctional labour to occur among primigravidae and it is essential to define the patterns of normal labour so that abnormal labour can be identified. The curve of normal cervical dilatations described by Friedman is not appropriate for early recognition of patients in prolonged labour because Friedman's curves begin at zero centimeters dilatation and the latent phase is typically of variable duration. These factors prevent accurate positioning of the first assessment of cervical dilatation along the graph. These problems were overcome by referring the admission dilatation to the graphs of cervical dilatation constructed.[36]

In 1969, O'Driscoll introduced the concept of an active approach to the management of labour. By regular assessment of cervical dilatation in labour and early correction of abnormal progress by oxytocin or prostaglandins the occurrence of prolonged labour in primiparous patients can be virtually eliminated and the incidence of caesarean section can be dramatically reduced.[36]

Philpott and Castle in 1972 introduced the concept of "ALERT" and "ACTION" lines. The aim of their work was to meet the needs of paramedical personnel practicing obstetrics amongst African primigravidae. The alert line represented the mean rate of progress of the slowest 10% of primigravid patients in the African population whom they served. The "alert" line was drawn at a slope of one centimeter per hour for primiparous women starting at zero time, which is the time of admission. The action line was drawn four hours to the right of the alert line indicating that if the patient had crossed the alert line, active management should be instituted within 4 hours. This gave adequate time for the transfer of the patient to a centre with facilities for augmentation of labour and, if required, caesarean section. The action line was subsequently drawn two hours to the right of the

alert line after it was realised that mothers and babies may require assistance earlier than 4 hours after crossing the "alert" line.[36, 37]

Philpot's graphic records showed UNFPA that two factors, which have a major influence on the length of labour and mode of delivery, are the patients' cervimetric progress and the presence or absence of a lumbar epidural block. Philpott and Castle reported a decrease in caesarean section rate from 9.9% in 1966 to 2.6% in 1972 in African primigravidae after the establishment of "alert" and "action" lines. Since the publication of the original work by Philpott and Castle, there have been many modifications of their basic partogram although the main principles have remained the same. [45]

Studd's labour stencils introduced in 1972 predicted the expected pattern of progression of labour based on the extent of dilatation achieved by the time the patient is admitted (zero time). Curves showing the average course of cervical dilatation were constructed for various dilatations on admission. Five separate patterns representing normal labour progression were constructed. The curves were transcribed onto acrylic stencils. On admission in labour, the cervical dilatation was assessed and a stencil was used to draw the relevant pencil line of expected progress on the patient's cervicograph, which was then completed. Those patients crossing the nomogram line were found to have a three-fold increase in instrumental delivery. (UNFPA), [35, 26, 37]

2.3.2 What is the partogram?

The partogram or labour graph is a graphic representation of the progress of labour. (See Appendix III) It is used to document progress of labour and facilitates demonstration of problems that are likely to occur or have already occurred which may go unnoticed in written notes. It should be used for all women that are admitted in labour at all levels of health care. The top part provides space for documentation of name, age, parity and date when the partogram is started. It is also important to document duration of labour and that of rupture of membranes when the partogram is started. Risk factors identified in the antenatal period and on admission in labour should be listed in the space provided. The idea is to have all the relevant information that will influence management of the patient on one page without having to refer to the ANC card, previous pages and other notes. [1, 35, 37]

The partogram is divided into the latent phase and active phases of labour. The latent phase of labour normally does not exceed 8 hours hence the horizontal line starting at zero hour to 8 hours on the partogram. The alert line, the first oblique line, represents the minimum acceptable cervical dilatation rate in the active phase, which is 1cm per hour.

The second oblique line is the action line.[10]Progress of labour is slow if the cervical dilatation graph crosses or falls on the action line and action must be taken to hasten delivery of the baby. If the woman is in a clinic without an advanced midwife in attendance, she will have to be referred to a hospital with theatre facilities for further management. If an advanced midwife is looking after the woman in labour she/he can augment the labour with oxytocin provided there are no other risk factors. In a hospital setting, a decision will also have to be made on whether to augment labour with oxytocin or proceed to a caesarean section. [37]

There are four major features on the graph – foetal condition, progress of labour, maternal condition and planned management. Zero time is always taken as the time of admission to the maternity department. However, it is important to indicate the time when labour started according to the mother in order to be alert to the passage of time. Each box on the foetal and maternal conditions sections of the graph represents half an hour whereas each box on the progress of labour section represents an hour.[35, 36, 37]

2.3.2.1 Foetal Condition

The foetal condition is recorded at the top part of the graph and includes the following:
- The fetal heart pattern
- The state of the liquor
- The degree of moulding

2.3.2.2 Foetal heart pattern

This section is constructed the way it is to facilitate documentation of not only the baseline foetal heart rate but also changes in the foetal heart rate during contractions, variability and the presence of decelerations. The foetal heart rate is assessed before, during and after a contraction.

2.3.2.3 Caput

Caput, or swelling of the scalp, is significant especially if it is severe and results in misinterpreting the descent of the head, particularly if it extends to the introitus. In this case the level of the head may be interpreted as 0/5 above the brim (i.e. head on perineum) when it may actually be 3/5 (i.e. widest diameter of head still above the brim. Cephalo-pelvic disproportion (CPD) is sometimes associated with a large amount of caput.

2.3.2.4 Progress of labour

The dilatation and effacement of the cervix, descent of the head and strength of contractions are the observations used to monitor progress of labour.

2.3.2.5 Cervical dilatation and effacement

Effacement (length of the cervical canal) is measured in centimeters (cm.) and is indicated by thickening the vertical line in cm. at the time the patient is admitted to the maternity department. Progressive effacement of the cervix is an indicator of progress in the latent phase of labour. An "X" is used to indicate cervical dilatation. A full vaginal assessment should be done at the first examination on admission in labour and repeated vaginal examination at regular intervals.

2.3.2.6 Descent of the head

This is expressed as fifths above the pelvic brim:
1. 5/5 the head is entirely above the pelvic brim
2. 4/5 the head is just entering the brim
3. 3/5 the hands can still go partially around the head
4. 2/5 the hands splay outwards
5. 1/5 only the sinciput can be tipped
6. 0/5 the head is entirely in the pelvis.

"O" indicates the level of the head on the graph, and is drawn big enough to be able to how position of the occiput within the "O" as indicated on the graph.

2.3.2.7 Uterine contractions

These are recorded by shading the appropriate boxes to indicate the number of contractions in the previous 10 minutes, as well as the strength of the contractions. Each square represents one contraction. If 2 contractions are felt in 10 minutes, 2 squares will be shaded. The strength of the contractions is indicated by putting dots, oblique lines or total shading within the boxes indicating how long each contraction lasts   i.e. whether contractions are mild, moderate or strong.

2.3.2.8 Maternal condition

The maternal condition is indicated by the blood pressure (BP), temperature, pulse and urine output including the biochemistry of urine and these are entered in the space provided. The BP is indicated with an upward arrow on systolic level and a downward arrow on the diastolic BP and these are joined by a vertical line. Pulse is indicated by a dot.

2.3.2.9 Drugs and intravenous fluids

Any drugs and intravenous fluids, which the patient is given during labour, are documented. Oxytocin has a special space to indicate the number of drops given at any one time and any change in the drops per minute given.

2.3.2.10 Management

The lowermost portion of the chart is for recording the problems or risk factors identified, as well as the action or management plan.

2.3.3 What is the value of the partogram?

2.3.3.1 Diagnosis of delay in the latent phase

The latent phase of labour should not last longer than 8 hours. A lag time of 4 hours is usually acceptable between the slowing of labour and the need to intervene. The latent phase ends and the active phase start when the cervix is 3 cm dilated. This section of the partogram is only useful when the woman presents in early labour[36, 37]

2.3.3.2 Help in detecting delay in the active phase of labour

The possible causes of delay in the active phase are that the patient may have primary uterine inertia, or there may be some mechanical reason for delay such as gross CPD (head 4/5 above the brim and marked moulding) and malpresentation (breech, transverse lie, face, or brow presentation, etc.) [11] Labour is seldom any problem if it goes at its proper pace but delay usually indicates trouble. In order to manage delay, a problem must be identified early, which requires an effective method of monitoring labour. The "cervicograph" and the descent of the head in fifths above the brim, measured against the duration of labour in hours enables health personnel to identify problems which are beginning to develop[35, 37]

In general the purpose of the partogram is:

- To prevent obstructed labour and ruptured uterus, moulding and excess caput (which cause 70% of maternal deaths in some areas) by enabling peripheral health workers to monitor labour, so as to detect deviations from the normal more effectively, and thus to refer mothers to hospital at the optimum moment before it is too late. This is the purpose of the "alert line'. Ideally, the partogram should be used to monitor even those labours which are expected to be normal; while mothers with 'risk factors should have already been referred to centres with facilities for caesarean section.

- To show the optimum time for intervention in the active phase. This is the purpose of the "action line". If the progress line of a mother's cervical dilatation moves to the right of the alert line, the health care worker must be extra vigilant. If she reaches the action line, some action must be taken.

2.3.3.3 Provides guidance in uncertain situations

Dilatation of the cervix and its relation to the action line is only one of the factors measuring the progress of labour. This and the descent of the baby's head are two factors plotted on the cervicograph. Although they are the most useful and the most easily plotted ones, there are other factors which determine management of labour which include the presentation and position of the foetus, the moulding excess caput scores, foetal condition, the mother's condition, and the strength and frequency of her contractions. [37]

Intervention needs to be earlier in a multiparous than in primiparous women, so some partograms have two action lines, one at 3 hours for multiparae and one at 4 hours for primiparae. The further the progress line is from the alert line, the greater the need to intervene. Some hospitals consider that 1 cm per hour is 'too active, and leads to an unnecessarily high caesarean section rate. This may be a problem for populations with an average family size of perhaps 8 children, and when a caesarean section has to be done under less than ideal circumstances in small hospitals, so these hospitals give the alert line a flatter slope. [41, 42]

In a peripheral unit, if a mother's progress line reaches the area between alert and action lines the patient should be referred. In hospital, intervention should be considered; the following further help can be achieved by the use of partogram:

- Diagnosis of obstructed labour If the presenting part is seen to have failed to descend, and there are other signs such as excess caput labour is not only delayed, it is also obstructed.

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- Diagnosis of possible prolongation of the latent phase If a patient who was 'admitted in labour has not reached the active phase after 8 hours
- Diagnosis of false labour: with membranes I intact, the cervix of a primiparous patient remains long and closed (or just admits a finger tip), and a cervix of a multiparous patient is not effaced (even though it may be 1 or 2 cm dilated). If there is no change in the cervix after four hours, the patient is not in labour.
- Diagnosis of truly prolonged latent phase: the cervix is completely effaced, but remains stationary at about 2 cm alternatively; it effaces and dilates very slowly.

2.3.4 Studies on the partogram

Partograms have proved useful in reducing both maternal and perinatal mortality. While the partogram is a very useful tool for managing labour, it will not help to identify risk factors present before labour started.

Several studies had been conducted to assess the use of the partogram. In Tanzania, a comparative study was conducted to see the difference between hospitals using the partogram and those not using it. There was a reduction in the length of labour from 6.4% in 1997 prior to introduction of the partogram to 3.4% in 1998 after introduction of the partogram. There was also a reduction in augmentation of labour from 20.7% to 9.1% and for emergency caesarean section a small reduction from 9.95 to 8.3%.[38]

Studies in Serbia showed that large maternity hospitals tend to use the partogram more often than do smaller hospitals.[39] A study conducted in UK concluded that the second stage partogram (progress of labour recording) offers an objective basis for the management of the second stage of labour [41]

Active management of labour reduces the duration of labour mainly by shortening the latent phase when associated with amniotomy [41, 42]. Managing labour using partograms with different action lines, showed that women are more satisfied with the two-hour arm line drawn two hourly than the 3 or 4 hourly [38]. The same study showed that caesarean section rates were lower when labour was managed using the partogram than when it was not used .[43]

A study conducted in Burkina Faso noted that 86% of the partogram users felt that starting the alert and action line at a point later than in the WHO partogram would prevent unnecessary transfer of patients. The acceptance of the partogram among health units signifies the efficacy and efficiency of the partogram as an indicator for patient transfer and labour abnormalities [44]

2.3.5. Conclusions

The partogram, a structured graphical representation of the progress of labour, has been adopted in many maternity units throughout the world and is considered by many as a necessary tool in the management of labour. In addition to the graph depicting cervical dilatation and descent of the presenting part in relation to time, space can be provided for notes on the frequency of contractions, degree of moulding, medications, the foetal heart rate, and other important events. With the use of a partogram, the progress of labour can be seen at a glance on one sheet of paper, failure to progress can be recognized readily, and the writing of lengthy descriptions can be avoided. It is simple to use, a practical teaching aid, and is an efficient means of exchange of technical information about labour progress between teams of caregivers. On the other hand, too much reliance on partograms especially with regard to rigid adherence to protocols can be an agent for regimenting labour rather than for caring for the woman in labour.

Observational studies have reported improved pregnancy outcomes with the use of a partogram, with reduced risk of perinatal death and prolonged labour. Only recently, has there been any controlled evaluation of the use of the partogram during labour. In a large multicentre trial in South East Asia, conducted by the World Health Organization, the use of the partogram with an agreed labour-management protocol reduced the incidence of prolonged labour, the proportion of labours requiring augmentation, the intrapartum stillbirth rate, and the emergency caesarean section rate[16].

The well-being of both the mother and the foetus must be carefully monitored during labour. This monitoring does not necessarily require the use of special equipment, but it always requires careful and individualized observation and accurate recording of findings.

Monitoring the progress of labour requires more than the assessment of uterine contractions and dilatation of the cervix. The rate of progress must be considered in the context of the woman's total well-being, rather than simply as a physical phenomenon. A dilatation rate of 1 cm per hour in a woman who is having strong contractions and is in severe distress, is far more worrying than a rate of 0.5 cm per hour in a woman who is comfortable, walking around, drinking cups of tea, and chatting with her companions

Slow progress should alert caregivers to the possibility of abnormal labour, but should not automatically result in intervention. The use of a partogram to graphically represent the progress of labour is beneficial to all patients in labour and to their caregivers.

2.4 Rapid Epidemiological Assessment (REA)

REA is a collection of methods which provide health information more rapidly and simply and at a lower cost than standard method of data collection yet reliable results for use primarily at the local level (that is quick but not dirty).[47, 48]
Since Rapid Appraisal, which is part of REA, was the method used to in the collection of the raw data an introduction on the use, strength and weakness of the methodology is included in the literature review.

2.4.1 What are REA Methods?

Rapid epidemiological assessment methods are quick, low-cost ways to gather data systematically in support of managers' information needs, especially questions about performance. REA methods fall on a continuum between very informal methods, such as casual conversations or short site visits, and highly formal methods, such as censuses, surveys, or experiments. Informal methods are cheap, "quick and dirty," and susceptible to bias. REA methods are neither very informal nor fully formal. They share some of the properties of both and that is their strength as well as their weakness. [47,48]

Small area survey and sampling methods are the major application of REA. This process has opened channels for local people to participate in both collection and use of health information. As a result, programmes have the capacity to be controlled at the local level by a wide range of people including service providers and beneficiaries.

2.4.2 Contribution of REA to the health field

REA has begun to make important contributions to the field of health policy and planning both in the developed and developing countries. In addition to its attraction as a quick and cheap method for data collection, it can be used under routine conditions to evaluate health services functioning where time constraints on staff and financial constraints on recourses are a critical factor. In addition, it can be used effectively and efficiently during emergency or in time of crises. [49, 50]

The methods are goal oriented to health service and community needs as opposed to complex epidemiological methods. REA methods emphasize the need for professionals to develop good communication and listening skills and to recognize the value of experiences for those they are to serve. In this respect, it makes an important contribution to reorienting health people toward Primary Health Care.

2.4.3 Strengths and Weakness of REA

Strengths of rapid appraisal methods include:

They are relatively low-cost. REA studies are usually low cost in comparison to formal studies. They typically have a smaller sample size and narrower focus, and they often require less technical and statistical expertise than formal methods.

They can be quickly completed. REA methods can gather, analyze, and report relevant information to decision-makers within days or weeks.

They provide flexibility. REA methods allow evaluators to explore relevant new ideas and issues that may not have been anticipated in planning the study.

Community participation It has developed techniques, which have generated participation from lay people, particularly among the poorer communities, as a means to initiate their participation in planning processes and supporting their confidence in order to become subjects, not objects of health programmes.[46, 48]

2.4.4 Limitations of REA

They have limited reliability and validity. Information generated may lack reliability and validity because of informal sampling techniques, individual biases of the evaluators or interviewers, and difficulties in recording, coding, and analyzing qualitative data.

They lack quantitative data from which generalizations can be made for a whole population. Most rapid appraisal methods generate qualitative information. Even those that generate quantitative data cannot be generalized with precision, because they are usually based on non-representative samples. While a rapid appraisal method can give a picture of the prevalence of a situation, behavior, or attitude, it cannot tell the extent or pervasiveness.

Their credibility with decision-makers may be low. Most decision-makers are more impressed with precise figures than qualitative descriptive statements.

2.4.5 When are REA methods appropriate?

Choosing between informal, rapid appraisal and formal methods of data collection should depend on balancing several potentially conflicting factors: [47, 49]

- Purpose of the study (importance and nature of the decision hinging on it)
- Time frame within which it is needed (when decision must be made)
- Resource constraints (budget, expertise)
- Nature of information required

Regarding the nature of the information required, REA methods are especially useful and appropriate:

- When qualitative, descriptive information is sufficient for decision-making.
- When there is no great need for precise or representative quantitative data, rapid appraisal is a good choice.
- When an understanding is required of the motivations and attitudes that may affect behavior.
- REA methods are successful in answering the "why" and "how" questions.
- When available quantitative data must be interpreted. [47]

2.4.6 Conclusion

REA is likely to continue to be of growing interest to health people, both because of its focus on rapid information gathering and on community participation. In addition, as a training process, it facilitates the promotion of attitudes and skills which professionals need to do solid and productive community work. It draws on well known methods in epidemiological research with speed and simplicity and adaptation to the local condition. Central to the concept of REA is the belief that improved information will leads to improved decision making which in turn will lead to better distribution of resources to those problems most likely to result in health gains. It has the potential to be a misused tool to collect poor information for supporting poor decisions and planning outcomes and the potential to gives substance to the rhetoric of community participation by providing tools, techniques and information useful to planners and people to build a partnership for better health and health planning.

2.5 Lot Quality Assurance Sampling (LQAS)

LQAS is an example of an REA. It is a sampling method that is used to obtain reliable information on a small geographic or administrative unit using a small sample.[43] LQAS can be used to accurately detect the extremes of performance; those which are exceeding an "upper threshold" of performance and those fail to meet a "lower threshold" of performance.[3] LQAS cannot detect performance levels between those arbitrarily set upper and lower thresholds. Studies will be descriptive and cross sectional.

Lot Quality Assurance Sampling (LQAS) uses a quantitative methodology.[47] It is a sampling method that can be used to identify and evaluate priority areas or indicators that are not reaching average coverage or an established standard.[53]

Experience with analysis of the LQAS survey showed that it is easy and does not require a sophisticated statistical package. Due to the small sample size in each lot, the analysis can be done using a simple spreadsheet. LQAS uses small samples, the most frequently used size being 19, which provides an acceptable level of error for making management decisions at least 92 % of the time; it identifies whether a coverage benchmark has been reached or whether a supervision area is substantially below the average coverage of a program area. Samples larger than 19 have practically the same statistical precision as 19.[4] They do not result in better information, and they cost more.

A sample of 19 is: [4]

- Good for setting priorities within a supervisory area
- Good for setting priorities among supervision areas with large differences in coverage
- Good for deciding what are the higher performing supervision areas to learn from
- Good for deciding what are the lower performing supervision areas in which to invest resources
- Good for identifying knowledge/practices that have high coverage from those of low coverage
- Not good for calculating exact coverage in a supervision area, but can be used to calculate coverage for an entire program
- Not good for setting priorities among supervision areas with little difference in coverage
- They do not result in better information, and they cost more.

For these reasons, LQAS was chosen as the sampling method for this Rapid appraisal.

2.5.1 Studies conducted by LQAS

The WHO uses this method to assess immunization coverage. Lot sampling is an efficient, simple and time-efficient procedure for quality assurance, under certain condition, efficiency can be improved with double sampling.[52, 53]

A study conducted in Madras, India with an objective to explore the usefulness of LQAS to identify division in a city that had an immunization coverage level of 80% for any of the four EPI vaccines. The conclusion was that the study demonstrated the utility of the LQAS technique in identifying 'unsatisfactory' pockets in Madras City when the overall coverage was satisfactory. The technique will have greater application with an increase in the number of large units (cities/districts) having an overall coverage of 90% or more.[51, 52]

LQAS was used to evaluate the technical competence of two cohorts of family planning service providers trained with a new six-week curriculum developed by the Kenyan Ministry of Health Family Planning Training Program. The study using an LQAS sampling methodology helped to identify task categories in which the new curriculum needs strengthening [49]

The WHO's Expanded Programme of Immunization (EPI) compared LQAS methodology to the 30 by 7 cluster sampling methodology more usually advocated by the WHO as a rapid epidemiological assessment method to evaluate immunization coverage. It showed that data collection took longer to complete in the LQAS survey than the EPI cluster survey. Likewise, travel and cost was higher in LQAS than EPI. However, it may be useful for routine monitoring of immunization programs in small areas where local staff is used and a very heterogeneous coverage exists in the area being evaluated. [51]

UNICEF has used this method to estimate measles vaccination. Using good performance to be 80% coverage and poor performance to be 50% coverage to demonstrate the strength and limitation of the LQAS method. The exercise revealed that LQAS is very good at detecting poor performances. Its sensitivity is almost 99% and its community risk is less than 2%. On the other hand, LQAS method is not specific and its positive predicted value tends to be low in most setting. Thus, the LQAS method is not necessarily good at predicting when a programme is doing a good job.[50]

2.6 Summary

In order to improve safe motherhood preventive actions need to be taken during pregnancy. Access to safe delivery is a high priority. Correct use of the partogram has been shown to improve labour outcome for mother and baby. Although rapid appraisals have some limitations they are appropriate for health service evaluation where resources are limited. LQAS can be used to accurately detect the performance of health service indicators and to identify areas that are performing below average

CHAPTER THREE

3. METHODOLOGY

3.1 Introduction

This dissertation is a secondary analysis of data obtained in the evaluation of the Saving Mothers Initiative in South Africa, and specifically the "recommendation 5" of the "*Saving Mothers Report*" concerning the application and use of the partogram in South Africa. The data was collected as part of a more extensive study into maternal health care. In order to be able to understand the validity of the data it is important to include a description of its source.

Methodology Part 1: A description of the way in which the raw data was obtained

Methodology Part 2: Explanation as to how the data was analysed.

3.2 Methodology Part 1

The raw data on the use of the partograms was obtained while researchers were assessing the extent to which the ten recommendations made by the National Committee for the Confidential Enquiry into Maternal Death (NCCEMD) in late 1998 had been implemented (See CHAPTER 1). The fifth of these recommendations was that "the *partogram must be used for monitoring labour in every pregnant woman and problems detected on the partogram must be managed accordingly.*" [3]

3.2.1 Study design for the collection of the raw data.

A random sample of 19 hospitals providing a maternity service (14 in one province that has only 14 hospitals providing a maternity service) in each of the nine provinces was surveyed over a six-week period by telephonic interviews collecting data using an open-ended interview schedule. In addition, on-site visits were made to five purposively selected hospitals in each province (six in one province), and tools were used to elicit information related to the implementation of 9 of the 10 recommendations. A total of 166 hospitals were selected for the telephonic survey and 46 for the site visits. Forty-three of the hospitals visited were also included in the telephonic survey thus providing an opportunity for validating the data collected telephonically. Since information concerning use of the partogram was not collected during the telephone interviews, this part of the raw data collection will not be discussed further.

On-site visits. Hospitals were selected purposively to give a balanced mix of urban and rural, level 1, level 2, and level 3 hospitals in each province. In each hospital a minimum of 19 maternity records were selected randomly in order to be able to assess the implementation of the fifth recommendation (the use of the partogram for monitoring labour in every pregnant woman). [4]

3.2.2 The study population

All public hospitals with a capacity of over 20 beds, that provides maternal services. They include rural, semi-urban, urban, levels 1, 2, and 3 hospitals.

3.2.3 Study period

Data collection took place between 24 June and 16 August 2002.

3.2.4 Sampling strategy and technique

Lot Quality Assurance Sampling (LQAS) was used (See chapter 2). This is a quantitative sampling methodology that can be used to identify and evaluate priority areas or indicators that are not reaching average coverage or an established standard.

LQAS uses small samples, the most frequently used being 19, which provides an acceptable level of error for making management decisions at least 92% of the time; it identifies whether a coverage benchmark has been reached or whether a supervision area is substantially below the average coverage of a program area. Samples larger than 19 have practically the same statistical precision. For these reasons, LQAS was chosen as the sampling method for this study.

3.2.5 Sample size

Visits were made to five purposively selected hospitals in each province with the exception of the Northern Cape Province where six hospitals were visited. Using the principle of LQAS 19 partograms from each of the 5 hospitals were randomly selected from the deliveries, which had taken place in the respective hospitals between March 1st 2002 and May 30th 2002. In total 942 records were included in the sample and these were assessed using a checklist based on the maternity record which had recently been developed by the National Department of Health (See Appendix IV).

3.2.6 Sampling frame for the labour records

The sampling frame was the delivery record of women who gave birth between 1 March and 30 May 2002.

3.2.7 Data collecting methods

Experienced field workers[e] collected the data at the time of visits to the 46 hospitals. The variables that were used to assess the application, recording and use of the partogram were categorized into the following four groups including a final summary of the labour outcome and, whether the record was completed properly.

- Admission assessment:
- Risk factors
- Labour graph recording:
    o In the latent phase:
    o In the active phase:
    o Assessment of progress of the labour:
- Final summary of labour.

The 36 variables identified were subsequently scored as part of the analysis done for this dissertation. One point was given to the "yes" and zero for "no" answer. No score was given to the answer if the variable was not rated, thus they are excluded in the analysis.

3.2.8 Definition of terms

For the purposes of this study, "use of partogram" was defined as "the number of cases for which recordings were made on the partogram for women admitted in labour with cervical dilatation of less than 9 cm who should have been monitored during their labour."

