

**Development of an administrative neonatal database instrument for
monitoring the status of neonatal intensive care practice in
South Africa: A consensus research approach**

by

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“I alone cannot change the world, but I can cast a stone across the waters to create many ripples.” – Mother Teresa

DECLARATION

Student number: 21240192

I, Lorraine Botha, hereby declare that this research study entitled **Development of an administrative neonatal database instrument for monitoring the status of neonatal intensive care practice in South Africa: A consensus research approach** is my own work and that all sources consulted or quoted have been indicated and acknowledged by means of complete references. I further declare that this work has not been submitted for any other degree at any other institution.

Lorraine Botha

Date

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LIST OF ACRONYMS AND ABBREVIATIONS

BAPM:	British Association of Perinatal Medicine
COINN:	Council of International Neonatal Nurses
ICNN:	International Conference for Neonatal Nurses
LINC:	Limpopo Initiative for Newborn Care
MDGs:	Millennium Development Goals
MRC:	Medical Research Council
NGT:	Nominal Group Technique
NICE:	National Institute for Health and Clinical Excellence
NICU:	Neonatal Intensive Care Unit
NNASA:	Neonatal Nursing Association of Southern Africa
PICS:	Paediatric Intensive Care Society
PPIP:	Perinatal Problem Identification Program
SANC:	South African Nursing Council
SANITSA:	South African Neonate, Infant and Toddler Support Association
UNICEF:	United Nations Children’s Fund
VON:	Vermont Oxford Network

ABSTRACT

Various local and international neonatal nursing organisations have identified the dire need for a comprehensive administrative database reflecting the true status of neonatal intensive care practice in South Africa. This would enable neonatal interest groups to give input into policy-making; implement, monitor, and evaluate policies; identify particular needs to be addressed by quality improvement initiatives or projects; and to promote international benchmarking. The overall aim of this study was to determine the content of an administrative neonatal database instrument to enhance delivery of the highest quality nursing care to ill and high-risk neonates nationwide. The specific research objectives of this study were to describe and refine the content of such an instrument. This was achieved by using two consensus research methods, the Nominal Group Technique (NGT) and the Delphi method. For the NGT session representatives of organisations such as NNASA, SANITSA, SANC and The National Department of Health as well as trained neonatal nurses from both public and private sector hospitals were invited. Five participants attended the NGT session. An electronic format of the Delphi method, the e-Delphi, was used and included the participants from the NGT as well as additional unit managers, paediatricians and neonatologists. By the end of the third round of the e-Delphi method, six participants had fully participated. Through both phases data collection and analysis took place simultaneously. Based on the analysis, a draft instrument for data collection was compiled. This instrument will in the near future be piloted on a larger scale.

Key words

Administrative neonatal database instrument, consensus research, Delphi method, instrument for data collection, neonatal intensive care practice, Nominal Group technique, South Africa.

CHAPTER 1: OVERVIEW OF THE STUDY

1.1 Introduction

During an official collaborative meeting held at the 7th Annual International Conference for Neonatal Nurses (ICNN) in October 2010, various organisations such as the Neonatal Nursing Association of Southern Africa (NNASA) and the Council of International Neonatal Nurses (COINN) identified the need for an administrative database on the status of neonatal nursing in South Africa. They pointed out that the lack of available data makes it difficult to explain the actual status of neonatal nursing in South Africa, to compare it with that of other countries, and to justify COINN's contribution to strengthening the South African neonatal situation. In particular, there is an urgent need for an administrative database that can be used by neonatal interest groups to give input on policy-making, monitor and evaluate the implementation of policies, identify particular needs that can be addressed by quality improvement initiatives or projects, and to create international benchmarks. This need was once again reiterated at the 4th Annual National Neonatal Nurses' Conference held in October 2011. All the representatives of the neonatal interest groups agreed that an administrative neonatal database can improve the quality of neonatal nursing care:

“If we know where we are, we can determine where we should go and how to get there”
(Anonymous).

The Research Unit for Maternal and Infant Health Strategies of the Medical Research Council (MRC) of South Africa states that every ill or high-risk neonate has the right to the highest quality of nursing care within a neonatal intensive care environment, which includes the availability of sufficient bed space and skilled staff (Pattinson 2011:2). Moreover, providing the highest level of quality care to all neonates requires an accessible and well-equipped neonatal intensive care unit (NICU) that will ultimately improve their health outcomes (Pattinson 2011:2). Maintaining a high level of quality in nursing care requires a sufficient number of appropriately trained human resources (Hongoro & McPake 2004:1453), but in most healthcare facilities there is a shortage of such resources (Hongoro & McPake 2004:1451).

This study therefore aims to describe the development of an administrative neonatal database instrument to monitor neonatal intensive care practices that can be implemented and, ultimately, be used by neonatal interest groups to enhance delivery of the highest quality of nursing care to ill and high-risk neonates.

1.2 Background to the research

In South Africa, neonatal mortality contributes to approximately 30% of deaths of children under the age of five years. These deaths occur during the first month of life, which is considered the time of highest risk for child death (Bradshaw, Chopra, Kerber, Lawn, Bamford, Moodley, Pattinson, Patrick, Stephan & Velaphi 2008a:1294).

The mortality rate of neonates in South Africa is alarmingly high, especially in areas where neonatal intensive care is not accessible and available to everyone (Pattinson 2000:61). To improve the overall quality of neonatal intensive care throughout South Africa, it is necessary to analyse and evaluate the healthcare services continuously in order to achieve the goal of delivering the highest quality nursing care (Yoder-Wise, 2003:174).

A significant problem, however, appeared to be the lack of data on the actual neonatal situation and available resources. This was attributed to the lack of a central database of information, or a situational analysis to describe clearly the current status of neonatal practice which is needed to develop policies or strategies. The data made available by current databases are limited and therefore insufficient for monitoring the status of neonatal intensive care practice in South Africa.

Questions that the neonatal interest groups are unable to answer with the existing databases relate to determining the number of NICUs in the public and private sector, the number and utilisation of neonatal intensive care and high-care beds, the number of intensive- and high-care neonatal patients admitted and discharged over specified periods (for example, per month or per year), the human resources allocated to these units, and the skills mix of the nursing staff.

The qualifications and levels of experience of the nursing staff employed in these areas tend to vary significantly from one hospital to another. The nursing staff members can include professional nurses, enrolled nurses and enrolled auxiliary nurses registered with the South African Nursing Council (SANC) as stipulated in Nursing Act No 33 of 2005. Only a limited number of the professional nurses are registered with an additional qualification in Medical and Surgical Nursing Science: Neonatal Nursing. Indeed, the total number on the SANC database is 255 (SANC 2011c).

Some have undergone training in neonatal nursing that is listed as a short course at SANC. These courses are registered as *Listed: Certificate in Neonatal Nursing Science* (the total number on the SANC database is 229) or as *Listed: Certificate in Neonatal Intensive Nursing* (the total number on the SANC database is 169) (SANC 2011d). The majority of the neonatal nursing staff members are registered as professional nurses in terms of Nursing Act No 33 of 2005, but without any recognised neonatal training (an additional qualification or listing as explained above). They are commonly referred to as “professional nurses with neonatal experience” on account of having worked in an NICU. It is unknown how many of the abovementioned professional nurses are actually employed in NICUs. It is furthermore assumed that trained neonatal nurses would contribute to quality care and, conversely, that a lack of trained neonatal nurses would reduce the quality of care; but the actual distribution of neonatal nurses is unclear.

Furthermore, many NICUs make use of lower-category nurses, namely enrolled nurses and enrolled auxiliary nurses as defined in the Nursing Act No 33 of 2005 (SANC 2011a). There is no consensus on what the skills mix should be for NICUs, and it is impossible to determine what it should be as the reality of the current situation is obscure due to a lack of data. If it is known, it will be possible to research the relationships between the staffing of NICUs and the quality of care.

A further reality is that the number of NICU beds varies from one hospital to another – that is, anything from four to forty beds. In the researcher’s experience as a neonatal nurse, NICUs are not distributed evenly but concentrated in metropolitan areas and sparse in rural areas. If the actual distribution is known; it will be possible for the neonatal interest groups to negotiate for initiatives to overcome these inequalities in order to provide quality care to all neonates.

At the International Neonatal Nursing Conference held in 2010, COINN and NNASA identified problems in neonatal nursing practice such as the negative publicity and public outcry about the lack of quality healthcare in South Africa. This confirms the need for accurate data regarding neonatal nursing practice in South Africa.

1.3 Problem statement

There is presently no administrative neonatal database available that includes data on, amongst other, the number of available NICUs in South Africa, their monthly bed occupancy rate, as well as the levels of skilled staff in each unit.

If the leaders in neonatal care and the government are ignorant of the current situation of neonatal nursing practice in South Africa, they cannot plan future strategies to maximise resources, improve the current situation, or develop sound policies. Consequently, there is a need for an administrative neonatal database that can be used together with the existing databases to contribute to and monitor policy development, strategic planning and human resource management. To develop such a database, it is necessary, firstly, to determine the instrument to be utilised for the database.

1.4 Research question

The research question formulated for this research project was the following: *What should be included in an administrative neonatal database instrument to monitor the status of neonatal intensive care practice in South Africa?*

1.5 Purpose and objectives of the study

The purpose of this study was therefore to *determine* the content of an administrative neonatal database instrument to monitor the status of neonatal intensive care practice in South Africa.

The objectives of the study were the following:

Objective 1: *Describe* the content for an administrative neonatal database instrument to monitor the status of neonatal intensive care practice.

Objective 2: *Refine* the content for an administrative neonatal database instrument to monitor the status of neonatal intensive care practice.

1.6 Significance of the study

The true value of this study is that it provides an administrative neonatal database instrument that can be used to obtain adequate and accurate information about the status of neonatal intensive care practice that the neonatal interest groups of South Africa can use for the development of policies, strategies and initiatives that will ultimately improve the quality of health/nursing care to all neonates. The government of the day cannot develop policies for the improvement of neonatal health/nursing care without the relevant data. Such a database will further assist in the identification of particular needs that can be addressed by quality improvement initiatives or projects, as well as in the provision of a mechanism to monitor these initiatives or projects.

By using an administrative neonatal database together with existing clinical databases will contribute to, and monitor policy development, strategic planning and human resource management. This will optimise the quality of neonatal nursing care provided to critically ill and high-risk neonates, as well as to benchmark South African practices and align them with international practices.

1.7 Clarification of concepts

1.7.1 Database instrument

A database is used to gather and store information needed for analysis (Burns & Grove 2005:318). Freshwater and Maslin-Prothero (2005:166) defines a database as “a store or bank of information”.

For the purpose of this study an instrument is defined as the tool for collecting administrative data to establish an administrative neonatal database.

In this study, the development of an administrative neonatal database instrument to monitor the status of neonatal intensive care practice in South Africa will be described.

1.7.2 Neonate

Newborn or newly born refers to the first hours of an infant's life directly after birth. The term neonate is therefore defined as the first 28 days of an infant's life (Verklan & Walden 2010:91).

1.7.3 Neonatal Intensive Care Unit (NICU)

COINN (2008) defines a NICU as a unit equipped to accommodate a population consisting of neonates with conditions that may be life threatening. In the South African context, a NICU is commonly a dedicated area in a hospital with equipment to care for ill and high-risk neonates, varying from the critically ill to those being prepared for discharge after a period of hospitalisation in the intensive- or high-care area of either a public or a private hospital.

Neonatal intensive care practice involves more than nursing care. It involves the total care rendered to all newborns by healthcare workers in NICUs in both public and private hospitals.

1.7.4 Neonatal intensive care practice

“Neonatal intensive care practice” refers to the specific care rendered to ill or high-risk newborns by trained and experienced healthcare workers in hospitals with adequately equipped NICUs.

1.8 Frame of reference

The relevant paradigm and methodological assumptions underlying the research project are described below.

In this study, pragmatism was used as the paradigmatic point of departure.

Pragmatism helps to clarify how the researcher can successfully combine research approaches in order to obtain the best possible answers to significant research questions (Johnson & Onwuegbuzie 2004:16). A pragmatic approach can be used to

gain knowledge about a problem that needs solving. Both qualitative and quantitative methods can therefore be used to solve a problem.

1.9 Research design and methodology

The research design is the end result of a series of decisions made by the researcher with regard to how the study will be implemented and can be seen as a blueprint to conduct a study (Burns & Grove 2005:211). Methodology refers to the methods of obtaining, organising or analysing data (Polit & Beck 2008:758).

1.9.1 Research design

The research on which this dissertation is based was conceptualised as a non-experimental, consensus study to determine and describe the content of an administrative neonatal database instrument to monitor the status of neonatal intensive care practice in South Africa.

Non-experimental research is defined by Polit and Beck (2008:759) as “studies in which the researcher collects data without introducing an intervention”.

Consensus research methods are used to obtain quantitative data by using qualitative approaches and aim to determine the extent to which experts can reach agreement on a certain matter (Jones & Hunter 1995:367). Consequently, such methods are increasingly being utilised to aid in problem-solving, and can also be used by pre-arranging an environment suitable for experts to reach an agreement (Fink, Kosecoff, Chassin & Brook 1984:979).

1.9.2 Research methods

In this research study, consensus methods were used to identify the shared priorities among the experts regarding the content of the database instrument needed to reflect on neonatal intensive care practice in South Africa.

Ager, Boothby and Wessells (2007:125) distinguishes between two consensus methods: the nominal group technique (NGT) and the Delphi method. These two consensus methods were used to achieve the study objectives.

1.9.2.1 Nominal group technique (NGT)

The first objective of this study was to determine the content that should be included in the neonatal database instrument. For this objective the NGT was used.

According to the Centres for Disease Control and Prevention (Department of Health and Human Services 2006:1), NGT is a planned way of group conversation in order to reach an agreement. Potter, Gordon and Hamer (2004:126) stated that the NGT can generate both qualitative and quantitative information.

1.9.2.1.1 Population

The target population for this objective included representatives of various organisations, for example NNASA, South African Neonate, Infant and Toddler Support Association (SANITSA), the Department of Health, the SANC as well as trained neonatal nurses working in NICUs in both government and private hospitals in the Gauteng province.

1.9.2.1.2 Sample

Purposive sampling was used for the NGT to select suitable participants as representatives of their line of work and for their knowledge and experience related to the topic.

The inclusion criterion for this objective was that the participants were able to read, speak and write English.

For the NGT session Potter et al. (2004:126) suggested 5-9 participants per group. The researcher invited 16 participants of whom six replied to the invitation and five took part in the NGT session.

1.9.2.1.3 Stages (data collection and analysis)

During the NGT session simultaneous data collection and analysis took place. Harvey and Holmes (2012:128) identify the following five stages in designing an NGT session: introduction and explanation, silent generation of ideas, sharing ideas, group discussion and voting and ranking. During these stages the data collected was analysed by the participants and consensus reached on the outcome.

These stages are discussed in detail in Chapter 3, and the findings of the NGT are discussed in Chapter 4.

1.9.2.2 The Delphi method

The second objective of this study was to refine the content that should be included in the administrative database instrument. For this objective the Delphi method was used to refine the data collected during the NGT session.

The Delphi method can be defined as an interactive route to obtain expert opinions and can also be used to reach agreement between experts regarding certain issues (Keeney, Hasson, & McKenna 2010:4). The e-Delphi method is a process like the classical Delphi, but in the form of an online survey implemented via e-mail (Keeney 2010:7), and was chosen for the purpose of this study as it was less time consuming and less costly.

1.9.2.2.1 Population

The target population for the e-Delphi method was comprised of neonatal unit managers, shift leaders, paediatricians, and neonatologists in South Africa.

1.9.2.2.2 Sample

For this objective, quota sampling in combination with purposive sampling was used to select the appropriate participants needed for the e-Delphi method as the researcher

deliberately included participants from the identified strata based on their particular characteristics.

The inclusion criteria for this objective was that the participants were able to read, speak and write English, have access to a computer and be computer literate.

For this study objective, 14 purposively selected participants as well as the five participants from the NGT session were invited to participate in the e-Delphi method.

1.9.2.2.3 Rounds (data collection and analysis)

The e-Delphi method, which consisted of three consecutive rounds, was used to achieve this objective and data collection and analysis were again carried out simultaneously.

The ten steps for utilising a Delphi study as suggested by Rowe (2012:3-4), were followed and are described in Chapter 3.

1.9.2.2.4 Validity and reliability

Polit and Beck (2008:768) define validity as “a quality criterion referring to the degree to which inferences made in a study are accurate and well-founded; in measurement, the degree to which the instrument measures what it is intended to measure”.

For the purpose of this study the validity and reliability of the database instrument will be established and the concepts related to internal validity, external validity, construct validity and reliability will be discussed in detail in Chapter 3.

1.10 Ethical considerations

The following three ethical principles were deemed essential for the purpose of this study: respect for persons, the principle of justice, and the principle of beneficence (Burns & Grove 2005:180).

Included in the principle of respect for persons were the right to self-determination, the right to privacy, the right to autonomy and self-confidentiality, the right to fair treatment and the right to be protected from discomfort and harm (Burns & Grove 2005:181).

In order to protect the ethical rights of the participants in both groups, the research proposal was approved by the Research Ethics Committee of the Faculty of Health Sciences at the University of Pretoria. (Annexure A).

Informed consent for both phases was obtained from the participants willing to attend the NGT session and complete the e-Delphi rounds.

A detailed discussion regarding the ethical considerations will be included in Chapter 3.

1.11 Limitations of the study

The limitations experienced were firstly that there was very limited interest from both public and private sector hospitals. Secondly it was difficult to find suitable dates for the collection of data as it took place during the participants' free time. Thirdly, the e-Delphi response rates were slow, despite frequent reminders, and by the end of round 3 less than half of the participants had fully participated.

1.12 Conclusion

This chapter provided a brief overview of the study, outlined the background to neonatal intensive care practice, and sketched the state of current South African neonatal intensive care practice research.

The lack of sufficient and accurate data on the reality of neonatal intensive care practice is evident from the background discussed in this chapter. An administrative neonatal database is of crucial importance as it could be used by various organisations to monitor, and ultimately improve, the status of neonatal intensive care practice in South Africa.

The following chapters will review the current research literature, outline the research design and methodology, discuss the findings of the study, state the conclusions drawn from the study, and make recommendations for further research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

In the previous chapter a general overview was given of the study. This chapter provides a more in-depth overview of the topic under study by reflecting on the literature that was reviewed.

According to Burns and Grove (2005:93), a literature review is done in order to direct the planning and execution of a study. By doing the literature review a picture can be obtained of what is known and what is unknown about the topic of interest. It also serves as a source in which gaps in previous research can be identified. Polit and Beck (2008:136) defines a research literature review as “a written summary of the state of evidence on a research problem” and added that the purpose of a literature review is to expand the researcher’s understanding of the research topic (Polit & Beck 2008:105).

As indicated in the overview, the lack of information on the current status of neonatal intensive care practice limits the ability of interest groups and policy makers to make the best possible decisions leading to high quality nursing care. For this reason, it is thus necessary to first view the topic under study from a broader perspective, namely the quality of care and those aspects contributory to high quality care. Thereafter data and databases will be reviewed so that the data that needs to be available to monitor neonatal intensive care practice specifically, can be determined. This will allow interested parties to maximise available resources and plan strategically so that ill or high-risk neonates can get high quality nursing care.

2.2 Quality in health care

The South African Constitution (1996:Chapter 2, clause 27.1) stipulates that every person has the right to have access to healthcare services. Furthermore, the World Health organisation (WHO) defines quality of care as the level of attainment of the intrinsic goals for improving health, and the responsiveness to the legitimate expectations of the population (Lourens 2012:3). In South Africa great efforts are being

made to improve the quality of health care of the population in general through the National Core Standards which is imbedded in the National Health Act, No 61 of 2003. These standards are seen as the basis for quality, and are structured in seven cross-cutting domains, of which the first three: patient rights, patient safety, clinical governance and care, and clinical support services are of special relevance to nursing care (Lourens 2012:3). According to Yoder-Wise (2003:174), to achieve the delivery of high quality nursing care, it is necessary to analyse and evaluate the health care services.

