NATIONAL PERINATAL MORTALITY AND MORBIDITY COMMITTEE (NaPeMMCo) TRIENNIAL REPORT (2008-2010)

Confidential

By National Perinatal Morbidity and Mortality Committee, June 2011

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ABBREVIATIONS

ANC- Antenatal Care
APH- Antepartum Haemorrhage
ART- Antiretroviral Therapy
ARVs- Antiretrovirals
BANC- Basic Antenatal Care
BBA- Born Before Arrival
C/S- Caesarean Section
CEO- Chief Executive Office
CHC- Community Health Centre
Child PIP- Child Healthcare Problem Identification Programme
CHW- Community Health Worker
Cong. Abn. – Congenital Abnormalities
CPAP- Continuous Positive Airway Pressure
CSP-
DDG- Deputy Director General
DHA- Department of Home Affairs
DHIS- District Health Information System
DHS- Demographic Health Survey
DOH- Department of Health
EC- Eastern Cape
Ecl.- Eclampsia
END- Early Neonatal Deaths
ENDR- Early Neonatal Death Rate
ENMR- Early Neonatal Mortality Rate
ENND- Early Neonatal Deaths
ENNDR- Early Neonatal Death Rate
ENNMR- Early Neonatal Mortality Rate
EPOC- Essential Postnatal Care
ESMOE- Essential Steps in Medical and Obstetric Emergencies
ETAT- Emergency Triage and Treatment
FS- Free State
GH- Gordonia Hospital
HAART- Highly Active Antiretroviral Therapy
HIV- Human Immunodeficiency Virus
HOD- Head of Department
HST- Health Systems Trust
HT- Hypertension
IMCI- Integrated Management of Childhood Illnesses
Inf.- Infections
IPA- Intrapartum Asphyxia
IPA & T- Intrapartum Asphyxia and Trauma
IUGR- Intrauterine Growth Retardation
IUD- Intrauterine Deaths
KHC- Kimberly Hospital Complex
KMC- Kangaroo Mother Care
KZN- KwaZulu-Natal
Jhb- Johannesburg
LBW- Low Birth Weight
LINC- Limpopo Initiative on Neonatal Care
LND- Late Neonatal Deaths
LNND- Late Neonatal Deaths
MAIN- Maternal and Infant
MCWH- Maternal, Child and Women's Health
MCWH/N- Maternal, Child and Women's Health and Nutrition
MD- Maternal Diseases
MDG- Millennium Development Goals
MEC- Member of Executive Council
MNCWH- Maternal, Neonatal, Child and Women's Health
MOU- Midwifery Obstetric Units
MRC- Medical Research Council
MUAC- Mid Upper Arm Circumference
NaPeMMCo- National Perinatal Morbidity and Mortality Committee
NC- Northern Cape
NCCEMD- National Committee for the Confidential Enquiries into Maternal Deaths
NGO- Non-Governmental Organization
NMDR- Neonatal Mortality Death Rate
NMM- Nelson Mandela Municipality
NMR- Neonatal Mortality Rate
NND- Neonatal Deaths
NNMR- Neonatal Mortality Rate
NPNMMC- National Perinatal and Neonatal Mortality and Morbidity Committee
NPRI- Non Pregnancy Related Infections
NVP- Nevirapine
NW- North West
PC- Personal Computer
PCI- Perinatal Care Index
PCR- Polymerase Chain Reaction
PEP- Perinatal Education Programme
PHC- Primary Health Care
PMTCT- Prevention of Mother To Child Transmission
PPIP- Perinatal Problem Identification Programme
PNC- Postnatal Care
PNMR- Perinatal Mortality Rate
PTL- Preterm Labour
ProPeMMCo- Provincial Perinatal Morbidity and Mortality Committee
SADHS- South African Demographic Health Survey
SB- Stillbirths
SBR- Stillbirth Rate
SPTB- Spontaneous Preterm Birth
Stats SA- Statistics South Africa
TB- Tuberculosis
TV- Television
Unexpl. SB- Unexplained Stillbirths
Unk- Unknown
UNFPA- United Nations Population Fund
UNICEF- United Nations Children's Fund
VCT- Voluntary Counselling and Testing
WC- Western Cape
WINC- Western Cape Initiative on Neonatal Care
WHO- World Health Organization

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INTRODUCTION

The National Perinatal and Neonatal Morbidity and Mortality Committee (NaPeMMCo) was established in March 2008 by the late Minister of Health Dr. Tshabalala-Msimang. It was tasked to audit all perinatal and neonatal deaths occurring in the country and produce annual reports and a final triennial report in 2011. The committee was also tasked to make recommendations on what needed to be done to reduce perinatal and neonatal deaths.

Due to large numbers of perinatal and neonatal deaths it was not possible for the committee to independently and *ab initio* review each and every death in the country. The committee therefore used all available databases in the country that collect information on perinatal and neonatal deaths.

Currently there are two national systems or databases that gather information on these deaths. The District Health Information System (DHIS) collects data on the number of stillbirths and neonatal deaths occurring within the state healthcare facilities. The data for the DHIS are gathered by the healthcare facilities and then forwarded to the provincial DHIS offices, which in turn forward the data to the national DHIS.

The second national database is that managed by the Department of Home Affairs (DHA) which records all deaths in the country, including stillbirths and neonatal deaths. This database includes deaths occurring in the public and private healthcare facilities and those occurring in the communities. The data from DHA are forwarded to Statistics South Africa (Stats SA) for analysis.

Both the DHIS and DHA databases record death tallies rather than the pathological and health system causes of perinatal and neonatal deaths. The database that records detailed information on pathological and health system causes of perinatal and neonatal deaths in the country is Perinatal Problem Identification Program (PPIP), which falls under the auspices of Medical Research Council. The PPIP collects data from maternity and neonatal wards in the facilities where births are conducted. It does not record information on the neonatal deaths that occur in the children's wards. The database that records data from children's wards is Child health Problem Identification Program (Child PIP).

Except for DHA/Stats SA, all the above-mentioned databases collect data in the public sector only. For this report, the committee has obtained information on deaths occurring in some private hospitals.

To ensure good quality of national data on perinatal and neonatal deaths there needs to be a process of data review at both healthcare facility and provincial levels to check for and correct inaccuracies or errors. The committee realized that this can only be achieved if the information is gathered and reviewed at the provincial level by both those who collect it and those who need to use it on a regular basis.

Therefore the committee decided to establish provincial committees where all the provincial data from different hospitals and districts would be reviewed. It was agreed that these committees will be composed of

- A member of the NaPeMMCo from the province who may act as a chairperson
- The co-coordinator of the provincial maternal and child health (MCH) directorate
- The provincial co-ordinator for PPIP
- The provincial co-coordinator for Child PIP
- The provincial co-coordinator for the District Health Information System
- A representative from the provincial department of Home Affairs

It was agreed that if the provinces had a similar structure as proposed above in existence already, the provincial NaPeMMCo member must become part of that structure instead of starting another structure. The coordinators of all provincial MCWH directorates were invited to a NaPeMMCo meeting to request their formation and co-ordination of such a committee (Provincial Perinatal Morbidity and Mortality Committee (ProPeMMCo)). The experiences from the provinces on establishment of these provincial committees are included in this report as well as data from 2007 to 2009 emanating from these committees.

After the data from the different database sets and from provinces were presented and reviewed in the committee, recommendations on what the country needs to do to reduce perinatal deaths were made. The committee has also made suggestions on how to implement these recommendations. In particular, obstetric and neonatal interventions that, if implemented, will have a significant impact in reducing neonatal deaths are presented in this report.

Different members of the committee were tasked with writing the chapters of this report. The provincial chapters were presented in the 2009 interim report therefore they were not edited for this report; they are published as submitted by the authors.

PART 1

STILLBIRTHS AND NEONATAL DEATHS IN SOUTH AFRICA ACCORDING TO DIFFERENT DATABASE SETS

CHAPTER 1

THE DISTRICT HEALTH INFORMATION SYSTEM (DHIS): 2004-2009

Author: F. Nkwanyana

Introduction

The District Health Information System (DHIS) was implemented in the public sector in 1999. The goal of DHIS is to use locally generated information to improve the coverage and quality of health services, and to impact positively on the health status of communities. It uses standardised tools for collecting, capturing, collating and disseminating data. The minimum amount of data to be collected by each facility, data collection tools, data quality checks and feedback systems have been standardised. Data are converted into indicators. Information from the DHIS is made available to managers or decision makers in the form of monthly or quarterly reports. Managers should use information from DHIS for service delivery planning and decision making. This includes developing mechanisms for quality control, monitoring service level agreements or giving incentives for good performance. Managers at all levels should use the health service indicators to monitor their business plans. The DHIS is used in all healthcare facilities that conduct births.

The committee requested perinatal care information from DHIS. The DHIS provided data from 2004 to 2009 on antenatal visits, teenage pregnancy, recorded births, modes of delivery, stillbirths and neonatal deaths.

Total Recorded Births

Births in healthcare facilities are divided into those that occur in the healthcare facility (In-facility births) and those that occur outside the facilities but are brought to the facilities soon after birth and are therefore recorded in the facilities. These births are often referred to as 'born before arrival or BBA'. Total recorded births consist of in-facility births and BBAs. They include live births and stillbirths. Table 1.1 below presents the number of recorded births in public healthcare facilities by province from 2004 to 2009. The proportion of births occurring before arrival to the healthcare facility is less than 10% in most provinces.

Table 1.1 Total numbers of births in healthcare facilities from year 2004 to 2009

Province	2004	2005	2006	2007	2008	2009	Total
Eastern Cape	111,268	117,307	121,204	113,564	121,132	133,601	718,076
Free State	53,235	57,065	59,159	59,843	60,066	55,470	344,838
Gauteng	182,858	188,436	195,629	203,055	205,287	211,507	1,186,772
KZN	192,475	207,404	212,373	207,532	217,364	214,713	1,251,861
Limpopo	105,093	118,600	127,100	128,297	134,680	129,568	743,338
Mpumalanga	67,039	75,069	75,635	73,044	79,461	78,463	448,711
North West	56,748	62,624	67,471	65,588	68,004	63,908	384,343
N. Cape	22,882	23,023	23,590	23,379	23,914	23,254	140,042
Western Cape	90,942	93,204	98,566	103,961	99,581	104,295	590,549
Total	882,540	942,732	980,727	978,263	1,009,489	1,014,779	5,808,530

Overall, there is a 15% increase in recorded births from 2004 (882,540 births) to 2009 (1,014,779). There are fluctuations in number of births from year to year in some provinces. This may be because of incomplete data for some years.

KwaZulu-Natal and Gauteng provinces accounted for 42% of total births over this six year period. There were no records of birth weight categories in the data provided. Estimation of the low birth weight rate in South Africa is not possible based on the DHIS data.

Antenatal Visits

Attending antenatal clinic early may influence the health of the baby at birth. Starting antenatal care early in pregnancy allows the healthcare workers to detect and treat problems early in pregnancy thereby reducing the chances of morbidity and mortality in the infant. The percentage of women giving birth that had antenatal visits before or at 20 weeks is presented in Table 1.2 below.

Table 1.2 Percentage of women who attended antenatal care before or at 20 weeks of pregnancy

Province	2004	2005	2006	2007	2008	2009
Eastern Cape	8	14	17	26	34	34
Free State	33	40	40	42	43	51
Gauteng	31	34	35	32	32	31
KZN	38	42	45	48	46	48
Limpopo	39	38	36	35	31	25
Mpumalanga	46	42	40	35	37	41
North West	25	35	35	39	41	47
Northern Cape	45	47	51	48	50	56
Western Cape	36	36	37	37	44	48

Pregnancy in women under 18 years

Percentages of pregnant women less than 18 years are shown in Table 1.3 below. Mpumalanga has the highest proportion of pregnancy in women less than 18 years, and the Northern Cape the lowest.

Table 1.3 Percentage of women giving birth who are under 18 years

Province	2004	2005	2006	2007	2008	2009
Eastern Cape	8.9	10.0	10.0	10.2	9.9	8.9
Free State	0.6	5.2	7.4	7.4	7.5	7.8
Gauteng	8.2	8.1	8.9	8.1	7.2	5.9
KZN	8.7	9.1	8.6	8.7	8.8	8.4
Limpopo	9.9	9.7	8.3	8.0	8.0	7.6
Mpumalanga	13.5	12.4	9.5	10.1	9.5	9.3
North West	8.3	7.7	8.4	9.1	8.6	7.8
Northern Cape	6.2	6.0	5.9	6.4	6.2	4.5
Western Cape	7.3	7.6	7.9	7.2	7.2	5.9

Caesarean Sections

There has been an increase in the proportion of births by caesarean section over this six year period. KwaZulu-Natal the highest proportion of births by caesarean section North West the lowest (Table 1.4).

Table 1.4 Percentage of pregnant mothers delivered by caesarean section

PROVINCES	2004	2005	2006	2007	2008	2009
Eastern Cape	14.7	15.6	17.0	17.1	18.7	20.1
Free State	15.9	15.0	16.9	16.9	18.1	18.3
Gauteng	17.6	18.1	18.1	18.5	19.7	20.5
KwaZulu-Natal	22.7	23.1	24.1	24.5	24.9	29.4
Limpopo	11.8	12.5	13.4	13.5	13.7	14.2
Mpumalanga	11.7	12.6	12.7	13.2	13.8	15.1
North West	10.6	9.8	12.2	13.9	14.2	14.9
Northern Cape	14.2	14.0	14.5	14.8	14.0	15.3
Western Cape	16.3	17.2	18.0	18.4	17.7	19.8

Stillbirths

The number of still births is shown in Table 1.5. There are more than 20 000 viable babies who die every year before they are born. The number of stillbirths has increased since 2004. The stillbirth rates (stillbirths/1000 deliveries) from 2004 to 2009 are shown in Table 1.6. Free State had more still births per 1000 deliveries over the six year period compared to other provinces. The stillbirth rate in Western Cape was relatively lower when compared to other provinces. There was a decrease and an increase in stillbirth rates in Gauteng and Western Cape respectively in 2009. This is difficult to explain, is most likely related to incomplete data.

Table 1.5 Number of stillbirths per province

Province	2004	2005	2006	2007	2008	2009
E. Cape	3128	3366	3204	2935	2659	2966
Free State	1656	1700	1722	1873	1739	1659
Gauteng	4079	3806	4198	4020	4279	2141
KZN	5093	5387	5449	5180	4910	5088
Limpopo	2263	2475	2835	2888	3145	2970
Mpumalanga	1558	1722	1804	1844	1896	2063
North West	1260	1331	1538	1596	1649	1791
Northern C	583	550	582	572	586	520
W. Cape	1738	1855	1937	2202	1818	2828
TOTAL	21358	22192	23269	23110	22681	22026

Table 1.6 Stillbirths per 1000 deliveries

Province	2004	2005	2006	2007	2008	2009
Eastern Cape	28.1	28.7	26.4	25.8	22.0	22.2
Free State	31.1	29.8	29.1	31.3	29.0	29.9
Gauteng	22.3	20.2	21.5	19.8	20.8	10.1
KZN	26.5	26.0	25.7	25.0	22.6	23.7
Limpopo	21.5	20.9	22.3	22.5	23.4	22.9
Mpumalanga	23.2	22.9	23.9	25.3	23.9	26.3
North West	22.2	21.3	22.8	24.3	24.3	28.0
Northern Cape	25.5	23.9	24.7	24.4	24.5	22.4
Western Cape	19.1	19.9	19.7	21.2	18.3	27.1

Neonatal Deaths

Table 1.7 shows the number of early neonatal deaths per province over the six year period reviewed. The number of early neonatal deaths has been steady in most provinces and for the country it ranges between 8000 and 9000 deaths per year. The early neonatal mortality rate (Table 1.8) has stayed the same for most provinces except for Eastern Cape where appears that there has been a decrease. We think that this decrease is most likely due to incomplete data, therefore it is not real.

Table 1.7 Number of early neonatal deaths occurring in public healthcare facilities

Province	2004	2005	2006	2007	2008	2009
Eastern Cape	1760	1944	1652	1468	1536	1461
Free State	524	476	470	562	532	542
Gauteng	1432	1619	1489	1478	1576	1809
KZN	1718	1602	1705	1098	1256	1053
Limpopo	1209	1221	1424	1378	1287	1320
Mpumalanga	682	619	693	794	793	788
North West	605	616	681	590	619	586
Northern Cape	235	198	254	248	242	212
W. Cape	574	598	554	518	398	455
TOTAL	8739	8893	8922	8134	8239	8226

Table 1.8 Early neonatal deaths per 1000 live births (early neonatal mortality rate)

Province	2004	2005	2006	2007	2008	2009
Eastern Cape	16.3	17.1	14.0	13.3	13.0	11.2
Free State	10.2	8.6	8.2	9.7	9.1	10.1
Gauteng	8.1	8.8	7.8	7.4	7.8	8.6
KZN	9.2	7.9	8.2	5.4	5.9	5.0
Limpopo	11.8	10.5	11.5	11.0	9.8	10.4
Mpumalanga	10.4	8.4	9.4	11.2	10.2	10.3
North West	10.9	10.1	10.3	9.2	9.3	9.4
Northern Cape	10.5	8.8	11.0	10.9	10.4	9.3
W. Cape	6.4	6.6	5.7	5.1	4.1	4.5

Late Neonatal Deaths

The number of late neonatal deaths varied considerably year by year for most provinces (Table 1.9). There was no data for the Western Cape. It is difficult to make sense of these numbers. These data are likely to be incomplete as they come mainly from maternity wards. Late neonatal deaths occurring in children's wards are likely not recorded.

Table 1.9 Number of Late Neonatal Deaths recorded in Healthcare Facilities conducting births

Province	2004	2005	2006	2007	2008	2009
Eastern Cape	40	88	127	91	202	221
Free State		183	300	228	187	132
Gauteng	3		201	230	134	200
KZN	381	491	323	67	80	345
Limpopo		65	101	122	107	146
Mpumalanga	16	33	48	69	91	66
North West	146	243	1871??	129	101	63
Northern Cape	16	12	27	14	27	44

Perinatal Deaths

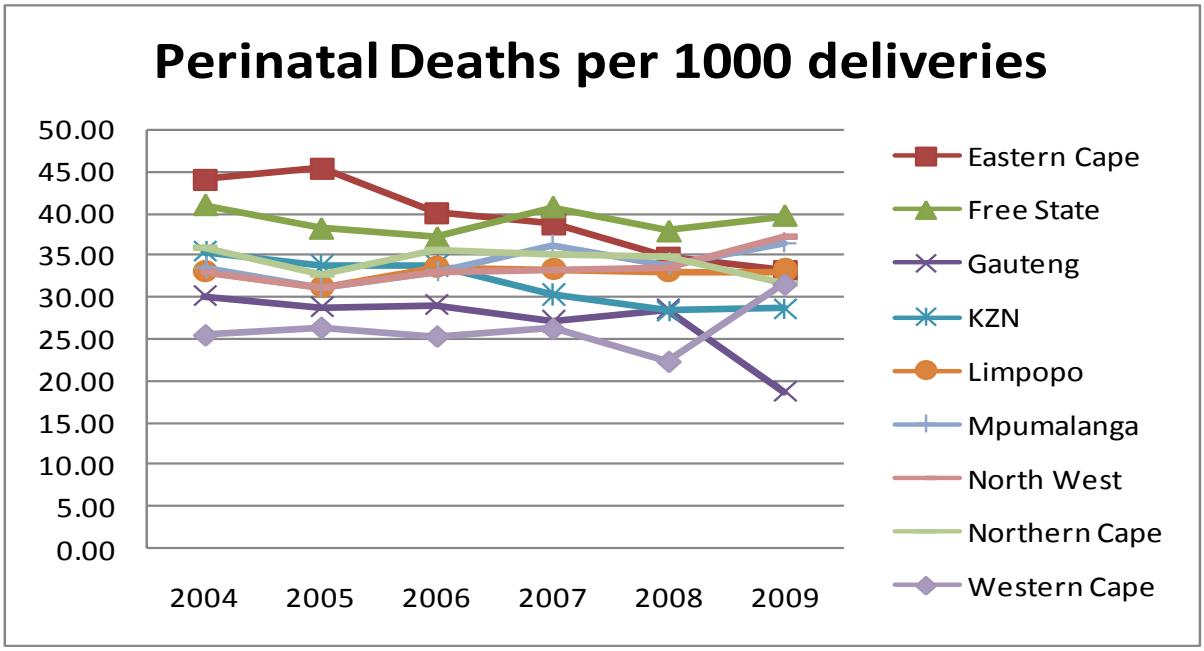
The reported figures of still births and early neonatal deaths were used to estimate perinatal deaths per 1000 deliveries. The results are shown in Table 1.10.

Table 1.10 Perinatal mortality rate (stillbirths and neonatal deaths per 1000 deliveries)

Province	2004	2005	2006	2007	2008	2009
Eastern Cape	43.9	45.3	40.0	38.8	34.6	33.1
Free State	41.0	38.1	37.1	40.7	37.8	39.7
Gauteng	30.1	28.8	29.1	27.1	28.5	18.7
KZN	35.4	33.7	33.7	30.3	28.4	28.6
Limpopo	33.0	31.2	33.5	33.3	32.9	33.1
Mpumalanga	33.4	31.2	33.0	36.1	33.8	36.3
North West	32.9	31.1	32.9	33.3	33.4	37.2
Northern Cape	35.8	32.5	35.4	35.1	34.6	31.5
Western Cape	25.4	26.3	25.3	26.2	22.3	31.5

The Eastern Cape and Free State provinces have the highest perinatal mortality rates. In the Eastern Cape there appears to have been some improvement since 2008 (Figure 1.1). The marked reduction in the perinatal mortality rate in Gauteng and the marked increase in the Western Cape are difficult to explain, but seem to be attributable to changes in the stillbirth rates.

Figure 1.1 Perinatal mortality rate (deaths per 1000 deliveries)



Summary Statistics for Stillbirths and Early Neonatal Deaths in South Africa

Table 1.11 show the annual data for births and perinatal deaths in South Africa.

Table 1.11 Stillbirth rates, Early Neonatal & Perinatal Mortality Rates in South Africa from DHIS

	2004	2005	2006	2007	2008	2009
Number of Births	884 544	944 737	982 733	980 270	1 011 497	1 016 788
Number of Stillbirths	21 358	22 192	23 269	23 110	22 681	22 026
Number of Early Neonatal Deaths	8 739	8 893	8 922	8 134	8 239	8 226
Stillbirth rate	24.2	23.5	23.7	23.6	22.5	21.7
Early Neonatal Mortality Rates	10.2	9.7	9.3	8.5	8.4	8.3
Perinatal Mortality Rate	34.1	33.0	32.8	31.9	30.6	29.8

Summary

South Africa has more than one million births occurring annually in the public health sector.

The DHIS collects data from all public healthcare facilities that conduct births in South Africa. It is a potentially valuable tool for generating country information on perinatal health indices.

Although the DHIS was implemented towards the end of 1999 in South Africa, the data from the healthcare facilities that conduct births were incomplete for the years 2000 to 2003. Even from 2004 onwards some indicators are still difficult to analyse because of incomplete data. For example, late neonatal deaths are not entered for all the years and by all the provinces. Some data are nonsensical. For example the antenatal care attendance rate which is reported in percentages is often given as more than 100%. Overall there has been an increase in registered births from 2004 to 2009. About 8 % of these are in women less than 18 years of age. The proportion of births by caesarean section for the country is about 17%. Though there is a trend towards improvement in a number of indicators (stillbirths, early neonatal mortality, and perinatal mortality rates) nationally, wide fluctuations in some indicators suggest a need to question the quality of the data or process of verification of data. Concerns about data quality are deepened when noting substantial differences in numbers of total births, stillbirths and neonatal deaths recorded in the national DHIS database compared to those recorded in the provincial DHIS databases (see Appendix 1), and such problems as numbers of stillbirths and live births not always adding up to total numbers of births.

A process of data verification is urgently required and grouping of perinatal indices into weight categories (see Appendix 2) is necessary for better understanding the health profile of the perinatal population. Improving quality of data in the DHIS on the perinatal population will better equip policy-makers, administrators and managers to optimise service delivery to this particularly vulnerable group.

CHAPTER 2

STILLBIRTHS AND NEONATAL DEATHS ACCORDING TO STATISTICS SOUTH AFRICA

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Vital registration: Neonatal deaths and Stillbirths

The Birth and Registration Act of 1992 requires that all deaths and stillbirths be registered with the Department of Home Affairs. In addition to certifying the fact of death, a doctor must complete the cause of death on the death notification form (DNF) providing information on the medical cause of death. In the case of a stillbirth, the DNF can be completed by a mid-wife. The onus is on the family of the deceased to register the death but this is often facilitated by the undertaker so as to obtain a burial order.

A new death notification form (DNF) was introduced in South Africa towards the end of 1998 incorporating the notification of stillbirths into a single form. The new DNF follows the international guideline on medical certification and includes 4 lines for the sequence of conditions resulting in the death as well as a line for other contributory causes. It does not have a specific section for stillbirths or perinatal deaths and there is no prompt for separate information about any medical conditions relating to the mother. During 2010, the Department of Home Affairs revised the DNF including a special section for perinatal deaths. However, for the period which is reported here, the inclusion of such detail remained at the discretion of the certifying medical practitioner.

Once the Department of Home Affairs has processed the form, it is given to Statistics South Africa for data capture. The cause of death is coded to ICD-10 and the underlying cause is identified using the Automated Coding of Medical Entities (ACME) programme to ensure a standardised selection. This approach has been used consistently since 1997. The most recently available data are for 2008. Medical causes of stillbirths are currently not captured by Statistics South Africa. This may be because of the incomplete nature of this information on the DNFs.

The analysis and interpretation of cause of death statistics needs to be done cautiously. Vital registration in South Africa is known to be incomplete, particularly in the case of children. Deaths from rural areas are not always registered. However, in recent years, there have been efforts to improve the registration of deaths with some degree of success, making it difficult to assess the increasing trend in the number of registered deaths.

Aside from under-registration of deaths, there is also a degree of mis-classification of causes. For example, there is evidence that across all ages, HIV is systematically not recorded on DNFs. While in some cases, HIV is not disclosed as the underlying cause of death but rather the indicator condition, in other cases, the certifying doctor might not have information

about the HIV status of the deceased. A further problem associated with the analysis of cause of death statistics has been the systematic mis-coding of causes of deaths (P codes) for infants rather that babies < 7 days old for the period 1997-2005.

Until such time as there is complete coverage of death registration as well as multi-levelled systems to ensure good quality cause of death certification, we need to accept inevitable uncertainty around the statistics from vital registration. However, it is important to endeavour to engage with the data alongside other sources of information and interpret it carefully. Most important is to identify the aspects of the system that can be improved.

Trend in numbers of registered deaths

Table 2.1 shows the number of stillbirths and infant deaths obtained from Statistics South Africa. The infant deaths are broken down into the early neonatal (0-6 days), late neonatal (7-28 days) and post-neonatal period (1-11 months). From the table, it can be seen that the number of deaths have increased over this period, with the post-neonatal period showing the major increase in numbers with a peak in 2006 (Figure 2.1). From the table, it can be seen that the number of stillbirths in 1997 and 1998 were considerably lower than the numbers in subsequent years and this coincides with the introduction of the new DNF.

Table 2.1 Number of stillbirths and infant deaths by age group, 1997-2008

Year	Stillbirths	Early neonatal 0-6 days	Late neonatal 7-28 days	Post neonatal 1-11 months	Infant <1 year
1997	5,976	6,843	2,381	15,504	24,728
1998	7,726	7,629	2,467	18,393	28,489
1999	11,966	6,403	2,620	19,600	28,623
2000	12,561	6,354	2,591	19,925	28,870
2001	14,181	5,482	2,508	21,837	29,827
2002	13,285	7,159	2,581	24,648	34,388
2003	14,638	7,878	3,061	27,465	38,404
2004	15,819	7,917	3,317	30,178	41,412
2005	13,822	9,576	3,336	33,515	46,427
2006	14,363	9,757	3,818	34,664	48,239
2007	14,179	9,490	3,916	33,147	46,553
2008	14,626	9,572	3,621	32,123	45,316

Source: Own calculation from data provided by Statistics South Africa from data for 1997-2007 and 2008

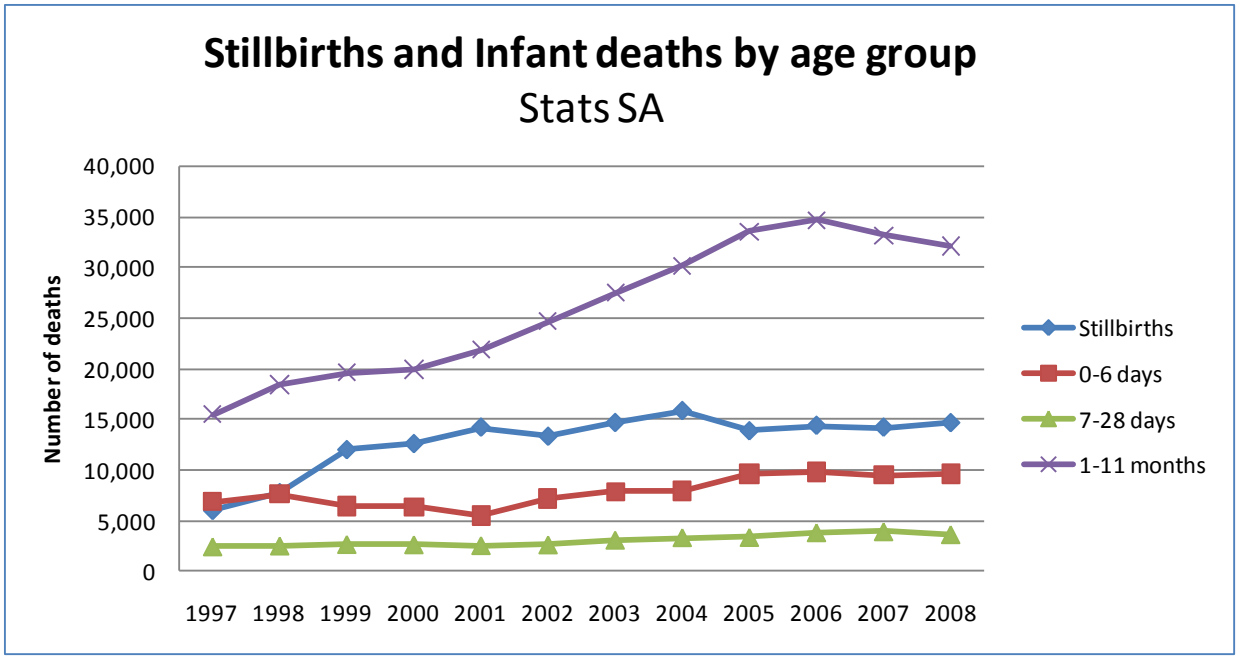


Figure 2.1 Trend in number of stillbirth and infant deaths by age group, 1997-2008

Source: Own calculations from data provided by Statistics South Africa for 1997-2007 and 2008

The numbers of registered stillbirths and infant deaths by age group are shown for each province in Table 2.2 and Figure 2.2. The trends are difficult to interpret and may reflect provincial differences in reporting patterns as well as underlying trends in mortality and stillbirth rates. It is hoped that as each province begins to monitor these trends more carefully, the quality of the data will be improved.

Table 2.2 stillbirths and Infant deaths by province of death, 1997-2008

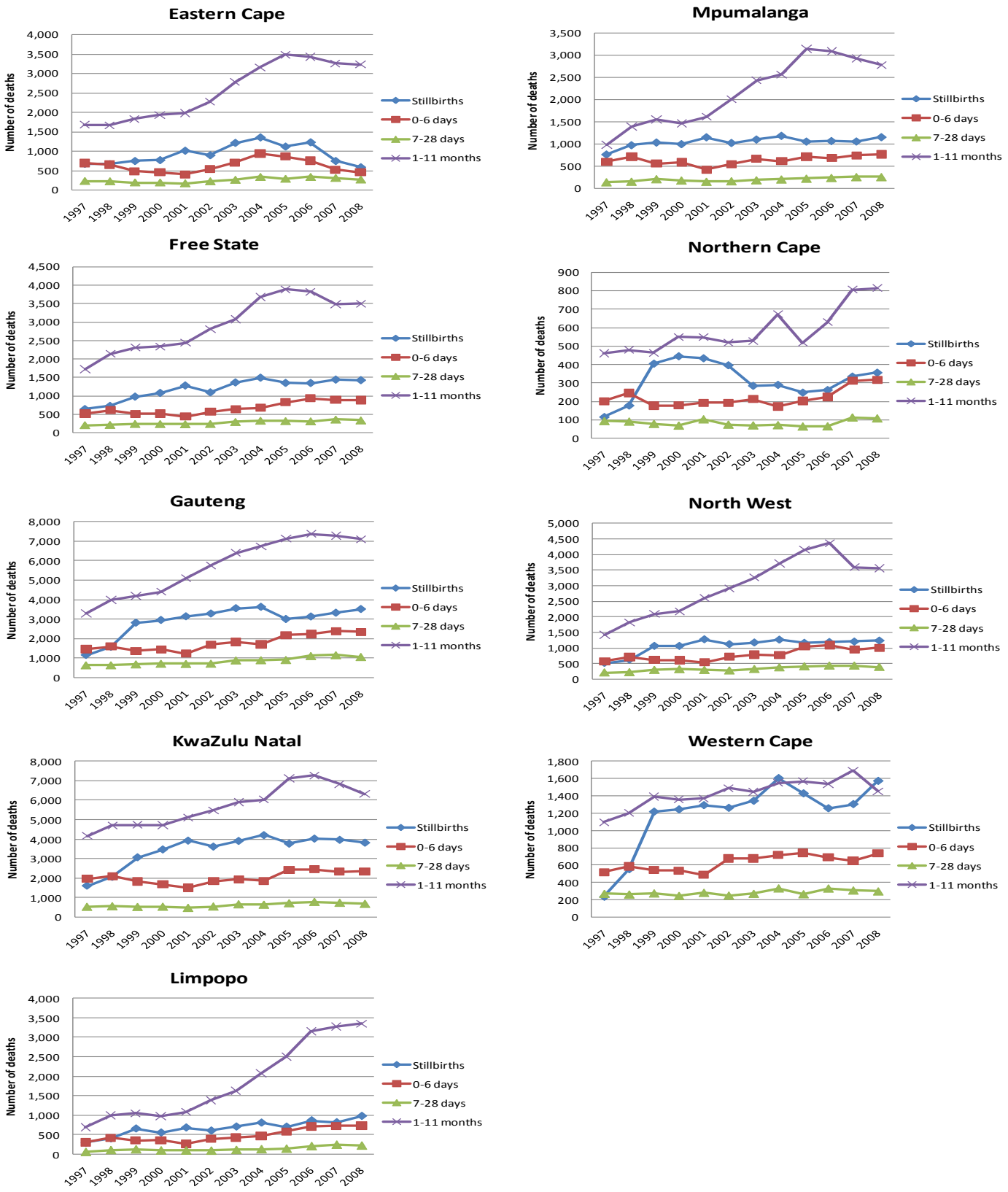
Year	Stillbirths	Early neonatal 0-6 days	Late neonatal 7-28 days	Post neonatal 1-11 months	Infant <1 year
Eastern Cape					
1997	677	698	231	1,683	2,612
1998	665	652	223	1,670	2,545
1999	748	482	192	1,829	2,503
2000	771	454	191	1,934	2,579
2001	1,013	405	168	1,980	2,553
2002	896	538	223	2,275	3,036
2003	1,214	710	262	2,786	3,758
2004	1,355	940	338	3,158	4,436
2005	1,119	865	290	3,486	4,641
2006	1,229	759	338	3,432	4,529
2007	748	525	312	3,264	4,101
2008	588	458	269	3,235	3,962
Free State					
1997	641	518	205	1,723	2,446
1998	726	614	211	2,138	2,963
1999	977	508	238	2,308	3,054
2000	1,079	515	236	2,337	3,088
2001	1,277	436	230	2,440	3,106
2002	1,092	571	238	2,814	3,623
2003	1,360	643	293	3,076	4,012
2004	1,487	678	329	3,675	4,682
2005	1,346	825	319	3,887	5,031
2006	1,346	932	312	3,823	5,067
2007	1,437	887	361	3,485	4,733
2008	1,420	880	336	3,501	4,717
Gauteng					
1997	1,142	1,459	642	3,294	5,395
1998	1,564	1,597	644	3,984	6,225
1999	2,802	1,358	688	4,183	6,229
2000	2,941	1,440	722	4,407	6,569
2001	3,127	1,231	714	5,091	7,036
2002	3,272	1,690	724	5,765	8,179
2003	3,546	1,828	893	6,397	9,118
2004	3,617	1,703	905	6,743	9,351
2005	2,991	2,173	916	7,139	10,228
2006	3,119	2,231	1,123	7,384	10,738
2007	3,342	2,406	1,171	7,368	10,945
2008	3,503	2,340	1,071	7,107	10,518

Year	Stillbirths	Early neonatal 0-6 days	Late neonatal 7-28 days	Post neonatal 1-11 months	Infant <1 year
KwaZulu-Natal					
1997	1,595	1,966	524	4,153	6,643
1998	2,050	2,094	554	4,704	7,352
1999	3,066	1,819	518	4,729	7,066
2000	3,472	1,673	528	4,721	6,922
2001	3,929	1,501	469	5,115	7,085
2002	3,620	1,834	537	5,474	7,845
2003	3,913	1,935	650	5,901	8,486
2004	4,213	1,857	631	6,029	8,517
2005	3,771	2,420	706	7,120	10,246
2006	4,035	2,444	775	7,264	10,483
2007	3,972	2,328	730	6,828	9,886
2008	3,821	2,337	675	6,312	9,324
Limpopo					
1997	293	305	61	690	1,056
1998	400	419	107	995	1,521
1999	652	347	126	1,050	1,523
2000	549	358	97	975	1,430
2001	678	264	96	1,081	1,441
2002	600	390	93	1,378	1,861
2003	702	423	110	1,628	2,161
2004	802	468	129	2,070	2,667
2005	699	582	141	2,501	3,224
2006	861	707	203	3,150	4,060
2007	813	723	238	3,276	4,237
2008	973	727	217	3,352	4,296
Mpumalanga					
1997	768	601	146	985	1,732
1998	975	713	159	1,397	2,269
1999	1,035	559	214	1,558	2,331
2000	999	592	186	1,466	2,244
2001	1,152	423	158	1,613	2,194
2002	1,025	550	169	2,016	2,735
2003	1,102	668	191	2,439	3,298
2004	1,184	614	209	2,567	3,390
2005	1,056	716	226	3,145	4,087
2006	1,068	683	242	3,094	4,019
2007	1,060	745	260	2,941	3,946
2008	1,154	771	260	2,785	3,816

Year	Stillbirths	Early neonatal 0-6 days	Late neonatal 7-28 days	Post neonatal 1-11 months	Infant <1 year
Northern Cape					
1997	116	201	94	461	756
1998	178	246	91	479	816
1999	405	176	79	464	719
2000	446	178	70	549	797
2001	434	192	103	548	843
2002	396	192	75	519	786
2003	285	213	71	528	812
2004	290	172	72	673	917
2005	248	203	65	518	786
2006	262	224	66	629	919
2007	335	311	113	806	1,230
2008	356	317	108	815	1,240
North West					
1997	510	576	209	1,420	2,205
1998	615	710	216	1,820	2,746
1999	1,065	611	291	2,088	2,990
2000	1,064	609	315	2,179	3,103
2001	1,280	541	289	2,599	3,429
2002	1,122	717	273	2,916	3,906
2003	1,175	782	321	3,261	4,364
2004	1,268	769	373	3,707	4,849
2005	1,165	1,051	407	4,149	5,607
2006	1,192	1,094	433	4,365	5,892
2007	1,209	949	430	3,606	4,985
2008	1,237	1,008	387	3,562	4,957
Western Cape					
1997	234	519	269	1,094	1,882
1998	552	584	262	1,202	2,048
1999	1,216	542	274	1,390	2,206
2000	1,242	535	246	1,356	2,137
2001	1,291	488	281	1,369	2,138
2002	1,260	677	249	1,489	2,415
2003	1,341	676	270	1,445	2,391
2004	1,603	715	331	1,551	2,597
2005	1,427	742	265	1,568	2,575
2006	1,255	688	330	1,538	2,556
2007	1,306	651	307	1,690	2,648
2008	1,571	733	297	1,451	2,481

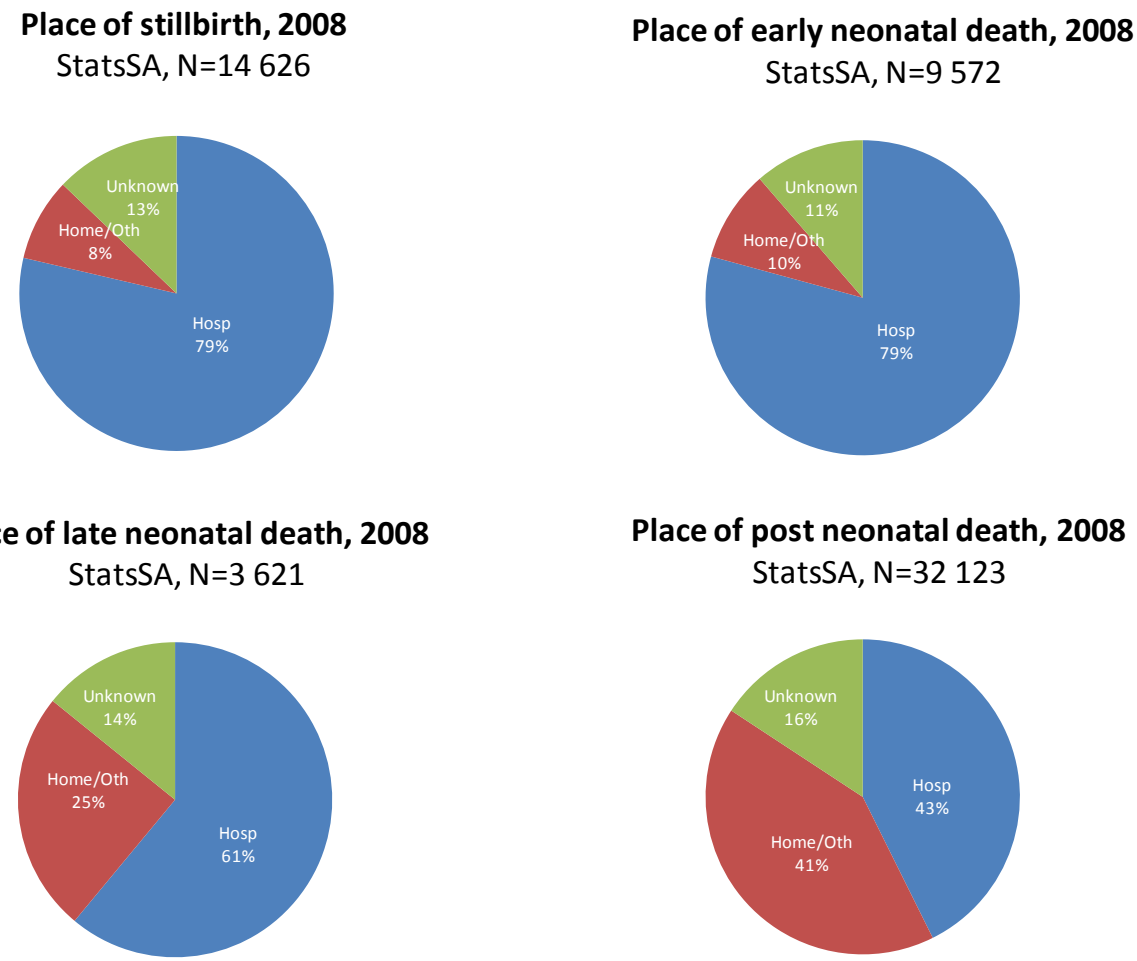
Source: Own calculations from data provided by Statistics South Africa

Figure 2.2 Trend in number of stillbirths and infant deaths by age group for each province, 1997-2008



Place of death

Overall about 13% of the DNFs have missing information about the place of death. None-the-less, the clear majority of registered deaths occurred in hospitals. The proportion



differed by age (Figure 3. 3).

Figure 2.3 Proportion of stillbirths and infant deaths by place of occurrence and age group, 2008

Source: Own calculations from data provided by Statistics South Africa

Almost 80% of the stillbirths and early neonatal deaths were recorded as being in hospital and about 10% out of institutions. The proportion of deaths out of an institution increased to 25% in the late neonatal period and 41% in the post-natal period. The place of death by province is reported for 2006 and 2007 combined in Table 2.3.