3.2.9 Definition of Enumeration area type (EA)

'Enumeration area type' relates to the types allocated during Census '96 demarcation, which were verified and, in some cases, updated during 'Project Eagle'. 'Project Eagle' involved the preparation of a GIS (Geographical Information System which is a computerised mapping system) covering the whole of South Africa. This project was conducted during the two years following the census.

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[e] The primary study conduceted by the Centre for Rural Health used three experienced obstetricans and midwifes to develop and verify the questionnaire. The fieldwork was conducted by these expericened workers as well. The initital report was prepared by them and presented to the National Department of Health

Enumeration area type is a classification of EAs according to (human) settlement. There were two principles guiding the assignment of an Enumerations Area to a particular class or type. The first one was the EAs specific geographical location. The second principle was the kind of dwellings that were most common within the EA. These two principles led to location and settlement types as follows:

Urban: An urban EA is within municipal or local authority boundaries. These are ordinary town or city areas in which various formal structures can be found, e.g. houses, blocks of flats and businesses, informal dwellings (so-called 'squatter areas').

Semi-urban – In a semi-urban Enumeration Areas, the population concentrates adjacent to a municipal border and has one common boundary with the municipal border.

Rural - Village/settlement without a local authority and which is not situated within a tribal area and with formal and semi-formal dwellings such as houses, huts and rondavels, tribal authority area with villages and area with mainly informal dwellings.

Based on the enumeration area developed the hospitals are situated in this geographic location giving a defined services to their vicinity. Thus the use of the partogram in the various stages of labour: comparisons between rural, semi-urban and urban hospitals can be made on hospital areas (urban, semi-urban and rural)

3.2.10 Levels of health care

In theory, all state hospitals in South Africa are categorized according to levels of care divided.

- *"Level 1 care is defined as hospitals staffed by generalist doctors without any full-time specialist staff.*
- *Level 2 care is a hospital with full-time specialists (usually physician, surgeon, obstetrician and paediatrician).*
- *Level 3 care is a hospital with sub-specialists and full intensive care facilities".*

The Provinces have attempted to classify their hospitals in this way but there is on-going reorganisation and amalgamation and some hospitals currently provide all three levels of care. In some level 2 hospitals, there are specialist posts, but they have not been filled. For the purposes of this study, the hospitals were classified according to the opinion of

officials from the national or provincial departments of health but these definitions sometimes had to be changed after consultation with the local senior staff.

3.3 Methodology Part 2

3.3.1 Objectives of the analysis

- To quantify the use of the partogram in monitoring labour in hospitals in South Africa.
- To compare the use of the partogram in different levels of hospitals and in rural, semi-urban and urban hospitals.
- To compare the use of the partogram in different provinces in South Africa in 2002.
- To assess the implementation of the key recommendation (recommendation 5} of the 1998 *"Saving Mothers Report On the Confidential Enquiry into Maternal Death in South Africa".*
- To inform and develop recommendations on the findings to all relevant health professionals.

3.3.2 Methodology for the analysis

The methodology used for the analysis was both quantitative and descriptive. The data was loaded into *Microsoft Access* and analysed as follows:

- A minimum of 16 and a maximum of 26 partograms were surveyed from each hospital. f

- The number of partograms for each hospital and province and for the whole country was counted.
- Each partogram was scored out of 100 using the checklist. Marks were allocated giving "half" or "one" for "yes" and "zero" for "no", which was considered in the analysis
- All the "Yes" values were counted and the number of the "yes" for each of the 36 variables determined.
- In order to determine the provincial decision rules:
  - All the "yes" value of one variable (e.g. ANC recording) of each province was counted.

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f Some of the data from the randomly collected partograms was not properly recorede and no values were given, As a result this incomplete data had to be excluded from the sample. A total of 942 records of partograms from 46 hospitals were collected. From this number, partograms with incomplmete data were excluded. Only 628 records were included in the final analysis. Although this is significant number it was still sufficient to obtain sufficient to either 'accept' or 'reject' a hospital as being average or below average using the LQAS methodology.

- - The "yes" value of that variable (e.g. ANC recording) was converted to percentage from the total partograms surveyed in that province.
  - This decision rule for this percentage was taken from the LQAS table in order to determine the provincial average for that variable.
- In order to determine the national averages:
  - All the "yes" values of one variable (e.g. ANC recording) of all provinces was counted
  - The "yes" value of that variable (e.g. ANC recording) was converted to percentage from the total partograms surveyed in South Africa
  - This average for this percentage was taken from the LQAS table in order to determine the national average for that variable (Appendix v).

After determining the national and provincial averages quantitative comparisons were made between the following.

- Using the provincial averages the hospitals within one province were compared to determine below average values for the phases of labour.
- Using the national averages the nine provinces were compared to determine below average value for phases of labour
- Using the national averages the areas (urban, semi urban and rural) hospitals were compared for the phases of labour.
- Using the national averages the levels (first, second and third) of hospitals were compared for the phases of labour.

In order to determine the relationship between the number of deliveries and the quality of the recording on the partogram three calculations were made and the following procedure was followed.

3.3.3 Provincial comparison

- A comparison of the data from each of the provinces was done

3.3.4 Comparison between levels

- Total number of deliveries of the levels was added (level 1,2, and 3)
- The total deliveries of one level were calculated from the total number of deliveries of all the levels.

- Finally, comparisons were made between numbers of deliveries and the recording of the partogram using the values of below national average.

3.3.5 Comparison between areas

- Total number of deliveries of the areas was added (Rural, semi urban and urban)
- The total deliveries of one area were calculated from the total number of deliveries of all the areas.
- Finally, comparisons were made between numbers of deliveries and the recording of the partogram using the values of below the national average.

Similarly, calculations were made comparing hospitals in rural, semi-urban and urban areas and at levels 1, 2, and 3. In these comparisons the hospitals with the best recording and the worst recording of the partogram was first identified within the levels and areas. Then they were compared between the levels and areas. Finally, they were compared using the phases of labour in the checklist

3.4 Ethical Consideration

Permission was obtained from the University of Natal, Faculty of Medicine Ethics Committee to perform a retrospective analysis of the data collected as part of the "Rapid Appraisal to see the progress with the implementation of the key recommendation of the 1998 "*Saving Mothers Report on the Confidential Enquiry into Maternal Death in the provinces of South Africa*"

Full credit will be given to the primary researchers. No report will be published without the consent of National Department of Health.[9]

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[9] The permission to conduct this study in the 46 hospitals was obtained by the primary researchers. This is a secondary analysis of data

3.5 Summary

This dissertation is a secondary analysis to evaluate the "Saving Mothers Initiative" in South Africa from the data collected, between 24 June and 16 August 2002[3] as part of a more extensive study into maternal health care. It has two parts a description of the way in which the raw data was   obtained and explanation as to how the data was analysed.
In part one the methodology it is explained into how the data was collected, the study design in which a random sample of 19 hospitals providing a maternity service has been surveyed. A total of 46 hospitals and 942 partogram[h] were surveyed using LQAS. It also defined areas and levels of hospitals.

In part two of the methodology after defining the objectives of the analysis it explained the creation of national and provincial averages an how the hospitals within one province and the hospitals between the provinces are compared. Finally, it defined into how the areas of hospitals and levels of hospitals are compared and it tried to see if number of deliveries has an association to the recording of the partogram.

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[h] 190 had incomplete data, 123 had no recording on the partogram – In th analysis these were taken as "no" – in otherwards a "worst-case" scenario

CHAPTER FOUR

4. RESULTS

4.1 Introduction

This chapter will focus on the main findings in the provinces on the application and use of partogram. Comparisons between the hospitals in each province and nationally will be made. The analysis will look at the application of the labour chart in rural, semi-urban and urban hospitals and in different levels of South African hospitals.

4.2 National use of the partogram

A total of 942 partograms were randomly selected as follows:
The number from each province was:

Eastern Cape	100
Free State	102
Gauteng	106
KwaZulu- Natal	102
Limpopo	98
Mpumalanga	103
Northern West	101
Northern Cape	125
Western Cape	105
South Africa (total)	**942**

Based on methodology 2, (chapter 3) comparisons were made using the national and provincial averages derived from the 36 variables that were used in the partogram checklist (Table 4.1). The hospitals in each province are compared first using the provincial then the national averages for these variables and all the recordings in the partogram with "yes" values were considered. The results are also categorised on phases of labour (admission assessment, labour graph, in the latent phase, in the active phase, assessment of progress of labour and final summary of labour).

(In categorizing the data, only the "yes" values were considered and the answers "partly" and "No" were ignored. "Partogram in provinces" is the number of partograms available for analysis for each province for the variable under consideration).

The provinces use and apply the partogram very differently. The overall use of the partogram based on all 36 variables in the checklist ranged from 34.5% in Eastern Cape to 47.5 % in Western Cape. The best province was the Western Cape with 47.6 % of all variables being correct and the weakest was Eastern Cape with 34.5% being correct (Table 4.1).

There was variation in the use of the 36 variables measured using the partogram checklist (Table 4.1). Completed partograms (the checklist 24) was recorded in 84% of the hospitals. Nearly all (92.4%) of all hospitals had recorded that a vaginal examination had been performed on women in labour. Only 8.8% of hospitals had recorded whether the membranes had been ruptured or not. The partogram was used differently in the six phases of labour. Based on the five phases of labour provinces have differences in how the partogram is completed.

On the admission assessment Western Cape performs best with 75 % of the partograms being used appropriately. In this phase of the partogram, KwaZulu-Natal performed next best with 69.7% and Free State 67.4% being done correctly. The weakest province is Northern Cape with 55.1% and Northern West with 55.8% of the admission assessment variables being completed

The labour graph was recorded badly. The highest number of partograms recorded was KwaZulu-Natal and Free State with 25.5% being correct, 23% in Northern West and the worst use of these variables was found in Gauteng with 6.4% (Table 4.1)

The latent phase of the labour is the phase most poorly used. Western Cape is better than the other province with 25.8% of the latent phase variables completed. The Eastern Cape with 4.2% and Northern Cape with 4.6 of the variables were recorded.

In the active phase, the partogram recording was better than the other phases. Mpumalanga had 55.1% of the variables in this phase recorded, with KZN 37.5% and Free State 31.7%. The worst provinces in this phase were Limpopo with 24.5% and Northern Cape with 25% correctly recorded.

The partogram was completed best in the Western Cape (94.3%) and KZN having 92.2% of partograms completed. The lowest recording was 77% in Mpumalanga.

Table 4.1 Number and Percent of each variable of the partogram checklist correctly completed for each province

Provinces	Eastern Cape	Free State	Gauteng	KwaZulu-Natal	Limpopo	Mpuma-langa	North West	Northern Cape	Western Cape	South Africa
Number of partograms	100	102	106	102	98	103	101	125	105	942
Admission Assessment										
ANC reviewed	43(43.0%)	41(41.2%)	45(42.5%)	56(54.9%)	32(32.7%)	38(36.9%)	20(19.8%)	33(26.4%)	80(76.2%)	388(**41.2%**)
Clinical history	76(76.0%)	99(97.1%)	93(87.7%)	94(92.2%)	91(92.8%)	72(69.9%)	86(85.1%)	113(90.4%)	102(97.1%)	826(**87.7%**)
CVS examined	22(22.0%)	64(62.0%)	44(41.0%)	6(0.8%)	15(15.3%)	20(19.4%)	42(41.6%)	72(57.6%)	71(67.6%)	412(**43.7%**)
Abdominal examination	86(86.0%)	96(67.6%)	89(84.0%)	98(96.1%)	84(85.7%)	96(93.2%)	85(84.2%)	95(76.0%)	98(93.3%)	827(**87.8%**)
Vaginal examination	88(88.0%)	100(98.0%)	97(91.5%)	99(97.1%)	92(93.9%)	99(96.1%)	93(92.1%)	102(81.6%)	100(95.2%)	870(**92.4%**)
Maternal risk factor	73(73.0%)	53(52.0%)	44(41.5%)	56(54.9%)	50(51.0%)	39(37.9%)	44(43.6%)	37(29.6%)	53(50.5%)	449(**47.7%**)
Foetal risk factor	71(71.0%)	52(51.0%)	44(41.5%)	52(51.0%)	49(50.0%)	39(37.9%)	43(42.6%)	34(27.2%)	41(39.0%)	425(**45.1%**)
Summary diagnosis	40(40.0%)	71(69.0%)	79(74.0%)	92(90.1%)	60(61.2%)	69(66.9%)	48(47.5%)	68(54.4%)	85(80.9%)	612(**65.0%**)
Summary management	35(35.0%)	71(69.0%)	80(75.0%)	92(90.2%)	68(69.4%)	68(66.2%)	47(46.0%)	66(52.8%)	84(80.0%)	611(**64.9%**)
Average for Admission Assessments	59.3%	67.4%	64.3%	69.7%	61.3%	58.3%	55.8%	55.1%	75.4%	54.2%
Labour graph										
Risk factors identified	24(24.0%)	45(44.0%)	3(2.8%)	42(41.2%)	35(35.7%)	11(10.7%)	12(12.0%)	30(24.0%)	43(40.9%)	245(**26.0%**)
Risk factor recorded	55(55.0%)	15(14.7%)	15(14.2%)	21(20.6%)	3(3.1%)	31(30.1%)	35(33.3%)	13(10.4%)	5(4.8%)	143(**13.1%**)
Rupture of membranes	11(11.0%)	14(13.7%)	6(5.7%)	6(5.9%)	4(4.1%)	4(3.9%)	28(27.7%)	19(15.2%)	1(1.0%)	83(**8.8%**)
Pelvic assessment	2(2.0%)	30(29.4%)	3(2.8%)	6(5.9%)	30(30.6%)	4(3.9%)	19(18.8%)	5(4.0%)	0(0.0%)	99(**10.5%**)
Average for Labour Graph Assessments	23.0%	25.5%	6.4%	18.4%	18.4%	12.2%	23.0%	13.4%	11.7%	14.6%
In the Latent Phase										
Foetal heart recorded	3(3.0%)	22(21.6%)	17(16.0%)	9(8.8%)	11(11.2%)	25(24.3%)	21(20.8%)	29(23.2%)	28(26.7%)	165(**17.5%**)
Cervical dilatation	2(2.0%)	17(16.6%)	11(10.4%)	10(9.8%)	14(14.3%)	18(17.5%)	21(20.8%)	29(23.2%)	15(14.3%)	137(**14.5%**)
Maternal BP	4(4.0%)	23(22.5%)	18(17.0%)	9(8.8%)	3(3.1%)	32(31.1%)	18(17.8%)	32(25.6%)	36(34.3%)	175(**18.6%**)
Maternal pulse	9(9.0%)	16(15.7%)	14(13.2%)	8(7.8%)	4(4.1%)	28(27.2%)	16(15.8%)	30(24.0%)	24(22.9%)	149(**15.8%**)

	EC	FS	G	KZN	LIM	MP	NW	NC	WC	SA
Maternal temperature	3(3.0%)	22(21.6%)	17(16.0%)	8(7.8%)	4(4.1%)	30(29.0%)	17(16.8%)	30(24.0%)	34(32.4%)	165(**17.5%**)
Avr. Latent Phase Asses	**4.2%**	**19.6%**	**14.5%**	**8.6%**	**7.4%**	**25.8%**	**18.4%**	**4.6%**	**26.1%**	**16.8%**
In the Active Phase										
Foetal heart	49(49.0%)	36(35.3%)	33(31.1%)	51(50.0%)	54(55.0%)	56(54.4%)	59(58.4%)	35(28.0%)	51(48.8%)	424(**45.0%**)
Cervical dilatation	56(56.0%)	51(50.0%)	36(34.0%)	70(68.6%)	63(64.3%)	62(60.2%)	64(63.4%)	73(58.4%)	32(30.5%)	507(**54.0%**)
Contractions	52(52.0%)	55(53.9%)	51(48.1%)	78(76.5%)	59(60.2%)	56(54.4%)	73(72.3%)	28(22.4%)	56(53.0%)	508(**53.9%**)
Caput	29(29.0%)	49(48.0%)	53(50.0%)	63(61.8%)	48(49.0%)	70(68.0%)	83(82.2%)	62(49.6%)	53(50.5%)	510(**54.1%**)
Level of head	52(52.0%)	55(54.0%)	51(48.0%)	78(76.5%)	59(60.2%)	56(54.4%)	73(72.3%)	28(22.5%)	56(53.0%)	508(**54.0%**)
Liquor	26(26.0%)	46(45.0%)	56(52.8%)	65(63.7%)	48(49.0%)	72(70.6%)	82(81.2%)	66(52.8%)	55(52.4%)	516(**55.0%**)
Moulding	25(25.0%)	50(49.0%)	52(49.1%)	63(61.8%)	50(51.0%)	70(68.0%)	83(82.2%)	61(48.8%)	53(50.5%)	507(**54.0%**)
Maternal BP	32(32.0%)	69(67.6%)	47(44.3%)	58(56.9%)	27(27.5%)	51(49.5%)	71(70.3%)	624(9.6%)	59(56.2%)	476(**50.5%**)
Maternal Pulse	6(6.0%)	64(62.7%)	40(37.7%)	35(34.3%)	20(20.4%)	50(48.5%)	42(41.6%)	25(20.0%)	53(50.5%)	335(**35.6%**)
Maternal temperature	26(26.0%)	43(42.2%)	36(34.3%)	58(65.9%)	37(37.8%)	54(52.2%)	65(64.4%)	52(41.6%)	39(37.0%)	410(**43.5%**)
Maternal urine	21(21.0%)	40(39.2%)	20(18.9%)	36(35.3%)	34(34.7%)	45(43.7%)	59(58.4%)	48(38.4%)	39(37.1%)	342(**36.3%**)
IV fluid given	9(9.0%)	45(44.1%)	19(18.0%)	50(49.0%)	54(55.1%)	25(24.3%)	28(27.7%)	18(14.4%)	37(35.2%)	285(**30.3%**)
IV fluid not indicated	64(46.0%)	27(26.5%)	30(28.3%)	23(22.5%)	50(51.0%)	42(40.8%)	39(38.6%)	51(40.8%)	21(20.0%)	347(**36.6%**)
Average for Active Phase Assessment	**33.0%**	**47.5%**	**38.0%**	**55.6%**	**47.3%**	**53.0%**	**62.5%**	**34.4%**	**44.2%**	**46.4%**
Assessment of Progress of Labour										
Vaginal exam	26(26.0%)	30(29.4%)	32(30.2%)	22(21.6%)	21(21.4%)	57(55.3%)	20(19.8%)	26(20.8%)	28(26.7%)	262(**27.8%**)
Problem identified	28(28.0%)	31(30.4%)	36(34.0%)	32(31.4%)	25(25.5%)	63(61.2%)	26(25.7%)	33(26.4%)	35(33.3%)	309(**32.8%**)
Plan of management	23(23.0%)	30(29.4%)	34(32.0%)	30(29.4%)	22(22.4%)	54(52.4%)	22(21.8%)	29(23.2%)	31(29.5%)	275(**29.2%**)
Proper management	31(31.0%)	71(69.6%)	52(49.0%)	68(66.7%)	28(28.6%)	53(51.4%)	37(36.6%)	37(29.6%)	49(46.7%)	426(**45.2%**)
Average for Progress of Labour Assessment	**27.0%**	**39.7%**	**36.3%**	**37.3%**	**24.5%**	**55.1%**	**26.0%**	**25.0%**	**34.1%**	**33.8%**
Forms completed										
Summary of Forms completed	89(89.0%)	87(85.3%)	90(85.0%)	94(92.2%)	86(87.7%)	77(74.8%)	89(88.1%)	89(71.2%)	99(94.3%)	800(**84.9%**)
Overall performance based on 36 variables	**34.47%**	**47.50%**	**40.75%**	**46.97%**	**41.10%**	**46.53%**	**45.63%**	**37.18%**	**47.63%**	**41.78%**

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4.2.1 Comparison between provinces

The provinces are compared with each other using the national average for each field variable on the partogram checklist, and arranged with the province with the least number of fields that are below the national average as the best province and the province with the greatest number of below average being the worst. (Table 4.2)

The application and use of the partogram in the provinces can be seen that the total of below averages (national and provincial) is high in Eastern Cape 162/840 (19.3%) followed by Limpopo142/840 (16.2%) and the best is KZN with only 57/840(8.7%) followed by Free State   71/840 (8.4%)

Table 4.2   Comparisons of provinces by the number of variables (percent) which are below the Provincial and National averages.

Provinces	Eastern Cape	Free State	Gauteng	KwaZulu-Natal	Limpopo	Mpumalanga	North West	Northern Cape	Western Cape	South Africa
Fields below provincial average	68 (18.2%)	33 (8.8%)	30 (8.0%)	36 (9.6%)	65 (17.4%)	40 (10.7%)	29 (7.7%)	34 (9.1%)	39 (10.4%)	374 (44.5%)
Fields below national average	94 (20.17%)	38 (8.15%)	48 (10.30%)	21 (4.50%)	77 (16.15%)	45 (9.65%)	46 (9.87%)	54 (11.58%)	43 (9.22%)	466 (55.47%)
Total fields below Provincial & National Average	162 (19.3%)	71 (8.4%)	78 (9.3%)	57 (8.7%)	142 (16.2%)	85 (10.1%)	75 (8.9%)	88 (10.5%)	82 (9.8%)	840 (100%)

Legend:
- Fields below provincial average
- Fields below national average

Province	Fields below provincial average	Fields below national average
Eastern Cape	68	94
Limpopo	65	77
Northern Cape	34	54
Gauteng	30	48
North	29	46
Mpumalanga	40	45
Western Cape	39	43
Free	33	38
KwaZulu-Natal	36	21
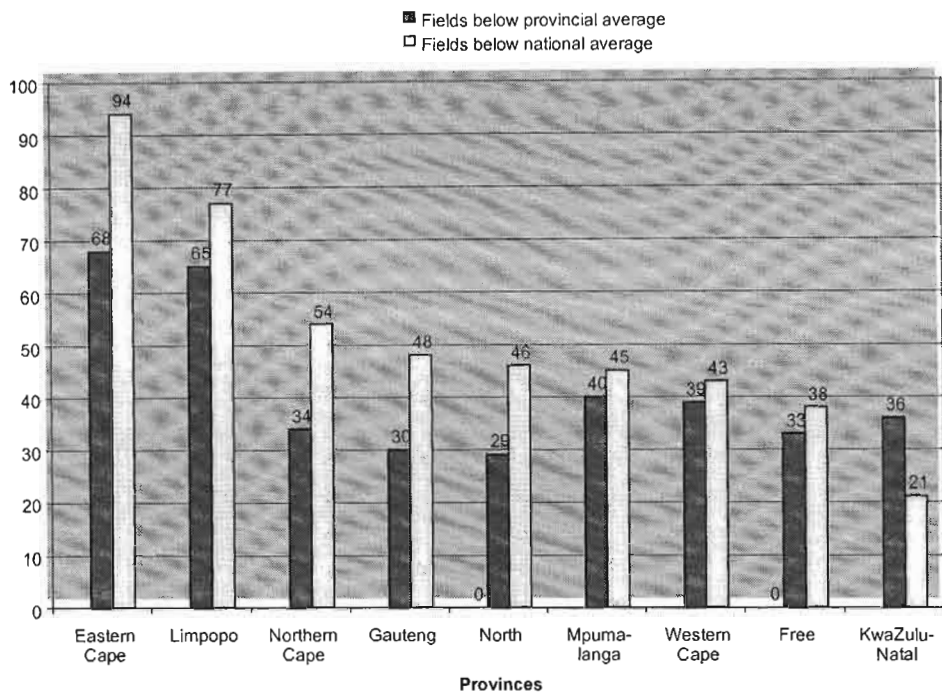
Figure 4.3.1 Provinces in South Africa Ranked from Worst to Best According to the Numbers of Partogram Field that are Below the National and Provincial Average, 2002

4.3.1 Comparisons within provinces

The first part of the analysis will compare the hospitals of each province among themselves in relation to the provincial and national decision rules. This part of the analysis will conclude by comparing the overall recording and use of the partogram in the provinces and will categorise the province according to the number of hospitals, which score below the national average.

4.3.1.1. Eastern Cape

A hundred partograms were surveyed from the five hospitals selected. From the 36 variables used in the checklist to measure the completion and use of the partogram, the best hospital was Frere Hospital (urban, level 3) which had 7/36 below the provincial average and 14/36 below for the national average; CMH Hospital (urban, level 3) has 8/36 (provincial), 13/36 (national) below average; Bisho Hospital (rural, level 1) has 15/36 (provincial), 19/36 (national) below average; Thafalofefe Hospital (rural, level 1) has 17/36 (provincial), 22/36 (national) below average; and, Butterworth Hospital was worst with 21/36 and 26/36 below provincial and national average respectively.

The total number of variables below the provincial average was 68 and the total number below the national average 94.

NB. Description of the table: The numbers in bold indicate the variable below the provincial average and the underlined numbers below the national average. Both bold and underlined indicates variables below both averages.

Table 4.2.1 Use of 36 Partogram Assessment Variables in Eastern Cape Province Hospitals Comparing Provincial and National Averages, 2002.