Presently South Africa is spending 8,5% of its gross domestic product (GDP) on health (NDoH 2012b) which is higher than the 5% that the WHO recommends. However, when looking at the infant mortality rate in South Africa of 43,1 per 1000 live births, and the maternal mortality rate of 165,5 per 100,000 live births, they are very poor outcomes (NDoH 2012a).

For the quality of healthcare for neonates to therefore be improved, it is clear that it can be done if an administrative neonatal database is available, which can be used to plan strategically.

2.3 Data and databases

Data can be defined as raw, unorganised facts that need to be processed and can appear to be random and useless until they are interpreted and organised (webopedia c2013). Once data have been processed and organised, the results can be presented as information that can be of significance to decision-makers (Gillies 1994:492). Information can therefore be seen as interpreted data which allows researchers to broaden their knowledge (webopedia c2013).

Figure 2.1 on the following page illustrates how data, information and knowledge all contribute to the decision-making process (Muller, Bezuidenhout & Jooste 2006:151).

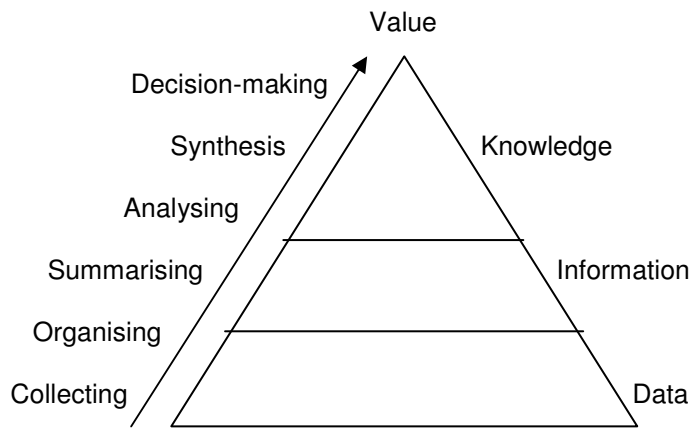


Figure 2.1 The contribution of data, information and knowledge to the decision-making process.

Data collected and analysed during research can add value to the decision-making process regarding policies and programmes and can thus contribute to saving newborn lives if applied in neonatal care (Bhutta, Darmstadt & Ransom 2003:1). Databases are systems used to gather and store the information needed for analysis (Burns & Grove 2005:318). It can also be seen as a collection of information that is organised in a way that allows a computer program rapid access to selected data pieces ([webopedia c2013](#)). Burns and Grove (2005:318) distinguish between two types of databases: clinical and administrative.

Clinical databases are created to gather clinical data and are mostly used by hospitals and healthcare professionals (Burns & Grove 2005:292). Examples of clinical data include patient records, mortality and infection rates. By comparison, *administrative databases* are valuable tools for providing information to improve service delivery and policy decision-making. During the process of investigating patterns of service consumption over a period of time, important information can be made available to interested parties by using administrative health databases (Allan, Stajduhar & Reid 2005:1). Examples of administrative data include information on both human and material resources.

According to Deyo, Cherkin and Ciol (1992:613), interest in the use of administrative databases for studying the outcomes of medical services has been increasing since the 1990s. Originally used as monitoring tools by policymakers in hospitals to track hospital activity, administrative databases have evolved over time to be used by healthcare

researchers as tools for clinical and policy-related research (Moise 2001:2). Yoder-Wise (2003:174) found that a detailed administrative database can assist healthcare institutions and providers in delivering high-quality nursing care and minimising risks to all patients. Aylin, Bottle and Majeed (2007:1) suggest that administrative databases should be used alongside clinical databases to help improve the quality of health care.

There are valuable clinical databases available but, although they play an important role in decision-making, they are not the main focus of this study, which is on administrative databases that have been identified as a need in neonatal practice. The value of both clinical and administrative databases will be discussed by means of examples in the section below, as they should be used to complement each other to improve practice.

2.3.1 Examples of databases

2.3.1.1 Clinical databases

As mentioned in the previous section, clinical databases are used to collect and store clinical data such as mortality rates. An example of a clinical database relevant to South Africa is the Vermont Oxford Network (VON) which is an international non-profit organisation formed by healthcare professionals dedicated to improving the quality and safety of the care given to neonates globally. This network contains clinical information about the health care and outcomes of high-risk neonates in NICUs. A NICU (public or private) has to meet specific criteria before it is accepted for participation in the VON research project (VON 2010:5). Also due to the costs involved, not all NICUs are able to participate, therefore the South African information made available by VON cannot be generalised or be seen as a true reflection of the South African situation. VON's information is not available in the public domain, but only to the participating units. It also excludes information about equipment and staffing of the NICUs as this information is more relevant to administrative data.

Velaphi and Rhoda (2012:67) mention The District Health Information System (DHIS) and the Perinatal Problem Identification Program (PPIP) as two other sources of information on neonatal deaths which are mostly from the public sector, but add that they have a tendency to report only on neonatal deaths during the first seven days of

life and not the whole 28 days of the neonatal period. The PPIP is a South African clinical database focussing on numbers and the causes of perinatal deaths and avoidable factors in South Africa (Pattinson 2011:94).

The aim of the PPIP is to assist healthcare facilities in the monitoring of their performances regarding the quality of healthcare in order to recognise areas in need of improvement (Pattinson 2011:94). The PPIP has been administered by the MRC's Maternal and Infant Health Care Strategies Research Unit since 1999.

Any clinical facility can participate in data collection for the PPIP as participation is voluntary, but it does imply a commitment to provide accurate information. During the period 2008-2009, there were 275 PPIP sites (clinical facilities) involved, all from the public sector (Pattinson 2011:2). It provides crucial information, but it involves voluntary participation and includes only public hospitals. The data therefore remain incomplete and not generalisable.

The reports also do not reflect administrative data regarding equipment, bed occupancy and staffing, but the recommendations refer to the need to improve quality healthcare through appropriate governance and training (Pattinson 2011:94-97).

Another clinical database that has been captured is the Saving Babies Interim Report (Pattinson 2011:3) which states that approximately 23000 newborn deaths occur in South Africa annually and mostly at district and regional hospitals. National data indicates that 61% of deaths under the age of five years are related to avoidable factors due to an inadequate healthcare system (UNICEF South Africa 2011a:1).

In South Africa, all neonatal deaths (public and private sector, as well as deaths outside health facilities) have to be reported to the Department of Home Affairs (DHA). The data received are then analysed and published by Statistics South Africa (StatsSA). However, there is always a delay of approximately two years. Consequently, the data published in 2012 only reflects neonatal deaths up to 2010. According to StatsSA, the neonatal mortality rate in 2009 was reflected as approximately 14/1000 live births, even though the WHO reported it to be 18/1000 (Velaphi & Rhoda 2012:67).

The Demographic Health Surveys conducted in 1998 and 2003 are another data source on neonatal deaths, but there is reluctance in the use of this data due to concerns about their quality (Velaphi & Rhoda 2012:67).

Studies were also carried out on neonatal mortality in health facilities, from which conclusions were drawn, such as the study by Bradshaw et al. (2008a:1294). The authors reported that neonatal mortality contributes to approximately 30% of deaths of South African children under the age of five years. These deaths occurred during the first month of life, which is considered the time of highest risk for child death.

Furthermore, a provincial newborn outreach project called the Limpopo Initiative for Newborn Care (LINC) was developed with the support of the Limpopo Provincial Department of Health, UNICEF and Save the Children. LINC was established in 2003 and aims to improve the quality of care for newborns on regional as well as district levels in the Limpopo province. Key components of LINC include training, mentoring, resource mobilisation and clinical tools (UNICEF South Africa 2011b:2-3). The total number of enrolled nurses trained by LINC from 2003 to 2010 increased from just over 50 to almost 250, and to almost 350 for professional nurses. The LINC initiative has established a solid foundation for prioritising newborn care and assisting in the improvement of facilities, skills and monitoring tools (UNICEF South Africa 2011b:17-18). Based on the requirements for proper care to newborns, the LINC team also developed an assessment tool. This tool was used for formal accreditation with which almost 50% of the hospitals in the Limpopo province have achieved the necessary standards (Pattinson 2011:vi).

UNICEF also uses clinical databases to evaluate the improvement of mother and child health through data collection and analysis. Global databases are updated and maintained and evidence-based data are used for planning and monitoring purposes. UNICEF assists in data collection through Multiple Indicator Cluster Surveys (MICS), an international household survey programme which uses its findings during policy decision-making and programme intervention and ultimately influences the quality of mother and child health globally (UNICEF 2012b).

The Child Mortality Estimation (CME) Info is another database that reflects the latest child mortality estimates based on research by the United Nations (UN) and it reported a decline in the neonatal mortality rate of 24% in Sub-Saharan Africa and 32% in Southern Africa from 1990 to 2011 (UNICEF 2012a).

Another clinical database of relevance to neonatal care is the Cochrane Collaboration. As an international non-profit organisation, the Cochrane Collaboration supplies updated research information related to health care. The Cochrane Library is a collection of databases containing expert and independent data to be used during healthcare decision-making, and the Cochrane Reviews provide quality evidence-based data to support clinical treatment decisions (The Cochrane Collaboration c2013).

The Egyptian Neonatal Network (EGNN), a non-profit organisation, aims to improve neonatal care, and its objectives include the development and maintenance of a neonatal database that can compare clinical data between participating facilities. The organisation aims to be a foundation for quality improvement, resource distribution and policy planning on departmental, regional and national levels (Healthy Newborn Network 2012:2).

In India, more than 80% of neonatal deaths happen at home and far away from health facilities. The Society for Education, Action and Research in Community Health (SEARCH) in India makes use of evidence regarding efficient care for newborns to generate a home-based approach to promote health in newborns and their mothers. Their approach involves training healthcare workers in instant emergency care to newborns, thermoregulation, breastfeeding and recognising early signs of infection. Three years after implementation of this program, a 60% decrease in newborn deaths was recorded (Bhutta et al.2003:5).

Another example of a clinical database is Saving Newborn Lives (SNL), which was started by Save the Children USA in an attempt to improve the health and survival of newborns. SNL was initiated in June 2000 and focuses mainly on informing policy-makers and programme managers on the need to make newborn health affordable. In countries such as South Africa, Egypt, India, Zimbabwe, Malawi and Ethiopia, where almost 50% of newborn deaths occur, Save the Children has joined forces with

government and other stakeholders to evaluate the state of newborn health in order to develop an action plan based on the findings (Tinker, Parker, Lord & Grear 2010:30-31).

The abovementioned examples represent clinical databases which focus mainly on clinical data that have been used as part of strategies or programmes to enhance neonatal practice. It is assumed that, during the development of the strategies or the programmes, administrative data were used, even if it is not indicated in the publications regarding the data and results. Administrative databases are therefore essential and will be discussed in the next section.

2.3.1.2 Administrative databases

More clinical data (for example on neonatal mortality) are accessible and available for countries globally, including South Africa, where the focus is on the neonatal patients and their outcomes. This information can be used to some extent to develop strategies to improve neonatal practice, but the strategies cannot be implemented without considering the administrative aspects of the context, which is currently not accessible to neonatal interest groups.

Various clinical databases are contributing to the collection of clinical data relevant to neonatal nursing care. However, there was no evidence of any available administrative databases reflecting the current status of neonatal nursing in South Africa specifically related to human and material resources to improve neonatal nursing care.

Since 1995, the PPIP has identified administrative problems, for example staff and facility shortages, as avoidable factors relating to health care (Pattinson 2011:12). Because of the lack of administrative data, the situation regarding the actual available facilities, services and staffing of neonatal intensive care practice in South Africa is unknown. This lack of data hampers the measurement of the level of quality care provided to ill and high-risk neonates, and it complicates the planning of appropriate strategies to enhance quality neonatal care (NNASA 2012).

The literature and international standards suggest that accurate data on the availability of human and material resources in NICU could assist in the recognition of

shortcomings and implementation of strategies to overcome them and improve neonatal healthcare. Currently, there is insufficient evidence to show exactly where South African neonatal nursing care stands in terms of international norms.

2.4 The need for an administrative database in neonatal nursing practice

The Research Unit for Maternal and Infant Health Strategies of the MRC (Pattinson 2011:2) states that every ill or high-risk neonate has the right to the highest quality of nursing care within an neonatal intensive care environment, including sufficiently skilled staff and ample bed availability.

In its vision, NNASA (2010) states that it aims to improve the delivery of optimal nursing care for all neonates born in South Africa. SANITSA (2005) aims to improve healthcare support to neonates, infants and toddlers in South Africa from the perinatal period until the age of three.

The National Department of Health (NDoH 2007:8) made a commitment to achieve a number of targets by the year 2000 to save the lives of mothers, infants and children, and it signed on to the Millennium Development Goals (MDGs) set by the WHO (Bradshaw, Chopra, Kerber, Lawn, Bamford, Moodley, Pattinson, Patrick, Stephan and Velaphi. 2008(b):1-15). The MDG4 is aimed at reducing mortality in children younger than five years by two-thirds by the year 2015 (Bryce, Daelmans, Dwivedi, Fauveau, Lawn, Mason, Newby, Requejo, Salama, Shankar, Starrs and Wardlaw 2008:1247-57), which is supported by various organisations and initiatives.

South African neonatal interest groups, namely the NNASA (2010) and SANITSA (2005), recognise the importance of working towards achieving MDG4. COINN, which is an important international neonatal organisation, also supports MDG4 by assisting affiliated neonatal nursing organisations such as NNASA with strategies to reduce neonatal mortality rate in their respective countries (COINN 2008). This organisation is also committed to promoting the health outcomes of all neonates and believes that neonatal care has to be provided by skilled neonatal nurses.

In order to utilise such an opportunity and to develop strategies to enhance neonatal practice, basic information regarding the true status of neonatal nursing was needed, but NNASA was unable to provide the information as the data were not accessible or available at a central place.

Velaphi and Rhoda (2012:68) mention the following contributing factors related to neonatal deaths in South Africa: staff shortages, insufficiently trained staff, equipment and facility inadequacy, bed unavailability and poor monitoring and resuscitation. They also add that these factors are of greater relevance in district hospitals. Even though 42,1% of the deaths in the district hospitals as mentioned above were due to hypoxia, the following recommendations were made: adequate facilities and equipment should be available, a sufficient number of staff members should be employed, and staff should be trained in basic newborn care and resuscitation (Pattinson 2011:xv).

In conjunction with clinical databases, administrative databases can provide valuable administrative data to assist in improving nursing care such as the number of NICUs (facilities), equipment in use, bed availability and aspects related to staffing.

2.4.1 Facilities and equipment

One of the objectives of the Paediatric Intensive Care Standards (PICS) focuses on the importance of a suitably equipped facility. Redshaw and Hamilton (2006:24) state that optimal neonatal health care requires ample bed availability and equipment in addition to adequately trained and available staff.

In South Africa, a large number of neonates are still admitted to the paediatric wards of hospitals where nearly 45% of them die within 24 hours, according to the Saving Babies Report 2008-2009 (Pattinson 2011:xv-xvi). The recommendation was therefore made that neonates should be admitted to specialised facilities with adequate equipment and resources (Pattinson 2011:xv-xvi). The Saving Babies Report states that the quality of care depends upon adequate resources at healthcare institutions, in addition to the availability of staff with the appropriate knowledge and skills to provide the care needed (Pattinson 2011:12).

In the UK, the Multidisciplinary Working Group at the Paediatric Intensive Care Society (PICS) drew up a set of standards for the care of critically ill children. The specific objectives of the paediatric intensive care standards consist of care given by properly trained staff in a suitably equipped facility with the relevant support services including the provision of family-centred care (PICS 2010:41). These standards are practice-based and reflect the belief that the specific medical, nursing, technical and emotional needs of critically ill children and their families are best provided for by a multidisciplinary team consisting of nurses, doctors, physiotherapists, pharmacists and psychologists (PICS 2010:4). If the structure of these standards includes, among others, the paediatric intensive care unit standards (PICS 2010:11), it is assumed that the standards will also apply to neonatal intensive care as the authors define children as “those aged 0-18 years” (PICS 2010:7).

The quality standard for specialist neonatal care no. 1, compiled by the National Institute for health and Clinical Excellence (NICE [n.d]:4), regarding in-utero and postnatal transfers recommends that mother and baby should be accommodated in the same facility.

The British Association of Perinatal Medicine (BAPM 2010:2) suggests lodging facilities for families of long-term patients. The Standard for NICU Design no. 17: Family Transition Rooms, focuses on the availability of fully equipped family-infant rooms inside or adjacent to the NICU. These rooms should be spacious enough to accommodate the infant’s bed and equipment as well as a bed for at least one parent. Providing these lodging facilities will encourage parents to stay overnight in the NICU (White, Smith & Shepley 2013:10).

In the researcher’s clinical experience, very few NICUs provide proper lodging facilities to mothers of critically ill neonates and the lodging provided at some facilities is unaffordable for most parents. This reflects negatively on neonatal care in South Africa as it appears that family-centred care is not a priority. The gathering and incorporation of data on the availability of free or cost-effective lodging into NICU action plans can be utilised to meet these needs.

2.4.2 Bed availability

Redshaw and Hamilton (2006:24) state that sufficient bed availability is essential in ensuring quality nursing care.

The number of neonatal intensive care beds in South Africa varies from one hospital to another – that is, anything from between four and forty beds. In the researcher's experience, most NICUs in South Africa experience a shortage of bed availability with a monthly bed occupancy rate of more than 100% for neonatal intensive care patients. At the same time, there is also a shortage of staff.

Bed availability and overcrowding remains a serious problem. An example of NICU bed availability in Gauteng is the neonatal unit of the Steve Biko Academic Hospital, which has 29 beds. It is a public facility that is primarily a referral site for high-risk, complicated births and foetal abnormalities diagnosed before birth (De Witt [n.d]:2). The bed occupancy in the Steve Biko Academic Hospital can reach about 190% with as many as 63 patients in a 29-bed unit, indicating a shortage of bed availability. Kalafong Hospital is also a public hospital in Gauteng that only has a 6-bed NICU, a 20-bed neonatal high-care unit, a 10-bed neonatal observation unit, and a 10-bed neonatal step-down facility (De Witt [n.d]:2). Two examples from the private hospital sector in Gauteng are the Mediclinic Kloof Hospital with 11 NICU beds ([Mediclinic \[n.d\]](#)) and the Netcare Femina hospital with 22 NICU beds ([Netcare \[n.d\]](#)). No literature relating to the monthly bed availability and bed occupancy could be found.

The Paediatric Intensive Care Society (PICS 2010:48) suggests that, in the paediatric ICU, the bed occupancy should not exceed 80% and recommends that bed occupancy should be monitored and that there should be proof of involvement by health boards should bed occupancy increase above 80%. In addition to the availability of ample bed space, the society states that adequately equipped facilities should also include disposable stock, updated maintenance, and the servicing of equipment and laboratory services for testing (PICS 2010:44).

In the researcher's experience as a neonatal nurse, in South Africa it is not possible to maintain 80% bed occupancy due to the high demand for NICU admissions in

comparison to the shortage of specialised facilities. However, information regarding the actual number of beds available, as well as monthly bed occupancy on national level, is not in the public domain.

The collection of accurate data on the availability of facilities and NICU beds in South Africa assists in the making of plans to improve or expand current NICUs. In the absence of data, improvements cannot be made to the NICUs.

2.4.3 Staffing

Ten Hoop-Bender, Liljestrand and MacDonagh (2006:226) state that the shortage of human resources is one of the major hurdles facing the MDGs on maternal and child health. Maintaining a high level of quality in nursing care requires a sufficient number of appropriately trained human resources (Hongoro & McPake 2004:1453), but in most healthcare facilities there is a shortage of human resources (Hongoro & McPake 2004:1451). Gerein, Green and Pearson (2006:40) are of the opinion that achieving the MDGs seems doubtful without considering the importance of the recruitment and retention of skilled staff.

An example of an administrative database regarding aspects of staffing is the Geographical Distribution of the Population of South Africa versus Nursing Manpower database that is used by the SANC to determine the distribution of registered nurses, enrolled nurses, nurse auxiliaries, as well as nurses in training over the nine provinces of South Africa, who are registered or enrolled with the SANC in any given year (SANC 2011b). It does, however, not account for the number of nursing posts available in private or public settings, nurses who are currently in nursing posts, or nurses who are not actively involved in nursing. The information is also not available to specific areas of interest such as neonatal intensive care, or any information regarding skills mixes.