Table 2.3 Place of occurrence by age group and province of death in 2006-2008

Year	Stillbirths	Early neonatal 0-6 d	Late neonatal 7-28 d	Post neonatal 1-11 m	Infant < 1 year
Western Cape					
N (2006-2008)	4132	2072	934	4679	11817
Hospital	2835 (69%)	1626 (78%)	529 (57%)	1624 (35%)	6614 (56%)
Home/Other	422 (10%)	184 (9%)	217 (23%)	1819 (39%)	2642 (22%)
Missing	875 (21%)	262 (13%)	188 (20%)	1236 (26%)	2561 (22%)
Eastern Cape					
N (2006-2008)	2565	1742	919	9931	15157
Hospital	1998 (78%)	1361 (78%)	559 (61%)	4532 (46%)	8450 (56%)
Home/Other	177 (7%)	146 (8%)	193 (21%)	3189 (32%)	3705 (24%)
Missing	390 (15%)	235 (13%)	167 (18%)	2210 (22%)	3002 (20%)
Northern Cape					
N (2006-2008)	953	852	287	2250	4342
Hospital	689 (72%)	622 (73%)	122 (43%)	856 (38%)	2289 (53%)
Home/Other	149 (16%)	146 (17%)	134 (47%)	1172 (52%)	1601 (37%)
Missing	115 (12%)	84 (10%)	31 (11%)	222 (10%)	452 (10%)
Free State					
N (2006-2008)	4203	2699	1009	10809	18720
Hospital	3291 (78%)	2188 (81%)	526 (52%)	4053 (37%)	10058 (54%)
Home/Other	623 (15%)	376 (14%)	423 (42%)	6173 (57%)	7595 (41%)
Missing	289 (7%)	135 (5%)	60 (6%)	583 (5%)	1067 (6%)
KwaZulu-Natal					
N (2006-2008)	11828	7109	2180	20404	41521
Hospital	9676 (82%)	6015 (85%)	1560 (72%)	10905 (53%)	28156 (68%)
Home/Other	663 (6%)	391 (6%)	448 (21%)	7673 (38%)	9175 (22%)
Missing	1489 (13%)	703 (10%)	172 (8%)	1826 (9%)	4190 (10%)
North West					
N (2006-2008)	3638	3051	1250	11533	19472
Hospital	2054 (56%)	1915 (63%)	573 (46%)	3708 (32%)	8250 (42%)
Home/Other	555 (15%)	466 (15%)	414 (33%)	5667 (49%)	7102 (36%)
Missing	1029 (28%)	670 (22%)	263 (21%)	2158 (19%)	4120 (21%)

Year	Stillbirths	Early neonatal 0-6 d	Late neonatal 7-28 d	Post neonatal 1-11 m	Infant < 1 year
Gauteng					
N (2006-2008)	9972	6977	3365	21859	42173
Hospital	7571 (76%)	5233 (75%)	2042 (61%)	8728 (40%)	23574 (56%)
Home/Other	857 (9%)	721 (10%)	723 (21%)	8566 (39%)	10867 (26%)
Missing	1544 (15%)	1023 (15%)	600 (18%)	4565 (21%)	7732 (18%)
Mpumalanga					
N (2006-2008)	3282	2199	762	8820	15063
Hospital	2831 (86%)	1855 (84%)	461 (60%)	3699 (42%)	8846 (59%)
Home/Other	216 (7%)	166 (8%)	204 (27%)	4074 (46%)	4660 (31%)
Missing	235 (7%)	178 (8%)	97 (13%)	1047 (12%)	1557 (10%)
Limpopo					
N (2006-2008)	2647	2157	658	9778	15240
Hospital	2199 (83%)	1828 (85%)	397 (60%)	3951 (40%)	8375 (55%)
Home/Other	179 (7%)	139 (6%)	175 (27%)	4293 (44%)	4786 (31%)
Missing	269 (10%)	190 (9%)	86 (13%)	1534 (16%)	2079 (14%)

Source: Own calculations from data provided by Statistics South Africa for 1997-2007 and 2008

Cause of death profile

The causes of death for infants have been grouped into categories that have programmatic clinical relevance. The ICD-10 codes are shown in Appendix 1 of this Chapter. Causes of stillbirths are not reported as the data are very limited for this category. Figure 2.4 show that in 2008, neonatal conditions accounted for 31% of the infant deaths. Of this, preterm was the most common cause of death accounting for 9%. This was followed by infections in the perinatal period which accounted for 6% of the infant deaths in 2008. Table 2.4 shows the cause of death profile for each province based on the place of residence reported on the DNF. The data are for 2006 - 2008 combined.

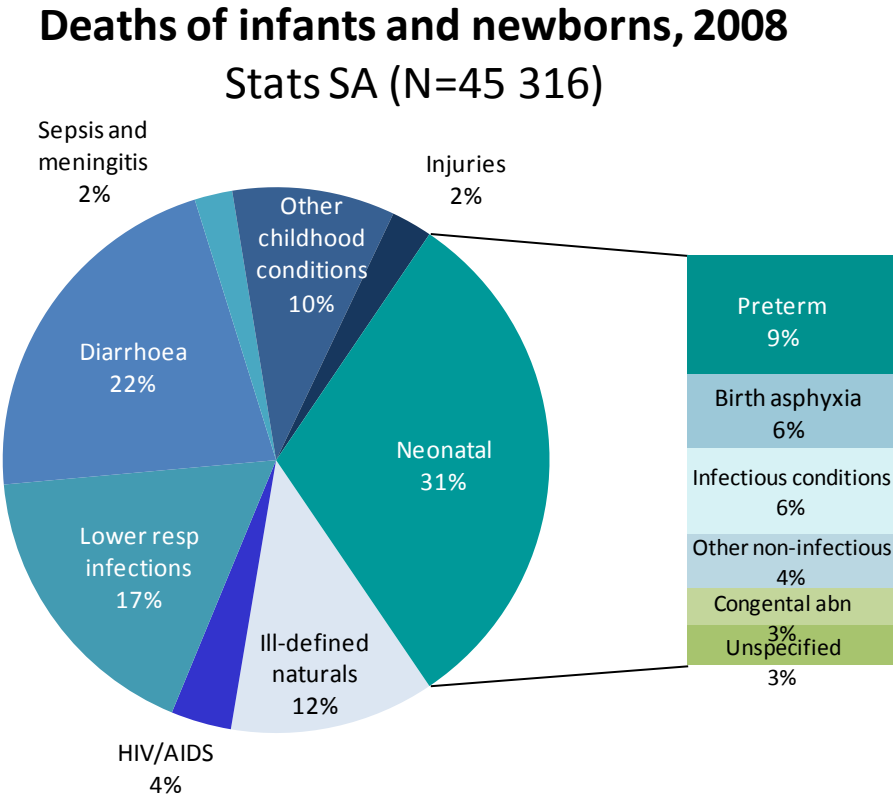


Figure 4: Cause of death profile for infants and newborns, 2008

Source: Own calculations from data provided by Statistics South Africa

Table 2.4 Infant and newborn cause of death profile by province, 2006-2008

	Eastern Cape	Free State	Gauteng	KwaZulu -Natal	Limpopo	Mpumalanga	Northern Cape	North West	Western Cape	South Africa
Total deaths (N)	12,592	14,517	32,201	29,693	12,593	11,781	3,389	15,834	7,685	140,285
Neonatal causes	23.7%	27.4%	34.9%	33.1%	24.0%	26.7%	36.7%	28.9%	43.6%	30.9%
Preterm birth complications	5.9%	8.7%	8.9%	10.4%	7.5%	9.0%	13.1%	9.4%	13.9%	9.2%
Birth asphyxia & trauma	3.7%	5.6%	5.3%	6.8%	5.4%	5.4%	4.5%	4.9%	5.2%	5.5%
Sepsis and other infections	5.6%	5.5%	7.7%	6.5%	4.4%	4.8%	6.0%	6.3%	6.8%	6.2%
Other non-infectious perinatal conditions	3.1%	3.1%	5.6%	4.4%	2.9%	3.4%	3.7%	3.5%	5.2%	4.1%
Congenital anomalies	2.8%	1.9%	3.6%	2.5%	2.1%	2.0%	3.2%	1.9%	6.9%	2.9%
Unspecified perinatal	2.6%	2.6%	3.8%	2.5%	1.7%	2.1%	6.0%	2.9%	5.6%	3.0%
HIV/AIDS	5.1%	3.2%	4.2%	3.8%	2.6%	3.8%	4.1%	3.1%	4.4%	3.8%
Diarrhoea	21.6%	20.8%	16.2%	22.7%	23.8%	26.1%	17.6%	21.9%	11.5%	20.5%
Lower respiratory infections	18.9%	24.4%	15.8%	15.5%	21.0%	22.2%	15.5%	21.9%	10.3%	18.3%
Sepsis and meningitis	2.1%	2.0%	2.5%	2.3%	2.5%	2.1%	2.0%	2.1%	2.0%	2.3%
Other childhood disease	10.3%	11.1%	9.5%	10.1%	8.4%	10.3%	9.4%	10.4%	6.4%	9.8%
Ill-defined naturals	15.2%	9.7%	14.3%	9.7%	15.1%	6.4%	12.4%	10.1%	16.0%	11.9%
Injuries	3.1%	1.5%	2.5%	2.8%	2.5%	2.4%	2.4%	1.5%	5.8%	2.6%

Source: Own calculations from data provided by Statistics South Africa (stillbirths are excluded)

Perinatal and Neonatal Mortality Rates

The MRC Burden of Disease Research Unit is currently undertaking a review of child mortality involving the assessment of data from multiple sources and a method of adjusting for under-registration is being explored. Child mortality rates have been estimated from the 2007 Community Survey based on questions about deaths in the household in the preceding 12 months as well as questions to women about the number of children ever born and the number that have died. The mortality rate derived from the survey together with the rates from the 1998 South African and Demographic Health Survey have been used to estimate the number of deaths when the rate is applied to the number of births estimated from the ASSA2003 model. These indicate that the registration of infant deaths has increased over this period from about 50% completeness to 90% in 2006. The adjusted numbers of stillbirths, early and late neonatal deaths, assuming 2007 and 2008 have no further improvement are shown in Table 2.5. Since there is no other information that can be used to assess the completeness of stillbirth registration, the stillbirths have been adjusted for the same level of under-registration as infant deaths. However, it is not clear whether the same improvement in registration of infant deaths has also been experienced for stillbirths. Thus the decline in the stillbirth rates may merely be an artefact of the adjustment factor and needs to be interpreted cautiously.

Table 2.5 Registered and adjusted number of stillbirths and neonatal deaths, 1997-2008

Year	Stillbirths		Early neonatal (0-6 days)		Late neonatal (7-28 days)	
	Registered	Adjusted	Registered	Adjusted	Registered	Adjusted
1997	5,976	13,163	6,843	15,073	2,381	5,244
1998	7,726	16,369	7,629	16,163	2,467	5,227
1999	11,966	24,470	6,403	13,094	2,620	5,358
2000	12,561	24,824	6,354	12,557	2,591	5,121
2001	14,181	26,261	5,482	10,152	2,508	4,644
2002	13,285	21,886	7,159	11,794	2,581	4,252
2003	14,638	21,686	7,878	11,671	3,061	4,535
2004	15,819	20,814	7,917	10,417	3,317	4,364
2005	13,822	16,261	9,576	11,266	3,336	3,925
2006	14,363	16,377	9,757	11,125	3,818	4,353
2007	14,179	16,168	9,490	10,821	3,916	4,465
2008	14,626	16,677	9,572	10,914	3,621	4,129

Source: Numbers adjusted by completeness factor from Dorrington and Darikwa, 2009

Age specific mortality rates have been calculated using the estimated number of births for each year from the ASSA2003 model (Table 2.6). The stillbirth rate was higher in 1999 than in 1997 and 1998, which can be attributed to the introduction of the new DNF. However, the adjusted stillbirth rates declined from a peak in 2001. This pattern contrasts with that of the stillbirth rate reported through the DHIS which showed a continued increase until 2003 before starting to decline. Furthermore, it is difficult to compare the stillbirth rates from vital registration with other sources such as PIP as there is no clear indication of the weight criteria used. The early neonatal rate appears to have declined from about 14 per 1000 live births in 1997/8 to about 11 per 1000 live births in subsequent years. It is possible that the introduction of the new DNF at the end of 1998 contributed to this drop. There appears to have been little change in the early or late neonatal mortality rates since about 2000.

Table 2.6 Stillbirth, early neonatal and late neonatal mortality rates per 1000 live births, 1997-2008

Year	Births	Stillbirths per 1000 live births		Early neonatal deaths (0-6 days) per 1000 live births		Late neonatal deaths (7-28 days) per 1000 live births	
		Registered	Adjusted	Registered	Adjusted	Registered	Adjusted
1997	1,154,226	5.2	11.4	5.9	13.1	2.1	4.5
1998	1,149,711	6.7	14.2	6.6	14.1	2.1	4.5
1999	1,143,246	10.5	21.4	5.6	11.5	2.3	4.7
2000	1,134,620	11.1	21.9	5.6	11.1	2.3	4.5
2001	1,128,469	12.6	23.3	4.9	9.0	2.2	4.1
2002	1,124,624	11.8	19.5	6.4	10.5	2.3	3.8
2003	1,118,771	13.1	19.4	7.0	10.4	2.7	4.1
2004	1,111,539	14.2	18.7	7.1	9.4	3.0	3.9
2005	1,103,623	12.5	14.7	8.7	10.2	3.0	3.6
2006	1,095,651	13.1	14.9	8.9	10.2	3.5	4.0
2007	1,087,930	13.0	14.9	8.7	9.9	3.6	4.1
2008	1,080,559	13.5	15.4	8.9	10.1	3.4	3.8

Source: Births are estimated from the ASSA2003 model and the numbers of deaths are adjusted by completeness factor from Dorrington and Darikwa, 2009

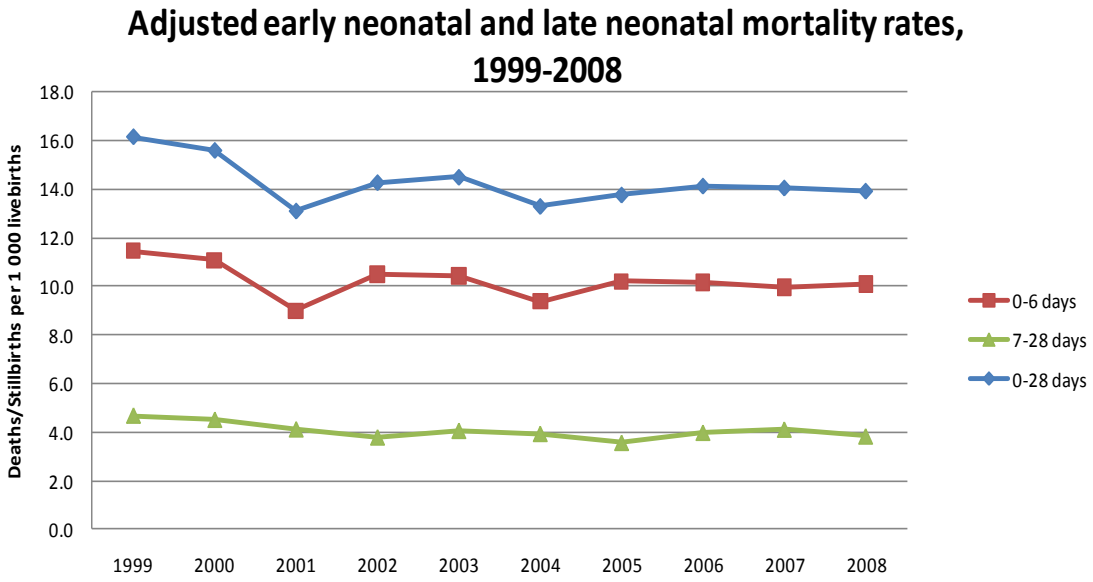


Figure 2.5 Adjusted mortality rates for early and late neonatal periods, 1999-2008

Source: Annual births from ASSA2003 and death data from Statistics South Africa adjusted for under-registration according to Dorrington and Darikwa, 2009.

The perinatal mortality rate and the neonatal mortality rates are presented in Table 7 based on registered deaths and the adjusted numbers. The perinatal mortality rate increased to about 33 per 1000 live births in 2000-2001 and then declined to about 26 per 1000 live births in 2007/8. The neonatal mortality rate drops from a level of about 18 per 1000 to 14 per 1000 live births. Other sources of data suggest the neonatal mortality rate was about 20 per 1000 live births in 1995-1998, suggesting that there may have been a decline in neonatal mortality.

Table 2.7 Perinatal and neonatal mortality rates per 1000 live births, 1997-2008

Year	Births	Perinatal mortality rate per 1000 live births (stillbirths plus early neonatal death 0-6 days)		Neonatal mortality rate per 1000 live births (early plus late 0-28 days)	
		Registered	Adjusted	Registered	Adjusted
1997	1,154,226	11.1	24.5	8.0	17.6
1998	1,149,711	13.4	28.3	8.8	18.6
1999	1,143,246	16.1	32.9	7.9	16.1
2000	1,134,620	16.7	32.9	7.9	15.6
2001	1,128,469	17.4	32.3	7.1	13.1
2002	1,124,624	18.2	29.9	8.7	14.3
2003	1,118,771	20.1	29.8	9.8	14.5
2004	1,111,539	21.4	28.1	10.1	13.3
2005	1,103,623	21.2	24.9	11.7	13.8
2006	1,095,651	22.0	25.1	12.4	14.1
2007	1,087,930	21.8	24.8	12.3	14.1
2008	1,080,559	22.4	25.5	12.2	13.9

Source: Births are estimated from the ASSA2003 model and the numbers of deaths are adjusted by completeness factor from Dorrington and Darikwa, 2009

Trend in cause specific mortality rates

The miscoding of infant causes of death until 2005 makes it difficult to assess trends in the cause specific mortality rates. However, the coding for the early neonatal period has been appropriate throughout the period and mortality rates for the leading causes of death are shown for newborns aged 0-6 days in Figure 6, adjusted for under-registration. The trend prior to 1999 shows a decline in deaths resulting from prematurity and respiratory distress syndrome but may be a consequence of the introduction of the DNF towards the end of 1998. Thereafter, mortality from most causes is stable over the period, with the exception of birth asphyxia and “other perinatal conditions” which increase after 2005. These rates correspond with a decrease in the stillbirth rate – and may possibly reflect a more reliable classification of live births. The rates do appear to fluctuate from year to year and interpretation of trends needs to be cautious. None-the-less, Figure 2.6 does indicate that the leading causes of death indicated for early neonates on the DNF are now P07 (short gestation and low birth weight), P21 (birth asphyxia) and P22 (respiratory distress syndrome).

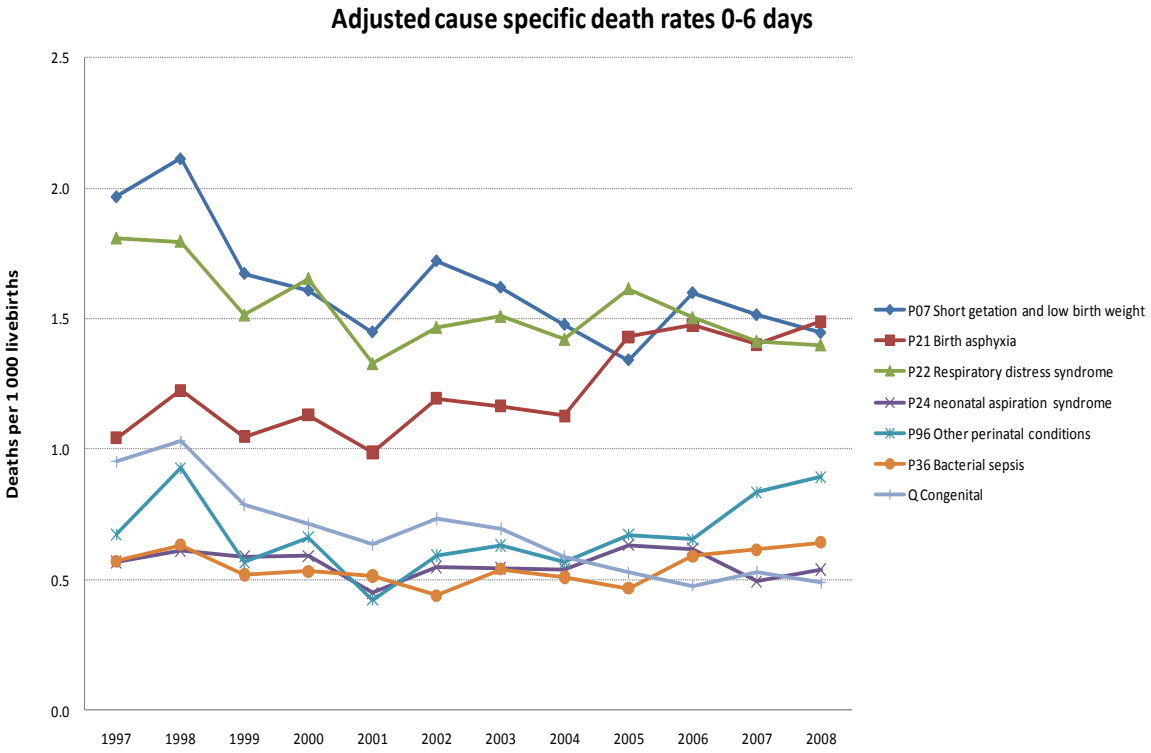


Figure 2.6 Estimated mortality rates for infants and stillbirths by age group, 1997-2008

Source: Annual births from ASSA2003 and death data from Statistics South Africa adjusted for under-registration according to Dorrington and Darikwa, 2009.

Discussion and conclusion

Vital statistics show increasing numbers of stillbirths and infant deaths for the period 1997-2008. It is possible that much of the increase was due to improved registration and that the neonatal mortality rate may have declined slightly during this period, while that for the older ages may have remained fairly level. It is estimated that in 2007, 90% of infant deaths were registered.

While the statistics provide an overall cause of death profile, HIV/AIDS is likely under-represented as a cause of death in this data. Comparison of the cause profile of the deaths that occurred in institutions with those recorded in PIP may be useful.

These findings suggest that if these levels of registration can be maintained, the vital registration system is poised to be able to serve a useful health information role. The provincial trends to date are difficult to interpret and may reflect provincial differences in reporting as well as differences in the underlying trend in mortality and stillbirth rates. It is hoped that as each province begins to monitor these trends more carefully, the quality of the data will be improved.

The reliability of the stillbirth rate from these data is unknown. It is not clear whether the observed increase in deaths from birth asphyxia and other perinatal conditions could

possibly be related to better classification of live births resulting in part from the apparent decrease in stillbirths.

The planned introduction of a new DNF by the Department of Home Affairs will see the inclusion of the international format for the medical certification of stillbirths and newborns< 7 days old and will provide an important opportunity to focus on improving the quality of statistics for these age groups. Informing doctors and mid-wives about the new DNF, providing guidelines and training for its accurate completion and setting up review processes in facilities (incorporate review of DNFs in the M&M review meetings), health district and the national statistical office, will go some way to improving the quality and utility of these statistics.

Appendix 1: ICD-10 code for cause of death categories

Category	ICD-10 code
Neonatal causes	
Preterm birth complications	P05,P07,P22,P25-P28,P77
Birth asphyxia and trauma	P02,P03,P10-P15,P20,P21,P24
Sepsis and other infectious conditions of the newborn	P23, P35-P38, P39
Other non-infectious conditions arising in the perinatal period	P00, P01, P04, P08, P29, P50-P76, P78-P94
Congenital anomalies	Q00-Q99
Perinatal death unspecified cause	P96
HIV/AIDS	B20-B24, B33, C46, D84
Diarrhoea	A00-A09
Lower respiratory infections	J09-J18, J20-J22, P23
Sepsis and meningitis	A39, A40-A41, A83-A86, A87, G00-G05, G07
Other childhood disease	A15-A19, A20-A28, A30-A32, A33-A37, A38, A42-A49, A50-A63, A65-A69, A70-A74, A75-A79, A80-A82, A88-A99, B00-B09, B15-B19, B25-B32, B34, B37-B67, B69, B70, B71, B75, B76-B81, B83, B92, B94-B99, C00-C45, C47-C99, D00-D83, D85-D99, E00-E99, F00-F99, G06, G08-G99, H00-H99, I00-I99,J00-J06, K00-K99, L00-L99, M00-M99, N00-M99, U51, U52
Ill-defined naturals	R00-R99
Injuries	V00-Y99

Comparison of DHIS and StatsSA numbers

The numbers of stillbirths and deaths of babies reported through the DHIS are compared with the number reported by StatsSA for 2007 and 2008 in Table 7. Since neither data set can be considered a gold standard, the results should be interpreted cautiously. About 85-87% of the births occurred in public health facilities. While there is no clear benchmark for this proportion, it is lower than the proportions observed in household surveys that found more than 90% of births occurred in facilities (2003 SADHS and 2008 HSRC survey). However, since a number of births occur in private facility, the reporting of births through the DHIS could be considered reasonable. In contrast, the comparison of the death rates within public facilities appears to be lower than that reported by StatsSA which is considered to be under-reported itself.

Table 2.7: Neonatal, and stillbirths from DHIS and StatsSA in 2007 and 2008

	2007		2008	
South Africa	**DHIS**	**StatsSA**	**DHIS**	**StatsSA**
Deaths				
Stillbirth	23,110	14,179	22,681	14,626
Neonatal	9,084	13,406	9,176	13,193
Births		(estimate)		(estimate)
Live births	919,897	1,087,930	943,330	1,080,559
% in public facilities	85%		87%	
Death rates per 1000 live birth				
Stillbirth	25.1	13.0	24.0	13.5
Neonatal	9.9	12.3	9.7	12.2

Table 2.8 shows the proportion of deaths that occurred in health facilities by comparing the number from the DHIS with the proportion of deaths that occurred in health facilities according to the deaths notifications processed by StatsSA. This also indicates that neonatal deaths might be under-reported on the DHIS while the stillbirths are under-reported by StatsSA. It is not clear whether the same definition of stillbirths is used by both systems.

Table 2.8: Proportion of deaths in facilities by category for 2007 and 2008

	2007		2008	
	DHIS/StatsSA	StatsSA data	DHIS/StatsSA	StatsSA data
Stillbirths	163%	76%	155%	79%
Early neonatal	70%	78%	70%	79%
Late neonatal	62%	57%	68%	61%
Neonatal deaths	68%	72%	70%	74%

CHAPTER 3

THE SOUTH AFRICAN DEMOGRAPHIC SURVEYS: 1998 AND 2003

Introduction

The first South African Demographic Survey (SADHS) was conducted in 1998 followed by the second one in 2003. The Department of Health (DOH) provided the funds for the survey but was also assisted by the Department of National Treasury. The DOH played a major role in the management of the surveys. Both surveys were conducted jointly by the National Department of Health, the Department of Social Development, Statistics South Africa, and the University of the Witwatersrand Reproductive Health Unit, the Medical Research Council, the University of Free State, the University of Stellenbosch, ORCMACRO International Maryland, and USAID.

The surveys were designed to collect data on a number of factors including information on antenatal and postnatal care, and number of births and deaths. The primary objective of the surveys was to provide up-to-date information on health care services, which would assist policy makers and programme managers in coming up with strategies for improving health services in the country. The 1998 survey interviewed 12, 247 households while the 2003 survey interviewed 7, 756 households.

Survey findings relating to perinatal and neonatal morbidity and mortality

The table below provides a comparison of data from the 1998 and the 2003 data with respect to maternal and child health indicators.

Table 3.1 Findings from the 1998 and 2003 SADHS
(Adapted from the Table on Key Findings on SADHS 2003)

Maternal and Child Health Indicators	1998	2003
Neonatal mortality (preceding 5 -10 years)		
Neonatal mortality rate per 1000 live births		
Male	23.1	26
Female	14.6	14
Neonatal mortality rate per 1000 live births		
Urban	16.4	20
Non-urban	22.0	18
Fertility of women 15-49 years (preceding 3 years)		
Total fertility rate: children per women	2.9 (2.7; 3.1)	2.1* (1.9; 2.3)
Ideal number of children	2.9 (2.8; 2.9)	2.5* (2.4; 2.5)
Percent women who want no more children	44 (42; 45)	61 (58; 64)
Modern contraceptive-use: sexually active women		
Percent currently using a modern method	61 (60; 63)	65 (63; 67)
Attended antenatal care: % of birth in last 5 years		
Mothers attended antenatal care during pregnancy	94 (93-95)	92 (90-93)
Assistance during delivery: % of birth in last 5 years		
Mother received medical care during pregnancy	84 (82; 86)	91 (89; 93)
Exclusive breastfeeding: % of infants		
< 6 months	6.8 (4.1; 9.5)	8.3 (3.1; 13.4)
6 – 9 months	0.2 (0.0; 0.4)	0.4 (0.0; 1.2)

There has been no change in the neonatal mortality rates between 1998 and 2003. However, the data on neonatal mortality rate from 2003 survey must be interpreted with caution as the data may be unreliable. Reasons for this include a systematic bias in the reporting of births, data being incomplete for one of the provinces, and the proportion of deaths for which an exact age at death was unknown was high at 21%.

Limitations on these survey and Recommendations

There were many anomalies in the ages of the sample respondents, indicating the problems with the quality of the data in the 2003 SADHS. Fertility levels and child mortality are not consistent with other data sources. According to the SADHS report, data problems arose from poor fieldwork, suggesting inadequate training, supervision and quality control during the survey. These issues have to be taken into account in the next SADHS.

The frequency of surveys such as these must be decided upon. It is possible that the SADHS has become overloaded with questions. Therefore consideration should be given to more frequent surveys with a rotation of modules as has been suggested by the WHO.

Conclusions

National household surveys are a useful and important source of information for policy makers and administrators when strategizing the National Health Service. Demographic and Health Surveys, using internationally tested questionnaires, have been conducted in many countries where shorter questionnaires and indirect demographic methods have been used. Ideally such surveys should be run every 3-5 years, so as to provide both ‘snapshot’ and trend information.

When conducted properly with appropriate quality controls, such surveys provides both accurate information on the levels of mortality and information on the coverage and access to strategic programmes aimed at improving newborn and child survival. In addition, national surveys cover the whole population including those who either do not use health services at all, or use the private sector.

Given the information gaps highlighted in this report, serious consideration should be given to conducting the next South African demographic, household and health survey with questionnaire content being driven by National Ministerial cross-sectoral priority needs, and being carried out by high quality programme directors, within strict quality control systems.

CHAPTER 4

THE QUALITY OF PERINATAL CARE IN SOUTH AFRICA ACCORDING TO 2008-9 PPIP DATA

Author: R.C. Pattinson

Introduction

The Perinatal Problem Identification Programme (PPIP), an audit tool for evaluating the quality of perinatal care, has been in used nationally since 2000. This chapter describes the quality of perinatal care during 2008-2009. The full report (*Saving babies 2008-2009: Seventh report on perinatal care in South Africa. Ed RC Pattinson. Tshepesa Press, Pretoria, 2011*) is available at www.ppip.co.za.

The spread of PPIP sites from which data was obtained is shown in Table 4.1.

Table 4.1 Spread of PPIP sites in South Africa

	Registered	Data	Total	% Registered	% data
Community Health Centres	74	45	327	22.6	13.8
District Hospitals	198	170	257	77.0	66.1
Regional Hospitals	43	50	65	66.2	76.9
Provincial Tertiary	5	5	6	83.3	83.3
National Central	6	5	9	66.7	55.6
Total	326	275	664	49.1	41.4

Table 2.2 illustrates the number of births covered by the PPIP sites in each level of care, the distribution of perinatal deaths and the perinatal mortality rates (PNMR) for each level. The PPIP sites represent all types of institutions and the sample is large for each site.

Table 4.2 Distribution of births and deaths per level of care on PPIP database 2008-9

≥500g	CHC	DH	RH	PT	NC
All births	96472	482129	286783	44058	53304
Live births	95673	471878	278607	42486	50402
≥1000g	CHC	DH	RH	PT	NC
All births	95992	478485	282541	43150	50811
Live births	95464	469958	276264	41991	49139
≥500g	CHC	DH	RH	PT	NC
Macerated	436	6409	5245	825	1148
Fresh	363	3848	2936	591	1746
Total SB	799	10257	8181	1415	2894
ENND	205	5815	3770	701	913
All PND	1004	16072	11951	2116	3807
≥1000g	CHC	DH	RH	PT	NC
Macerated	291	5266	4137	585	485
Fresh	237	3257	2138	426	672
Total SB	528	8524	6275	1011	1157
ENND	134	4703	2520	478	521
All PND	662	13227	8795	1489	1678
Rate ≥500g	CHC	DH	RH	PT	NC
Macerated	4.52	13.29	18.29	18.72	21.54
Fresh	3.76	7.98	10.24	13.41	32.76
Total SB	8.28	21.27	28.53	32.13	54.30
ENND	2.14	12.32	13.53	16.50	18.11
All PND	10.41	33.33	41.67	48.04	71.42
Rate ≥1000g	CHC	DH	RH	PT	NC
Macerated	3.03	11.01	14.64	13.55	9.55
Fresh	2.47	6.81	7.57	9.88	13.23
Total SB	5.50	17.81	22.21	23.43	22.78
ENND	1.40	10.01	9.12	11.38	10.60
All PND	6.89	27.64	31.13	34.51	33.03

According to the DHIS 15.7% of births occur in the CHCs, 43.0% in the District Hospitals, 29.5% in the Regional Hospitals, 5.6% in the Provincial Tertiary Hospitals and 6.1% National Central Hospitals. Using this distribution it is possible to estimate a national PNMR for 2008-9 which was approximately 35.3/1000 for births ≥500g (Table 4.3).

Table 4.3 Extrapolation of PPIP data to estimate the Perinatal Mortality Rate (PNMR) and number of deaths per level of care per year

	CHC	DH	RH	PT	NC	Total
Births DHIS[#]	288498	790559	543457	102624	111301	1836439
Distribution of births (%)	15.7	43.0	29.6	5.6	6.1	100
PNMR ≥ (500g)	10.41	33.33	41.67	48.04	71.42	35.33
Extrapolated Total Deaths (2008-9)	3003	26353	22647	4930	7949	64883
Extrapolated Deaths per year	1502	13177	11324	2465	3975	32441

[#]- DHIS data October 2010 (for 2008-9)

The sample from which the findings are made is large and representative of the whole countries institutional births.

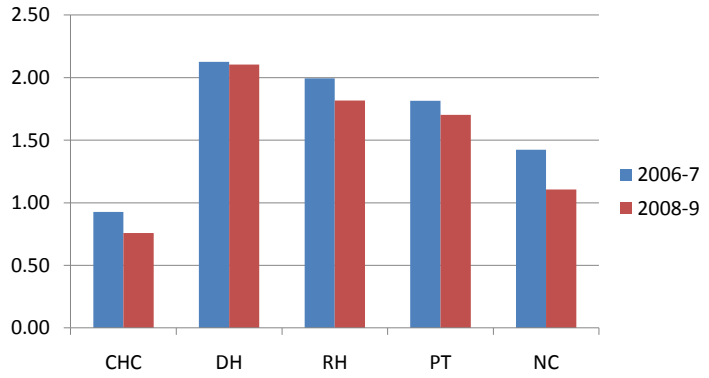
Table 4.4 Comparisons of perinatal care indices according to levels of care

	CHC	DH	RH	PT	NC
PNMR (≥500g)	10.41	33.33	41.67	48.04	71.42
SBR (≥500g)	8.28	21.27	28.53	32.13	54.30
ENNDR (≥500g)	2.14	12.32	13.53	16.50	18.11
PNMR (≥1000g)	6.89	27.64	31.13	34.51	33.03
SBR (≥1000g)	5.50	17.81	22.21	23.43	22.78
ENNDR (≥1000g)	1.40	10.01	9.12	11.38	10.60
LBWR (all births ≥500g)	9.1	13.1	17.1	20.3	29.9
LBWR (live births)	8.5	12.0	15.5	18.2	26.6
LBWR (all births ≥1000g)	8.6	12.5	15.9	18.6	26.4
LBWR (Live births)	8.3	11.7	14.7	17.3	24.8
PCI ≥500g	1.15	2.54	2.43	2.37	2.39
PCI ≥1000g	0.80	2.22	1.96	1.86	1.25
SB:NND ratio ≥500g	3.90	1.76	2.17	2.02	3.17
SB:NND ratio ≥1000g	3.94	1.81	2.49	2.12	2.22

Table 4.4 illustrates gives the perinatal care indices for each category of health institution. As expected the mortality rates increase as the level of care increases. Community Health Centres are only supposed to care for pregnant women with no risk factors. It is expected that the rates would be low. The tertiary hospitals (Provincial Tertiary and National Central hospitals) see the most complicated cases and the highest mortality rates should be at those sites. This is evidenced by the increasing low birth weight rate as the level of care rises.

The Perinatal Care Index is an index that has been validated as a true measure of the quality of care, the higher the index the poorer the care. Ideally it should be used to compare like hospitals, i.e. hospitals within the category to identify outliers. Traditionally however, the values should be below 1 for CHCs and below 2 for all hospitals. It is concerning that the average for both the District Hospitals for ≥1000g is above 2. Figure 1 compares the Perinatal Care index per level of care with the 2006-7 rates.

Figure 1 Comparison of Perinatal Care Index between 2006-7 and 2008-7



The mortality rates for the birth weight categories per institutional category are given in Tables 4.5 to 4.7.

Table 4.5 Perinatal mortality rates per birth weight category

Weight category	CHC	DH	RH	PT	NC
500 - 999g	712.50	777.72	742.34	689.43	649.82
1000 - 1499g	312.80	417.77	365.35	312.50	230.84
1500 - 1999g	100.15	178.60	151.67	138.73	122.96
2000 - 2499g	17.20	55.88	56.94	55.69	62.51
2500g+	2.59	14.03	13.21	14.41	15.54

Table 4.6 Stillbirth rates per birth weight category

Weight category	CHC	DH	RH	PT	NC
500 - 999g	792.40	608.33	603.05	659.74	759.26
1000 - 1499g	251.22	242.93	241.17	223.01	172.89
1500 - 1999g	83.58	57.81	115.17	121.21	102.13
2000 - 2499g	14.36	41.77	45.84	46.37	49.31
2500g+	1.95	8.73	9.03	10.82	10.94

Table 4.7. Early neonatal death rates per birth weight category

Weight category	CHC	DH	RH	PT	NC
500 - 999g	339.71	578.13	533.50	430.30	308.79
1000 - 1499g	82.25	230.94	163.64	115.17	70.06
1500 - 1999g	18.08	137.38	41.25	19.94	23.20
2000 - 2499g	2.88	14.73	11.63	9.77	13.89
2500g+	0.64	5.34	4.21	3.63	6.38

The early neonatal death rate for district hospitals between 1-2kg is unacceptably high, as is the early death rate for neonates ≥2.5kg.

Figure 2. Percent fresh stillbirths alive on admission

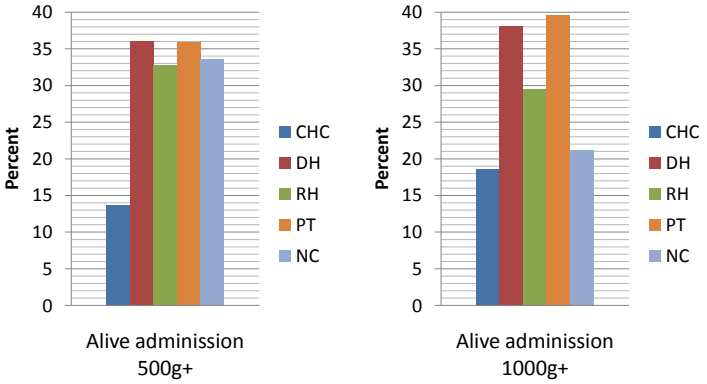
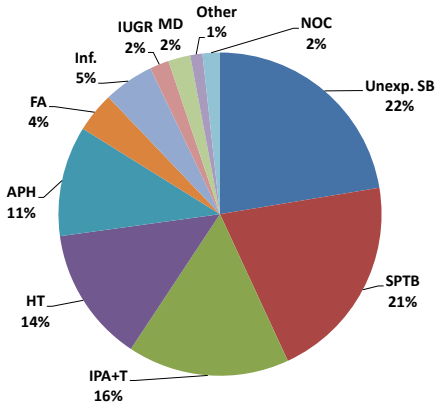


Figure 2 illustrates the percentage of fresh stillbirths alive on admission. As expected the number of fresh stillbirths presenting alive on admission to CHC is low, but it is surprising that about a third of fresh stillbirths ≥500g were alive on admission indicating an opportunity to intervene. For babies ≥1000g where one would expect to be able to save the babies lives, close to 40% were alive on admission in District Hospitals and Provincial Tertiary Hospitals. This would indicate that there was considerable opportunity for intervention in hospital in two of the five fresh stillbirths, perhaps indicating a delay in treatment. The greater proportion of fresh stillbirths dead on admission perhaps points to a problem in getting to a health institution because of either lack of recognition of a problem or lack of transport.

Primary obstetric causes of perinatal deaths

The primary obstetric causes of perinatal death are shown in Figure 3.

Figure 3. Distribution of primary cause of perinatal death ≥500g



Unexp. SB – Unexplained stillbirth; SPTB – spontaneous preterm birth; IPA+T – Intrapartum asphyxia and birth trauma; HT – Hypertension; APH – Antepartum haemorrhage; Inf. – Infections; FA – Foetal abnormalities; IUGR – unexplained intrauterine growth restriction; MD – Pre-existing medical conditions; NOC – no obstetric cause.

There are three major primary obstetric causes identified: spontaneous preterm birth, intrapartum asphyxia and birth trauma and placenta/placental bed disease (pre-eclampsia/eclampsia and abruptio placenta). Unexplained stillbirths are mostly macerated stillbirths and their causes are most likely to be undiagnosed infection, intrauterine growth restriction and foetal abnormalities. Thus these three categories are under-represented. Placenta/placental bed disease is a new category and is based on a better understanding of the causes of pre-eclampsia and abruptio placenta. Abruptio placenta causes 80% of antepartum haemorrhages, this new category accounts for about 23% of all perinatal deaths, the largest single category. The importance of this condition has been under-estimated in the past in perinatal deaths but is well recognised as causes of maternal deaths.

Primary obstetric causes of perinatal death and maternal age

Figure 4 illustrates the PNMR per age categories <18 years, 18 and 19 years, 20-24 years and more than 34 years. Clearly at the extremes of age, the mortality rates are significantly higher. Teenagers less than 18 years had a significantly higher PMNR for unexplained stillbirths, spontaneous preterm birth and intrapartum asphyxia than women between the ages of 20 and 34 years. Women more than 34 years had significantly higher PNMR for unexplained stillbirths, spontaneous preterm birth, intrapartum asphyxia, complications of hypertension, antepartum haemorrhage, foetal abnormality and pre-existing medical conditions (see Figure 5).

Figure 4. Perinatal mortality rates in age categories

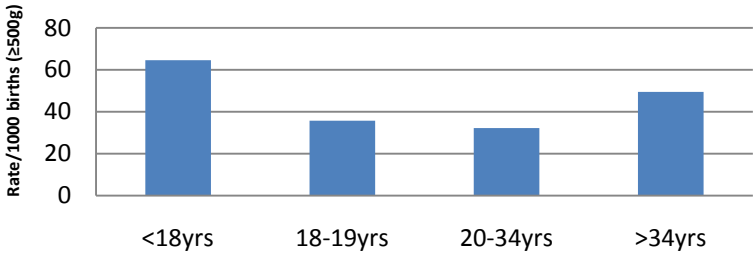
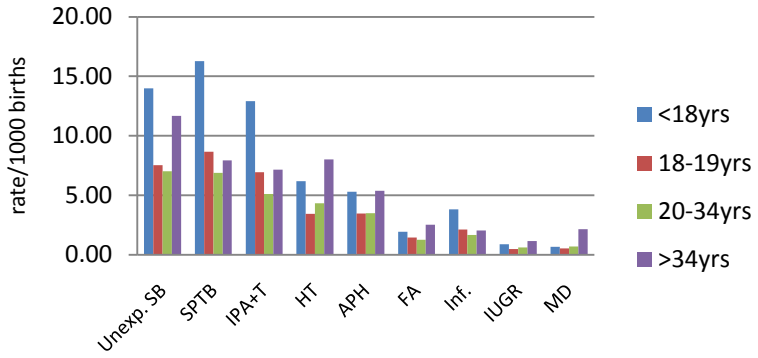


Figure 5. Comparison of primary obstetric causes of death and maternal age categories



Primary obstetric causes of perinatal death and birth weight category

Some institutions only complete the first section of PPIP, i.e. the number of births and deaths per birth weight category and do not complete the causes of death or avoidable factors sections. For this reason, a correction factor has been introduced so that the mortality rates are not underestimated. In all 85.4% of stillbirths had a primary obstetric cause allocated and 89.8% of early neonatal deaths had a primary obstetric and final neonatal cause allocated. Table 4.8 shows the primary obstetric causes of death per number of deaths per birth weight category.

Table 1.8. Comparison of primary obstetric cause of death per number of deaths per birth weight category (corrected PPIP data 2008-9)

Primary obstetric cause	500-999g	1000-1499g	1500-1999g	2000-2499g	2500g+	TOTAL
Unexp. SB	1495	1459	1328	1327	2474	8083
SPTB	3895	2113	959	187	163	7317
IPA	123	210	301	701	4057	5393
T	46	54	69	71	381	621
HT	1444	1086	781	543	771	4624
APH	630	759	730	716	906	3743
Inf.	214	236	232	257	434	1373
FA	270	323	268	293	665	1819
IUGR	121	118	113	105	192	649
MD	110	120	106	104	353	794
Other	83	77	68	61	147	436
NOC	61	75	54	93	315	597
Total	8491	6631	5010	4459	10858	35449

Figure 6. Distribution of all perinatal deaths per cause of death and birth weight category: Estimated all deaths per year in SA

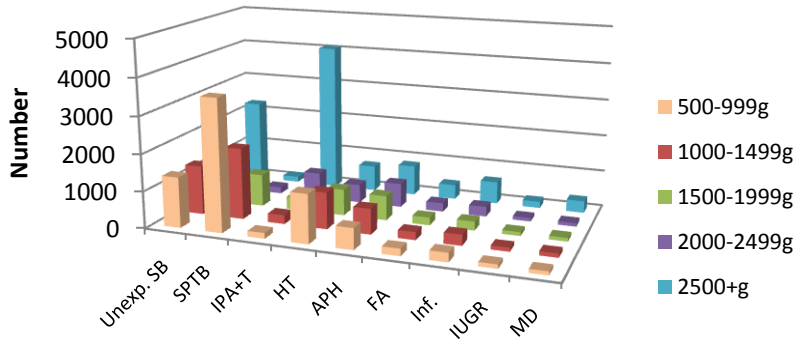


Figure 6 illustrates the common causes of death per number of deaths in birth weight categories from 500g extrapolated to the whole of South Africa. Most perinatal deaths in South Africa fall into the category unexplained stillbirths (22%). The second most common primary obstetric cause of death is spontaneous preterm birth with 53% being less than 1000g. The third most common cause is intrapartum asphyxia and birth trauma with an estimated 5504 babies per year and the vast majority (4064, 74%) have a birth weight of ≥2500g. Complications of hypertension and antepartum haemorrhage are the next two categories. Eighty per cent of the antepartum haemorrhages were classified as abruptio, the rest being due to placenta praevia (7%), antepartum haemorrhage of unknown origin (9%) and the remained as unspecified antepartum haemorrhage (4%). Both pre-eclampsia/eclampsia and abruptio placenta are probably placenta/placental bed diseases. If these two are combined the proportion of perinatal deaths is 22.8%, becoming the most common cause of perinatal death. This is important as calcium supplementation has been shown to reduce the complications of pre-eclampsia/eclampsia and given the high number of deaths due to this per year in South Africa, including maternal deaths, calcium supplementation should be introduced as a prevention strategy.

Neonatal deaths

The most common primary obstetric causes of neonatal deaths were spontaneous preterm births and intrapartum asphyxia combined with trauma (Figure 7), and these two conditions accounted for the vast majority of all neonatal deaths. The relative importance of the two varies depending on the birth weight cut-off used.