Hospital	Bisho n=21	Butterworth =20	CMH n=19	Frere n=19	Thafalofefe n=19	Eastern Cape Average N=98	Provincial Decision Rule	National Average	National Decision Rule
Admission assessment									
Check Lists Fields	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ANC Reviewed	8	**2**	15	15	**3**	43%	6	41.2%	6
Clinical History	12	11	16	19	18	58%	10	87.7%	15
CVS	17	16	16	15	1	22%	**2**	43.7%	6
Abdominal Exam	<u>14</u>	18	17	19	18	86%	16	87.8%	17

	Bis	But	CMH	Fre	Tha	EC	PDR	NA	NDR
Vaginal Exam	13	19	19	19	18	88%	17	92.4%	18
Risk Factor Maternal	12	15	16	16	14	73%	13	47.7%	8
Risk Factor Foetal	12	14	16	15	14	71%	21	45.1%	6
Summary Diagnosis	6	3	10	16	3	40%	5	65.0%	11
Summary Management	5	3	8	16	1	35%	5	64.9%	11
Labour graph									
Risk Factor Record	6	6	2	2	6	24%	2	26.0%	3
Duration of labour	0	0	1	4	0	5%	1	8.8%	1
Estimated Foetal Wt	0	0	0	1	0	1%	1	13.1%	1
Pelvic assessment	0	0	0	1	1	2%	1	10.5%	1
In the latent phase									
Foetal Heart	0	0	3	0	0	3%	1	17.5%	2
Cervical Dilatation	0	0	2	0	0	2%	1	14.5%	2
Maternal BP	0	0	3	1	0	4%	1	18.6%	2
Maternal Pulse	0	0	3	0	0	9%	1	15.8%	2
Maternal Temperature	2	0	3	2	1	3%	1	17.5%	2
In the active phase									
Foetal Heart	8	6	10	11	13	49%	8	45.0%	6
Cervical Dilatation	10	8	5	6	14	56%	9	54.0%	9
Liquor	6	4	8	10	7	52%	8	55.0%	9
Moulding	6	3	5	6	4	29%	3	54.0%	9
Caput	6	4	6	7	5	52%	8	54.1%	9
Head	8	11	8	8	17	26%	3	54.0%	9
Contraction	10	9	11	11	16	25%	2	53.9%	9
BP	7	3	3	12	7	32%	4	50.5%	8
Pulse	0	0	3	4	0	6%	1	35.6%	4
Temperature Record	6	4	6	4	6	26%	3	43.5%	6
Urine output	7	3	5	3	4	21%	2	36.3%	4
IV fluid given	4	1	0	2	1	9%	1	36.8%	3
Not Indicated	6	9	8	7	14	46%	6	35.0%	4
Assessment of progress of the labour									
Vaginal Exam	6	0	5	13	0	26%	2	27.8%	3
Problem Identified	5	2	4	13	2	28%	3	32.8%	3
Plan of Management	4	1	3	12	1	23%	2	29.2%	3
Properly Managed	6	3	3	15	3	31%	3	45.2%	6
Final summary of labour									
Record completed	11	19	18	14	17	89%	17	84.9%	16
Total fields below Provincial average	15	21	8	7	17	-	-	-	68
Total fields below National average	19	26	13	14	22	-	-	-	94

Underlined – Below National Average **Bold** – Below Provincial Average
Bold and underlined -- below both averages
Provincial Decision Rule – **PDR** = Using LQAS methodology PDR is the number of partograms correctly completed in a hospital using the provincial average
National Decision Rule – **NDR** - number of partograms correctly completed in a hospital using the national average

Figure 4.2.1 Percentage of Partogram Variables below Provincial and National Average in Hospitals in Eastern Cape Province, 2002.

4.3.1.2 Free State

One hundred and two (102) partograms were surveyed from the five hospitals selected. In descending order the hospitals can be categorised as: National Hospital (urban: level 1) 4/36 below provincial average, 4/36 below national average: Universitas Hospital (urban: level 3) 5/36 (provincial), 6/36 (national) below average; Botshabelo hospital (semi urban, level 1) 6/36 (provincial), 8/36 (national) below average; Pelonomi Hospital (urban: level 2) 9/36 (provincial), 10/36 (national) below average: and Clocolan Hospital (rural: level 1) with 9/36 below provincial average and 10/36 below the national average. The over-all values of below average are 33 for provincial and 38 for national, which is much better than most provinces.

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Table 4.2.2 Use of 36 Partogram Assessment Fields in Free State Province Hospitals Comparing Provincial and National Averages, 2002.

Hospitals	National N=21	Botshabelo N=21	Pelonomi N=18	Clocolan N=25	Universitas N=17	Free State (Average)	Provincial Decision Rule	National average	National Decision Rule
Admission assessment									
Check Lists Fields	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ANC Reviewed	9	3	9	6	11	41.2%	5	41.2%	6
Clinical History	21	21	18	22	17	96.1%	18	87.7%	15
CVS	19	4	13	12	17	62.0%	11	43.7%	6
Abdominal Exam	21	21	16	24	17	67.6%	12	87.8%	17
Vaginal Exam	21	21	18	25	16	98.0%	18	92.4%	18
Risk Factor Maternal	8	13	6	8	16	52.0%	8	47.7%	8
Risk Factor Foetal	9	13	5	8	16	51.0%	8	45.1%	6
Summary Diagnosis	5	19	14	8	16	69.0%	12	65.0%	11
Summary Management	15	18	14	8	16	69.0%	12	64.9%	11
Labour Graph									
Risk Factor Record	11	8	6	7	13	44.0%	6	26.0%	3
Duration of labour	4	1	1	1	7	14.7%	1	8.8%	1
Estimated Foetal Wt	2	5	3	1	2	13.7%	1	13.1%	1
Pelvic assessment	11	13	7	7	3	29.4%	3	10.5%	1
In the latent phase									
Foetal Heart	5	4	2	2	9	21.6%	1	17.5%	2
Cervical Dilatation	1	3	2	2	9	16.6%	1	14.5%	2
Maternal BP	5	3	3	2	10	22.5%	2	18.6%	2
Maternal Pulse	5	2	3	2	10	15.7%	1	15.8%	2
Maternal Temperature	2	2	2	1	9	21.6%	1	17.5%	2
In the active phase									
Foetal Heart	3	4	3	14	11	35.3%	4	45.0%	6
Cervical Dilatation	15	6	11	12	7	50.0%	8	54.0%	9
Liquor	12	8	9	8	9	53.9%	9	55.0%	9
Moulding	13	9	8	9	11	48.0%	8	54.0%	9
Caput	13	9	7	9	11	54.0%	9	54.1%	9
Head	16	7	10	14	8	45.0%	6	54.0%	9
Contraction	14	13	6	18	7	49.0%	8	53.9%	9
BP	11	14	11	19	13	67.6%	12	50.5%	8
Pulse	11	14	11	16	13	62.7%	11	35.6%	4
Temperature Record	9	13	3	11	7	42.2%	6	43.5%	6
Urine output	11	11	6	4	7	39.2%	5	36.3%	4
IV fluid given	11	12	5	5	13	44.1%	6	36.8%	3
Not Indicated	7	2	4	13	1	26.5%	3	35.0%	4
Assessment of progress of the labour									
Vaginal Exam	4	7	6	0	13	29.4%	3	27.8%	3
Problem Identified	4	8	6	0	13	30.4%	3	32.8%	3
Plan of Management	4	8	5	0	13	29.4%	3	29.2%	3
Properly Managed	17	11	12	17	14	69.6%	12	45.2%	6

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	Nat	Bot	Pel	Clo	Uni	FS	PDR	NA	NDR
Final summary of labour									
Record completed	17	17	**15**	22	17	85.3%	16	84.9%	**16**
Total fields below Provincial average	4	6	9	9	5	-	-	-	33
Total fields below National average	4	8	10	10	6	-	-	-	38

Underlined – Below National Average

Bold – Below Provincial Average

Bold and underlined -- below both averages

Figure 4.2.2   Percentage of Partogram Variables below Provincial and National Average in Hospitals in Free State Province, 2002.

4.3.1.3 Gauteng

One hundred and six (106) partograms were surveyed from the five hospitals selected in descending order. Yusuf Dadoo Hospital (semi urban: level 1) had the best results with 2/36 variables below the provincial average and 4/36 below the national average, followed by: Coronation Hospital (urban level 2) 3/36 (provincial), 3/36 (national) below average;

Johannesburg Hospital (urban: level 3) 3/36 (provincial), 7/36 (national) below average; Nelspruit Hospital (urban: level 2) 10/36 (provincial), 16/36 (national) below average: and Thembisa Hospital (semi urban: level 2) 12/36, below provincial and 18/36 below that national average. The total number of below provincial average was 30 and for the national average 48.

Table 4.2.3   Use of 36 Partogram Assessment Fields in Gauteng Province Hospitals Comparing Provincial and National Averages, 2002.

Hospitals	Nelspruit N=21	Thembisa N=22	Johannesburg N=18	Yusuf Dadoo N=24	Coronation N=21	Gauteng (Average)	Provincial Decision Rule	National average	National Decision Rule
Admission Assessment									
Check Lists Fields	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ANC Reviewed	16	2	8	7	12	42.5%	6	41.2%	6
Clinical History	18	19	18	18	20	87.7%	17	87.7%	15
CVS	8	10	6	6	13	41.0%	5	43.7%	6
Abdominal Exam	17	20	18	16	18	84.0%	16	87.8%	17
Vaginal Exam	17	21	18	21	20	91.5%	17	92.4%	18
Risk Factor Maternal	13	5	5	11	10	41.5%	5	47.7%	8
Risk Factor Foetal	11	5	5	11	10	41.5%	5	45.1%	6
Summary Diagnosis	18	8	17	18	18	74.0%	13	65.0%	11
Summary Management	19	8	17	18	18	75.0%	13	64.9%	11
Labour Graph									
Risk Factor Record	1	0	2	6	0	2.8%	1	26.0%	3
Duration of labour	0	3	2	5	6	14.2%	1	8.8%	1
Estimated Foetal Wt	0	0	3	0	3	5.7%	1	13.1%	1
Pelvic assessment	2	0	1	0	0	2.8%	1	10.5%	1
In the Latent Phase									
Foetal Heart	2	5	4	4	2	16.0%	1	17.5%	2
Cervical Dilatation	2	3	2	4	0	10.4%	1	14.5%	2
Maternal BP	2	5	5	4	2	17.0%	1	18.6%	2
Maternal Pulse	2	4	5	4	2	24.0%	2	15.8%	2
Maternal Temperature	1	1	5	5	2	16.0%	1	17.5%	2
In the Active Phase									
Foetal Heart	2	1	8	6	16	31.1%	3	45.0%	6
Cervical Dilatation	7	5	7	8	9	34.0%	4	54.0%	9
Liquor	9	11	11	9	16	48.1%	8	55.0%	9
Moulding	9	11	9	9	14	50.0%	8	54.0%	9
Caput	10	11	9	9	14	48.0%	8	54.1%	9
Head	10	11	7	10	12	52.8%	9	54.0%	9
Contraction	6	9	11	9	14	49.1%	8	53.9%	9
BP	6	5	11	10	15	44.3%	6	50.5%	8
Pulse	3	5	10	10	11	37.7%	5	35.6%	4

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	Nel	The	Joh	Yus	Cor	Gau	PDR	Nat	NDR
Temperature Record	**1**	**3**	9	11	12	34.3%	4	43.5%	6
Urine output	1	3	5	4	7	18.9%	1	36.3%	4
IV fluid given	2	1	5	6	5	18.0%	1	36.8%	3
Not Indicated	6	9	**2**	5	8	28.3%	3	35.0%	4
Assessment of Progress of the Labour									
Vaginal Exam	**1**	3	13	4	11	30.2%	3	27.8%	3
Problem Identified	**1**	3	13	6	13	34.0%	4	32.8%	3
Plan of Management	**0**	**2**	12	7	13	32.0%	4	29.2%	3
Properly Managed	9	9	12	8	14	49.0%	8	45.2%	6
Final Summary of Labour									
Record completed	20	**15**	**14**	24	18	85.0%	16	84.9%	16
Total fields below Provincial average	10	12	3	2	3	-	-	-	30
Total fields below National average	16	18	7	4	3	-	-	-	48

<u>Underlined</u> – Below National Average

Bold – Below Provincial Average

Bold and <u>underlined</u> -- below both averages
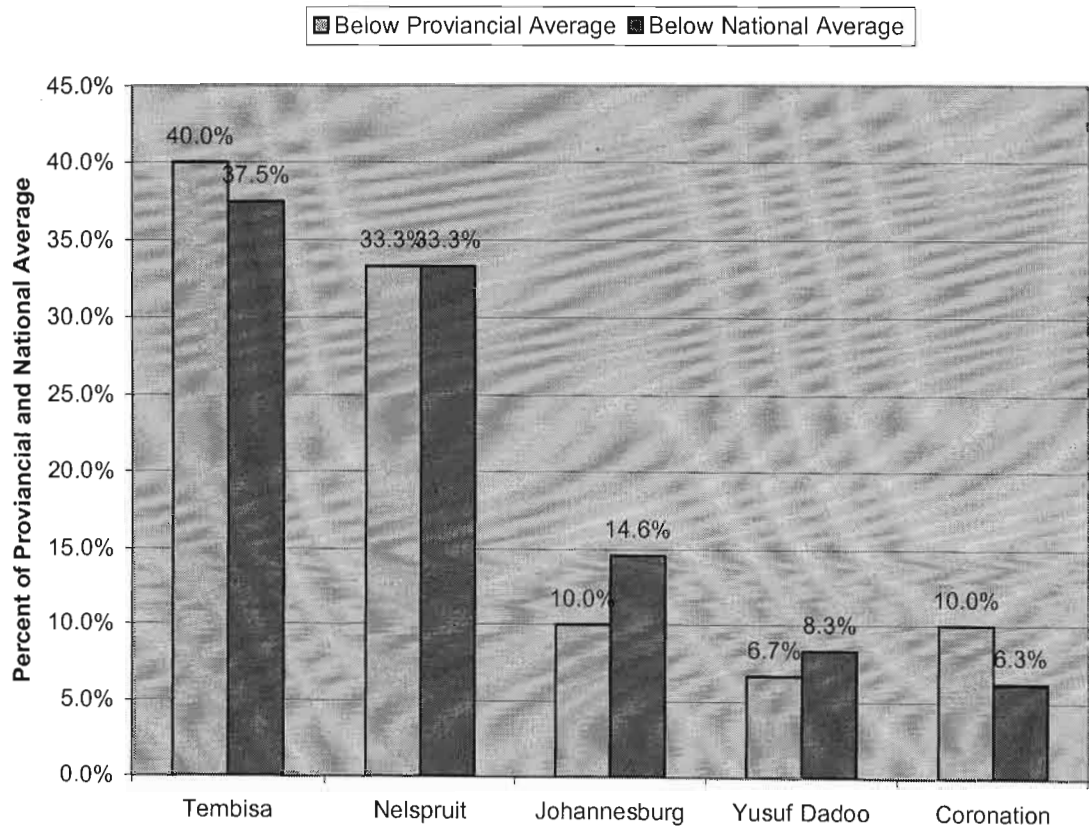
Figure 4.2.3 Percentage of Partogram Variables below Provincial and National Average in Hospitals in Gauteng Province, 2002.

4.3.1.4 KwaZulu - Natal (KZN)

One hundred and two partograms were surveyed from five hospitals. The hospitals were categorised with the best being Montebello Hospital (rural: level 1) with 3/36 below the provincial average, and 2/36 below the national average; Osindisweni Hospital (urban: level 2) 4/36 (provincial), 4/36 (national) below average: King Edward 8th Hospital (urban: level 3) 5/36 (provincial), 1/36 (national) below average; Stanger Hospital (urban: level 2) 10/36 (provincial), 5/36 (national) below average; and GJ Crookes Hospital being worst with (semi urban: level 1) 14/36 below the provincial average and 9/36 below the national average. KwaZulu-Natal performed best overall with only 21 variables below the national and 36 below the provincial average.

Table 4.2.4   Use of 36 Partogram Assessment Fields in KwaZulu - Natal Province Hospitals Comparing Provincial and National Averages, 2002.

Hospitals	GJ Crookes N=21	Montebello N=21	Stanger N=19	Osindisweni N=21	KEH N=21	KwaZulu-Natal (Average)	Provincial Decision Rule	National average	National Decision Rule
Admission assessment									
Check Lists Fields	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ANC Reviewed	16	11	4	12	13	54.9%	9	41.2%	6
Clinical History	20	21	16	17	20	92.2%	17	87.7%	15
CVS	7	7	11	18	19	60.8%	10	43.7%	6
Abdominal Exam	20	21	17	19	21	96.1%	18	87.8%	17
Vaginal Exam	20	21	19	18	21	97.1%	18	92.4%	18
Risk Factor Maternal	16	18	6	5	11	54.9%	9	47.7%	8
Risk Factor Foetal	16	17	7	5	10	51.0%	8	45.1%	6
Summary Diagnosis	18	20	15	19	21	90.0%	17	65.0%	11
Summary Management	18	19	15	20	21	90.2%	17	64.9%	11
Labour Graph									
Risk Factor Record	6	14	10	9	4	41.2%	5	26.0%	3
Duration of labour	8	0	6	3	4	20.6%	1	8.8%	1
Estimated Foetal Wt	1	0	2	0	3	5.9%	1	13.1%	1
Pelvic assessment	0	1	4	1	0	5.9%	1	10.5%	1
In the latent phase									
Foetal Heart	0	2	3	2	2	8.8%	1	17.5%	2
Cervical Dilatation	0	2	2	4	2	9.8%	1	14.5%	2
Maternal BP	0	2	3	2	2	8.8%	1	18.6%	2
Maternal Pulse	0	2	2	2	2	7.8%	1	15.8%	2
Maternal Temperature	0	2	2	2	2	7.8%	1	17.5%	2
In the active phase									

	GJC	Mon	Sta	Osi	KEH	KZN	PDR	Nat	NDR
Foetal Heart	15	13	**_5_**	8	11	50.0%	8	45.0%	**6**
Cervical Dilatation	16	17	12	13	13	68.6%	12	54.0%	**9**
Liquor	**12**	14	13	15	**12**	76.5%	13	55.0%	**9**
Moulding	12	13	12	15	11	61.8%	10	54.0%	**9**
Caput	**12**	13	**12**	15	**11**	76.5%	13	54.1%	**9**
Head	18	14	15	15	17	63.7%	11	54.0%	**9**
Contraction	15	17	12	14	13	61.8%	10	53.9%	**9**
BP	**8**	16	11	12	12	56.9%	9	50.5%	**8**
Pulse	**_3_**	9	**_3_**	9	11	34.3%	4	35.6%	**4**
Temperature Record	**_2_**	16	14	14	11	65.9%	11	43.5%	**6**
Urine output	**_1_**	5	10	10	8	35.3%	4	36.3%	**4**
IV fluid given	**3**	15	15	15	**3**	49.0%	8	36.8%	**3**
Not Indicated	9	4	**_1_**	**_1_**	9	22.5%	1	35.0%	**4**
Assessment of progress of the labour									
Vaginal Exam	5	5	4	6	3	21.6%	1	27.8%	**3**
Problem Identified	8	7	3	7	9	31.4%	3	32.8%	**3**
Plan of Management	6	7	3	6	9	29.4%	3	29.2%	**3**
Properly Managed	13	16	12	12	16	66.7%	11	45.2%	**6**
Final summary of labour									
Record completed	19	21	18	20	17	92.2%	17	84.9%	**16**
Total fields below Provincial average	14	3	10	4	5	-	-	-	36
Total fields below National average	9	2	5	4	1	-	-	-	21

Underlined – Below National Average

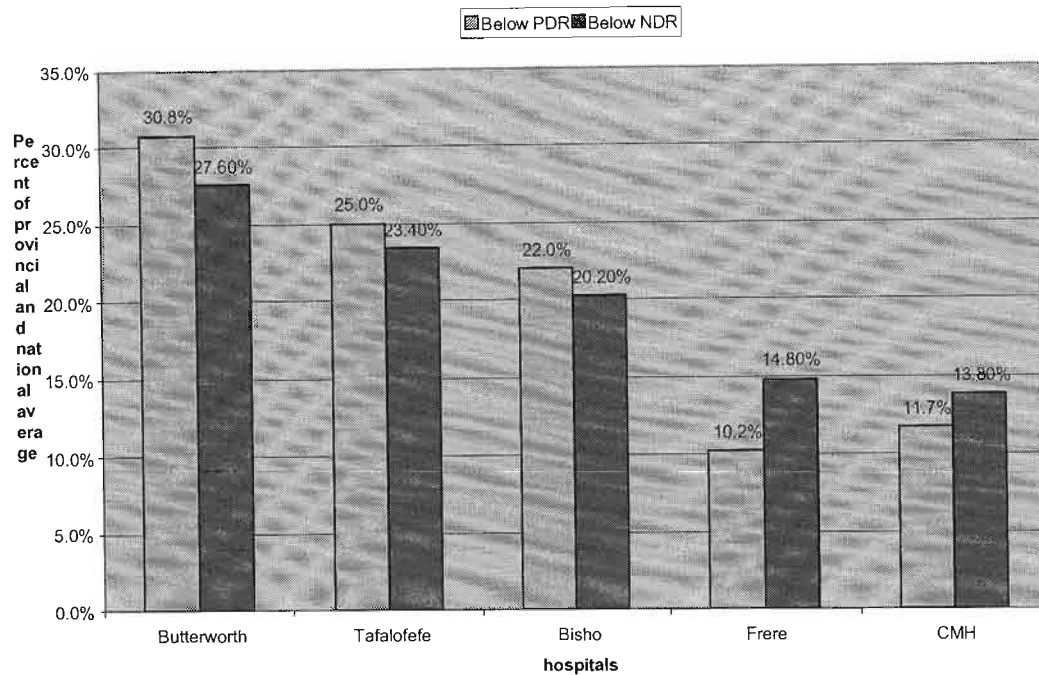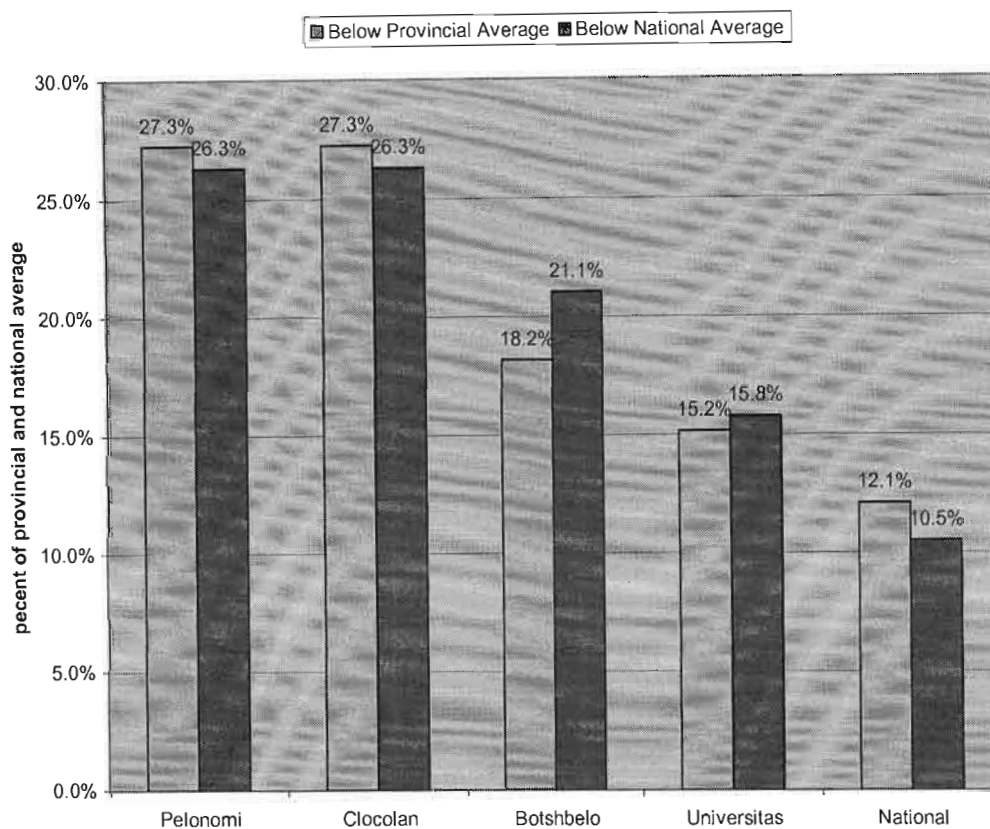**Bold** – Below Provincial Average

Bold and underlined -- below both averages
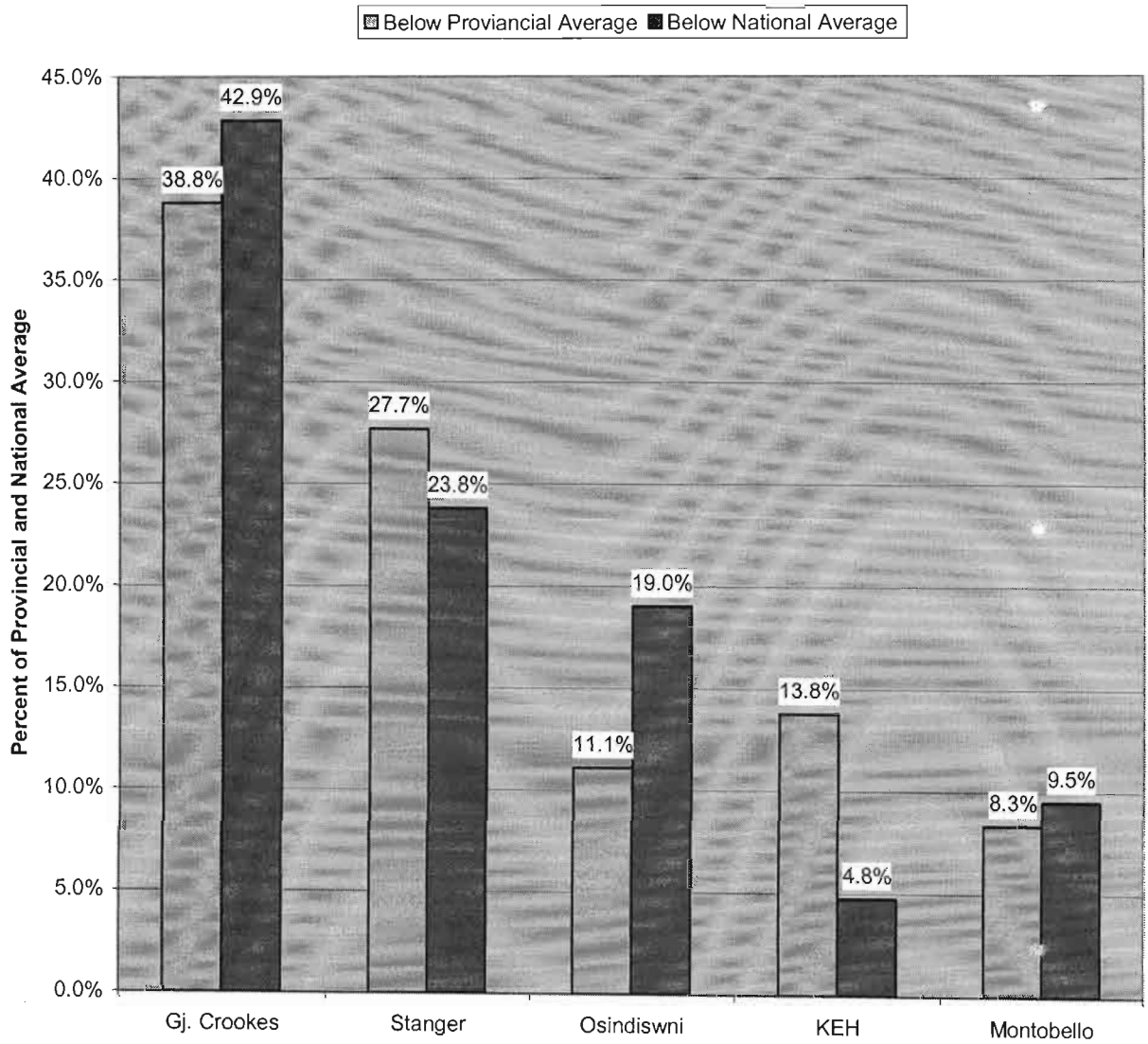
Figure 4.2.4 Percentage of Partogram Variables below Provincial and National Average in Hospitals in KZN Province, 2002.