According to the quality standard for specialist neonatal care no. 3 (NICE [n.d]:8), specialised neonatal care should involve competent and skilled healthcare professionals, including nursing and medical staff.

The following requirements for qualifying as a specialised neonatal nurse are compulsory:

- qualification as a registered nurse or midwife;
- basic knowledge of the speciality;
- clinical decision-making skills (BAPM 2010:4-5).

PICS (2010:46) add that nurses in charge of neonatal units should be competent and experienced in the care of critically ill children. In response, BAPM (2010:4) suggests an orientation programme relevant to the basic care for neonates. PICS (2010:46) argues that newly qualified nurses should have sufficient knowledge and skills required for specialised neonatal care and recommend that every neonatal unit select a nurse responsible for providing support and advice for the professional development of nursing staff.

The unavailability of trained neonatal nurses retaining competency in neonatal care also seems to be a matter of concern. According to Velaphi and Rhoda (2012:68), contributing factors relating to neonatal deaths in South Africa are poor monitoring and resuscitation. The authors state that proper training in newborn resuscitation has contributed to a 38% reduction in early neonatal deaths and to a 30% decline in deaths due to intrapartum asphyxia, but training alone is of little use without adequate staff and equipment (Velaphi & Rhoda 2012:69). PICS (2010:46) suggest that all nurses should be updated with resuscitation training and medical staff and senior nurses should be competent in advanced paediatric life support.

BAPM (2010:2) and PICS (2010:47) suggest that the training and development needs of neonatal nurse practitioners should be met by the health institution in partnership with the universities. After conducting an electronic search of the South African nursing websites, the researcher concluded that there is currently no formal neonatal training course that is recognised by SANC. As the training needs in South Africa are not yet sufficiently being met by means of a formal, structured course, data on the shortage of trained staff can be used to motivate for formal neonatal training programmes.

The need for properly trained staff is linked to the need for sufficient staff numbers. According to a document entitled Service Standards for Hospitals Providing Neonatal

Care published by BAPM (2010:8), staff shortages can result in unsafe care, therefore contributing to mortality and morbidity rates. According to Hamilton, Redshaw and Tarno-Mordi (2007:99), the shortage of nurses in the UK could be linked to the provision of inadequate nursing care and poor patient outcomes. One hospital in London reported that six of the fifteen beds in their unit were unavailable due to a lack of staff (Health and Public Services Committee 2006:12). According to the Saving Babies Report of 2008-2009 (Pattinson 2011:xv), the mortality rate of newborns weighing 1000-1499g was the highest in district hospitals (250,4/1000 live births) where nurses were sometimes unavailable to care for newborns during the night.

The Intensive Care Nursery (ICN) of the Royal Women's Hospital in Britain provides neonatal intensive care to about 1100 infants per year. Apart from their permanent and regular staff, they also make use of casual and agency staff to fill the gaps in staff shortages. The nurse-to-patient ratio is classified as follows:

- intensive care patients – 1:1 nurse per infant;
- high-dependency patients – 1:2 nurse per infant;
- medium-dependency patients – 1:3 nurse per infant;
- recovery patients – 1:5 nurse per infant.

They do not specify the qualifications of the nurses (Callaghan, Cartwright, O'Rourke & Davies 2003:94).

BAPM (2010:8) recommends that nursing staff levels should be based on the following ratios of neonatal nurses qualified in neonatal care:

- intensive care – 1:1 nurse per infant;
- high-dependency care – 1:2 nurse per infant;
- special care – 1:4 nurse per infant.

However, registered nurses and other clinical staff may assist in the nursing care of these neonates under the direct supervision and support of the neonatal nurse qualified in this speciality.

According to the Human Resources for Health South Africa: HRH Strategy for the Health Sector (NDoH 2012b:30-31), there were 231,086 nurses registered with SANC in 2010.

Included in this number were the following categories of nurses theoretically available in both the private and public sectors per population of 10,000:

- enrolled nursing assistants (ENA) 56,039 – 11,42 per 10,000;
- professional nurses (PN) 90,836 – 18,52 per 10,000;
- enrolled nurses (EN) and pupil enrolled nurses (PEN) 31395 – 6,4 per 10,000.

It is estimated that most of the PNs that are actively employed in both the private and public sectors are located in the Gauteng and Kwazulu-Natal provinces, while the lowest number of them are located in the North West and Northern Cape provinces (NDoH 2012b:34). However, the actual numbers of those who are still in practice are unknown.

It is the researcher's observation that, in South Africa, neonatal nursing staff consists mostly of professional nurses with neonatal experience based on their having worked in an NICU. Owing to the shortage of trained neonatal staff, there also seems to be an increase in the use of lower-category nurses, namely enrolled nurses and enrolled nursing auxiliaries as defined in the Nursing Act No 33 of 2005.

NICE ([n.d]:2) compiled quality standards for specialist neonatal care emphasising the importance of adhering to the physical, psychological and social needs of neonates and their families. The aim of the quality measures relating to these standards is to improve specialised neonatal care linked to health outcomes.

Another objective of PICS focuses on the significance of support services, which include pharmacy, physiotherapy, dietetics, occupational therapy, speech and language therapy, psychological support, and social services (BAPM 2010:12), as well as administrative and clerical support relevant to the size of the unit and the level of care (PICS 2010:47).

Two examples of support services relating to neonates and their families include support with breastfeeding and the accommodation of families to remain in close contact with the neonates. The accommodation issue has already been discussed earlier, to illustrate the kind of support to parents that can contribute to the long-term outcomes of the neonates and their families, but it can only be included in the planning of facilities if the reality of the current situation is known.

The quality standard for specialist neonatal care no. 6 focuses on the importance of rendering support to mothers of critically ill babies regarding breastfeeding and the expressing of breast milk. This means that healthcare professionals take responsibility to support all the mothers of babies in NICU with breastfeeding and the expressing of breast milk (NICE [n.d]:11). The Recommended Standards for NICU Design no. 14: Support Space for Ancillary Services recommends a relaxing environment with hand basins and access to the NICU as part of lactation support (White et al. 2013:10). Knowledge about the availability of breastmilk banks and adequate breastfeeding facilities in South African NICUs can assist neonatal groups in improving on existing policies regarding the advantages of breast milk.

In all the examples mentioned, there is insufficient information available for the neonatal interest groups or the public regarding matters such as staffing, bed occupancy and equipment. To engage in strategies or programmes in collaboration with international bodies such as COINN, there is a need to provide detailed administrative information regarding bed availability, equipment, staffing, etc., which is currently unavailable on a central database. This identified need gave rise to the research reported on in this dissertation.

2.5 Conclusion

This chapter reviewed the existing literature that discussed the value of data and databases referring to neonatal nursing care.

As long as it is unclear what the reality of the current situation is, it is impossible to develop proper policies, strategies or initiatives to improve the quality of neonatal health care in South Africa. The lack of data on the current status of neonatal nursing in South Africa prevents the proper measurement of quality neonatal health care as well as the planning of quality improvement strategies (NNASA 2010). It appears that the data is available at the respective NICUs but remains inaccessible to national neonatal interest groups.

Developing an administrative neonatal database to determine the current status of neonatal nursing in South Africa could assist neonatal interest groups and governing

bodies in decision-making, policy development and human resource management, including staff training, as positive contributions to a common goal for neonatal nursing in South Africa. The development of such a database would also make international benchmarking and collaboration on shared interests possible and have a positive impact on the quality and availability of neonatal care provided by skilled professionals. Chapter 3 will focus on the research design and methodology used to reach the specific research objectives.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

True professions are based on scientific knowledge that is systematised, codified and validated. The term scientific is not synonymous with the natural sciences, but refers to facts or phenomena that have been gained through the use of the scientific method. Babbie and Mouton (2001:72) state that all empirical research conforms to a standard logic. They describe this as the PRODEC framework, namely: Pro: a research problem, D: the research design, E: empirical evidence, C: conclusions.

As discussed in the previous chapters, the main problem identified for this study was the lack of available data to explain the actual status of neonatal nursing in South Africa. The data made available by current databases are limited and therefore insufficient to monitor the status of neonatal intensive care practice, or to be utilised by neonatal interest groups to influence policy and decision-making in South Africa. This created a crucial need for a comprehensive administrative database to monitor the status of neonatal intensive care practice in all South African settings over time. The research was limited to describing the content of an administrative neonatal database instrument. The study was based on the research question: *What should be included in an administrative neonatal database instrument to monitor the status of neonatal intensive care practice in South Africa?*

Chapter 2 reviewed literature relevant to the topic; this chapter will explain the research design and methodology used to obtain empirical evidence from which conclusions can then be drawn.

3.2 Research design

According to Polit and Beck (2008:203), the research design of a study indicates the basic strategies researchers can use to build up precise and interpretable evidence. For the purposes of conducting a study, the research design is regarded as a blueprint to

maximise control over factors that may influence its validity and provides guidance to the researcher during the planning and implementation of the study in order to achieve the intended goal (Burns & Grove 2005:211).

For this study the research method chosen to determine and describe the content of an administrative neonatal database instrument to monitor the status of neonatal intensive care practice in South Africa was non-experimental consensus methods.

The aim of consensus research methods is to obtain quantitative data by using qualitative approaches and aims to determine the extent to which experts can reach an agreement on a specific matter about which they have knowledge and experience (Jones & Hunter 1995:376).

Consensus research is a non-experimental design which is consistent with the definition by Polit and Beck (2008:759), which describes it as “studies in which the researcher collects data without introducing an intervention”. In this study there was no intervention by the researcher during either of the two consensus methods to manipulate either the decisions of the participants or the outcome of the selected data.

Consensus methods provide structure for agreement and disagreement and also look for ways to manage possible bias (Ager et al. 2007:124). The authors further suggest that consensus methodology can be a resourceful and valuable way to identify shared priorities in research and development (Ager et al. 2007:126). By pre-arranging an environment suitable for experts to reach an agreement, consensus research methods can be helpful in problem-solving (Fink et al. 1984:979).

3.3 Research methodology

Research methodology can be defined as “the steps, procedures and strategies for gathering and analysing data in a study” (Polit & Beck 2008:758). Holloway and Wheeler (2010:340) define methodology as “the framework of theories and principles on which methods and procedures are based”.

The framework within which the study was conducted was pragmatism. According to Johnson and Onwuegbuzie (2004:18), a few general characteristics can be associated with pragmatism:

- Pragmatism aims to find a feasible solution to a problem.
- The reality and influence of human experience in action is highly regarded by pragmatism.
- Knowledge is mutually constructed and based on the reality of people's worldly experiences.
- Present truths, meaning and knowledge are seen as temporary and can change over time.
- Action is preferred to philosophising.
- Theory that can be put into valuable practice is endorsed.
- Pluralism is also endorsed.

The following assumptions of the pragmatic researcher are relevant to this study (Creswell 2009:10-11):

- Pragmatists do not perceive the world as an absolute unity.
- A mixture of approaches can be used to study the world.
- Truth is what currently works and various methods are used to obtain relevant information to solve the problem.
- Pragmatism permits numerous methods of data collection and analysis.

In this study, two consensus research methods were used to identify the shared priorities among the experts regarding the information needed to reflect on the status of neonatal intensive care practice in South Africa. Firstly, the researcher chose the nominal group technique (NGT) because experts within Gauteng who had access to the pre-arranged venue could meet face-to-face to discuss and determine the content needed to be included in the database instrument. Secondly, by using the e-Delphi method in refining the data collected during the NGT session, the researcher conducted all correspondence via e-mail and could invite experts without considering geographical restrictions.

3.3.1 Nominal group technique (NGT)

The NGT is one of the most frequently used consensus development methods (Harvey & Holmes 2012:188). Developed in the 1960s, it was used to assist in valuable group decision-making in socio-psychological research, but it has since been used in health and education research as well (Potter et al. 2004:126).

A main characteristic of the NGT, which distinguishes it from other methods, is the pre-arranged face-to-face discussion sessions held to obtain data from experts on a specific topic (Harvey & Holmes 2012:188), thus enabling the researcher to obtain and prioritise actual data from experts that are actively working in the applicable field (Harvey & Holmes 2012:190).

The purpose of the NGT is to gather data on a specific topic and then to prioritise the data in the course of group discussions (Potter et al. 2004:126). The authors identified three typical uses of the NGT: identifying the problem, developing solutions to this problem, and creating priorities for action.

Using the NGT from a focus group perspective can add significant value to the focus group when generating ideas regarding a specific topic and then prioritising the data during group discussion (Harvey & Holmes 2012:188). By involving various experts from different settings, the NGT can also provide shared views of a certain topic significant to them (Harvey & Holmes 2012:190).

The researcher must be a specialist in the subject matter and have a clear understanding of the issues under discussion. The purpose of the NGT session must be clear, the questions should be interesting, and the researcher should be familiar with the method of the NGT in order to provide adequate facilitation (Potter et al. 2004:127).

One of the main advantages of the NGT is time efficiency: it requires little or no preparation on the part of the participants and makes it possible for a considerable amount of data to be collected in a single session. This ensures participant satisfaction as the results are obtained during the actual session. The use of this method furthermore curtails expenses, thereby making the NGT cost effective. By providing an

environment where all participants are given an equal opportunity to share their views, this method also proves to be useful in creating mutual enthusiasm among the participants that can ultimately lead to better results (Harvey & Holmes 2012:190).

According to Potter et al. (2004:127), the NGT can reduce researcher bias as it is a structured method. Sumsion (2000:3) adds that structure can ensure a valuable contribution from the participants. The NGT is furthermore a non-intimidating and depersonalised method to identify significant issues. Prioritising these issues takes place by voting and ensures clarification of the issues for both researcher and participants.

Although the NGT has many advantages, it also labours under a few disadvantages. Gallagher, Hares, Spencer, Bradshaw and Webb (1993:79) point out that preparing for the NGT might be time-consuming as the researcher has to find and prepare an appropriate venue. The NGT also lacks flexibility as it can only manage one issue at a time and requires a certain number of participants to be involved. The selected participants should feel at ease with one another as well as with the process.

As the advantages of the NGT outweigh its shortcomings, this method was chosen as part of the research methodology.

3.3.1.1 Population

Polit and Beck (2008:761) define population as “the entire set of individuals or objects having some common characteristics”, and distinguish between a *target population* and an *accessible population*. A target population is said to be the “aggregate of cases about which the researcher would like to generalise” and the accessible population is defined as the “aggregate of cases that conform to designated criteria and that are accessible as subjects for a study” (Polit & Beck 2008:338).

For the NGT, the target population included the representatives of various organisations of relevance in the neonatal field, for example NNASA, SANITSA, the Department of Health, and SANC, which are all involved in the use of nursing-related databases, as well as trained neonatal nurse practitioners from both private and public sector hospitals in the Gauteng province.

3.3.1.2 Sample

Sampling involves a course of action where a part of the population is selected to symbolise the entire population (Polit & Beck 2008:339). The authors define a sample as “a subset of a population, selected to participate in a study”.

Purposive sampling was used to select suitable participants for participation in the NGT session. According to Polit and Beck (2008:343), purposive sampling is one of several methods a researcher uses to choose certain members of a population for a specific reason. The participants were chosen as representatives of their line of work and selected for their knowledge and experience related to the topic. They were the following:

- Members serving on the boards or committees of neonatal interest groups, for their knowledge about the need for information to use during discussions on policy and decision-making.
- Members of the National Department of Health and SANC, for their interest in neonatal care and health databases.
- NICU managers and/or shift leaders from both the private and public sector hospitals in Gauteng, South Africa, for their input from the nursing field.

The inclusion criterion for the study was the following:

- Participants had to be able to read, speak and write English, as this was the medium of communication that was used during the NGT session.

Even though large groups have previously been used in NGT sessions, Potter et al (2004:126) suggest 5-9 participants per group.

The researcher invited 16 representatives from various organisations as well as from private and government hospitals to participate in the NGT session. These selected participants were invited via e-mail three weeks in advance to attend the NGT session. The information and consent leaflet (see Annexure B) was included in the e-mail, explaining in detail the purpose of the NGT session as well as what would be expected from each participant on the day. The venue chosen was centrally situated and easily accessible. The researcher had selected a date and time that suited most of the

participants. Of the 16 representatives invited, 6 replied to the invitation and 5 took part in the NGT session. These five participants included two unit managers, two shift leaders and one NNASA representative. The participants who attended the NGT session represented both the private (Mediclinic Southern Africa) and public health sector and NNASA.

3.3.1.3 Stages (including data collection and analysis)

Burns and Grove (2005:733) define data collection as a “precise, systematic gathering of information relevant to the research purpose or the specific objectives, questions or hypotheses of a study” and add that data analysis is used to trim down and categorise data as well as determining the significance of it.

Simultaneous data collection and analysis forms an integral part of the steps of the NGT (Potter et al. 2004:128). The data collected for this study during the NGT session were analysed and prioritised by the group. The findings are discussed in Chapter 4.

Harvey and Holmes (2012:128) identify five stages in designing a NGT session. These stages are discussed in the following section, with specific reference to their application in this particular study and how the stages materialised.

The actions to be taken in each of these five stages, as described by Potter et al. (2004:191), were followed.

Stage 1: Introduction and explanation

As the facilitator of the NGT session, the researcher opened the session by introducing herself to the participants and welcoming them to the discussion. Each participant was given the opportunity to introduce herself to the rest of the group. The facilitator provided a brief background to the study, including the purpose of the study. Informed consent was obtained from each participant by them completing and signing the consent document attached to the information and consent leaflet (Annexure B). The objective as well as the various stages of the NGT session was explained to the group.

Stage 2: Silent generation of ideas

The following procedures for the second stage of the NGT session were followed as suggested by Potter et al. (2004:191). The researcher provided each participant with a written copy of the question to be discussed. The following question concerning the purpose of the meeting was written on a white board, visible to all participants: *What data do you think should be included in this database instrument for us to determine the true status or reality of neonatal intensive care practice in South Africa?*

Each participant was given a booklet of removable self-adhesive (Post-it) notes and asked to, briefly and independently, write down their ideas (one idea per Post-it note) relevant to the question, without engaging in any discussion. A time limit of 10 minutes was given for this stage.

Stage 3: Sharing ideas

As suggested by Potter et al. (2004:191), the facilitator started with the nearest participant and, in a clockwise direction, gave each participant the opportunity to verbalise each of their ideas while the rest of the participants write down new ideas that occurred to them on hearing what the others have to say.

The facilitator then collected all the Post-it notes with the ideas and placed them on a whiteboard, visible to all participants. No discussion took place during this stage, which lasted 20 minutes.

Stage 4: Group discussion

The next step involved a discussion of all the ideas that had been written on the Post-it notes.

During this stage, every idea submitted by the participants was discussed to determine its relevance to the question. The facilitator afforded all the participants an opportunity to ask questions or give input regarding each idea, ensuring that all their ideas were understood. The participants identified three main groups in which the ideas could be

included. This is discussed in more detail in Chapter 4. This stage of the NGT session lasted 60 minutes.

Stage 5: Voting and ranking

During the NGT session, the facilitator once again emphasised that every idea had to be relevant to the question. The participants were given the opportunity to prioritise each idea under the relevant group and reach consensus regarding the content obtained. This stage lasted 60 minutes. The results are discussed in Chapter 4.

The objective of the NGT, namely to determine the content for an administrative neonatal database instrument to monitor the status of neonatal intensive care practice, was met. It was followed by the Delphi method, which is discussed in the next section, so as to refine the content.

3.3.2 The Delphi method

Keeney et al. (2010:3) define the Delphi method as “a multi-staged survey which attempts ultimately to achieve consensus on an important issue” and adds that the Delphi method can be seen as an interactive route for experts to reach agreement by obtaining expert opinions regarding certain issues (Keeney et al. 2010:4).

The Delphi method differs from the NGT in the sense that it obtains consensus from experts on a specified topic through multiple structured questionnaires, also called rounds (Hasson, Keeney & McKenna 2000:1010). The various rounds are discussed later in this chapter.