Figure 7. Comparison of distribution of primary obstetric causes of early neonatal death between ≥500g and ≥1000g

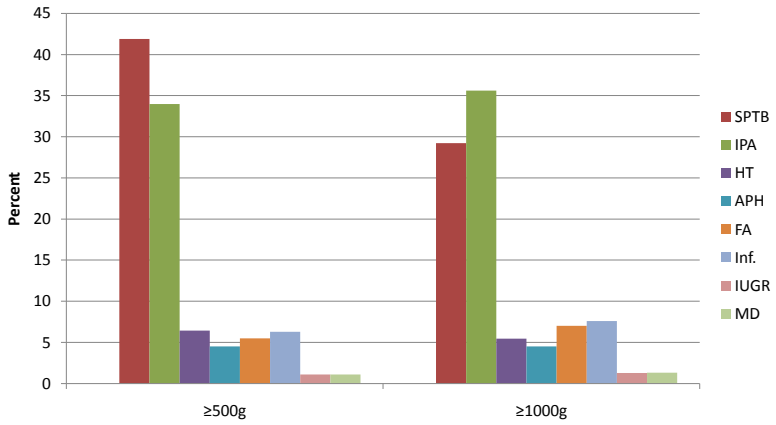


Figure 8. Comparison of final early neonatal causes of death ≥500g and level of care

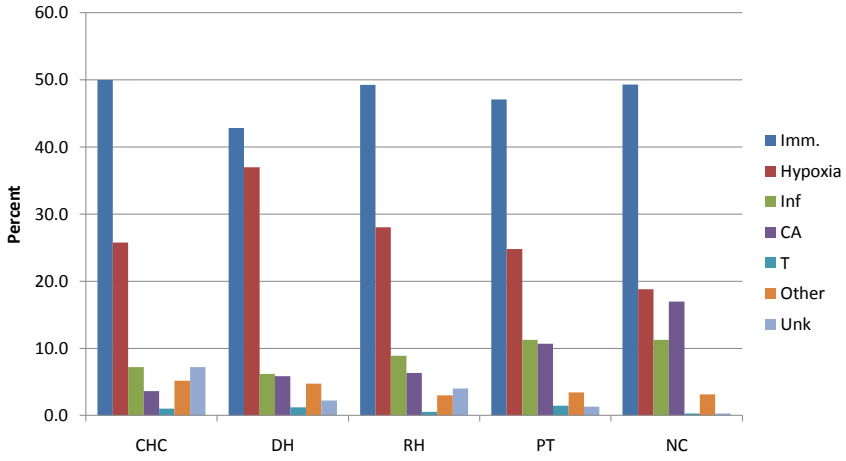
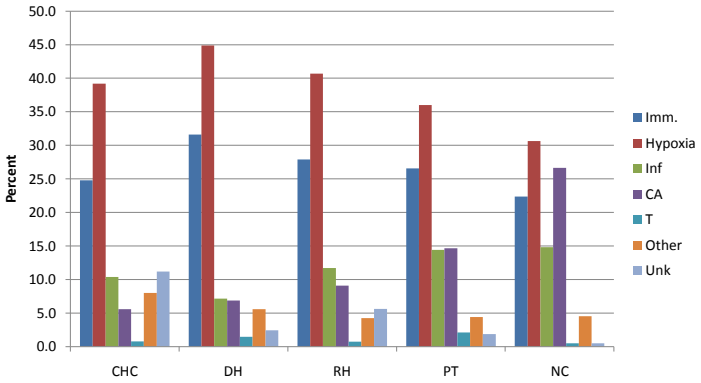


Figure 9. Comparison of final early neonatal causes of death ≥1000g and level of care



Figures 8 and 9 give the final neonatal causes of death at the two cut-off points, again illustrating the dominance of immaturity and hypoxia as the major final causes at all levels of care except National Central hospitals, where congenital abnormalities have prominence. This probably reflects the referral of cases to these hospitals. Details of the final causes of death in neonatal deaths are shown on Table 4.9

Table 4.9. Detail of the final causes of neonatal death ≥500g

Description	Number	% of group
Immaturity related	**5031**	
Extreme multi-organ immaturity	2304	45.8
Hyaline membrane disease	1594	31.7
Necrotizing enterocolitis	179	3.6
Pulmonary haemorrhage	166	3.3
Other	140	2.8
Intraventricular haemorrhage	105	2.1
Not specified	543	10.8
Hypoxia	**3314**	
Hypoxic ischaemic encephalopathy	1764	53.2
Meconium aspiration	824	24.9
Other	245	7.4
Persistent foetal circulation	82	2.5
Not specified	399	12.0
Infection	**1152**	
Septicaemia	429	37.2
Pneumonia	172	14.9
HIV infection	148	12.8
Nosocomial infection	122	10.6
Congenital infection	91	7.9
Other	71	6.2
Congenital syphilis	36	3.1
Meningitis	25	2.2
Group B streptococcal infection	8	0.7
Tetanus	5	0.4
Not specified	45	3.9

Table 4.9. Detail of the final causes of neonatal death ≥500g (Cont.)

Description	Number	% of group
Congenital abnormalities	**829**	
Other (incl. multiple & skeletal)	193	23.3
Chromosomal abnormality	126	15.2
Respiratory (incl. diaphragmatic hernia)	107	12.9
Central nervous system	99	11.9
Cardiovascular system	91	11
Alimentary (excl. diaphragmatic hernia)	47	5.7
Renal system	28	3.4
Biochemical abnormality	12	1.4
Not specified	126	15.2
Other	**472**	**0**
Other	95	20.1
Sudden Infant Death Syndrome (SIDS)	87	18.4
Aspiration pneumonia	85	18
Hypothermia	74	15.7
Haemorrhagic disease of the newborn	29	6.1
Hydrops - non-immune	22	4.7
Isoimmunisation	20	4.2
Hypovolaemic shock	14	3
Not specified	46	9.7
Unknown cause of death	**282**	
Trauma	98	
Other	65	51
Subaponeurotic haemorrhage	33	33.7

Among the neonatal deaths whose final neonatal cause of death was immaturity related, the most common diagnoses were extreme immaturity and hyaline membrane disease and among those with hypoxia the common diagnosis was hypoxic ischaemic encephalopathy and meconium aspiration (Table 4.9).

Primary obstetric causes of perinatal death per level of care

Table 4.10 gives the perinatal mortality rate per disease category per level of care for babies ≥500g. Data for deaths ≥1000g is given in the appendix.

Table 4.10. Perinatal mortality rate per disease category per level of care for babies ≥500g

	CHC	DH	RH	PT	NC
Unexp. SB	2.14	8.62	10.11	8.03	6.88
SPTB	3.46	6.81	8.35	8.29	14.88
IPA+T	1.49	7.21	5.65	7.07	5.68
HT	0.38	3.22	6.11	9.81	16.03
APH	0.94	2.30	5.56	6.57	12.32
FA	0.22	1.01	1.34	2.24	6.98
Inf.	0.90	2.03	1.74	1.66	2.61
IUGR	0.40	0.44	0.94	0.64	1.79
MD	0.12	0.85	0.71	1.44	1.80
Other	0.05	0.42	0.47	0.42	1.32
NOC	0.31	0.43	0.69	1.90	1.13
Total	10.41	33.33	41.67	48.04	71.42

Figure 10. Perinatal mortality rate per primary cause of death and level of care

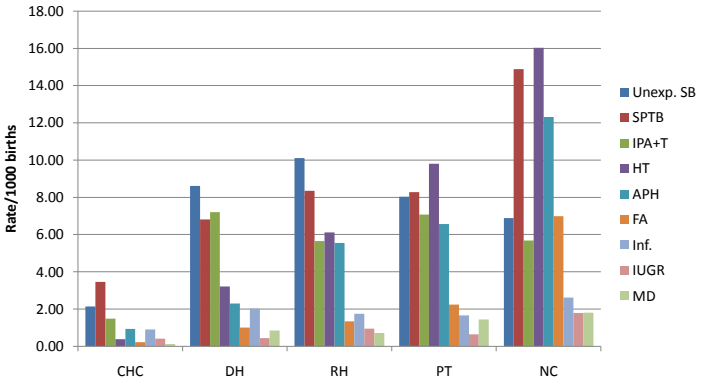
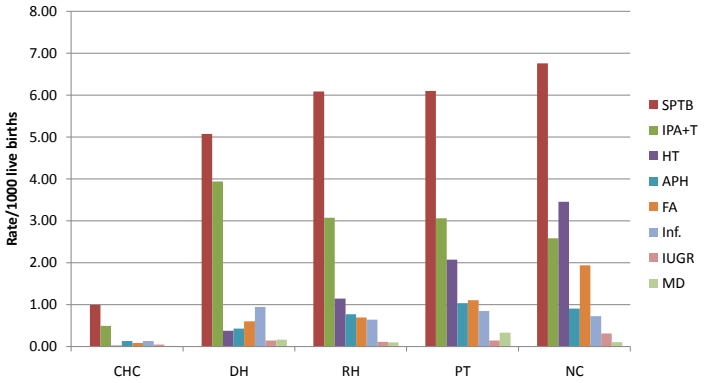


Table 4.11 gives the early neonatal death rates per disease category per level of care for babies ≥500g and is illustrated in figure 11.

Table 4.11. Early neonatal death rate per disease category per level of care for babies ≥500g

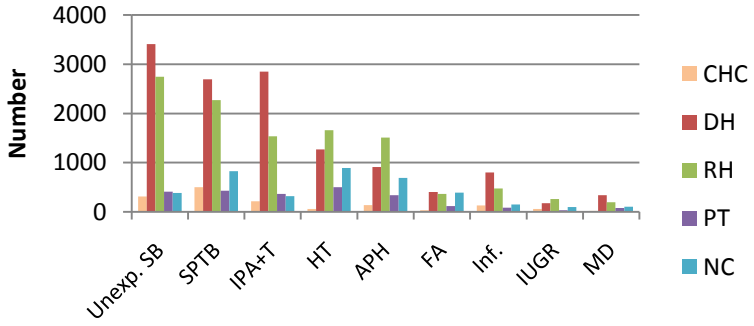
	CHC	DH	RH	PT	NC
SPTB	0.99	5.07	6.09	6.10	6.76
IPA	0.46	3.72	2.87	2.90	2.50
T	0.03	0.22	0.20	0.16	0.08
HT	0.02	0.37	1.14	2.07	3.46
APH	0.13	0.43	0.77	1.04	0.90
FA	0.09	0.60	0.69	1.11	1.93
Inf.	0.13	0.94	0.64	0.85	0.72
IUGR	0.04	0.14	0.11	0.14	0.31
MD	0.01	0.16	0.10	0.33	0.10
Other	0.01	0.17	0.15	0.14	0.34
NOC	0.19	0.33	0.38	1.65	1.01
Total	2.14	12.32	13.53	16.50	18.11

Figure 11. Early neonatal death rate per primary cause of death and level of care



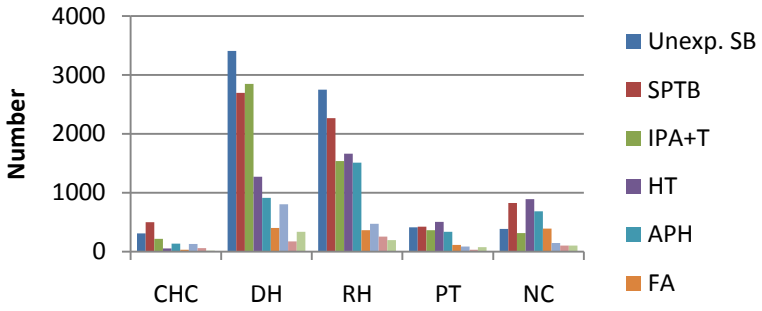
Figures 12 and 13 illustrate the extrapolated number of deaths per primary obstetric causes for South Africa per level of care. The two bar graphs clearly demonstrate that the major causes of perinatal death are spontaneous preterm birth and intrapartum asphyxia and birth trauma and placenta/placental bed diseases (pre-eclampsia/eclampsia and abruptio placenta). In spontaneous preterm birth, intrapartum asphyxia and birth trauma the district hospitals have the greatest number of deaths and the highest perinatal mortality rates, followed by regional hospitals.

Figure 12. Extrapolated number of deaths per primary obstetric causes per level of care for South Africa



Placenta/placental bed disease is most common in regional hospitals followed by district hospitals.

Figure 13. Extrapolated number of deaths per primary obstetric cause per level of care for South Africa



Figures 14 and 15 give the early neonatal death rates in birth weight categories and level of care. The early neonatal death rate for all birth weight categories is highest for district hospitals, followed by regional hospitals in the 1-2kg categories, but the national central hospitals have the second highest rates in the ≥2kg and more category. It is not at all clear why this is the case, but referrals probably play an important role.

Figure 14. Early neonatal death rates in birth weight categories and levels of care

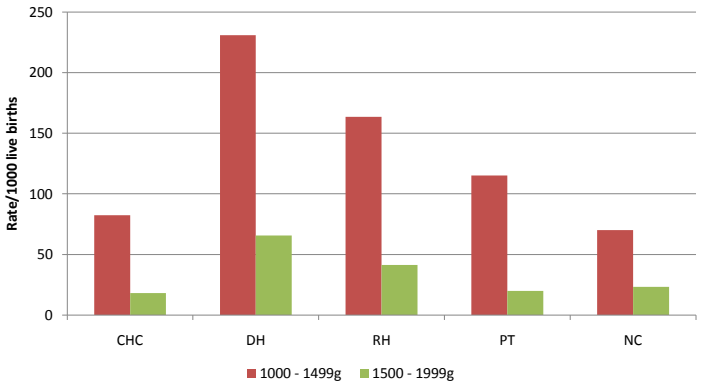


Figure 15. Early neonatal death rates in birth weight categories and levels of care

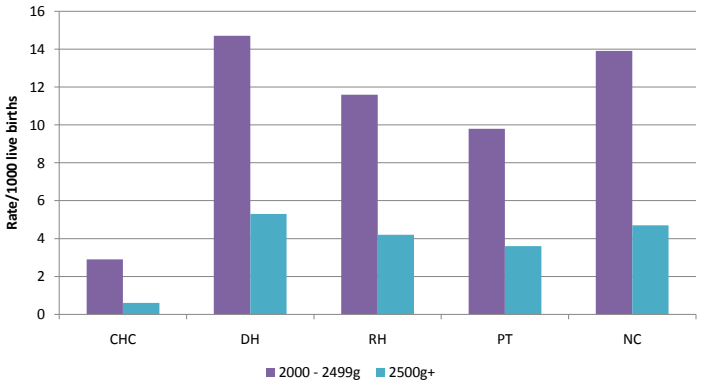
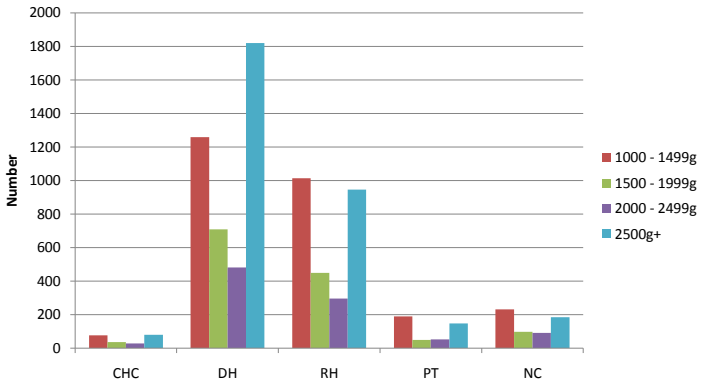


Figure 16 extrapolates the early neonatal death rates to the whole population of South Africa to give an estimate as to which level of care has the highest number of deaths. Clearly most deaths in all neonates are in the district hospitals and they include both immature and mature infants. This figure clearly highlights the area where intrapartum and neonatal care must be improved.

Figure 16. Estimated numbers of early neonatal deaths in SA per birth weight category and level of care



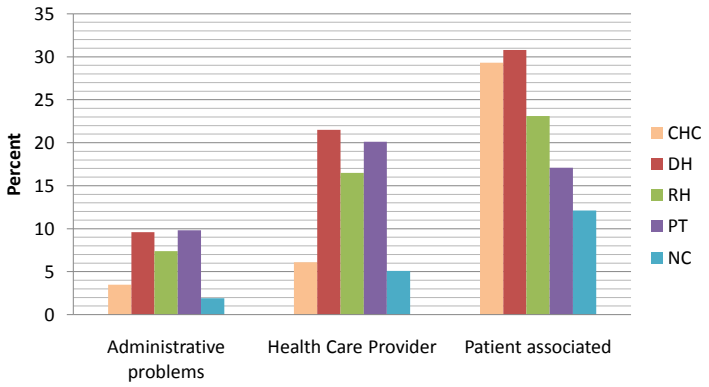
Health system problems

PPIP sites also examine each death to look for avoidable factors, missed opportunities and sub-standard care. These can be grouped as health system problems. The sites grade the deaths as those which were possibly avoidable or probably avoidable. The *probable avoidable factors* are cases where if they were not present the assessors consider that the baby would probably have survived. These are the health system causes that need to be tackled urgently. Only probable avoidable factors are reported in this document.

The health system problems are classified as those directly related to the patient, for example, not attending antenatal care; for administrative problems e.g. lack of neonatal ICU facilities; and for health care provider problems e.g. misinterpreting foetal distress during heart rate monitoring. Administrative and health care provider problems are those that the health system can directly influence. Health care promotion and constant health messages will impact on the patient orientated problems.

Figure 17 illustrates the distribution of probable avoidable factors per level of care. The district hospitals have the highest proportion of probable avoidable factors related to health care providers and administrative problems.

Figure 17. Distribution of avoidable factors that probably resulted in death of baby



District hospital and provincial tertiary hospitals recorded around 1 in 5 of the deaths as being probably avoidable with regional hospitals recording 1 in 6 deaths as being probably avoidable. These three sectors again recorded the highest percentages of avoidable deaths due to administrative factors, all being close to 1 in 13 deaths.

The estimated number of avoidable deaths within the health system (health care provider and administrative problems) has been extrapolated from the distribution of probable avoidable factors recorded in PPIP and the birth recorded per level of care on the DHIS. An *avoidable mortality rate* (avoidable deaths/total births x 1000 per level of care) can then be calculated and this will give a measure of the quality of care at the level of care which can be compared with other levels. The distribution of avoidable deaths throughout the health system has also been estimated.

Table 4.12. Avoidable mortality rate per level of care

Rate of probable avoidable deaths	CHC	DH	RH	PT	NC
Patient associated	2.73	9.43	8.43	7.79	7.45
Health care provider associated	0.57	6.57	6.02	9.15	3.11
Administrative problems	0.32	2.93	2.70	4.45	1.16

Table 4.12 gives the avoidable mortality rate per level of care. Surprisingly in both health care provider and administrative problems provincial tertiary hospitals had the highest rates, (9.15/1000 births and 4.45/1000 births respectively). This indicates the poorest quality of care. However, when extrapolated to the number of avoidable deaths throughout the country this translates into estimated avoidable deaths per year of 459 and 223 respectively because provincial tertiary hospital only conduct 5% of births. The avoidable mortality rate for health care providers in district hospitals (6.57/1000 births) and the avoidable mortality rate of administrative problems in district hospitals (2.29/1000 births) were the second highest. This translates into estimated avoidable deaths per year of 2576 and 898 perinatal deaths respectively, indicating district hospital need the most attention.

Figure 18 illustrates the percentage of probably avoidable deaths in disease categories and level of care. Just over half of the perinatal deaths due to intrapartum asphyxia and birth trauma were thought to be probably avoidable in district hospitals, just under half in regional hospitals and just over forty percent in provincial tertiary hospitals. Surprisingly, perinatal deaths due to complications of hypertension were also considered probably avoidable in between 25-30% of cases in these three sectors. The relatively low proportion of deaths due to spontaneous preterm birth is mostly due to the cut-off of ≥1000g used for this section; however it was the most common condition where administrative factors were concerned (Figure 19) with 1 in 5 deaths due to spontaneous preterm labour being recorded as being administratively avoidable.

Figure 18. Percent health worker related probably avoidable deaths per disease category and level of care ≥1000g

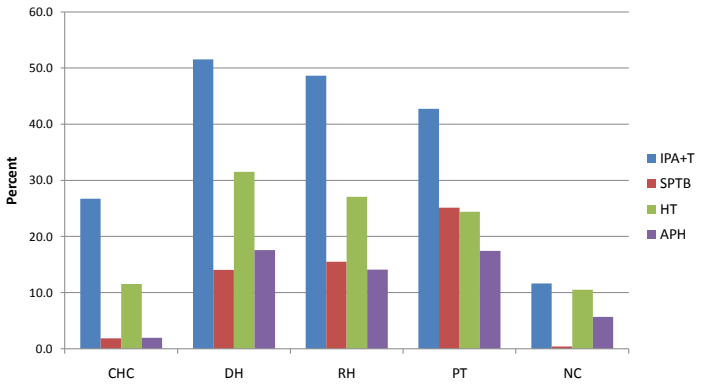


Figure 19. Percent administrative related probably avoidable deaths per disease category and level of care ≥1000g

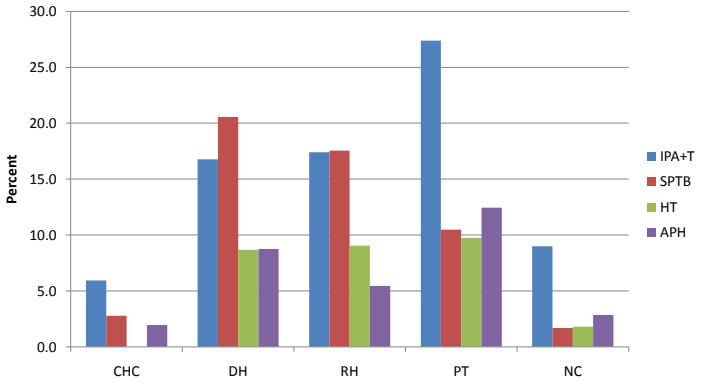


Figure 20 illustrates the probably avoidable perinatal death rate per disease category and level of care. The highest rate occurred in district hospitals and was due to intrapartum asphyxia and birth trauma. However, avoidable deaths in the hypertension category are also significant.

Figure 20. Health care provider related probably avoidable deaths rate per disease category and level of care ≥1000g

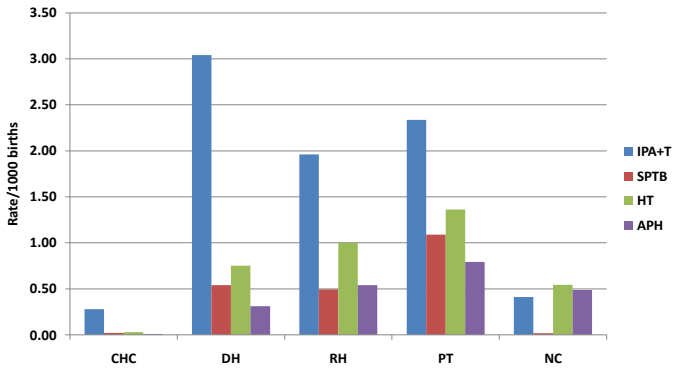


Figure 21. Estimated number of health care provider related probably avoidable deaths rate per disease category and level of care in South Africa ≥1000g per year

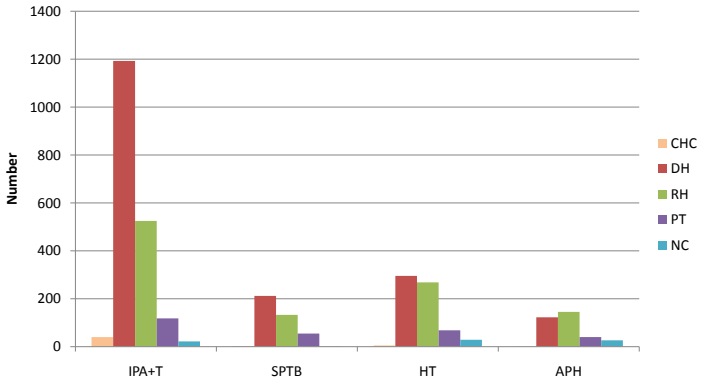


Figure 21 estimated the health care provider number of probably avoidable deaths there are per year due to the common primary obstetric causes of death at the various levels of care for babies ≥1000g. Almost 2000 babies probably died unnecessarily per year had the health care provider acted differently, with 1200 being in district hospitals and just over 500 avoidable perinatal deaths occurred in regional hospitals. Although the rates were very high in provincial tertiary hospitals, the numbers delivering at those hospitals is low; hence the number of avoidable perinatal deaths is low with respect to district and regional hospitals. Just fewer than 1,900 babies were estimated to have died probably avoidable deaths due to intrapartum asphyxia and birth trauma. Placenta/placental bed disease accounted for 1000 avoidable perinatal deaths. Spontaneous preterm birth accounted for 400 avoidable perinatal deaths. This relatively low number is due to the birth weight cut-off for these calculations being ≥1000g.

Tables 4.13- 4.16 detail the health care provider avoidable factors that occur most commonly in the major primary obstetric causes of death.

Provincial tertiary hospitals had the highest probably avoidable perinatal death rate due to administrative factors than any other level of care. This was related to intrapartum asphyxia and birth trauma and was most due to delays around performing caesarean sections. The administrative factors mostly occurring in district hospitals were lack of facilities and lack of trained staff. Similar problems were experienced in regional hospitals.

Table 4.13. Health care provider avoidable factors related to intrapartum asphyxia and birth trauma

	Number	% of group
Intrapartum asphyxia	2130	
Foetal distress not detected intrapartum; foetus monitored	453	21.3
Foetal distress not detected intrapartum; foetus not monitored	212	10.0
Management of 2nd stage: prolonged with no intervention	196	9.2
Delay in medical personnel calling for expert assistance	114	5.4
Poor progress in labour, but partogram not used correctly	113	5.3
Delay in referring patient for secondary/tertiary treatment	110	5.2
Medical personnel underestimated foetal size	105	4.9
Poor progress in labour - partogram interpreted incorrectly	97	4.6
Delay in doctor responding to call	67	3.1
Neonatal care: management plan inadequate	59	2.8
Birth Trauma	189	
Medical personnel underestimated foetal size	24	12.7
Breech presentation not diagnosed until late in labour	22	11.6
Delay in referring patient for secondary/tertiary treatment	18	9.5
Delay in medical personnel calling for expert assistance	13	6.9
Delay in doctor responding to call	12	6.3
Management of 2nd stage: prolonged with no intervention	12	6.3

Table 4.14. Health care provider avoidable factors related to spontaneous preterm birth

	Number	% of group
Spontaneous preterm birth	453	
Neonatal care: management plan inadequate	62	13.7
Neonatal care: inadequate monitoring	47	10.4
Delay in referring patient for secondary/tertiary treatment	46	10.2
Nosocomial infection	44	9.7
Antenatal steroids not given	33	7.3
Baby managed incorrectly at Hospital/Clinic	21	4.6
Neonatal resuscitation inadequate	21	4.6
Incorrect management of premature labour	15	3.3
Inadequate / No advice given to mother	13	2.9
Delay in medical personnel calling for expert assistance	11	2.4
Medical personnel underestimated foetal size	8	1.8

Table 4.15. Health care provider avoidable factors related to complications of hypertension

	Number	% of group
Complications of hypertension	742	
No response to maternal hypertension	244	32.9
Delay in referring patient for secondary/tertiary treatment	98	13.2
Inadequate / No advice given to mother	40	5.4
Foetal distress not detected antenatally; foetus monitored	38	5.1
Foetal distress not detected intrapartum; foetus monitored	26	3.5
No response to poor uterine fundal growth	23	3.1
Foetal distress not detected antepartum; foetus not monitored	20	2.7
Foetal distress not detected intrapartum; foetus not monitored	19	2.6
No response to history of stillbirths, abruptio etc.	18	2.4
Medical personnel underestimated foetal size	15	2.0

Table 4.16. Health care provider avoidable factors related to antepartum haemorrhage

	Number	% of group
Antepartum haemorrhage	368	
No response to maternal hypertension	64	17.4
Delay in referring patient for secondary/tertiary treatment	47	12.8
Incorrect management of antepartum haemorrhage	35	9.5
Inadequate / No advice given to mother	31	8.4
No response to history of stillbirths, abruptio etc.	18	4.9
Foetal distress not detected intrapartum; foetus monitored	17	4.6
Delay in medical personnel calling for expert assistance	12	3.3
Foetal distress not detected intrapartum; foetus not monitored	11	3
No response to poor uterine fundal growth	11	3
Physical examination of patient at clinic incomplete	10	2.7

Administrative avoidable factors were most common in birth trauma, intrapartum asphyxia and spontaneous preterm birth. Tables 4.17 – 4.20 detail the administrative avoidable factors in common causes of perinatal death.

Table 4.17. Administrative avoidable factors related intrapartum asphyxia and birth trauma

	Number	% of group
Intrapartum asphyxia	755	
Inadequate facilities/equipment in neonatal unit/nursery	151	20
Anaesthetic delay	76	10.1
Insufficient nurses on duty to manage the patient adequately	76	10.1
Lack of transport - Home to institution	73	9.7
Inadequate theatre facilities	62	8.2
Personnel not sufficiently trained to manage the patient	58	7.7
Lack of transport - Institution to institution	47	6.2
Insufficient doctors available to manage the patient	46	6.1
No accessible neonatal ICU bed with ventilator	39	5.2
Inadequate resuscitation equipment	32	4.2
Birth trauma	76	
Personnel not sufficiently trained to manage the patient	15	19.7
Lack of transport - Home to institution	12	15.8
Anaesthetic delay	11	14.5
Inadequate facilities/equipment in neonatal unit/nursery	6	7.9
Inadequate theatre facilities	6	7.9

Table 4.18. Administrative avoidable factors related to spontaneous preterm birth

	Number	% of group
Spontaneous preterm birth	569	
Inadequate facilities/equipment in neonatal unit/nursery	285	50.1
No accessible neonatal ICU bed with ventilator	81	14.2
Lack of transport - Home to institution	39	6.9
Personnel not sufficiently trained to manage the patient	33	5.8
Insufficient nurses on duty to manage the patient adequately	23	4
Lack of adequate neonatal transport	19	3.3
Lack of transport - Institution to institution	16	2.8
Inadequate resuscitation equipment	12	2.1
Insufficient doctors available to manage the patient	5	0.9
Personnel too junior to manage the patient	3	0.5

Table 4.19. Administrative avoidable factors related to complications of hypertension

	Number	% of group
Complications of hypertension	225	
Inadequate facilities/equipment in neonatal unit/nursery	47	20.9
No accessible neonatal ICU bed with ventilator	29	12.9
Lack of transport - Institution to institution	16	7.1
Personnel not sufficiently trained to manage the patient	14	6.2
Anaesthetic delay	13	5.8
Lack of transport - Home to institution	12	5.3
Inadequate theatre facilities	11	4.9
Insufficient doctors available to manage the patient	10	4.4
Insufficient nurses on duty to manage the patient adequately	10	4.4
Personnel too junior to manage the patient	10	4.4

Table 4.20. Administrative avoidable factors related to antepartum haemorrhage

	Number	% of group
Antepartum haemorrhage	174	
Inadequate facilities/equipment in neonatal unit/nursery	26	14.9
Lack of transport - Home to institution	25	14.4
Inadequate theatre facilities	22	12.6
Lack of transport - Institution to institution	19	10.9
Insufficient doctors available to manage the patient	15	8.6
Anaesthetic delay	13	7.5
No accessible neonatal ICU bed with ventilator	13	7.5
Personnel not sufficiently trained to manage the patient	11	6.3
Insufficient nurses on duty to manage the patient adequately	5	2.9
Insufficient blood / blood products available	3	1.7

Tables 4.21 – 4.23 detail the probable avoidable factors related to early neonatal deaths. In early neonatal deaths due to immaturity, administrative factors were the most common with lack of facilities, transport and staff featuring prominently (Table 4.21). In early neonatal deaths due to hypoxia, the health care providers' recorded highest numbers, almost three times those of health care provider related deaths due to immaturity. Lack of skills seems the major problem associated with these deaths.

Table 1.21. Avoidable factors directly associated with early neonatal deaths due to immaturity

Immaturity	**Number**	**% of group**
Administrative problems	**704**	
Inadequate facilities/equipment in neonatal unit/nursery	356	50.6
No accessible neonatal ICU bed with ventilator	125	17.8
Lack of transport - Home to institution	44	6.3
Personnel not sufficiently trained to manage the patient	34	4.8
No syphilis screening performed at hospital / clinic	24	3.4
Result of syphilis screening not returned to hospital/clinic	22	3.1
Lack of adequate neonatal transport	20	2.8
Inadequate resuscitation equipment	18	2.6
Insufficient nurses on duty to manage the patient adequately	15	2.1
Lack of transport - Institution to institution	11	1.6
Insufficient doctors available to manage the patient	6	0.9
Personnel too junior to manage the patient	4	0.6

Immaturity	Number	% of group
Health care provider associated	**510**	
Neonatal care: management plan inadequate	81	15.9
Delay in referring patient for secondary/tertiary treatment	53	10.4
Antenatal steroids not given	48	9.4
Neonatal care: inadequate monitoring	34	6.7
Neonatal resuscitation inadequate	31	6.1
Multiple pregnancy not diagnosed antenatally	22	4.3
No response to history of stillbirths, abruptio etc.	18	3.5
Delay in medical personnel calling for expert assistance	16	3.1
Nosocomial infection	16	3.1
Baby managed incorrectly at Hospital/Clinic	15	2.9
Incorrect management of premature labour	15	2.9
Multiple pregnancy not diagnosed intrapartum	15	2.9
Medical personnel overestimated foetal size	14	2.7
No response to maternal hypertension	14	2.7

Table 1.22. Avoidable factors directly associated with early neonatal deaths due to hypoxia

Hypoxia	Number	% of group
Administrative problems	**588**	
Inadequate facilities/equipment in neonatal unit/nursery	165	28.1
Insufficient nurses on duty to manage the patient adequately	60	10.2
No accessible neonatal ICU bed with ventilator	49	8.3
Anaesthetic delay	42	7.1
Lack of transport - Home to institution	42	7.1
Personnel not sufficiently trained to manage the patient	42	7.1
Inadequate resuscitation equipment	32	5.4
Insufficient doctors available to manage the patient	32	5.4
Inadequate theatre facilities	27	4.6
Lack of transport - Institution to institution	26	4.4
Health care provider associated	**1409**	
Foetal distress not detected intrapartum; foetus monitored	294	20.9
Management of 2nd stage: prolonged with no intervention	136	9.7
Foetal distress not detected intrapartum; foetus not monitored	120	8.5
Delay in referring patient for secondary/tertiary treatment	88	6.2
Poor progress in labour, but partogram not used correctly	75	5.3
Delay in medical personnel calling for expert assistance	71	5
Neonatal care: management plan inadequate	62	4.4
Poor progress in labour - partogram interpreted incorrectly	59	4.2
Medical personnel underestimated foetal size	58	4.1
Neonatal resuscitation inadequate	55	3.9
Delay in doctor responding to call	42	3
Neonatal care: inadequate monitoring	38	2.7
Management of 2nd stage: inappropriate use of vacuum	27	1.9
Poor progress in labour, but partogram not used	27	1.9

Overall, lack of facilities, lack of skills and personnel and poor transport were the main avoidable factors in early neonatal deaths (Table 4.23). Not surprisingly the lack of skills was mostly related to managing the labour.

Table 4.23. Common administrative and health care provider avoidable factors directly associated with early neonatal deaths

Description	Number	% of ENND
Inadequate facilities/equipment in neonatal unit/nursery	534	5.3
Foetal distress not detected intrapartum; foetus monitored	306	3.0
No accessible neonatal ICU bed with ventilator	194	1.9
Neonatal care: management plan inadequate	190	1.9
Delay in referring patient for secondary/tertiary treatment	182	1.8
Management of 2nd stage: prolonged with no intervention	142	1.4
Foetal distress not detected intrapartum; foetus not monitored	131	1.3
Neonatal care: inadequate monitoring	112	1.1
Lack of transport - Home to institution	101	1.0
Delay in medical personnel calling for expert assistance	96	1.0
Neonatal resuscitation inadequate	92	0.9
Personnel not sufficiently trained to manage the patient	85	0.8
Insufficient nurses on duty to manage the patient adequately	84	0.8
Medical personnel underestimated foetal size	83	0.8
Poor progress in labour, but partogram not used correctly	81	0.8
Inappropriate response to rupture of membranes	70	0.7
Poor progress in labour - partogram interpreted incorrectly	64	0.6
Inadequate resuscitation equipment	55	0.5
Antenatal steroids not given	53	0.5
Delay in doctor responding to call	52	0.5
Lack of transport - Institution to institution	50	0.5

Summary of findings

- The national PNMR was approximately 35/1000 births (≥500g).
- The PNMR per level of care was 10.41/1000 births in CHCs; 33.33/1000 births in district hospitals; 31.67/1000 births in regional hospitals; 48.04/1000 births in provincial tertiary hospitals; and 71.42/1000 births in national central hospitals.
- Extrapolating the data for South Africa approximately 1,500 perinatal deaths occurred in CHCs; 13,200 in district hospitals; 11,300 in regional hospitals; 2,400 in provincial tertiary hospitals; and 4,000 in national central hospitals per year.
- The PNMR was highest for pregnant women less than 18 years old (64.5/1000 births) followed by pregnant women more than 34 years (49.4/1000 births). Avoiding pregnancy at the extremes of reproductive age is an important way of reducing the PNMR.
- In district hospitals, 38% of the fresh stillbirths were alive on admission to the institution, indicating a clear window of opportunity where deaths can be prevented. Delay in accessing the correct treatment was the major avoidable factor in this group.
- The top 5 categories of perinatal deaths were unexplained stillbirths (22%), spontaneous preterm birth (21%), intrapartum asphyxia and birth trauma (16%), complications of hypertension in pregnancy (14%) and antepartum haemorrhage (11%). These 5 causes account for 84% of perinatal deaths. Abruptio placenta accounted for 80% of the antepartum haemorrhages. Pre-eclampsia/eclampsia and abruptio placenta are

considered placenta/placental bed diseases and if combined make 22.8% of perinatal deaths, becoming the most common category of perinatal deaths.

- Placenta/placental bed disease is recognised for the first time as being the most important contributor to perinatal death. These deaths can be reduced by introducing calcium supplementation to all pregnant women. This will not only prevent perinatal deaths but also maternal deaths.

- Two-thirds of early neonatal deaths were classified as being due to spontaneous preterm birth and labour related problems. Three out of four neonates died either due to immaturity or hypoxia.

- Perinatal mortality rates for intrapartum asphyxia and birth trauma were highest in district hospitals at 7.21/1000 births approximately 2,850 perinatal deaths in South Africa per year. This was followed by provincial tertiary hospitals at 7.07/1000 births (360 perinatal deaths per year in SA).

- District hospitals had the highest early neonatal death rate per birth weight category and extrapolating this data to the population of South Africa, district hospitals have about 2,200 early neonatal death 2kg and over and 2000 early neonatal deaths between 1-2kg. Regional hospitals had approximately 1,100 and 1,500 early neonatal deaths in the same birth weight categories. All the other sites had less than 400 early neonatal deaths for the same categories.

- Intrapartum asphyxia and birth trauma were the most common health care provider probably avoidable deaths (51%) and provincial tertiary hospitals had the highest administrative probably avoidable deaths (27%).

- Most health care provider probably avoidable deaths occur in district hospitals (55%) and most were due to intrapartum asphyxia and birth trauma (63% of 55%).

- Provincial tertiary hospitals had the highest avoidable mortality rates of 9.14 for health care provider and 4.44 for administrative. This translates into estimated avoidable deaths per year of 459 and 223 respectively.

- The avoidable mortality rate for health care providers in district hospitals (6.57/1000 births) and intrapartum asphyxia and birth trauma is the most common cause and the avoidable mortality rate of administrative problems in district hospitals (2.29/1000 births) and relate mostly to intrapartum asphyxia and birth trauma and spontaneous preterm birth. This translates into estimated avoidable deaths per year of 2576 and 898 perinatal deaths respectively.

Conclusion

This perinatal care survey has concentrated on identifying the disease categories in which most deaths are thought to be preventable and identifying the levels of care where the most impact can be made with respect to reducing perinatal mortality. Placenta/placental bed

disease has been recognised for the first time as the major contributor to perinatal death. Potentially these deaths can be prevented by introducing calcium supplementation to all pregnant women.

Avoidable mortality rates in the health care system can be used as a measure of quality of care. To do this in PPIP 'probably avoidable deaths related to health care providers' and 'probably avoidable deaths related to administrators' were used as primary indicators. The mortality rates were calculated by extrapolating the data to all births at each level of care (from PPIP and DHIS data) so approximations of the number of deaths that can be prevented could be calculated.

Caring appropriately for a woman in labour is the core business of midwives and doctors dealing with pregnancy. Almost half of the deaths due to intrapartum asphyxia and birth trauma were thought to be probably avoidable had the health care provider acted in a different way. This category provided the most avoidable deaths. The data implies that the health system is failing in one of its most basic functions. Most intrapartum asphyxia deaths occurred in district hospitals and the avoidable mortality rate was highest for both health care provider and administrative problems in these hospitals. This indicates the quality of care was poorest in this category of hospital. Quality of care is determined by having adequate staff, equipment and drugs, and health care providers having the appropriate skills and knowledge and also a caring attitude. Most births occur in district hospitals; hence it is imperative that attention be given to the proper functioning of these hospitals. Provincial tertiary hospitals had the second worst quality of care measure. They also need urgent attention in performing their functions effectively.

CHAPTER 5

THE PERINATAL PROBLEM IDENTIFICATION PROGRAM (PPIP): TEN YEARS OF THE NATIONAL PERINATAL CARE SURVEYS

Author: D Greenfield, N Rhoda, RC Pattinson

Introduction

The Perinatal Problem Identification Programme (PPIP) has been used as a facility -based national data base for monitoring the quality of care and perinatal mortality for 10 years. Data are sent from sentinel sites – hospitals or community health centres where deliveries are conducted – on a voluntary basis. The sites were not chosen, but staff working there decided that they wanted to monitor their own perinatal mortality data and also submitted their data to the national data base. The participating facilities from which data has been submitted have changed over time: some facilities have dropped out, while others have joined.

The data are entered into and analysed by a computer programme which was designed for this purpose. The information obtained is helpful in assessing problems and planning solutions at facility, district, provincial and national level, so that patient care can be improved.

Currently, the Programme has been adopted by some Provinces as a key tool for monitoring their own provincial perinatal mortality data. In these provinces, all facilities where deliveries are conducted are required to use PPIP and to submit their perinatal mortality data as PPIP files to the provincial office, from where it is forwarded to the national data base.

The National Perinatal Mortality and Morbidity Committee (NaPeMMCo), ministerial created, has previously recommended that PPIP be conducted in all public hospitals. To date it represents 52.4% of these facilities and this comprises the National database which is reviewed here.

Methods

The data are analysed by birth weight category using 500g weight ranges, from 500g to 2500g or more, and by level of care, from Community Health Centres to Tertiary Hospitals.

The mortality rates for each birth weight category are reviewed. The primary obstetric cause of death, final neonatal cause of death and avoidable factors are assessed for each of these levels of care and birth weight categories.

A retrospective evaluation of the data in the national PPIP database from the last ten years has been performed for this report. A small proportion of the facilities have submitted data for the full 10 years.

Three year time periods were used for comparing trends overtime. These were: 2000 – 2002, 2003 – 2005, and 2006 – 2008. The year 2009 was assessed on its own.

Results

For the 10 year period, there were just under 3,000,000 births occurring in the participating health facilities.

Figure 5.1: Proportion of deliveries by level of care (% of total)

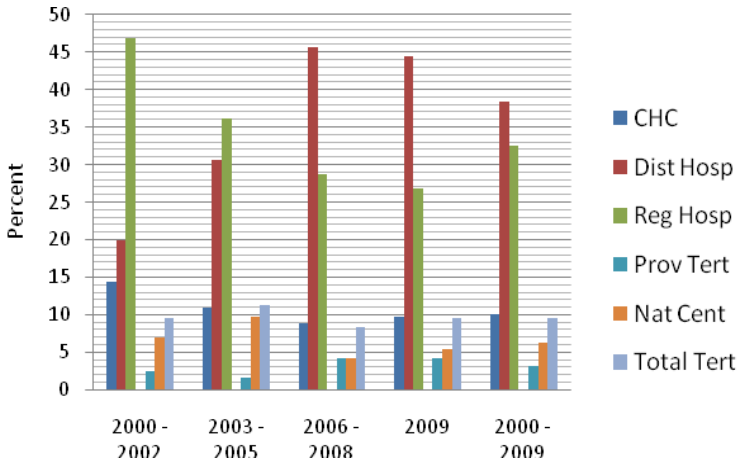


Figure 5.1 illustrates the proportion of the deliveries by level of care. Initially most of the data were from regional hospitals. The proportions have changed over the 10 years so that the majority of the data is now from District Hospitals. This coincides with some provinces making compulsory the collection and submission of PPIP data as part of their monitoring of the quality of care process. Most of the delivery services and immediate newborn care in South Africa are provided in District Hospitals.

These figures illustrate the proportions of total deliveries from each level of care, not absolute numbers.

There has been an increase in the number of District Hospitals participating in the data collection. This is partly because some Provinces are requiring hospitals to submit the data, and others because the staff realise the benefit of using the data to improve the quality of care which is provided.

Overall, about 60 – 70% of the data have been submitted from District and Regional hospitals.