4.3.1.5 Limpopo

Ninety-eight partograms were surveyed from five hospitals. The performance of each hospital using the 36 variables was compared with the provincial and national averages (Table 4.2.1).

Matikwane Hospital (rural: level 1) performed best with only I 7/36 variables below the provincial average and 7/36 below the national average. Mankweng Hospital (rural: level 1) 13/36 below provincial and 17/36 below the national average: Mapulaneng Hospital (rural: level 2) 14/36 (provincial), 16/36 (national) below average: Groothoek Hospital (semi-urban level 1) 14/36 (provincial), 19/36 (national) below average: CN Phatude Hospital (rural: level 1) 17/36 (provincial), 18/36 (national) below average. The total number of variables below provincial and national average was 65 and 77 respectively.

Table 4.2.5 Use of 36 Partogram Assessment Fields in Limpopo Province Hospitals Comparing Provincial and National Averages, 2002.

Hospitals	Mapulaneng N=19	Matikwane N=20	CN Phatude N=19	Groothoek N=22	Mankweng N=18	Limpopo (Average)	Provincial Decision Rule	National average	National Decision Rule
Admission assessment									
Check List Fields	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ANC Reviewed	8	18	1	0	5	36.9%	5	41.2%	6
Clinical History	19	19	19	18	16	96.9%	16	**87.7%**	15
CVS	4	7	0	2	2	19.4%	1	43.7%	6
Abdominal Exam	19	19	19	21	17	93.2%	16	87.8%	17
Vaginal Exam	16	19	19	21	17	96.1%	16	92.4%	18
Risk Factor Maternal	11	16	13	7	3	37.9%	5	47.7%	8
Risk Factor Foetal	3	17	14	7	4	37.9%	5	45.1%	6
Summary Diagnosis	9	19	11	11	10	67.0%	10	65.0%	11
Summary Management	14	19	12	11	12	66.2%	10	64.9%	11
Labour Graph									
Risk Factor Record	5	12	5	8	5	10.7%	1	26.0%	3
Duration of labour	1	0	0	2	0	30.1%	3	8.8%	1
Estimated Foetal Wt	2	0	0	1	1	3.9%	1	13.1%	1
Pelvic assessment	5	5	2	13	5	3.9%	1	10.5%	1
In the latent phase									
Foetal Heart	1	4	1	1	1	24.3%	2	17.5%	2
Cervical Dilatation	2	4	3	2	3	17.5%	2	14.5%	2
Maternal BP	1	0	2	0	0	31.1%	3	18.6%	2
Maternal Pulse	1	0	2	0	1	27.2%	3	15.8%	2
Maternal Temperature	1	1	1	0	0	29.0%	3	17.5%	2

	Map	Mat	CNP	Gro	Man	Lim	PDR	Nat	NDR
In the active phase									
Foetal Heart	8	11	14	13	8	54.4%	8	45.0%	6
Cervical Dilatation	11	13	14	13	12	60.2%	9	54.0%	9
Liquor	12	9	7	9	11	54.4%	8	55.0%	9
Moulding	12	11	7	9	11	68.0%	11	54.0%	9
Caput	12	11	6	9	16	54.4%	8	54.1%	9
Head	12	12	15	9	11	70.6%	11	54.0%	9
Contraction	12	11	14	15	10	68.0%	11	53.9%	9
BP	4	5	7	4	7	49.5%	7	50.5%	8
Pulse	2	5	5	3	5	48.5%	7	35.6%	4
Temperature Record	6	10	9	6	6	52.2%	7	43.5%	6
Urine output	5	7	9	6	7	43.7%	6	36.3%	4
IV fluid given	2	3	1	1	7	24.3%	2	36.8%	3
Not Indicated	8	11	13	11	7	40.8%	5	35.0%	4
Assessment of progress of the labour									
Vaginal Examination	2	9	6	0	4	55.3%	8	27.8%	3
Problem Identified	2	9	7	2	5	61.2%	9	32.8%	3
Plan of Management	2	8	5	2	5	52.4%	7	29.2%	3
Properly Managed	7	7	4	0	10	51.4%	7	45.2%	6
Final summary of labour									
Record completed	17	18	19	15	17	74.8%	12	84.9%	16
Total fields below Provincial Average	14	7	17	14	13	-	-	-	65
Total fields below National Average	16	7	18	19	17	-	-	-	77

Underlined – Below National Average

Bold – Below Provincial Average

Bold and underlined -- below both averages

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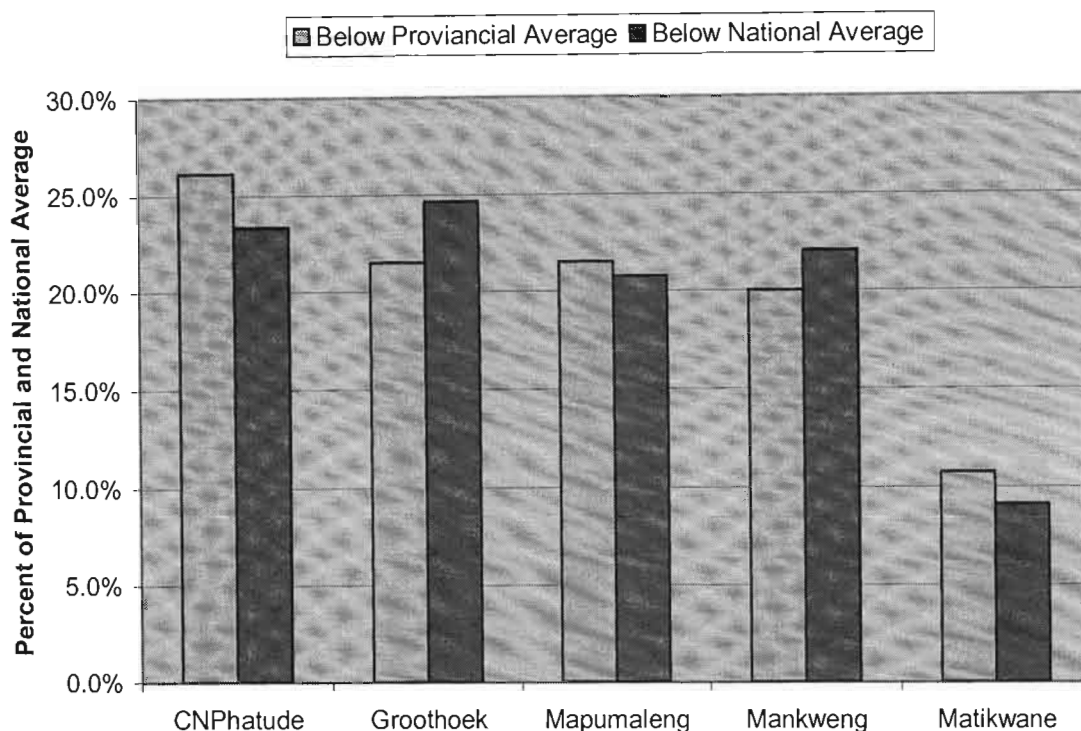
Figure 4.2.5 Percentage of Partogram Variables below Provincial and National Average in Hospitals in Limpopo Province, 2002.

4.3.1.6 Mpumalanga

One hundred and three partograms were surveyed from the five hospitals selected. The hospitals with the best result in a descending order are: Barberton Hospital (semi-urban: level 1) provincial 2/36, national 2/36: below average. Thembisa Hospital (semi-urban: level 2) provincial 5/36, national 7/36: Rob Ferreira Hospital (urban: level 2) provincial 8/36, national 10/36: Sabie Hospital (rural: level 1) provincial 11/36, national 12/36: and Lydenburg Hospital (rural: level 1) provincial 14/36, national 14/36. The over-all score of below average of the five hospitals of the province was 40 below the provincial average and 45 below national average.

Table 4.2.6 Use of 36 Partogram Assessment Fields in Mpumalanga Province Hospitals Comparing Provincial and National Averages, 2002.

Hospitals	Barberton n=19	Rob Ferreira N=19	Themba N=20	Lydenburg N=21	Sabie N=22	Mpumalanga (average)	Provincial Decision Rule	National average	National Decision Rule
Admission assessment									
Check List Field	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	Yes
ANC Reviewed	11	12	11	2	2	36.9%	5	41.2%	6
Clinical History	19	18	19	10	6	96.9%	16	**87.7%**	15
CVS	7	4	13	7	2	19.4%	1	43.7%	6
Abdominal Exam	19	17	19	20	21	93.2%	16	87.8%	17
Vaginal Exam	19	18	20	21	21	96.1%	16	92.4%	18
Risk Factor Maternal	13	12	8	2	4	37.9%	5	47.7%	8
Risk Factor Foetal	13	12	8	2	4	37.9%	5	45.1%	6
Summary Diagnosis	17	17	19	12	1	67.0%	10	65.0%	11
Summary Management	18	17	18	11	1	66.2%	10	64.9%	11
Labour Graph									
Risk Factor Record	2	0	18	1	5	10.7%	1	26.0%	3
Duration of labour	2	1	0	12	3	30.1%	3	8.8%	1
Estimated Foetal Wt	1	1	1	0	1	3.9%	1	13.1%	1
Pelvic assessment	1	1	1	0	1	3.9%	1	10.5%	1
In the latent phase									
Foetal Heart	8	1	5	7	2	24.3%	2	17.5%	2
Cervical Dilatation	4	1	4	5	2	17.5%	2	14.5%	2
Maternal BP	8	1	5	10	6	31.1%	3	18.6%	2
Maternal Pulse	7	1	5	10	5	27.2%	3	15.8%	2
Maternal Temperature	8	2	5	6	5	29.0%	3	17.5%	2
In the active phase									
Foetal Heart	15	13	10	5	10	54.4%	8	45.0%	6
Cervical Dilatation	17	12	10	10	12	60.2%	9	54.0%	9
Liquor	18	16	8	13	15	54.4%	8	55.0%	9
Moulding	18	16	8	11	15	68.0%	11	54.0%	9
Caput	18	15	8	12	15	54.4%	8	54.1%	9
Head	15	10	9	7	14	70.6%	11	54.0%	9
Contraction	19	12	10	10	13	68.0%	11	53.9%	9
BP	17	12	10	4	5	49.5%	7	50.5%	8
Pulse	15	14	10	4	6	48.5%	7	35.6%	4
Temperature Record	17	15	10	4	6	52.2%	7	43.5%	6
Urine output	12	15	9	3	6	43.7%	6	36.3%	4
IV fluid given	8	2	1	4	9	24.3%	2	36.8%	3
Not Indicated	10	8	8	10	5	40.8%	5	35.0%	4
Assessment of progress of the labour									
Vaginal Exam	12	15	11	10	9	55.3%	8	27.8%	3

	Bar	Rob	The	Lyd	Sab	Mpu	PDR	Nat	NDR
Problem Identified	15	13	11	13	10	61.2%	9	32.8%	3
Plan of Management	15	10	10	12	6	52.4%	7	29.2%	3
Properly Managed	15	10	7	11	9	51.4%	7	45.2%	6
Final summary of labour									
Record completed	17	17	19	18	4	74.8%	12	84.9%	16
Total fields below Provincial Average	2	8	5	14	11	-	-	-	40
Total fields below National Average	2	10	7	14	12	-	-	-	45

Underlined – Below National Average

Bold – Below Provincial Average

Bold and underlined -- below both averages

Figure 4.2.6 Use of 36 Partogram Assessment Fields in Mpumalanga Province Hospitals Comparing Provincial and National Averages, 2002.

4.3.1.7 North West

A total of 101 partograms were surveyed from the 5 hospitals selected. The hospitals are categorised according to scores below provincial and national averages. The findings putting the best first were: George Stegmann Hospital (rural: level 1) provincial 0/36,

national 3/36 variables below average: ODI Hospital (semi urban: level 1) provincial 3/36, national 6/36: Mafikeng Hospital (urban: level 2) provincial 5/36, national 10/36: Rustenburg Hospital (urban: level 1) provincial 8/36, national 9/36 and lastly Brits Hospital (semi urban: level 1) provincial 13/36, national 18/36. The total number below the provincial and national averages was 29 and 46 respectively.

Table 4.2.7   Use of 36 Partogram Assessment Fields in North West Province Hospitals Comparing Provincial and National Averages, 2002.

Hospitals	Brits N=20	Odi N=22	George Stegmann N=22	Rustenburg N=19	Mafikeng N=18	North West (Average)	Provincial Decision Rule	National average	National Decision Rule
Admission assessment									
Check Lists Fields	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ANC Reviewed	3	9	5	2	1	19.8%	1	41.2%	6
Clinical History	17	19	20	17	13	85.1%	14	87.7%	15
CVS	5	11	13	1	9	41.6%	5	43.7%	6
Abdominal Exam	15	18	20	19	13	84.2%	14	87.8%	17
Vaginal Exam	17	20	21	19	16	92.1%	15	92.4%	18
Risk Factor Maternal	6	14	9	8	7	43.6%	6	47.7%	8
Risk Factor Foetal	6	14	9	8	6	42.6%	6	45.1%	6
Summary Diagnosis	5	10	10	15	8	47.0%	7	65.0%	11
Summary Management	5	9	10	15	8	46.0%	6	64.9%	11
Labour Graph									
Risk Factor Record	2	4	3	0	3	12.0%	1	26.0%	3
Duration of labour	8	11	14	0	2	33.3%	4	8.8%	1
Estimated Foetal Wt	2	7	16	0	8	27.7%	3	13.1%	1
Pelvic assessment	0	10	18	0	1	18.8%	1	10.5%	1
In the latent phase									
Foetal Heart	3	4	5	6	1	20.8%	1	17.5%	2
Cervical Dilatation	3	4	6	6	2	20.8%	1	14.5%	2
Maternal BP	3	3	4	6	2	17.8%	1	18.6%	2
Maternal Pulse	3	2	3	6	2	15.8%	1	15.8%	2
Maternal Temperature	2	2	3	7	2	16.8%	1	17.5%	2
In the active phase									
Foetal Heart	7	17	18	4	13	58.4%	9	45.0%	6
Cervical Dilatation	8	14	12	17	13	63.4%	10	54.0%	9
Liquor	15	16	21	18	12	72.3%	11	55.0%	9
Moulding	15	16	21	18	13	82.2%	13	54.0%	9
Caput	15	16	21	18	13	72.3%	12	54.1%	9
Head	11	14	17	18	13	81.2%	13	54.0%	9
Contraction	10	17	19	11	13	82.2%	13	53.9%	9
BP	12	16	20	11	12	70.3%	11	50.5%	8
Pulse	4	8	12	8	12	41.6%	5	35.6%	4

	Bri	Odi	Geo	Rus	Maf	NW	PDR	Nat	NDR
Temperature Record	6	14	17	14	14	64.4%	10	43.5%	6
Urine output	4	15	13	14	13	58.4%	9	36.3%	4
IV fluid given	3	7	16	6	6	27.7%	3	36.8%	3
Not Indicated	11	8	6	9	5	38.6%	5	35.0%	4
Assessment of progress of the labour									
Vaginal Exam	1	1	9	8	0	19.8%	1	27.8%	3
Problem Identified	2	1	11	10	2	25.7%	2	32.8%	3
Plan of Management	2	1	10	7	2	21.8%	1	29.2%	3
Properly Managed	2	4	10	4	12	36.6%	5	45.2%	6
Final summary of labour									
Record completed	18	17	20	18	16	88.1%	15	84.9%	16
Total fields below Provincial average	13	3	0	8	5	-	-	-	29
Total fields below National average	18	6	3	9	10	-	-	-	46

Underlined – Below National Average

Bold – Below Provincial Average

Bold and underlined -- below both averages
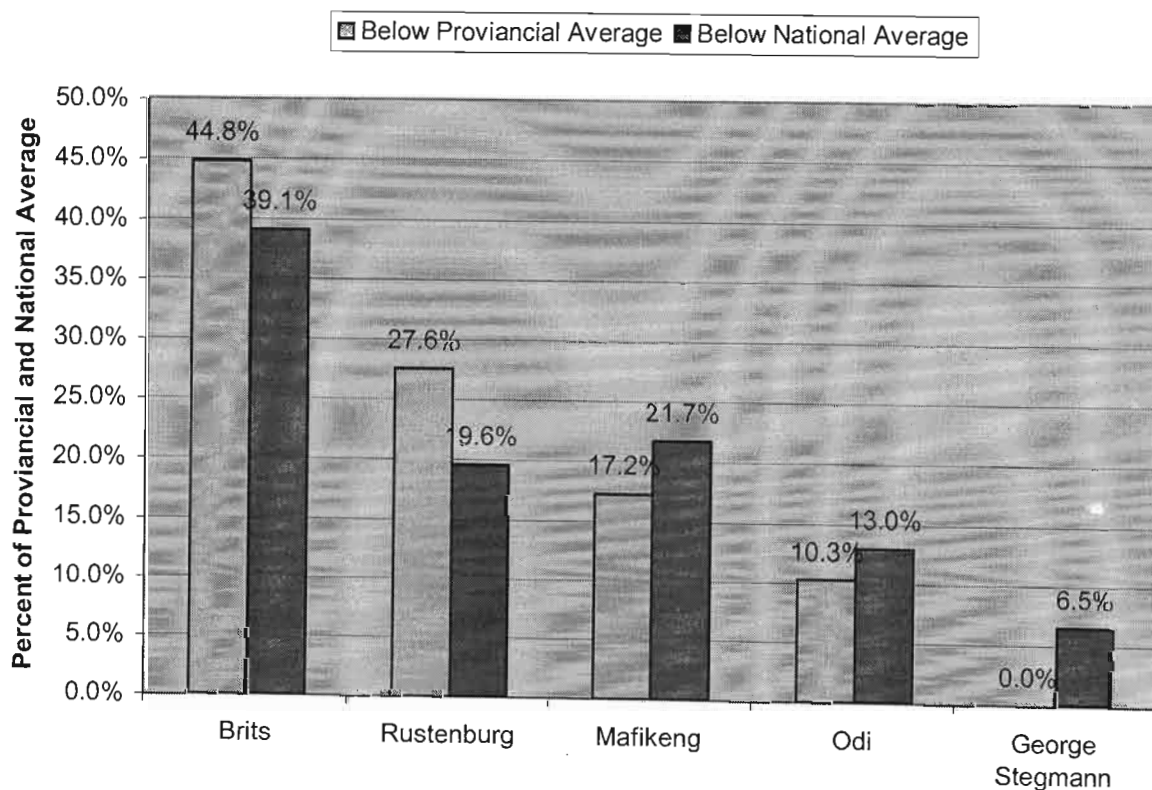
Figure 4.2.7 Use of 36 Partogram Assessment Fields in North West Province Hospitals Comparing Provincial and National Averages, 2002.

4.3.1.8 Northern Cape

One hundred and twenty five partograms were surveyed from the six hospitals selected. The hospitals scoring below provincial and national average are categorised in descending order i.e. best results first: Postmasburg Hospital (semi urban: level 1) 0/36 (provincial), 3/36 (national) below average; Kimberley Hospital (urban: level 2) 2/36 (provincial), 5/36 (national) below average; Kuruman Hospital (semi urban: level 1) 6/36 (provincial), 7/36 (national) below average; Gordonia Hospital (urban: level 2) 8/36 (provincial), 9/36 (national) below average; Kakamas Hospital (semi urban: level 1) 9/36 (provincial), 14/36 (national) below average; De Aar Hospital (rural level 1) 9/36 (provincial), 17/36 (national) below average.

The total numbers below the provincial and national averages are 37 and 54 respectively.

Table 4.2.8 Use of 36 Partogram Assessment Fields in Northern Cape Province Hospitals Comparing Provincial and National Averages, 2002.

Hospitals	Kuruman N=20	Postmasburg N=26	Kakamas N=22	Gordonia N=23	De Aar N=16	Kimberly N=19	Northern Cape (Average)	Provincial Decision Rule	National average	National Decision Rule
Admission assessment										
Check Lists Fields	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ANC Reviewed	6	9	6	6	8	9	26.4%	2	41.2%	6
Clinical History	18	23	16	21	16	19	55.2%	8	55.4%	9
CVS	4	21	9	14	12	12	57.6%	9	43.7%	6
Abdominal Exam	19	24	18	21	15	19	76.0%	13	87.8%	17
Vaginal Exam	19	25	20	23	15	19	81.6%	14	92.4%	18
Risk Factor Maternal	9	8	9	2	9	5	29.6%	3	47.7%	8
Risk Factor Foetal	9	5	9	2	9	5	27.2%	3	45.1%	6
Summary Diagnosis	6	20	11	14	7	10	54.0%	8	65.0%	11
Summary Management	6	20	9	14	8	10	52.8%	8	64.9%	11
Labour Graph										
Risk Factor Record	2	6	5	8	4	6	24.0%	2	26.0%	3
Duration of labour	1	8	0	2	2	3	10.4%	1	8.8%	1
Estimated Foetal Weight	5	2	1	4	3	2	15.2%	2	13.1%	1
Pelvic assessment	7	12	3	12	5	6	4.0%	1	10.5%	1
In the latent phase										
Foetal Heart	5	4	5	3	3	9	23.2%	2	17.5%	2
Cervical Dilatation	5	4	5	3	3	8	23.2%	2	14.5%	2
Maternal BP	5	4	3	3	6	11	25.6%	2	18.6%	2
Maternal Pulse	4	3	3	3	6	11	24.0%	2	15.8%	2
Maternal Temperature	6	4	2	3	6	9	24.0%	2	17.5%	2

	Kur	Pos	Kak	Gor	DeA	Kim	NC	PDR	Nat	NDR
In the active phase										
Foetal Heart	10	8	**2**	**2**	**4**	9	28.0%	3	45.0%	6
Cervical Dilatation	16	16	**6**	**8**	**5**	12	58.4%	9	54.0%	9
Liquor	12	14	**6**	10	9	15	22.4%	2	55.0%	9
Moulding	12	14	**5**	9	8	13	49.6%	7	54.0%	9
Caput	13	14	5	9	8	13	22.5%	2	54.1%	9
Head	**2**	12	**5**	**5**	**2**	1	52.8%	8	54.0%	9
Contraction	14	15	**4**	**4**	**5**	15	48.8%	7	53.9%	9
BP	9	16	9	**6**	7	15	49.6%	7	50.5%	8
Pulse	**1**	4	3	1	6	10	20.0%	2	35.6%	4
Temperature Record	11	12	7	9	5	8	41.6%	5	43.5%	6
Urine output	6	10	8	7	5	12	38.4%	5	36.3%	4
IV fluid given	4	4	**0**	4	**0**	6	14.4%	1	36.8%	3
Not Indicated	13	9	7	7	9	6	40.8%	5	35.0%	4
Assessment of progress of the labour										
Vaginal Exam	4	7	2	2	**0**	10	20.8%	1	27.8%	3
Problem Identified	4	10	3	3	3	10	26.4%	2	32.8%	3
Plan of Management	4	6	2	3	2	12	23.2%	2	29.2%	3
Properly Managed	8	9	4	6	**2**	8	29.6%	3	45.2%	6
Final summary of labour										
Record completed	**11**	13	19	22	**11**	**13**	71.2%	12	84.9%	16
Total fields below Provincial average	6	0	9	8	9	2	-	-	-	34
Total fields below National average	7	2	14	9	17	5	-	-	-	54

Underlined – Below National Average

Bold – Below Provincial Average
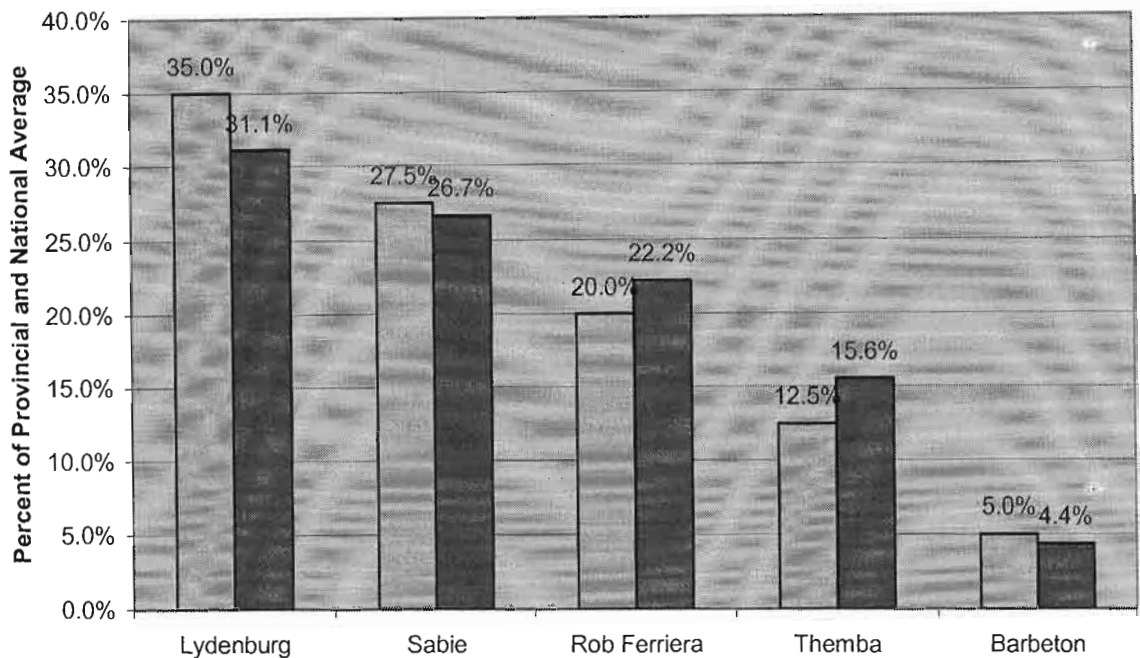
Bold and underlined -- below both averages

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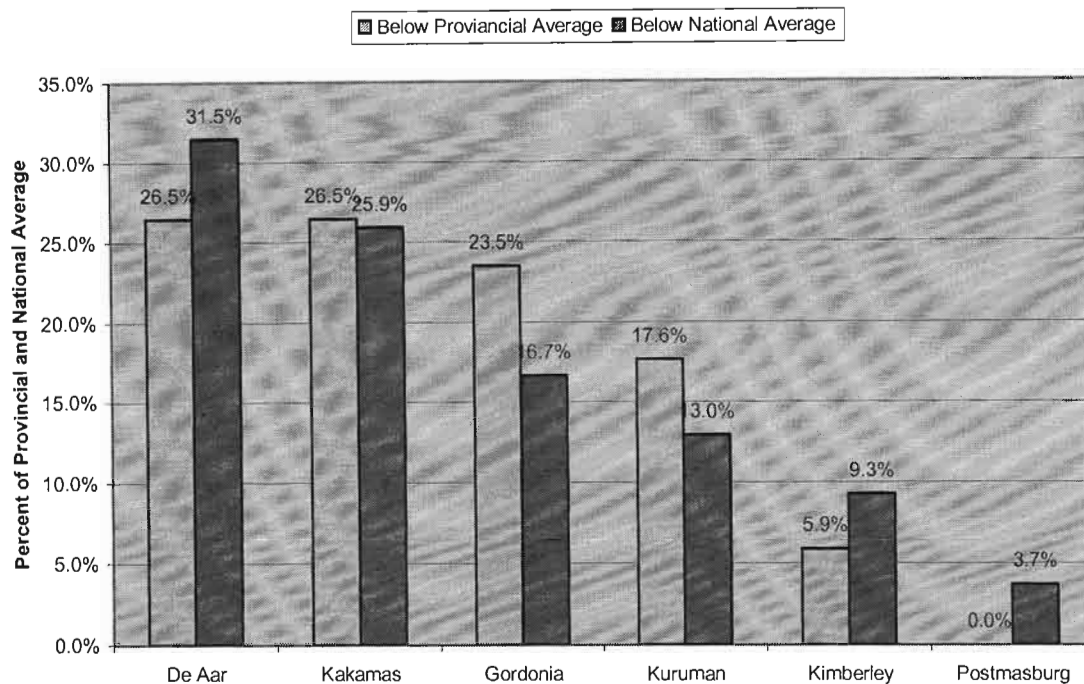
Figure 4.2.8 Use of 36 Partogram Assessment Fields in Northern Cape Province Hospitals Comparing Provincial and National Averages, 2002.