Developed in the 1950s (Rowe 2012:1), the Delphi method is believed to be valuable when participants are from different backgrounds as regards their knowledge and skills, and consensus is required in a field where it was previously lacking. Powell (2003:376) states that the Delphi method is a useful technique to combine individual opinions when faced with deficient information.

The key purpose of this method is to facilitate communication between a group of experts that are geographically distributed, while simultaneously avoiding the peer pressure associated with physical group meetings (Lindqvist & Nordänger 2007:2). McIntyre, Novak & Cusick (2009:2) add that the Delphi method can be valuable when multiple participants are required to communicate effectively and numerous meetings between these participants are not possible.

For this study, the e-Delphi method was used to follow on the NGT and refine the data collected during the NGT session. The e-Delphi method is a process similar to the classical Delphi, but in the form of an online survey implemented via e-mail according to the description given by Keeney et al. (2010:7).

Given the paper-based tradition of the Delphi method, it was compulsory for participants to be able to communicate in some written format (Hasson et al. 2000:1011). Originally, questionnaires were sent out via regular mail (Lindqvist & Nordänger 2007:3); however, electronic communication has rapidly become the preferred method of communication, requiring participants to be competent in computer skills (Hasson et al. 2000:1011). The use of e-mail communication creates a user-friendly environment whereby participants are able to respond to the requirements of the process while often working in a busy environment (Lindqvist & Nordänger 2007:3).

Apart from the fact that there are hardly any geographical restrictions, the main advantage of the Delphi is the ability to reach consensus on an issue where information and practical data are limited. Participants contribute significantly to this process by sharing their knowledge and skills through the various rounds where the feedback obtained can be inspirational as new ideas are created (Powell 2003:377).

Keeney et al. (2010:9) identified the advantage of anonymity and stated that it implies that each participant is able to present his or her ideas and respond to other ideas without being influenced by the identity of other participants. Anonymity between participants also makes it possible for participants to be straightforward about their opinions, thus providing the researcher with significant information.

As the participants do not meet face-to-face, they are on an equal footing and no individual is able to dominate the discussion (Rowe 2012:4). By using e-mail, the researcher is physically absent and therefore unable to establish an influencing relationship with the participants (Lindqvist & Nordänger 2007:4). Data could therefore be collected without an intervention by the researcher.

As in the case of the NGT, there are more advantages than disadvantages associated with the Delphi method. A few basic disadvantages were identified. Powell (2003:377) states that the Delphi method may be time-consuming for participants, thereby adding to their already busy work schedules, which also increases the risk of participants not responding to the e-mails sent out during the Delphi rounds. There is also the possibility of losing interest if the process takes too long (Rowe 2012:4).

The validity of a Delphi study can be influenced by the researcher's ability to achieve and sustain a high response rate from the participants (Hsu & Sandford 2007:1), as well as preventing them from losing interest.

According to Hsu and Sandford (2007:4), establishing a clear and achievable deadline for participants can prevent them from losing interest if the process takes too long to complete. The deadline can vary from one to two weeks, after which their responses are required. The authors further suggest that the researcher should send out an e-mail reminder two to three days after the deadline, as a reminder to the participants that their responses are still outstanding.

It is important that all participants experience a feeling of partnership in the study (Keeney et al. 2010:12), and selecting participants with a mutual interest in the objective may boost their response during the various Delphi rounds.

Despite the various advantages of the Delphi method, the researcher chose it as part of the research methodology.

3.3.2.1 Population

The success of the Delphi method rests on the combined expertise of the participants who make up the expert panel (Powell 2003:378). Similarly, interest and participation in the objective under discussion can improve the degree of participant dedication (Keeney et al. 2010:8).

For the purposes of the e-Delphi method, the target population comprised of neonatal intensive care experts who would in future also be involved in the collection and utilisation of the data of this database. These experts included neonatal unit managers, shift leaders, paediatricians, and neonatologists.

3.3.2.2 Sample

Powell (2003:379) suggests that experts should be selected for their contribution to and reputation in the field. Selection of the expert panel will have a direct influence on the validity of the results, therefore the credibility of the participants is crucial (Rowe 2012:5). Preparation of a sample needs to be done appropriately to ensure positive response rates during this process (Hasson et al. 2000:1011). Participants who form part of this expert panel should be able to provide significant input applicable to the objective (Rowe 2012:2).

The input of ideas and data collected for analysis can be directly affected by the number of participants (Hasson et al. 2000:1010). As Keeney et al. (2010:8) point out, the sample size depends on the purpose of the study as well as the timeframe for data collection. Rowe (2012:2) implies that a higher number of participants could improve the reliability of the data, but suggests that 10-15 participants should be adequate.

In this study, quota sampling in combination with purposive sampling was used to select the appropriate participants needed for the e-Delphi method.

Quota sampling can be seen as a way for the researcher to identify the population strata (in this case, the various hospitals) and then to select the appropriate participants from each strata (in this case, the neonatal unit managers, shift leaders, paediatricians and neonatologists) by using knowledge regarding the characteristics of the population (Polit & Beck 2008:342).

Purposive sampling was used in the study as the researcher deliberately included participants from the identified strata based on their particular characteristics. They were the following:

- Unit managers and shift leaders responsible for neonatal nursing, training and development, from the private and public sectors, for their input from the nursing field.
- Paediatricians and neonatologists for their active involvement in the improvement of neonatal healthcare.
- Participants from the NGT session for their expertise in neonatal care and initial involvement in data collection.

The inclusion criteria for this study were the following:

- Participants were able to read, speak and write English, as this was the language of communication.
- Participants were computer literate and had access to a computer with internet and e-mail facilities as this was the communication method of choice for the e-Delphi method.

For this part of the study, the researcher invited 14 participants as well as the five participants from the NGT session. The 14 participants included two paediatricians, five unit managers and seven shift leaders.

3.3.2.3 Rounds (including data collection and analysis)

The e-Delphi method consisted of three consecutive rounds. Data collection and analysis were carried out simultaneously during the rounds of the e-Delphi method.

Rowe (2012:3-4) suggests ten steps for implementing a Delphi study, which were implemented during this study.

Step 1: Determine the objective

For this phase, the objective was to refine the data collected during the NGT session as possible content for the database instrument to monitor the status of neonatal intensive

care practice. The participants were therefore expected to refine the data through a process of elimination.

Step 2: Round 1

Rowe (2012:3) suggests that, after the first set of questions has been designed, the list should be sent out to the selected participants. The researcher, however, used the first round to send out an e-mail to each of the 19 selected participants. It contained the participant information leaflet (Annexure C) explaining the research objective as well as requesting each participant's consent to participate in this study. The researcher included a summary of the ideas generated during the NGT session on the content required for the database instrument (Annexure G). The participants were given a week to respond to this e-mail as confirmation of their willingness to participate in the e-Delphi study.

Step 3: Send a reminder

Rowe (2012:3) recommends sending out an e-mail to participants as a reminder for them to respond to the first e-mail. The reminder e-mail was sent out four days later to draw their attention to the one-week deadline for participant consent. A week later, by the date stipulated in the first e-mail, the researcher had received only nine responses.

Step 4: Analyse the responses from round 1

Of the 19 participants invited during the first round, only 9 agreed to participate in the e-Delphi study and were included in the second round.

Step 5: Round 2

Rowe (2012:3) suggests that the researcher should test the second round by using a small sample of participants to determine if the results will be significant. The researcher, however, decided to include all participants, as there were only nine.

The researcher categorised and transposed all the ideas generated during the NGT session to a 3-point Likert scale (see Annexure H). According to Burns and Grove (2011:357), the Likert scale is “designed to determine the opinions or attitudes of study subjects” and is the most frequently used of all scaling methods. As explained by Burns and Grove (2005:358), the original version of the Likert scale included three response categories, each of which is given a value of 0 for the most negative response and 2 for the most positive. The researcher included the following agreement options: 0 – not to be included in the database (disagree), 1 – idea to be considered for inclusion in the database (uncertain) and 2 – definite inclusion in the database (agree).

An e-mail, which included the 3-point Likert scale (see Annexure H) as well as a brief description of what was expected of each participant, was sent out to the nine participants. They were asked to rank each idea on this scale according to the agreement options provided. In addition, they were encouraged to comment on their reason for each ranking as well as add suggestions for additional ideas to be included. The participants were asked to return their completed Likert scale within two weeks.

Step 6: Send a reminder

Rowe (2012:3) once again recommends that a reminder e-mail be sent to all participants. A week later, the researcher sent out a reminder e-mail to each of the participants, reminding them of the two-week deadline. By the deadline, only four of the nine participants had completed the Likert scale. Another e-mail was sent out, thanking those who had already responded and giving the remaining six participants another week to complete the second round.

Step 7: Analyse the responses from round 2

After a total period of three weeks, nine participants had completed the second round. The researcher analysed each participant’s responses. The highest score that could be given to each idea was two and as there were nine participants, the researcher multiplied this score by the nine participants to obtain a total score of 18. All ideas ranking 50% or lower than this score (therefore obtaining 9 or less out of 18) were excluded, thus refining the data. The result from the second round is discussed in Chapter 4. The ideas that obtained more than 50% were transferred to another scale (see Annexure I).

Step 8: Round 3

Again, the researcher decided not to test this round on a small sample as advised by Rowe (2012:4), but to involve all nine participants. The researcher sent out an e-mail to the nine participants and included the second scale and a brief explanation of what was expected of each participant during this round. This scale only had two response categories, namely *Agree* and *Disagree*, where each participant was asked whether she agreed or disagreed with the remaining data as a whole. If they disagreed, they were asked to motivate why.

The researcher asked the participants to respond within three weeks with their completed scale.

Step 9: Send a reminder

Two weeks later, the researcher sent out a reminder e-mail.

Step 10: Analyse the responses from round 3

After three weeks, only six of the nine participants had responded to the third round. According to Rowe (2012:4), during this stage, the researcher analyses the responses from the third round and determines whether the objective has been achieved. Once consensus is reached and the data has been converted into a format or instrument that can be used to obtain the baseline data, it would be circulated once more to the participants for feedback.

The researcher found the chosen methodology to be effective in determining and refining the data needed for this database.

3.3.2.4 Validity and reliability

For the purpose of this study, the concepts related to internal validity, external validity, construct validity and reliability will be discussed.

3.3.2.4.1 Internal validity

According to Burns and Grove (2005:215), internal validity is “the extent to which the effects detected in the study are a true reflection of reality rather than the results of extraneous variables”.

In this study, internal validity was enhanced by the fact that the data collected was a true reflection of each participant’s input and not of the researcher’s preferences. The internal validity of the study was further enhanced by the use of experts in the field who knew and understood the context very well and could therefore identify the content needed to reflect the reality of neonatal intensive care practice in a database. This was done by utilising the two aforementioned methods to obtain and refine the content of the instrument. An inherent advantage of using the process followed in the NGT (objective 1) and the e-Delphi technique (objective 2) was the resultant increase in internal validity.

3.3.2.4.2 External validity

External validity refers to the degree to which results can be generalised or transferred to other settings or groups (Burns & Grove 2005:218).

The content for the database instrument was determined by participants from various institutions in neonatal practice to increase the potential of the results to be generalised in all provinces in South Africa.

3.3.2.4.3 Construct validity

The construct validity of an instrument refers to the extent to which the research concept is being measured (Polit & Beck 2008:750).

Within the context of this study, construct validity was established by using the input of the various participants in both the NGT and the e-Delphi method to determine the content needed for an administrative database instrument. The content of the database would reflect the priority given to the information which was selected by the experts while using these methods.

3.3.2.4.4 Reliability

Polit and Beck (2008:764) define reliability as “the degree of consistency or dependability with which an instrument measures an attribute”.

An inherent characteristic of the NGT and the Delphi technique is that they enhance the reliability of the results by involving experts, who were in this study, experts in neonatal care who gave their input regarding the research.

3.4 Ethical considerations

The principles of ethics were adhered to as follows. The study was approved by the Research Ethics Committee of the Faculty of health Sciences at the University of Pretoria (Annexure A). Furthermore, the following three ethical principles were deemed essential for the purpose of this study: respect for persons, the principle of justice, and the principle of beneficence (Burns & Grove 2005:180).

3.4.1 Respect for persons

Respect for persons or human dignity includes the right to self-determination and the right to full disclosure (Polit & Beck 2008:171).

The right to self-determination means that participation in this study was completely voluntary. The participants were informed that they had the right to withdraw from the study at any time when the study was explained to them and they were invited to participate.

The right to full disclosure means that all the information regarding the study would be disclosed to the participants. Such disclosure would enable them to make an informed decision whether or not to participate in the study. Each participant received a participant information leaflet with the relevant information about the study. After the participant was satisfied with the information provided in the leaflet, a written informed consent document was signed for participation in the NGT (see Annexure B).

For the e-Delphi method, each participant was sent a participant information leaflet (see Annexure C) via e-mail and consent was obtained when the participant responded to the e-mail sent out during Round 1.

3.4.2 Principle of justice

The principle of justice includes the right to fair treatment and the right to privacy (Polit & Beck 2008:173).

The right to fair treatment was taken into consideration when selecting the various participants for each group. The researcher adhered to the selection criteria as previously stipulated.

The researcher ensured that the participants' right to privacy was respected at all times and no information was used without their explicit consent. Each participant signed the participant consent document, but once the data was analysed no one was able to identify any of the participants as their names were not used during data collection.

A significant advantage of the e-Delphi method was that participants were given the opportunity to provide input without being dominated or influenced by other participants as all communication was done via e-mail only between the researcher and participants.

3.4.3 Principle of beneficence

This principle includes the right to freedom of harm and discomfort and the right to protection from exploitation (Polit & Beck 2008:170).

During this study, the researcher exercised extreme caution not to harm or cause discomfort to any participant by ensuring that no participant was coerced into giving input or participating against his or her will. All participants received the participant information leaflet and signed the consent form for the NGT session and/or replied to the invitation for the e-Delphi method. Under no circumstances was information obtained from any of the participants without their consent and participants had the choice to continue or withdraw from the study at any time.

All the data collected during the NGT session and the e-Delphi method will be stored for 15 years as stipulated by the Research Ethics Committee of the Faculty of Health Science of the University of Pretoria. In addition, the participants' confidentiality remained protected as all data collected were kept strictly confidential and no one was able to identify any of the participants. Research reports and articles in scientific journals would not include any information that could identify the participants or the institution they represented.

3.5 Limitations of the study

Although the chosen methodology proved to be effective for data collection during this study, the researcher found that both methods had limitations, as will be discussed in the rest of this section.

The first significant limitation was that only one of three private sector hospital groups chose to participate, and there was either a lack or a limited amount of interest from the public sector as well as from health- and nursing-related organisations, resulting in an unequal amount of input received from the neonatal healthcare-related organisations concerned.

A second limitation was the time and availability of experts to participate in the NGT discussions, because the researcher found it difficult to accommodate them on a date and time suitable for all. In addition, the researcher had to conduct this study without any financial assistance and could not provide interested parties with travelling and accommodation allowances to involve more participants. During the e-Delphi method session, the researcher found that invitees chose not to participate due to time constraints as all of them worked full-time and had to utilise their free time to participate. Even though the e-Delphi method enabled the researcher to reach more participants, many had either no or only limited access to e-mail and Internet facilities.

Thirdly, during the e-Delphi method, the response rate of the participants was slow, despite the clear deadline given for each round. The researcher sent out reminders between the stages to encourage the participants to respond, but this continued to present a problem during the study.

Fourthly, the use of research terminology in the participant consent and information leaflet also proved to be a limitation during this study as a few invitees lost interest due to their not understanding what was expected of them. A large number of hospitals and organisations simply declined the invitation without giving any reason. Through verbal and electronic feedback, several of the participants remarked that, initially, they had found the research terminology intimidating and discouraging.

3.6 Conclusion

This chapter focused on the research design and methodology used to address the particular research question. Through the use of consensus methods sufficient data was collected during the NGT session and refined during the e-Delphi rounds to develop an administrative neonatal database instrument to monitor the status of neonatal intensive care practice in South Africa. The findings of both methods will be discussed in Chapter 4.

CHAPTER 4: RESEARCH FINDINGS

4.1 Introduction

In the previous chapter an explanation was given of all the steps followed to obtain the data that was relevant to the study, in a scientific manner. According to Smit (1983) in De Vos, Strydom, Fouche and Delpont (2002:249), the overall goal of a research report is to present the findings in an intelligible and scientific manner, as effectively and economically as possible. Burns and Grove (2005:737) add that the findings of a study are the results which have been translated and interpreted.

This chapter will present and discuss the findings obtained from the investigation using the NGT and the e-Delphi method, as well as the relevant literature.

The need for an administrative neonatal database was discussed through a literature review in Chapter 2. The aim of this study was to describe the content that should be included in an administrative neonatal database instrument by using two consensus research methods.

4.2 Findings of Nominal group technique (NGT)

The NGT was used during the first objective to describe the content for this administrative neonatal database instrument. Simultaneous data collection and analysis took place during the following five stages: (1) introduction and explanation, (2) silent generation of ideas, (3) sharing of ideas, (4) group discussion and (5) voting and ranking, as explained in Chapter 3.

After the introduction, explanation of the stages and clarification of the research objective, the participants had the opportunity to generate ideas relevant to the research question presented in stage one. They verbalised all their ideas without discussion and the Post-it notes were placed on the white board for all to see. The various ideas generated during stages two and three are recorded in Annexure F.

During stage four, all the participants were given the opportunity to motivate the inclusion of their ideas, give input on each other's ideas, and clarify what they did not understand. After the discussion, the following main themes were identified and will be discussed in more detail:

- Staff;
- Hospital;
- Resources.

As mentioned in Chapter 2, administrative databases can provide valuable information on essential aspects such as staffing, availability of NICUs and their bed availability, and relevant equipment. The results of the NGT session therefore confirm what is stated in the literature.

4.2.1 Staff

The current shortage of neonatal nurses has had a significant effect on the nursing profession (Hom 2003:36), and the training, support and management of neonatal staff seemed to be the main subthemes identified during the NGT session.

4.2.1.1 Training of staff

As regards staff and staff training, the shortage of trained staff seemed to be a widespread problem. The shortage of nursing staff contributes to the slow progress in reducing mother and child mortality rates (UNICEF 2011b). Several hospitals in London have reported having unoccupied beds due to the severe shortage of trained neonatal staff to nurse patients in those beds (Health and Public Services Committee 2006:12).

Neonatal nursing staff members are mostly professional nurses with neonatal experience based on their having worked in an NICU. The use of lower-category nurses, and sometimes even lay healthcare workers, seems to be increasing due to the shortage of trained neonatal staff. These lower-category employees are enrolled nurses and enrolled nursing auxiliaries as defined in Nursing Act No 33 of 2005, as sanctioned by the Department of Health (2012). Redshaw and Hamilton (2006:26) report that, in the

UK, the majority of nursing staff in neonatal units, apart from charge nurses and sisters, are enrolled nurses or enrolled nursing auxiliaries or healthcare workers.

Gerein, Green and Pearson (2006:40) state that the availability of trained staff could contribute to the delivery of high-quality healthcare to mothers and newborns. Training can take on various shapes. Opiyo and English (2010:5) propose that in-service training programmes such as the Neonatal Resuscitation Program (NRP) could improve staff members' ability to provide quality nursing care to newborns. With new nurses entering the profession and retired nurses returning for various reasons, the need for the training of neonatal nurses has increased.

4.2.1.2 Support of staff

New nurses need constant supervision through mentoring and support to develop professionally (Hom 2003:36). According to the author, orientation programmes are effective in educating staff and helping to familiarise them with the operations of a specific neonatal unit (Hom 2003:39). Healthcare facilities that demonstrate effort in promoting training and development of staff show an increase in staff retention. Buffum and Brandon (2009:358) add that mentoring can assist in improving communication between nurses and busy management and also support nurses in stressful situations.

4.2.1.3 Management of staff

Included in this sub-theme were amongst others, the need for data relating to skills mix and the use of agency staff.

According to Thomas, Sherwood, Mulhollem, Sexton, and Helmreigh (2004:554), the combination of permanent and agency staff in the neonatal unit often generates an unpredictable and difficult work atmosphere, besides influencing the continuity of nursing care.

The inclusion of data on the availability of neonatal staff, formal training, in-service training, as well as the proper support and management of neonatal staff, will assist

stakeholders in developing strategies to improve staffing conditions and, ultimately, neonatal health care.