Birth weight analysis

Figure 5.2 Proportion of deliveries by birth weight (% of total deliveries)

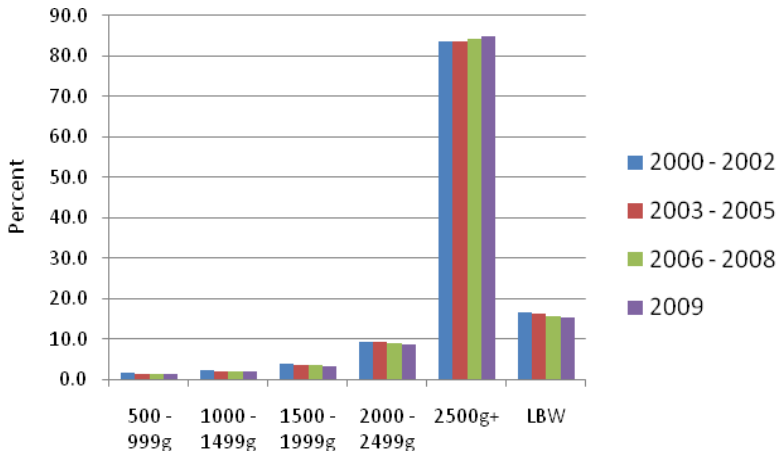


Figure 5.2 illustrates the distribution of births by birth weight. The important aspects are:

The percentages for each birth weight category are: 500 – 999g are < 2%; 1000 – 1499g are < 2%; 1500 – 1999g are ± 4%; 2000 – 2499g are ± 8%; and 2500g + are ±84%

The low birth weight rate is ±16%

The proportions have remained very constant despite the changes in data sources

Figure 5.3 Perinatal Mortality Rate (per 1000 births): Birth weight ≥500g

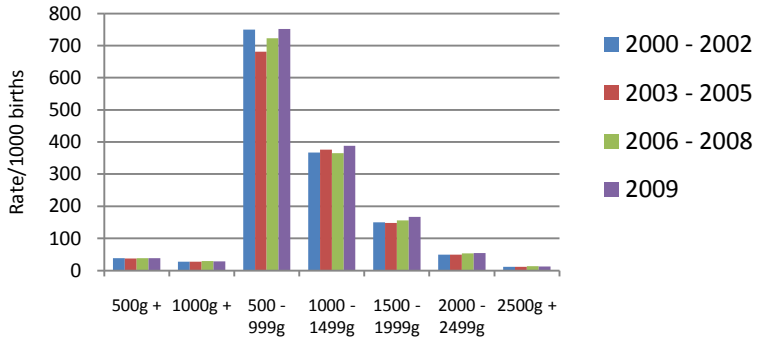
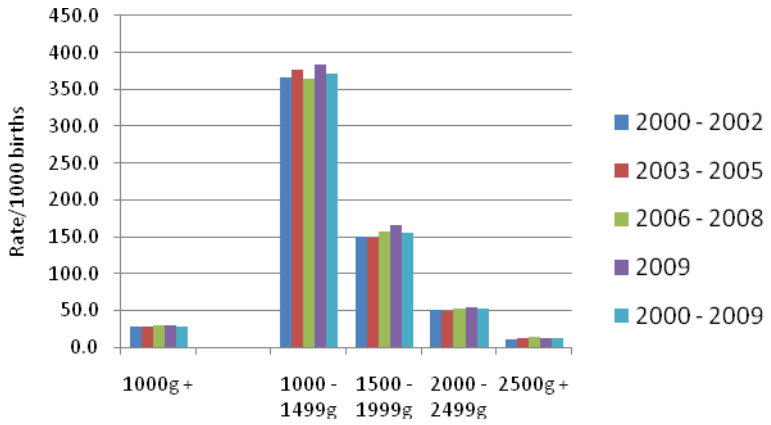


Figure 4.4 Perinatal Mortality Rate (per 1000 births): Birth weight ≥1000g



Figures 5.3 and 5.4 give the perinatal mortality rates (PNMR) for different birth weight categories:

- The overall PNMR for birth weight ≥500g is 38/1000 births
- The overall PNMR for birth weight ≥1000g is 28/1000 births
- The highest rates are for the smallest babies, especially those with a birth weight of less than 1500g
- The mortality rates have not changed over the 10 year period

Figure 5.5 Early Neonatal Mortality Rate (per 1000 live births): Birth weight ≥500g

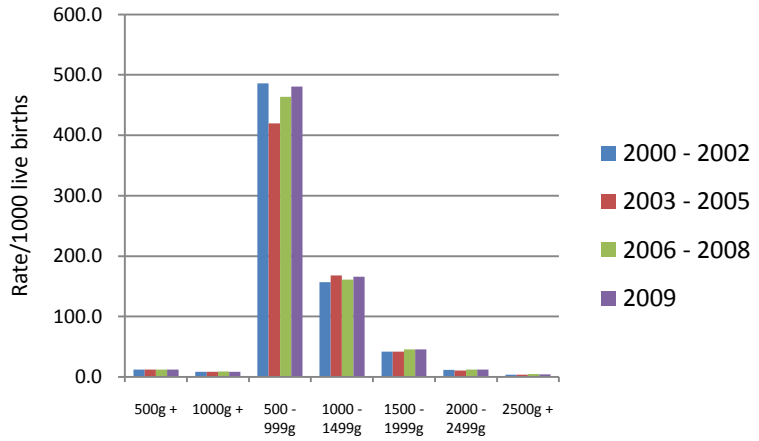
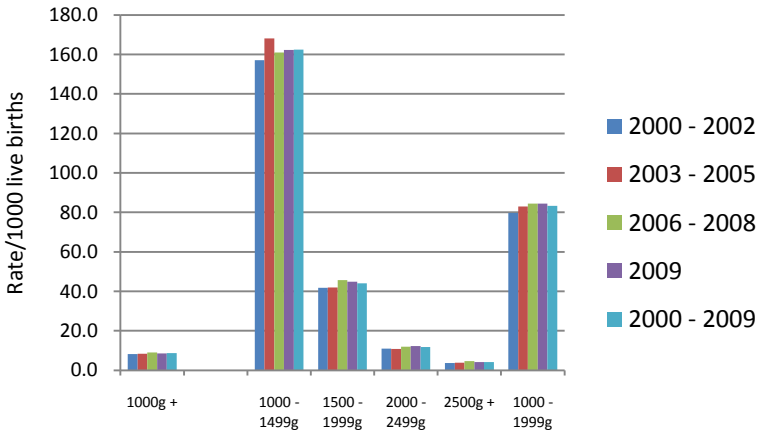


Figure 5.6 Early Neonatal Mortality Rate (per 1000 live births): Birth weight ≥1000g



Figures 5.5 and 5.6 give the early neonatal mortality rate (ENNMR):

- A significant factor in the very high mortality rate in infants with a birth weight of 500 – 999g is that these infants are not usually offered intensive care and ventilatory support.
- The overall rate for all infants with a birth weight of ≥500g is 12/1000 live births.
- The overall rate for all infants with a birth weight of ≥1000g is 8.5/1000 live births.
- There have been no changes of note over the 10 year period.

Figure 5.7 Primary Obstetric Cause of Death (birth weight ≥500g)

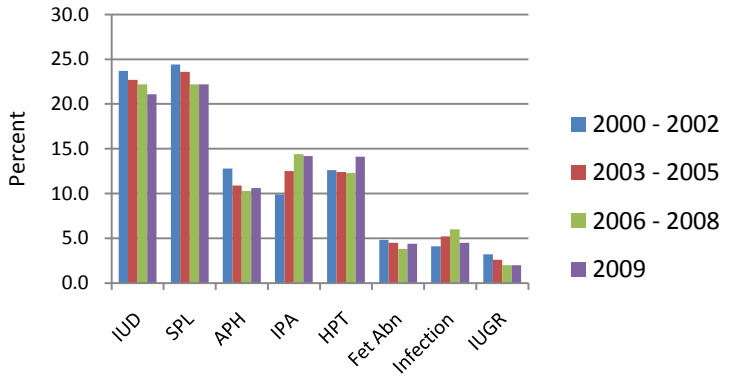
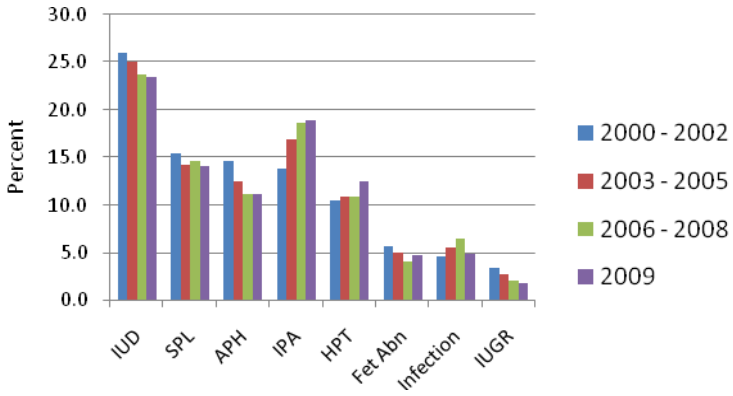


Figure 5.8 Primary Obstetric Cause of Death (birth weight ≥1000g)



Figures 5.7 and 5.8 give the distribution of primary obstetric cause of death:

- The only real difference between the data for babies with a birth weight of ≥500g and those with a birth weight of ≥1000g is the increased proportion of deaths from spontaneous preterm labour in the ≥500g group.
- Unexplained intrauterine death is the commonest recorded category of death in infants weighing ≥1000g at birth.
- Intrapartum hypoxia is the next commonest recorded cause of death. This is of great concern because it is potentially avoidable.
- The high numbers of deaths resulting from maternal hypertension and antepartum haemorrhage are noteworthy. A significant number of the deaths related to antepartum haemorrhage are also related to hypertension (see figure 5.9, below)
- The pattern of disease has not really changed over the 10 years although the proportion of deaths due to intrapartum asphyxia seems to be increasing. This might be due to the increasing numbers of district hospitals submitting data to the database

Figure 9: Primary Obstetric Cause of Death: 2000 - 2009 (% of all deaths)

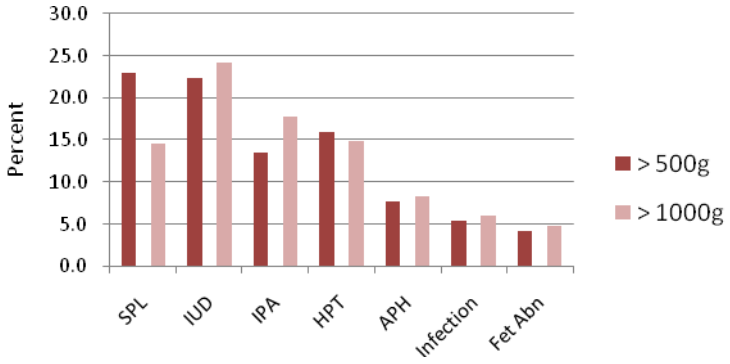


Figure 5.9 illustrates the causes of death;

- In this graph, the cause of death "abruptio placenta with hypertension" has been included with hypertension and not with antepartum haemorrhage.
- It is clear that, apart from unexplained intrauterine death, spontaneous preterm labour, intrapartum hypoxia and hypertension are the 3 most important primary obstetric causes of death. These 3 conditions are the primary obstetric causes of death in about 45% of all the deaths. For all of these conditions there are interventions which can improve the outcome for the baby.

Figure 5.10 Final neonatal Cause of Death (Birth weight ≥500g)

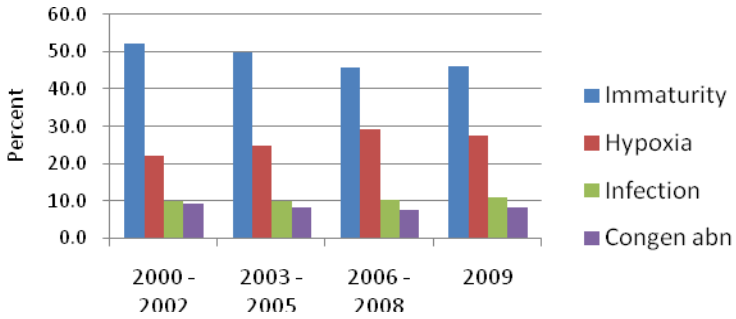


Figure 5.10 illustrates the final neonatal cause of death in babies ≥500g:

As expected, the dominant cause of death is "Immaturity related".

Figure 5.11 Final Neonatal Cause of Death (Birth weight ≥1000g) (% of total)

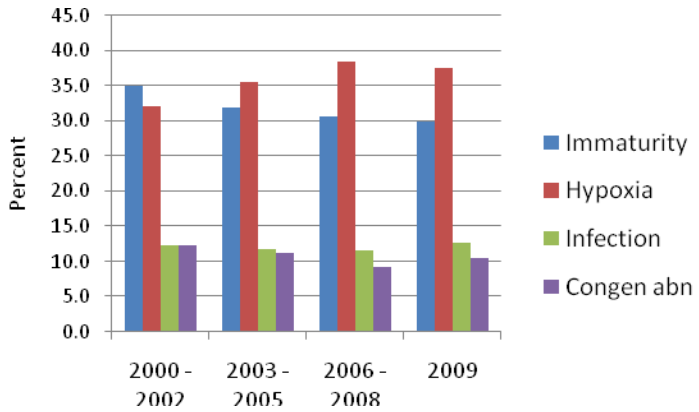


Figure 5.11 gives the final neonatal causes of death for neonates ≥1000g:

- The main causes of death are "Immaturity related" and "Hypoxia". Together these make up about 2/3 of all the neonatal deaths in infants with a birth weight of 1000g or more
- Immaturity related causes are in the low birth weight babies, especially those with a birth weight of less than 1500g. These deaths are a marker of the quality of newborn care.
- Hypoxia is a problem which usually arises during labour. It is an indicator that foetal distress is not being recognised and/or not being managed actively during labour.

Figure 5.12 Probable avoidable factors (% of deaths with an avoidable factor recorded)

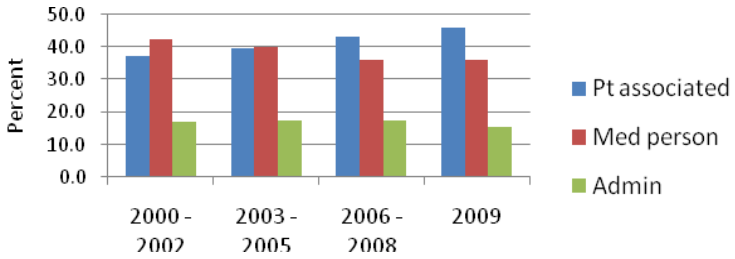


Figure 5.12 illustrates the distribution of the deaths where there were avoidable factors that probably resulted in the death of the baby:

- Only the avoidable factors recorded as "probable" have been included in the above graph.
- The greatest percentage of avoidable factors is in the 2 categories of "Patient associated problems" and "Medical personnel related" factors.
- These factors have not really changed over the 10 years.

Table 5.1 Probable avoidable factors: (% of total deaths)

Patient associated factors		Health care provider associated		Administrative factors	
Delays in attending for care	9.4	Antenatal care problems	5.0	Facilities inadequate	3.0
No antenatal Clinic attendance	8.5	Labour care problems	4.9	Personnel related	2.1
		Delays in attending or transferring	2.3	Transport problems	1.5
		Neonatal care	1.3		

Table 5.1 gives the common causes of the avoidable factors that probably resulted in the death of the baby:

Many of the patient related factors may be related to an inability to access care

Administrative problems:

- Facilities inadequate: Many of these are related to inadequate neonatal facilities.
- Personnel related: There were either insufficient personnel available or they are not sufficiently experienced or trained to be able to deal with the problems

Health care provider related problems

- These were present in 13,5% of the total deaths
- This is something which can be addressed and needs attention.

It is likely that the health care provider and administrative avoidable factors may be under recorded.

Level of care analysis

Figure 5.13 Perinatal Mortality Rate (/1000 births) by level of care: Birth weight ≥500g

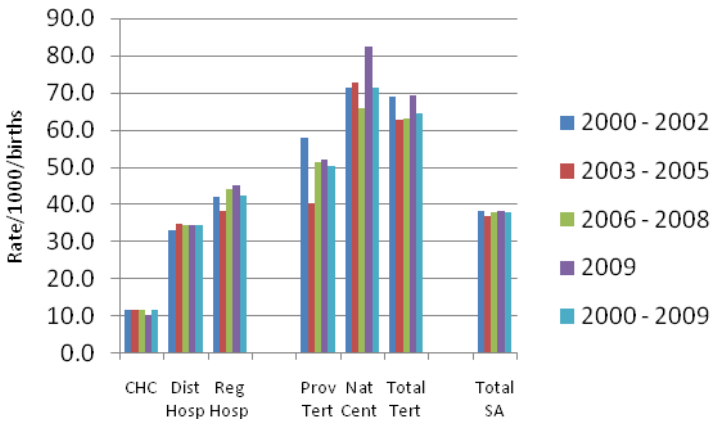
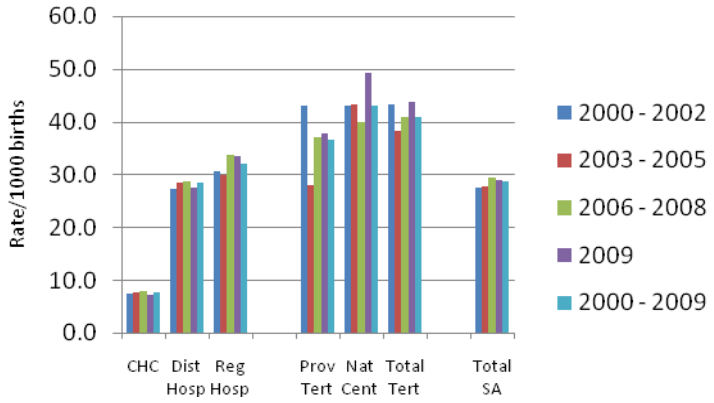


Figure 5.14 Perinatal Mortality Rate (/1000 births) by level of care: Birth weight ≥1000g



Figures 5.13 and 5.14 give the PNMR per level of care in birth weight categories ≥500g and ≥1000g:

- The PNMR for the various levels of care have not really changed over the 10 years
- The PNMR is low in the Community Health Centres (CHC), which suggests that the referral system is working reasonably well.
- The high rates at the tertiary hospitals may be because the sickest patients end up there. Some of these hospitals are also functioning as regional hospitals when there is not a regional hospital in the area.
- The rates in the District and Regional hospitals are higher than expected and the differentiation between the mortality rates is much smaller than expected. Visits to district hospitals have shown that the standard of the facility itself (equipment, protocols, etc) and the knowledge and skills of the staff working there are not what they should be.

Figure 5.15 Early Neonatal Mortality Rate by level of care (/1000 live births): Birth weight ≥500g

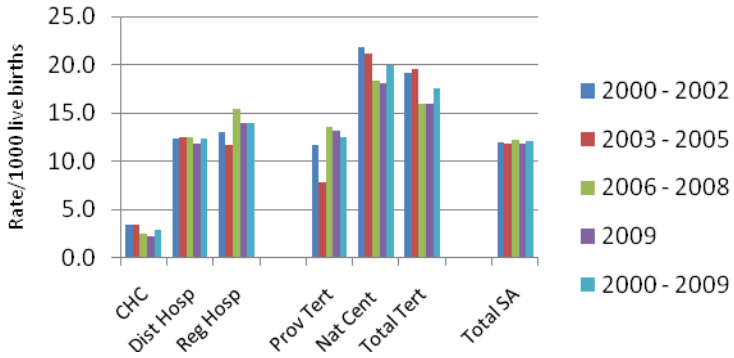
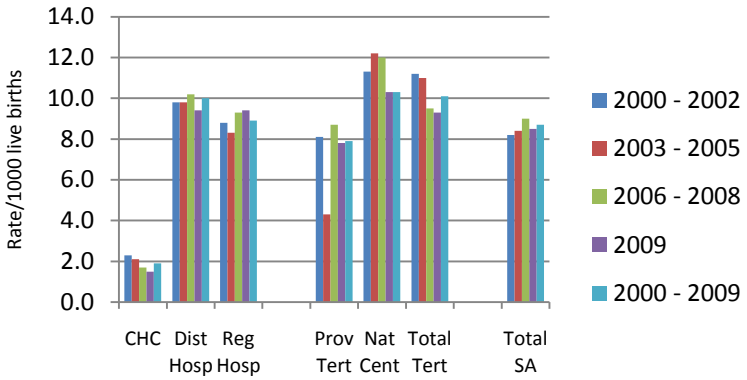


Figure 5.16: Early Neonatal Mortality Rate by level of care (/1000 live births): Birth weight ≥1000g



Figures 5.15 and 6.16 illustrate the ENNMR by level of care and birth weight category:

- The ENNMR for the various levels of care have not really changed over the 10 years
- The pattern is the same for all babies (birth weight of ≥500g and those weighing ≥1000g.)
- The mortality rates are highest at the tertiary hospitals and lowest at the Community Health Centres. This may be the result of appropriate referral patterns.
- The high ENNMR in district hospitals (higher than regional hospitals) is of concern. This indicates either the referral system is not working; the care is poor for various reasons in district hospital, or both.
- There has not been any real change in the rates over the 10 years.

Figure 5.17 Early Neonatal Mortality Rate Birth weight 1000 – 1499g by level of care

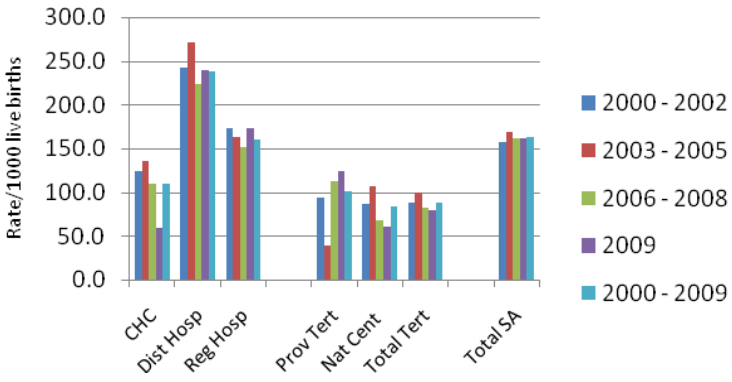


Figure 5.17 illustrates the ENNMR in neonates weighing 1000-1499g:

- The rates have not changed over time
- The rates are particularly high in district hospitals. They are well above the national average.

- The ENNMR in this birth weight category reflects the quality of newborn care. The high rate in the district hospitals suggests that there is generally sub-standard newborn care in these hospitals.

Figure 5.18: Early Neonatal Mortality Rate: Birth weight ≥2500g per level of care

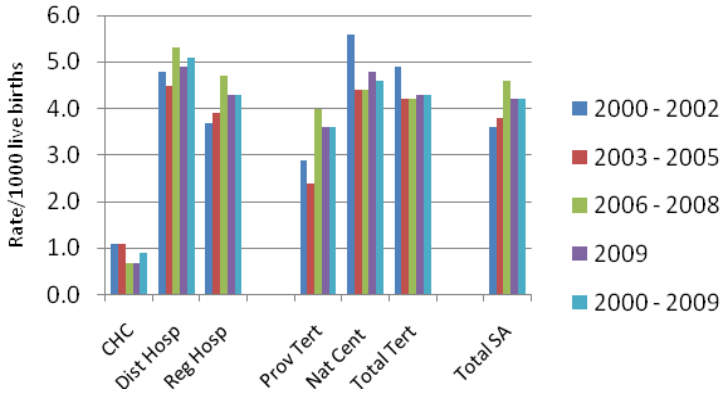


Figure 5.18 illustrates the ENNMR of neonates' ≥2500g per level of care:

- The rates have not changed over the 10 years
- The highest rate is in the District Hospitals.
- The rate is generally high in all levels of care except for the Community Health Centres.

Table 5.2 Total perinatal deaths per birth weight category (2000 – 2009)

Birth weight	500-999g	1000-1499g	1500-1999g	2000-2500g	2500g +	Total
Number of perinatal deaths	27859	20801	15519	13602	30688	108469

Table 5.2 clearly shows that the greatest number of perinatal deaths is in the birth weight category ≥2500g. The only other category which is close is that of <1000g, where, for logistic reasons, a high level of care is not offered.

The primary obstetric causes of death for fresh stillbirths and neonatal deaths in babies with a birth weight of ≥2500g are:

Intrapartum hypoxia	48.9%
Unexplained intrauterine death	6.2% *(These are most likely to have been due to intrapartum hypoxia)*
Trauma	4.8%
Total	59.9%

The main cause of neonatal death in babies with a birth weight of ≥2500g is:

Hypoxia 65.2%

Intrapartum hypoxia is therefore a very important cause of death. This is something which can be reduced by improving the quality of intrapartum care.

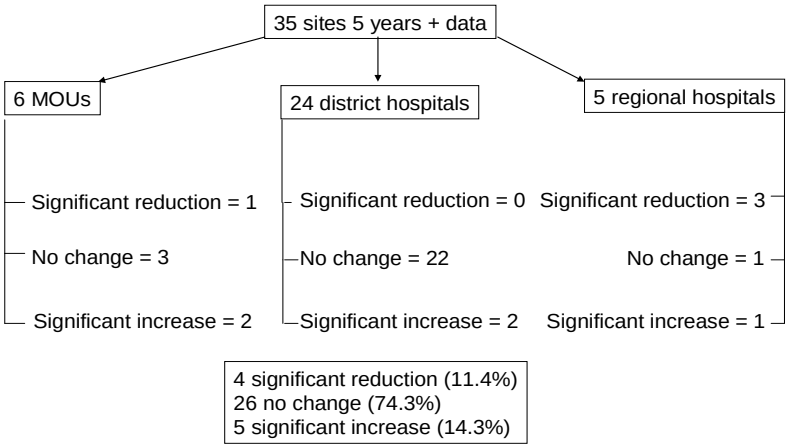
Serial data

There were 35 PPIP sites that had five years or more serial data, which is summarised in Figure 5.19: six Midwife Obstetric Units (MOUs), 24 district hospitals and five regional hospitals (Figure 19). In these sites four had a significant reduction in perinatal mortality rate - three were regional hospitals and one was an MOU. Five sites showed a significant increase in PNMR - two were district hospitals, two were CHCs and one was a regional hospital. The remaining 26 sites showed no measurable change in PNMR and the PCI. The sites that showed a decrease did not appear to be different from the other sites, they did not have high PNMRs to start off with, nor did those that increased have low PNMRs to start with. The variation of the PNMR from PNMRs of 6/1000 births to 40/1000 births in the groups that remained unchanged is large because of the different types of institutions involved (CHCs to regional hospitals).

Table 5.3 Amalgamated Serial PPIP data for types of institutions (≥1000g)

	Year	Total	Total deaths	Live births	PNMR	SBR	NNMR
CHC (n=6)							
	2000	7605	71	7563	9.3	5.5	3.8
	2001	7250	84	7200	11.6	6.9	4.7
	2002	8084	82	8026	10.1	7.2	3.0
	2003	8594	98	8537	11.4	6.6	4.8
	2004	10107	135	10011	13.4	9.5	3.9
	2005	11189	125	11100	11.2	8.0	3.2
	2006	11880	121	11794	10.2	7.2	3.0
	2007	10567	123	10477	11.6	8.5	3.1
DH (n=24)							
	2003	26581	838	25959	31.5	23.4	8.3
	2004	40348	1459	39413	36.2	23.2	13.3
	2005	34163	1028	33523	30.1	18.7	11.6
	2006	35327	1135	34578	32.1	21.2	11.2
	2007	36876	1167	36108	31.6	20.8	11.1
RH (n=5)							
	2002	11736	428	11454	36.5	24.0	12.7
	2003	13849	476	13557	34.4	21.1	13.6
	2004	15780	444	15466	28.1	19.9	8.4
	2005	15055	393	14750	26.1	20.3	6.0
	2006	18714	498	18354	26.6	19.2	7.5
	2007	18392	581	17953	31.6	23.9	7.9

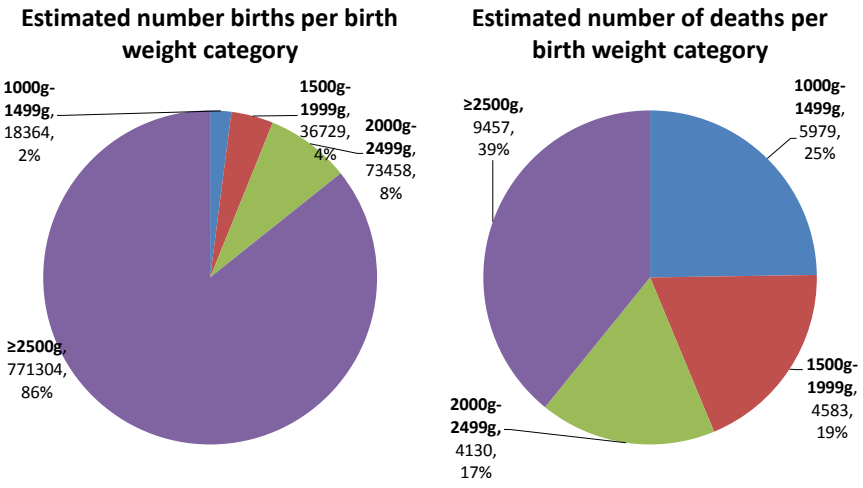
Figure 5.19 Serial PPIP data and perinatal mortality rates



Numbers, rates and priorities

Figure 5.20 compares the estimated number of births and perinatal deaths in South Africa per birth weight categories as extrapolated from the 2008-9 PPIP and DHIS data. In the birth weight category ≥2500g has many more deaths than the other birth weight category, even though the PNMR (~ 12.3/1000 births) is lowest for all the birth weight categories. The majority of perinatal deaths in this category is due to intrapartum asphyxia and birth trauma and the major final neonatal cause of death is hypoxia. To significantly reduce the PNMR improving intrapartum care must be a priority.

Figure 20. Comparisons of the numbers of births and perinatal deaths per birth weight category in South Africa



The PNMR is highest for the birth weight categories 1000g-1499g (~ 325.6/1000 births) and 1500g-1999g (124.8/1000 births) but because fewer births occur is these birth weight categories (~2% and 4% respectively), less perinatal deaths occur in these groups compared with those ≥2500g. However, the number of perinatal deaths in the birth weight categories

1000g-1499g and 1500g-1999g is estimated to be slightly more (10562 deaths) than in the category ≥2500g (9457 deaths). Most of these deaths are due to spontaneous preterm labour, complications of hypertension and antepartum haemorrhage, and the most common final causes of death relate to complications of immaturity. To reduce the PNMR there will have to be a large improvement in managing immature babies.

The highest number of deaths due to hypoxia and immaturity occur in the district hospitals. Thus to significantly reduce the PNMR in South Africa intrapartum care and care of the immature infant must be improved especially at the district hospitals.

Summary

1. There has not been a decrease in perinatal or neonatal mortality over the 10 year period 2000 – 2009 in any of the levels of care. Although the institutions supplying the data varied for the different time periods, the serial data confirm the lack of change. This is in spite of several reports with clear guidelines and recommendations having been produced. (Saving Babies Reports, 2003, 2005, 2007)

2. The greatest number of perinatal deaths is in the birth weight category ≥2500g. These are term or near term babies in whom there should be a good outcome.

3. Problems for which there are interventions which can improve the outcome for the babies are:

    - The recognition and management of preterm labour, hypertension, and intrapartum hypoxia.
    - For newborn babies, the major interventions which can improve the outcomes are: the care of the small and sick baby, and resuscitation of the newborn.

4. Avoidable factors show that there is a problem in all aspects of care given by medical personnel in from the antenatal clinic to postnatal and newborn care. In some instances it has been reported that there are insufficient staff on duty, and that they are not adequately trained to manage the patients.

5. There is a problem in District hospitals, and to some extent in Regional hospitals. The mortality rates for babies with very low birth weights and birth weights of ≥2500g in these hospitals are high.

6. Priorities for improving the quality of care.

    - The recognition and management of hypertension in pregnancy
    - The management of preterm labour
    - The recognition and management of hypoxia/foetal distress in labour
    - Resuscitation of the newborn
    - The management of the small and sick newborn

7. Target mortality rates

    The following are suggested. They apply mainly to District hospitals.

- Perinatal mortality rates:

Birth weight:	≥1000g	25 / 1000
	1000 – 1499g	200 / 1000
	1500 – 1999g	120 / 1000
	2000 – 2499g	30 / 1000
	≥2500g	7 / 1000

- Neonatal mortality rates:

Birth weight:	≥1000g	8 / 1000
	1000 – 1499g	150 / 1000
	1500 – 1999g	50 / 1000
	1000 – 1999g	100 / 1000
	2000 – 2499g	8 / 1000
	≥2500g	4 / 1000

These are initial targets. Once they have been achieved, the target rate must be lowered.

CHAPTER 6

THE CHILD HEALTHCARE PROBLEM IDENTIFICATION PROGRAM: NEONATAL DEATHS AND QUALITY OF NEONATAL CARE IN CHILDREN'S WARDS 2005-2009

Authors: Stephen CR, Patrick ME

Introduction

The Child Healthcare Problem Identification Programme (Child PIP), which uses the hospital-based mortality review process to assess quality of care children receive in the South African health system, enables the systematic review of all deaths occurring in children's wards.

Despite modern recommendations and accepted standards for neonatal care, which designate that newborns should be cared for in nurseries, many newborns are still admitted to children's wards. This is due to outdated policies which state that any newborn that leaves a nursery to go home should never be allowed in a nursery again. The quality of care newborns receive in children's wards, wards not designed for providing newborn care, is not well described.

In this chapter Child PIP begins to describe the health profile and quality of care that these newborns receive in South African hospitals.

Setting

Currently there are over 100 hospitals using Child PIP and 95 have contributed data to the national database for 2009. Thus, one fifth of South African hospitals arousing Child PIP and are distributed in 32 out of the 52 districts in South Africa. Over half of the participating sites are district hospitals. About 40% of all regional hospitals and half of all provincial tertiary hospitals are using the Child PIP mortality review process.

Methods

Included in this survey are all neonates (0-28 days) admitted to the children's wards of hospitals participating in the Child PIP project, between 2005 and 2009.

For this population of children, the Child PIP audit process was used to determine the in-hospital mortality rate (IHMR) and, for those who died, their social, nutritional and HIV context, causes of death, and modifiable factors in the care they received.

Ward admission and discharge registers were used for monthly tallies, from which IHMRs were derived. Each death was analysed using the structured Child PIP mortality review process with information being captured on the standardised death data capture sheet.

Results

During the study period, altogether 95 hospitals participated in Child PIP for varying periods of time, during which there were 22 778 admissions of neonates 0-28 days, and 1 284 tallied deaths, giving an in-hospital mortality rate of 5.6 per 100 admissions. A total of 1 060 deaths (6% of all deaths in children's wards) were audited in detail.

From 2005 to 2009, the IHMR rate for children of all ages has dropped. However the IHMR for neonates has been rising from a rate of 5.6 in 2005 to almost 7 per 100 admissions in 2009.

Table 6.1 Core data 2005-2009

Year	2005	2006	2007	2008	2009	Total
Sites (cumulative)	19	30	51	75	95	
NN admissions	1355	2769	4534	7867	6253	22778
NN deaths	76	150	192	440	426	1284
Neonatal IHMR	5.6	5.4	4.2	5.6	6.8	5.6
Admissions / site	71	92	89	105	66	85
All child admissions	23653	40665	63378	106860	107544	342100
All child deaths	1543	2393	3190	5376	5329	17831
Paediatric IHMR	6.5	5.9	5.0	5.0	5.0	5.2
NN proportion of all admissions	6%	7%	7%	7%	6%	7%

Table 6.2 Audited deaths 2005-2009

Year	2005	2006	2007	2008	2009	Total
Sites (cumulative)	19	30	51	75	95	
Neonatal deaths	31	122	208	326	373	1060
All deaths	1537	2871	3837	5530	5448	19223
Proportion of audited deaths	2%	4%	5%	6%	7%	6%
Neonatal MFs	52	206	386	804	1183	2631
MF rate (per death)	1.7	1.7	1.9	2.5	3.2	2.5

Health profile

Nutritional status

In Chart 6.1, it is immediately striking that the weight of 9% of neonates dying in hospital was unknown. About one half of neonates were below normal weight for age (UWFA and severe malnutrition), which may reflect birth weight rather than poor nutrition.

However, when looking at the underlying condition for these babies as shown in Chart 2, 79% were classified as having no underlying problem and only 10% were classified as being preterm or having low birth weight. This seems to imply that either the recording of underlying conditions was inaccurate or that significant nutritional deprivation is happening in the first 28 days of life.

Chart 6.1 Nutritional status of neonates 2005-9

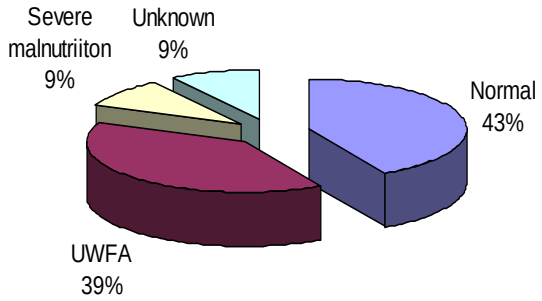
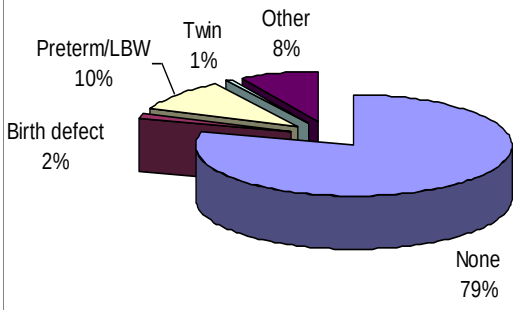


Chart 6.2 Underlying condition 2005-9



HIV context

Chart 6.3 shows that the HIV status for half of all neonates dying in children's wards was unknown. This represents an enormous gap in care particularly as all pregnant women should be tested for HIV during pregnancy. About 37% of babies dying in hospital were either HIV-exposed or already diagnosed as infected with HIV.

A similar picture emerges when looking at babies receiving nevirapine and/or AZT as part of prevention of mother-to-child transmission of HIV (PMTCT) shown in Chart 6.4, where, for almost half of the babies who died, it was unknown whether they received perinatal antiretrovirals (ARVs) or not. Furthermore, nearly half of the babies known to have been eligible for perinatal ARVs did not receive them. At least one third of babies dying had mothers known to be HIV-infected.

Chart 6.3 HIV status of neonates 2005-2009

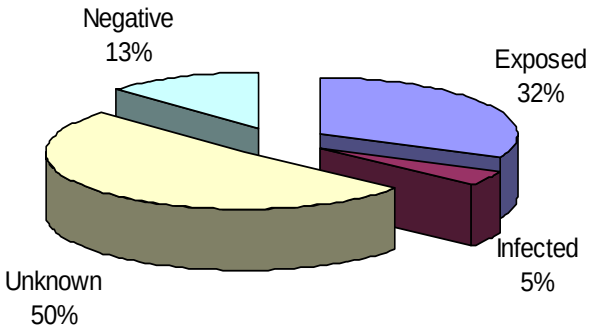
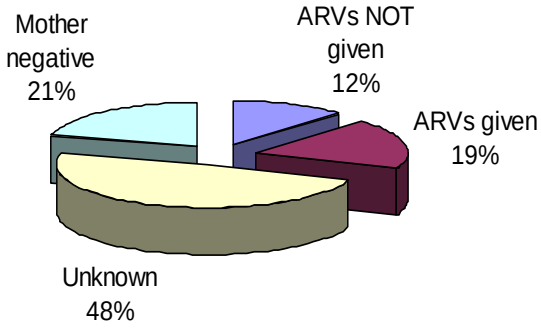


Chart 6.4 Perinatal ARVs in neonates 2005-2009



With regard to feeding practice, 28% of neonates were fed exclusively on formula; 26% were exclusively breast-fed; 9% received mixed feeding and the feeding choice was unknown for 37%.

Cause of death

The majority of deaths in neonates were caused by infections. Of the infections, septicaemia was the most common cause, followed by pneumonia, acute diarrhoeal disease, meningitis, PCP, and surprisingly perhaps in this age group, TB was the sixth most common cause of death.

As the Child PIP programme collects HIV data for every child, as well as their immediate cause of death, the data shows that 37% of neonates who died were either HIV-exposed or HIV-infected, making up over one-third of all the newborn deaths.

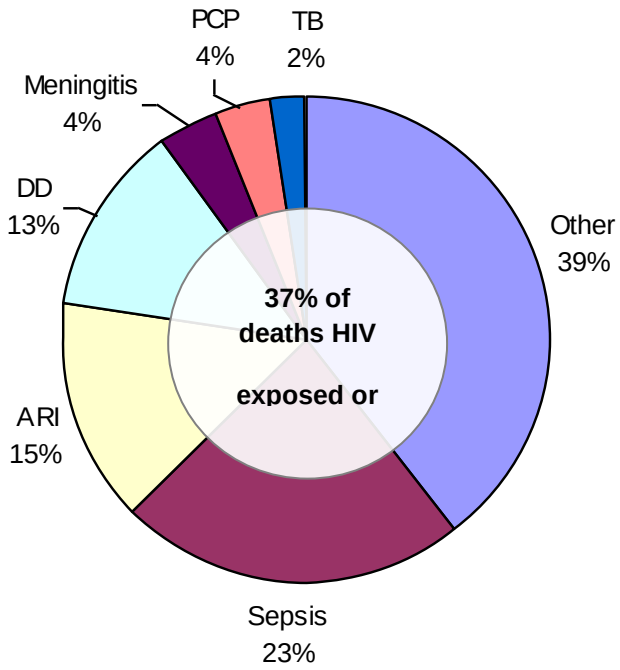


Chart 6.5 Cause of death in neonates 2005-2009

Quality of care

Child PIP data describing the quality of care received by neonates in children's wards in South Africa are presented, using length of stay and modifiable factor data.

Length of stay

Deaths occurring within 24 hours of admission to hospital may reflect a range of quality of care issues such as late presentation (caregiver, clinic or general practitioner, transport) and/or inadequate first-line assessment and management on admission to hospital.

Charts 6.6 and 6.7 show 'length of stay' data for neonates and all children respectively. Of significance is that 45% of all neonates dying in children's wards died within 24 hours of admission compared to 29% of all child deaths.

Proportionately, almost twice as many neonates than children present as dead on arrival (DOA).

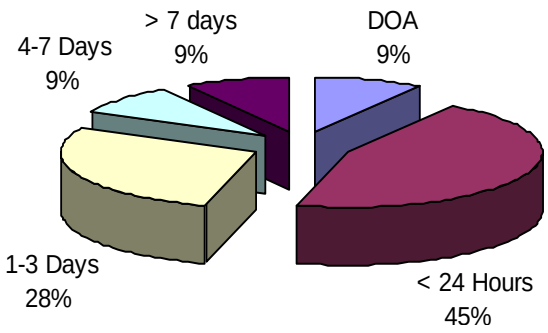


Chart 6.6 Length of stay: Neonates 2005-2009

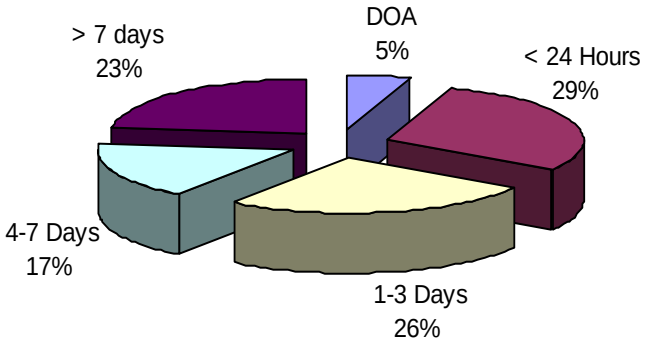


Chart 6.7 Length of stay: ALL ages 2005-2009

Modifiable factors

Modifiable factors (MFs) can be grouped by where they occurred in the health system, and by who was responsible. Chart 8 shows where they occurred, Chart 9 shows who was responsible and Table 3 lists the top MFs according to the place where they occurred.

Looking at where the MFs occurred, 59% were identified in hospitals, almost equally distributed between the emergency department and the wards, 9% in clinics, and 29% at home.

For neonates, 52% of all MFs were attributed to clinical personnel, 20% to administrators, and the remainder to caregivers (Chart 9).

Chart 6.8 Modifiable factors: Where? 2005-2009

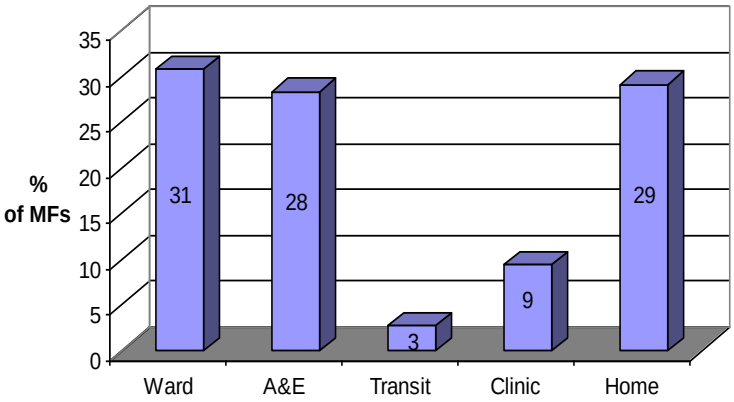


Chart 6.9 Modifiable factors: Who? 2005-2009

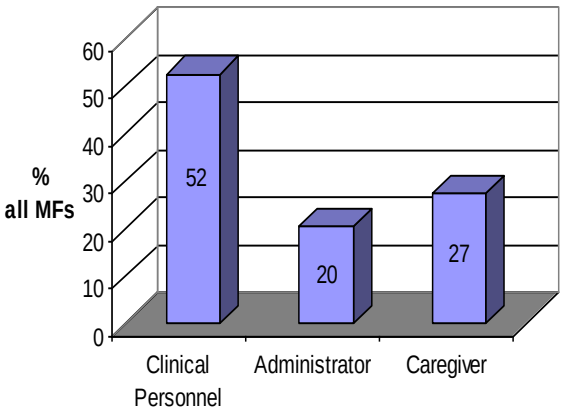


Table 6.3 Modifiable factors according to where they occurred 2005-2009 (n=2631)

Care in the Ward	No.	% of total
Monitoring (e.g. RR, SATS, blood glucose)	185	7.0
Buildings/Beds (e.g. lack high care/ICU facilities)	119	4.5
Clinical management (e.g. IV fluids incorrect)	76	2.9
Staff (e.g. lack of professional nurse and experienced doctors)	74	2.8
Assessment (e.g. new danger signs not identified)	35	1.3
Communication (e.g. between peripheral and referral hospital)	34	1.3
Care in Admission and Emergency	**No.**	**% of total**
Monitoring (e.g. O_2 saturation, blood glucose)	118	4.5
Assessment (e.g. RR not taken, not classified as critically ill)	114	4.3
Clinical management (e.g. appropriate antibiotics not prescribed)	81	3.1
Investigations (inadequate bloods, x-ray etc)	74	2.8
Clinical methods (inadequate history taking in A&E)	67	2.5
Care in Clinics	**No.**	**% of total**
Assessment (e.g. IMCI not used, malnutrition not identified)	74	2.8
Clinical management (e.g. inadequate fluids in DD, delay in referring acute	45	1.7
Notes (e.g. on clinical care)	26	1.0
Treatment (e.g. IMCI not used)	19	0.7
Care at Home	**No.**	**% of total**
Care seeking and Compliance (e.g. delay, recognition of danger signs)	495	18.8
Home treatment (e.g. inappropriate remedies)	84	3.2
Growth & Development (e.g. inadequate nutrition)	58	2.2
Notes (e.g. home circumstances, health history)	47	1.8

Discussion

Having reviewed all the modifiable factors, health workers considered that only one quarter of the neonatal deaths occurring in children's wards were unavoidable leaving a very significant number of deaths, many due to infections, where a difference in overall care could have changed the outcome for the baby.