4.3.1.9 Western Cape

One hundred and five partograms were surveyed from the five hospitals selected. The hospitals scoring below provincial and national averages are categorised in descending order i.e. best results first. The findings were: Paarl Hospital (urban: level 2) provincial 2/36, national 2/36: Tygerberg Hospital (urban: level 3) provincial 3/36, national 4/36: George Hospital (semi-urban: level 2) provincial 4/36, national 3/36: Mowbray Hospital (urban: level 2) provincial 12/36, national 14/36: Ceres Hospital (rural: level 1) provincial 18/36, national 18/36 below the provincial and national averages respectively.

The overall scores below the provincial and national averages were 39 and 43 respectively.

Table 4.2.9 Use of 36 Partogram Assessment Fields in Western Cape Province

Hospitals Comparing Provincial and National Averages, 2002.

Hospitals	Paarl N=21	Mowbray N=20	Ceres N=22	Tygerberg N=20	George N=21	Western Cape (Average)	Provincial Decision Rule	National average	National Decision Rule
				Admission assessment					
Check Lists Fields	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ANC Reviewed	5	16	17	18	13	76.2%	13	41.2%	6
Clinical History	21	20	21	20	20	96.2%	18	87.7%	15
CVS	17	11	5	20	17	67.6%	12	43.7%	6
Abdominal Exam	21	18	18	20	21	93.3%	18	87.8%	17
Vaginal Exam	19	19	22	19	21	95.2%	18	92.4%	18
Risk Factor Maternal	12	13	8	15	5	50.5%	8	47.7%	8
Risk Factor Foetal	12	12	8	14	5	39.0%	6	45.1%	6
Summary Diagnosis	18	18	11	20	17	80.0%	14	65.0%	11
Summary Management	19	18	11	20	16	80.0%	14	64.9%	11
				Labour Graph					
Risk Factor Record	8	6	5	12	7	40.9%	5	26.0%	3
Duration of labour	2	7	0	2	0	4.8%	1	8.8%	1
Estimated Foetal Wt	1	0	0	0	0	1.0%	1	13.1%	1
Pelvic assessment	0	0	0	0	0	0.0%	0	10.5%	1
				In the latent phase					
Foetal Heart	5	4	2	13	4	26.7%	3	17.5%	2
Cervical Dilatation	6	1	0	4	4	14.3%	1	14.5%	2
Maternal BP	10	3	3	15	5	34.3%	4	18.6%	2
Maternal Pulse	9	3	2	15	4	22.9%	2	15.8%	2
Maternal Temperature	7	4	3	6	4	32.4%	4	17.5%	2
				In the active phase					
Foetal Heart		7	6	9	14	48.8%	8	45.0%	6
Cervical Dilatation	9	3	2	5	13	30.5%	3	54.0%	9
Liquor	12	4	11	12	16	53.0%	9	55.0%	9
Moulding	13	2	10	14	14	50.5%	8	54.0%	9
Caput	13	2	10	15	14	53.0%	9	54.1%	9
Head	14	5	11	13	13	52.4%	9	54.0%	9
Contraction	14	7	9	12	17	50.5%	8	53.9%	9
BP	13	11	7	12	14	56.2%	10	50.5%	8
Pulse	13	9	6	12	11	50.5%	8	35.6%	4
Temperature Record	9	6	9	3	8	37.0%	5	43.5%	6
Urine output	9	3	9	10	8	37.1%	5	36.3%	4
IV fluid given	12	8	2	8	7	35.2%	4	36.8%	3
Not Indicated	4	0	8	5	4	20.0%	1	35.0%	4

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	Paa	Mow	Cer	Tyg	Geo	WC	PDR	Nat	NDR
Assessment of progress of the labour									
Vaginal Exam	11	9	1	4	4	26.7%	3	27.8%	3
Problem Identified	12	7	3	6	7	33.3%	4	32.8%	3
Plan of Management	6	8	3	7	7	29.5%	3	29.2%	3
Properly Managed	15	6	3	11	14	46.7%	6	45.2%	6
Final summary of labour									
Record completed	18	20	21	19	21	94.3%	18	84.9%	16
Total fields below Provincial average	2	12	18	3	4	-	-	-	39
Total fields below National average	2	14	18	4	5	-	-	-	43

Comparison of hospitals Using PDR and NDR
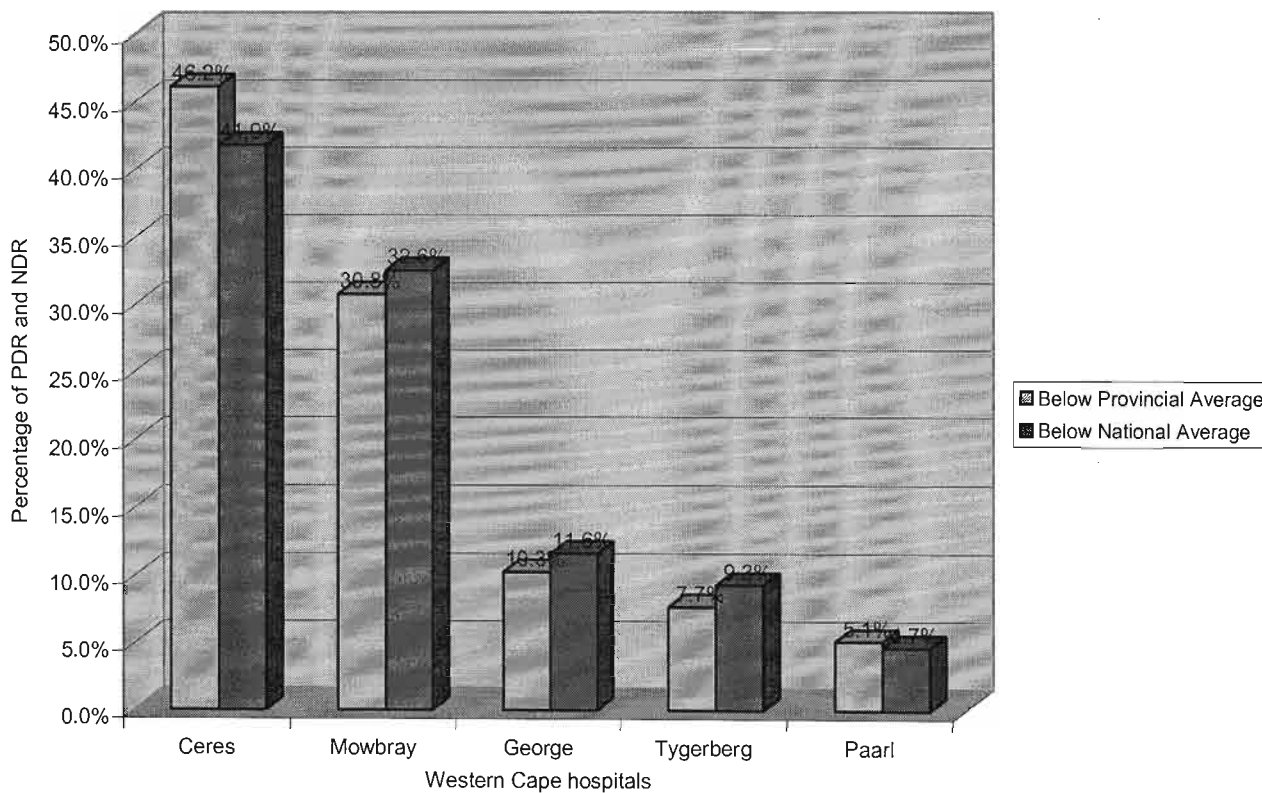
Figure 4.2.9 Use of 36 Partogram Assessment Fields in Western Cape Province Hospitals Comparing Provincial and National Averages, 2002.

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4.4 Rural-urban divide

Hospitals were categorised into rural, semi-urban and urban (see chapter 3 methodology).

4.4.1 Findings from rural hospitals

Thirteen hospitals were categorised as rural. Of the 267 partograms surveyed from these hospitals. In ascending order the rural hospitals with the number of fields below the national average are: Montebello Hospital (level 1 in KZN) 2/36; George Stegmann Hospital (level 1 in Limpopo) 3/36; Matikwane (level 1 in Limpopo) 7/36; With Thafalofefe (level 1 in Eastern Cape) being the worst with 20/36 fields of the partogram checklist below the national average.

Comparison based on the phases of progress of labour was also made and the findings were:

4.4.1.1 Admission assessment

Based on the checklists the recording for admission assessment for all the 13 rural hospitals, 5 hospitals have below national average for the variables of a summary with a decision on diagnosis and management.

4.4.1.2 Labour graph

For the recording of these variables 7 out of 13 rural hospitals scored below the national average for the recording of duration of labour, Rupture of membrane, and recording of estimation of foetal weight and three hospitals for the variable pelvic assessment.

4.4.1.3 Latent phase

Four hospitals scored below national average for maternal pulse and maternal temperature.

4.4.1.4 Active phase

Eight rural hospitals scored below national average for the variable of recording of BP. Four hospitals scored below average on four variables - recording of liquor, moulding, caput and IV fluid given.

4.4.1.5 Assessment of progress of labour (Active phase)

For the recording in this phase of labour four hospitals scored below average for vaginal examination and proper management.

4.4.1.6 Final summary of labour

For the final variable three hospitals scored below the national average.

4.4.1 Use of 36 Partogram Assessment Fields in rural Hospitals Comparing Provincial and National Averages, 2002

Hospitals	Bisho n=21	Thafalofefe n=19	Lydenburg N=21	Sabie N=22	Matikwane N=20	CN Phatude N=19	De Aar N=16	Clocolan N=25	Ceres N=22	Montebello N=21	Mapulaneng N=19	Mankweng N=18	George Stegmann N=22	National average	No. of hospitals below
Admission assessment															
Checklist fields	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ANC reviewed	8	3	2	2	18	1	8	6	17	11	8	5	5	6	4
Clinical history	12	18	10	6	19	19	16	22	21	21	19	16	20	9	1
CVS	17	1	7	2	7	0	12	12	5	7	4	2	13	6	4
Abdominal Exam	14	18	20	21	19	19	15	24	18	21	19	17	20	17	2
Vaginal Exam	13	18	21	21	19	19	15	25	22	21	16	17	21	18	2
Risk factor Maternal	12	14	2	4	16	13	9	8	8	18	11	3	9	8	2
Risk factor Foetal	12	14	2	4	17	14	9	8	8	17	3	4	9	6	2
Summary diagnosis	6	3	12	1	19	11	7	8	11	20	9	10	10	11	5
Summary Management	5	1	11	1	19	12	8	8	11	19	14	12	10	11	5
Labour graph															
Risk factors recorded	6	6	1	5	12	5	4	7	5	14	5	5	3	3	1
Duration of labour	0	0	12	3	0	0	2	1	0	0	1	0	14	1	7
Estimated foetal weight	0	0	0	1	0	0	3	1	0	0	2	1	16	1	7
Pelvic assessment	0	1	0	1	5	2	5	7	0	1	5	5	18	1	3
In the latent phase															
Foetal heart	0	0	7	2	4	1	3	2	2	2	1	1	5	2	3
Cervical dilatation	0	0	5	2	4	3	3	2	0	2	2	3	6	2	2
Maternal BP	0	0	10	6	0	2	6	2	3	2	1	0	4	2	3
Maternal pulse	0	0	10	5	0	2	6	2	2	2	1	1	3	2	4
Maternal temperature	2	1	6	5	1	1	6	1	3	2	1	0	3	2	4
In the active phase															

	Bis	Tha	Lyd	Sab	Mat	CNP	DeA	Clo	Cer	Mon	Map	Man	GSt	Nat	No.
Foetal heart	8	13	5	10	11	14	4	14	6	13	8	8	18	6	2
Cervical dilatation	10	14	10	12	13	14	5	12	2	17	11	12	12	9	2
Liquor	6	7	13	15	9	7	9	8	11	14	12	11	21	9	4
Moulding	6	4	11	15	11	7	8	9	10	13	12	11	21	9	4
Caput	6	5	12	15	11	6	8	9	10	13	12	16	21	9	4
Level of head	8	17	7	14	12	15	2	14	11	14	12	11	17	9	1
Contractions	10	16	10	13	11	14	5	18	9	17	12	10	19	9	1
BP	7	7	4	5	5	7	7	19	7	16	4	7	20	8	8
Pulse	0	0	4	6	5	5	6	16	6	9	2	5	12	4	2
Temp record	6	6	4	6	10	9	5	11	9	16	6	6	17	6	2
Urine output	7	4	3	6	7	9	5	4	9	5	5	7	13	4	3
IV fluid given	4	1	4	9	3	1	0	5	2	15	2	7	16	3	4
IV fluid not indicated	6	14	10	5	11	13	9	13	8	4	8	7	6	4	0
Assessment of progress of the labour															
Vaginal examination	6	0	10	9	9	6	0	0	1	5	2	4	9	3	4
Problem Identification	5	2	13	10	9	7	3	0	3	7	2	5	11	3	0
Plan of Management	4	1	12	6	8	5	2	0	3	7	2	5	10	3	3
Proper Management	6	3	11	9	7	4	2	17	3	16	7	10	10	6	4
Final summary of labour															
Record Completed	11	17	18	4	18	19	11	22	21	21	17	17	20	16	3
Total fields below national average	19	22	14	12	7	18	17	10	18	2	16	17	3	175	

4.4.2 Findings from Semi urban hospitals

Two hundred eighty (280) partograms were examined from 13 semi-urban hospitals Barberton Hospital (level 1 Mpumalanga province) and Yusuf Dadoo Hospital (level 1 Gauteng province) had one variable below the national average. Groothoek Hospital (level 1) and Thembisa Hospital (level 2 Gauteng province) had 15/36 variables below average. (Table 4.4.2)

Finding of semi-urban hospitals according to the proper recording and use of partogram during phases of labour

4.4.2.1 Admission assessment

From the 13 semi-urban hospitals 4 scored below the average of national average value for ANC review, CVS recording and maternal risk factor recording.

4.4.2.2 Labour Graph

In this phase, four hospitals scored below national average for risk factor recording and pelvic assessment.

4.4.2.3 Latent phase

In this phase of labour three hospitals scored below average for maternal temperature.

4.4.2.4 Active phase

In this phase of labour 4 hospitals of the semi urban group scored below average for cervical dilatation, Pulse, IV fluid given, and IV fluid no indicated.

4.4.2.5 Assessment of progress of labour

In this phase of labour five hospitals recorded below national average for plan of management and four hospitals for the rest three variables of this phase. (Table 4.4.2)

4.4.2.6 Final summary of labour

In this part of the checklist, four hospitals scored below national average for this last variable.

4.4.2.7 Summary

Even though most semi urban hospitals scored above the national average, from the 13 semi-urban hospitals five hospitals scored below the national average for one variable and four hospitals for 17 variables (Table 4.4.2)

Table 4.4.2 Use of 36 Partogram Assessment Fields in Semi-urban Hospitals Comparing Provincial and National Averages, 2002.

Hospitals	Barberton n=19	Groothoek N=22	Brits N=20	Odi N=22	Kuruman N=20	Postmasburg N=26	Kakamas N=22	Yusuf Dadoo N=24	Botshabelo N=21	GJ Crookes N=21	Themba N=20	Thembisa N=22	George N=21	National average	No. of hospitals below
Admission assessment															
Check Lists Fields	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	**Yes**	
ANC reviewed	11	0	3	9	6	9	6	7	3	16	11	2	13	6	4
Clinical history	19	18	17	19	18	23	16	18	21	20	19	19	20	9	0
CVS	7	2	5	11	4	21	9	6	4	7	13	10	17	6	4
Abdominal Exam	19	21	15	18	19	24	18	16	21	20	19	20	21	17	0
Vaginal Exam	19	21	17	20	19	25	20	21	21	20	20	21	21	18	0
Risk factor Maternal	13	7	6	14	9	8	9	11	13	16	8	5	5	8	4
Risk factor Foetal	13	7	6	14	9	5	9	11	13	16	8	5	5	6	3
Summary diagnosis	17	11	5	10	6	20	11	18	19	18	19	8	17	11	1
Summary Management	18	11	5	9	6	20	9	18	18	18	18	8	16	11	2
Labour graph															
Risk factors recorded	2	8	2	4	2	6	5	6	8	6	18	0	7	3	4
Duration of labour	2	2	8	11	1	8	0	5	1	8	0	3	0	1	3

	Bar	Gro	Bri	Odi	Kur	Pos	Kak	YDa	Bot	CJC	The	The	Geo	Nat	N
Estimated foetal wt	1	1	2	7	5	2	1	0	5	1	1	0	0	1	3
Pelvic assessment	1	13	0	10	7	12	3	0	13	0	1	0	0	1	4
In the latent phase															
Foetal heart	8	1	3	4	5	4	5	4	4	0	5	5	4	2	2
Cervical dilatation	4	2	3	4	5	4	5	4	3	0	4	3	4	2	1
Maternal BP	8	0	3	3	5	4	3	4	3	0	5	5	5	2	2
Maternal pulse	7	0	3	2	4	3	3	4	2	0	5	4	4	2	2
Maternal temperature	8	0	2	2	6	4	2	5	2	0	5	1	4	2	3
In the active phase															
Foetal heart	15	13	7	17	10	8	2	6	4	15	10	1	14	6	2
Cervical dilatation	17	13	8	14	16	16	6	8	6	16	10	5	13	9	4
Liquor	18	9	15	16	12	14	6	9	8	12	8	11	16	9	3
Moulding	18	9	15	16	12	14	5	9	9	12	8	11	14	9	2
Caput	18	9	15	16	13	14	5	9	9	12	8	11	14	9	2
Level of head	15	9	11	14	2	12	5	10	7	18	9	11	13	9	3
Contractions	19	15	10	17	14	15	4	9	13	15	10	9	17	9	1
BP	17	4	12	16	9	16	9	10	14	8	10	5	14	8	2
Pulse	15	3	4	8	1	4	3	10	14	3	10	5	11	4	4
Temp record	17	6	6	14	11	12	7	11	13	2	10	3	8	6	2
Urine output	12	6	4	15	6	10	8	4	11	1	9	3	8	4	2
IV fluid given	8	1	3	7	4	4	0	6	12	3	1	1	7	3	4
IV fluid not indicated	10	11	11	8	13	9	7	5	2	9	8	9	4	4	4

	Bar	Gro	Bri	Odi	Kur	Pos	Kak	YDa	Bot	CJC	The	The	Geo	Nat	N
Assessment of progress of the labour															
Vaginal examination	12	0	1	1	4	7	2	4	7	5	11	3	4	3	4
Problem Identification	15	2	2	1	4	10	3	6	8	8	11	3	7	3	4
Plan of Management	15	2	2	1	4	6	2	7	8	6	10	2	7	3	5
Proper Management	15	0	2	4	8	9	4	8	11	13	7	9	14	6	4
Final summary of labour															
Record Completed	17	15	18	17	11	13	19	24	17	19	19	15	21	16	4
Total fields below average national value	2	19	18	6	7	2	14	4	8	9	7	18	5	119	

4.4.3. Findings from urban hospitals

Three hundred and ninety four (394) partograms were surveyed from 20 urban hospitals. Of these hospitals, Butterworth (level 2 in Eastern Cape) scored 23/36 below national average. The urban hospitals with the best scores were Osindisweni (level 3 in KZN) 1/36 closely followed by National (level 1in Free State) and Paarl (level 2 in Western Cape), each of which scored 2/36 below the national average. (Table 4.4.3)

4.4.3.1 Admission assessment

From the 20 urban hospitals, 7 hospitals scored below the national value for one variable the recording of maternal risk factor, five hospitals for review of ANC and foetal risk factor recording and four hospitals for the recording of summary of decision of diagnosis. (Table 4.4.3)

4.4.3.2 Labour graph

Eight of the urban hospitals scored below average for the recording of pelvic assessment, seven hospitals for the recording of risk factor at the top of the labour graph, and estimation of foetal weight and three hospitals for the duration of labour and Rupture of membrane.

4.4.3.3 Latent phase

Six urban hospitals scored below national average for the recording of cervical dilatation every four hours and three hospitals for the recording of maternal pulse.

4.4.3.4 Active phase

In this phase eight hospitals scored below national average for the recording of cervical dilatation every two hours, seven hospitals for recording of level of head, five hospitals for moulding, contraction, pulse, IV fluid given and IV fluid not indicated. Four hospitals scored below the national average for foetal heart, caput, BP, temperature recording and urine out put.

4.4.3.5 Assessment of progress of labour

In this phase, four hospitals scored below the national value for the recording of vaginal examination and three hospitals for problem identification and proper management.

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4.4.3.6 Final summary of labour

Four urban hospitals scored below national average for this variable the completion of the form.

4.4.4 Summary

In conclusion from the 20 urban hospitals 8 hospitals scored below the national average for two variables (pelvic assessment and cervical dilatation), seven hospitals scored below national average for four variables (maternal risk factor recording, risk factor recording at the labour graph, EFW, and recording of level of head), six hospitals scored below the national average for one variable (cervical dilatation in the latent phase), five hospitals scored below the national average for six variables and four hospitals for eight variables scored below the national average. Of the entire recording on the partogram pelvic assessment and the recording of the cervical dilatation every two hours were the least recorded with eight hospitals scoring below national average.

Table 4.4.3   Use of 36 Partogram Assessment Fields in urban Hospitals Comparing Provincial and National Averages, 2002.