4.2.2 Hospital

Additional data generated for improving neonatal health care include accessibility to an adequately equipped facility, ample availability of beds and specialist resources. These aspects also appear to be relevant in neonatal healthcare areas worldwide.

4.2.2.1 Bed availability

According to the Health and Public Services Committee (2006:1,9), the current 29 neonatal units across London are experiencing a shortage of beds due to the increasing birth rate and the nearly 11,000 neonates needing neonatal intensive care per year.

In South Africa, the neonatal unit at the Steve Biko Academic Hospital forms part of the Steve Biko Foetal and Maternity Service and has 29 beds. It is primarily a referral site for high-risk, complicated births and foetal abnormalities diagnosed before birth. The current bed occupancy rate of about 190%, with as many as 63 patients having to be treated in a 29-bed unit, has resulted in severe overcrowding and a concomitant increase in the infection and mortality rates (De Witt [n.d.]).

4.2.2.2 Specialist services

The need for specialised equipment, doctors, nursing staff and the availability of specialist services such as radiology, audiology and ophthalmology were also identified as essential data to collect for this administrative neonatal database.

Without accurate data regarding the availability and accessibility of neonatal healthcare facilities and available specialist services improvements to neonatal nursing care cannot be made.

4.2.3 Resources

In addition to staffing and facilities, basic resources regarding neonatal nursing care were also identified.

According to UNICEF (2011d) maternal and newborn complications can be avoided if the essential resources are available. The availability of free formula milk at certain clinics is a matter of concern due to poor sanitation and the lack of running water in some communities. Consequently, breast milk is recommended as the safest alternative (UNICEF South Africa 2011c). The South African Breastmilk Reserve (SABR) is a public division with 17 human milk banks of which 6 are situated in Gauteng and at the Kalafong hospital, the Steve Biko Academic hospital, Mediclinic Sandton, and at Netcare Femina hospitals. The aim of SABR is to provide safe donated human milk to infants that are unable to receive their own mother's milk. This initiative contributes to the health of premature babies (SABR 2012).

Significant improvements regarding neonatal health care can be made if accurate information regarding the true situation was available.

After the group discussion (stage 4) the following ideas were found to be irrelevant to this objective as they were not related to administrative data required for this database instrument:

- Socio-economic status of the families;
- Literacy levels of the mother;
- Patient diagnosis;
- Nutritional status of the mother;
- HIV status of the mother;
- Infection rate;
- Disease profile of the unit.

During stage five of the NGT the participants voted and agreed on the relevant data to be included in the database instrument as part of the first objective. Refer to Annexure G for detailed classification of ideas included under the above mentioned themes and sub-themes.

4.3 Findings of the e-Delphi method

For the second objective of this study, the e-Delphi method was used to refine the content already identified and prioritised by the participants during the NGT session. The data collection and analysis were again carried out simultaneously during the three rounds of the e-Delphi method. As the *details* of each round have already been discussed in Chapter 3, the following discussion will address the *findings*.

The participants had to use the three response categories (0 = disagree, 1 = uncertain and 2 = agree) in the Likert scale to score the ideas which, as individuals, they would prefer to see included in this administrative neonatal database instrument (Annexure H). According to the response categories, the highest score every participant could give each idea was 2. Nine participants completed the Likert scale, therefore assigning a total score out of 18 for each idea. In order to refine the data collected during the NGT session, the researcher analysed the responses of round 2 by assigning a score out of 18 to each idea, according to the responses of the participants. All ideas that obtained nine or less ($\leq 50\%$) out of 18 were eliminated, and therefore excluded from the database instrument.

Based on the responses received during the final analysis, the following data were eliminated as they obtained a **score of 50% or less**:

Table 4.1: Data that scored 50% or less

Ideas generated	Score	Comments
Work profile available	50%	One participant commented that this should be available at the human resources department
Social support of staff	33%	
Financial support of staff	22%	
Overtime hours of permanent staff	38%	One participant commented that this should reflect in the overtime books
Unit floor space in m ²	44%	
Water resources	50%	
Sanitation	50%	
Laundry on site	50%	
Budget requested and budget allocated	44%	One participant commented that this should be explained by the finance department

Even though the ideas reflected in Table 4.1 are all important, they were voted as unnecessary to include in this specific database.

Annexure J provides a detailed lay-out of the 3-point Likert scale ranking and scores as analysed by the researcher according to the participants' responses during round 2.

Based on the final responses from participants, the following ideas **scored >85%** under each main theme, clearly indicating a need for this data to be included:

Table 4.2: Data that scored >85%

Ideas generated	Score
1. Staff	
Formal training available	100%
Number of permanent staff	100%
2. Hospital	
Number of registered beds	100%
Monthly bed occupancy	100%
Monthly mortality rate	100%
Availability of laboratories	94%
Availability of paediatricians	94%
Radiology	88%
3. Resources	
Availability of quality improvement programmes	94%
Implementation of care bundles	94%
Breastfeeding facilities	88%
Availability of policies and procedures	88%

It is evident from the highest ranked ideas that the literature discussed in Chapter 2 remains significant to this database.

Ideas that deemed to be of importance by being **scored between 50% and 85%** is reflected in Table 4.3 on the following page.

Table 4.3: Data that scored between 50% and 85%

Ideas generated	Score
1. Staff	
Qualifications of staff	83%
Number of trained staff	83%
Orientation programme available	83%
Emotional support of staff	83%
In-service training available	77%
Number of agency staff	77%
Staff turnover	77%
Staff absenteeism	77%
Number of experienced staff	72%
Training support of staff	72%
Skills mix	72%
Available administrative staff	72%
2. Hospital	
Location of hospital	83%
Monthly admissions	83%
Availability of ophthalmologist	83%
Type of admissions	72%
Availability of audiologist	72%
Availability of paediatric surgeon	72%
Availability of neonatologists	61%
3. Resources	
Kangaroo mother care	83%
Milk kitchen	83%
Availability and maintenance of equipment	83%
Risk management	83%
Lodging facilities	77%
Availability and replacement timeframe of stock	72%
Electricity and back-up generator	66%
Oxygen and medical air supply	66%
Linen available	61%

All ideas that scored more than 50% (Annexure J) during this round were compiled into a second Likert scale (see Annexure I) as part of round 3. During this round participants all agreed on the final content for this administrative neonatal database instrument.

The draft administrative neonatal database instrument (see Annexure L) was sent out to all six remaining participants and all agreed on the final product.

4.4 Conclusion

Collecting accurate data as part of the administrative neonatal database will enable stakeholders to determine the true status of neonatal intensive care practice in order to develop proper policies, strategies and initiatives to improve the quality of neonatal health and nursing care in South Africa.

The next chapter will focus on the future recommendations of this study and the final conclusion.

CHAPTER 5: SUMMARY AND RECOMMENDATIONS

5.1 Introduction

In the previous chapter the findings of the study have been presented and interpreted. As seen in Chapter 1, the significance of the study was to develop an administrative database instrument that can be used to obtain adequate and accurate information about the status of neonatal intensive care practice. The neonatal interest groups of South Africa can then use the data for the development of policies, strategies and initiatives that will ultimately improve the quality of health/nursing care to all neonates. For this to be realised, the data that needs to be included in the administrative database needs to be identified. A summary would contribute to this in a concise manner.

According to Bailey and Powell (1987), as cited by De Vos et al. (2002:256), a summary allows one to highlight the main points of a report. Based on the summary, recommendations can be made on how the administrative neonatal database can be started and rolled out on a national level in South Africa.

This chapter will focus on the conclusions drawn from the research into the two study objectives, as well as the recommendations for improving neonatal intensive care practice, education and future research.

5.2 Summary

Based on the ideas generated during the NGT session, there were three main themes identified, namely: (1) staff, (2) hospital and (3) resources.

Under each main theme the following sub-themes were identified as laid out in Table 5.1 on the following page.

Table 5.1: Main themes and sub-themes

Main theme	Sub-theme
1. Staff	Training of staff
	Support to staff
	Management of staff
2. Hospital	Classification of hospital
	Specialist services available
3. Resources	Basic resources
	Resources relevant to the facility
	Financial resources
	Other e.g. policies, procedures, care bundles

Refer to Annexure G for a detailed lay-out of all the sub-themes.

During the three rounds of the e-Delphi method, the data generated through the NGT were refined before the draft administrative neonatal database instrument was compiled.

As part of the refining process, the researcher eliminated all sub-themes that obtained a **score of 50% and less**. Therefore the following data were excluded from the database instrument:

Table 5.2: Data excluded from neonatal database instrument

Main theme	Data excluded
1. Staff	Work profile available
	Overtime hours of permanent staff
	Social support of staff
	Financial support of staff
2. Hospital	Unit floor space in m ²
3. Resources	Water resources
	Sanitation
	Laundry on site
	Budget requested and budget allocated

The following sub-themes obtained a score of **between 50% – 85%** and were also included:

Table 5.3: Data included in neonatal database instrument (score 50% - 85%)

Main theme	Data included
1. Staff	Qualifications of staff
	Number of trained staff
	Orientation programme available
	Emotional support of staff
	In-service training available
	Number of agency staff
	Staff turnover
	Staff absenteeism
	Number of experienced staff
	Training support of staff
	Skills mix
	Available administrative staff
2. Hospital	Location of hospital
	Monthly admissions
	Availability of ophthalmologist
	Type of admissions
	Availability of audiologist
	Availability of paediatric surgeon
	Availability of neonatologists
3. Resources	Kangaroo mother care
	Milk kitchen
	Availability and maintenance of equipment
	Risk management
	Lodging facilities
	Availability and replacement timeframe of stock
	Electricity and back-up generator
	Oxygen and medical air supply
	Linen available

Under each main theme the following sub-themes obtained a **score of >85%**, clearly indicating a need for this data to be included:

Table 5.4: Data included in neonatal database instrument (score >85%)

Main theme	Data included
1. Staff	Formal training available
	Number of permanent staff
2. Hospital	Number of registered beds
	Monthly bed occupancy
	Monthly mortality rate
	Availability of laboratories
	Availability of paediatricians
	Radiology
3. Resources	Availability of quality improvement programmes
	Implementation of care bundles
	Breastfeeding facilities
	Availability of policies and procedures

All themes and their relevant sub-themes that obtained >50% were compiled into an instrument for data collection (Annexure L).

The findings of this study were confirmed by means of a literature review (Chapter 2) which identified aspects such as staff shortages, insufficient staff training, inadequately equipped facilities, a shortage of available beds, and the lack of basic resources as issues of both national and international concern.

5.3 Recommendations

When recommendations are made they need to be, according to De Vos et al. (2005:255), suggestions given to someone to carry out. They are based on the summary and should be simple and realistic so that they can be realised in the clinical setting.

As a provisional instrument for data collection has been compiled, what remains is to indicate how the best possible use could be made of the findings of the study to improve the quality of neonatal intensive care nursing.

5.3.1 Recommendations for professional practice

An instrument has been developed to collect data for an administrative neonatal database to determine the true status of neonatal intensive care practice in South Africa. Therefore, after the finalisation of this instrument, the researcher recommends that this instrument for data collection be distributed to NICUs as part of a pilot testing drive to determine the usability of the instrument and to provide input regarding the content. The feedback received will enable the researcher to adapt and refine the provisional instrument so that a formal instrument can be compiled. The researcher will then brief the participants on the recommended plan to distribute the instrument for data collection and data processing.

The data collected for this database will assist in determining the true status of neonatal intensive care practice in South Africa, as well as to identify the problems, shortages, and specific needs associated with neonatal intensive care practice.

Neonatal interest groups such as NNASA and COINN can use the database and negotiate with various stakeholders about how it should be implemented. The data in this administrative database can then be used by these and other neonatal interest groups to develop strategies and inform policy-making decisions in South Africa, in addition to benchmarking it and collaborating with neonatal healthcare providers worldwide.

As mentioned in Chapter 2, the need for newborn resuscitation training is essential in order to reduce newborn mortality. It is therefore recommended that data on newborn resuscitation training and advanced neonatal life support should be added to the instrument for data collection as it did not form part of the data collected during this study.

The inclusion of accessible breast milk banks and milk pasteurisers in the instrument for data collection is also recommended to determine the availability and promote the safe pasteurisation of breast milk.

The data collected can be used by healthcare facilities and NICUs to promote the development of orientation and mentorship programmes for new nurses as well as for

quality improvement programmes specifically related to the problems identified. Proper data collection will assist in pinpointing the shortage of specialist services and equipment, as well as in the development of proper plans to address these problems.

5.3.2 Recommendations for education

It is evident from the literature discussed in Chapter 2 as well as the data obtained during the NGT session that there is a link between the shortage of trained neonatal staff and high mortality rates. The data can therefore be used to motivate the need for proper neonatal training courses recognised by all healthcare institutions in collaboration with universities and recognised by SANC. The availability of quality training programmes can encourage the professional development of nurses and ultimately improve neonatal nursing care.

5.3.3 Recommendations for research

A research article should be published to create awareness both nationally and internationally about the development of this administrative neonatal database. As mentioned in Chapter 1, there is currently no consensus on the skills mix recommended for NICUs as the true status of neonatal intensive care nursing is still unclear. The researcher believes that a proper administrative neonatal database will stimulate further research to determine the relationships between the staffing of NICUs and the quality of care.

5.6 Conclusion

Through a literature study, it became evident that there are ample clinical databases available but no administrative neonatal databases to reflect the crucial administrative data needed to assist in the improvement of neonatal health care in South Africa. As discussed in Chapter 2, the international standards recommended for neonatal intensive care practice exist, but in South Africa quality standards or guidelines cannot be prepared as the status of neonatal nursing is as yet unknown. Therefore the aim of this study was to determine the content of an administrative neonatal database instrument

monitor the current status of neonatal intensive care practice in South Africa. The data collected by means of this instrument can then in future assist in the establishment of a proper administrative neonatal database that can be used by neonatal interest groups during strategy development and decision-making processes. This will improve neonatal health care; ultimately help to reduce neonatal mortality. Thus enabling South Africa to reach the MDGs as set by the WHO.

LIST OF REFERENCES

- Ager, A., Boothby, N. & Wessells, M. 2007. The use of consensus methodology in determining key research and practice: Development questions in the field of intervention with children associated with fighting forces. *Intervention*, 5(2):124–129.
- Allan, D.E., Stajduhar, K.I. & Reid, R.C. 2005. The uses of provincial administrative health databases for research on palliative care: Insights from British Columbia, Canada. *BMC Palliative Care*, 4(2):1–9.
- Aylin, P., Bottle, A. & Majeed, A. 2007. Use of administrative data or clinical databases as predictors of risk of death in hospital: Comparison of models. *BMJ Online First*. Available from: <http://www.bmj.com/content/334/7602/1044.pdf%2Bhtml> [Accessed: 17 April 2013].
- Babbie, E. & Mouton, J. 2001. *The practice of social research*. Cape Town: Oxford University Press.
- Bhutta, Z.A., Darmstadt, G.L. & Ransom, E.I. 2003. Using evidence to save newborn lives. *Save the Children*. Washington, DC: Population Reference Bureau.
- Bradshaw, D., Chopra, M., Kerber, K., Lawn, J.E., Bamford, L., Moodley, J., Pattinson, R., Patrick, M., Stephan, C. & Velaphi, S. 2008a. Every death counts: Use of mortality audit data for decision making to save the lives of mothers, babies and children in South Africa. *The Lancet*, 317(9620):1294–1304.
- Bradshaw, D., Chopra, M., Kerber, K., Lawn, J.E, Bamford, L., Moodley, J., Pattinson, R., Patrick, M., Stephan, C. & Velaphi, S. 2008b. *Every death counts: Saving the lives of mothers, babies and children in South Africa*. MRC research report.
- British Association of Perinatal Medicine (BAPM). 2010. *Service standards for hospitals providing neonatal care*. Third edition. Available from: <http://www.bapm.org/publications/documents/guidelines> [Accessed: 3 October 2013].

- Bryce, J., Daelmans, B., Dwivedi, A., Fauveau, V., Lawn, J.E., Mason, E., Newby, H., Requejo, J., Salama, P., Shankar, A., Starrs, A. & Wardlaw, T. 2008. Countdown to 2015 for maternal, newborn, and child survival: The 2008 report on tracking coverage of interventions. *The Lancet*, 317(9620):1247–1257.
- Buffum, A.R. & Brandon, D.H. 2009. Mentoring new nurses in the neonatal intensive care unit. *Journal of Perinatal & Neonatal Nursing*, 23(4):357–362.
- Burns, N. & Grove, S.K. 2005. *The practice of nursing research: Conduct, critique and utilization*. Fifth edition. Maryland Heights, MO: Elsevier Saunders.
- Burns, N. & Grove, S.K. 2011. *Understanding nursing research: Building an evidence-based practice*. Fifth edition. Maryland Heights, MO: Elsevier Saunders.
- Callaghan, L.A, Cartwright, D.W, O'Rourke, P, Davies, M.W. 2003. Infant to staff ratios and risk of mortality in very low birthweight infants. *Arch Dis Child Fetal Neonatal Ed* 88:94-97.
- Constitution of the Republic of South Africa act No 108. 1996. *Chapter 2: Bill of rights*. Available from: <http://www.acts.co.za/constitution-of-the-republic-of-south-africa-act-1996/> [Accessed: 18 December 2013].
- Council of International Neonatal Nursing (COINN). 2008. *Position statement on neonatal nursing education*. Available from: <http://www.coinnurses.org/resources> [Accessed: 31 May 2011].
- Creswell, JW. 2009. *Research designs: qualitative, quantitative and mixed method approaches*. Third edition. USA: SAGE publications, inc.
- De Vos, AS., Strydom, H., Fouche, C.B. & Delport C.S.L. 2002. *Research at grass roots: for the social sciences and human professions*. Second edition. Pretoria: Van Schaik.

De Witt, T.W. N.d. *Keeping the dream alive: Reduction in neonatal mortality rate at the Steve Biko Academic Hospital*. Available from: <http://www.departmentofpaediatrics.co.za/files> [Accessed: 10 April 2013].

Deyo, R.A., Cherkin, D.C. & Ciol, M.A. 1992. Adapting a clinical comorbidity index for use with ICD-9-CM administrative databases. *Journal of Clinical Epidemiology*, 45(6):613–619.

Fink, A., Kosecoff, J., Chassin, M. & Brook, R.H. 1984. Consensus methods: Characteristics and guidelines for use. *American Journal of Public Health*, 74(9):979–983.

Freshwater, D. & Maslin-Prothero, S.E. (eds.). 2005. *Blackwell's nursing dictionary*. Second edition. London: Blackwell.

Gallagher, M., Hares, T., Spencer, J., Bradshaw, C. & Webb, I. 1993. The nominal group technique: A research tool for general practice? *Family Practice*, 10(1):76–81.

Gerein, N., Green, A. & Pearson, S. 2006. The implications of shortages of health professionals for maternal health in sub-Saharan Africa. *Reproductive Health Matters Journal*, 14(27):40–50.

Gillies, D.A. 1994. *Nursing management: A systems approach*. Third edition. Philadelphia: Saunders.

Hamilton, K.E., Redshaw, M.E. & Tarnow-Mordi, W. 2007. Nurse staffing in relation to risk-adjusted mortality in neonatal care. *Arch Dis Child Fetal Neonatal Ed*, 92:99–103.

Harvey, N. & Holmes, C.A. 2012. Nominal group technique: An effective method for obtaining group consensus. *International Journal of Nursing Practice*, 18:188–194.