Large numbers of neonates (7% of all admissions) are still admitted to children's wards which are, by definition, not designed to adequately accommodate them, and their IHMR has increased over the 5 year period.

Within the health system, HIV care is seriously suboptimal and the Child PIP data graphically and tragically illuminate the HIV experience of infants not surviving beyond their first month of life. HIV is rampant, and the quality of care provided in this context needs drastic and urgent attention. Overall, basic, simple clinical care processes are often not followed in hospitals, and at clinic level IMCI approaches are not used.

Major resource allocation problems with regard to both neonatal high and intensive care facilities have been identified in this survey, as well as deficiencies in the allocation of skilled clinical personnel.

In the home and community, there is the ongoing serious problem of delay in seeking care, which has also been shown by the Perinatal Problem Identification Programme (PPIP) in the

Saving Babies reports and by the Confidential Enquiry into Maternal Deaths in the Saving Mothers reports, and by Child PIP for older children in the Saving Children reports. As far as we know no-one has yet tackled the reasons for this.

Recommendations

In general, neonates need warmth, air/oxygen, food, and infection prevention and control. These conditions can best be provided in facilities specifically designed, equipped and staffed according to the special needs of the neonatal population, as they are not found in general children's wards. All South African hospitals caring for neonates should, as a matter of priority, provide proper facilities for neonates, building them from scratch, or modifying current inadequate nurseries.

More specifically:

- Perinatal HIV care continues to need improvement notwithstanding the launch of the new national ART Guidelines
- Posts for regional neonatologists (supported by academic Departments of Neonatology), whose primary responsibility is the improvement of neonatal care throughout their geographic areas, must be created country-wide, and neonatologists should be actively head-hunted for these posts
- 'Resource-Allocation-to-Neonates' policies must be examined to ensure that resources are appropriately and equitably allocated to the neonatal population
- Neonatal guidelines using an IMCI approach (such as the Limpopo Newborn Care Charts on the Management of Sick and Small Newborns in Hospital) should be implemented immediately at clinics and hospitals

CHAPTER 7

STILLBIRTHS AND NEONATAL DEATHS IN PRIVATE HOSPITALS

Author: P. Cooper

INTRODUCTION

Life Healthcare, Netcare and Medi-Clinic groups are three large private sector hospital groups in South Africa.

Data on perinatal and neonatal morbidity and mortality were obtained from all three groups. One hospital group was able to supply one year's data, a second almost three year's data and the third supplied five years of data. However, not all of the data were in the same format and, as a result, some of the data needed to be extrapolated.

Not included in this report are deliveries from the relatively small number of independent private hospitals that are not part of one of these hospital groups. The number of deliveries in these hospitals is unknown.

The three large hospital groups provided data from a total of 117 hospitals with delivery numbers for the individual hospitals ranging between around 4000 and less than 50 per year. The total number of deliveries per year for each of the three hospital groups was similar.

Core data

Table 7.1 provides the core data for the three groups of private hospitals.

Table 7.1: Perinatal data from three private sector groups combined

Total annual deliveries	108 000
Stillbirth rate (range 6.9-8.6/1000 births)	7.5/1000 births
Neonatal mortality rate (range 3.5-4.4/1000 live births*)	4.0/1000live births
PNMR for weight category<1500g (data from one hospital group)	188/1000 live births
Caesarean Section rate (range 65-70%)	68%
HIV Positive**	8.6%

*One hospital group gave a figure of 2.8/1000 live births but this applied only to early neonatal deaths (up to 7 days of age).

** Only one of the hospital groups gave a figure for HIV and this was felt to be unreliable as these came from hospital records and the HIV status may be known to the doctor but not recorded in the hospital records.

Causes of Death

Only one hospital group supplied data on causes of stillbirths and this was on a small number (49). The results are shown in the table below.

A breakdown of neonatal deaths by cause and weight/gestation was difficult to establish from the available data. From this data it would seem that prematurity related deaths still contribute substantially to neonatal mortality with the greatest number of immaturity

related deaths occurring in those babies weighing <1000g. Birth asphyxia appears to be an uncommon cause of neonatal death probably making up less than 5% of all neonatal deaths.

Table 7.3 Cause of death of stillbirths in private hospitals

Cause of stillbirth: All births >500g		
Unexplained intrauterine death	26	53%
Abruptio placentae	7	14%
Pregnancy induced hypertension	6	12%
Congenital abnormalities	2	4%
Cord around neck	2	4%
Intrapartum asphyxia	1	2%
Other	5	10%
TOTAL	49	

Many of the private hospital groups submit data to the Vermont Oxford Network, an international network of over 800 neonatal units around the world and the network allows hospitals to benchmark themselves in relation to other units internationally. One of the hospital groups supplied data from the Network that they had submitted for very low birth weight babies (<1500g at birth). The overall mortality for their units for babies <1500g at birth was 188/1000 and this compared favourably with the overall database of the Network. Their results also compared favourably with the Network with respect to nosocomial infection rates, incidence of necrotizing enterocolitis and retinopathy of prematurity.

Comments

Deliveries in the private sector make up about 10% of all births in the country with stillbirth, perinatal and neonatal mortality rates comparable to those of the developed countries of the world. When calculating overall national mortality rates, it is important that these rates be included. While the mortality rates are pleasing to note, the high caesarean section rate is cause for concern.

CHAPTER 8

NATIONAL SURVEY ON EQUIPMENT FOR NEONATAL CARE

Author: F. Nkwanyana, S. Velaphi

Background

A survey was carried out in 2010 to assess the availability of equipment in the neonatal units of South African hospitals providing a neonatal service. The main aim was to assess whether health facilities hospitals have adequate equipment to care for neonates, including thoseof low birth weight.

Six provinces submitted their data in time for analysis. These were Free State, Gauteng, KwaZulu-Natal, Limpopo, Mpumalanga and North West.

Table 8.1 shows the numbers of facilities that participated in the survey by province.

Table 8.1: Number of district and regional hospitals that were surveyed

Province	Number (%) of District Hospitals Surveyed	Total District hospitals	Number (%) of Regional Hospitals Surveyed	Total Regional Hospitals	D&R Hospitals Surveyed (%)
Free State	8 (32%)	25	2 (40%)	5	33%
Gauteng	6 (86%)	7	5 (42%)	12	58%
KwaZulu-Natal	29 (81%)	36	11 (84%)	13	82%
Limpopo	26 (68%)	38	2 (40%)	5	65%
Mpumalanga	16 (94%)	17	3 (100%)	3	95%
North West	9 (41%)	22	2 (50%)	4	42%
Total	94 (65%)	145	25 (64%)	39	65%

A total of 94 district and 39 regional hospitals responded. Participation in the survey by Mpumalanga and KwaZulu-Natal provinces was good and thus the results for these provinces give a fair reflection of the situation in the provinces.

Equipment Statistics

During data collection, the participants indicated if the equipment in the list was in an intensive care unit, high care unit or nursery. In this report, the data presented are for the whole neonatal unit as a whole, and not specific to the wards.

Tables 8.2 and 8.3 present the number of hospitals that reported without essential equipment items.

Table 8.2 Number of hospitals without incubators, bassinettes, radiant warmers, resuscitation, and oxygen monitoring equipment

Equipment	Number of district hospitals without the specified equipment (n = 94)	Number of regional hospitals without the specified equipment (n = 25)
Beds		
Radiant warmers	64 (68%)	7 (28%)
Closed incubators	11 (12%)	0
Washable Bassinettes	31 (33%)	8 (32%)
Transport Incubators	52 (55%)	18 (72%)
Resuscitation Equipment		
Resuscitation bags (Neonatal)	63 (67%)	6 (24%)
Neopuff	83 (88%)	15 (60%)
Laryngoscopes	67 (71%)	3 (12%)
Oxygen, Medical Air and Suction		
Oxygen source: fixed points	19 (20%)	0
Oxygen source: Cylinders	16 (17%)	2 (8%)
Medical air source	50 (53%)	4 (16%)
Suction: wall suction	20 (21%)	0
Suction: portable	29 (31%)	3 (12%)
Administration and Monitoring Oxygen		
Flow meters for oxygen	71 (75%)	4 (16%)
Oxygen blenders	75 (80%)	12 (48%)
Pulse oximeters	24 (26%)	1 (4%)

Table 8.3 Number of hospitals without vital sign monitors, ventilators & infusion sets.

	Number of district hospitals without the specified equipment (n = 94)	Number of regional hospitals without the specified equipment (n = 25)
Monitoring Vital Signs		
Cardiorespiratory monitor	82 (87%)	8 (32%)
Apnoea monitors	74 (79%)	9 (36%)
BP machine/ Dinamaps	75 (80%)	16 (64%)
Glucose monitors	19 (20%)	1 (4%)
Ventilators and Humidifiers		
Ventilator (conventional)	Not applicable*	10 (40%)
nCPAP/ SiPaP machine	Not applicable	7 (28%)
Heated humidifiers	Not applicable	10 (40%)
Trans-illumination light	Not applicable	21 (84%)
Administration of Fluid		
Infusion pumps	35 (37%)	1 (4%)
Syringe pumps	66 (70%)	5 (20%)
Management of Jaundice		
Phototherapy units	19 (20%)	0
Transcutaneous bilirubinometer	77 (82%)	16 (64%)

*Not applicable: hospital is not expected to have or keep the type of equipment

A third of district and regional hospitals did not have bassinettes. Two thirds of district hospitals did not have critical equipment required for the resuscitation of neonates. Forty-eight percent of regional and 80% of district hospitals did not have oxygen blenders rendering control of concentration of administered oxygen impossible, and a quarter of district hospitals did not have pulse oximeters. One third of regional hospitals did not have

equipment to monitor vital signs. More than a quarter of regional hospitals did not have equipment for respiratory support.

Discussion and conclusion

The data show that most district hospitals do not have adequate equipment to resuscitate newborns. The high number of deaths due to hypoxia in the district hospitals could partly be due to lack of or inadequate equipment needed for neonatal resuscitation.

Sick neonates require close monitoring using essential vital sign monitors. The absence of these from many neonatal units may contribute to avoidable deaths of newborn babies, and is a cause for major concern.

Many units do not have the equipment for delivering and monitoring appropriate neonatal oxygen therapy. This places neonates at risk of avoidable death, brain injury and retinopathy of prematurity (ROP).

Many regional hospitals do not have adequate radiant warmers, nor ventilators that are required to support infants with respiratory problems. This might partly explain why district hospitals have high mortality rates as regional hospitals are not able to accept patients from district hospitals who need respiratory support.

CHAPTER 9

SUMMARY OF FINDINGS

District Health Information System

- Information on stillbirths and neonatal deaths is collected in all public healthcare facilities that conduct births through DHIS
- The information on late neonatal deaths from DHIS is incomplete
- DHIS does not provide data according to birth weight categories in 500 gram ranges, namely 500-1000 grams, 1000-1499g, 1500-1999g, 2000-2499g and ≥2500 grams
- There are differences in numbers of births and deaths acquired from provincial DHIS compared to those acquired from the national DHIS
- The incomplete data and differences between provincial and national DHIS data is of major concern as it suggests inadequate verification processes of data as the data is passed on from facilities to provinces and from provinces to national DHIS
- The data on births and deaths according to DHIS are as follows
- The number of births occurring in the government healthcare facilities in the country has increased by 15% from 2004 to 2009, and that as from 2008 there are more than 1 million births per year in these facilities.
- From 2005 to 2009 more than 22 000 babies per year died before they were born (stillborns). This gives a stillbirth rate ranging between 24.7/ 1000 births in 2004 to 21.7 per 1000 births in 2009, showing a reduction of only 10% over a six year period.
- From 2004 to 2009 in addition to the 22 000 babies mentioned above, more than 8000 babies who were born alive but died within the first week of life. This gives an early neonatal mortality rate of 10.2/ 1000 live births in 2004 decreasing to 8.3/ 1000 live births in 2009, a reduction of 18.6% over a six year period
- The changes in stillbirth rates and early neonatal mortality rates should be considered as estimates onlybecause of concerns regarding the quality of data from DHIS.
- The committee is unable to give estimates of neonatal mortality rates as it includes both early and late neonatal mortality rates and the data from DHIS on late neonatal deaths were incomplete

Statistics South Africa/ Department of Home Affairs

- All deaths and stillbirths must be registered with the department of Home Affairs

- The doctor certifying the death must record the cause of death in the death notification form (the death notification form is under revision and will to include improved information on perinatal deaths)

- Once the Department of Home Affairs has processed the form, it is given to Statistics South Africa for data capture

- Deaths from rural areas are not always registered. However, in recent years, there have been efforts to improve the registration of deaths with some degree of success, making it difficult to assess the increasing trend in the number of registered deaths.

- Aside from under-registration of deaths, there is also a degree of mis-classification of causes. For example, there is evidence that across all ages, HIV is systematically not recorded on DNFs.

- A further problem associated with the analysis of cause of death statistics has been the systematic miscoding of causes of deaths (P codes) for infants rather that babies < 7 days old for the period 1997-2005.

- Until such time as there is complete coverage of death registration as well as multi-levelled systems to ensure good quality cause of death certification, we need to accept inevitable uncertainty around the statistics from vital registration.

- However, it is important to endeavour to engage with the data alongside other sources of information and interpret it carefully.

- The number of registered births in1997 were recorded to be 1, 154, 226 compared to 1, 080, 559 in 2008. One needs to note that there is a delay in registering births in the country; therefore births for 2008 are less complete than those for 1997.

- Though most of the stillbirths and neonatal deaths occurred in the healthcare facilities (79%), 8-10 % occurred at home and 11-13% the place of death was unknown

- The registered numbers of stillbirths and deaths are adjusted for completeness factor based on previous Community Survey and ASSA 2003 model

- The adjusted number of stillbirths per year have increased over this period from about 13 163 in 1997 to 16 677 stillbirths in 2008. This give a stillbirth rate increasing from 11.4/ 1000 births in 1997 to 15.9/ 1000 births in 2008, with wide variations in between these time periods

- The adjusted number of early neonatal deaths increased from about 15 073 in 1997 to 20 317 in 2008. The early neonatal (<7days) mortality rates decreased from 13.1/ 1000 live births in 1997 to 10.1/ 1000 live births in 2008.

- The adjusted number of all neonatal deaths increased from 10 914 in 1997 to 15 043 in 2008. Based on these figures the neonatal mortality rate decreased from 17.6/ 1000 live births in 1997 to 13.9/ 1000 in 2008

- There appears to have been little change in the neonatal mortality rates since 2000
- The leading causes of death are short gestation and low birth weight (prematurity), and birth asphyxia
- Mortality from the causes listed above is stable over the period, with the exception of birth asphyxia which increases after 2005
- Vital statistics show increasing numbers of stillbirths and neonatal deaths for the period 1997-2008. It is possible that much of the increase was due to improved registration and that the neonatal mortality rate may have declined slightly during this period. It is estimated that in 2007, 90% of infant deaths were registered.
- These findings suggest that if these levels of registration can be maintained, the vital registration system is poised to be able to serve a useful health information role.
- The provincial trends to date are difficult to interpret and may reflect provincial differences in reporting as well as differences in the underlying trend in mortality and stillbirth rates.
- It is hoped that as each province begins to monitor these trends more carefully, the quality of the data will be improved.

South African Demographic Health Survey

The first South African Demographic Survey was conducted in 1998 by the National Department of Health with the Provincial Departments of Health, the Medical Research Council, and The Free State University. At that time, it was agreed that the survey had to be conducted every five years to enable the Department of Health to monitor changes in health services. The 2003 Survey was conducted by Department of Social Development, Statistics South Africa, the University of the Witwatersrand Reproductive Health Unit, the Medical Research Council, and the University of Stellenbosch.

Neonatal mortality rates were determined from each of the surveys. For the 1998 survey, the rate for the preceding 10 years was 23.7 (males) and 14.6 (females) per 1000 deliveries. In the 2003 survey the neonatal mortality rate (males and females) was 15 per 1000 deliveries.

There were major concerns about quality of data collected for both surveys, therefore neonatal mortality rates based on these survey may not be true reflection of the country's mortality rates

There are no records that 2008 survey was conducted

Perinatal Problem Identification Program

The Perinatal Problem Identification Programme (PPIP) has been used as a facility-based national data for monitoring the quality of care and perinatal mortality. It has been used in the country for more than 10 years. Data are collected from government healthcare

facilities that are using PPIP including all types of hospitals and community health centres where deliveries are conducted.

Data collection has been done on a voluntary basis. The sites were not chosen, but staff working in the facilities decided that they wanted to monitor their own perinatal mortality data and also submitted their data to the national PPIP data base. The participating facilities from which data has been submitted have changed over time: some facilities have dropped out, while others have joined.

The PPIP data is analysed and published in the Saving Babies Report bi-annually

- The 2008-2009 PPIP data represents 52% of all government healthcare facilities that conduct births
- Majority of births (59%) occur in Community Health Centers and District hospitals
- According to PPIP, the low birth weight rate is ±16%
- The majority of both stillbirths and neonatal deaths (higher perinatal mortality rate) occur in district hospitals
- The overall early neonatal mortality rate for all infants with a birth weight of ≥500g is 12/1000 live births.
- The overall early neonatal mortality rate for all infants with a birth weight of ≥1000g is 8.5/1000 live births.
- The overall perinatal mortality rate (PNMR) for birth weight ≥500g is 38/1000 births
- The overall PNMR rate for birth weight ≥1000g is 28/1000 births
- The PNMR was the highest in pregnant women less than 18 years of age (64.5/ 1000 births) followed women more than 34 years of age (49.4/ 1000 births) when compared to 32.0/ 1000 births among women between the ages 20 and 34 years. Avoiding pregnancy at the extremes of reproductive age could be an important factor in reducing the PNMR in the country.
- PPIP mortality rates (stillbirth rate and neonatal mortality rate) have not changed over the last 10 years
- The common primary obstetric causes associated with perinatal deaths were unexplained intrauterine deaths (22%), spontaneous preterm labour (21%), intrapartum hypoxia and trauma (16%), maternal hypertension (15%) and antepartum haemorrhage (11%).
- In over two thirds of early neonatal deaths the causes of deaths were prematurity and labour related, thefinal diagnosis reported as immaturity-related (45%), intrapartum asphyxia-related (28%), infections (10%) and congenital abnormalities (8%).

- Amongst babies weighing ≥2500 grams about half (48.9%) die due to intrapartum hypoxia
- District and provincial hospitals recorded that 1 in 5 deaths were probably avoidable.
- The PPIP users felt that 46% of deaths due to labour-related complications were probably avoided had the healthcare provider acted appropriately
- Avoidable factors related to administrators were highest in the provincial tertiary hospitals and were mostly due to lack of appropriate facilities, staff and transport
- The early neonatal mortality rate calculated from DHIS is similar to that recorded from PPIP for the babies weighing >1000 grams. Since DHIS has not recorded the weight categories, it is not clear if their mortality rate included or excluded babies weighing <1000 grams.

Child-Healthcare Problem Identification Program (Child PIP)

Child PIP uses the hospital-based mortality review process to assess quality of care children receive in the South African health system.

- One fifth of South African hospitals are using Child PIP, with about 40% of all regional hospitals and half of all provincial tertiary hospitals using the Child PIP mortality review process.
- Neonates account for 7% of admissions in neonatal wards
- About 10% of neonatal deaths recorded in children's ward arrive in hospital dead, and another 45% die within 24 hours of admission suggesting either late recognition of signs of illness, inadequate transport or inadequate care in the facilities.
- About half (48%) of neonates who die in children's wards weigh below the normal weight for age, and yet only 8% were classified as being born preterm or low birth weight. This suggests a problem of early malnutrition.
- More than three quarters of these neonatal deaths were recorded as having no underlying problem.
- Among the 63% with known type of feeding, 28% were exclusively breastfed, 26% were exclusively formula fed and 9% were given mixed feeding
- About half of the neonates who die in the children's wards have an unknown maternal HIV status
- Only one third of neonates who were born to mothers who were HIV positive were receiving anti-retrovirals for PMTCT
- The majority of deaths in neonates who died in children's wards were caused by infections. Of the infections, septicaemia was the most common cause, followed by

pneumonia, acute diarrhoeal disease, meningitis, PCP, and surprisingly perhaps in this age group, TB was the sixth most common cause of death.

Private Sector

Life Healthcare, Netcare and Medi-Clinic groups are three large private sector hospital groups in South Africa. These three large hospital groups provided data from a total of 117 hospitals with delivery numbers for the individual hospitals ranging between around 4000 and less than 50 deliveries per year. Data on perinatal and neonatal morbidity and mortality were obtained from all three groups. One hospital group was able to supply one year's data, a second almost three year's data and the third supplied five years of data. However, not all of the data were in the same format and, as a result, some of the data needed to be extrapolated.

Not included in this report are deliveries from the relatively small number of independent private hospitals that are not part of one of these hospital groups. The number of deliveries in these hospitals is unknown.

- Deliveries in the private sector make up about 10% of all births in the country.
- The stillbirth rate of 7.5/ 1000 deliveries, and neonatal mortality rate of 4.0/ 1000 live births are comparable to those reported from developed countries of the world.
- If these deaths are registered with Department of Home Affairs, these numbers will be included in the country mortality rates from Stats SA.
- While the mortality rates are pleasing to note, the high caesarean section rate is cause for concern and it is not clear as to what were the indications of the caesarean section.

National Survey on Equipment for Neonatal Care

- A third of district and regional hospitals did not have bassinettes.
- Two thirds of district hospitals did not have critical equipment required for the resuscitation of neonates.
- Forty-eight percent of regional and 80% of district hospitals did not have oxygen blenders making it impossible to control the concentration of oxygen administered
- A quarter of district hospitals did not have pulse oximeters.
- One third of regional hospitals did not have equipment to monitor vital signs.
- More than a quarter of regional hospitals did not have equipment for respiratory support.
- The data show that most district hospitals do not have adequate equipment to resuscitate newborns. The high number of deaths due to hypoxia in the district hospitals could partly be due to lack of or inadequate equipment needed for neonatal resuscitation.

- Sick neonates require close monitoring using essential vital sign monitors. The absence of these from many neonatal units may contribute to avoidable deaths of newborn babies, and is a cause for major concern.
- Many units do not have the equipment for delivering and monitoring appropriate neonatal oxygen therapy. This places neonates at risk of avoidable death, brain injury and retinopathy of prematurity (ROP).
- Many regional hospitals do not have adequate radiant warmers and ventilators that are required to support infants with respiratory problems. This might partly explain why district hospitals have high mortality rates as regional hospitals are not able to accept patients from district hospitals who need respiratory support.

CHAPTER 10

RECOMMENDATIONS

Introduction

This section deals with the recommendations derived from the analysis of the data from different Chapters presented in this report but mainly from the chapters that have reported on issues related to quality of care provided in our hospitals. While the recommendations focus on the issues related to quality of care, the committee would like to highlight the importance of improving the quality of data that is being collected by different bodies in the country.

The recommendations have focussed on areas that were identified to play a contributory role to the perinatal and neonatal deaths in the country. These areas were related to accessibility to appropriate healthcare (support to district hospitals and referral system); quality of care provided (appropriate training and skilling of all healthcare workers); availability of resources (hospital beds and theatres, human resources and equipment/ consumables); and auditing and monitoring (conducting mortality reviews). In addition to the recommendations, the committee has put specific interventions that should be implemented in all healthcare facilities. The committee feels that the implementation of theserecommendations and specific interventions should have a major impact in reducing perinatal and neonatal deaths if implemented effectively and countrywide.

A. IMPROVING ACCESS TO APPROPRIATE HEALTHCARE

Recommendation 1

Regional clinicians should be appointed to establish, run and monitor and evaluate outreach programmes for maternal and neonatal health

- Outreach posts must be dedicated posts and have specific job descriptions. There must be posts for both doctors and nurses.
- Each province must have at least two clinicians (a doctor and an advanced midwife) who conduct and co-ordinate the outreach program in both maternal and neonatal care.
- Depending on the population size of the province there might be a need for more than two outreach clinicians. Large provinces might be divided into regions (having a number of districts combined), with two outreach clinicians responsible for each.
- Ideally there should be 1 paediatrician going with a neonatal nurse, and 1 obstetrician going with a midwife in each province or region. If this is not possible, there should be 1 family physician who will cover both maternal and neonatal care and an advanced midwife who will cover both midwifery and neonatal care.

Recommendation 2

Improve transport system for patients and establish referral routes

- Women in labour and sick neonates must be treated as emergency patients
- The response time from receiving the call to arrival of an ambulance should be less than 60 minutes
- Referral routes must be established and adhered to
- Referral systems must be set up in such a way that patients who need to be referred to regional or tertiary hospitals do not have problems of access.
- Referral systems must ensure that midwifery obstetric units and clinics are well supported by the hospitals and that the district hospitals are well supported by regional and tertiary hospitals.

Recommendation 3

The government should ensure that constant health messages are conveyed to all and understood by all

- Community
- Patient/client
- Health Care Provider

B. IMPROVING QUALITY OF CARE

Recommendation 4

Improve the Training of Health Care Professionals

- Undergraduate
  - Maternal and Neonatal Guidelines must be part of and emphasized in the curricula in medical schools and nursing colleges
  - Training must put more emphasis on clinical skills therefore more time must be spent in the wards than classrooms
  - Teaching in medical schools and nursing colleges must include training in medical, obstetric and neonatal emergency care including resuscitation
- Medical doctors during their internship training must spend at least a month in the neonatal units during their rotation in the departments of paediatrics
- The Health Professionals Councils of South Africa (HPCSA) should consider including a requirement for certification of competency in emergency obstetrics and neonatal care before providing registration to practice as a doctor

- After the usual four year nursing training, nurses should spend at least one year in a maternity unit (obstetrics and neonatology)
- Government should train and employ Community Healthcare Workers (CHW) to assist with postnatal care of mothers and babies
- In-service Training.
  - Any in-service training that is given must be such that it trains people in both theoretical knowledge and on practical skills on management of obstetric conditions identified as major contributors to perinatal deaths and to focus on skills identified as lacking by the PPIP.
  - Both doctors and nurses working in clinics and hospital wards that care for pregnant women and neonates should go through in-service training on appropriate management of women in labour and immediate care of both sick and well newborn infants.
  - The training must include management of medical and obstetric emergencies, neonatal resuscitation and obstetric anaesthesia.
  - This training must be structured and be easily accessible to all health workers. The equipment needed for training on practical skills such asmannequins and teaching videos must be made available.
  - The provinces must ensure that all health professionals (nurses and doctors)who need to go for training are supported to attend the training
  - The training package that includes training in anaesthesia, neonatal resuscitation, and management of medical and obstetric emergencies should be encouraged as it covers both the mother and the newborn. Currently this package is provided by the course called Essential Steps in Medical and Obstetric Emergencies (ESMOE). Provincial Departments of Health should request that ESMOE become the standard of care for maternal and newborn services throughout the country.
  - Midwives/Nurses and doctors should be trained or given an update on programmes that are implemented in the country and have been shown to improve the quality of care and reduce mortality for example Perinatal Education Programme (PEP) course.

Recommendation 5

National maternal and neonatal guidelines should be followed in all healthcare facilities

- All national guidelines on management of neonatal and maternal conditions must be available in all healthcare facilities
- Management of patients should be according to national guidelines
  - Maternal guidelines

- Neonatal guidelines

Recommendation 6

Improve provision and delivery of postnatal care

- Healthcare workers must ensure that mothers and neonates are examined within 6 hours post-delivery, and are seen again within 6 days of life, at 6 weeks, and at 6 months
- Where possible the healthcare facilities should consider keeping all women and babies in the facility for 24 hours unless they can be seen the next day by a health care provider
- Government should train and employ Community Healthcare Workers (CHW) to assist with postnatal care of mothers and babies
- Community health care workers should be informed of the discharge of a mother so they can be seen within 3 days of discharge at their homes
- Communication between site of delivery and clinic to be improved so that relevant information is transferred between health institutions through appropriate use of Road to Health Card
- A patient carried card should be used as the communication method

Recommendation 7

Normalisation of HIV infection as any chronic disease

- All health care providers must provide HIV counselling and testing. Certification for counselling and testing must be abolished and restrictions on who does the counselling and testing must be removed. HIV counselling and testing should be governed by the same principles and follow the same procedures as all other medical conditions
- All HIV infected women must get antiretroviral drugs either for PMTCT or for HAART. HAART must be started within 2 weeks of HIV diagnosis in appropriate cases

C. ENSURE THAT ADEQUATE RESOURCES ARE AVAILABLE

Recommendation 8

Provide adequate nursing and medical staff, adequate equipment for the health needs of both mothers and babies, especially the equipment required for emergency and critical care.

- *Staffing*
  - Norms specified (Appendix 3) must be followed in labour ward, maternity units and neonatal care.
  - Staff must be used in the most efficient way.

- Working environment and salaries must be improved/ adjusted so that the public healthcare facilities are able to attract and retain staff
- Consideration should be given to task shifting, for example employing Clinical Associates to assist with performance of caesarean sections.
- There should be an increase in the number of nurses and doctors trained in the country.

- *Equipment*
  - All clinics and hospitals should have basic equipment required during
    - Antenatal care
    - Intrapartum care
    - Resuscitation for both babies and mothers
    - Postnatal care of mothers
    - Postnatal care for sick babies and low birth weight babies (Appendix 4).

Recommendation 9

Provide adequate number of hospital beds for the health needs of mother and babies at all levels of health care, including critical care beds.

- Increase the number of neonatal beds to accommodate the number of sick neonates. The following norms should be provided:
  - Level 1 beds: 3-4 per 1000 live births
  - Level 2 beds: 2-3 per 1000 live births
  - Level 3 beds: 1 per 1000 live births
- Increase number of beds to accommodate mothers for at least 24 hours post delivery

D. AUDITING AND MONITORING

Recommendation 10

Improving data collection and review

- All provinces must ensure that all healthcare facilities collect data using PPIP in addition to the data collected by DHIS.
- Each province must have a PPIP co-coordinator for collection and collation of data from facilities. If there is/are outreach/ regional clinician/s the function of the PPIP co-coordinator could be done by this person or one of them.
- A national standardized register in labour wards and neonatal wards/ nurseries should be used by all provinces.

- The ProPeMMCo's should be strengthened and supported in all provinces to review data gathered by all available databases in the province and give a feedback to the MNCWH on the performance of the province.
    - For this to happen these committees need to be supported by the Provincial Department of Health.
    - This support includes ensuring that all representatives of provincial DHIS, MNCWH co-coordinators, provincial PPIP co-coordinator, provincial Child PIP, provincial PNMMC facilitator and representative from Home Affairs attend the committee meetings.
    - The Provincial Department must provide for their travelling and accommodation expenses during these meetings.
    - The Provincial Department must provide secretarial support to the committee. The committee is expected to meet four times a year.

CHAPTER 11

SPECIFIC OBSTETRIC AND NEONATAL INTERVENTIONS TO REDUCE PERINATAL AND NEONATAL DEATHS

Authors: J. Hofmeyr, M. Adhikari

Introduction

Each year about 22 000 babies die in South Africa. The purpose of this chapter is to highlight and list a core set of obstetric and neonatal interventions for different causes of perinatal and neonatal deaths. We have focussed on interventions which are feasible and, based on the findings of this committee documented in previous chapters (especially chapters 4 and 5). These interventions will have the greatest impact in reducing perinatal and neonatal deaths if they are implemented at a wider scale in the country.

A. OBSTETRIC INTERVENTIONS

1. Reducing unexplained intrauterine deaths

- Early start of antenatal care
- Educate women on recognizing and reporting decrease in foetal movements
- Educate communities on bad foetal outcomes related to smoking and alcohol
- Train health workers training antenatal foetal assessment
- Foetal assessment algorithms: movements, CTG, delivery
- Symphysis-fundus measurement chart
- Implement on-site syphilis testing
- Provision of patient-held antenatal record to all health practitioners and requirement that essential information recorded whenever a pregnant woman is seen
- Train healthcare workers on Basic Antenatal Care (BANC)
- Implement baseline early pregnancy ultrasound scans by midwives (dating, encourage attendance)
- Algorithms for early delivery for previous unexplained intrauterine death, post-dates, poor growth, hypertension, diabetes, APH, reduced foetal movements

2. Reducing deaths related to spontaneous preterm birth

- Enquire about history of previous pregnancies in order to identify women with previous mid-trimester pregnancy losses, who might benefit from use of cervical cerclage

- Diagnosis and treatment of infections, e.g. UTI, HIV
- Maternal steroids (plus tocolysis) to prevent respiratory distress syndrome in the newborn.

3. Reducing deaths due to intrapartum asphyxia

- Correct use of the partogram
- Health worker training on intrapartum foetal assessment
- Safe labour induction (e.g. extra-amniotic saline)
- Provide adequate facilities to perform caesarean sections (C/S), including mid-level workers to do C/S where doctors not available
- Use of beta-stimulants (tocolysis) for foetal distress while women are being transported during labour and women awaiting caesarean section

4. Reducing deaths related to maternal hypertensive disorders

- Availability of sphygmomanometers
- BANC training
- Protocols for management of hypertensive disorders (e.g. on posters)

5. Reducing deaths related to antepartum haemorrhage (APH)

- Educate pregnant women in getting medical assistance early when having vaginal bleeding
- Protocols for management of APH to be strictly followed

6. Interventions to reduce unplanned pregnancies

- Strengthening of family planning services
- Re-introduction of choice of family planning methods including the intrauterine device (IUD)

B. NEONATAL INTERVENTIONS

The Saving Babies Report 2006 and Chapter 4 in this report have identified two areas that require immediate consideration if neonatal mortality is to be reduced[1]. These were

- term deaths due to asphyxia and
- deaths of low birth weight infants above 1000 grams

The Saving Babies report clearly indicated the modifiable factors for neonatal care that contributed to these babies dying. These factors identified were

- Inadequate management plan
- Inadequate resuscitation of the newborn
- Inadequate monitoring
- Poor resuscitation and monitoring equipment
- Poor clinic or level one facility management
- Nosocomial infection
- Baby sent home prematurely

It is urgent that these problems should be addressed if the millennium development goals are to be achieved[2]. All hospitals conducting births should provide basic neonatal care according to the National Neonatal Guidelines.

1. Reducing neonatal deaths due to asphyxia:

- Prompt recognition of neonates requiring resuscitation
- Starting resuscitation immediately,
- Close monitoring and on-going care of neonates who required resuscitation,

2. Reducing deaths in low birth weight infants:

- Appropriate management of infants with respiratory distress – provide oxygen therapy, appropriate fluid therapy, antibiotics, non-invasive ventilation that is providing continuous positive airway pressure (CPAP), and surfactant replacement therapy[3, 4].
- Temperature control: keep babies warm, avoid hypothermia
- Blood sugar control: regular monitoring of glucose levels
- Fluid balance: provide appropriate amounts of fluids; enthral, parenteral or both
- Provide oxygen therapy as needed with appropriate oxygen delivery system and monitoring of oxygen levels in babies (saturations)
- Enforce strict aseptic techniques at all times: Washing of hands and/ or use of alcohol-based hand-rubs
- Recognition of jaundice and the management thereof

- Treating neonatal infections- early recognition, and appropriate antibiotic use[5]
- Promote breastfeeding or feeding breast milk for all babies
- Feeding choices – Encourage breast feeding including in those who are born to HIV positive mothers[6],
- Provide flash heating of breast milk from HIV positive mothers
- Provide formula feeding only if appropriate criteria are present
- Provide Kangaroo mother care (KMC)
- Follow-up care of low birth weight infants
- monitor growth and development of the high risk infant with appropriate interventions as indicated,
- maternal education with respect to the Road to Health Card, oral rehydration, signs of illness, feeding and weaning
- maternal education and literacy, contraception, condom usage and birth spacing,

3. Reducing HIV related deaths through prevention of mother to child transmission of HIV infection

Chapter 5 has highlighted that a number of babies die without their mothers or their HIV status being known. This results in the following missed opportunities

1. For mothers and their babies getting anti-retroviral drugs for prevention of mother to child transmission of HIV
2. for those babies who are exposed to get prophylaxis against PCP
3. for those babies who might be infected with HIV getting HAART.

To prevent deaths related to HIV infection the following must be done:

- All pregnant women must be tested for HIV using the approach of provider-initiated HIV testing (opt-out)
- All health professionals to provide HIV counselling, in addition to caregivers trained in HIV counselling.
- Implement PMTCT regimen in HIV positive pregnant women
- Fast-track HAART for eligible pregnant women
- All babies who are HIV exposed must receive ART for prophylaxis
- Maternal history for tuberculosis and other co-infections must be obtained
- HIV PCR testing should be performed on all babies by six weeks of age

- Mothers must be advised on condom usage, child spacing and contraception, noting that contraception in the HIV positive women require specific considerations.

4. Reducing all neonatal deaths through improving clinical and procedural skills of healthcare workers

- Healthcare workers require training in clinical, procedural skills
- Clinical skills should include resuscitation and examination of newborn, monitoring and management of ill babies
- Procedural skills include blood sugar monitoring and heel prick, blood letting, insertion of peripheral intravenous and umbilical catheters, and insertion of oro-/naso-gastric tube.

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CHAPTER 12

IMPLEMENTATION STRATEGIES

Author: RC Pattinson

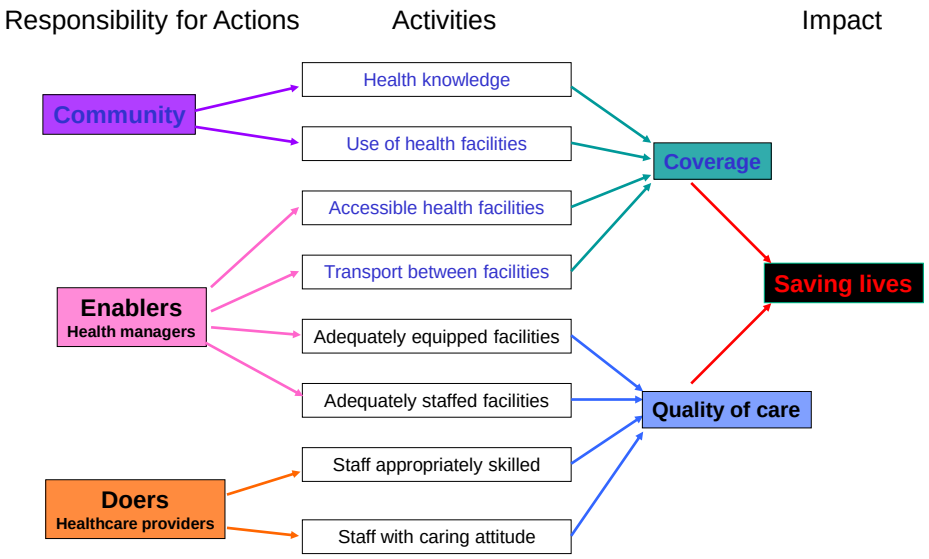
(Adapted from Pattinson RC, Kerber KJ, Buchmann EJ, Friberg I, Belizan M, Lansky S, Wisemann E, Rudan I, Walker N, Lawn JE.Stillbirths: how can health systems deliver for mothers and babies? Lancet 2011)

Introduction

A health system is not a machine or factory where the input at one end results in a predictable output at the other end. In contrast it is a complex adaptive system. Introducing an input might have considerably different output from that predicted and the output might vary between sites and from time to time. Implementing new interventions or improving on the quality of current practices is a complex exercise. Many actors are involved in any intervention and at many levels of management.

To save lives, any intervention must be proven to be effective, and then the intervention must be implemented so that there is close to 100% coverage of the population and the intervention must be practiced with good knowledge and skill, i.e. with good quality of care. The previous chapter deals with the interventions that have been proven to be effective; this chapter will deal with what it takes to implement an effective intervention successfully.

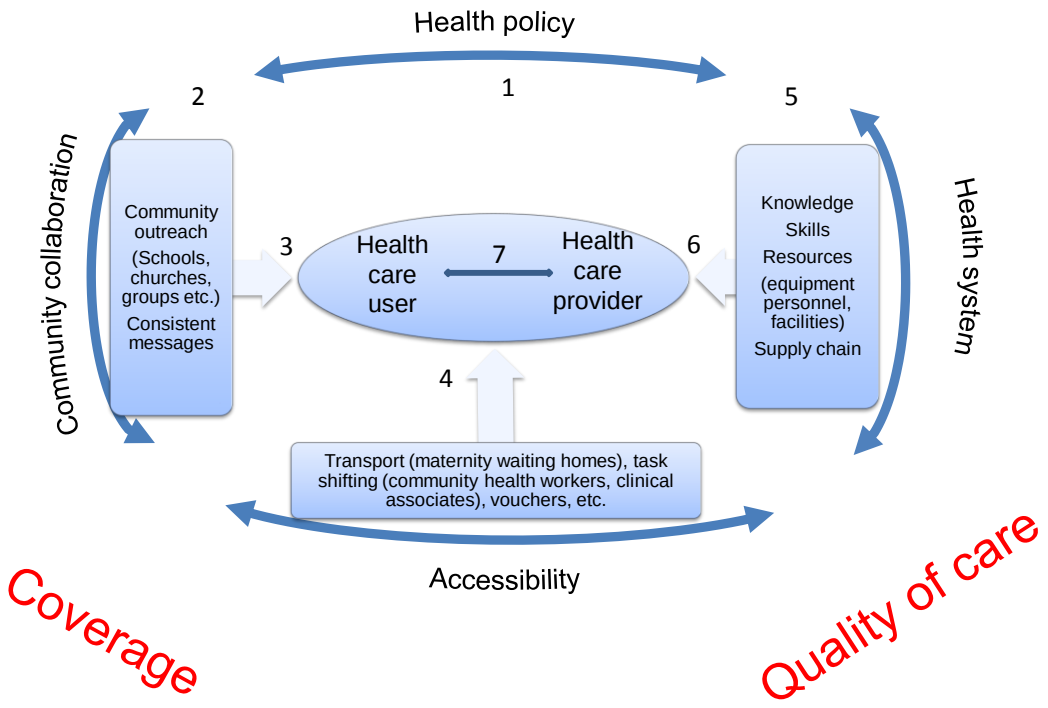
Figure 12.1. A schema of the necessary requirements to save lives



Coverage will only reach all the intended targets if the appropriate people have the required knowledge when to use the intervention or facility; the intervention or facility must be accessible to the intended population, thus it must be available at the appropriate site and transport must be available to get to the site. The scale up of antiretroviral therapy is such an example. The patients must know they are HIV infected, must know they need therapy and where to get the therapy (responsibilities of the patient and community) and the therapy must be accessible to the patient. The high prevalence of the disease requires that treatment be devolved down to primary health care clinics as the number of patients requiring treatment is too large for hospitals to cope with. The health care managers must provide the clinics accessible to the patients, with the appropriate level of staff with the appropriate knowledge and skills to be able to manage the patient and also ensure the clinic had the appropriate tests and drugs available.

However, ensuring good coverage alone will not improve health care; it also requires that the intervention be implemented with the appropriate level of knowledge and skill and with the appropriate sensitivity.

Figure 12.2 Interfaces that must be addressed to implement an intervention effectively



Legend: Interfaces

1. **Policy makers – heads of health**: decide on and convey policy
2. **Heads of health – health care managers**: convey policy, decide strategy and messages for the community
3. **Health promotion managers –community**: provide constant messages
4. **Health care managers – community**: ensure community has access to health care to enable policy to be implemented
5. **Heads of health – health care managers**: convey policy, and decide allocation of resources necessary to implement policy
6. **Health care managers – health care providers**: convey policy, provide resources and knowledge and skills necessary to implement policy
7. **Health care providers – health care user (patient)**: provider implements knowledge and skills and uses resources to provide care to the patient within policy guidelines including adequate information to enable discussion and appropriate decisions by the patient.

To ensure appropriate coverage and quality of an intervention various role players need to be involved. These role players need to interact with each other to ensure that the desired activity is carried out. Figure 12.2 introduce seven interfaces that need to be addressed to ensure an intervention is properly implemented.

The legend gives the activities involved at each interface. Interface 7 - health care provider-health care-user (patient) - is the most important interface as it is at this level that the patient behaviour is influenced and the management accepted and followed fully, partially

or not at all. For this interface to be effective, the health care user needs some basic knowledge so the health care provider can giving the information will be understood. This involves interfaces 2 and 3. On the other side, the health care provider must have the appropriate knowledge, skills and resources to be able to help the health care user. This involves interfaces 5 and 6. However, none of this will be effective unless the health care user and provider actually meet, and thus the health care facilities must be accessible and this involves interface 4.

Table 1 gives the effective methods on how to influence these interfaces successfully. Each interface must be addressed in the local context. Fortunately, South Africa has a policy in place that is very supportive, so interface 1 is already in place. Our task is to assess where each of our areas are in respect of the other 6 interfaces and implement the changes that are necessary at the respective interfaces where necessary.

Table 1: Health system agent's interfaces and strategies likely to be successful

Interfaces:	**Examples of strategies likely to be successful**
1: Policy makers-heads of health: decide on and convey policy	Variable: Burden of disease, cost effectiveness, availability of effective solutions, political decisions, actors power, etc.
2: Heads of health-health promotion managers: convey policy, decide strategy and messages for the community	Diagonal approach (creating demand providing resources to fulfilled it)
3: Health promotion managers-community: provide constant messages	Patient mediated interventions; Mass media; Participatory interventions
4: Health care managers-community: ensure community has access to health care to enable policy to be implemented	Community mobilization; Financing strategies; Communication and transport system; Antenatal risk screening by community health workers; Maternity waiting homes
5: Heads of health-health care managers: convey policy, and decide allocation of resources necessary to implement policy	Formal integration of services; Improving office systems; Structural interventions; Provider incentives
6: Health care managers-health care providers: convey policy, provide resources and knowledge and skills necessary to implement policy	Distribution of educational material; Audit and feedback; Reminders; Educational meetings; Local consensus processes; Problem based learning in continuing medical education; Educational outreach visits; Local opinion leader; Multifaceted interventions; Tailored interventions to overcome identified barriers to change.
7: Health care providers-patients: provider implements knowledge and skills and uses of resources to provide care to the patient within policy guidelines including adequate information to enable discussion and appropriate decisions by the patient.	Motivational interviews; Patient education programmes such as Informed patient choice, Shared decision making between patients and providers, Patient decision aids

(Adapted from Web table 3 in Pattinson R, Kerber K, Buchmann E, Friberg IK, Belizan M, Lansky S, Weissman E, Mathai M, Rudan I, Walker N, Lawn JE, for The Lancet's Stillbirths Series steering team. Stillbirths: how can health systems deliver for mothers and babies? *The Lancet* 2011; 377. Published online April 14, 2011 DOI:10.1016/S0140-6736(10)62306-9

PART 2: PROVINCIAL REPORTS

(Published as submitted)

CHAPTER 13

EASTERN CAPE

Author: M. Nazo

Introduction

Population

According to the 2007 Community Survey conducted by Statistics South Africa the total population of the Eastern Cape stood at 6,527.745 ,but has dropped by 1.4% to 6,436,736 according to latest estimate of July 2010.