Hospitals	Rustenburg N=19	National N=21	Butterworth n=20	Rob Ferreira N=19	Mafikeng N=18	Gordonia N=23	Kimberley N=19	Natalspruit N=21	Coronation N=21	Pelonomi N=18	Paarl N=21	Mowbray N=20	Stanger N=19	Osindisweni N=21	CMH n=19	Frere n=19	Johannesburg N=18	Universitas N=17	Tygerberg N=20	KEH N=21	National average	Below Average
Admission assessment																						
Check Lists Fields	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ANC reviewed	2	9	2	12	1	6	9	16	12	9	5	16	4	12	15	15	8	11	18	13	6	5
Clinical history	17	21	11	18	13	21	19	18	20	18	21	20	16	17	16	19	18	17	20	20	9	1
CVS	1	19	16	4	9	14	12	8	13	13	17	11	11	18	16	15	6	17	20	19	6	2
Abdominal Examination	19	21	18	17	13	21	19	17	18	16	21	18	17	19	17	19	18	17	20	21	17	2
Vaginal Exam	19	21	19	18	16	23	19	17	20	18	19	19	19	18	19	19	18	16	19	21	18	3
Risk factor Maternal	8	8	15	12	7	2	5	13	10	6	12	13	6	5	16	16	5	16	15	11	8	7
Risk factor Foetal	8	9	14	12	6	2	5	11	10	5	12	12	7	5	16	15	5	16	14	10	6	5
Summary of diagnosis	15	5	3	17	8	14	10	18	18	14	18	18	15	19	10	16	17	16	20	21	11	4
Summary of Management	15	15	3	17	8	14	10	19	18	14	19	18	15	20	8	16	17	16	20	21	11	3
Labour graph																						
Risk factors recorded	0	11	6	0	3	8	6	1	0	6	8	6	10	9	2	2	2	13	12	4	3	7
Duration of labour	0	4	0	1	2	2	3	0	6	1	2	7	6	3	1	4	2	7	2	4	1	3
Estimated foetal wt	0	2	0	1	8	4	2	0	3	3	1	0	2	0	0	1	3	2	0	3	1	7
Pelvic assessment	0	11	0	1	1	12	6	2	0	7	0	0	4	1	0	1	1	3	0	0	1	8

	Rus	Nat	But	Rfe	Maf	Gor	Kim	Spr	Cor	pel	Paa	Mow	Sta	Osi	CMH	Fre	Joh	Uni	Tyg	KEH	Nat	<
In the latent phase																						
Foetal heart	6	5	0	1	1	3	9	2	2	2	5	4	3	2	3	0	4	9	13	2	2	2
Cervical dilatation	6	1	0	1	2	3	8	2	0	2	6	1	2	4	2	0	2	9	4	2	2	6
Maternal BP	6	5	0	1	2	3	11	2	2	3	10	3	3	2	3	1	5	10	15	2	2	2
Maternal pulse	6	5	0	1	2	3	11	2	2	3	9	3	2	2	3	0	5	10	15	2	2	3
Maternal temperature	7	2	0	2	2	3	9	1	2	2	7	4	2	2	3	2	5	9	6	2	2	1
In the active phase																						
Foetal heart	4	3	6	13	13	2	9	2	16	3	15	7	5	8	10	11	8	11	9	11	6	4
Cervical dilatation	17	15	8	12	13	8	12	7	9	11	9	3	12	13	5	6	7	7	5	13	9	8
Liquor	18	12	4	16	12	10	15	9	16	9	12	4	13	15	8	10	11	9	12	12	9	3
Moulding	18	13	3	16	13	9	13	9	14	8	13	2	12	15	5	6	9	11	14	11	9	5
Caput	18	13	4	15	13	9	13	10	14	7	13	2	12	15	6	7	9	11	15	11	9	4
Level of head	18	16	11	10	13	5	1	10	12	10	14	5	15	15	8	8	7	8	13	17	9	7
Contractions	11	14	9	12	13	4	15	6	14	6	14	7	12	14	11	11	11	7	12	13	9	5
BP	11	11	3	12	12	6	15	6	15	11	13	11	11	12	3	12	11	13	12	12	8	4
Pulse	8	11	0	14	12	1	10	3	11	11	13	9	3	9	3	4	10	13	12	11	4	5
Temp record	14	9	4	15	14	9	8	1	12	3	9	6	14	14	6	4	9	7	3	11	6	4
Urine output	14	11	3	15	13	7	12	1	7	6	9	3	10	10	5	3	5	7	10	8	4	4
IV fluid given	6	11	1	2	6	4	6	2	5	5	12	8	15	15	0	2	5	13	8	3	3	5
IV fluid not indicated	9	7	9	8	5	7	6	6	8	4	4	0	1	1	8	7	2	1	5	9	4	5
Assessment of progress of the labour																						
Vaginal Exam	8	4	0	15	0	2	10	1	11	6	11	9	4	6	5	13	13	13	4	3	3	4
Problem Identification	10	4	2	13	2	3	10	1	13	6	12	7	3	7	4	13	13	13	6	9	3	3

	Rus	Nat	But	Rfe	Maf	Gor	Kim	Spr	Cor	pel	Paa	Mow	Sta	Osi	CMH	Fre	Joh	Uni	Tyg	KEH	Nat	<
Plan of Management	7	4	1	10	2	3	12	0	13	5	6	8	3	6	3	12	12	13	7	9	3	2
Proper Management	4	17	3	10	12	6	8	9	14	12	15	6	12	12	3	15	12	14	11	16	6	3
Final summary of labour																						
Record Completed	18	17	19	17	16	22	13	20	18	15	18	20	18	20	18	14	14	17	19	17	16	4
Total fields below national average	9	4	26	10	10	9	5	16	3	10	2	14	5	4	13	14	7	6	4	1	172	
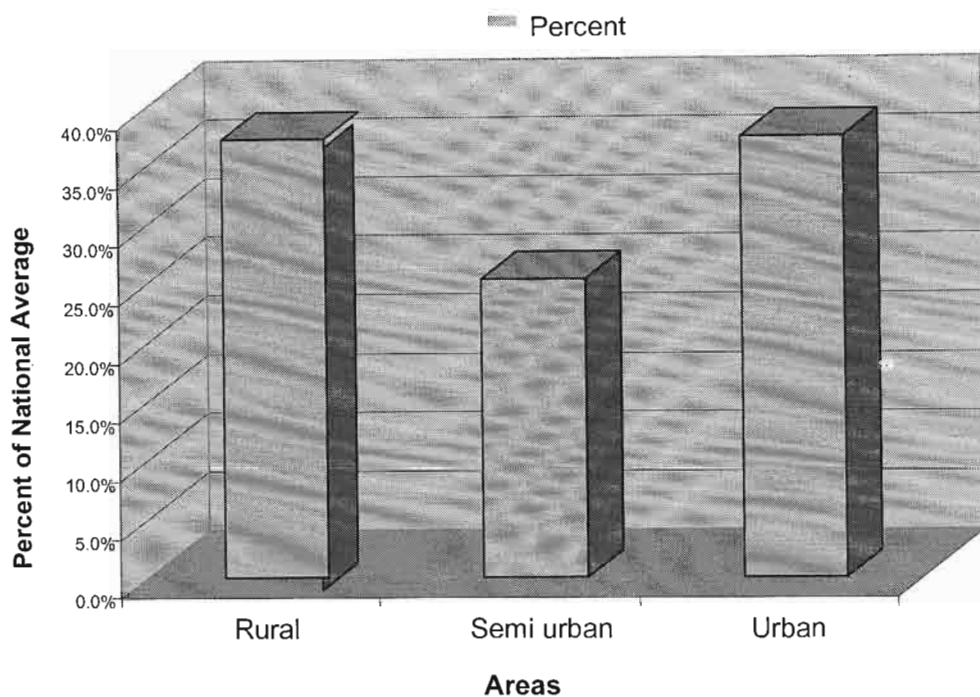
Figure 4.4.3 Comparison between the Use of the Partogram According to the Checklist in Rural, Semi-urban and Urban Hospitals

4.4.5 General Summary

The correct use of the partogram was very variable. In the 13 rural hospitals 8 (61.5%) scored below average for recording of pulse and 7 hospitals for three variables (CVS, ROM, EFW). Four semi-urban hospitals scored below average for 14 variables while 8 scored below average for the variable pelvic assessment and cervical dilatation. 7 hospitals scored below average for four variables and six hospitals for one variable. According the (Tables 4.4.1, 4.4.2, 4.4.3,) even though there are differences to the number of hospitals surveyed based on the areas they serve semi-urban hospitals appear to record the chart better than urban and rural hospitals. In total 466 variables remain below the national average. From these number urban hospital scored (174, 37.3%) below the national average, rural hospitals (174, 37.3%) and semi-urban hospitals (118, 25.3%). In most of the hospitals, the labour graph and the latent phase of the progress of labour are least recorded.

4.5 Levels of care

The use of the partogram was also analysed according to the level of hospital where the data was collected. There were 23 level one, 17 level two and 6 level three hospitals in the sample.

4.5.1 Level One

The total numbers of level one hospitals surveyed were 23. Of all the level one hospitals, Thafalofefe Hospital (rural, Eastern Cape) scored 20/36 and had the largest number of variables below the national average. De Aar Hospital (rural, Northern Cape Province) gave a similar result with 17/36 variables below the national average. The best recording with only 1/36 below national average was Barberton Hospital (semi urban, Mpumalanga)

4.5.1.1 Admission Assessment

From 23 level one hospitals of level one surveyed 11 scored below the national average for the variable summary of diagnosis and 10 hospitals scored below the national average for ANC review, recording of VCS and summary of management. The variable recording of clinical history has been scored above the national average except in one hospital. From all the variables in phase of admission assessment the recording of clinical history remain above the national average except in one hospital but the four variables are less recorded and remain below the national average in 10 hospitals.

4.5.1.2 Labour Graph

On this phase, the recording of duration of labour and estimation of foetal weight scored below the national average in 9 hospitals. 7 hospitals remain below the national average for the variable pelvic assessment and five hospitals for the risk factor recording.

4.5.1.3 Latent Phase

In this phase of the checklist, 7 hospitals scored below national average for the recording of maternal temperature and six hospitals scored below the national average for the variables foetal heartbeat and maternal temperature. Five hospitals remain below the national average for the remaining variable. (Table 4.5.1)

4.5.1.4 Active phase

In the active phase of labour the recording of the partogram was found in 10 hospitals to be below national average for the recording of BP. Six hospitals scored below the national average for foetal heart recording, recording of cervical dilatation, liquor and IV fluid given. The recording of the fluid indicated is the variable that remains above the national average except in one hospital. The recording of contraction and urine out put are also above the national average except in two hospitals.

4.5.1.5 Assessment of progress of labour

Nine hospitals scored below the national average for recording the proper management of labour. Seven hospitals remain below the national average for vaginal examination and plan of management and five hospitals for the identification of the problem.

4.5.1.6 Final Summary of labour

In this phase six hospitals scored below the national average

4.5.1.7 Summary

From all the level one hospital 11 hospital for one variable 10 hospitals for 5 hospitals 9 hospitals for two variables 7 hospitals for four hospitals and six hospitals for six variables remain below the national average. The best recorded variables are the recording of clinical history; fluid not indicated contraction, and urine out put. The highest variable of below the national average is the recording of summary diagnosis with 11 hospitals remains below the national average. In addition, the variables ANC review, recording of CVS, summary management, and contraction remain below the national average in 10 hospitals. (Table 4.5.1)

Table 4.5.1 Use of 36 Partogram Assessment Fields in Level one Hospitals Comparing Provincial and National Averages, 2002.

	Bisho n=21	Thafalofefe n=19	Lydenburg N=21	Sabie N=22	Matikwane N=20	CN. Phatude N=19	GJ Crookes N=21	Mankweng N=18	Brits N=20	Odi N=22	George Stegmann N=22	Rustenburg N=19	Kuruman N=20	Postmasburg N=26	Kakamas N=22	De Aar N=16	Yusuf Dadoo N=24	National N=21	Botshabelo N=21	Clocolan N=25	Ceres N=22	Groothoek N=22	Montebello N=21	National average	Below National average
Admission assessment																									
ANC reviewed	8	3	2	2	18	1	16	5	3	9	5	2	6	9	6	8	7	9	3	6	17	0	11	6	10
Clinical history	12	18	10	6	19	19	20	16	17	19	20	17	18	23	16	16	18	21	21	22	21	18	21	9	1
CVS	17	1	7	2	7	0	7	2	5	11	13	1	4	21	9	12	6	19	4	12	5	2	7	6	10
Abdominal Exam	14	18	20	21	19	19	20	17	15	18	20	19	19	24	18	15	16	21	21	24	18	21	21	17	4
Vaginal Exam	13	18	21	21	19	19	20	17	17	20	21	19	19	25	20	15	21	21	21	25	22	21	21	18	4
Risk factor Maternal	12	14	2	4	16	13	16	3	6	14	9	8	9	8	9	9	11	8	13	8	8	7	18	8	5
Risk factor Foetal	12	14	2	4	17	14	16	4	6	14	9	8	9	5	9	9	11	9	13	8	8	7	17	6	3
Summary diagnosis	6	3	12	1	19	11	18	10	5	10	10	15	6	20	11	7	18	5	19	8	11	11	20	11	11
Summary Management	5	1	11	1	19	12	18	12	5	9	10	15	6	20	9	8	18	15	18	8	11	11	19	11	10
Labour graph																									
Risk factors recorded	6	6	1	5	12	5	6	5	2	4	3	0	2	6	5	4	6	11	8	7	5	8	14	3	5
Duration of labour	0	0	12	3	0	0	8	0	8	11	14	0	1	8	0	2	5	4	1	1	0	2	0	1	9

	Bis	Th a	Ly d	Sa b	Ma t	C N P	GJ C	Ma n	Bri	O di	G St	Ru s	Kur	Po s	ka k	D e A	YD a	Na t	Bo t	Cl o	Ce r	Gr o	Mo n	N at	<
Estimated foetal wt	0	0	0	1	0	0	1	1	2	7	16	0	5	2	1	3	0	2	5	1	0	1	0	1	9
Pelvic assessment	0	1	0	1	5	2	0	5	0	10	18	0	7	12	3	5	0	11	13	7	0	13	1	1	7
In the latent phase																									
Foetal heart	0	0	7	2	4	1	0	1	3	4	5	6	5	4	5	3	4	5	4	2	2	1	2	2	6
Cervical dilatation	0	0	5	2	4	3	0	3	3	4	6	6	5	4	5	3	4	1	3	2	0	2	2	2	5
Maternal BP	0	0	10	6	0	2	0	0	3	3	4	6	5	4	3	6	4	5	3	2	3	0	2	2	5
Maternal pulse	0	0	10	5	0	2	0	1	3	2	3	6	4	3	3	6	4	5	2	2	2	0	2	2	6
Maternal temperature	2	1	6	5	1	1	0	0	2	2	3	7	6	4	2	6	5	2	2	1	3	0	2	2	7
In the active phase																									
Foetal heart	8	13	5	10	11	14	15	8	7	17	18	4	10	8	2	4	6	3	4	14	6	13	13	6	6
Cervical dilatation	10	14	10	12	13	14	16	12	8	14	12	17	16	16	6	5	8	15	6	12	2	13	17	9	6
Liquor	6	7	13	15	9	7	12	11	15	16	21	18	12	14	6	9	9	12	8	8	11	9	14	9	6
Moulding	6	4	11	15	11	7	12	11	15	16	21	18	12	14	5	8	9	13	9	9	10	9	13	9	5
Caput	6	5	12	15	11	6	12	16	15	16	21	18	13	14	5	8	9	13	9	9	10	9	13	9	5
Level of head	8	17	7	14	12	15	18	11	11	14	17	18	2	12	5	2	10	16	7	14	11	9	14	9	5
Contractions	10	16	10	13	11	14	15	10	10	17	19	11	14	15	4	5	9	14	13	18	9	15	17	9	2
BP	7	7	4	5	5	7	8	7	12	16	20	11	9	16	9	7	10	11	14	19	7	4	16	8	10
Pulse	0	0	4	6	5	5	3	5	4	8	12	8	1	4	3	6	10	11	14	16	6	3	9	4	6
Temp record	6	6	4	6	10	9	2	6	6	14	17	14	11	12	7	5	11	9	13	11	9	6	16	6	3
Urine output	7	4	3	6	7	9	1	7	4	15	13	14	6	10	8	5	4	11	11	4	9	6	5	4	2
IV fluid given	4	1	4	9	3	1	3	7	3	7	16	6	4	4	0	0	6	11	12	5	2	1	15	3	6

	Bis	Tha	Lyd	Sab	Mat	CNP	GJC	Man	Bri	Odi	GSt	Rus	Kur	Pos	kak	DeA	YDa	Nat	Bot	Clo	Cer	Gro	Mon	Nat	<
IV fluid Not indicated	6	14	10	5	11	13	9	7	11	8	6	9	13	9	7	9	5	7	2	13	8	11	4	4	1
Assessment of progress of the labour																									
Vaginal Exam	6	0	10	9	9	6	5	4	1	1	9	8	4	7	2	0	4	4	7	0	1	0	5	3	7
Problem Identification	5	2	13	10	9	7	8	5	2	1	11	10	4	10	3	3	6	4	8	0	3	2	7	3	5
Plan of Management	4	1	12	6	8	5	6	5	2	1	10	7	4	6	2	2	7	4	8	0	3	2	7	3	7
Proper Management	6	3	11	9	7	4	13	10	2	4	10	4	8	9	4	2	8	17	11	17	3	0	16	6	9
Final summary of labour																									
Record Completed	11	17	18	4	18	19	19	17	18	17	20	18	11	13	19	11	24	17	17	22	21	15	21	16	6
Total fields below national average	19	22	14	12	7	18	9	17	18	6	3	9	7	2	14	17	4	4	8	10	18	19	2	259	

4.5.2 Level Two

The numbers of level 2 hospitals surveyed were 16 and the numbers of the partograms reviewed were 322. From the entire level two hospitals surveyed Butterworth Hospital (urban in Eastern Cape Province) scored 24/36 the highest count of below average of the national value. The other two hospitals with poor scores were Nelspruit Hospital (urban in Gauteng Province) 15/36 and Thembisa Hospital (semi urban in Gauteng Province) 16/36 the second highest (worst) score after Butterworth.

4.5.2.1 Admission assessment

For the proper recording and use of the partogram in the first phase of admission assessment, 8 hospitals scored below the national average for maternal risk factor recording. 7 hospitals remain below the national average for foetal risk factor recording and 5 hospitals for the variable review of ANC.

4.5.2.2 Labour graph

For this phase, 6 hospitals scored below the national average for estimation of foetal weight and pelvic assessment. For the remaining two variables, (Table 4.5.2) four hospitals remain below the national average.

4.5.2.3 In the latent phase

In this phase, four hospitals scored below average for the recording of maternal temperature and three hospitals for cervical dilatation.

4.5.2.4 In the active phase

In this phase, 6 hospitals scored below national average for IV fluid given 5 hospitals for foetal heart recording, recording of BP, and IV fluid not indicated. Four hospitals remain below the national average for five variables. (Table 4.5.2)

4.5.2.5 Assessment of progress of labour

In this phase, 5 hospitals scored below national average for vaginal examination and plan of management and four hospitals for identification of problem. Properly managed is the variable with only one hospital below the national average.

4.5.2.6 Final summary of labour

In this phase, only 3 hospitals scored below the national average.

4.5.2.7 Summary

From the 17 level two hospitals 8 scored below the national average for one variable (maternal risk factor recording) (Table 4.5.2) 7 hospitals for foetal risk factor recording, six hospitals for three variables (EFW, pelvic assessment, and IV fluid given), five hospitals for 7 variables and 4 hospitals for 9 variables. The best recorded variables are foetal heart recording and properly managed with one hospital remain below the national average.

Table 4.5.2   Use of 36 Partogram Assessment Fields in Level two Hospitals Comparing Provincial and National Averages, 2002.

Hospitals	Butterworth n=20	Rob Ferreira N=19	Themba N=20	Barberton n=19	Mapulaneng N=19	Mafikeng N=18	Gordonia N=23	Kimberley N=19	Natalspruit N=21	Thembisa N=22	Coronation N=21	Pelonomi N=18	Paarl N=21	Mowbray N=20	George N=21	Stanger N=19	Osindisweni N=21	National average	Below average
Admission assessment																			
Check lists	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	**Yes**	
ANC reviewed	2	12	11	11	8	1	6	9	16	2	12	9	5	16	13	4	12	6	5
Clinical history	11	18	19	19	19	13	21	19	18	19	20	18	21	20	20	16	17	9	0
CVS	16	4	13	7	4	9	14	12	8	10	13	13	17	11	17	11	18	6	2
Abdominal Exam	18	17	19	19	19	13	21	19	17	20	18	16	21	18	21	17	19	17	2
Vaginal Exam	19	18	20	19	16	16	23	19	17	21	20	18	19	19	21	19	18	18	2
Risk factor Maternal	15	12	8	13	11	7	2	5	13	5	10	6	12	13	5	6	5	8	8
Risk factor Foetal	14	12	8	13	3	6	2	5	11	5	10	5	12	12	5	7	5	6	7
Summary of diagnosis	3	17	19	17	9	8	14	10	18	8	18	14	18	18	17	15	19	11	2
Summary of Management	3	17	18	18	14	8	14	10	19	8	18	14	19	18	16	15	20	11	2
Labour graph																			
Risk factors record	6	0	18	2	5	3	8	6	1	0	0	6	8	6	7	10	9	3	4
Duration of labour	0	1	0	2	1	2	2	3	0	3	6	1	2	7	0	6	3	1	4
Estimated foetal wt	0	1	1	1	2	8	4	2	0	0	3	3	1	0	0	2	0	1	6
Pelvic assessment	0	1	1	1	5	1	12	6	2	0	0	7	0	0	0	4	1	1	6
In the latent phase																			
Foetal hear	0	1	5	8	1	1	3	9	2	5	2	2	5	4	4	3	2	2	1
Cervical dilatation	0	1	4	4	2	2	3	8	2	3	0	2	6	1	4	2	4	2	3
Maternal BP	0	1	5	8	1	2	3	11	2	5	2	3	10	3	5	3	2	2	2
Maternal pulse	0	1	5	7	1	2	3	11	2	4	2	3	9	3	4	2	2	2	2
Maternal temperature.	0	2	5	8	1	2	3	9	1	1	2	2	7	4	4	2	2	2	4

Hospitals	Butt	Rob	The	Barb	Map	Maf	Gor	Kimb	Natal	The	Coro	Pelo	Paarl	Mow	Geor	Stan	Osi	Natio nal	Below
In the active phase																			
Foetal heart	6	13	10	15	8	13	2	9	2	1	16	3	15	7	14	5	8	6	5
Cervical dilatation	8	12	10	17	11	13	8	12	7	5	9	11	9	3	13	12	13	9	5
Liquor	4	16	8	18	12	12	10	15	9	11	16	9	12	4	16	13	15	9	3
Moulding	3	16	8	18	12	13	9	13	9	11	14	8	13	2	14	12	15	9	4
Caput	4	15	8	18	12	13	9	13	10	11	14	7	13	2	14	12	15	9	4
Level of head	11	10	9	15	12	13	5	1	10	11	12	10	14	5	13	15	15	9	3
Contractions	9	12	10	19	12	13	4	15	6	9	14	6	14	7	17	12	14	9	3
BP	3	12	10	17	4	12	6	15	6	5	15	11	13	11	14	11	12	8	5
Pulse	0	14	10	15	2	12	1	10	3	5	11	11	13	9	11	3	9	4	4
Temperature recorded	4	15	10	17	6	14	9	8	1	3	12	3	9	6	8	14	14	6	4
Urine output	3	15	9	12	5	13	7	12	1	3	7	6	9	3	8	10	10	4	4
IV fluid given	1	2	1	8	2	6	4	6	2	1	5	5	12	8	7	15	15	3	6
IV fluid Not indicated	9	8	8	10	8	5	7	6	6	9	8	4	4	0	4	1	1	4	5
Assessment of progress of the labour																			
Vaginal Exam	0	15	11	12	2	0	2	10	1	3	11	6	11	9	4	4	6	3	5
Problem Identification	2	13	11	15	2	2	3	10	1	3	13	6	12	7	7	3	7	3	4
Plan of Management	1	10	10	15	2	2	3	12	0	2	13	5	6	8	7	3	6	3	5
Proper Management	3	10	7	15	7	12	6	8	9	9	14	12	15	6	14	12	12	6	1
Final summary of labour																			
Record Completed	19	17	19	17	17	16	22	13	20	15	18	15	18	20	21	18	20	16	
Total fields below national average	26	10	7	2	16	10	9	5	16	18	3	10	2	14	5	5	4		

4.5.2 Level three

The numbers of level three hospitals surveyed were six and the number of partograms was 114. CMH Hospital (urban, Eastern Cape) scored 11/36 Frere Hospital (urban: Eastern Cape) scored 12/36. While KEH Hospital (urban, KZN) scored 1/36 and Tygerberg Hospital (urban, Western Cape) scored 2/36.

4.5.3.1 Admission assessment

Almost all hospitals completed the partogram with only one hospital scoring below average for three variables. (Table 4.5.3)

4.5.3.2 Labour graph

In this phase, three hospitals scored below average for risk factor recording and pelvic assessment.

4.5.3.3 In the latent phase

All hospitals scored above average of the national average

4.5.3.4 In the active phase

In this phase, four hospitals scored below average for one variable the recording of the level of head.

4.5.3.5 Assessment of progress of labour

All hospitals scored above national average

4.5.3.6 Final summary of labour

Two hospitals scored below the national average for this variable

4.5.3.7 Summary

Four out six level three hospitals scored below the national average for the variable the recording of the level of head recording. Three hospitals for two variables recording of the risk factor at the labour graph and pelvic assessment, two hospitals for six variables remain below the national average.

Table 4.5.3   Use of 36 Partogram Assessment Fields in Level three Hospitals
Comparing Provincial and National Averages, 2002.

Hospitals	CMH n=19	Frere n=19	Johannesburg N=18	Universitas N=17	Tygerberg N=20	KEH N=21	National average	Below National average
Admission assessment								
Check lists	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ANC reviewed	15	15	8	11	18	13	6	0
Clinical history	16	19	18	17	20	20	9	0
CVS	16	15	6	17	20	19	6	0
Abdominal Exam	17	19	18	17	20	21	17	0
Vaginal Exam	19	19	18	16	19	21	18	1
Risk factor Maternal	16	16	5	16	15	11	8	1
Risk factor Foetal	16	15	5	16	14	10	6	1
Summary of diagnosis	10	16	17	16	20	21	11	0
Summary of Management	8	16	17	16	20	21	11	0
Labour graph								
Risk factors recorded	2	2	2	13	12	4	3	3
Duration of labour	1	4	2	7	2	4	1	0
Estimated foetal wt	0	1	3	2	0	3	1	1
Pelvic assessment	0	1	1	3	0	0	1	3
In the latent phase								
Foetal heart	3	0	4	9	13	2	2	1
Cervical dilatation	2	0	2	9	4	2	2	1
Maternal BP	3	1	5	10	15	2	2	1
Maternal pulse	3	0	5	10	15	2	2	1
Maternal temperature	3	2	5	9	6	2	2	0
In the active phase								
Foetal heart	10	11	8	11	9	11	6	0
Cervical dilatation	5	6	7	7	5	13	9	1
Liquor	8	10	11	9	12	12	9	1
Moulding	5	6	9	11	14	11	9	2
Caput	6	7	9	11	15	11	9	2
Level of head	8	8	7	8	13	17	9	4
Contractions	11	11	11	7	12	13	9	0
BP	3	12	11	13	12	12	8	1
Pulse	3	4	10	13	12	11	4	1
Temperature record	6	4	9	7	3	11	6	2
Urine output	5	3	5	7	10	8	4	1
IV fluid given	0	2	5	13	8	3	3	2
IV fluid not indicated	8	7	2	1	5	9	4	2

	CMH	Fre	Joh	Uni	Tyg	KEH	Nat	<
Assessment of progress of the labour								
Vaginal Exam	5	13	13	13	4	3	3	0
Problem Identification	4	13	13	13	6	9	3	0
Plan of Management	3	12	12	13	7	9	3	0
Proper Management	3	15	12	14	11	16	6	0
Final summary of labour								
Record Completed	18	14	14	17	19	17	16	2
Total fields below national average	13	14	7	6	4	1	45	

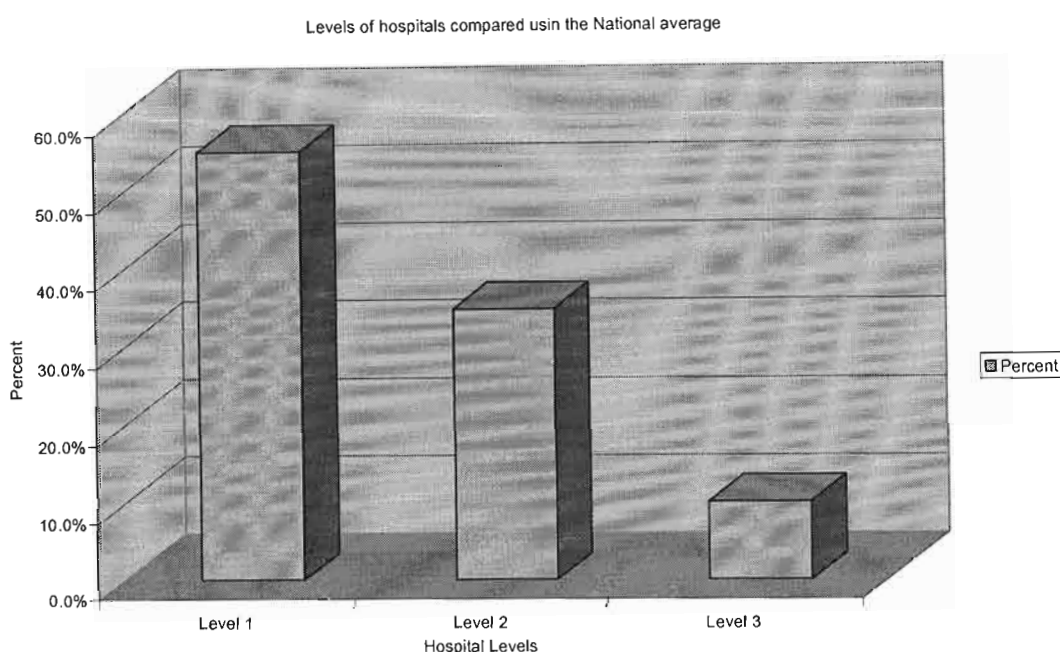Levels of hospitals compared usin the National average

Figure 4.5.3 Comparison between the Use of the Partogram According to the Checklist in Different Levels of Hospital

4.5.3 General Summary

Level one hospital had the largest percentage of variables below the national average. Eleven hospitals scored below average to the variable summary of labour with the decision on diagnosis. Ten hospitals scored below average for four variables (ANC review, CVS, summary of management and BP). 9 hospitals scored below average for three variables. While in level two 8 hospitals scored below average for the variable maternal risk factor recording and 7 hospitals for summary diagnosis 6 hospitals for two variables. In level 3 four hospitals scored below average for the variable recording of level of head and three hospitals scored below average for the variable pelvic assessment. According to the finding of (Tables 4.5.1, 4.5.2, 4.5.3) even though the hospitals are small

in number level three hospitals are better in recording and using the partogram. This is to be expected, as these hospitals are all academic hospitals with teaching responsibilities and high staff to patient ratios.