- Hasson, F., Keeney, S. & McKenna, H. 2000. Research guidelines for the Delphi survey technique. *Journal of Advanced Nursing*, 32(4):1008–1015.
- Health and Public Services Committee. 2006. *Counting the cots: Neonatal care services in London*. Available from: <http://www.london.gov.uk> [Accessed: 10 April 2013].
- Healthy Newborn Network. 2012. *Egyptian Neonatal Network*. Available from: <http://www.healthynewbornnetwork.org/partner/egyptian-neonatal-network> [Accessed: 25 March 2013].
- Holloway, I. & Wheeler, S. 2010. *Qualitative research in nursing*. Third edition. London: Wiley-Blackwell.
- Hom, E.M. 2003. Coaching and mentoring new graduates entering perinatal nursing practice. *Journal of Perinatal and Neonatal Nursing*, 17(1):35–49.
- Hongoro, C. & McPake, B. 2004. How to bridge the gap in human resources for health. *The Lancet*, 364:1451–1456.
- Hsu, C. & Sandford, B.A. 2007. Minimising non-response in the Delphi process: How to respond to non-response. *Practical Assessment, Research and Evaluation*, 12(17):n.p.
- Johnson, R.B. & Onwuegbuzie, A.J. 2004. Mixed methods research: A research paradigm whose time has come. *Issues in Educational Research*, 33(7):14–26.
- Jones, J. & Hunter, D. 1995. Qualitative research: Consensus methods for medical and health services research. *British Medical Journal*, 311:367–375.
- Keeney, S., Hasson, F. & McKenna, H. 2010. *The Delphi technique in nursing and health research*. West Sussex, UK: Blackwell.

- Lindqvist, P. & Nordänger, U.K. 2007. (Mis-?) using the e-Delphi method: An attempt to articulate the practical knowledge of teaching. *Journal of Research Methods and Methodological Issues*, 1(1):n.p.
- Lourens, G. 2012. The National Core Standards and evidence-based nursing. *Professional Nursing Today*, 16(1):3-4.
- Mediclinic. N.d. *Mediclinic Kloof Healthcare Services*. Available from: <http://www.mediclinic.co.za/hospitals/pages/services.aspx?h=41> [Accessed: 19 April 2013].
- McIntyre, S., Novak, I. & Cusick, A. 2009. Consensus research priorities for cerebral palsy: A Delphi survey of consumers, researchers and clinicians. *Developmental Medicine & Child Neurology*, 52(3):270-275.
- Moise, P. 2001. *Using hospital administrative databases for a diseased-based approach to studying health care systems*. OECD Ageing Related Diseases study: Technical report. Available from: <http://www.oecd.org/denmark/1889879.pdf> [Accessed: 7 September 2012].
- Muller, M., Bezuidenhout, M. & Jooste, K. 2006. *Healthcare service management*. Cape Town, South Africa: Juta.
- National Department of Health (NDoH). 2007. *Achieving the health-related Millennium Goals (MDGs): Progress and challenges*. Pretoria: Government Printers.
- National Department of Health (NDoH). 2012a. *Strategic plan for maternal, newborn, child and women's health (MNCWH) and nutrition in South Africa, 2012–2016*. Available from: <http://www.doh.gov.za/docs/stratdocs/2012/MNCWHstratplan.pdf> [Accessed: 15 April 2013].
- National Department of Health (NDoH). 2012b. *The HRH strategy for the health sector: Human resources for health South Africa*. Version 3. Available from: <http://www.doh.gov.za> [Accessed: 22 July 2013].

- National Institute for Health and Clinical Excellence (NICE). N.d. *Quality standards programme*. Available from: <http://www.nice.org.uk> [Accessed: 3 October 2013].
- Neonatal Nursing Association of Southern Africa (NNASA). 2010. *NNASA vision*. Available from: <http://www.nnasa.org.za> [Accessed: 31 May 2011].
- Neonatal Nursing Association of Southern Africa (NNASA). 2012. *7th International Conference for Neonatal Nurses*. Available from: <http://www.healthynewbornnetwork.org/event> [Accessed: 6 December 2011].
- Netcare. N.d. *Netcare Femina Hospital*. Available from: http://www.netcare.co.za/live/netcare_content.php?Item_ID=5571 [Accessed: 19 April 2013].
- Opiyo, N. & English, M. 2010. In-service training for health professionals to improve care of the seriously ill newborn or child in low and middle-income countries. *The Cochrane Library*, 5:5.
- Paediatric Intensive Care Society (PICS). 2010. *Standards for the care of critically ill children*. Fourth edition. Available from: <http://www.ukpics.org.uk> [Accessed: 3 October 2013].
- Pattinson, R.C. (ed.). 2000. *Saving babies: A perinatal care survey of South Africa*. Durban: Medical Research Council.
- Pattinson, R.C. (ed.). 2011. *Saving babies 2008–2009: Seventh report on perinatal care in South Africa*. Pretoria: Tshepesa Press.
- Polit, D.F. & Beck, C.T. 2008. *Nursing research: Generating and assessing evidence for nursing practice*. Second edition. Philadelphia: Lippencott, Williams & Wilkens.
- Potter, M., Gordon, S. & Hamer, P. 2004. The Nominal Group Technique: A useful consensus methodology in physiotherapy research. *NZ Journal of Physiotherapy*, 32(3):127–130.

- Powell, C. 2003. The Delphi technique: Myths and realities. *Journal of Advanced Nursing*, 41(4):376–382.
- Redshaw, M. & Hamilton, K. 2006. *Networks, admissions and transfers: The perspectives of networks, neonatal units and parents*. Available from: <http://www.npeu.ox.ac.uk> [Accessed: 7 April 2013].
- Rowe, M. 2012. *The Delphi method in clinical research*. Available from: <http://www.mrowe.co.za/blog/2012/04> [Accessed: 12 January 2013].
- South African Breastmilk Reserve (SABR). 2012. *Keeping it real – Our footprint*. Available from: <http://www.sabr.org.za/milk-banks.html?page=MilkBank&province=Gauteng> [Accessed: 15 April 2013].
- South African Neonatal, Infant and Toddler Support Association (SANITSA). 2005. *Constitution: aim, objectives and definitions*. Unpublished.
- South African Nursing Council (SANC). 2011a. *Nursing Act, Act 33 of 2005*. Available from: <http://www.sanc.co.za/pdf/Nursing%20Act%202005.PDF>. Accessed: 21 January 2012].
- South African Nursing Council (SANC). 2011b. *Geographical distribution of the population of South Africa versus nursing manpower*. Available from: <http://www.sanc.co.za/stats/stat2011/Distribution%202011xls.htm> [Accessed: 31 May 2011].
- South African Nursing Council (SANC). 2011c. *Additional qualifications*. Available from: <http://www.sanc.co.za/stats/stat2011/SANCStats2011AddQualsOnReg.pdf> [Accessed: 13 July 2012].
- South African Nursing Council (SANC). 2011d. *Listed qualifications*. Available from: <http://www.sanc.co.za/stats/stat2011/SANCStats2011ListedQualsOnReg.pdf> [Accessed: 13 July 2012].

Sumsion, T. 2000. Nominal group technique: A format for focus groups. Paper delivered at the Qualitative Evidence-based Practice Conference, Coventry University, UK, 15-17 May.

Ten Hoop-Bender, P., Liljestrand, J. & MacDonagh, S. 2006. Human resources and access to maternal health care. *International Journal of Gynaecology and Obstetrics*, 94(3):226–233.

The Cochrane Collaboration. c2013. *About us*. Available from:
<http://www.cochrane.org/aboutus> [Accessed: 30 April 2013].

Thomas, E.J., Sherwood, G.D., Mulhollem, J.L., Sexton, J.B. & Helmreigh, R.L. 2004. Working together in the neonatal intensive care unit: Provider perspectives. *Journal of Perinatology*, 24:552–559.

Tinker, A., Parker, R., Lord, D. & Grear, K. 2010. Advancing newborn health: The saving newborn lives initiative. *Global Public Health*, 5(1):28–47.

United Nations (UN). 2013. *The Millennium Development Goals report*. Available from:
<http://www.un.org/millenniumgoals/pdf/report-2013> [Accessed: 22 July 2013].

United Nations Children's Fund (UNICEF). 2012a. *CME info*. 2012. Available from:
<http://www.childmortality.org> [Accessed: 20 April 2013].

United Nations Children's Fund (UNICEF). 2012b. *UNICEF statistics and monitoring*. Available from: http://www.unicef.org/statistics/index_24287.html [Accessed: 19 April 2013].

United Nations Children's Fund South Africa (UNICEF SA). 2011a. *Child and maternal health: Mother and child healthcare*. Available from:
<http://www.unicef.org/southafrica/survival> [Accessed: 25 March 2013].

United Nations Children's Fund South Africa (UNICEF SA). 2011b. *Improving newborn care in South Africa: Lessons learned from Limpopo Initiative for Newborn Care (LINC)*. Pretoria.

United Nations Children's Fund South Africa (UNICEF SA). 2011c. *Child and maternal health: Impact on children – safe feeding and child survival*. Available from: <http://www.unicef.org/southafrica/survival> [Accessed: 15 April 2013].

United Nations Children's Fund South Africa (UNICEF SA). 2011d. *Young child survival and development: Maternal and newborn health*. Available from: <http://www.unicef.org/esaro/5479> [Accessed: 15 April 2013].

Velaphi, S. & Rhoda, N. 2012. Reducing neonatal deaths in South Africa: Are we there yet, and what can be done? *SA Journal of Child Health*, 6(3):67–71.

Verklan, M.T. & Walden, M. 2010. *Core curriculum for neonatal intensive care nursing*. Fourth edition. California: Saunders.

Vermont Oxford Network (VON). 2010. *Manual of operations*. Release 13.0. Unpublished.

Webopedia. c2013. *Data and database definition*. Available from: <http://www.webopedia.com/TERM> [Accessed: 19 April 2013].

White, R.D., Smith, J.A. & Shepley, M.M. 2013. Recommended standards for newborn ICU design, eighth edition. *Journal of Perinatology*, 33:2–16.

Yoder-Wise, P.S. 2003. *Leading and managing in nursing*. Third edition. St. Louis: Elsevier.

ANNEXURE A

**Letter of approval from the Research Ethics Committee, Department
of Nursing Science, University of Pretoria**

Faculty of Health Sciences Research Ethics Committee

3/10/2012

Number : **S182/2012**

Title : **Development of an administrative database to monitor the status of neonatal intensive care practice in Gauteng: A consensus research approach**

Investigator : **L Botha, Department of Nursing Science, University of Pretoria**
(SUPERVISOR: Dr C Maree / Mrs E A du Rand)

Sponsor : **None**

Study Degree: **M Cur (Clinical)**

This Student Protocol was reviewed by the Faculty of Health Sciences, Student Research Ethics Committee, University of Pretoria on 2/10/2012 and found to be acceptable. The approval is valid for a period of 3 years.

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Prof R Delpoit (female)BA et Scien, B Curationis (Hons) (Intensive care Nursing), M Sc (Physiology), PhD (Medicine), M Ed Computer Assisted Education

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Dr T Rossouw (Female) MBChB.(cum laude); M.Phil (Applied Ethics) (cum laude), MPH (Biostatistics and Epidemiology (cum laude), D.Phil

Mr Y Sikweyiya MPH (Umea University Umea, Sweden); Master Level Fellowship (Research Ethics) (Pretoria and UKZN); Post Grad. Diploma in Health Promotion (Unitra); BSc in Health Promotion (Unitra)

Dr L Schoeman (Female) BPharm (NWU); BAHons (Psychology)(UP); PhD (UKZN); International Diploma in Research Ethics (UCT)

Dr R Sommers **Vice-Chair** (Female) - MBChB; MMed (Int); MPharMed.

Prof T J P Swart BChD, MSc (Odont), MChD (Oral Path), PGCHE

Prof C W van Staden **Chairperson** - MBChB; MMed (Psych); MD; FCPsych; FTCL; UPLM; Dept of Psychiatry

Student Ethics Sub-Committee

Prof R S K Apatu MBChB (Legon,UG); PhD (Cantab); PGDip International Research Ethics (UCT)

Mrs N Briers (female) BSc (Stell); BSc Hons (Pretoria); MSc (Pretoria); DHETP (Pretoria)

Prof M M Ehlers (female) BSc (Agric) Microbiology (Pret); BSc (Agric) Hons Microbiology (Pret); MSc (Agric) Microbiology (Pret); PhD Microbiology (Pret); Post Doctoral Fellow (Pret)

Dr R Leech (female) B.Art et Scien; BA Cur; BA (Hons); M (ECI); PhD Nursing Science

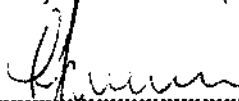
Mr S B Masombuka BA (Communication Science) UNISA; Certificate in Health Research Ethics Course (B compliant cc)


Dr S A S Olorunju BSc (Hons). Stats (Ahmadu Bello University –Nigeria); MSc (Applied Statistics (UKC United Kingdom); PhD (Ahmadu Bello University – Nigeria)

Dr L Schoeman **CHAIRPERSON:** (female) BPharm (North West); BAHons (Psychology)(Pretoria); PhD (KwaZulu-Natal); International Diploma in Research Ethics (UCT)

Dr R Sommers **Vice-Chair** (Female) MBChB; M.Med (Int); MPhar.Med

Prof L Sykes (female) BSc, BDS, MDent (Pros)


.....
DR L SCHOEMAN; BPharm, BA Hons (Psy), PhD;
Dip. International Research Ethics
CHAIRPERSON of the Faculty of Health Sciences
Student Research Ethics Committee, University of Pretoria


.....
DR R SOMMERS; MBChB; M.Med (Int); MPhar.Med.
VICE-CHAIR of the Faculty of Health Sciences Research
Ethics Committee, University of Pretoria

ANNEXURE B

Information leaflet and informed consent for non-clinical research – Nominal group technique

Annexure B

INFORMATION LEAFLET AND INFORMED CONSENT FOR NON-CLINICAL RESEARCH – NOMINAL GROUP TECHNIQUE

Title of study: The development of an instrument to monitor the status of neonatal intensive care practice in South Africa: A consensus research approach.

Dear

1) Introduction

You are invited to participate in a research study. This information leaflet will help you to decide if you want to participate. Before you agree to take part you should fully understand what is involved. If you have any questions that this leaflet does not fully explain, please do not hesitate to ask the researcher.

2) The nature and purpose of this study

The purpose of this study is to describe the process of developing an administrative neonatal database to monitor the status of neonatal intensive care practice in South Africa.

The first objective of this study is to determine the content for an administrative neonatal database to monitor the status of neonatal intensive care practice.

Your input as participant is important in order to achieve this objective.

3) Explanation of procedures to be followed

For this objective the study involves the nominal group technique (NGT). This involves a discussion group consisting of various participants related to the care of neonatal patients. You will be invited to attend this discussion group at least one month in advance. This invitation will be sent by e-mail. The discussion group will meet at a centrally situated and easily accessible venue at a time that is suitable for most. The following steps will provide a brief description of the process that will take place during this discussion group:

Step 1 – Generating ideas:

The objective for this group will be to determine the content that should be included in the database. The researcher will act as the facilitator of this session. The objective will be written on a white board and explained to the group. The facilitator will then ask that the participants briefly and independently write down their ideas relevant to the objective on a post-it note that will be provided. No discussion will take place at this point.

Step 2 – Recording ideas:

Each participant will now be given the opportunity for verbal feedback on their ideas without discussing it. The facilitator will write down each participant's feedback on the white board, visible for all to see.

Step 3 – Discussing ideas:

Every idea submitted by the participants will now be discussed to determine significance to the objective and the administrative neonatal database. The facilitator will give all participants the opportunity to ask questions and/or give their input regarding each idea. This will ensure that each idea is understood and applicable to the objective. The ideas will then be clustered together in themes as agreed by the participants.

Step 4 – Voting on ideas:

The facilitator will explain that every idea should be relevant to the objective. Once each idea has been discussed and understood, the members will be requested to reach consensus regarding the ideas by privately voting for the ideas they consider relevant. Participants will then rank/prioritise the ideas to be included in the database according to their significance: 5 being the highest ranking and 1 being the lowest. The researcher will then analyse the results to determine the order of ranking to determine which ideas have been selected for inclusion in the database. After participants have reached consensus regarding the selected ideas, the meeting will be concluded. The selected ideas will now be refined during the Delphi-method.

4) Risk and discomfort involved

The discussion group will take one day (about 9 hours) of your time and there are no risks involved.

5) Possible benefits of this study

All input obtained from this study will be used to maximise benefits to all newborn babies in South Africa. Under no circumstances will any information obtained from participants be used for exploitation.

This study will be conducted with the utmost respect to all participants and their views.

6) What are your rights as a participant?

Your participation in this study is entirely voluntary. You will not be forced to give input or participate should you choose not to. You may refuse to participate or stop at any time during the discussion group without giving any reason. Your withdrawal will not affect you or the company you represent.

7) Has the study received ethical approval?

This study has received written approval from the Research Ethics Committee of the Faculty of Health Sciences at the University of Pretoria and a copy of the approval letter is available if you wish to have one.

Contact details:

Prof CW van Staden

Chair: Faculty of Health Sciences Research Ethics Committee University of Pretoria

Steve Biko Academic Hospital

Tel: 012 354 1330 / 012 354 1677

Fax: 012 354 1367

E Mail: manda@med.up.ac.za - Main Committee

E Mail: deepeka.behari@up.ac.za - Student Committee

8) Information and contact person

The contact person for the study is Lorraine Botha. If you have any questions about the study please contact me at 082 940 0605 (c)

Alternatively you may contact my supervisor Dr Carin Maree at 083 286 6696 (c)

9) Compensation

Your participation is voluntary. No compensation / contribution towards your transport expenses will be given for your participation. Refreshments will be provided on the day of the discussion group.

10) Confidentiality

All information that you give will be kept strictly confidential. Once the data has been analysed no one will be able to identify you. Research reports and articles in scientific journals will not include any information that may identify you or the company you represent.

CONSENT TO PARTICIPATE IN THIS STUDY

I confirm that the person asking my consent to take part in this study has told me about the nature, process, risks, discomforts and benefits of the study. I have also received, read and understood the above written information (Information Leaflet and Informed Consent) regarding the study. I am aware that the results of the study, including personal details, will be anonymously processed into research reports. I am participating willingly, had time to ask questions and have no objection to participate in the study. I understand that there is no penalty should I wish to discontinue with the study and my withdrawal will not affect myself or the company I represent in any way.

Participant's name: _____ (Please print)

Participant's signature: _____ Date: _____

Researcher's name: _____ (Please print)

Researcher's signature: _____ Date: _____

Witness's Name: _____ (Please print)

Witness's signature: _____ Date: _____

ANNEXURE C

Information leaflet and informed consent for non-clinical research – e-Delphi method

Annexure C

INFORMATION LEAFLET AND INFORMED CONSENT FOR NON-CLINICAL RESEARCH – e-DELPHI METHOD

Title of study: The development of an instrument to monitor the status of neonatal intensive care practice in South Africa: A consensus research approach.

Dear

1) Introduction

You are invited to participate in a research study. This information leaflet will help you to decide if you want to participate. Before you agree to take part you should fully understand what is involved. If you have any questions that this leaflet does not fully explain, please do not hesitate to ask the researcher.

2) The nature and purpose of this study

The purpose of this study is to describe the process of developing an administrative neonatal database to monitor the status of neonatal intensive care practice in South Africa.

The first objective of this study was to determine the content for an administrative neonatal database to monitor the status of neonatal intensive care practice. This objective was achieved by participants attending the nominal group technique (NGT) discussion session. The second objective of this study is to refine the content for this database using the ideas generated by the participants from the NGT.

Your input as participant is important in order to achieve this second objective.

3) Explanation of procedures to be followed

This objective involves various participants related to the care of neonatal patients participating in the e-Delphi method. All communication and participation in the e-Delphi will take place electronically via e-mail. The following steps will provide a brief description of the process that will take place:

Round 1:

During the first round the researcher will send an e-mail to each selected participant containing the participant information leaflet explaining the research objective as well as obtaining each participant's consent to participate in this study. The researcher will also include a brief summary of the results obtained during the NGT discussion group on the content required for this database. You will be given one week to respond.

Round 2:

The researcher compile a Likert scale containing all ideas received under the respective themes. This scale will include three response categories each giving a value: 0 for disagree, 1 for uncertain and 2 for agree.

The researcher will e-mail the Likert scale to all participants and you will be asked to complete the Likert scale indicating the value you consider most appropriate for each idea under each theme.

You will be requested to respond within two weeks. The researcher will then analyse the results calculated in percentage and prioritise each idea accordingly. Ideas scoring 50% and less will be eliminated and those scoring >50% will be included in the next round.