Number of healthcare facilities conducting births

- PHC/ CHC/ Clinics/ MOUs (all together) - 36
- District hospitals - 63
- Regional hospitals - 2
- Tertiary hospitals - 3

Number of health workers

- Nurses - 8535 filled posts and 16845 vacant posts with a vacancy rate of 66.4%
- Doctors
    - 1284 MO filled posts and 1156 vacant posts with a vacancy rate of 47.4%,
    - 197 Specialists filled posts and 313vacant posts with a vacancy rate of 61.4%

PROVINCIAL COMMITTEE (ProPeMMCo)

The ProPeMMCo was established on the 18 -2 -2009 and is constituted as shown below:

NaPeMMCo Member (Provincial Facilitator) – Prof Z M Nazo
CHIP Provincial Facilitator – Dr K Harper
MCWH Provincial coordinator - Ms N Didiza
NaPeMMCo – Ms T Mtyenge
DHIS Representative – Ms N Sithole

Three provincial meetings took place for 2009 on the following dates - 18th February, 2nd of June and 14th of September. The first meeting of the provincial structure was held in the office of the director of Saving Babies on 18-2- 2009.

SOURCES OF DATA AVAILABLE FOR THE PROVINCE

The established perinatal data collecting tools are the DHIS and PPIP systems. There are 50 hospital PPIP sites in the EC and 36 of these sites are collecting and submitting their perinatal data to the provincial office. According to Saving Babies V: 2003-2005 report there were 33 PPIP sites reporting data electronically to the provincial office.

Presently the EC relies on the DHIS for the perinatal data. The DHIS produces detailed data, but certain elements are not correctly grouped, e.g. birth weight, BBAs and stillbirths. The reporting period is Jan 2007 to December 2009

QUALITY OF DATA

Perinatal data for Eastern Cape are derived predominantly from the DHIS and is readily available. The problem with the data is that its arrangement is confusing at times. The reliability of the data can be said to be fair. The PPIP data are not available for 2007. The data for 2008 are available but the data are not according to the standard PPIP format. The PPIP data provide for the analysis of primary obstetric causes of perinatal deaths, neonatal causes of death and avoidable factors. This information is lacking in EC 2008 PPIP data. The distribution of stilbirths and neonatal deaths according to birth weight category is not available both for PPIP and DHIS statistics. The DHIS does attempt to group the neonatal deaths according to birth weight but lacks continuity and consistency.

DATA ANALYSIS

DHIS

Table 13.1 Perinatal data for the years 2007, 2008 and 2009 from DHIS

	2007	2008	2009
Births	120375	119261	124978
Live Births	117126	117751	122509
Stillbirths	3109	2687	2773
Early Neonatal Deaths	1433	1697	1436
Late Neonatal Deaths	135	245	372
Stillbirth rate	25.8	22.5	22.2
Early Neonatal Mortality Rate	12.2	14.4	11.7
Perinatal Mortality Rate	37.7	36.7	33.7
Neonatal Mortality Rate	13.4	16.5	14.8
Low Birth Weight Rate	12.3	12.6	12.5
Perinatal Care Index	3.1	2.9	2.7

Table 13.2 Dataset from DHIS over the three year period (2007-2009) for the EC Province.

	Years	Alfred Nzo DM	Ama-thole DM	C. Hani DM	Cacadu DM	Nelson Mandela M	O R Tambo D M	Ukhahla-mba DM	TOTAL
Total Births	2007	6902	28222	13972	7480	22994	34444	6361	120375
	2008	8296	27466	13723	6592	23906	33166	6112	119261
	2009	7314	33271	13707	6077	23444	35322	5843	124978
Still Births	2007	126	683	276	187	514	1164	159	3109
	2008	181	634	267	132	453	911	109	2578
	2009	137	662	272	113	543	921	125	2772
Live Births	2007	6776	27539	13703	7291	22343	33273	6201	117126
	2008	8115	27282	13287	6577	23551	33086	5853	117751
	2009	7177	32609	13435	5964	22901	34401	5718	122509
Still Birth Rate	2007	18.3	24.2	19.8	25	22.4	33.4	25	25.8
	2008	21.8	23	19.4	20	18.9	27.5	17.8	21.6
	2009	18.7	19.9	19.8	18.6	23.2	26.1	21.4	22.2
Early Neonatal Deaths	2007	1.7	11.5	5,2	4.7	12.7	20	7.9	12.2
	2008	13.9	19.2	3.8	7.6	16.7	15.9	6.3	14.4
	2009	9.9	8.7	9.4	8.4	5.5	16.7	7.5	11.7
Perinatal Mortality Rates	2007	20	35.4	24.8	30	34.7	53.2	32.7	37.7
	2008	35.9	42.1	23	27.6	35.4	43.3	23.9	36.8
	2009	28.4	28.4	29	26.8	35.4	42.3	28.8	33.7
LBWR	2007	6.2	12.5	11.8	18.2	14	11.4	11.6	12.3
	2008	8.2	13.2	11.8	18.4	14.9	10.8	10.3	12.6
	2009	9	11.1	12.4	17.4	13.9	12.8	13	12.5
PCI	2007	3.2	2.8	2.1	2.5	1.9	4.7	2.8	2.1
	2008	4.4	3.2	1.9	1.5	2.4	4.0	2.3	2.8
	2009	3.1	2.6	2.3	1.5	2.5	3.3	2.2	2.6

Table 13.3 Other indicators

	2007	2008	2009
Percentage of Women attending ANC	3.2	2.9	2.7
Percentage of Women attending ANC <20 wks	29	30.9	32.4
Percentage of teenage pregnancies	10.7	10.5	10.2
Proportion of pregnant women tested for HIV	118.9	92.8	103.6
Proportion of tested women who are HIV positive	19.8	19.3	20.7
Percentage of pregnant women positive for syphilis	7.3	4.9	4.2
Caesarean Section Rates	16	13	19.3

Table13. 4 Delivery load by level of care according to DHIS

	2007	**2008**	**2009**
PHC / CHC	8011	11946	12942
DH	59941	58997	56677
RH	9927	8736	9256
TH	36281	32890	31312
TOTAL	114160	112569	110187

Perinatal Problem Identification Program (PPIP)

Table 13.5 PPIP perinatal care indices from 2007-2009

Indicator	2007	2008	2009
PNMR >1000g	25.2	27.1	22.4
ENNDR >1000g	10.3	12.3	7.7
SBR	17.9	17.9	15.2
SB:NND ratio	1.8:1	1.4:1	1.9:1
LBW	24.2	20.5	12.8
PCI	1	1.3	1.8

Table 13.6 PPIP Perinatal Mortality Rates (PNMR)/1000 births according to birth weight categories from 2007-2009

Weight Category	2007	2008	2009
500-999	699.1	737.3	789.5
1000-1499	228.1	182.9	408.3
1500-1999	90.2	74.8	146.6
2000-2499	21.1	37.4	60
2500g+	13.9	17.4	10.1
Total births	17308	20006	14444

Table 13.7 PPIP Neonatal Death Rates (NNDR)/1000 births according to birth weight categories from 2007-2009

Weight Category	2007	2008	2009
500-999	413.8	491.2	583.3
1000-1499	108.3	86.8	187
1500-1999	36.5	23.9	57.9
2000-2499	8.7	12.1	12.8
2500g+	5.8	10.7	4.2

Table 13.8 Final neonatal causes of death

Final cause of death	2007	2008	2009	Total (%)	
Hypoxia	33 (36.7%)	63 (43.8%)	35 (35%)	131	39.3%
Congenital abnormalities	8(8.9%)	12(8.3%)	13 (13%)	33	9.9%
Immaturity	33 (36.7%)	31 (21.5%)	22 (22%)	88	25.8%
Infections	6 (6.7%)	8(5.6%)	11 (11%)	25	7.5%
Unknown	5 (5.6%)	13 (9%)	2(2%)	20	6.0%
Other	2 (2.2%)	13 (%)	14(14%)	29	8.7%
Birth trauma	2 (2.2%)	4(2.8%)	3 (3%)	9	2.7%

DATA INTERPRETATION

Date Interpretation will mainly involve the DHIS as this is the only fairly reliable source for the province. Reference will be made about the conclusions of Health Systems Trust analysis of some PPIP sites in the Eastern Cape.

Table 13.1 reveals that births decreased by 0.9% in 2008 and increased by 4.6% in 2009.

Stillbirths decreased by 13.5% in 2008 to 10.8 % in 2009. The neonatal deaths numbers show an increasing trend from 2007. Because of a decrease in stillbirths the Perinatal Mortality Rate indicate a decline. The PCI is high reflecting a poor perinatal care.

The DHIS data comparison of district municipalities depicts the Oliver Tambo municipality as one with worse perinatal outcomes followed by Amathole and Nelson Mandela Metropolitan municipalities. Table 3 indicates low ANC attendance, high proportion of women testing for HIV and low HIV positive rate. The reliability of these figures cannot be ascertained and is questionable.

District Hospitals followed by Tertiary Hospitals bore the largest delivery load as depicted in Table 13.4.

The HST analysis of the EC PPIP sites concluded that the analysis of the causes of death using mortality rates is unreliable and comparison of mortality rates is also difficult due to the widely varying mortality rates per birth weight category. This might indicate that not all deaths were being collected

Table 13.8 lists the final causes of neonatal deaths and reveals that 67% of neonatal deaths are related to labour because hypoxia accounted for 39 %, immaturity for 26%, and trauma for 2%.

On the basis of these findings the E C should be targeted for aggressive perinatal care improvement with special attention to O.R. Tambo municipality and the priority areas ar:

- Intrapartum asphyxia and birth trauma
- Spontaneous preterm birth
- Hypertension and antepartum haemorrhage
- Infection
- Neonatal management of an asphyxiated and preterm neonates

PROBLEMS ENCOUNTERED THAT LIMITED THE FUNCTION OF THE COMMITTEE

The directors of the MCWH and the Saving Baby were informed telephonically and by means of e-mail of the establishment of the ProPeMMCo and the Terms of Reference including the names of the members of NaPeMMCo from the Eastern Cape. Despite this the committee members did not get good response from the MCWH regarding getting access to the data.

The possible reasons for this lack of support include the following.

1. The provincial office of the MCWH has been in disarray from the time this committee was established making it difficult for the committee to get support and assistance from MCWH.

2. There has been a change in leadership in the provincial MCWH which resulted in lack of commitment, accountability, collaboration and communication leading to organizational disorder.

3. The personnel with the knowledge and skills of the PPIP system left to form the Saving Babies directorate working independently of the MCWH. One member of this group has been involved with PPIP for a long time.

4. The present provincial co-ordinator for PPIP has been employed since September 2008 and is unable to use the PPIP Software and that is why the PPIP data for EC is either unavailable or incomplete. Apparently the EC has also not submitted data to MRC Unit during this period.

RESPONSES TO THE ABOVE PROBLEMS

A letter was written on the 19th of January 2010 to the EC DDG for Health informing her of the difficulties and the problems encountered with MCWH and asking for her intervention. Her response was prompt and she promised to assist us getting access to the data but by the 15th of February 2010 we still had not received the data. I then had no alternative but to phone and e-mail the MEC for Health on the 16th February, informing him that the EC MCWH is failing the mandate of the Minister of Health and that the EC will have a poor report with no precise and concise data interpretation that could inform implementation of recommendations.

A member of the Ministerial NaPeMMCo and who was also a member of provincial sub-committee has resigned to due frustration with MCWH for not being supportive and leading to tensions.

THE CHALLENGES FACING THE PROVINCIAL COMMITTEE

- MCWH inefficient operations regarding PPIP data collection and interpretation
- Synchronisation and correlation of the DHIS to suit the needs of NaPeMMCo
- MCWH taking charge of activities of ProPeMMCo
- Convincing the Home Affairs and Stats SA to be part of the provincial committee
- Regular quarterly meetings of the provincial committee.

PROGRESS ON THE 10 RECOMMEDATIONS

1. Normalization of HIV as a chronic disease
    - PMTCT is disorganised and dysfunctional in most parts of the EC
2. Clinical Skills Improvement
    - Paediatric outreach – Neonatal resuscitation
    - Obstetric outreach -- BANC,ESMOE
3. Training /education
    - The Community Obstetrician in Amathole conducts training sections for Medical Officers and Nurses.
4. Implementation of National guidelines
5. Postnatal Care
    - PCR for babies and their follow up- unknown
    - Follow up of HIV infected mothers- unknown
6. Regional Clinician Appointment
    - There has been appointment of Community Obstetrician in Amathole region.
    - Other regions still have no improvement
7. Auditing,monitoring and evaluation

- DHIS data is readily available
- Collection, submission and interpretation of the PPIP data are a challenge in the EC.
- Child PIP is on good footing, workshops were held and institutions are expected to using it.

8. Constant Health Messages
9. Staffing,equipment and facilities
10. Transport and Referral Routes
    - Ambulances are very few, in bad condition, ill – equipped and sometimes ordinary vehicles are hired to transport patients
    - In some regions referral routes are ill defined and confusing

CHAPTER 14

FREE STATE

Author: W. J. Steinberg

INTRODUCTION

The Free State province is situated in the centre of the country. It has a population of about 2.8 million. The population is thinly spread across the province with a low population density and some higher density in towns. Health facilities are spaced far apart with long distances between them.

The province has 5 Health Districts: Fezile Dabi; Lejweleputswa; Motheo; Thabo Mofutsanyane and Xhariep.

The province has 24 district hospitals, (Fezile Dabi 4; Lejweleputswa 5 ; Motheo 4; Thabo Mofutsanyane 8 and Xhariep 3) and 5 regional hospitals (Fezile Dabi 1; Lejweleputswa 1 ; Motheo 1; Thabo Mofutsanyane 2 and Xhariep 0) and one tertiary hospital and a psychiatric complex both situated in Motheo. One health district, Thabo Mofutsanyane has two regional hospitals and Xhariep in the south uses the regional hospital of Motheo as a referral facility, due to the relatively small population in that region.

PROVINCIAL COMMITTES (ProPeMMCo)

The Free State has taken the decision to have all the three committees, the saving mothers, the saving babies and saving children combined in one committee.

The committee has not been function well over the period of review, due to the fact many personnel of the mother and child directorate have resigned during or before the period and it has taken on average 2 years for them to be replaced. Only at the end of the reporting period were people finally appointed in the required positions. The committee started meeting again in 2010.

SOURCES OF DATA AVAILABLE FOR THE PROVINCE

The DHIS data is kept and collated at the provincial headquarters. From there it is sent on to National Health on a quarterly basis. The figures used in this report were obtained from the relevant section in Bophelo House (Free State Provincial Health Department), Bloemfontein as being the official figures for the Free State. The ability to analyze and interpret the data locally is underused. The question of reliability of the data often arises and would depend on the "maintenance work" performed on it. Each hospital has trained data capturers; however there is much migration of people in these positions. The system is frequently "updated", which further affects its reliability. During the period under review 2007 – 2009 certain datasets where changed in mid 2007 and an updated version was introduced in mid 2009. (From version1.3 to 1.4)

The data-set is however pretty consistent. Maternal and child health in the province show certain trends of note. There are two sets of data that are combined to give the entire provincial picture. The first set is the so called PHC data-set that is concerned with the clinics of the province and the second is the hospital data set, collected for all facilities and this can be broken down into district hospital, regional hospitals and tertiary hospital. In this analysis the data sets are combined and presented as district and provincial figures.

QUALITY OF DATA

The data has been accepted as is. No direct quality checks on this data set were made. Previous comparisons of the dataset with the institution's books have revealed acceptable correlation. However that check has not been performed for some time and there have been some changes to the dataset. The data from the PPIP sites is derived from the more enthusiastic sites. It cannot be regarded as fully representative. It is derived from a sample of primary and secondary hospital institutions in the Free State. Although the represent ability of the PPIP sites is not ensured, the data from the individual sites can be regarded as accurate. The interpretation however needs to be circumspect.

DATA ANALYSIS

DHIS Dataset

Table 14.1. Free State Perinatal data for the years 2007, 2008 and 2009 from DHIS

	2007	2008	2009
Births	52646	53284	49080
Live Births (in facilities)	51889	53794	48080
Total Births (including BBA's)	58952	59931	55140
Stillbirths (including BBA's)	1872	1746	1653
Early Neonatal Deaths	562	550	560
Stillbirth rate	31.8 /1000	29.1/1000	30.0/1000
Early Neonatal Mortality Rate	10.8/1000	10.2/1000	11.6/1000
Perinatal Mortality Rate	38.1/1000	33.9/1000	35.7/1000

Table 14.2.Free State Dataset from DHIS over the three year period (2007-2009) for the Free State Province according to Districts.

	Years	Fezile Dabi	Lejweleputswa	Motheo	Thabo Mofutsanyane	Xhariep	TOTAL
Total Births (including BBA's)	2007	9699	13293	17719	16307	1934	58952
	2008	10573	13429	17412	16636	1881	59931
	2009	9537	12520	16594	14890	1599	55140
Still Births (including BBA's)	2007	308	429	591	497	47	1872
	2008	337	365	532	458	54	1746
	2009	300	400	437	472	44	1653
Live Births	2007	8620	11469	16017	14213	1570	51889
	2008	9509	11830	16081	14891	1483	53794
	2009	8342	10789	14922	12792	1226	48080
Still Birth Rate/1000	2007	31.8	32.3	33.4	30.5	24.3	31.8
	2008	31.9	27.2	30.6	27.5	28.7	29.1
	2009	31.5	31.9	26.3	31.7	27.5	30.0
Early Neonatal Deaths	2007	56	141	186	146	33	562
	2008	115	121	144	143	27	550
	2009	98	171	132	135	24	560
Perinatal Mortality Rates /1000 (includes BBA's)	2007	35.4	40.4	40.2	36.3	33.1	38.1
	2008	38.4	32.8	33.8	32.6	27.6	33.9
	2009	36.1	42.0	30.0	37.0	32.5	35.7

Table 14.3 Other indicators

	2007	2008	2009
Percentage of teenage pregnancies (PHC facilities)	13.6%	15.5%	15.1%
Percentage of teenage pregnancies (Hospitals)	22.0%	21.7%	22.7%
Caesarean Section Rates	15.4%	16.1%	16.9%

Table 14.4 Delivery load by level of care in the Free State 2007-2009

Total deliveries including BBA's	2007	2008	2009
PHC	19.1%	19.4%	19.5%
District hospitals	56.8%	56.9%	57.3%
Regional Hospitals	23.2%	22.9%	22.2%
Tertiary Hospitals	1%	0.8%	1%

PPIP Dataset

Table 14.5 Perinatal data for the years 2007, 2008 and 2009 from PPIP for the Free State

	2007	2008	2009
Births	11977	11884	10552
Live Births	11407	11396	10001
Stillbirths	570	488	551
Early Neonatal Deaths	254	204	211
Late Neonatal Deaths	51	37	56

Table 14.6 PPIP perinatal care indices from 2007-2009 for the Free State.

Indicator	2007	2008	2009
PNMR >500g	72.3	61.3	77.5
ENNDR >500g	21.5	21.1	21.1
PNMR >1000g	54.9	46.8	55.4
ENNDR >1000g	14.6	15.4	15.4
SBR	50.0	42.8	55.1
SB:NND ratio	1.9 : 1	2.0 : 1	2.1 : 1
LBW :rate	24.9	22.4	25.6
PCI	2.2	2.1	2.2

Table 14.7 PPIP Perinatal Mortality Rates (PNMR)/1000 births according to birth weight categories from 2007-2009 for the Free State facilities.

Weight Category	2007	2008	2009
500-999	675.6	760.3	833.3
1000-1499	351.3	404.8	398.0
1500-1999	174.7	166.4	189.8
2000-2499	69.8	68.3	69.7
2500g+	23.8	16.8	21.3
Total births	**72.3**	**61.3**	**77.5**

Table 14.8 PPIP Neonatal Death Rates (NNDR)/1000 births according to birth weight categories from 2007-2009 for the Free State facilities

Weight Category	2007	2008	2009
500-999	470.9	539.7	586.8
1000-1499	182.8	227.5	219.6
1500-1999	38.3	56.4	78.8
2000-2499	15.4	12.6	18.6
2500g+	8.2	4.6	6.2

Table 14.9 Primary obstetric causes of perinatal deaths from the Free State PPIP data.

Primary obstetric causes	2007	2008	2009	Total (%)	
Spontaneous preterm labour	185 (22.8%)	156 (23.0%)	192 (23.7%)	533	23.3%
Hypertensive disorders	166 (20.5%)	149 (22.0%)	166 (20.5%)	481	20.9%
Intrauterine death (unexplained)	158 (19.5%)	117 (17.3%)	152 (18.8%)	427	18.6%
Antepartum haemorrhage	86 (11.3%)	80 (11.8%)	95 (11.7%)	261	11.4%
Intrapartum hypoxia	92 (11.3%)	64 (9.4%)	66 (8.1%)	222	9.7%
Infections	32 (3.9%)	37 (5.5%)	20 (2.5%)	89	3.9%

Table 14.10 Final neonatal causes of death from the Free State PPIP data

Final cause of death	2007	2008	2009	Total (%)	
Immaturity	134 (48.4%)	133 (58.8%)	131 (49.6%)	398	51.9%
Hypoxia	71 (25.6%)	45 (19.9%)	52 (19.7%)	168	21.9%
Infections	35 (12.6%)	27 (11.9%)	50 (18.9%)	112	14.6%
Congenital abnormalities	25 (9.0%)	17 (7.5%)	17 (6.4%)	59	7.7%
Unknown	6 (2.2%)	1 (0.4%)	6 (2.3%)	13	1.7%
Other	4 (1.4%)	3 (1.3%)	8 (3.0%)	15	2.0%
Birth trauma	2 (0.7%)	0 (0.0%)	0 (0.0%)	2	0.3%

Table 14.11 Avoidable factors associated with perinatal deaths from the Free State PPIP data

Avoidable factors	2007	2008	2009	Total (%)	
Patient Associated	263 (33.4%)	222 (34.6%)	294 (41.6%)	779	36.5%
Medical Personnel associated	304 (38.6%)	225 (35.1%)	213 (30.2%)	742	34.8%
Administrative problems	187 (23.7%)	170 (26.5%)	176 (24.9%)	533	25.0%
Insufficient notes to comment	34 (4.3%)	24 (3.7%)	23 (3.3%)	81	3.8%

DATA INTERPRETATION

DHIS dataset

There has been a slight rise of the total deliveries per annum over the last years, however it can be noted that the figures for 2009 are slightly lower than the previous year, a little unexpected. This may well be related to amalgamation of the DHIS version 1.3 and version 1.4 into one set. The verification of that process has not yet been done formally.

The total number of deliveries counted for the province according to the DHIS compares favourably with figures obtained from other sources such as stats SA.[1]

Stats SA data for the year 2007 shows that there were 62 976 births registered with the Free State Home affairs office: 50692 of these births were for 2007 (12 280 were recorded in 2007, but were births of previous years). However in the same report it is estimated that there was 81% completeness of the 2007 data, i.e. it could be expect that the final births for 2007 would thus be about 62587 births for 2007 for the province. [1](If 50692 is 81%, then 62587 would be 100%) The public health facilities according to the DHIS recorded 58 952 births, that includes all the known births in the public sector. The difference of 3635 would easily fit the number of expected births in the private sector (as previously recorded). These

two data-sets would be in a similar "ballpark" and it could be concluded that the DHIS data set are relatively reliable. (Saving babies report for Free State sections)

Within the dataset there are however some functions which do not show satisfactory congruency. The analysis within birth weight categories does not tally well, but may be used at facility level to work out rates for specific weight categories. Also the number of maternal deaths in the FS DHIS is consistently lower than that counted by a separate method used for the confidential enquiry into maternal deaths.

It is not clear as to why this calculation for 2008 shows slightly more live births recorded than deliveries for the same period. This may be a function of some confusion at the collection points as to the difference of a delivery vs. live births vs. total births.

The total figures in 2009 are slightly less than those of previous years. This can in part be explained by the amalgamation of the data-sets (see above) rather than being a true reflection of a true decline, although the "rate of growth" of delivery numbers has certainly decreased over the years. (See previous saving baby reports for the FS) [2]

What should be noted in this context however is that although the number of total deliveries has come down in this data-set, the number of deaths has not, proportionally leading to some of the mortality rates to increase. Difference may not be due to the artefact/ counting in one of the data-sets.

Comparing the number of deliveries in the facilities with the number of known births, including BBA's, there is a significant difference (about 6000 per annum). This difference is consistent over the years and can only minimally be ascribed to multiple pregnancies.

For more than 10% of the provincial deliveries, the babies are born before arrival at the facility i.e. the mothers do not make it to the health facility on time for the delivery. It has previously been shown that this group of babies have a significantly higher mortality rate in the FS.

The perinatal mortality rate in the Free State seems to be coming down slowly if compared with previous reports. (Saving babies V) [2]. It must however be kept in mind that these figures only represent what is measured in the Health facilities and may not represent the entire (community) picture. Patients are being discharged from facilities rapidly, often before breastfeeding is established. This may have as consequence that babies die at home and therefore are not reflected on the institutional figures. In a report of the health systems trust a calculation of the perinatal mortality rate is made based on the number of deaths received from Stats SA, but using the DHIS data set as a denominator. In their calculation the PNMR for the FS in 2005 would be 67.4/1000. This shows that there are about 1/3 more perinatal deaths captured by stats SA compared to the DHIS figures. It is plausible that these deaths occur in the community after discharge from the health facility. This would implicate a poorly functioning post natal care service in the Free State. This phenomenon is not replicated in other provinces[3]

The difference between the stillbirth rate (SBR) and the perinatal mortality rate (PNMR) in these figures is not very large. Stillbirths make up the majority of the perinatal mortality.

This may well be a function of mothers not being able to access health facilities sufficiently early and/or not being aware that they need to go to the clinic. The net result is that babies die in uterus often before the mother reaches the facility and there is not much health workers can do to prevent the death at that stage. It needs to be established as to whether better access to the healthy facilities and more community awareness would reduce this high proportion of stillbirths.

A relatively high early neonatal mortality rate (ENMR) is noted for the Xhariep region. This is consistent over the years and reflects the fact that there are inadequate neonatal facilities in that region. The lower rates specifically in Motheo can be ascribed to the fact that the functional neonatal services.

PPIP and Child PIP data for the Free State facilities is not available for the period under discussion but has been reported on previously.

It is of interest to note that the load of delivery care is clearly left with the level one institution's in the Free State province.

PPIP Dataset

It has been mentioned that the represent ability of this dataset is not guaranteed. In the Free State province the PPIP data set covers about a fifth of the deliveries of the Free State. It is of note that at these sites the perinatal mortality rate is higher than calculated by the DHIS dataset. Compared to other facilities this rate seems high.

The PPIP data used from the FS PPIP sites is mainly used in order to fill in information about the "cause of death"(not part of the DHIS dataset) and does not attempt to replicate the DHIS. For the individual sites desirable congruency between the DHIS and PPIP datasets previously been achieved. Unfortunately the functionality of all the sites has not been maintained sufficiently over this period as the person driving the process has resigned and has not been replaced.

It comes up consistently in the PPIP data that the most common cause of a perinatal death is due to spontaneous preterm deliveries followed by hypertensive disorders and then unexplained intrauterine deaths.

In terms of measuring the causes of neonatal deaths, immaturity related causes are the commonest. Hypoxia and infections features high in second and third place.

Over the time period, it seems as if the patient associated avoidable causes have increased. There may be a certain degree of "patient blaming" in this measurement, however this also does indicate insufficient co-operation between the health facilities and the people they are to serve.

EXPERIENCES OR PROBLEMS ENCOUNTERED IN FORMATION OF FREE STATE ProPeMMCo

Much of the process of data gathering is spent on making sure all data is "in" and sending it on to National Health. The lack of using the data locally, understanding and working with it/using it for the management locally is noted.

The political will to address the problems that arise from dataset analysis, seems to be absent. There is little vision perceived for the solving of the relevant problems on the service delivery front. Irregular meetings, no clear vision, lack of accountability all contribute to the relative inertia experienced from the provincial health administration. The task and extent of influence that this committee can have in the Free State is doubtful. The Primary health care facilities are not being sufficiently supported as they should be.

WAY FORWARD/ SUGGESTIONS IN IMPROVING

- From DHIS point of view seems to be "running" along. Have not verified this data. Previously was more at ease with the correctness of data as many of the data sets were verified with the delivery books of the institutions.

- Establishing and maintaining provincial ProPeMMCo as pillars of data collection and monitoring

- Reducing mortality rates should remain an overall aim.

PROGRESS ON RECOMMENDATIONS MADE BY NaPeMMCo IN THE FIRST INTERIM REPORT

It is the view of the author that little tangible has been done to implement these recommendations in the Free State in the last three years.

The recommendations have been presented to the top management of the province, however little constructive response has been given.

1. Normalization of HIV as a chronic disease
    - There is, in part, acceptance of the new national guidelines, but the implementations are not fully supported on the ground.

2. Clinical skill improvement
    - Few training sessions have been arranged esp. ESMOE training as well as training in neonatal resuscitation esp. amongst midwives. It is doubtful as to how much tangible difference these training sessions have as their organisation seems to be erratic and the target groups poorly selected. There also tends to be a large chasm between the theory advocated and the practical situation in the maternity sections.
3. Training / education
    - There is ongoing updates and training via iCAM, but not driven with sufficient vision due to lack of co-ordinators in the provincial administration and "financial constraints".
4. Implementation (Availability in facility) of National guidelines
    - There has been an improvement on this score all be it slow. The reduction of "beds" in the regional facilities has hampered the referral of suggested cases, overloading facilities to a level of impracticality.
5. Postnatal Care
    - This is still not taken this seriously at the moment, as facilities are perceived to be overloaded and leadership does not see an importance priority in postnatal care. There also is "massive mobility" of women to facilities for delivery (about 1/3 of women deliver in an area far from their dwelling), so that the continuity of care is

not ensured. The onus is squarely on the patient to come back to the facility, there are little to no follow-up facilities for those that "fall through the cracks".

6. Regional clinician appointments
    - There has been very little progress in this respect. The concept of regional clinicians is not well understood by the administrators in this province. Appointments of clinicians in general for the institutions are lacking. In the last 2 years there has been a net outflow of clinicians out of the province, compared to the desirable net inflow.
    - The working conditions (read conditions not payment) for clinicians need to be drastically improved in order to achieve adequate service delivery.
7. Auditing, monitoring & evaluation
    - The sites that had PPIP and child PIP data available find it difficult to continue with this process due to insufficient support: administrative as well as political. [Mpumalanga province has clearly demonstrated the benefit of having continuous and dedicated people involved with the data collection of PPIP and Child PIP Programs.]
8. Constant health messages
    - Due to the political infighting, it has been difficult to decipher clear health messages. Rivalry of managers is having the effect of policy circulars being issued and shortly thereafter withdrawn or contradicted, leading to confusion and uncertainty as to which direction the province has chosen to lead. This creates a confusing and chaotic environment which does not enhance service delivery.
9. Staffing, equipment and facilities
    - The province has a mismatch between clinicians and administrators. The facilities that need to provide the services are not having their workforce replaced and those that remain behind are overburdened. No transparent guidelines or priority criteria are being used, and this makes appointment seem haphazard and a function of political point scoring, rather than service delivery orientated.
10. Transport and referral routes:
    - Referral routes are worked out. However facilities are not coping with the load and there is constant blaming on others as the team of administrators, clinicians and emergency service workers do not have shared priorities and goals.

References:

Statistics SA; Recorded live births 2007 Statistical release P0305

Saving Babies reports; Compiled by MRC unit for maternal and infant healthcare strategies.

HST report 2006 Chapter 15 Health and related indicators p266-7

CHAPTER 15

GAUTENG

Author: R. Mphahlele

Final Report of the National Perinatal Mortality Morbidity Committee on the Province of Gauteng [2007 -2009]

The map above illustrates the 6 Municipal districts in Gauteng province.

INTRODUCTION

Population

The province of Gauteng has a population of 11.19 million people[1]. This represents 22.4 % of the total population of South Africa. The province has three metropolitan municipalities: City of Johannesburg, Ekurhuleni and City of Tshwane as well as three local municipalities, Metsweding, Sedibeng and west Rand. This report discusses Perinatal Mortality data for the period 2007 – 2009 in Gauteng.

Number of healthcare facilities conducting births in the province

- 35 MOUs
- 8 District hospitals
- 11 Regional hospitals
- 4 Tertiary hospitals

Numbers of health care professionals

Table 15.1 Number of nurses in public sector Gauteng 2010

Enrolled nurses	4975
Nursing assistants	6877
Professional nurses	9393
TOTAL	21 245

Data: Health Systems Trust

Data extracted from the National Department of Health's PERSAL system and published by the Health Systems Trust shows the following:

Table 15.2 Numbers of doctors in Gauteng province for the year 2010

Medical practitioners in public sector	2480
Ratio (per 100 000 pop)	31.5
Medical specialists in public sector	1721
Ratio (per 100 000 pop)	21.1

PROVINCIAL COMMITTEES (ProPeMMCo)

At the time of the writing of this report Gauteng had just set up a provincial committee under the chairmanship of the Acting Director of Maternal Women's and Child Health to look into perinatal mortality and morbidity data. The committee consisted of representatives from DHIS in Gauteng, Department of Home Affairs, the acting provincial representative of the National Perinatal Mortality Morbidity Committee, a representative from CoMMic (Child Mortality Committee) and a representative from the MRC Unit of Maternal and Perinatal Health.

SOURCES OF DATA AVAILABLE FOR THE PROVINCE

Sources of data include Stats SA, Department of Home Affairs (for birth registration data) and DHIS. PPIP data for the province is not available as only 4 facilities in the province have submitted data for the time period under review.

QUALITY OF DATA

In order to make some assessment of the accuracy of the data, a simple set of calculations was done using the data elements provided.

Total births were calculated from the data set by adding Stillbirths and Live births and compared to the Total births recorded in the data set.

These calculations were made for each of the six districts of Gauteng as well as for the province as a whole.

A. Total Births

The expectation is that the calculated Total Births should be equal to or very similar to the Total Births as recorded in the data set, assuming that data collection is complete. The following table illustrates that there was reasonable agreement between these two values in the different districts.

Table 15.3 Total births

District	Total births calculated	Total births recorded	Percentage difference
City of Jhb 2007	55951	56068	0.1
City of Jhb 2008	65634	64689	1.5
City of Jhb 2009	63548	64399	1.3
Tshwane 2007	36683	36683	0.0
Tshwane 2008	43108	40009	7.0
Tshwane 2009	47248	45071	4.8
Ekurhuleni 2007	48220	48234	< 0.1
Ekurhuleni 2008	58375	58358	< 0.1
Ekurhuleni 2009	58077	56099	3.5
Sedibeng 2007	13165	13167	0.0
Sedibeng 2008	16820	15858	6.0
Sedibeng 2009	16638	14471	14.9
West Rand 2007	10217	10217	0.0
West Rand 2008	12736	12736	0.0
West Rand 2009	12578	12578	0.0
Gauteng 2007	164603	164 736	< 0.1
Gauteng 2008	197549	192443	2.5
Gauteng 2009	199143	192961	3.2

As can be seen, the largest variability occurred in the districts of Tshwane in 2008 and Sedibeng in 2008 as well as 2009. This calculation was not performed for the district of Metsweding as the figures in the data set provided for total births were less than the live births in 2008, and the rest of the figures were very small. The recorded and calculated births for the West Rand district were exactly the same.

It should also be noted that the data presented (as recorded in the DHIS) may not be completely accurate – for example, live births in the province for the years 2008 and 2009 are recorded as being greater than the number of total births (stillbirths plus live births combined). This is clearly not possible and may be due to recording or calculation errors in the data. However, the data can still be used to follow trends and give some indication of the health of newborns in the province, albeit limited.

DATA ANALYSIS

DHIS

Table 15.4 Perinatal data for the years 2007, 2008 and 2009 from DHIS

	2007	2008	2009
Births	164369	191730	192618
Live Births	160876	192280	193887
Stillbirths	3360	4394	4202
Early Neonatal Deaths	1260	1631	1774
Late Neonatal Deaths	185	128	199
Stillbirth rate	19.9	22.3	21.9
Early Neonatal Mortality Rate	7.8	8.5	9.1
Perinatal Mortality Rate	27.2	30.4	32.6
Neonatal Mortality Rate	8.8	9.1	9.9
Low Birth Weight Rate (%)	13.6	13.3	11.5
Perinatal Care Index*	2.0	2.2	2.8

* Perinatal care Index = Perinatal mortality rate/ low birth weight rate

Table 15.5 Comparing registered live births with Stats SA and recorded live births in DHIS for 2007 and 2008[Gauteng province]

Year	Stats SA	DHIS
2007	228 370	161 240
2008	242 375	193 149

It should be noted that DHIS data is facility –based therefore these figures represent those births which occurred only in facilities. Births which occurred in private facilities are also not captured in the DHIS. The total number of registered births in South Africa in 2007 was 1 199 712. Gauteng province registered 19% of these (228 370). In 2008, the province registered 242 375 births out of a total of 1 277 763 recorded live births in the country. It is not clear whether the difference in numbers between the two datasets can be accounted for by private facility deliveries and home births.

Table 15.6 Dataset from DHIS over the three year period (2007-2009) for Gauteng Province according to Districts.

	Years	Jo'burg	Tshwane	Ekurhuleni	Sedibeng	West Rand	Gauteng
Total Births	2007	56068	36683	48234	13167	10217	164369
	2008	64689	40089	58358	15858	12736	191730
	2009	64399	45071	56099	14471	12578	192618
Live Births	2007	54937	35844	47158	12861	10076	160876
	2008	64350	41897	57048	16443	12542	192280
	2009	62438	46095	56725	16235	12394	193887
Still Births	2007	1014	839	1062	304	141	3360
	2008	1284	1211	1327	377	194	4394
	2009	1110	1153	1352	403	184	4202
Early Neonatal Deaths	2007	413	230	451	90	76	1260
	2008	623	319	470	130	89	1631
	2009	693	374	455	139	113	1774
PNMR (per 1000 Total births)	2007	25	29	31	30	21	27.2
	2008	29	38	31	32	22	30.4
	2009	27.9	33.9	40.1	37.5	23.6	32.6
SBR(per 1000 total births)	2007	18	22.8	22	23.1	13.8	19.9
	2008	19.8	30.2	22.7	23.8	15.2	22.3
	2009	17.2	25.6	24.1	27.8	14.6	21.9
ENMR (per 1000 live births)	2007	7.5	6.4	9.6	7.0	7.5	7.8
	2008	9.7	7.6	8.2	7.9	7.1	8.4
	2009	11.1	8.1	8.0	8.6	9.1	9.1

Table15.7 Other indicators

	2007	2008	2009
Percentage of Women attending ANC	136.5	143.9	128.8
Percentage of Women attending ANC <20 wks	25.7	24.4	25.2
Percentage of teenage pregnancies	8.6	6.8	5.8
Proportion of pregnant women tested for HIV (%) #	68.4	76.9	100
Proportion of tested women who are HIV positive (%) $	27.5	26.5	26.2
Percentage of pregnant women positive for syphilis*	3.8	2.7	2.9
Caesarean Section Rates (%) ^	19.2	19.7	21.2

*National Antenatal Sentinel HIV and Syphilis Prevalence Survey in South Africa 2009
District Health Barometer (This indicator is defined as the proportion of clients coming for first ANC visit who are tested for HIV)
$ DHIS, National Department of Health
^ Health Systems Trust (extracted from DHIS)

It can be seen that figures for Antenatal Clinic attendance (in Table 4 above) are in excess of 100%. The denominator used for this calculation is the number of children under one year of age and if this is an underestimate, could explain the very high ANC attendance figures.

Also of note is the fact that data for two indicators for 2007 and 2008 could not be found in time for the writing and submission of this report.

Table 15.8 Delivery load by level of care according to DHIS

	2007/08	2008/09	2009/10
MOU's	42202	48641	46944
District hospital	32178	33205	34433
Regional hospitals	71109	75191	74812
Tertiary hospitals	45280	44456	42966
TOTAL	190769	201493	199155

PPIP (Perinatal Problem Identification Programme)

Due to the fact that only 4 facilities in the province had submitted PPIP data, no representative data for Gauteng is available for the period under review. This is unfortunate as no data for cause of death is thus available for analysis and consequently no analysis of avoidable factors can be done.

DATA INTERPRETATION

Overview

The province has seen a steady increase in the number of births over the three year period under review (Table 1). A noticeable increase occurred between 2007 and 2008. An increase in stillbirths and early neonatal deaths also occurred during this time. It is unclear what the cause of this may have been, however Gauteng is known to be the fastest growing province and these figures could be the result of an influx of people into the province.

The Neonatal Mortality Rate (NMR) in industrialized countries was just 3 per 1000 live births in 2004[2] compared to a rate of 40 per 1000 in Sub-Saharan Africa. South Africa's NMR is estimated at 17 per 1000 live-births for the year 2004.[2] NMR for PPIP sites for the year 2006/7 was calculated to be 10 per 1000 live-births which is considerably lower than the estimates by Unicef[2] but is very similar to the NMR for Gauteng as a province.

The NMR largely reflects early neonatal mortality (death within the first 7 days of life) as very few late neonatal deaths are recorded in delivery facilities and deaths occurring after 8 days of life are a smaller proportion of neonatal deaths overall. We are unable to estimate how many deaths occurring in the community (outside facilities) are not reported.

More developed nations have a Perinatal Mortality Rate (PNMR) in the region of 10 per 1000 total births (Still births and early Neonatal deaths combined) [3]. The province's PNMR of 33 per 1000 is very high and is largely due to a high Still Birth Rate (SBR) of 22 per 1000 which is 3-4 times greater than the SBR in the more developed nations of the world[3]. The province's PNMR has increased over the three years from 2007 to 2009.

The Perinatal Care Index (an index of quality of care) showed a sharp increase in 2009 to 2.8 but may be a reflection of the increase in the PNMR and a lower Low Birth Rate. It would be important to follow the trend over the coming years before making any conclusions to suggest that quality of care in the province is in fact deteriorating.

Detailed Analysis of Districts

The City of Johannesburg has the largest number of deliveries accounting for one third of the province's births in 2009 (Table 3). The district of Ekurhuleni follows closely with about 10 000 fewer births. West Rand has the least number of deliveries. It should be noted that no indicators have been calculated for the district of Metsweding, as the data available was incomplete.

The three districts with the highest PNMR are the City of Tshwane, Ekurhuleni and Sedibeng (all of which have a PNMR above the provincial average - Table 3). While Ekurhuleni and Tshwane are large municipalities, Sedibeng on the other hand is comparable to West Rand in terms of numbers of deliveries but has a much higher PNMR and almost double the SBR of that in the West Rand (Table 3).Of note, the Early Neonatal Mortality Rates (ENMR) of Sedibeng and the West Rand are very similar indicating that the High PNMR in Sedibeng is due largely to the high number of still births recorded in that district. The West Rand has the lowest PNMR and SBR of all the districts.

The ENMR is similar across the districts with the exception of the City of Johannesburg which has the highest ENMR (increasing to 11.9 per 1000 in 2009). Other districts have shown smaller increases over the three year period to within a range of 8 – 9 deaths per 1000. Ekurhuleni is the only district to have shown a decrease in ENMR over this triennium.

Maternal Health Indicators

With reference to maternal health indicators that can be related to perinatal outcomes, it is accepted anecdotally that in general most pregnant women attend Ante natal clinic at least once (Table 4).The calculated percentage reflects a figure of above 100% but this may be related to the denominator used to calculate this indicator being underestimated. Of interest, the attendance at ANC before 20 weeks is low (figures available only for 2009) at only 25%. This is a well known phenomenon and needs to be corrected.

The proportion of pregnant women tested for HIV has increased progressively over the last three years – it is unclear whether 100% were truly tested in 2009 (Table 4), however a great deal of effort has gone into the province's Prevention of Mother to Child Transmission programme particularly with the introduction of dual therapy in 2008 and the new WHO guidelines adopted nationally. The percentage of women testing HIV positive remained largely unchanged.

The Caesarean Section (C/S) rate for the province as reflected by data from Health Systems Trust (extracted from the DHIS) is around 20%, however this seems low when considering the C/S rate in Regional Hospitals was 24% and in the Tertiary hospitals was 38% for the year 2009/2010 as reported from Gauteng Department of Health.

EXPERIENCES OR PROBLEMS ENCOUNTERED IN FORMATION OF ProPeMMCo

Gauteng Province has only recently formed a provincial mortality morbidity committee and has had two meetings. This committee is still in its fledgling state and more representation is still to be sort from institutions other than Gauteng Health, such as Stats SA. Officials from the Department of Health and from the Department of Home Affairs in the province have

shown enthusiasm for the process. The process will require leadership from the Directorate of Maternal Child and Women's Health for future progress.

CONSIDERATIONS FOR PROGRESS IN THE PROVINCE

The lack of PPIP data in the province is an area that requires attention. There appears to be a process that began in 2010 of training of information officers or other officials at health facilities for collection of data in the PPIP format. This needs to be continued and expanded to all levels of facilities across the province.

In order to reduce perinatal mortality in the province, an understanding of the causes of mortality is vital in order to inform the remedial action. Cause of mortality data is not currently available and this is a gap that can be aptly filled by use of the PPIP process. However, in looking superficially at the Perinatal Mortality Rate in the province the high Still Birth component of this rate requires attention. All still born infants should be examined clinically, and mortality audits performed at the facility level and integrated into PPIP data so that these deaths can be reviewed and associated factors elucidated.