CHAPTER FIVE

5. DISCUSSION AND CONCLUSIONS

5.1 Introduction

The focus of this dissertation is the application and uses of the partogram in South Africa hence the questions, which need to be answered, are: how widely is the partogram being applied and how effectively and efficiently is it being used when applied? Before answering these questions, the "gold standard" against which to measure the extent of the application of the partogram and the degree of effectiveness and efficiency needs to be determined. As far as the use of the partogram is concerned that has been set in "recommendation 5" of the 1998 *"Saving Mothers Report"* which states *"the partogram should be used in the monitoring of every pregnant woman and problems detected on the partogram must be managed accordingly.* This RECOMMENDATION was modified somewhat in the 1999-2000 *"Saving Mothers Report"* as follows *"Correct use of the partogram should become the norm in each institution conducting births. A quality assurance programme should be implemented using an appropriate tool."* The gold standard for effectiveness and efficiency is not quite so straightforward as there are differences of opinion over certain management issues such as how often cervical dilation should be assessed in the early part of the active phase of labour.

The first part of Chapter 4 (Table 4.1) gives a summary of the extent of the use of the partogram throughout South Africa and allows us to answer the questions as to what extent the partogram is being used throughout South Africa and the effectiveness and efficiency of its use. The remaining tables and graphs in chapter 4 give comparisons between hospitals within provinces and comparison of hospitals between provinces as well as comparisons within and between rural, semi-urban and urban areas and comparisons within and between the various levels of care.

5.2 To what extent is the partogram being used

The standard currently being achieved overall is far below the 100% aimed at in "recommendation 5) of the 1998 *"Saving Mothers Report."* (Table 4.1) From the 36 variables used to check the recording of the partogram, only 12 variables remain above national average. The highest score obtained was the variable vaginal examination, which means almost every woman who came for delivery the variable is performed. The second highest were taking clinical history, abdominal examination and the completion of the record. The other variables remain below the national average some variables scoring "1"

in some provinces. If you compare the variable between the provinces Eastern Cape Province has the highest number of variables below the national average while KZN has the lowest number of variables below the national average. (Table 4.2.1.1, 4.2.1.4.1) The hospital that scored the highest number of variables below the national average is Butterworth Hospital (urban level 2) with 26 variables blow the national average (Table 4.2.1.1) and the hospital with the lowest of below the national average is King Edward Hospital in KZN with only one variable below the national average (urban Level 3) (Table 4.2.1.4.1)

These results may present a picture that is somewhat gloomier than the true situation since in some instances, the partogram may have been used but the record not completed. However, the number of such cases is probably small and this practice of itself indicates sub-standard management, as the labour graph should be completed with the details of the delivery record. The principle of "what is not recorded is not done," can be applied. Responsibility for failure to use the labour graph does not always rest directly with the health care personnel. In some instances, patients arrive at the delivery facility too late in labour to be monitored. Even this however indicates a failure in the system of patient education, poor transport facilities or delays in admission procedures. Cases in which labour proceeds so quickly that there is no times to use the record do occur, but these are rare.

Some variables are consistently below the national and provincial averages in all the provinces (Table 4.1). These variables are in the recording of the labour graph phase in the latent phase. Especially in rural and level one hospitals the variables recording duration labour, estimation of foetal weight, pelvic assessment, foetal heart maternal BP, pulse, cervical dilatation and maternal temperature are poorly recorded and remain below the national averages, even when the national average for this variables is very low. The most common, consistently under utilised variables are the completion of active phase findings and use of the partogram for the latent phase.

The reasons for this poor practice could be due to a number of factors that need to be evaluated. These include lack of resources, particularly staff, lack of knowledge concerning the use of the partogram, careless practice and failure to provide an effective monitoring system such as double-checking of the labour record. The variables most commonly recorded are abdominal and vaginal examinations. In summary, the over all use of the partogram is very low in all provinces.

5.3 To what extent is the partogram being used effectively and efficiently?

This question can be answered by comparing each indicator against the accepted norm or gold standard. As can be seen from Table 1 the results are far from satisfactory. A few examples taken from each section of the partogram will illustrate this point

5.3.1 Admission assessment

Examination of the cardio-vascular system was only recorded in 43.7% of the 942 partograms that were assessed. A record of ANC review was observed in 41.2%. Maternal and foetal risk factor recording were 47.7% and 45.1% respectively. Some provinces were very low. One scored 15% (CVS in Limpopo) and 19% (ANC review in Mpumalanga) showing that they are the worst in this phase of labour. Thus, the majority of women are going into labour without their CVS checked or their ANC reviewed. If cardiac disease is present, it may well not be picked up and maternal death could be the result of this omission. In addition, from the 9 variables, four variables are very low.

Vaginal and abdominal examination are scored consistently high as one would expect, as it is not possible to even begin to manage labour without the information obtained from these examinations.

5.3.2 Labour graph

The partogram is consistently under-utilized in labour with essential data on foetal condition, maternal condition and progress of labour frequently omitted.

From the four variables in this phase of labour, no variable is recorded adequately in the partograms. A total of 83 (8.8%) of 942 partograms surveyed recorded the duration of labour and rupture of membrane.

5.3.3 Latent phase of labour

Almost all the variables remain below the accepted standard. For the recording of cervical dilatation, only 14.5% recorded that it was done. In general, the recording in this phase is very low, the best province being 34% and the worst 2%.

An unrecognised prolonged latent phase can have serious implications for mother and baby leading to physical damage or death. This phase of labour is one of the least recorded and least used parts of the partogram. All provinces consistently under-utilised

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the partogram in the latent phase and there is no difference in all levels of care, or whether the hospital is rural, semi-urban or urban.

There are a number of possible reasons for under utilisation of the partogram in the latent phase. Apart from the issues mentioned above such as shortage of staff, there is often confusion as to whether labour has commenced. There is resistance of staff to starting to use the partogram until they are sure the patient is in labour by which time the patient may have reached the active phase, another problem is late admission to the labour ward. This may be a patient related problem as patients prefer to remain ambulant or who have problems finding transport to take them to the hospital. Overcrowded labour wards and too few trained staff may also results in delays in adequately using the partogram. In general, all the five variables remain below the acceptable values.

5.3.4 Active phase of labour

Progress with cervical dilatation was measured two - hourly in only 54.0% of women nationally. In the best province, it was measured in 68.8% and in the worst 30.5% of the sampled partograms. The worst recorded variable in this phase is maternal pulse where only 35.6% of the 942 partograms had this variable recorded.

This part of the partogram is relatively well recorded. In most provinces, at all levels of care in rural or urban areas the variables in this phase were better than other phases. However, failure to measure the cervical dilatation at the recommended intervals in 54% of the sample leaves mother and baby at risk of the staff not recognising complications that could cause serious morbidity or mortality in the mother and / or the baby.

Of the 13 variables in this phase of labour six variables, remain below average. This phase of labour is recorded relatively well compared to the other phases of the graph and most probably properly applied. Hospitals from KZN and Western Cape are good at recording in this phase of labour.

5.3.5 Assessment of progress

This phase is poorly recorded in all the provinces and in all areas and levels of health care. The national average for this stage is very low even the worst in some hospitals. Four of the variables are below the average. This is another serious problem as unless the progress of labour, maternal, and foetal well-being is regularly reviewed serious injury

can ensue. The foetus cannot call for help and the mother may not appreciate if there is a problem. Only regular assessment of progress will ensure that progress is satisfactory.

5.3.6 Final assessment

This part of the checklist is almost complete in all provinces, levels and areas with the highest score of all the variables. This has long been part of midwifery practice so is part of the tradition of maternity care. Other aspects of the partogram are relatively new but until these essential observations are being made and recorded to the same extent as the final assessment, patient care will remain substandard.

After comparing and evaluating the application and use of the partogram among the hospitals of each province, between provinces, between urban, semi-urban and rural locations and between levels of care (Chapter 4), the following basic questions need to be discussed.

1. Which part of the partogram is most frequently recorded or not recorded?
2. Is there a difference between the hospitals of each province in the application and use of the partogram?
3. Is there a difference between the provinces in the application and use of partogram?
4. Is there a difference between urban, semi-urban and rural in the application and use of partogram?
5. Is there difference between levels of care in the use and application of the graph?
6. Is there any relation between the number of deliveries and proper recording and application of the graph?

5.4 Comparisons within the provinces

5.4.1 Eastern Cape

Five hospitals were surveyed (3 urban, 2 rural, two level 1, one level 2, and two level three). The rural and level one hospitals have the highest number of variables below the national average. Furthermore, the one level 2 hospital, Butterworth, has the highest number of variables below average (26/36) than all other urban and level three hospitals. Eastern Cape hospitals remain very low in the recording of the partogram. (Table 4.2.1.)

The overall stand in the provinces is 9th with 94 variables below the national average.

5.4.2 Free State

Five hospitals were surveyed (one rural, one semi urban, three urban, of which three were level 1, one level 2, and one level 3). One of the rural level one and one urban level two have 10 variables on the checklist below the national average. Free State hospitals remain good at recording the partogram and the overall are the 2nd best province with only 38 variables below the national average (Table 4.2.2).

5.4.3 Gauteng

Five hospitals were surveyed (three urban, and two semi urban, of which one was level 1, three level 2, and one level 3). Two of the level 2 hospitals have scored high numbers of below national average. Thembisa Hospital (18/36) scored high and Coronation Hospital (3/36) score low to the national averages. The over all stand in the province is 6th with a score of 48 of below the national average. (Table 4.2.3)

5.4.4 KwaZulu-Natal (KZN)

Five hospitals were surveyed in KZN were 5 (one rural, one semi urban, three urban of which two were level 1, two level 2 and one level 3). Semi urban hospital in KZN had a high number below the average value whilst an urban hospital scored second highest, suggesting that there is no correlation between location of the hospital and the recording on the labour graph. (Table 4.2.4)

The overall recording activity is good in KZN than any other province in South Africa and e stands 1st with a score of 21 of below the national average

5.4.5 Limpopo

Five hospitals were surveyed (four rural and one semi-urban, four level 1 and one level 2). In comparing the hospitals to the national average, four hospitals were low in recordings on the partogram and have the highest number of below average. Four hospitals of the province scored 16, 17, 18, and 19/37 for the checklists. Comparing the rural and the semi-urban hospital, the semi-urban hospital high number of below average compared with the rural hospitals. However, the values are not greatly separated. This shows that almost all rural hospitals have scored a high count below national average indicating a comparative under-utilisation many of the variables on the partogram. The overall stand is 8th with a score of 77 of below the national average. (Table 4.2.5)

5.4.6 Mpumalanga

Five hospitals were surveyed (two rural, two semi urban and one urban, two level 1, and three level 2). If you compare the scores of below national average, the two rural hospitals have a high number of unrecorded partograms. The overall stand with 45 of below national is 4th. (Table 4.2.6)

5.4.7 North West

Five hospitals were surveyed (one rural, two semi-urban, two urban, four level 1 and one level 2). Comparing the hospitals to the national average the semi urban hospital at Brits scored a high number below the national average (18/36). The second is Mafikeng urban and level 2 with a score of (10/36). In general, this province has 46 variables below national average and the overall stand is 5th. (Table 4.2.7)

5.4.8 Northern Cape

Six hospitals were surveyed (one rural, three semi-urban, two urban four level 1 and two level 2). If you compare the scores of the hospitals, the only rural hospital has a high number below average of the national decision rule. Postmasburg Hospital remains high to the provincial average, but De Aar Hospital has scored high to the national average. This province has 54 variables of below the national average and the overall stand is 6th. (Table 4.2.8)

5.4.9 Western Cape

Five hospitals were surveyed (one rural, one semi urban, and three urban, one level 1, three level 2, and one level 3). The rural hospital has a higher below average number than the semi urban and urban hospitals. This province has 43 variables of below the national average and the overall stand is 3rd in SA. (Table 4.2.9)

5.5 Summary of comparisons between the provinces and conclusions

There are big differences between the provinces in their application and use of the partogram. This difference is seen in Tables (4.3.1) where in KZN has 21 variables and Eastern Cape, 94 variables below the national average. Most Eastern Cape hospitals remain low in the recording of the partogram. The other province with low recording is Limpopo province with 77 variables below the national average and the second best is the Free State with 38 variables below the national average. These conditions are explained

and reported in the NCCEMD, which attribute the problems to patient, administrative, and health care provider factors, which are worst in the Eastern Cape.

5.5.1 Comparisons between rural, semi-urban and urban

These comparisons are made using the national averages. First the numbers of hospitals in the various areas are separated. Then the hospitals that scored below the national average are counted. Finally, the number of hospitals that scored below the national average in the 36 variables on the checklist is identified.

From the 13 rural hospitals, 8 hospitals for recording of BP, 7 hospitals CVS, duration of labour and estimated foetal weight scored below the national average.

Four of 13 semi-urban hospitals scored below average for 14 variables. Eight urban hospitals scored below average for two variables pelvic assessment and recording of cervical dilatation from the 36 variables on the checklist. Seven hospitals scored below average for four variables and 6 hospitals for one variable. A total of 137 variables in rural hospitals were below the national average; 98 variables below the national average for the semi-urban hospitals and 149 variables for the urban hospitals. The variable recorded most poorly for rural hospitals are in the labour graph section of the checklist and the variables risk factor, rupture of membranes, estimation of foetal weight and pelvic assessment are most commonly poorly done. The other variables recorded poorly are in the latent phase, such as foetal heart, cervical dilatation, BP, pulse, and maternal temperature recording. (Table 4.4.1, Table 4.4.2, Table 4.4.3).

5.5.2 Summary of comparison between rural, semi-urban and urban

In conclusion, rural hospitals are worst at recording, application and use of the partogram. Even though there are more urban hospitals than rural and semi-urban hospitals, proportionally still rural hospitals remain far below average in the recording of the graph. These conditions could be attributed to several factors that are explained in the NCCEMD report of 1998 and that of 1999-2001.
These include the number, staff and the logistical deficiency present in the hospitals (Table 4.4.1, Table 4.4.2, and Table 4.4.3)

5.5 Comparisons between level 1, 2 and 3

From the 46 hospitals surveyed (24 level one, 16 level two and 6 level three) eleven level one hospitals scored below national average for the variable summary diagnosis. Ten

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hospitals scored below national average for ANC review, CVS, summary Management, and BP. Nine hospitals scored below national average for duration of labour, estimation of foetal weight, and properly managed, seven hospitals for the variables pelvic assessment, maternal temperature, vaginal examination, and plan Management, 6 hospitals for 7 variables and 5 hospitals for 8 variables scored below national average. A total of 216 variables remain below the national average in level one hospitals. Thafalofefe 20, Bisho 17, and De Aar 17 variables remain below the national average. (Table4.5.1)

From the 16 level two hospitals, 8 hospitals for the variable maternal risk factor recording, 7 hospitals for foetal risk factor, 6 hospitals for variables pelvic assessment, estimation of foetal weight and foetal risk factor and five hospitals recorded below the national average for 7 variables. A total of 98 variables remain below the national average in level two hospitals. Hospitals Butterworth 24, Thembisa 16, and Nelspruit 15 variables remain below the national average. (Table 4.5.2)

From the six level 3 hospitals, 4 hospitals for the variable recording of level of head, 3 hospitals for risk factor, and pelvic assessment scored below the national average. A total of 35 variables remain below the national average. (Table 4.5.3)

5.6 Conclusions

Even though the number of hospitals is different, proportionally level one hospitals and especially hospitals from the Eastern Cape are weak at using and recording the partogram. This may be attributed to a number of factors that were explained in the NCCEMD reports. This includes some avoidable factors, missed opportunities and standard of care such as attendance of antenatal care. Level three hospitals are good at recording of the partogram, which may be attributed to the geographic location, the number and skill of the staff

5.7 Relationship between use of the partogram and number of deliveries

There are no evidences that the number of deliveries has an influence on the quality recording of the partogram. Most level three hospitals had a large number of deliveries but also were found to use the partogram well. Most rural hospitals recorded fewer deliveries and the use of the partogram was poor. There was no correlation with the number of deliveries in a province and the optimal use of the partogram.

One rural hospital in the Free State had 38 deliveries a month and one urban hospital 287 deliveries in a month. The small rural hospital used the partogram optimally and the large

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and busy hospital used it poorly. In Gauteng a hospital with a high number of deliveries (636 deliveries per month), scored much better than a hospital with few deliveries. Factors such as staff, infrastructure and training affect the use of the partogram more than the number of deliveries.

There is no clear correlation between number of deliveries and the efficient use of the partogram. While one might expect a low number of deliveries to be equated with efficient use of the partogram, there are many compounding variables. These will include the comparative number and experience of the staff, staff distribution, with more staff allocated during the day than the night shift. Supervision may also play a role. A well-supervised maternity unit is likely to use the partogram well irrespective of the number of staff or patients while a poorly supervised unit will have poor records. (Table 4.6.1, 4.6.2, and 4.6.3).[9]

5.8 General conclusions

The application and use of the partogram in South African is very unsatisfactory. Level three hospitals, most of which are academic hospitals, faired best. The rural hospitals were particularly poor at using the partogram. Hospitals in semi-urban areas fair better than the rural hospitals, but many of these operated below the national average. The Eastern Cape and Limpopo have the worst results for use of the partogram while the results from KwaZulu-Natal, Free State and Western Cape are above average.

The most commonly ignored variable in level one hospitals was the recording of BP, which is particularly serious in a community with a high prevalence of hypertension in pregnancy. Another variable that was often below average was the variable "summary with a decision on diagnosis and management" suggesting that there is rarely a proper plan of management of labour in these level 1 hospitals. Data essential for proper management of the woman in labour was not available.

The variable most often completed is the recording of the summary of labour. Other variables carried out well are the abdominal and vaginal examinations.

Results have been analysed here according to whether the findings for that hospital and province are above or below the national average in order to highlight areas that need special attention. However, this gives no indication as to whether the average is

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[9] This conclusion is speculative

satisfactory. The table one in chapter 4 suggest that correct use of the partogram is far from ideal even in those provinces well above the national average.

CHAPTER 6

6. RECOMMENDATIONS

The "Gold Standard" set in the 1999-2001 *"Saving Mothers Report"* is that *"correct use of the partogram should become the norm in each institution conducting births."* It is apparent from the analysis presented in this dissertation that, in general, institutions providing maternity care fall far below this standard. The analysis also shows that there are important differences between provinces and between hospitals within those provinces. In order to try to ensure correct use of the partogram the *"Saving Mothers Report"* (1999-2001) recommended that "a quality assurance programme should be implemented using an appropriate tool" and set a target of 30% of health care institutions to have quality assurance programmes available by December 2004. A quality assurance programme is available from the National Department of Health.

The following recommendations are made:

1. The National Department of Health should discuss the results of the analysis with all the Provincial Departments of Health

2. The Provincial Departments of Health make the results known to health care institutions throughout the province

3. Research should be conducted to determine why the standard for the use of the partogram is, in general, so poor and to identify steps that should be taken to rectify the problems which have been identified.

4. Training institutions (nursing colleges and medical schools) be informed of the results of this analysis and encouraged to ensure that adequate emphasis be given during training on the importance of the partogram, its usage and means of providing quality assurance.

5. Particular attention should be given to those provinces showing low levels of correct use of the partogram. Resources of staff and training should be provided to help them improve their standards.

6. Community education and antenatal health education should aim to ensure that mothers report for care early in labour.

7. Hospital administrations should ensure that resources of personnel and equipment are sufficient to ensure that the recommended standard for the use of the partogram can be implemented.

8. A Rapid Appraisal similar to that conducted in 2002 should be repeated in 2005 to determine if standards have improved.

Appendix I: Abstract of the Report "Saving Mothers"

Findings and Analysis

1. *Guidelines: Development, distribution and to some extent the implementation of guidelines for maternal care was fairly well implemented. Fourteen indicators were used to measure this recommendation and the coverage ranged from 51% to 84%. The Northern Cape was below average in nine of the 14 indicators, Free State $^7/_{14}$ and Eastern Cape below the national average in $^6/_{14}$ of the indicators.*

2. *Referrals: Lack of clear agreements with regard to referrals was a common problem reported by over half the hospitals in some provinces. Poor transport arrangements remain a life-threatening hazard for many women, and because of inadequate feedback on referred patients an excellent opportunity for in-service training for the staff at the sending hospital was missed. It was also a way of providing moral support for nursing and medical colleagues. Of the four indicators used, coverage ranged from 22% to 72%. Mpumalanga was below the national average in $^4/_5$ and Gauteng in $^3/_5$ of the indicators.*

3. *Staff, Equipment and Drugs: Generally speaking, staffing norms have not been developed either nationally or provincially, and lack of staffing by midwives and doctors appeared to be the most serious problem in maternal care. Four indicators were measured and coverage ranged from 22% to 52%. Mpumalanga was below average in ¾ of the indicators. Only a few hospitals (41%) report equipment shortages, which might endanger the life of the mother, but there appears to be a serious problem in the maintenance and replacement of equipment in some provinces.*

4. *TOP services: Existing TOP services in some provinces are threatened by a rapid turnover of medical and nursing staff willing to participate in the programme and by lack of medical backup. KwaZulu-Natal and Northern Cape had below average (28% and 50%) coverage of TOP services.*

5. *Partogram: This study provides convincing evidence that the partogram was not being used optimally to either monitor or manage labour. The Eastern Cape, Gauteng and Northern Cape were below the national average more than most provinces with theses indicators.*

6. *Emergency blood: Seventeen percent of hospitals carrying out caesarean sections considered their supply of emergency blood to be unsatisfactory and a similar percentage claim that they have to wait over 30 minutes for uncross matched blood in an emergency. Limpopo ($^3/_3$) and Free State ($^3/_3$) were below the national average in the indicators used.*

7. *Cardiac disease: The provision of medical obstetric clinics was relatively good for the care of pregnant women with cardiac disease. Most patients (59%) were not having their hearts auscultated during antenatal care or when admitted in labour, so existing cardiac disease was likely to be missed at a stage when it could be managed optimally. In four provinces (Limpopo, Mpumalanga, Eastern Cape and Gauteng) the number of hospitals reporting*

that they perform auscultation routinely on pregnant women was below the national average of 41%.

8. **Anesthetic used at caesarean section**: Two thirds of hospitals surveyed were using spinal anaesthesia as the anaesthetic of choice for caesarean sections. Limpopo and Northern Cape were below average with this indicator.

9. **Family Planning Services**: In 55% hospitals it was estimated that less than half grandmultiparous women were being offered tubal ligation, and tubal ligation was rarely being done for any indication other than grand multiparity and repeat caesarean section. Family planning coverage indicators were worst in Gauteng ($^3/_3$) and North West ($^2/_3$) indicators.

10. **HIV services** for pregnant women were rudimentary in many areas at the time of the study. Over a third of hospitals did not have protocols for the care of HIV+ve women; the availability of pre and post test counseling was very limited; advice on infant feeding varied from hospital to hospital and post partum support for HIV+ve women was very limited.

11. **Perinatal review** meetings were being held in all the larger hospitals but many of the smaller hospitals were not regularly holding perinatal reviews."

Appendix II: Checklist Used

Rapid Appraisal: **QUALITY CHECK OF LABOUR RECORDS**

Province_____ Hospital: _____ Level: 1 / 2 / 3 Urban/ semi-urban/rural

19 randomly selected labour records for deliveries during March, April and May 2002.

For each 'yes' answer, score 1 point (except where indicated otherwise).

Admission assessment: **Risk factors: _____**

Are all these items complete?