Round 3:

The researcher will distribute all the results from the previous round to each participant and you will be requested to go through the ideas and motivate whether you agree or disagree with the ideas scoring >50%. You will be requested to respond within two weeks.

The researcher will then analyse the feedback and make adjustments accordingly. If there is consensus amongst all participants, the information will be converted into a format / instrument that can be used to obtain the baseline data. This draft instrument will be circulated once more to the participants for feedback after which the instrument can be finalised.

4) Risk and discomfort involved

There are no risks in participating in the e-Delphi method and due to the fact that it is done via e-mail, you are able to spend time on it as it suits your schedule. Please note the deadlines for feedback as will be stipulated in each e-mail.

5) Possible benefits of this study

All input obtained from this study will be used to maximise benefits to all newborn babies in South Africa. Under no circumstances will any information obtained from participants be used for exploitation.

This study will be conducted with the utmost respect to all participants and their views.

6) What are your rights as a participant?

Your participation in this study is entirely voluntary. You will not be forced to give input or participate should you choose not to. You can refuse to participate or stop at any time during these rounds without giving any reason. Your withdrawal will not affect you or the company you represent.

7) Has the study received ethical approval?

This study has received written approval from the Research Ethics Committee of the Faculty of Health Sciences at the University of Pretoria and a copy of the approval letter is available if you wish to have one.

Contact details:

Prof CW van Staden

Chair: Faculty of Health Sciences Research Ethics Committee University of Pretoria

Steve Biko Academic Hospital

Tel: 012 354 1330 / 012 354 1677

Fax: 012 354 1367

E Mail: manda@med.up.ac.za - Main Committee

E Mail: deepeka.behari@up.ac.za - Student Committee

8) Information and contact person

The contact person for the study is Lorraine Botha. If you have any questions about the study please contact me at 082 940 0605 (c)

Alternatively you may contact my supervisor Dr Carin Maree at 083 286 6696 (c)

9) Compensation

Your participation is voluntary. No compensation / contribution towards you or the company you represent will be given for your participation.

10) Confidentiality

All information that you give will be kept strictly confidential. Once we have analysed the information no one will be able to identify you. Research reports and articles in scientific journals will not include any information that may identify you or the company you represent.

CONSENT TO PARTICIPATE IN THIS STUDY

I confirm that the person asking my consent to take part in this study has told me about the nature, process, risks, discomforts and benefits of the study. I have also received, read and understood the above written information (Information Leaflet and Informed Consent) regarding the study. I am aware that the results of the study, including personal details, will be anonymously processed into research reports. I am participating willingly, had time to ask questions and have no objection to participate in the study. I understand that there is no penalty should I wish to discontinue with the study and my withdrawal will not affect myself or the company I represent in any way.

Participant's name: _____ (Please print)

Participant's signature: _____ Date: _____

Researcher's name: _____ (Please print)

Researcher's signature: _____ Date: _____

Witness's Name: _____ (Please print)

Witness's signature: _____ Date: _____

ANNEXURE D

**Information leaflet and informed consent for non-clinical research –
Gauteng Department of Health**

Annexure D

INFORMATION LEAFLET AND INFORMED CONSENT FOR NON-CLINICAL RESEARCH: GAUTENG DEPARTMENT OF HEALTH

To whom it may concern,

I (the researcher), Lorraine Botha, hereby requests permission to conduct this research study with the participation of neonatal intensive care units (NICUs) and staff.

Title of study: The development of an instrument to monitor the status of neonatal intensive care practice in South Africa: A consensus research approach.

The nature and purpose of this study

The purpose of this study is to describe the development of an administrative neonatal database to monitor the status of neonatal intensive care practice in South Africa.

The study is limited to Gauteng with the assumption of applying it to other provinces as well. The objectives are to determine and refine the content for an administrative neonatal database to monitor the status of neonatal intensive care practice. The participation of medical and nursing staff related to neonatal intensive care is important in order to achieve these objectives.

Explanation of procedures to be followed

The methodology used in this study involves the Nominal group technique (NGT) and the e-Delphi method. This involves various participants related to the care of neonatal patients. They will be invited to participate in either the NGT or the e-Delphi method. The purpose of these methods is to reach consensus on the content of the administrative neonatal database. Once consensus is reached amongst all participants, an instrument for data collection will be compiled for the collection of baseline data for this database. Participants will mainly consist of unit managers, senior professional nurses, paediatricians and neonatologists. Different participants will be selected for the NGT and e-Delphi method.

The following steps will provide a brief description of the process that will take place during the NGT:

Step 1 – Generating ideas:

The objective for this group will be to determine the content that should be included in the database. The researcher will act as the facilitator of this session. The objective will be written on a white board and explained to the group. The facilitator will then ask that the participants briefly and independently write down their ideas relevant to the objective on a post-it note that will be provided. No discussion will take place at this point.

Step 2 – Recording ideas:

Each participant will now be given the opportunity for verbal feedback on their ideas without discussing it. The facilitator will write down each participant's feedback on the white board, visible for all to see.

Step 3 – Discussing ideas:

Every idea submitted by the participants will now be discussed to determine significance to the objective and the administrative neonatal database. The facilitator will give all participants the opportunity to ask questions and/or give their input regarding each idea. This will ensure that each idea is understood and applicable to the objective. The ideas will then be clustered together in themes as agreed by the participants.

Step 4 – Voting on ideas:

The facilitator will explain that every idea should be relevant to the objective. Once each idea has been discussed and understood, the members will be requested to reach consensus regarding the ideas by privately voting for the ideas they consider relevant. Participants will then rank/prioritise the ideas to be included in the database according to their significance: 5 being the highest ranking and 1 being the lowest. The researcher will then analyse the results to determine the order of ranking to determine which ideas have been selected for inclusion in the database. After participants have reached consensus regarding the selected ideas, the meeting will be concluded. The selected ideas will now be refined during the Delphi-method.

The following steps will provide a brief description of the process that will take place during the e-Delphi method:**Round 1:**

During the first round the researcher will send an e-mail to each selected participant containing the participant information leaflet explaining the research objective as well as obtaining each participant's consent to participate in this study. The researcher will also

include a brief summary of the results obtained during the NGT discussion group on the content required for this database. You will be given one week to respond.

Round 2:

The researcher compile a Likert scale containing all ideas received under the respective themes. This scale will include three response categories each giving a value: 0 for disagree, 1 for uncertain and 2 for agree.

The researcher will e-mail the Likert scale to all participants and you will be asked to complete the Likert scale indicating the value you consider most appropriate for each idea under each theme.

You will be requested to respond within two weeks. The researcher will then analyse the results calculated in percentage and prioritise each idea accordingly. Ideas scoring 50% and less will be eliminated and those scoring >50% will be included in the next round.

Round 3:

The researcher will distribute all the results from the previous round to each participant and you will be requested to go through the ideas and motivate whether you agree or disagree with the ideas scoring >50%. You will be requested to respond within two weeks.

The researcher will then analyse the feedback and make adjustments accordingly. If there is consensus amongst all participants, the information will be converted into a format / instrument that can be used to obtain the baseline data. This draft instrument will be circulated once more to the participants for feedback after which the instrument can be finalised.

Risk and discomfort involved

There are no risks in participating in this study. Participants are selected and asked to complete a consent form explaining the study objectives and what will be expected of them.

Possible benefits of this study

All input obtained from this study will be used to maximise benefits to all newborn babies in South Africa. Under no circumstances will any information obtained from participants or the institutions they represent be used for exploitation.

This study will be conducted with the utmost respect to all participants and their views.

What are the rights of the participants?

Participation in this study is entirely voluntary. They will not be forced to give input or participate should they choose not to. They can refuse to participate or stop at any time during the study without giving any reason. Their withdrawal will not affect them or the institution you represent.

Has the study received ethical approval?

This study has received written approval from the Research Ethics Committee of the Faculty of Health Sciences at the University of Pretoria and a copy of the approval letter is available if you wish to have one.

Contact details:

Prof CW van Staden

Chair: Faculty of Health Sciences Research Ethics Committee University of Pretoria
Steve Biko Academic Hospital

Tel: 012 354 1330 / 012 354 1677

Fax: 012 354 1367

E Mail: manda@med.up.ac.za - Main Committee

E Mail: deepeka.behari@up.ac.za - Student Committee

Information and contact person

The contact person for the study is Lorraine Botha. If you have any questions about the study please contact me at 082 940 0605 (c)

Alternatively you may contact my supervisor Dr Carin Maree at 083 286 6696 (c)

Compensation

Participation is voluntary. No compensation / contribution towards any participant or the institution they represent will be given.

Confidentiality

All information gathered will be kept strictly confidential. Once we have analysed the information no one will be able to identify any participant or the institution they represent. Research reports and articles in scientific journals will not include any information that may identify any participant or the institution they represent.

CONSENT BY DEPARTMENTAL HEAD

I hereby grant permission for the researcher to conduct this research study with participation of Gauteng neonatal intensive care units (NICUs) and staff. I have read and understood the above written information regarding the study.

Head of department's name: _____

(Please print)

Head of department's signature: _____ Date: _____

Researcher's name: _____ (Please print)

Researcher's signature: _____ Date: _____

ANNEXURE E

Information leaflet and informed consent for non-clinical research – Private institutions

Annexure E

INFORMATION LEAFLET AND INFORMED CONSENT FOR NON-CLINICAL RESEARCH: PRIVATE INSTITUTIONS

To whom it may concern,

I (the researcher), Lorraine Botha, hereby requests permission to conduct this research study with the participation of neonatal intensive care units (NICUs) and staff.

Title of study: The development of an instrument to monitor the status of neonatal intensive care practice in South Africa: A consensus research approach.

The nature and purpose of this study

The purpose of this study is to describe the development of an administrative neonatal database to monitor the status of neonatal intensive care practice in South Africa.

The study is limited to Gauteng with the assumption of applying it to other provinces as well. The objectives are to determine and refine the content for an administrative neonatal database to monitor the status of neonatal intensive care practice. The participation of medical and nursing staff related to neonatal intensive care is important in order to achieve these objectives.

Explanation of procedures to be followed

The methodology used in this study involves the Nominal group technique (NGT) and the e-Delphi method. This involves various participants related to the care of neonatal patients. They will be invited to participate in either the NGT or the e-Delphi method. The purpose of these methods is to reach consensus on the content of the administrative neonatal database. Once consensus is reached amongst all participants, an instrument for data collection will be compiled for the collection of baseline data for this database. Participants will mainly consist of unit managers, senior professional nurses, paediatricians and neonatologists. Different participants will be selected for the NGT and e-Delphi method.

Step 1 – Generating ideas:

The objective for this group will be to determine the content that should be included in the database. The researcher will act as the facilitator of this session. The objective will be written on a white board and explained to the group. The facilitator will then ask that the participants briefly and independently write down their ideas relevant to the objective on a post-it note that will be provided. No discussion will take place at this point.

Step 2 – Recording ideas:

Each participant will now be given the opportunity for verbal feedback on their ideas without discussing it. The facilitator will write down each participant's feedback on the white board, visible for all to see.

Step 3 – Discussing ideas:

Every idea submitted by the participants will now be discussed to determine significance to the objective and the administrative neonatal database. The facilitator will give all participants the opportunity to ask questions and/or give their input regarding each idea. This will ensure that each idea is understood and applicable to the objective. The ideas will then be clustered together in themes as agreed by the participants.

Step 4 – Voting on ideas:

The facilitator will explain that every idea should be relevant to the objective. Once each idea has been discussed and understood, the members will be requested to reach consensus regarding the ideas by privately voting for the ideas they consider relevant. Participants will then rank/prioritise the ideas to be included in the database according to their significance: 5 being the highest ranking and 1 being the lowest. The researcher will then analyse the results to determine the order of ranking to determine which ideas have been selected for inclusion in the database. After participants have reached consensus regarding the selected ideas, the meeting will be concluded. The selected ideas will now be refined during the Delphi-method.

The following steps will provide a brief description of the process that will take place during the e-Delphi method:**Round 1:**

During the first round the researcher will send an e-mail to each selected participant containing the participant information leaflet explaining the research objective as well as obtaining each participant's consent to participate in this study. The researcher will also

include a brief summary of the results obtained during the NGT discussion group on the content required for this database. You will be given one week to respond.

Round 2:

The researcher compile a Likert scale containing all ideas received under the respective themes. This scale will include three response categories each giving a value: 0 for disagree, 1 for uncertain and 2 for agree.

The researcher will e-mail the Likert scale to all participants and you will be asked to complete the Likert scale indicating the value you consider most appropriate for each idea under each theme.

You will be requested to respond within two weeks. The researcher will then analyse the results calculated in percentage and prioritise each idea accordingly. Ideas scoring 50% and less will be eliminated and those scoring >50% will be included in the next round.

Round 3:

The researcher will distribute all the results from the previous round to each participant and you will be requested to go through the ideas and motivate whether you agree or disagree with the ideas scoring >50%. You will be requested to respond within two weeks.

The researcher will then analyse the feedback and make adjustments accordingly. If there is consensus amongst all participants, the information will be converted into a format / instrument that can be used to obtain the baseline data. This draft instrument will be circulated once more to the participants for feedback after which the instrument can be finalised.

Risk and discomfort involved

There are no risks in participating in this study. Participants are selected and asked to complete a consent form explaining the study objective and what will be expected of them.

Possible benefits of this study

All input obtained from this study will be used to maximise benefits to all newborn babies in South Africa. Under no circumstances will any information obtained from participants or the institutions they represent be used for exploitation.

This study will be conducted with the utmost respect to all participants and their views.

What are the rights of the participants?

Participation in this study is entirely voluntary. They will not be forced to give input or participate should they choose not to. They can refuse to participate or stop at any time during the study without giving any reason. Their withdrawal will not affect them or the institution you represent.

Has the study received ethical approval?

This study has received written approval from the Research Ethics Committee of the Faculty of Health Sciences at the University of Pretoria and a copy of the approval letter is available if you wish to have one.

Contact details:

Prof CW van Staden

Chair: Faculty of Health Sciences Research Ethics Committee University of Pretoria
Steve Biko Academic Hospital

Tel: 012 354 1330 / 012 354 1677

Fax: 012 354 1367

E Mail: manda@med.up.ac.za - Main Committee

E Mail: deepeka.behari@up.ac.za - Student Committee

Information and contact person

The contact person for the study is Lorraine Botha. If you have any questions about the study please contact me at 082 940 0605 (c)

Alternatively you may contact my supervisor Dr Carin Maree at 083 286 6696 (c)

Compensation

Participation is voluntary. No compensation / contribution towards any participant or the institution they represent will be given.

Confidentiality

All information gathered will be kept strictly confidential. Once we have analysed the information no one will be able to identify any participant or the institution they represent. Research reports and articles in scientific journals will not include any information that may identify any participant or the institution they represent.

CONSENT BY DEPARTMENTAL HEAD

I hereby grant permission for the researcher to conduct this research study with participation of Gauteng neonatal intensive care units (NICUs) and staff. I have read and understood the above written information regarding the study.

Head of department's name: _____

(Please print)

Head of department's signature: _____ Date: _____

Researcher's name: _____ (Please print)

Researcher's signature: _____ Date: _____

ANNEXURE F

Generated ideas from the nominal group technique session

ANNEXURE F GENERATED IDEAS FROM THE NGT SESSION

Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
List of hospitals in Gauteng	Patient acuity	Staff knowledge on caring for neonates	Transfers to / from other facilities	Breakdown of unit e.g. level 1, 2 or 3
Infection rate	Bad availability	Access to information for parents	Statistics	Administrative staff available
Disease profile of the unit	Breastfeeding information	Socio economic status of the families	Type of admissions	Specialist services e.g. surgeon
Number of units and bed per unit	Mortality	Literacy levels of mother	Patient acuity	Paediatrician / neonatologist available
Morbidity	Morbidity	Nutrition status of mother	Bed availability / occupancy	Clinical facilitators
Mortality rate	Unit size	HIV status of mother	Location of hospital	Location of hospital
Facility resources	Staff orientation program	Availability of human resources	Staff: patient ratio	Staff experience (years)
Bed occupancy	Policies and procedures available	Availability of physical resources	Patient diagnosis	Qualifications of all staff

Participant 1	Participant 2	Participant 3	Participant 4	Participant 5
Nursing categories used	Staff qualifications	Support to parents	Support to staff	Job descriptions
Overtime rate	Staff experience	Support to staff	Management of staff	Staff utilization / acuity
Number of trained staff	Budget		Resources available for staff, patient, family	Hours worked by agency staff
Cost / financials	Stock available		Staff skills mix	
Stock	Equipment available		Staff numbers	
Equipment maintenance	Equipment maintenance		Trained staff	
Bed spaces available	Mentors available		Job descriptions	
Admissions per unit			Staff training support	
Patient: nurse ratio			Agency staff	
			Staff turnover	
			Budget	
			Policies available	

ANNEXURE G

Categorised groups of ideas

ANNEXURE G CATEGORISED GROUPS OF IDEAS

Staff	Hospital	Resources
Training of staff <ul style="list-style-type: none"> • Formal training available • Qualifications of staff • In-service training available • Number of trained staff • Number of experienced staff • Orientation program available • Work profile available 	Classification of hospital <ul style="list-style-type: none"> • Location of hospital • Unit floor space in m² • Number of registered beds in unit incl. ICU, high care beds • Monthly bed occupancy • Monthly admissions • Type of admissions e.g. medical, surgical • Monthly mortality rate 	Basic resources available <ul style="list-style-type: none"> • Water • Sanitation • Electricity and back-up generator • Oxygen and medical air supply • Linen • Laundry on site
Support to staff <ul style="list-style-type: none"> • Emotional support e.g. debriefing / counseling • Social support • Financial support • Training support incl. mentor / clinical facilitator available 	Specialist services available on site <ul style="list-style-type: none"> • Radiology • Audiology • Ophthalmology • Laboratories • Paediatricians • Neonatologists • Paediatric surgeons 	Facility resources <ul style="list-style-type: none"> • Lodging facilities – beds available, are there costs involved or not • Kangaroo mother care (KMC) • Breastfeeding facilities • Milk kitchen

Staff	Hospital	Resources
Management of staff <ul style="list-style-type: none"> • Number of permanent staff • Number of agency staff • Overtime hours of permanent staff • Staff turnover • Skills mix • Staff absenteeism (sick leave, unplanned leave) • Administrative staff available (incl. secretary and stock controller) 		Financial resources <ul style="list-style-type: none"> • Budget requested: budget allocated • Equipment incl. availability, good working order, maintenance schedule • Stock incl. availability, replacement timeframe Other resources <ul style="list-style-type: none"> • Policies and procedures • Risk management • Quality improvement programs • Care bundles implemented

ANNEXURE G CATEGORISED GROUPS OF IDEAS

Staff	Hospital	Resources
Training of staff <ul style="list-style-type: none"> • Formal training available • Qualifications of staff • In-service training available • Number of trained staff • Number of experienced staff • Orientation program available • Work profile available 	Classification of hospital <ul style="list-style-type: none"> • Location of hospital • Unit floor space in m² • Number of registered beds in unit incl. ICU, high care beds • Monthly bed occupancy • Monthly admissions • Type of admissions e.g. medical, surgical • Monthly mortality rate 	Basic resources available <ul style="list-style-type: none"> • Water • Sanitation • Electricity and back-up generator • Oxygen and medical air supply • Linen • Laundry on site
Support to staff <ul style="list-style-type: none"> • Emotional support e.g. debriefing / counseling • Social support • Financial support • Training support incl. mentor / clinical facilitator available 	Specialist services available on site <ul style="list-style-type: none"> • Radiology • Audiology • Ophthalmology • Laboratories • Paediatricians • Neonatologists • Paediatric surgeons 	Facility resources <ul style="list-style-type: none"> • Lodging facilities – beds available, are there costs involved or not • Kangaroo mother care (KMC) • Breastfeeding facilities • Milk kitchen

Staff	Hospital	Resources
Management of staff <ul style="list-style-type: none"> • Number of permanent staff • Number of agency staff • Overtime hours of permanent staff • Staff turnover • Skills mix • Staff absenteeism (sick leave, unplanned leave) • Administrative staff available (incl. secretary and stock controller) 		Financial resources <ul style="list-style-type: none"> • Budget requested: budget allocated • Equipment incl. availability, good working order, maintenance schedule • Stock incl. availability, replacement timeframe Other resources <ul style="list-style-type: none"> • Policies and procedures • Risk management • Quality improvement programs • Care bundles implemented

ANNEXURE H:

e-Delphi: Round 2 – Refining the data: Scale 1

ANNEXURE H e-DELPHI: ROUND 2

Refining the data: Scale 1

This document contains all the generated ideas from the NGT as summarized in the previous email from round 1.