PROGRESS ON RECOMMENDATIONS MADE BY NaPeMMCo IN THE FIRST INTERIM REPORT

1. Normalization of HIV as a chronic disease
    - The province has made good progress with regard to broadening access to PMTCT and has been active in engaging with the new WHO guidelines. The existence of a broad partnership between government and partners through various forums such as the Gauteng PMTCT Working Group has been pivotal in attempting to normalize HIV.
2. Clinical Skills improvement
    - The province has been actively involved in Neonatal Resuscitation and Partogram training through a successful partnership with Johnson and Johnson having reached a total of 4090 health care workers (doctors and nurses) and having delivered 133 courses since it's inception in 2006.
3. Training/education e.g. Nurses Training
    - This information is known to the Gauteng Department of Health.
4. Implementation of National guidelines
    - From discussions held at the NaPeMMCo, it would appear that these guidelines had not filtered down to facility level at the time of the writing of this report.
5. Postnatal Care –clinic/home visits and Community Health workers
    - This is a provincial Department of Health competency but partner organizations in the province have been assisting particularly with HIV related care.
6. Regional clinicians' appointments
    - Once again, this is a GDOH (Gauteng Department of Health) competency and the writer is not in possession of information that relates to this recommendation.
7. Auditing, monitoring and evaluation e.g. use of DHIS, PPIP and Child PPIP by facilities
    - As mentioned elsewhere in this report PPIP use needs to be scaled up significantly in the province. The use of Child PIP is also not universal in the province. However, steps are being taken to remedy this.
8. Constant health messages
    - Information on progress made with regard to this recommendation is known to GDOH.
9. Staffing, equipment and facilities

- Information should be available from GDOH.

10. Transport and referral routes
    - Information is available from the GDOH

LIMITATIONS OF REPORT

The data presented in this report and subsequent recommendations made have been seriously limited by the absence of representative PPIP data for the province for the period under review.

A further limitation of this report is that a Provincial Mortality Morbidity Committee was set up very late in the process. This has resulted in limited sharing of information with regard to provincial health initiatives and has therefore impacted on the quality and quantity of information available in this report.

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The State of the World's Children Report. UNICEF. Published November 2009

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CHAPTER 16

KWAZULU-NATAL

Author: M. Adhikari

INTRODUCTION

This report presents the work and findings of the KwaZulu-Natal (KZN) ProPeMMCo, a subcommittee of NaPeMMCo. The committee is chaired by Dr Buthelezi, who is the general manager for strategic health programmes. It is constituted by the Chief specialists in charge of Obstetrics and Gynaecology and chief specialist in charge of Paediatrics, coordinator of provincial Maternal and Child Health, the Area 1 manager, and the District manager. There is currently no representation from Home Affairs, District Health Information Systems (DHIS) and Child healthcare Problem Identification Program (Child PIP). Members of the Committee discussed proposals on how to improve services and provide a holistic service to the mothers and newborns in KZN. Some efforts on the proposals involved improving services for children. Two meetings were held in 2009. The NaPeMMCo provincial facilitator communicates frequently or as needed with provincial MCH co-coordinator.

Population of KZN

The province is divided into three areas. The total population of KZN is 10,139,987. The population of the three areas is as follows:

Area 1- 4,625,568

Area 2 - 3,036,039

Area 3 – 2,478,380

AVAILABLE DATA SOURCES

DHIS

The total number of districts in the province is 11. All districts collect data for DHIS. According to MCWH quarterly review meetings are held with the district teams. Regular feed back is given to the districts. Despite these meetings completeness of data varies from facility to facility and from month to month. To develop systems to correct the variability in the data collected from facilities, 227 clinics were selected for a study to see if intensive monthly feedbacks to the clinic improved completeness of data[1]. Completeness of data improved from 54.2% in March 2008 to 84.1% by October 2008. Data agreement within 10% was achieved in these clinics.

DHIS Data for 2007-2008 (2009 is incomplete)

Table 16.1 Perinatal data for the years 2007, 2008 and 2009 from DHIS

	2007	2008	2009 Not Available
Births	194885	204007	
Live Births	189234	199632	
Stillbirths	4929`	4584	
Early Neonatal Deaths	1098	1256	
Late Neonatal Deaths	116	106	
Stillbirth rate	2.5	2.2	
Early Neonatal Mortality Rate	0.5	0.62	
Perinatal Mortality Rate	30.9	28.6	
Neonatal Mortality Rate	0.6	0.58	
Low Birth Weight Rate**	18-20	18-20	
Perinatal Care Index	1.5-2.06	1.43 -1.6	

*Figures for 2009 are incomplete

** LBW was not in the data base – these are my figures

PPIP

Period: July - September 2009 to 10 Dec. 2009

PIPP should be collected from 54 sites; however this data is collected from 16 sites

Sites registered = 52

Non registered sites = 2[Osindisweni & Appelsboch]

Sites constantly reporting = 28

Non constantly reporting sites = 24

DISTRICTS	Constantly reporting	Non constantly reporting	Reported this Q2
uMzinyathi [4 hospitals]	CJM Hosp Greytown Hosp.	COSH Dundee Hosp.	CJM Hosp Greytown Hosp.
uThukela [3 hospitals]	Estcourt Hosp.	Emmaus Hosp.	Estcourt Hosp.
uThungulu [6 hospitals]	Catherine Booth Eshowe Hosp KwaMagwaza Mbongolwane	Nkandla Hosp. LUWMH	Eshowe Hosp KwaMagwaza Mbongolwane
Zululand [7 Hospitals]	Ceza Hosp. Itshelejuba St Fransis	Benedictine Nkonjeni Vryheid	Ceza Hosp. Itshelejuba St Fransis
eThekwini [10 hospitals]	KEH McCords St Mary's	MGMH Addington Hosp.	KEH McCords St Mary's
iLembe [4 Hospitals]	Montobella uNtunjambilli Stanger	uMphumulo Hosp.	Montobella uNtunjambilli Stanger

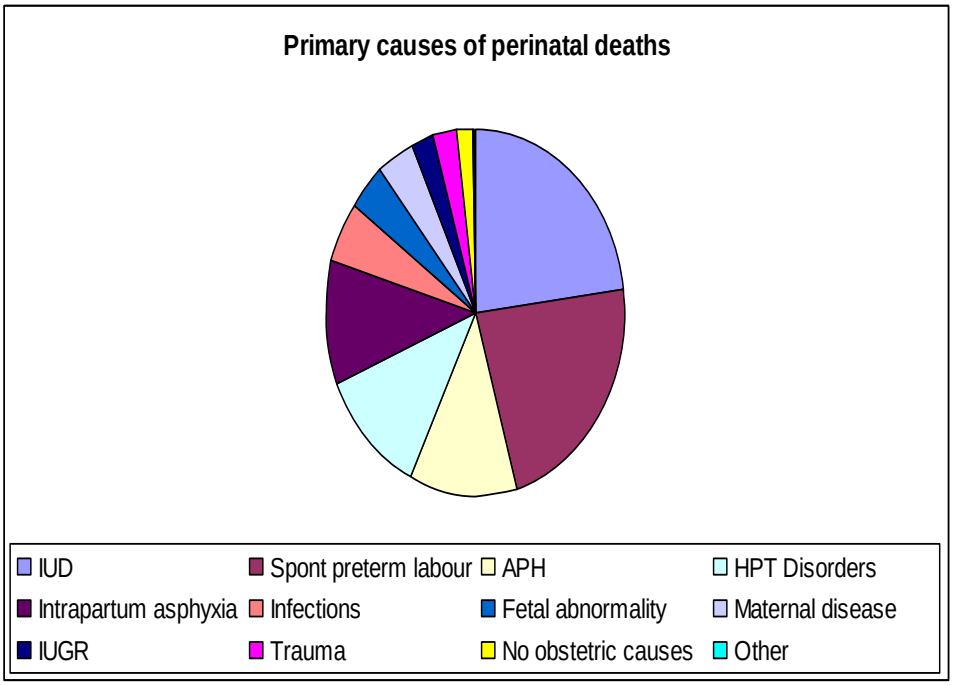
Total deliveries	15958	
Still births	331	2.1%
Early NN Deaths	170	1.1%
Late NN Deaths	15	0.1%
Born alive	15627	97.9%
Survived	15 442	98.8%

Mortality Rates

	All Deliveries	All 1000g+
PNMR	32.2/1000	26.0/1000
NNMR	11.8/1000	8.8/1000
ENMR	10.9/1000	8.0/1000
FD Ratio	21.2/1000	17.7/1000
FD Rates	20.7/1000	17.4/1000
ND Ratio	1.8:1	
PCI	2.10	

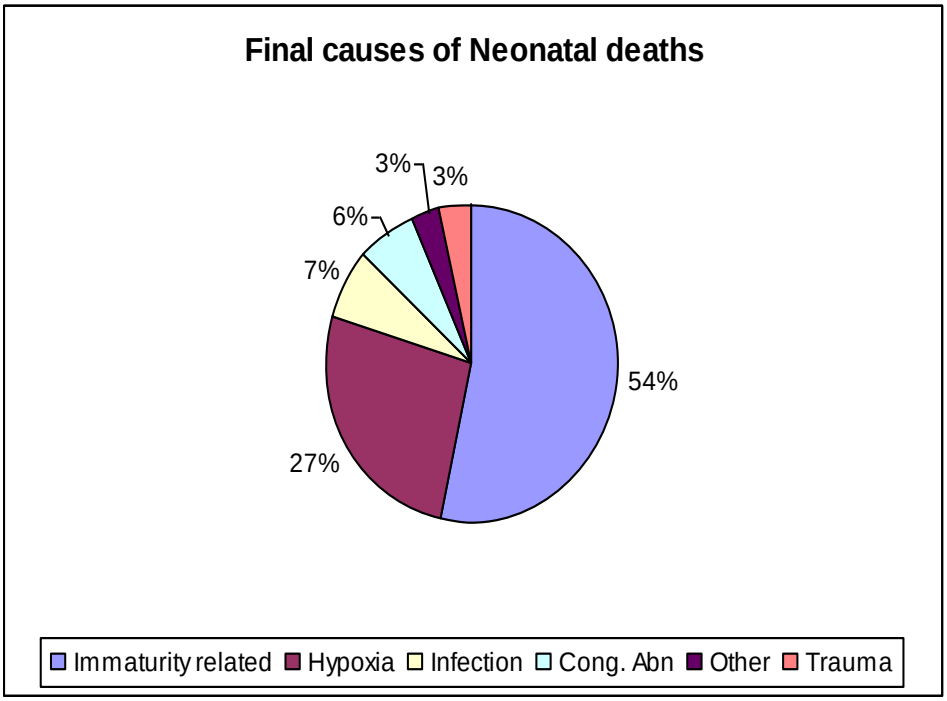
Primary Cause of Death

Intra uterine death	116	23.7%
Spontaneous preterm labour	109	22.3%
Ante partum haemorrhage	56	11.5%
Hypertensive disorders	56	11.5%
Intra partum Asphyxia	53	10.8
Infections	26	5.3%
Fetal abnormality	20	4.9%
Maternal disease	19	3.1%
Intrauterine growth retardation	13	2.7%
Trauma	12	2.5%
No obstetrical causes	8	1.6%
Other	1	0.7%



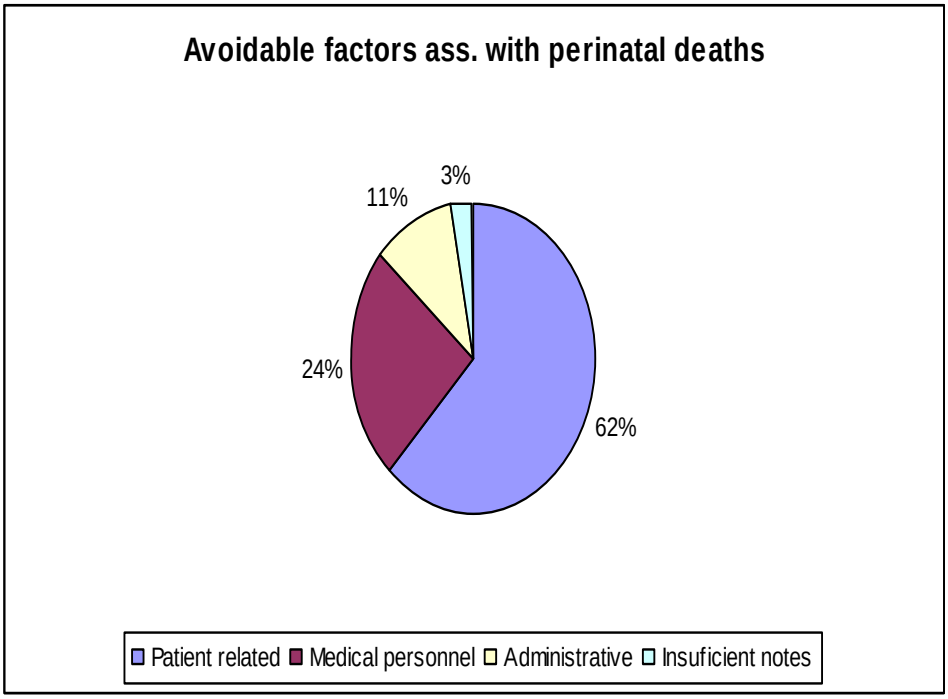
Final Causes of Neonatal Death

Immaturity Related	94	51.9%
Hypoxia	47	26%
Infection	13	7.2%
Congenital abnormalities	11	6.1 %
Other (Hypothermia, haemorrhagic disease of newborn etc)	6	3.3%
Trauma	6	3.3%
Unknown cause of death	4	2.2%



Avoidable factors associated with Perinatal Deaths

Patient Associated	303	62.1%
Personnel Associated	119	24.4%
Administrative problems	53	10.9%
Insufficient notes to comment on avoidable factor	13	2.7%



Quality of Care by Person	
Caregiver (patient)	68.9%
Unbooked	13.3%
Booked late	12.7%
Poor response to decreased foetal movements	12%
Health Care Provider	28.7%
Insufficient nurses and MOs	2.7%
Fetal distress not detected	2.6%
Other	2.3%
Administrator	15.2%
Delay in transport from home to institution	1.6%
No RPR results	1.6%
Other	1.5%

Challenges

Keep institutions reporting and support or data collection

PIPP 2008

Fifty hospitals collect data for PPIP. Collection of this data depends on the interest of the availability of an interested doctor in hospital. Use of PPIP is not enforced by the province. Recently the doctor responsible for PPIP data retired and this has led to delays in compiling the provincial PPIP data. Therefore there is a need to appoint another doctor as soon as possible. The hospitals that collect PPIP data include King Edward VIII, Greys, Mahatma Gandhi, Prince Mshiyeni Memorial, RK Khan, Stanger, Edendale hospitals and 21 district facilities.

Table 1.Mortality rates from KZN based on PPIP data with 76716 births for the period of Jan-Dec 2008

	2 Tertiary Hospitals	4 Regional Hospitals	11 District Hospitals
Stillbirth rate	35.3	29.1	17.5
ENNDR	15.1	11.5	11.6

Table 2. Common obstetric causes of perinatal death for 2008

1. Spontaneous preterm labour	23.8%
2. Intra-uterine death	22.3%
3. Intrapartum asphyxia &trauma	15.2%
4. Antepartum haemorrhage	9.1%
5. Infection	8.4%

Table 3. Common neonatal causes of death for 2008

1. Immaturity-related	44.9%
2. Hypoxia	31.7%
3. Infections	9.7%
4. Chromosomal ban	7.2%
5. Unknown	3.1%

Table 4. Quality of care by person (Avoidable factors) for 2008

a. Caregiver (Patient) – 62.8%

1. Unbooked	13.3%
2. Booked late	12.7%
3. Poor response to decreased foetal movements	12.0%

b. Healthcare provider – 26.5%

1. Insufficient nurses & doctors	2.7%
2. Foetal distress not detected – foetus monitored	2.6%
3. Other	2.3%

c. Administrator – 14.2%

1. Delay in transport from home to institution	1.6%
2. No RPR results	1.6%
3. Other	1.5%

Table 5. Mortality rates from KZN based on PPIP data with 38104 births for the period of Jan-Dec 2007 from 16 sites.

	Tertiary Hosp	Secondary Hosp	Primary Hosp
LBW (%)	17.5%	15.6	11.6
PNMR	48.6	43.7	28.1
NNMR	19.3	16.8	11.2
ENNMR	17.3	15.1	10.7
SB rate	31.9	29.0	17.6
SB:NND	1.7:1	1.8:1	1.6:1
PCI	1.9	2.2	2.00

Table 6. Primary Obstetric Causes of Death in Percent for 2007

	Tertiary Hosp	Secondary Hosp	Primary Hosp
IUD	12.0	16.7	25.2
PTL	24	23.6	25.2
IPA & Trauma	13.2	8.3	13.9
HT	13.2	14.6	7.2
APH	16.8	14.1	6.8

Table 7. Final Neonatal Causes of Death in Percent for 2007

	Tertiary Hosp	Secondary Hosp	Primary Hosp
Immaturity	50	43.2	46.5
Hypoxia	19	28.4	30.6
Infections	18.1	13.6	7.1
Congenital Abnormalities	7.1	7.4	6.8

Table 8. Avoidable factors in Percent for 2007

	Tertiary Hosp	Secondary Hosp	Primary Hosp
Patient Associated	57.5	77.5	67.8
Medical Personnel	24.6	14.6	34.5
Administration	22.6	14.6	-

PROGRESS IN NaPeMMCo RECOMMENDATIONS IN THE PROVINCE

1. Normalization of HIV as a chronic disease

HIV PMTCT

Study from Institute for Health Care Improvement looked at an integrated approach to maternal and child survival[1]. Birth rate in KZN Province is ~250,000/year. ANC HIV prevalence rate is ~38%, the transmission rate at 6 weeks is ~20.8%, and Total Children infected ~20,000/year (1700/month). 7.6% of all infants (189/2473) attending for immunisations were already infected with HIV by 6 weeks of age.

Aims were

- Primary outcome measure: Reduce MTCT rate to <5% in 3 priority districts

- 6 Process measures to show interim progress
- Strengthen health system
- Build sustainability through training of DOH staff

Covered 3 districts – 60% of KZN population, 25 clinics in first year, 15 hospitals,
Staffing: 5 quality mentors, 4 data collectors, improvement advisors, 763 visits in a year.
Results revealed :

- VCT improved -20%
- CD4 uptake improved by 6%
- NVP uptake – 46% to 88%
- NVP data to mothers & babies better
- PCR testing – 40% to just >60%

Progress made HAART essential steps for dual therapy, facilitating CD4 counts in mothers. This will now change with the new policy for earlier commencement of ARVs

(a) 60% pretest counselling in eThekweni.
(b) HAART rolling out from PHC clinics – 60% coverage
(c) Implementation (Availability in facilities) of national guidelines: the Essential steps to include dual therapy have been revised. Completed meetings with heads of institutions to discuss the implementation of guidelines.

Changes in the management of pregnant women with TB/HIV by 1st April

- ART for patients wit TB/HIV with CD4 350 and less
- ART for pregnant women with CD4 count 350 and less
- Pregnant women to start dual therapy at 14 weeks of pregnancy (NVP and AZT)
- ART for all<1 year old who are HIV infected

Support for nurses required since more patients will be treated. UNICEF assisting. Meeting with NGOs who will be supporting Districts. WHO recommending withdrawing Stavudine replacement drugs have to be considered. Although expensive the advantages outweigh the costs

Considering withdrawing formula feeds for PMTCT Programme and offering babies NVP for one year while being breast fed.

Consider a repeat PCR at 9 months of age to detect those who are positive so ART can commence before 1 year of age.

2. Clinical Skills Improvement

- There is ongoing neonatal outreach from Inkosi Chief Albert Luthuli Hospital emphasizing neonatal resuscitation, breast feeding, KMC, and infection control. Ongoing training in ESMOE.
- Training of nurses : attempts being made to set up Continuing Professional Programmes through UKZN while the Nursing Council is reviewing all programmes of training. Will try to do courses over two weeks, will require some financial support.

3. Training/ education:
    - In service training on breastfeeding, prevention of mother to child transmission, discharge and follow up policy and contraception has been planned. All these will be combined into one training programme including ANC/PNC policy.
    - KMC Management and care of low birth weight babies – struggling with that. Will be focused on next year
    - Feeding choices for all women. – emphasis on exclusive breastfeeding for all women whether HIV positive or negative, donor milk from HIV negative mothers is available form mothers in the unit. This is prepared by flash heating their milk. Standard procedures for flash heating, labeling and storage are followed.
    - All formula will be withdrawn from the PMTCT programme next year, exclusive breast feeding with NVP for 6 months will be implemented.
4. Community Health Workers
    - A programme for CHW is being developed for KZN. This is still in progress.
5. Regional clinicians appointments
    - Area 1 – yes. Area 2 not all hospitals, Area 3 no regional facility. Colleges of Medicine of South Africa compiling training programme for regional clinicians emphasizing the public health aspects of care.

Reference

KZN Impact 2009. Evaluation of the implementation of the PMTCT Programme in six districts in KZN

CHAPTER 17

LIMPOPO

Author: N. Shipalana

INTRODUCTION

a) Population:

Limpopo Province is one of the poorest Provinces in South Africa with an estimated population of 5.5 million people. The child population is 14 % of the total child population in South Africa – over 2.6 million children. Over 88% of these children live in rural areas with limited access to advanced health care facilities, poor transport facilities and very little recreation facilities.

b) Health Facilities conducting deliveries:

i. PHC/CHC/Clinics/MOU all together 411
ii. District hospitals are 30
iii. Regional hospitals 5
iv. Tertiary hospitals 2

c) Number of health workers:

i. Nurses
ii. Doctors: Medical officers 862 (1744 vacant posts)
: Specialist 81 (323 vacant posts)

Provincial Committee

The Provincial Committee was formed in 2009 comprising of the 3 National representatives, DHIS, PPIP coordinator, Chip coordinator, Managers from MCWH.

Representatives from Home Affairs and Stats SA have not attended the Provincial meetings. Home Affairs indicated that they do not keep records of births or deaths, all the Data gets send from District level to Stats SA.

The committee had 3 meetings in 2009 and 2 meetings in 2010—chaired by the Provincial facilitator.

SOURCES OF DATA AVAILABLE FOR THE PROVINCE

DHIS—has data from delivery sites

PPIP--- has data from most hospital, clinics not yet doing PPIP

Child PIP--- very few hospitals doing Child PIP(cannot be used for any meaningful analysis)

Home affairs--- no data (only obtainable from Stats SA),

QUALITY OF DATA AVAILABLE FOR THE PROVINCE

a) DHIS:

They collect information from 5 Districts in the Province--- births and deaths from all delivery sites. They have mechanisms/ actions taken to ensure good quality Data is send to National office: - *Data quality check and validations, information management meetings, centralized data submission meetings and feedback reporting.*

b) PPIP

All hospitals in the Province have the latest PPIP version installed and working. Several workshops and training sessions were conducted from 2006 to 2009. Health information officers, maternity sisters and doctors were trained on capturing and importing data. Clinics are not doing PPIP, a few Health centres had training in PPIP in 2009 but due to lack e-mail connection they cannot import data.

The submission of Data was over all satisfactory (2008 &2009) although some hospitals delay in submitting data and need phone calls to urge them to submit (frequent interruptions of e- mail connection also affects ability of facilities to send data).

In 2008 34 hospitals had complete data, 2009 30 hospitals had complete data and 2010 28 hospitals had complete data

Ms Mashao (LINC co-ordinator) has taken over the function of Provincial PPIP coordination since Dr Feuntes resigned from this function in 2009.

c) Child Healthcare (Child PIP)

There are very few hospitals doing Chip in the Province, about 3 in 2008. 3 Training sessions for Potential Chip users were conducted between 2008- 2010.

Hospitals are encouraged to do Chip but due to the rapid change over of medical staff in most district and regional hospitals this is not possible. Efforts are being made by the MCWH to ensure that at least all hospital conduct perinatal/ mortality/morbidity meetings (quality review meetings).

DATA ANALYSIS

DHIS

Table 17.1 Perinatal data for the years 2007, 2008 and 2009 from DHIS

	2007	2008	2009
Births	120 900	126565	123 479
Live Births	118 248	123 757	120 685
Stillbirths	2 652	2 808	2 670
Early Neonatal Deaths	1 378	1 287	1 289
Late Neonatal Deaths	122	109	133
Stillbirth rate	21.9	22.1	21.6
Early Neonatal Mortality Rate	11.4	10.2	10.6
Perinatal Mortality Rate	33.3	32.3	32.1
Neonatal Mortality Rate	12.4	10.3	11.7
Perinatal Care Index	0.3	0.2	0.2

Table 17.2. Dataset from DHIS over the three year period (2007-2009) for Limpopo Province according to Districts.

	Years	Capricorn	Sekhukhune	Mopani	Vhembe	Waterberg	TOTAL
Total Births	2007	27 466	25 598	25 719	31 859	13 473	124 115
	2008	27 752	26 770	26 827	32 584	13 847	127 780
	2009	27 505	25 277	26 619	31 113	13 925	124 439
Still Births	2007	727	675	486	510	289	2 687
	2008	748	671	544	520	310	2 793
	2009	705	672	535	490	299	2 701
Live Births	2007	26 739	24 923	25 233	31 349	13 184	121 428
	2008	27 004	26 099	26 283	32 064	13 537	124 987
	2009	26 800	24 605	26 084	30 623	13 626	121 738
Still Birth Rate	2007	27	27	19	16	22	22
	2008	27	25	20	16	22	22
	2009	26	27	20	16	22	22
Early Neonatal Deaths	2007	15.6	12.2	10.4	9.0	13.1	11.8
	2008	14.6	13.2	9.1	8.8	13.8	11.6
	2009	16	11.2	10.4	10.2	11.4	11.8
Perinatal Mortality Rates	2007	39.8	37.8	28.4	24.6		
	2008	39.5	37	28.4	24.6	34.1	32.4
	2009	39.4	36.7	29.1	25.3	31.8	32.3
LBWR	2007	8.9	4.5	6.0	6.4	11.6	7.1
	2008	11.9	10.3	8.3	7.7	12.0	9.7
	2009	?43	10.1	10.5	9.2	11.4	?17.3
PCI	2007	0.3	0.8	0.2	0.2	0.2	0.3
	2008	3.3	2.9	3.6	2.0	2.8	2.6
	2009	0.3	0.3	0.3	0.2	0.3	0.3

Table 17.3. Other indicators

	2007	2008	2009
Percentage of Women attending ANC	?	93.7	99.3
Percentage of Women attending ANC <20 wks	32.0	40.1	42.1
Percentage of teenage pregnancies	8.5	8.5	8.1
Antenatal client 1st HIV test rate	86.3	98.2	107.6
Antenatal client HIV 1st test positive rate	16.7	15.8	20.1
Percentage of pregnant women positive for syphilis	2.2	1.7	2.1
Caesarean Section Rates	13.9	13.8	14.5

Table 4. Delivery load by level of care according to DHIS

PHCs/ CHC/ MOUs – (? numbers)
District hospitals
Regional hospitals
Tertiary hospitals

PPIP

Table 17.5 Perinatal data for the years 2007, 2008 and 2009 from PPIP for the province

	2007	2008	2009
Births	93 495	99 485	96 241
Live Births	91 416	97 189	93 961
Stillbirths	2 079	2 296	2 280
Early Neonatal Deaths	1 393	1 325	1 317
Late Neonatal Deaths	156	102	100

Table 17.6 PPIP perinatal care indices from 2007-2009

Indicator	2007	2008	2009
PNMR >500g	38.8	37.4	38.4
ENNDR >500g	15.2	13.6	14
PNMR >1000g	31.5	31.2	31.5
ENNDR >1000g	11.7	11	10.8
SBR	22.2	23.1	23.7
SB:NND ratio	1.3: 1	1.6: 1	1.6:1
LBW	13.7 %	12.7%	12.9%
PCI	2.30	2.50	2.40

Table17.7 PPIP Perinatal Mortality Rates (PNMR)/1000 births according to birth weight categories from 2007-2009

Weight Category	2007	2008	2009
500-999	780.1	802.5	774.7
1000-1499	454.9	508.9	487.7
1500-1999	209.3	210.5	213.4
2000-2499	62.3	65.9	64.7
2500g+	15.3	15	15.3
Total births	38.8	37.4	38.4

Table 17.8 PPIP Neonatal Death Rates (NNDR)/1000 births according to birth weight categories from 2007-2009

Weight Category	2007	2008	2009
500-999	629.8	631.1	616.4
1000-1499	304.7	337	289.3
1500-1999	88.9	88.1	81
2000-2499	20.4	19.5	18.8
2500g+	6.4	5.4	5.9

Table 17.9 Primary obstetric causes of perinatal deaths in percentages

Primary obstetric causes	2007	2008	2009	Total	%
Intrauterine death (unexplained)	22.4	24.3	22.2	2568	22.9%
Spontaneous preterm labour	24.7	21.7	21.8	2540	22.7%
Antepartum haemorrhage	4,6	6,2	5.4	606	5.4%
Intrapartum hypoxia	18.9	18.5	20.5	2176	19.4%
Hypertensive disorders	9.5	10.2	12.4	1202	10.7%

Table 17.10 Final neonatal causes of death in percentages

Final cause of death	2007	2008	2009	Total	(%)
Hypoxia	29.5	31.5	29	1406	29.9%
Congenital abnormalities	9.0	7.1	9.3	400	8.5%
Immaturity	42.3	43.1	42.2	1995	42.5%
Infections	10	9.9	12	501	10.7%
Unknown	1.9	2.2	0.9	77	1.6%
Other	5.7	4.7	5.2	245	5.2%
Birth trauma	1.6	1	1.2	60	1.3%

Table 11. Avoidable factors associated with perinatal deaths

Avoidable factors	2007	2008	2009	Total (%)	
Patient Associated	52.8	52.1	48.8	6376	51%
Medical Personnel associated	28.8	29.3	35.6	3947	31.6%
Administrative problems	13.1	12.1	12.6	1571	12.6%
Insufficient notes to comment	5.2	6.6	3.0	598	4.8%

DATA INTERPRETATION –

DHIS is collecting Data from all facilities doing deliveries

PPIP Data is from hospitals only (not all hospitals have complete data).

Higher SB rate, ENND and overall PNMR from PPIP data which is related to more complicated deliveries at all hospital.

No decline in the perinatal indicators despite evidence of improved antenatal attendance , not sure if this may be related to the increased HIV prevalence or better Data collection picking up all deaths and deliveries especially extreme low birth weight babies which would have been classified as abortions.

EXPERIENCES OR PROBLEMS ENCOUNTED IN FORMATION OF ProPeMMCo

Representative from MCWH, DHIS, PPIP co-ordinator and Chip co-ordinator were always willing to participate in the meetings although MCWH and DHIS did not attend all the meetings either due to double commitments or forgetting meeting dates.

The recommendation from the NaPeMMCo chairperson was for MCWH to organise meetings and for this directorate to review Data from DHIS quarterly, this still need implementation in the Province.

Representative from Home Affairs clearly indicated that there was no point in them attending the meetings as they do not keep records of births and deaths from various districts in the Province, data get send to Stats SA.

The Chip co-ordinator was not asked to attend all meetings as there are very few hospitals doing Chip in Limpopo.

WAY FORWARD IN IMPROVING THE FOLLOWING:

a) Data collection / quality of data

i)Continuous in-service training and support to all data collectors and captures
ii) Involvement of IT staff and health information officers in both DHIS and PPIP (in some institutions health information officers only collect DHIS data)
iii) Making DHIS and PPIP part of the hospital managers (nursing and medical) key performance areas and reporting on progress quarterly.
iv) Provincial office to ensure that all facilities have e- mail connection that is working and reliable.
v) Provincial MCWH to take ownership of PPIP:
Appoint PPIP Co-ordinators in all districts.
Design some means of re- enforcing PPIP data submission from facilities

b) Establishing and maintaining ProPeMMCo

i) The Senior manager in charge of MCWH must take responsibility of organising and running the meetings.
ii) Involvement of other stake holders who can make sure the recommendations are implemented --- District managers, PHC managers, HIV managers, It managers
iii) Annual year plan for the meetings

c) Reducing mortality rates

i) Institutions must have frequent perinatal review meetings (clinics attend at their local hospital).
ii) All stake holders to attend combined hospital management meetings--- transport, laundry, laboratory, medical engineers, etc.
iii) Staff training as mentioned in recommendations.
iv) Proper staffing of all health care facilities and functioning equipment
iv) Community involvement and education in All aspects of Health Care.

PROGRESS ON RECOMMENDATIONS MADE BY NaPeMMCo

1. Normalization of HIV as a chronic disease---Child health Unit has entered in to partnership with the Foundation of Professional Development – Employ doctors in districts to improve PMTCT uptake& fast tracking of HAART IN children. 2 Doctors were employed, one re-signed in January 2011. The effects of this intervention will be evaluated by a research project soon. Most PHC sisters will be trained on HIV management as part of IMCI expansion.

2. Clinical skill improvement – MCWH organized a Provincial meeting where all hospital managers, district managers, PHS, HIV & Nursing College tutors were invited to discuss the recommendations from the 3 committees--- Action plans with time lines were drafted.

LINC project already doing neonatal resuscitation training.
Interns rotating in O& G and Paediatrics do ESMOE and neonatal resuscitation

3. Training / education: Tutors from nursing colleges attended above Provincial meeting. Anaesthetic training for junior doctors was emphasized.

4. Implementation (Availability in facility) of National guidelines—discussed at Provincial meetings. CEO'S, clinical managers & nursing managers to ensure that protocols are available in facilities.

5. Postnatal Care—clinic/ home visits—Department of Community Health together with MCWH is linking IMCI House Hold & Community with mother and child care. Existing community volunteers will be trained on maternal, neonatal care skills. Hopefully these can be employed as paid staff later.

6. Regional clinician appointments-- One paediatrician works as a Child health specialist. Recruitment of other specialist for both O&G and paediatrics are proving difficult--- doctors not applying for posts.

7. Auditing, monitoring & evaluation: DHIS data readily available. Managers were asked to monitor submission and use of PPIP data at institutions. Manager in child health is promoting use of Chip by hospitals.

8. Constant health messages -- MCWH to help with posters, billboard messages.

9. Staffing, equipment and facilities--- Discussed at Provincial meeting, Follow National norms.

10. Transport and referral routes: Provincial department to provide emergency ambulance services that are to be stationed at every District the Province has an EMS helicopter which is used frequently to transport critically sick patients. Stabilizing and correct temperature control on transport needs to be improved by the referring institutions.

ADDITIONAL MEASURES TO IMPROVE NEWBORN CARE

Limpopo Initiative for Newborn Care (LINC).

The LINC project started in 2003. The need to improve newborn care in the Province was highlighted by an intervention which was done by Professor Philpot together with the O& G department at the Province called Toward Unity in Reproductive Care (TURC). Professor Philpot& O&G staff use to conduct outreach perinatal mortality reviews, training workshops for doctors and nurses; it was from these workshops that the reproductive health teams identified the deficiencies in Newborn care in the Province. They approached the department of Paediatrics & Child Health to assist in improving newborn care.

An application was submitted to the Polokwane/ Mankweng Complex (PMHC) management and Province to utilize the Health Professions Training Grant (HPTD) to fund the LINC project; this was approved and funding for this project has been renewed annually since 2003—thanks to the understanding of our senior managers.

Members of the LINC team: Polokwane--- *Dr A Robertson – paediatrician from PMHC, Ms L Mashao an advanced midwife and LINC trainer.*

Visiting professionals: *Professor A Malan—retired neonatologist from UCT, Dr D Greenfield community neonatologist, Ms Z Mzolo advanced midwife from Centre for Rural Health, University of KwaZulu-Natal.*

LINC activities

- Development of protocols
- Advice of facility infrastructure, equipment needs, staffing needs and referral guidelines
- Neonatal admission records
- Accreditation of hospitals for good Newborn care – 1 Tertiary 5 Regional and 14 District hospitals
- Attending perinatal mortality review meetings at various districts
- Implementing KMC and nasal CPAP --- 4 Regional hospitals using CPAP
- Training of doctors, nurses, paramedics, medical students in the Province— clinical based training during training courses and visits to the hospitals (the team use to visit all hospitals in the Province, now Ms Mashao does the visits with local paediatrician and at times a paediatric registrar).
- Also training of facilitators—7 trained.

Staff trained

	2004 to 2006	2007	2008	2009	2010	Total
Doctors	212	75	35	26	-	348
Nurses(R/N, ENA Advanced midwifes)	423	96	96	95	81	695

- Accreditation of hospitals for good Newborn care – 1 Tertiary 5 Regional and 15 District hospitals
- Attending perinatal mortality review meetings at various districts
- Implementing KMC and nasal CPAP --- 4 Regional hospitals using CPAP
- Facilitating PPIP data collection—Ms Mashao is now a Provincial PPIP co-ordinator
- Producing the LINC Newborn Care charts (funded by Unicef and Save the Children fund).
- The LINC programme has achieved a lot in terms in terms of improving Newborn Care in the Province as highlighted above. More health care providers are now aware that Newborns needs dedicated nursing and medical staff to care for them.
- Facilities and equipment for Newborn care is in the process of improving in the Province.
- There is improvement in the outcome of low birth weight babies in almost all districts except Mopani where there is an increase in ENND by 28%).

The overall reduction in ENND for the Province is 8%.

Malamulele hospital (district hospital in Vhembe) shows a 50% reduction in ENND which is a commendable and encouraging achievement. It shows that with dedication and commitment babies' lives can be saved even without high technology equipment like ventilators on site.

Table showing LINC achievements in reducing early neonatal deaths (ENND rate for babies over 1000grams.

District	2006	2007	2008	2009	2010	% Reduction
Capricorn	11.9	13.3	10.1	10.3	11.4	-13%
Mopani	10.3	12.7	11.6	13.2	11.6	+28%
Sekhukhune	13. 6	11.6	12	10.9	10.2	-20%
Vhembe	11	9.8	9.7	10.3	9.9	-6%
Waterberg	11.7	11.1	11.8	9.2	9.6	-21%
Province (overall)	11.8	11.8	10.9	10.9	10.6	-8%
Malamulele Hospital	11.1	9	5.7	5.6		-50%

The improvement in the outcomes are lower than expected due to a number of factors:

- This project on newborn care needs the full participation of Obstetrics to improve ANC (BANC) and intra-partum care.
- Rapid turnover of doctors at all levels. Doctors trained in LINC newborn care hardly spend 6 months to a year working in Neonatal unit.
- Most doctors working in the Peripheral hospitals are junior doctors—CSMO or junior SMO.
- Rotation of nursing staff trained in LINC
- Regional hospital paediatric medical staff—1or 2 people who cannot cover all paediatric calls.
- Repair and maintenance of equipment at all hospitals.
- No staff establishment for neonatal units (both nursing and medical).

CHAPTER 18

MPUMALANGA

Author: R. C. Pattinson, M Khoza

INTRODUCTION

Mpumalanga province has a population of about 3.5 million people and two thirds of the population is rural. It has a high unemployment rate. There are three health districts, Ehlanzeni, Gert Sibande and Nkangala. Recently the Bushbuck Ridge area was incorporated into Mpumalanga from Limpopo Province and is now included in the Ehlanzeni district.

Mpumalanga Province has a challenge in attracting health care providers to the province and in 2006 the ratio's of health care providers per population was:

Medical specialists – 0.7/100000 population

Medical practitioners – 17.9/100000 population

Professional nurses –119.3/100000 population

At this time 67.4% of the health professional posts were vacant.

QUALITY OF PERINATAL MORTALITY DATA 2008

Data sources available include (Home Affairs/ Stats SA, DHIS, PPIP, Child PIP). Data sources are readily available from the DHIS, PPIP and Child PIP. All hospitals at present run the PPIP and Child PIP programmes. Currently the births from CHCs are not collected on PPIP but will be in 2010. Data from home affairs is available from the Stats SA publications. The data from Stats SA does not include stillbirths and for provincial summaries only includes the top 10 causes for children 0-14 years. This data is not useful for the NaPeMMCo in its current form.

DATA ANALYSIS AND INTERPRETATION

The registration for births by district in Mpumalanga for 2008 is given in table 1. From the table it appears that the registration of births with home affairs and the DHIS data correlate well. It must be remembered that home births are not counted by the DHIS and this might account for some of the discrepancies. Table 2 compares the DHIS and PPIP data with respect to births, stillbirths and neonatal deaths and the various indices. Table 3 compares the indices. Note that the DHIS data includes CHC births and deaths. The higher rates in the PPIP data can be attributed to the non inclusion of the births and deaths from the CHCs in the PPIP data. Table 4 shows the perinatal indices using the PPIP data and the births in the CHCs. This data is not very different from the DHIS perinatal indices. There is fair agreement between the data sources in Mpumalanga.

Table 18.1 Comparison Stats SA Recorded Live Births data and DHIS data for 2008

Districts	Births by registration	DHIS (live births)
Ehlanzeni	38375	39039
Gert Sibande	15032	16093
Nkangala	22112	18813
Total Province	75519	73945

Table 18.2 Comparison of births in DHIS (without CHCs) with PPIP for 2008

Districts	DHIS without CHCs	PPIP	% difference
Ehlanzeni	34234	34690	-1.31
Gert Sibande	14529	14110	2.97
Nkangala	13830	15616	-11.44
Total Province	62593	64416	-2.83

Table 18.3 Comparison of perinatal indices in DHIS with PPIP for 2008

Districts	PNMR		SBR		NNDR	
	DHIS	PPIP	DHIS	PPIP	DHIS	PPIP
Ehlanzeni	29.5	32.9	20.0	21.6	9.8	10.8
Gert Sibande	35.4	40.3	23.1	26.4	13.5	13.8
Nkangala	33.1	39.0	21.8	25.0	11.3	13.4
Total Province	32.9	36.0	21.1	23.5	11.8	12.1

Table 18.4 Perinatal indices using PPIP data and CHC births 2008.

PPIP incl. CHCs	Ehlanzeni	Gert Sibanda	Nkangala	Total for Province
SBR	19.81	23.28	20.37	20.74
ENDR	10.92	12.41	11.30	11.22
PNMR	30.52	35.40	31.45	31.73

COMPARISON OF INDICATORS OVER A 3 YEAR PERIOD

Table 18.5 and 18.6 gives a comparison of the perinatal care indicators using PPIP for 2007-2009.

Table 18.5 Indicators for Mpumalanga: 2007 till Jul 2010

	2007	2008	2009	Jan-Jul 2010
Hospitals and CHCs				
PNMR >500g per 1000 births	31.74	31.73	33.75	33.9
SBR >500g per 1000 births	20.37	20.74	22.61	22.73
NNDR >500g per 1000 live births	11.61	11.22	11.40	11.43
PNMR >1000g per 1000 births	27.11	25.04	27.77	29.14
SBR >1000g per 1000 births	17.79	16.04	19.13	19.38
NNDR >1000g per 1000 live births	8.99	8.73	8.27	9.37
Hospitals only				
LBW (%)	13.3	13.4	14.3	13.8
PCI	2.4	2.3	2.1	2.5
NNDR 1-2kg per 1000 live births	152.9	113.1	112	120.8
PNMR >2,5kg per 1000 births	14.2	15.9	15.7	17.0
C/S rate (%)	14	15.8	17.3	18.2
% teenage pregnancies	10.4	10	10.5	9.7
% syphilis unknown	62.5	34.4	17.2	3.9
Prop women attend ANC (%)	98.6	97.7	98	144.3
Prop women attend ANC <20wks (%)	28	31.2	35.4	28.8
% HIV testing unknown	28.3	18.6	20.0	4.7
HIV+ % of those tested	27.7	29.2	34	28.8
Prop HIV+ on dual/mono therapy (%)		Data unreliable		82.7
Prop women on HAART (%)	No data	No data	No data	5.2
Prop HIV exposed babies getting PCR (%)	No data	14.6	26.1[#] and 54.6[##]	58.8

[#]- Nkangala district; [##]- Ehlanzeni district

There has been little change in the perinatal care indicators over time, but there has been a marked improvement in screening for syphilis, testing for HIV infection and initiating HIV infected women on antiretroviral therapy, be that dual therapy or HAART.

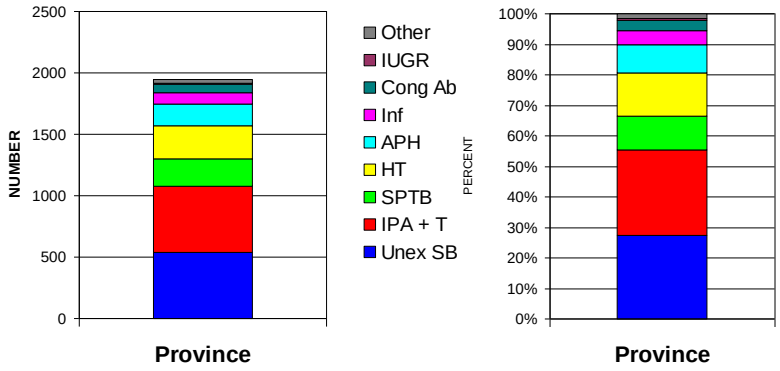
Table 18.6 Perinatal care indices in hospitals over time

Mpumalanga: Hospitals only	2007	2008	2009	Jan-Jul 2010
PNMR >500g per 1000 births	37.6	37.2	38.7	40.9
SBR >500g per 1000 births	24.2	24.2	26.1	26.9
NNDR >500g per 1000 live births	13.0	12.6	12.2	13.6
PNMR >1000g per 1000 births	31.7	30.7	31.8	34.6
SBR >1000g per 1000 births	20.8	20.4	22.1	23.1
NNDR >1000g per 1000 live births	11.1	10.5	9.4	11.2

OBSTETRIC AND NEONATAL DIAGNOSES AMONG PERINATAL AND NEONATAL DEATHS

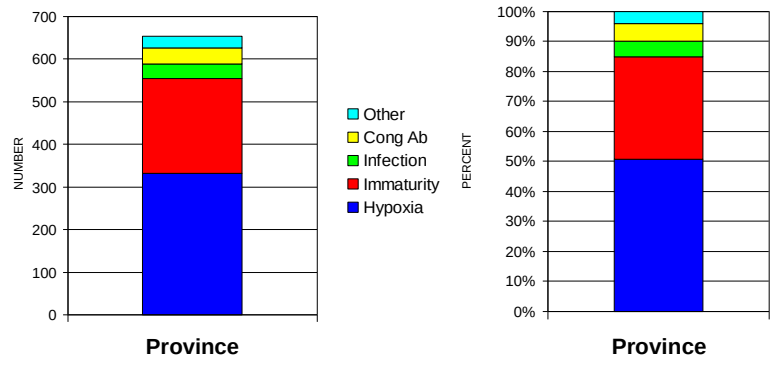
The causes of perinatal and maternal deaths are given in figures 1-3.