1. Evidence that the health worker has reviewed and summarised the ANC record

2. Clinical history _____general examination (including CVS) _____

3. Abdominal examination _____ vaginal examination_____

4. Risk factors: maternal_____ foetal_____

5. A summary with a decision on: diagnosis management

Labour graph:

6. Are the risk factors recorded at the top of the labour graph?

7. Is there a record of duration of labour and of ROM?

8. Is there a record of EFW_____ pelvic assessment_____?

In the latent phase:

                                                                  (1/2 each)

9. Has the foetal heart been recorded at least 2-hourly?

10. Has the cervical dilatation been recorded 4-hourly?

11. Have the maternal: BP_____ pulse_____ been recorded 4 hourly?

12. Has the maternal temperature been recorded 4-hourly?

In the active phase:

13. Has the foetal heart rate been recorded every 30 minutes?

14. Has the cervical dilatation been recorded 2-hourly and plotted according to the
      Alert and Action lines?

15. When a PV was done is there a record of:

        Liquor: ___ moulding: ___ caput: _____level of the head: _____ **(4 points)**

16. Have the contractions been recorded at least hourly?

17. Have the maternal: BP_____ pulse_____ been recorded at least hourly?

18. Have the maternal: temperature_____ urine output: _____ been recorded at least 4-hourly? 19. Is there a record of drugs and IV fluids given_____ they were not indicated_____?

Assessment of progress of the labour:

20. Is this recorded after each vaginal examination?

21. Have any problems been identified?

22. Is there an appropriate plan of management?

 23. Was this patient managed appropriately?

Final summary of labour:

24. Has this form been completed?

Total out of 25:_____

Multiply by 4: % _____

Cervical dilatation on admission: _____

Cervical dilatation when active phase recordings started: _____

Time of delivery: _____

Appendix III: "Saving Mothers Report" Recommendation 5

5. The partogram must be used for monitoring labour in every pregnant woman and problems detected on the partogram must be managed accordingly.

The RA sought to investigate the extent to which the partogram was being used to monitor labour and the quality of utilization of the partogram.

5.1. Methodology

Visits were made to 5 purposively selected hospitals in each province (with the exception of the Northern Cape where the Provincial MCWH co-coordinator requested that six hospitals should be visited) and the labour records were selected as explained in the sampling methodology at the beginning of the report. At least 19 records were randomly selected from each hospital for assessment. In total 941 records were selected and these were assessed using a checklist based on the maternity record which has recently been developed by the National Dept of Health. For the purposes of this study, "use of partogram" was defined as "the number of cases for which recordings were made on the partogram for women admitted in labour with cervical dilatation of less than 9 cm".

We based our calculations on women who were admitted and assessed as being in labour, were less than 9cm dilated and who should have been monitored during their labour.

5.2. Findings

5.2.1. Clinical assessment on admission in labour

Not only the partogram but also clinical assessment recordings form part of the whole labour record. However, the partogram section forms the basis for making decisions about whether or not the client is in labour, the stage of labour (latent or active phase) and how the labour should be managed.

The records of the initial clinical assessments of women made on their admission to labour ward were scrutinized for this part of the RA. It was anticipated that all 941 patients who were admitted in labour would have been clinically assessed (including assessment of the cardio-vascular system), a diagnosis made about whether or not the patient was in labour and a plan of management formulated by a health care worker.

The findings showed that a diagnosis and plan of management were made for 611 (65%) women. The CVS was examined in 385 (41%) of women either at ANC or on admission in labour[10].

5.2.2. Use of the partogram

Of the 941 labour records selected, 190 (20%) were excluded from the study because:
- In 30 (3%) no partogram was found in the notes.
- 84 (9%) were admitted to the labour ward with the head on the perineum.
- 76 (8%) were admitted at 9 or 10 cm dilated which precluded the possibility of meaningful monitoring in labour using the partogram.

The remaining 751 (80%) women who were admitted in labour with a cervical dilatation < than 9 cm form the basis of this part of the RA. The partogram should have been used for monitoring labour in all 751 but it was only used in 628 (84%) of these women.

In 121 (16%) women there were no recordings whatsoever on their partogram. The percentage of patients for whom the partogram was used ranged from 96% in KZN to 70% in Eastern Cape.

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[10] Examination of the cardio-vascular system (heart and lungs) is standard practice in rendering antenatal care as recommended in the guidelines for maternity care in South Africa 2000

Table 5a – Summary of the use of the partogram by province

Provinces:	EC	FS	GP	KZN	LP
Records selected for assessment	**100**	**102**	**106**	**102**	**98**
No partogram found in notes	9	3	-	-	-
Fully dilated on admission- no partogram started	6	10	15	13	5
Admitted at 9cm dilatation	7	4	2	6	5
Admitted at 10 cm dilatation	4	3	5	2	10
Total (%) records excluded	**26 26%**	**20 20%**	**22 21%**	**21 21%**	**20 20%**
No. of records that fulfilled the criteria for assessment	**74**	**82**	**84**	**81**	**78**
Monitored	<u>52</u> <u>70%</u>	73 89%	<u>60 71%</u>	78 96%	67 86%
No recordings even though admitted at <9cm	22 29%	9 11%	24 29%	3 4%	11 14%

Figure 5(a): Percentage of patients admitted <9cm dilated for whom a partogram was used to monitor labour, by province (N=751)

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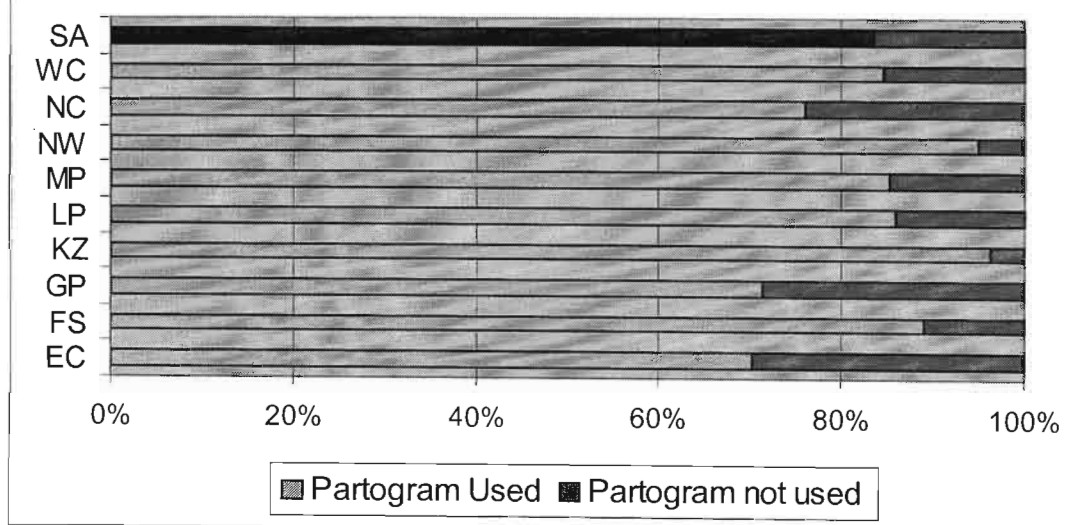
On average in South Africa 84% of women admitted to hospitals less than 9 cm dilated and in labour had their labour recorded on a partogram. This ranged from 96% in KwaZulu-Natal down to 70% of women in labour in Eastern Cape. The use of the partogram in 4/9 of the provinces during labour was below the national average. The provinces are Eastern Cape, Gauteng, North West and Northern Cape provinces.

5.2.3. Recordings made in the Latent Phase of labour

Out of the 751 women in the study, 427 (56%) were admitted at a stage in labour when the latent phase could have been monitored

The monitoring standard in the latent phase of labour that we used was the following frequency of observations:

- Foetal heart: every 2 hours
- Cervical dilatation: every 4 hours
- BP and pulse: every 4 hours
- Temperature: every 4 hours

Table 5b: Frequency of adequate monitoring in women admitted in the latent phase of labour

Admitted < 4cm dilated	Foetal Heart monitored	Cervical dilatation monitored	BP and pulse monitored	Temp Monitored
427	165 (39%)	137 (32%)	166 (39%)	149 (35%)

Of the 427 women admitted in the latent phase, 39% had the foetal heart, 32% cervical dilatation, 39% BP & pulse and 35% temperature monitored to a standard consistent with the guidelines.

5.2.4. Recordings made in the Active Phase of labour

Of the 751 women who should have been monitored in the Active Phase, 628 (84%) women were actually monitored.

The standard of monitoring in the active phase of labour used was the following frequency of observations:

- Foetal heart: every 30 minutes
- Cervical dilatation: every 2 hours
- Liquor, caput, moulding & level of head   every 2 hours
- Contractions: every hour
- Maternal BP and pulse: every hour
- Maternal temp and urine output: every 4 hours

Table 5c: Standard of monitoring of each observation in the active phase of labour, by province

	EC	FS	GP	KZN	LP	MP	NW	NC	WC	SA
No. of records selected for assessment	100	102	106	102	98	103	101	125	104	941
% of records with at least one criteria monitored	**70%**	89%	**71%**	96%	85%	85%	86%	**76%**	85%	**84%**
Foetal heart monitoring	51%	**35%**	**29%**	51%	60%	55%	59%	**28%**	58%	**47%**
Liquor, caput, moulding & level of head	**33%**	**52%**	**52%**	71%	**57%**	66%	85%	**47%**	63%	**58%**
Cervical dilatation measured	**45%**	54%	**35%**	74%	**37%**	60%	65%	56%	**36%**	**51%**
Blood Pressure monitored	28%	76%	48%	59%	26%	48%	74%	55%	68%	**54%**
Pulse recorded	**7%**	70%	39%	**31%**	**17%**	47%	38%	**18%**	61%	**26%**
Temperature +Urine monitored	**17%**	42%	**25%**	46%	**37%**	46%	63%	43%	42%	**40%**

All six criteria used in the active phase were above average in Mpumalanga and North West. In the Eastern Cape and Gauteng 4 0f the 6 criteria used were below average. Figure 5b shows the proportion of all partograms reviewed in which the given standards of monitoring were recorded for each activity.

Figure 5(b): Average percentage of all partograms in which the given standards of monitoring in the active phase of labour were recorded

Figure 5(c): Percentage of partograms in which the fetal heart was correctly monitored and recorded in the active phase of labour, by province

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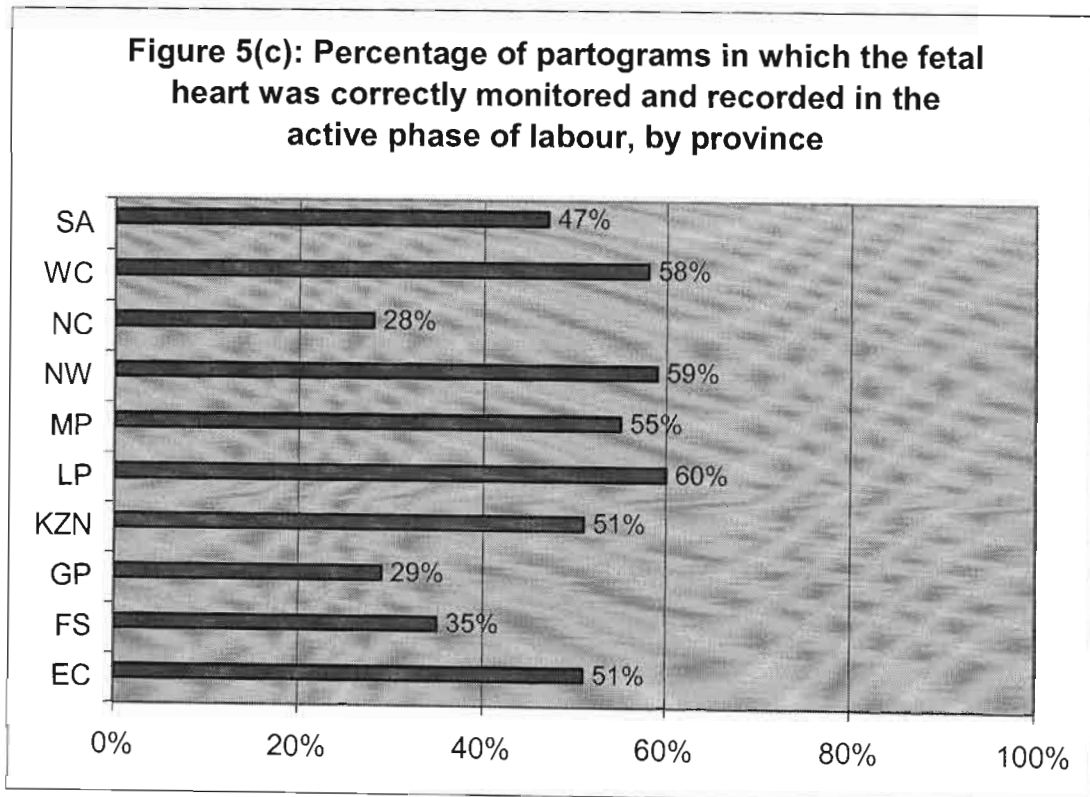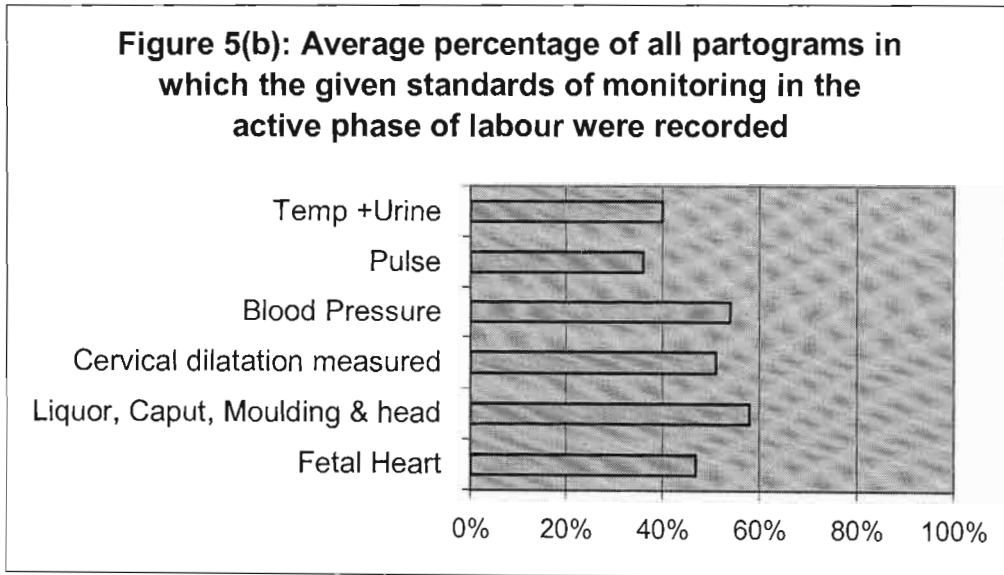
Figure 5c shows the proportion of partograms in which the foetal heart was monitored and recorded according to the given standard. The average achieved for the country is 47%.

Figure 5(d): Percentage of partograms in which the cervical dilatation in the active phase of labour was correctly assessed and recorded, by province

Province	Percentage
SA	51%
WC	36%
NC	56%
NW	65%
MP	60%
LP	37%
KZN	74%
GP	35%
FS	54%
EC	45%

Figure 5d shows the extent to which cervical dilatation was assessed and recorded every two hours in the active phase, by province

Figure 5(e): Percentage of partograms in which the maternal pulse and blood pressure were monitored and recorded half-hourly in the active phase of labour, by province

Figure 5e shows the extent to which the maternal pulse and blood pressure was recorded half-hourly in the active phase of labour, by province. This reveals that the majority of the provinces were far 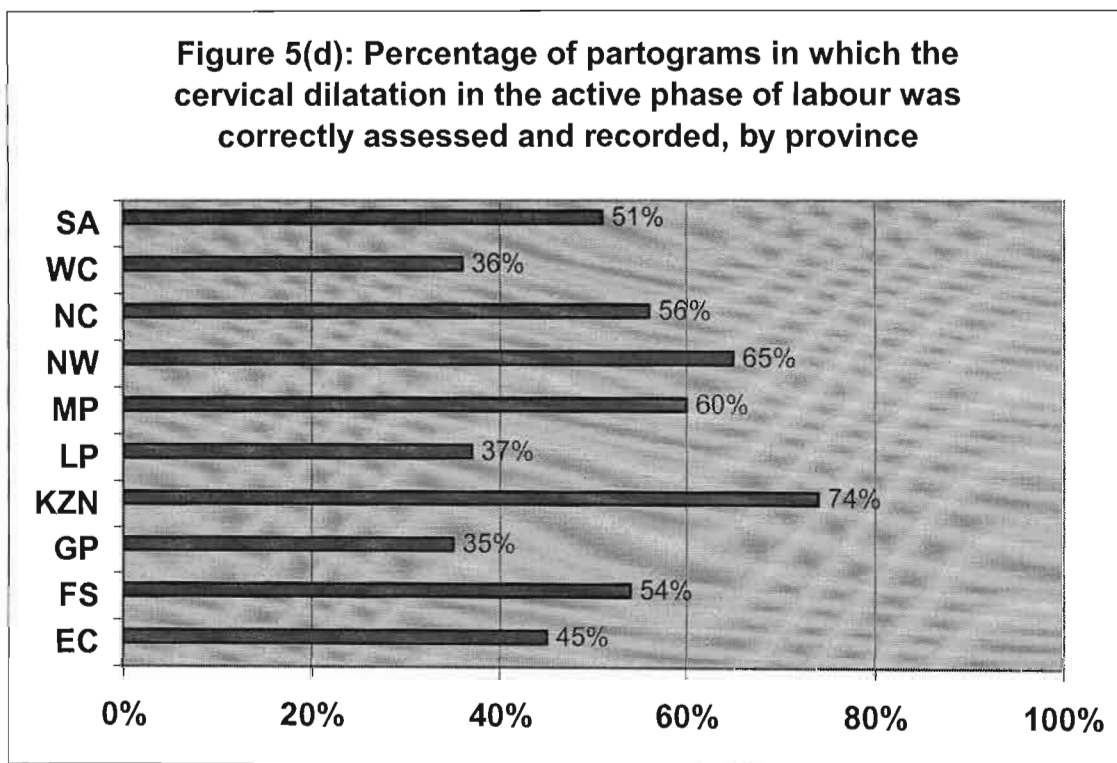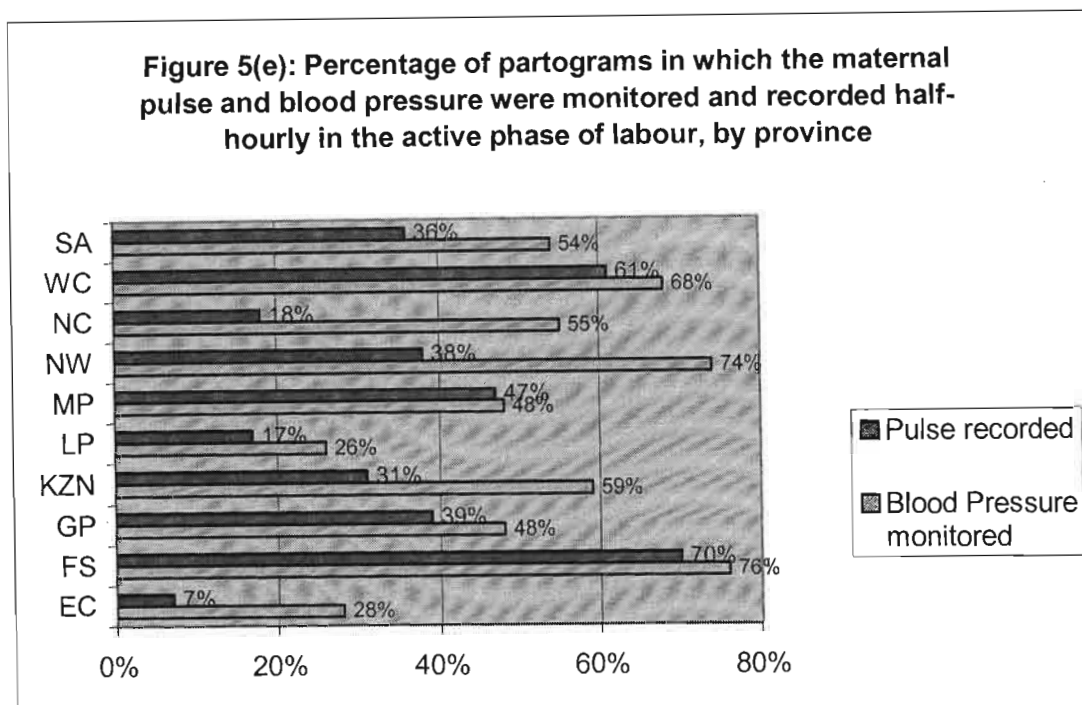from the accepted standard in the monitoring of the maternal pulse with the exception of two provinces that performed slightly above 60%.

Monitoring of the temperature and urinary output during labour was also poorly done. The average for the country falls far below 50%

5.3. Recordings of summaries and interpretation of findings:

Each two-hourly assessment (vaginal examination) in the active phase of labour should be followed by a summary of foetal condition, maternal condition, progress of labour and an action plan.

Of the 751 women in the study, 228 (30%) had a summary of the condition of the mother and the foetus recorded after each vaginal examination, as well as an indication of the progress of labour and a plan for on-going management. A further 79 (10%) women had a summary recorded after more than one vaginal examination.

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5.4. Discussion and conclusions.

This study provides conclusive evidence that recommendation five is not being implemented. Nationally 18% of women were reaching the labour ward too late for partogram use, while another 16% of women were not monitored using the partogram despite arriving timeously. Fifty six percent of women were admitted at a stage when the latent phase could have been monitored but of these well under a half had the foetal heart, cervical dilatation, BP, pulse and temperature monitored to a standard consistent with the guidelines laid down in "Guidelines for Maternal Care in South Africa". Monitoring in the active phase was also sub-standard in all parameters in all provinces. While there could be many reasons for this poor standard of monitoring, staff shortage is probably the most common. (See the case study under 3.4.1.1). In one level 1 hospital visited there was only one professional nurse on duty at night serving the whole hospital. When a patient is admitted in labour at night she is assessed, observations recorded and then she is told to ring the bell when she wants to push!

Since the LQAS sampling technique was used (see methodology), the results are statistically significant and can be used as a basis for setting priorities within provinces and for measuring progress with implementation.

5.5.   Recommendations.

5.5.1. Staffing norms for labour wards need to be established and urgent attention given to meeting these norms.

5.5.2. The National MCWH Sub-Directorate should commission the planning of a national campaign to improve the management of labour using the partogram.

5.5.3. The provinces should plan in-service training programmes for both medical and nursing staff on the use of the partogram.

5.5.4. Each maternity service should set up an effective system for the regular monitoring of the use of the partogram and for review of procedures for admission to the centre and the labour ward to eliminate avoidable delays in arrival at the labour ward.

5.5.5. Teaching institutions need to ensure that the partogram is used in their institutions as designed and that trainees should not be allowed to graduate until they are competent in its use.

5.5.6 Health education in the antenatal clinic should make clear to pregnant women the need to make satisfactory arrangements to ensure admission to hospital in early labour. In areas where reliable transport is not always available Waiting Mother's Areas should be provided at the delivery centre.

PARTOGRAM

NAME _____ PARITY _____ AGE _____ DATE _____ PELVIS _____ EFW _____

RISK FACTORS _____ DURATION OF LABOUR O/A _____

DURATION OF ROM O/A

LOW RISK

HIGH RISK

FETAL CONDITION

BASELINE	NORMAL (120-160)
	> 160
	< 120
VARIABILITY	GOOD
	POOR
	INTERMEDIATE
DECELERARIONS	EARLY
	LATE
	VARIABLE
	MIXED

LIQUOR

MOULDING — OP / PP

CAPUT

PROGRESS OF LABOUR

Denote Position e.g. LOA

Cervical length

X Cervical dilatation

CERVICAL DILATATION AND EFFACEMENT

LEVEL OF HEAD

Alert line Action line

TIME

	Contractions per 10 mins.		5
			4
■ > 40 sec	CONTRACTION		3
▨ 20-40 sec			2
▨ < 20 sec			1

MATERNAL CONDITION

DRUGS AND

INTRAVENOUS

FLUIDS

| | | Oxytocin Amount | |
| | | Drops per minute | |

	Pulse / BP	B.P. AND PULSE	210
			200
			190
			180
			170
			160
			150
			140
			130
			120
			110
			100
			90
			80
			70
			60

URINE	Prot.
	Ket.
	Glucose
	Vol.
	Temp.
	Initials

MANAGEMENT

ASSESSMENT TIME				
PROBLEMS IDENTIFIED				
ACTION TAKEN				

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Module Five
Session 3
Overhead 2

LQAS Table: Decision Rules for Sample Sizes of 12-30 and Coverage Targets/Average of 10%-95%

Sample Size*	Average Coverage (Baselines) / Annual Coverage Target (Monitoring and Evaluation)																	
	10%	15%	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	75%	80%	85%	90%	95%
12	N/A	N/A	1	1	2	2	3	4	5	5	6	6	7	8	8	9	10	11
13	N/A	N/A	1	1	2	3	3	4	5	6	6	7	8	8	9	10	11	11
14	N/A	N/A	1	1	2	3	4	4	5	6	7	8	8	9	10	11	11	12
15	N/A	N/A	1	2	2	3	4	5	5	6	7	8	9	10	10	11	12	13
16	N/A	N/A	1	2	2	3	4	5	6	7	8	8	9	10	11	12	13	14
17	N/A	N/A	1	2	2	3	4	5	6	7	8	9	10	11	12	13	14	15
18	N/A	N/A	1	2	2	3	5	6	7	8	9	10	11	11	12	13	14	16
19	N/A	N/A	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
20	N/A	N/A	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17
21	N/A	N/A	1	2	3	4	5	6	8	9	10	11	12	13	14	16	17	18
22	N/A	N/A	1	2	3	4	5	7	8	9	10	12	13	14	15	16	18	19
23	N/A	N/A	1	2	3	4	6	7	8	10	11	12	13	14	16	17	18	20
24	N/A	N/A	1	2	3	4	6	7	9	10	11	13	14	15	16	18	19	21
25	N/A	1	2	2	4	5	6	8	9	10	12	13	14	16	17	18	20	21
26	N/A	1	2	3	4	5	6	8	9	11	12	14	15	16	18	19	21	22
27	N/A	1	2	3	4	5	7	8	10	11	13	14	15	17	18	20	21	23
28	N/A	1	2	3	4	5	7	8	10	12	13	15	16	18	19	21	22	24
29	N/A	1	2	3	4	5	7	9	10	12	13	15	17	18	20	21	23	25
30	N/A	1	2	3	4	5	7	9	11	12	14	16	17	19	20	22	24	26

N/A: *not applicable*, meaning LQAS can not be used in this assessment because the coverage is either too low or too high to assess an SA.

▒ : shaded cells indicate where *alpha* or *beta* errors are ≥ 10%.

▓ : hashed cells indicate where *alpha* or *beta* errors are > 15%.

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