Read through each idea in all three categories (staff, hospital and resources) and complete the relevant columns on the document using the following response categories:

0=Do not include (meaning you disagree to include this idea in the data collection instrument)

1=Consider (meaning you would consider this idea to be included, but you are uncertain)

2=Include (meaning you would definitely include this idea in the data collection instrument)

Please return your completed document to the researcher via e-mail.

Likert scale: Round 2

Generated ideas	Include	Consider	Do not include	Comments	Suggestions
	2	1	0		
1. Staff					
Training of staff					
Formal training available					
Qualifications of staff					
In-service training available					

Number of trained staff					
Number of experienced staff					
Orientation program available					
Work profile available					
Support to staff					
Emotional support e.g. debriefing / counselling					
Social support					
Financial support					
Training support incl. mentor / clinical facilitator available					
Management of staff					
Number of permanent staff					
Number of agency staff					
Overtime hours of permanent staff					
Staff turnover					
Skills mix					
Staff absenteeism (sick leave, unplanned leave)					
Administrative staff available (incl. secretary and stock controller)					

2. Hospital					
Location of hospital					
Unit floor space in m ²					
Number of registered beds in unit incl. ICU, high care beds					
Monthly bed occupancy					
Monthly admissions					
Type of admissions e.g. medical, surgical					
Monthly mortality rate					
Specialist services available on site					
Radiology					
Audiology					
Ophthalmology					
Laboratories					
Paediatricians					
Neonatologists					
Paediatric surgeons					
3. Resources					
Water					
Sanitation					
Electricity and back-up generator					
Oxygen and medical air supply					
Linen					

Laundry on site					
Lodging facilities – beds available, are there costs involved or not					
Kangaroo mother care (KMC)					
Breastfeeding facilities					
Milk kitchen					
Budget requested: budget allocated					
Equipment incl. availability, good working order, maintenance schedule					
Stock incl. availability, replacement timeframe					
Policies and procedures					
Risk management					
Quality improvement programs					
Care bundles implemented					

ANNEXURE I

e-Delphi: Round 3 – Refining the data: Scale 2

ANNEXURE I e-DELPHI: ROUND 3

Refining the data: Scale 2

After analyzing the votes from round 2, the following data ideas remained.

Read through each remaining idea in all three categories (staff, hospital and resources) and indicate with a \checkmark whether you agree or disagree.

If you agree with ALL data please indicate **yes** at the **bottom** of the document.

If there are some of the data you disagree with, please indicate **no**, and provide a reason in the comment section next to the specific data idea you disagree with.

Please return your completed document to the researcher via email.

Likert scale: Round 3

Selected data	Agree	Disagree (include comment)
1. Staff		
Training of staff		
Formal training available		
Qualifications of staff		
In-service training available		
Number of trained staff		
Number of experienced staff		
Orientation program available		

Support to staff		
Emotional support e.g. debriefing / counselling		
Training support incl. mentor / clinical facilitator available		
Management of staff		
Number of permanent staff		
Number of agency staff		
Staff turnover		
Skills mix		
Staff absenteeism (sick leave, unplanned leave)		
Administrative staff available (incl. secretary and stock controller)		
2. Hospital		
Location of hospital		
Number of registered beds in unit incl. ICU, high care beds		
Monthly bed occupancy		
Monthly admissions		
Type of admissions e.g. medical, surgical		
Monthly mortality rate		
Specialist services available on site		
Radiology		
Audiology		
Ophthalmology		
Laboratories		
Paediatricians		
Neonatologists		
Paediatric surgeons		
3. Resources		
Electricity and back-up generator		
Oxygen and medical air supply		
Linen		

Lodging facilities – beds available, are there costs involved or not		
Kangaroo mother care (KMC)		
Breastfeeding facilities		
Milk kitchen		
Equipment incl. availability, good working order, maintenance schedule		
Stock incl. availability, replacement timeframe		
Policies and procedures		
Risk management		
Quality improvement programs		
Care bundles implemented		

Yes, I agree with all data selected (this means you agree that all the data above will be included in the data collection instrument)		No, I disagree (if you disagree, please remember to comment next to the specific data entry)	
--	--	---	--

ANNEXURE J

e-Delphi: Round 2 – Analysis of the data from round 2

ANNEXURE J e-DELPHI ROUND 2: ANALYSIS

Analysis of the data from round 2

The highest score given to each idea is 2. The scale was completed by 9 participants. The 9 responses multiplied by the high score of 2 gives a total of 18.

Ideas needed a score of >9 or > 50% to be included in the data collection instrument.

All ideas that scored ≤ 9 or 50% were eliminated (highlighted in red).

Generated ideas	Results out of 18	Results %	Participant responses								
			1	2	3	4	5	6	7	8	9
1. Staff											
Training of staff											
Formal training available	18	100	2	2	2	2	2	2	2	2	2
Qualifications of staff	15	83	1	2	1	2	2	2	2	1	2
In-service training available	14	77	2	2	2	1	2	1	2	1	1
Number of trained staff	15	83	1	2	2	2	1	2	2	2	1
Number of experienced staff	13	72	1	1	2	2	2	1	2	1	1
Orientation program available	15	83	2	2	2	1	2	1	2	1	2
Work profile available	9	50	1	2	2	1	2	0	1	0	0

Support to staff											
Emotional support e.g. debriefing / counselling	15	83	2	2	2	1	2	2	2	1	1
Social support	6	33	0	2	0	1	1	1	1	0	0
Financial support	4	22	0	0	0	1	1	1	1	0	0
Training support incl. mentor / clinical facilitator available	13	72	2	0	2	2	2	1	2	1	1
Management of staff											
Number of permanent staff	18	100	2	2	2	2	2	2	2	2	2
Number of agency staff	14	77	0	2	2	2	2	2	2	1	1
Overtime hours of permanent staff	7	38	0	0	2	1	2	0	2	0	0
Staff turnover	14	77	2	2	2	2	2	1	1	1	1
Skills mix	13	72	2	2	2	1	2	1	1	1	1
Staff absenteeism (sick leave, unplanned leave)	14	77	2	2	2	1	2	1	2	1	1
Administrative staff available (incl. secretary and stock controller)	13	72	2	2	2	1	2	1	1	1	1
2. Hospital											
Location of hospital	15	83	2	2	2	2	2	1	1	2	1
Unit floor space in m ²	8	44	0	0	2	1	2	1	2	0	0
Number of registered beds in unit incl. ICU, high care beds	18	100	2	2	2	2	2	2	2	2	2
Monthly bed occupancy	18	100	2	2	2	2	2	2	2	2	2
Monthly admissions	15	83	2	2	2	1	2	2	1	1	2
Type of admissions e.g. medical, surgical	13	72	2	2	2	1	2	1	1	1	1
Monthly mortality rate	18	100	2	2	2	2	2	2	2	2	2

Specialist services available on site											
Radiology	16	88	2	2	2	1	2	2	2	1	2
Audiology	13	72	1	1	2	1	2	2	2	1	1
Ophthalmology	15	83	1	1	2	1	2	2	2	2	2
Laboratories	17	94	2	2	2	1	2	2	2	2	2
Paediatricians	17	94	1	2	2	2	2	2	2	2	2
Neonatologists	11	61	0	0	2	2	2	2	2	0	1
Paediatric surgeons	13	72	1	0	2	2	2	2	2	1	1
3. Resources											
Water	9	50	0	2	2	1	2	1	1	0	0
Sanitation	9	50	0	2	2	1	2	1	1	0	0
Electricity and back-up generator	12	66	0	2	2	1	2	2	1	1	1
Oxygen and medical air supply	12	66	0	2	2	1	2	2	1	1	1
Linen	11	61	2	2	2	1	2	1	1	0	0
Laundry on site	9	50	1	1	2	1	2	1	1	0	0
Lodging facilities – beds available, are there costs involved or not	14	77	2	2	2	2	2	1	1	1	1
Kangaroo mother care (KMC)	15	83	1	2	2	2	2	2	1	1	2
Breastfeeding facilities	16	88	2	2	2	2	2	2	1	1	2
Milk kitchen	15	83	2	2	2	2	2	1	1	2	1
Budget requested: budget allocated	8	44	1	2	2	1	0	1	1	0	0
Equipment incl. availability, good working order, maintenance schedule	15	83	2	2	2	2	2	2	1	1	1
Stock incl. availability, replacement timeframe	13	72	2	2	2	2	2	0	1	1	1

Policies and procedures	16	88	2	2	2	2	2	1	2	2	1
Risk management	15	83	2	2	2	2	2	1	2	1	1
Quality improvement programs	17	94	2	2	2	2	2	2	2	1	2
Care bundles implemented	17	94	2	2	2	2	2	2	2	2	1

ANNEXURE K

e-Delphi: Round 3 – Analysis of the data from round 3

ANNEXURE K

e-DELPHI ROUND 3: ANALYSIS

Analysis of the data from round 3

The following indicates the individual responses from participants in round 3. Only 6 participants responded.

Participant response	Yes, I agree with all data	No, I disagree with all / some data
1	√	
2	√	
3	√	
4	√	Agree, but would like to see staff overtime included
5	√	
6	√	

Likert scale: Round 3

Selected data
1. Staff
Training of staff
Formal training available
Qualifications of staff
In-service training available
Number of trained staff
Number of experienced staff
Orientation program available

Support to staff
Emotional support e.g. debriefing / counselling
Training support incl. mentor / clinical facilitator available
Management of staff
Number of permanent staff
Number of agency staff
Staff turnover
Skills mix
Staff absenteeism (sick leave, unplanned leave)
Administrative staff available (incl. secretary and stock controller)
2. Hospital
Location of hospital
Number of registered beds in unit incl. ICU, high care beds
Monthly bed occupancy
Monthly admissions
Type of admissions e.g. medical, surgical
Monthly mortality rate
Specialist services available on site
Radiology
Audiology
Ophthalmology
Laboratories
Paediatricians
Neonatologists
Paediatric surgeons
3. Resources
Electricity and back-up generator
Oxygen and medical air supply
Linen

Lodging facilities – beds available, are there costs involved or not
Kangaroo mother care (KMC)
Breastfeeding facilities
Milk kitchen
Equipment incl. availability, good working order, maintenance schedule
Stock incl. availability, replacement timeframe
Policies and procedures
Risk management
Quality improvement programs
Care bundles implemented

ANNEXURE L

Instrument for administrative neonatal database

Instrument for Administrative Neonatal Database

Year: _____ Institution: _____

Location of hospital: _____

Data to be completed annually:

Number of registered beds: ICU: Ward:

Highcare: KMC:

Type of admissions: Medical:

Surgical:

Specialist services on site: Paediatrician:

Neonatologist:

Pediatric surgeon:

Pathology:

Radiology:

Ophthalmologist:

Audiologist:

Administrative support: Administrative assistant:

Stock controller:

Emotional support:

If yes, list the type of emotional support available:

Training support:

 Yes No

If yes, list the type of support available:

Orientation program:

 Yes No

In-service training:

 Yes No

If yes, list the type of training programs:

Formal training:

 Yes No

If yes, list the type of training programs:

Resources on site:

Oxygen and medical air:

 Yes No

Laundry:

 Yes No

Milk Kitchen:

 Yes No

Lodging:

 Yes No

If yes, indicate the following:

Number of lodging beds:

Costs involved to lodgers:

 Yes No

Breastfeeding facilities:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Risk management:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Neonatal procedures:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Unit specific policies:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Care bundles implemented:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Equipment:	Available	Working	Serviced
Ventilators:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CPAP drivers:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IV pumps:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cardiac monitors:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pulse oximeters:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
O2 blenders:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T-piece resuscitators:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:			
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Data to be completed monthly:

Monthly bed occupancy:

Monthly admissions:

Monthly staff skill mix:

Number of permanent staff:

RN: EN:

ENA: CW:

Number of neonatal trained staff:

Indicate number of neonatal qualifications:

Degree:

Diploma:

Certificate:

Number of neonatal experienced staff:

0-12 months

1-5 years:

6-10 years:

> 10 years:

Number of agency staff:

RN: EN:

ENA: CW:

Skills mix ratio:

Monthly staff turnover:

Resignations:

Staff absenteeism:

Monthly mortality rate:

Stock:

Essential stock available:

Replacement timeframe:

ANNEXURE M

Permission to conduct research at Mediclinic hospitals in Gauteng

ESTELLE JORDAAN
Nursing Executive

Yours sincerely

Your research proposal entitled "Development of an administrative database to monitor the status of neonatal intensive care practice in Gauteng: A consensus research approach" refers. It is in order for you to conduct your research at Mediclinic hospitals in Gauteng, and I wish you success with this project.

PERMISSION TO CONDUCT RESEARCH AT MEDICLINIC HOSPITALS IN GAUTENG

Dear Lorraine

Ms L Botha
P.O. Box 27052
SUNNYSIDE
0132

4 December 2012

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Head of department's name: Estelle Jordaan
 Head of department's signature: *Estelle Jordaan*
 Date: 28/11/2012
 Researcher's name: Lorraine Botha
 Researcher's signature: *Lorraine Botha*
 Date: 04/12/12
 Researcher's signature: *Lorraine Botha*

I hereby grant permission for the researcher to conduct this research study with participation of Gauteng neonatal intensive care units (NICU's) and staff. I have read and understood the above written information regarding the study.

CONSENT BY DEPARTMENTAL HEAD

All information gathered will be kept strictly confidential. Once we have analysed the information no one will be able to identify any participant or the institution they represent. Research reports and articles in scientific journals will not include any information that may identify any participant or the institution they represent.

CONFIDENTIALITY

Participation is voluntary. No compensation / contribution towards any participant or the institution they represent will be given.

COMPENSATION

The contact person for the study is Lorraine Botha. If you have any questions about the study please contact me at 082 940 0605 (c)
 Alternatively you may contact my supervisor Dr Carin Maree at 083 286 6696 (c)

INFORMATION AND CONTACT PERSON

Tel: 012 354 1330 / 012 354 1677
 Fax: 012 354 1367
 E Mail: manda@med.up.ac.za - Main Committee
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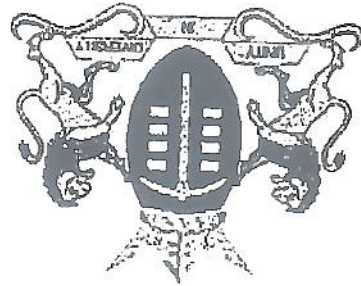
ANNEXURE N

Permission to conduct research – Gauteng Province

This approval is granted only for a research proposal submitted to GDH by L Botha entitled "Development of an administrative database to monitor the status of neonatal intensive care practice in Gauteng: A consensus research approach."

CONTACT DETAILS OF THE RESEARCHER	
Date	21 December 2012
Contact number	Tel: (012) 421 9100
Email	lorraine.botha@medclinic.co.za
Researcher / Principal Investigator (PI)	L Botha
Supervisor	Dr C Maree
Institution	Department of nursing, University of Pretoria
Research title	Development of an administrative database to monitor the status of neonatal intensive care practice in Gauteng: A consensus research approach.

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA



CONDITIONS OF APPROVAL OF A RESEARCH STUDY PROPOSAL

POLICY, PLANNING AND RESEARCH (PPR)

Enquiries: Dr B Ikalafeng

Tel: +2711 355 3500

Fax: +2711 355 3675 Email:bridget.ikalafeng@gauteng.gov.za

Approval is hereby granted by the Gauteng Department of Health for the above mentioned research study proposal for a study to be conducted within GDH domain. Approval is limited to compliance with the following terms and conditions:

1. All principles and South African regulations pertaining to ethics of research are observed and adhered to by all involved in the research project. Ethics approval is only acceptable if it has been provided by a South African research ethics committee which is accredited by the National Health Research Ethics Council (NHREC) of South Africa; this is regardless of whether ethics approval has been granted elsewhere.

Of key importance for all researchers is that they abide by all research ethics principles and practice relating to human subjects as contained in the Declaration of Helsinki (1964, amended in 1983) and the constitution of the Republic of South Africa in its entirety. Declaration of Helsinki upholds the following principles when conducting research, respect for:

- Human dignity;
- Autonomy;
- Informed consent;
- Vulnerable persons;
- Confidentiality;
- Lack of harm;
- Maximum benefit;
- and justice

2. The GDH is indemnified from any form of liability arising from or as a consequence of the process or outcomes of any research approved by HOD and conducted within the GDH domain;

3. Researchers commit to providing the GDH with periodic progress and a final report; short term projects are expected to submit progress reports on a more frequent basis and all reports must be submitted to the Director: Policy, Planning and Research of the GDH;
4. The Principal Investigator shall promptly inform the above mentioned office of changes of contact details or physical address of the researching individual, organisation or team;
5. The Principal Investigator shall inform the above office and make arrangements to discuss their findings with GDH prior to dissemination;
6. The Principal Investigator shall promptly inform the above mentioned office of any adverse situation which may be a health hazard to any of the participants;
7. The Principal Investigator shall request in writing authorization by the HOD via PPR for any intended changes of any form to the original and approved research proposal;
8. If for any reason the research is discontinued, the Principal Investigator must inform the above mentioned office of the reasons for such discontinuation;
9. A formal research report upon completion should be submitted to the Director: Policy, Planning and Research of the GDH with recommendations and implications for GDH, the Directorate will make this report available for the HOD.

This approval is granted only for a research proposal submitted to GDH by L. Botha entitled "Development of an administrative database to monitor the status of neonatal intensive care practice in Gauteng: A consensus research approach."

Date: 02/01/2012
Mrs C Nkosi, Acting Director PPR
Approved / not approved

Date: 21/12/2012
Dr Bridget Ikalang, DD: Research and Epidemiology
Reviewed and recommended

This study will provide a database with adequate and accurate information regarding the status of neonatal intensive care practice that the neonatal interest groups of South Africa can use for the development of policies, strategies and initiatives to ultimately improve the quality of health/nursing care to all neonates. This database can be used together with existing databases to contribute to and monitor policy development, strategic planning and human resource management in order to optimize the quality of neonatal nursing care provided to critically ill and high risk neonates, as well as to benchmark South African practices with international practices. This study is therefore recommended for approval.

REVIEWER'S FINAL CONCLUSION

This is a non experimental consensus study to determine and describe the process for developing an administrative database. Both the nominal group technique and the Delphi method will be used to collect data on the content that is needed to be included in the database as well as strategies on how to obtain the data. For the nominal technique, the target population will include representatives of various organizations, e.g NNISA, COINN, SATTSA, DOH, SANC as well as trained neonatal nurses working in NICU's in both government and private hospitals in Gauteng. The Delphi method will be used to refine the content and strategies of the database. It is an interactive route to obtain expert opinions and can also be used to reach agreement between experts regarding certain issues (Keeney, 2014). This technique is a "multi staged survey which attempts ultimately to achieve consensus on an important issue". The target population will be neonatal intensive care experts who will also be involved in the collection and utilization of the data for this database. The experts will include neonatal unit managers / shift leaders pediatricians and neonatologists. The group in the nominal group technique will not be included, as the instrument being used for the e-Delphi will be derived from their input. Pilot testing of the data collection instrument will be done to obtain and analyze the content of the database.

METHODS

ANNEXURE O

Editor's declaration

A. Harold

BA (Hons), MA (Wits); BA (Hons), MA (Cum Laude), HED (Unisa)

Language Practitioner/ Editor/Sworn Translator of the High Court of South Africa

Member of the South African Translators' Institute

Member of the Professional Editors' Group (PEG)

Full Member of the English Academy of Southern Africa

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26 October 2013

EDITOR'S DECLARATION

I certify that I have edited the language of the dissertation entitled *The development of an administrative neonatal database instrument to monitor the status of neonatal intensive care practice* submitted to me by Ms Lorraine Botha and that I deem the writing to be of a sufficiently high standard to warrant submission of the dissertation for examination.


A. Harold