Figure 1. Mpumalanga Province – Summary Obstetric Causes



The most common primary obstetric causes of perinatal death (figure 1) are intrapartum related asphyxia and birth trauma, followed by spontaneous preterm birth, and placenta/placental bed diseases namely pre-eclampsia/eclampsia and abruptio placenta. Figure 2 clearly illustrates how there are only two major causes of early neonatal death namely, complications of prematurity and intrapartum hypoxia. Together they account for over 80% of early neonatal deaths.

Figure 2. Mpumalanga Province – Summary Neonatal Causes



Non pregnancy related infections (NRPI) mostly due to complications of HIV infection is by far the moose common cause of maternal death. The Saving Children reports that 81% of

infant deaths in Mpumalanga from those mothers or infants, whose HIV status was known, were HIV exposed.

Therefore the priority conditions in Mpumalanga for maternal, neonatal and child health is:

- HIV screening and treating
- Intrapartum care *including* neonatal resuscitation
- Care of the immature infant
- Preventing and managing hypertension in pregnancy
- Postnatal care – very few babies are getting PCR testing or HIV infected mothers being followed up appropriately

Motivation

- HIV/AIDS – Most common cause of maternal death and 81% of infant that died are HIV exposed or infected
- Labour related conditions – intrapartum asphyxia (prolonged labour, cord prolapse etc.) is the most common maternal cause of perinatal death; hypoxia and immaturity are the most common neonatal cause of death; and obstetric haemorrhage and puerperal sepsis are common perinatal causes of maternal death.
- Hypertensive conditions in pregnancy are common causes of maternal and perinatal death.

The interventions that would have the biggest impact in Mpumalanga maternal, neonatal and child health are:

- PMTCT + programme full scale-up
- Implement Basic Intrapartum Care programme (includes neonatal resuscitation)
- Supply and train personnel in District Hospitals to use nasal CPAP
- Ensure all District and Regional hospitals are using KMC
- Train all health care workers in ESMOE
- Introduce Calcium supplementation to all pregnant women
- Improve postnatal care – to ensure all HIV infected mothers and exposed babies are appropriately followed up

All these are within the recommendations made previously by the NaPeMMCo and the NCCEMD.

These can be implemented using the following programmes that are available:

Clinics

- Integrated BANC and PMTCT+
- Calcium supplementation
- Postnatal care (EPOC)

Hospitals

- ARVs
- Basic Intrapartum Care
- ESMOE
- Nasal CPAP
- KMC
- Postnatal Care (EPOC)

PROGRESS OF IMPLEMENTATION OF NaPeMMCo RECOMMENDATIONS

- PMTCT uptake has improved.
- Improvement in integration of PMTCT with MCWYH program
- Functioning of Maternal Health Task team
- The 3 districts are implementing BANC, however not yet all PHC facilities
- One Provincial training on ESMOE was conducted, trained doctors are cascading information to their respective relevant facilities
- Neonatal Resuscitation, ETAT and postnatal care trainings conducted
- Involvement of Nursing schools and college during trainings
- Quarterly reviews are occurring
- Auditing, monitoring & evaluation e.g. use of DHIS and PPIP by facilities
- Dissemination of information through health education, radio and posters
- Midwifery Discussion Group meetings
- Survey on availability of equipments has been done
- Challenges on Referral system identified, development of referral policy is in process of being finalized

PROGRESS ON IMPLEMENTATION OF SAVING MOTHER'S/ NCCEMD RECOMMENDATIONS

The MCWH department in Mpumalanga established a Maternal Health Task Team. An audit tool on Saving Mothers recommendations was developed and distributed in 2007/8. Results of the audit are as follows:

- Only 25% of patients get transported within an hour of request and over 50% after one hour.
- 98.5% had no guidelines on allocation of human resources. 94.5% has regular rotation of nursing personnel that is monthly or quarterly.
- Availability of essential equipment at the various levels of care ranges between 40-49% in all institutions. Of these, about 40-55% has been removed for maintenance purposes, while 20% are non-functional.
- 98% of the institutions encounter problems with obtaining drugs for the treatment of pregnant women.
- About 50% of the facilities do not have blood on site (maternity ward) for emergency blood transfusion to mothers that may require it.
- Out of 28 hospitals, 11 (39.2%) were offering Termination of Pregnancy services. However, the situation has deteriorated since audit was conducted, as only 7(25.9%) are currently offering this service.
- Most facilities (76%) provide regular updates/ workshops on plotting of partogram.
- Only 20% of the municipalities are conducting regular activities targeting women and population to raise awareness regarding maternal, neonatal, reproductive and STIs
- Provision of appropriate IEC materials on behavioural change as well as on major issues around maternal health is done by 30% of the facilities

CHAPTER 19

NORTH WEST

Author: P. Mphampe

INTRODUCTION

The province has four districts namely Ngaka Modiri Molema, Dr Kenneth Kaunda, Dr Ruth Segomotsi Mompati and Bojanala districts. There are three regional hospitals and sixteen district hospitals conducting births in the province. North West province does not have MOUs. There are 45 CHCs and 199 fixed clinics. Some of these clinics do conduct deliveries using an on duty call system. The province has a critical shortage of health care workers at all levels.

PROVINCIAL SUB-COMMITTEE OF NaPeMMCo

There was no member of NaPeMMCo who came from NW when NaPeMMCo was established; therefore there was no provincial facilitator from NW who could assist in establishment of the ProPeMMCo or to attend provincial meetings with MCWH. After getting the provincial facilitator only two meetings were held. Committee members in attendance was the chairperson Dr A Njie, the co-coordinator of PPIP in Ngaka Modiri Molema, Child PIP coordinator, Co-coordinator of MNCWH, representatives from district PPIP committees and DHIS member. The provincial facilitator for NW has subsequently resigned. There was no representative from Department of Home Affairs.

DATA SOURCES

Home Affairs: For the period Jan –Dec 2009, Department of Home Affairs registered 2052 births only. Therefore the data from Home Affairs for 2009 is incomplete.

DHIS: Information for DHIS is collected from all 4 Districts in the Province. There is a concern on quality of the data collected by DHIS. The efforts to improve this data will need establishing a data flow policy, appointment of data monitoring manager at a senior level namely, deputy director and to give regular feedbacks to the districts.

PPIP: There are three (3) regional hospitals and thirteen (13) district hospitals collecting data for PPIP. The province has just made a decision to have Sub Districts registering as PPIP sites so that we can capture those deliveries in PPIP.

Child PIP: There is one regional hospital (1) and eleven (11) district hospitals collecting data for Child PIP.

Table 19.1.Dataset from DHIS over the three year period (2007-2009) for the North West Province

	2007	2008	2009
Total births	61108	65078	63342
Live births	59979	64441	61537
Still births	1461	1485	1488
Early Neonatal Deaths	590	628	594
Late Neonatal Deaths	129	102	64
Still Birth Rate 500g and above	24	23	23
Early Neonatal Death Rate 500g and above	9.8	9.7	9.7
Late Neonatal Deaths Rate 500g and above	2.2	1.6	1.0
Perinatal Mortality Rate 500g and above	34	32	33
Perinatal Mortality Rate 1000g and above	15	27	25
Caesarean Section Rate	13.6	14	14.1
Teenager deliveries Rate	9.9	9.4	8.6
Perinatal care Indices	2.8	2.6	2.4
Low Birth Weight Rate	12.1	12.1	13.6

Figure 1. Mortality rates for North West for 2007-2009 period

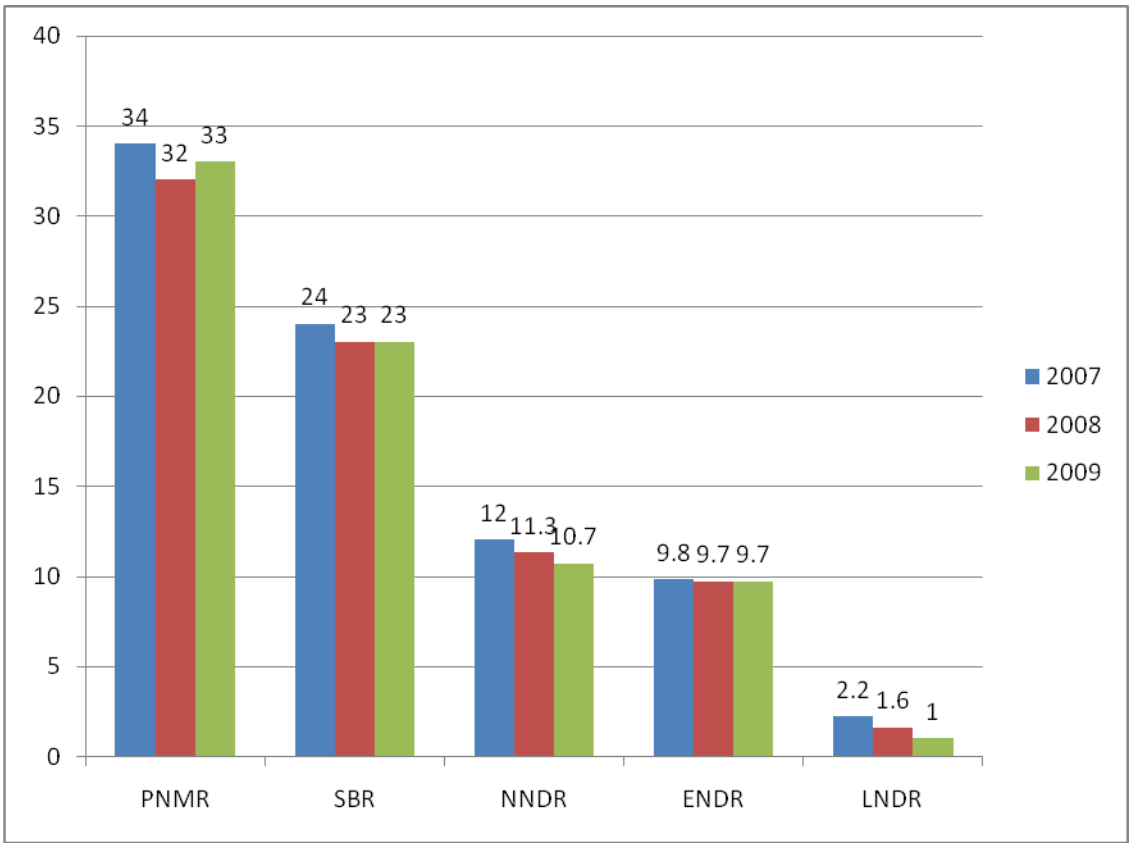


Table 3. Dataset from DHIS over the three year period (2007-2009) for the North West Province according to Districts.

	Years	Dr K Kaunda	Ngaka Modiri Molema	Bojanala	Dr Ruth Mompati	North West Province
Total Births	2007	15 914	16 471	20 389	8 334	61 108
	2008	16 947	17 053	21 275	9 803	65 078
	2009	16 621	16 860	21 144	8 717	63 342
Still Births	2007	360	396	504	201	1 461
	2008	373	395	467	250	1 485
	2009	359	378	503	248	1 488
Live Births	2007	15 982	16 065	19 814	8 118	59 979
	2008	17 396	16 674	20 808	9 563	64 441
	2009	15 932	16 435	20 619	8 551	61 537
Early Neonatal Deaths	2007	171	167	172	80	590
	2008	181	197	151	99	628
	2009	153	210	176	55	594
Late Neonatal Deaths	2007	59	42	26	2	129
	2008	49	24	25	2	100
	2009	26	20	17	1	64
Perinatal Mortality Rates ≥500g	2007	33	34	33	34	34
	2008	33	35	29	36	32
	2009	31	31	32	35	33
Still Birth Rate ≥500g	2007	23	24	25	24	24
	2008	22	23	22	23	23
	2009	22	22	24	23	23
Neonatal Mortality Rate ≥500g	2007	14.4	13	10	10.1	12
	2008	13.2	13.3	8.5	10.6	11.3
	2009	11.2	14	9.4	6.5	10.7
Low Birth Weight rate	2007	14.1	12.9	10.2	11.3	12.1
	2008	14.1	12.6	10.7	10.8	12.1
	2009	16.0	14.0	12.3	11.2	13.6
PCI	2007	2.3	2.6	3.2	3.0	2.8
	2008	2.3	2.7	2.7	3.3	2.6
	2009	1.9	2.2	2.6	3.1	2.4

Table19. 4 Comparing District Health System (DHIS) to Perinatal Problem Identification Program (PPIP) Data from 2007-2009

	DHIS 2007	DHIS 2008	DHIS 2009	PPIP 2009
Total births	61108	65078	63342	34866
Live births	59979	64441	61537	34019
Still births	1461	1485	1488	847
Early Neonatal Deaths	590	628	594	577
Late Neonatal Deaths	129	100	64	23
Still Birth Rate	24	23	23	22.8
Early Neonatal Death Rate	9.8	9.7	9.7	17
Late Neonatal Death Rate	2.1	1.6	1.0	0.7
Perinatal Mortality Rate	34	32	33	38.9

Table 19.5 Common neonatal causes of death according to 2009 PPIP Data

1.Hypoxia
2.Immaturity
3.Unknown cause of death
4. Infection
5. Congenital abnormalities

Table 19.6 Avoidable factors according to 2009 PPIP Data

Caregiver
1. Inappropriate response to poor foetal movements.
2. Never initiated antenatal care.
3. Delay in seeking medical attention during labour.

Healthcare provider
1. Delay in referring patient for secondary /tertiary treatment
2.Delay in medical personnel calling for expert assistance
3.No response to maternal hypertension

Administrator
1. Lack of transport- home to institution
2.Inadequate facilities/equipment in the unit
3. Lack of transport-institution to institution

PROGRESS ON IMPLEMENTATION OF RECOMMENDATIONS

1. Normalization of HIV as a chronic disease
    - The province is using provider initiated HIV counselling and testing (opt out methodology). To date, 51 PHC facilities are providing ART.

2. Clinical Skills improvement e.g. ESMOE, BANC, Neonatal Resuscitation.
    - The province has 25 Neonatal Resuscitation Trainer of trainers' health care workers comprising nurses and doctors. In Dr Kenneth Kaunda district alone, 37 doctors and 78 nurses were trained in neonatal resuscitation from 2007 to 2009. Each district team is led by Family Physicians and districts are conducting the training as part of their outreach programme. MCWH/ N directorate assisted by HST are conducting training on BANC. BANC coverage is standing at 42%. Doctors are routinely attending training on anaesthetic skills in Klerksdorp Tshepong Complex. ESMOE training is happening on a small scale. We have asked MRC to increase Trainer of trainers from 3 to 25.

3. Training/ education e.g. Nurses Training
    - Two nursing colleges in the province are providing teaching for Advance Midwifery and Basic Midwifery. The directorate is refreshing educators on maternal and neonatal guidelines in order improved their skills when teaching the undergraduate. In future, BANC will be integrated into the undergraduate nursing student's curriculum. Health messages for maternal and neonatal care are developed and been circulated for use.

4. Implementation (Availability in facilities) of national guidelines.
    - Maternity Care and Neonatal Care guidelines have been distributed to all districts. More copies need to be reprinted in this current financial year.

5. Postnatal Care- clinic/ home visits- CHW
    - All PHC facilities are rendering post natal care using 4x6 principles. The province has developed a user-friendly training manual for CHCW to initiate home visit on the 3rd day. Trainings are under way for capacity building of CHCW.

6. District clinician's appointments
    - All districts have appointed family physicians; one district has a district paediatrician.

7. Auditing, monitoring & evaluation e.g. use of DHIS, PPIP and Child PIP by facilities.
    - Morbidity and Mortality meetings are conducted in all facilities that conduct deliveries. 12 Hospitals are Child PIP whereas 16 are PPIP users. Each district uses DHIS to monitor quality of care in their facilities. Districts quartely performance reviews are conducted to monitor progress. Maternity case records audit are conducted monthly in all maternity facilities.

8. Constant health messages e.g. radio, TV, posters in clinics.
    - A range of constant messages are an integral part of Community Postnatal Care manual and are available in all facilities. The directorate in collaboration with Health promotion conducts regularly radio slot targeting and neonatal topics. Some facilities do have posters that convey maternal and neonatal information.
9. Staffing, equipment and facilities
    - Staffing norms for maternal and neonatal care are not available in the province. Equipment for maternal and neonatal care are available in all facilities conducting deliveries.

10. Transport and referral routes.
    - Referral routes are established in the provinces. Maternal and neonates are classified as priority one for transportation to higher levels of care. Availability of obstetric ambulances is an option the province is looking at in order to improve response time.

WHAT DOES THIS REPORT SAY ABOUT MY PROVINCE

ProPeMMCo

Members of the committee were formally appointed in March 2009. Members of the committee are:

Chairperson: Dr A Njie (Family Physicians : Ngaka Modiri Molema District
Dr T Tshenkeng (Paediatrician) : Klerksdorp Hospital
Dr T Kanku: :Vryburg Hospital
Dr RG Hukuimwe(O and G specialist) : JST Hospital
Dr Lomalisa(O and G specialist) : Private
Dr O.I. Adejayan (CMO) : Mmacon
Ms O Mamabolo (Advanced Midwife) : Gelukspan Hospital
Ms E Tlotleng (MCWH coordinator) : Rustenburg Sub District
Ms M Letsapa (MCWH coordinator) : Tswaing Sub district

Ms N Molefe (NCCEMD member)	: Brits Hospital	
Mr Phamphe M P(DD:MCH)	: Provincial Office	:
Ms G Tsele (Dir: MCWH/N)	: Provincial Office	
Ms M Mokgothu (DD: HIV Prevention)	: Provincial Office	

The committee has since been revived from the district levels. Chairpersons of PPPI and Child PIP from all districts are members of the provincial committee. Members who represent the province in NaPeMMCo and CoMMiC need to be appointed.

Quality of provincial prenatal care data

DHIS, PPIP and Child PIP data base need regular cleaning to ensure good quality of the data.

3. Perinatal population health profile

It reflects that the province is faced with known common killers of neonates namely:

Hypoxia, infections and prematurity complications

4. Perinatal population quality of care

Where are the problems?

- Staffing, equipment and transport norms.
- Health care worker critical skills shortage at all levels.
- Clients, community and social dynamics.

Who is responsible?

- Managers at various level of care, National, Provincial and Districts. As long as there is no standardization on staffing norms for maternal and neonatal care, quality care remains a dream to attain.

BUILDING NW ProPeMMCo

ProPeMMCo was formally appointed by HOD of the health branch.

Credibility

- The HOD Provincial Department of Health has appointed the committee and it officially recognized for its work.

Function

- To strengthen and promote ongoing quality assurance programmes within the province.
- To collate districts PPIP and Child PIP reports and analyze the trends in order to take appreciate decisions.
- To develop strategic plans and methodologies that are designed to reduce morbidity and mortality and are relevant to the Committee's functions.
- To monitor and evaluate with particular reference to the implementation of the saving babies and children recommendations.
- To present an interim report annually and a comprehensive report triennial to the Health Branch.
- Act as the coordinating body for the various districts morbidity and mortality committees
- Advise the NW DOH on clinical policy issues relating to pregnancy care, labour and delivery, and perinatal health and child health.

- Undertake such other roles and responsibilities as may be requested by the HOD or MEC for Health and Social Development.

SETTING HEALTH PRIORITIES FOR THE PERINATAL POPULATION

- Improve access of pregnant women to attendance by skilled care during childbirth is considered critical to maternal and newborn health and survival.
- Improve health professionals recognition and treatment serious infection(Skills improvement in management of communicable and non communicable diseases)
- Strengthen early postnatal care for mothers and newborns (CHCW postnatal home visit on the 3rd and facility visit on the 6th day)

IMPROVING QUALITY OF CARE FOR THE PERINATAL POPULATION

- Improve emergency obstetric care and neonatal resuscitation in all health care settings.
- Provide supervision, promote quality assurance.
- Strengthen human resources: promote evidence-based guidelines/standards, provide job aids; strengthen in-service and pre service training.
- In collaboration with other sectors, increase women's education and social status. This directly improves the health of other household including her newborn.

RECOMMENDATIONS FOR IMPROVING COUNTRY PERINATAL CARE DATA

1. How can my ProPeMMCo contribute?
    - Regular meetings that analysis the performance of the province, give feedback to the hospitals, develop recommendations and generate reports to the HOD and to NaPeMMCo.
2. How can my data contribute?
    - Perinatal clinical information can fulfil amongst others the following purposes:
    - Quality review and improvement processes.
    - Allocation of resources
    - Budget and planning process.
3. How can my province's innovations contribute?
    - Perinatal data of the province must be accurate-correct and valid. Information generated from the data must be used optimally to monitor measures and improve perinatal care.
    - It is action to the information collated through technology that perinatal care can improved and the province is moving along that route of finding ways to use information more effectively.

IMPROVING QUALITY OF PERINATAL DATA

Home Affairs

- The department of Home Affairs has introduced e-registration of births and deaths at hospitals. They are also planning to deploy full time staff in as many health institutions as possible.

DHIS

- MCWH coordinators at the sub districts and unit managers in labour ward must clean up data before it is loaded in the data base.
- Hospital managers must be trained on MCWH indicators in order to address areas of concerns as reflected by the data that is generated.

PPIP

- PPIP stats must be validated before exportation.
- All hospitals must be PPIP user sites.
- All PPIP user sites must export data on monthly basis.
- All must have monthly morbidity and mortality meetings.

Child PIP

- Child PIP stats must be validated before exportation.
- All hospitals must be Child PIP user sites.
- All Hospitals must have monthly morbidity and mortality meetings.

CONCLUSION

The perinatal data reported in this report does not include births that happened in PHCs (Sub districts). Health care workers need to be trained on minimum PPIP data set so that errors can be eliminated. Many of the information officers will not clinically understand PPIP data set if data is not accurate. Morbidity and mortality meetings must occur in all sites where women delivery. All deaths must be analyzed and relevant forms completed using appropriate codes. Each district must have a manager that must comprehensively look at the affairs of perinatal and child health.

CHAPTER 20

NORTHERN CAPE

Author: A. Jassen

INTRODUCTION

The Northern Province has a population of approximately 1.1 million. Districts in the province are Frances Baard, John TaoleGaetsewe, Siyanda, Pixleyka-Semme and Namaqua. There is one regional hospital which is Kimberley Hospital Complex (KHC), 17 district hospitals, 29 Community Health Centres and 127 Clinics.

PROVINCIAL COMMITTEE

The Committee is composed of the following members: Chair: Dr. P. Jooste, ProPeMMCo Provincial facilitator: Dr. A. Jassen; DHIS Representative: Ms. P. Ndlovu; PPIP Co-ordinator: Ms. L. Pityana; Child PIP: Dr. P. Jooste; MNCWH Co-ordinator: Ms. L. Pityana& Dr Delis; Home Affairs Representative: Ms. J Barnard. Number of meetings held to date were three and were held on the following dates - 20.05.09; 19.08.09 and 18.11.09.

DATA AVAILABILITY/RELIABILITY

Data for the Northern Cape is available from the following databases Home affairs/Stats SA; DHIS and PPIP. Sixteen sites collected data for PPIP. Of these 16 sites only 11 sites submitted data with only 2 submitting completed data. There are several problems related to data collection and they include communication difficulties, timeous collection and forwarding of data, staff having difficulty with finding time to do the work and understanding of the avoidable factors. These problems can be reduced by getting a fully trained, computer literate co-coordinator at the Provincial MCWH office. Galeshewe day Hospital (CHC) is the only community health care centre who submitted data and it has been incorporated into the KHC's data. PPIP data is not reliable except for KHC and Gordonia Hospital.

Table 20.1 Summarized Total Live births 2007-2008 Northern Cape

	Stats SA	DHIS	PPIP
2007	22 784	22 806	23 634 (2007and 2008)
2008		23 357	

Table 2: PPIP Data on Live Births and Neonatal deaths 2007-2008 (>500g)

PPIP- Site	Live Births	Early Neonatal Deaths (Rates)
Douglas Hospital	598	10,2
Warrenton Hospital	421	2,4
Jan Kempdorp Hospital	1050	12,6
Calvinia Hospital	606	8,2
Colesberg Hospital	247	12,5
Kuruman Hospital	3519	11,9
Barkley-West Hospital	990	18,2
Springbok Hospital	2054	17,9
De Aar Hospital	1718	18,3
Kimberley Hospital Complex*	11 612	20,5
Gordonia Hospital*	4338	15,6
Northern Cape Total:	23634	23,1

* Complete Data for the period 1 Jan 2007 – 31 Dec 2008

The Kimberley data include the information from the Kimberley Hospital Complex and its Community Health Centre, Galeshewe Day Hospital.

Table 3: DHIS data in facility 2007 – 2008

District	Years	Total Births	Live Births	Stillbirths
Frances Baard	2007	8367	8142	225
	2008	8521	8307	214
John TaoleGaetsewe	2007	4371	4287	84
	2008	4691	4593	98
Siyanda	2007	3861	3778	83
	2008	3700	3621	79
Pixley Ka-Semme	2007	3367	3300	67
	2008	3438	3343	95
Namaqua	2007	1537	1491	46
	2008	1670	1639	31
NORTHERN CAPE	2007	21 503	20 998	505 (23.5)
	2008	22 020	21 503	517 (23.5)

Fig. 1: Perinatal Mortality for Kimberley Hospital Complex and Gordonia Hospital per 1000.

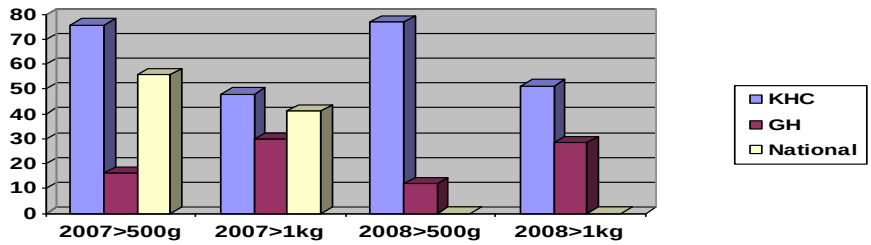


Fig. 2: Early Neonatal Deaths: KHC (Kimberley Hospital Complex) and GH (Gordonia Hospital) per 1000:

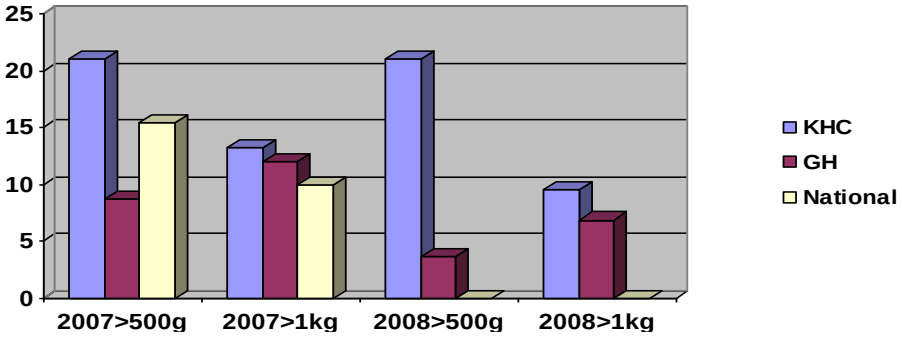


Fig. 3. Stillbirths for 2007-2008 according to DHIS

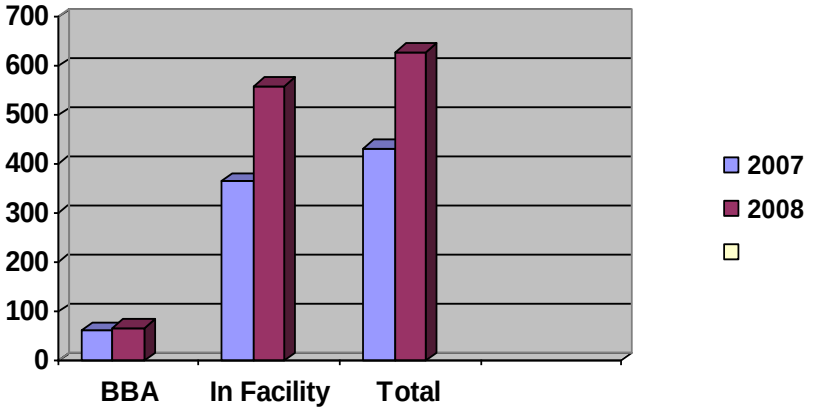


Table 20.4 Primary Obstetric causes of Death (PPIP)

Intrauterine death (unexplained	23.5%
Spontaneous preterm labour	25.8%
Antepartum haemorrhage	15.1%
Intrapartum hypoxia	12%
Hypertensive disorders	7.5%

Table 20.5 Neonatal Causes of Death (PPIP)

Prematurity	63.8%
Asphyxia	22.6%
Sepsis/Infection	11.3%
Intra-Uterine Death	2.3%

Table 6: Avoidable factors associated with perinatal deaths (PPIP)

Patient Associated	57.9%
Medical Personnel associated	22.3%
Administrative problems	12.7%
Insufficient notes to comment	7.1%

DATA INTERPRETATION

- Eleven out of the 16 sites that collect data for PPIP submitted their data but only 2 of these eleven had a complete data.
- Comment Fig. 2: Significant decrease in early neonatal mortality rate from 2007 to 2008
- Comment Fig. 3: Major increase in stillbirths from 2007 to 2008.

- Possible reasons for this increase: - Improvement in data collection, poor transport for women in labour to facility, poor Antenatal clinic attendance, lack of recourses, availability of theatres, and distance between Primary Health Care Centres to District Hospitals

- Comment Table 2: There are still several problems related to data collection and they include communication difficulties, timeous collection and forwarding of data, staff having difficulty with finding time to do the work, and understanding of the avoidable factors. These problems are enhanced by the lack of a fully trained, computer literate co-coordinator at the Provincial MCWH office.

PROBLEMS IDENTIFIED FOR THE PROVINCE:

- PMTCT program not running optimal.

- High incidence of neonatal deaths with the highest incidence occurring in the Pixley district.

PROGRESS ON NaPeMMCo RECOMMENDATIONS

1. Normalization of HIV as a chronic disease
   - Improve PMTCT programme.
   - Availability of ARV's
2. Clinical Skills improvement e.g. ESMOE, BANC, Neonatal Resuscitation
   - Rotation of nursing staff between clinic and hospital.
3. Training/education e.g. Nursing Training
   - HIV Management (PCR)
   - Breast Feeding
   - IMCI
4. Implementation (Availability in facilities) of national guidelines
   - Campaign 7 -20th Sept 2009: Deworming, Vitamin A, MUAC
5. Postnatal Care - clinic/home visits -CHW
   - Breastfeeding enhancement
   - Post-natal visits (3 -7 days post partum)
6. Regional Clinicians appointments
7. Auditing, monitoring and evaluation e.g. use of DHIS, PPIP and Child PIP by facilities
   - Workshops on PPIP and Child PIP in the province
   - Use of the following to capture data:
     Standard birth register
     Standard admissions register
     PPIP monthly Tally Sheet
     Child PIP monthly Tally Sheet
     DHIS
8. Constant health messages e.g. radio, TV, posters in clinics
   - Press conference
   - Breastfeeding week
   - Child health week
   - Meeting with the Social Cluster Cabinet of the NC
9. Staffing, equipment and facilities
   - Neonatal resuscitation equipment
10. Transport and referral routes

- Training ambulance personnel to take patients to nearest health care facility to be stabilized.

RECOMMENDATION THAT NEED TO BE TAKEN BY THE PROVINCE

- Equipment Needed for Newborns and Training
  - KMC (Kangaroo Mother Care)
  - CPAP (Continuous Positive Airway Pressure)
  - Training (Resuscitation and care of neonates
  - Adequate neonatal and paediatric resuscitation
  - Equipment (audit and provide)
  - Oxygen Saturation monitors with neonatal and paediatrics
  - probes
  - Intravenous infusion pumps
- Exclusive Breastfeeding
- Postnatal visit 3-7 days after discharge at home or at a clinic
- Improve antenatal and intrapartum care (BANC/ESMO/PEP)
- Completeness of the H10 card (Booking Blood Results)
- Reduce nosocomial Infections
- Public Awareness:
  * If you are pregnant
    - Go to clinic as soon as you know you are pregnant
    - Know you HIV status
    - Stay HIV negative
    - Stop Smoking
    - Don't drink alcohol
    - Deliver in Hospital or Clinic
  * In the first year of life:
    - Only breast milk for the first 6 months
    - Take baby to clinic 3-7 days after birth for check-up
    - Take baby for immunizations and weight check at 6, 10, 14 weeks and 9 and 18 months
    - Weigh baby monthly at clinic
    - If you are HIV positive take you baby for testing at 6 weeks
- Audits and management: Quarterly Reports from districts

CHAPTER 21

WESTERN CAPE

Author: N. Rhoda

INTRODUCTION

The Western Cape (WC) province has a population of approximately 5,5 million people. In addition Stats SA states that the WC is one of only 2 provinces where there is an influx of people at a rate of 250 000/ annum. The impact of this migration of population is hardest felt within the West Coast (69% increase) and Eden district which borders the Eastern Cape (EC).

The provincial deliveries per annum are approximately 97 000, with 75% of these within the metropole of Cape Town. The growth rates for the metro is 5% and for the rural districts about 10%. All hospital neonatal units within the metro are functioning at 120% bed occupancy. It is with these realities that a co-ordinated neonatal blue print plan was drawn up in 2008. Systematically the province is addressing and implementing changes that will have a direct effect on reducing perinatal mortality and thereby achieve Millenium Development Goal 4.

PROVINCIAL NEONATAL MORBIDIDTY AND MORTALITY COMMITTEE (ProPeMMCo) COMPOSITION

People attending the ProPeMMCo subcommittee meeting

Chair: Mrs Edna Arends / Dr N R Rhoda
Secretary: R Peters / K Adams
National Rep./ Provincial facilitator from NaPeMMCo: Dr N R Rhoda
PPIP co-ordinators:
Metro West: Drs M T Ismail, C Van Nelson, L Dietrich, D Nage
Metro East: Drs M Wates, M Nieuwhoudt, W Viljoen, F Patel, Prof W Steyn
West Coast: Dr S Gebhardt, J Spicer
Overberg / Cape Winelands: Dr CharlOettle
MNCWH: all 6 districts: Ms S Neethling,Ms V Adriaans, Ms G Terblanche, Ms D Nortje, Dr SB van Schoor

DHIS + Child PIP + Home Affairs: have been invited to attend the meetings.

Number of meetings held to date = 5, November 11th, February 6th, June 19th, Sept 18th, 2009 and February 26th, 2010
Number of meetings the following people attended

Chair and National Rep:	5
PPIP:	5
MNCWH:	5

Telephonic communication and data comparisons ongoing with Home Affairs, DHIS and Child PIP.

DATA SOURCES

The following are the data sources which collect data on neonatal deaths and could be accessed by the committee.

Home Affairs : Birth and death registrations

Towards the end of 2009, discussion ensued over the perinatal deaths, but analysis has proven that the undercount is approximately 10 - 30%. All 6 provincial districts are reporting.

DHIS

DHIS data is not validated, has a lag phase of 3-4 months and most importantly it underscores the perinatal deaths by between 10-50%. All 6 provincial districts are reporting.

PPIP

PPIP is 100% functional within the province, has appointed doctors who perform validation checks before data submission and is an accurate account of perinatal deaths. PPIP data is thus solely used for neonatal planning and reporting in the province. All 6 provincial districts are reporting.

Child PIP

Recently Dr Kunneke has managed to get her Cape Winelands district on board but still requires 2 regional and 12 district hospitals to come on board before late neonatal deaths can be accurately assessed. Only 2 provincial districts are reporting.

Sinjani

Provincial data source which interacts in real time with DHIS, currently has a shorter lag phase but still had gross inaccuracies where death are concerned when audited (between 5-40%). Data is sent on the 7th of the month, so late entries might miss the cut off date.

All 6 provincial districts are reporting.

EFFORTS TO IMPROVE QUALITY OF MINIMAL DATASETS:

Actions that are taken to improve the quality of DHIS Data

1. SINJANI loaded on all managers PCs

2. SINJANI training to all managers

3. Validity checks done by PPIP coordinators

4. Quarterly updates by district managers

PPIP DATA ANALYSIS FOR 2009

Table 21.1 MNCWH: PPIP and CHIP facilities

	W. Cape (Total)	Tertiary	Regional	District	MOU
Number of hospitals conducting births in the province	51	2	5	30	14
Number of hospitals using PPIP in the province	51	2	5	30	14
Number of hospitals using Child PIP in the province	14	3	3	8	0

Table 21.2 Summarized Minimal Dataset Year 2009: PPIP all births > 500g

	Total Province	District 1 Metro	District2 Cape WL	District 3 C Karoo	District 4 Eden	District 5 Overberg	District 6 W Coast
Total Births	93990	62428	13188	1320	9541	2660	4853
Stillbirths	2279	1619	284	21	212	47	96
Total Live births	91711	60809	12904	1299	9329	2613	4757
E. Neonatal Deaths	690	418	113	18	77	28	36
L. Neonatal Deaths	106	80	16	1	5	2	2

Table 21.3 Summarized Minimal Dataset Year 2009: PPIP>1000g)

	District 1 Metro	District2 Cape WL	District 3 C Karoo	District 4 Eden	District 5 Overberg	District 6 W Coast
Stillbirth Rate	16	12.7	6.5	12.6	12.2	7.5
Early Neonatal Mortality Rate	3.7	5	4.8	4.4	4.6	4.6
SB:NND	3.3:1	2.2:1	1.3:1	2.61	1.6:1	2.5:1
PCI	1.2	0.9	0.8	0.9	1	0.8

Table 21.4 Summarized Minimal Dataset Year 2009 According to Facilities (all births)

	W. Cape (Total)	Tertiary Hospitals	Regional Hospitals	District Hospitals	MOU
Total Births	93385	11766	24372	29891	27961
Stillbirths	2258	907	625	526	221
Total Live births	91127	10859	23747	29365	27740
E. Neonatal Deaths	679	187	207	219	77
Early Neonatal Mortality Rate	7.4	17.2	8.7	7.5	2.8

Table 5: Summarized Minimal Dataset year 2009: PPIP>1kg

	W. Cape	Tertiary	Regional	District	MOU
SB Rate	14.5	44	15.4	11.7	5.4
Early Neonatal Death Rate	4.1	9.5	4.0	4.5	1.8
SB: NND	2.9:1	3.7:1	2.6:1	2.3:1	2.7:1

Table 21.6 COMMON OBSTETRIC CAUSES OF DEATH

Spontaneous PTL
APH
Hypertension
IUD
Infections
Intrapartum asphyxia

Table 21.7 COMMON NEONATAL CAUSES OF DEATH

Immaturity (Extreme MO Immaturity)
Hypoxia
Congenital Abnormalities
Infection (septicaemia)

Table 21.8 Trends in PNMR and ENNMR from PPIP years 2007 -2009

PNMR				**NATIONAL**
	2007	2008	2009	
All	36.9	30.8	33.4	39.6
All > 999g	22	18.4	19.5	27.2
500 - 999	780	740.4	743.7	797.8
1000 - 1499	293.1	261.9	252.1	347.9
1500 - 1999	129.1	89.8	109.6	161.8
2000 - 2499	35.7	35.8	33	48.4
2500+	7.9	6.4	7.1	10.4
1000 - 1999	173.3	151	162.3	

ENNMR				**NATIONAL**
	2007	2008	2009	
All	9.4	7	8.9	11.1
All > 999g	4.6	3.8	4.8	5.9
500 - 999	497.2	401.4	447.9	532.5
1000 - 1499	82.2	69.9	82.5	130.8
1500 - 1999	21.5	16.3	20.5	33.7
2000 - 2499	6.4	6	6.7	8.3
2500+	2	1.6	2.2	3.3
1000 - 1999	41.7	33.7	31.1	68.4

Table 6 demonstrates that even though the Western Cape data is consistently below the national figures, it is exceedingly difficult to maintain these decreasing trends.

We have thus for 2010/11 focused our energies and resources on the very important transversal issue of neonatal nursing training, and with emphasis on the small and sick neonates.

Only then can we realistically set targets for the ENNDR in the following weight categories:

Table 9: Targets for 2012 according to birth weight

Weight category	Target for 2012
1000 – 1499	50
1500 – 1999	15
2000 – 2499	5
2500+	1
1000 – 1999	30

Table 10: Causes of Neonatal Deaths According to Districts

Rank	Provincial	Metro	CW/lands	C/Karoo	Eden	Overberg	W/Coast
No of deaths>	708	418	122	17	81	32	38
1	Immaturity related	Immaturity related	Immaturity related	Immaturity related	Immaturity related	Immaturity related	Immaturity related
2	Hypoxia	Hypoxia	Hypoxia	Hypoxia	Hypoxia	Hypoxia	Cong Abnorm
3	Cong Abnorm	Cong Abnorm	Infection	Cong Abnorm	Infection	Cong Abnorm	Hypoxia
4	Infection	Infection	Other	Other	Cong Abnorm	Other	Other

QUALITY OF CARE BY PLACE (AVOIDABLE FACTORS) - PPIP

Home

- Lack of transport home to institute
- Patient declines admission
- Family declines admission

Clinic

- Syphilis related
- Personnel not sufficiently trained to manage patient
- Inadequate facilities / equipment for neonates

Labour ward

- Inadequate intrapartum monitoring
- Inadequate estimation of gestation / fundal growth
- Inadequate hypertension management

Nursery

- Management plan inadequate
- Inadequate monitoring
- Inadequate Resuscitation equipment

QUALITY OF CARE BY PERSON (AVOIDABLE FACTORS) - PPIP

Caregiver / Patient

- Never initiated care
- Delay in seeking medical attention during labour
- Inappropriate response to poor foetal movements

Healthcare provider/ medical personnel

- Delay in referring patient for 2/3 treatment
- Fetal distress not detected despite monitor
- no response to poor uterine fundal growth, maternal HPT, history of SB

Administrator

- Lack of transport (home/institute to institute)
- Inadequate theatre facilities
- Personnel not sufficiently trained to manage patient
- No access to NICU or ventilator

PROGRESS ON IMPLEMENTATION OF NaPeMMCo RECOMMENDATIONS: MNCHW

1. Normalization of HIV as a chronic disease
    - PMTCT roll out to all birthing facilities
    - Appointment of NGO's e.g. Love Life counselors who ensure that all pregnant mothers are offered VCT in antenatal clinics and at tertiary centres
    - Pasteurization of all milk to HIV positive mothers
    - All HIV exposed babies are offered their mothers' pasteurized EBM
    - Usage of Milk Banks instead of formula milk
2. Clinical Skills improvement e.g. ESMOE, BANC, Neonatal Resuscitation
    - ESMOE with BANC at all clinics, coverage 90% of birthing facilities
    - Estimated 65% of staff are trained in neonatal resuscitation with accreditation in process from training facility.
    - All hospitals have adequate resuscitation equipment.
3. Training/ education e.g. Nurses Training

- Neonatal IMCI program for accreditation at nursing college
- MCWH has PEP training course resurrected and included as SPMS for nurses
- Booklet for all district hospital on management of neonates

4. Implementation (Availability in facilities) of national guidelines
    - Hospital visits to check that guidelines available
    - Level 1 management guidelines to all hospitals (FREE)
    - WINC accreditation process – started 2009/10
5. Postnatal Care- clinic/ home visits- CHW
    - Ambulatory KMC pilot: CBS workers pilot project to discharge stable babies home earlier- June 2009
6. Regional clinicians' appointments
    - CSP funded 3 paediatricians for each of 5 regional hospitals ,currently 3 of the 5 regional hospitals have a neonatologist as the 3rd paediatrician
7. Auditing, monitoring & evaluation e.g. use of DHIS, PPIP and Child PIP by facilities
    - All facilities have functional PPIP, CHIP base growing
    - Provincial stats and analysis sent to district managers.
8. Constant health messages e.g. radio, TV, posters in clinics
    - Work in progress with health promotion and prevention plan
9. Staffing, equipment and facilities
    - Staffing norms calculated and in process of negotiation with HR
    - Neonatal equipment list available and updated regularly
    - WINC accreditation target 2 hospitals for 2009/10
10. Transport and referral routes
    - Dedicated neonatal ambulance with retrieval team in metro, still reducing the response time to rural areas.
    - Referral routes in place and updated a/c to drainage areas

MDG PROGRESS

Currently our province is focusing on the neonate weighing more than 1000g. The early neonatal mortality rate in this weight category is 4.1/ 1000 live births and the perinatal mortality rate is 20/ 1000 births and these indicators are well within the MDG 4. Late neonatal deaths will be quantifiable once we have Child PIP being used by at least 50% of hospitals.

ACHIEVEMENTS AND FUTURE PLANS FOR THE WESTERN CAPE

Using our PPIP data we were able to plan in a systematic way, interventions that would directly reduce the number of deaths within the province. Thus for 2008/9 the following was planned and budgeted for:

Achievements for the Year 2008/9:

All facilities using PPIP: 100% functional PPIP. Over the last 2-3 years of visiting all sites within province and training, we finally managed to get PPIP used by all facilities (Use of PPIP 100% in the province).

Dedicated Transport services for neonates. Sick babies must get to the right level of care quickly with ambulance medics trained in neonatal emergency care. We offer training at the tertiary centre Groote Schuur Hospital. The response time is 40 minutes within the metro and 1 hour beyond.

Year 2009/10

- Resuscitation training for all staff attending births. With Hypoxic deaths still the major cause of death in >2,5kg babies, this is an important intervention, and must be ongoing in order to see the impact on death reductions in this weight category.
- CPAP roll out at pressure points within the province
- 2 tertiary hospitals
- 5 regional hospitals
- 10 carefully chosen district hospitals (2 working, 5 in process, 3 planned for 2010/11)
- Reduction of neonatal indicator Early Neonatal Deaths (ENNDR) in >1000g
- Monitor intrapartum care and neonatal care. Acquisition of the right equipment and neonatal care guidelines was central to have an effect on ENNDR.
- Ambulatory KMC
- Dehospitalizing patients while desired must be done in a safe manner and the pilot has proven to be extremely successful by using the community workers and dieticians. Roll out is planned to sites over a 5 year plan!

Year 2010/11

- Neonatal training for nurses
- Postnatal care package
- 3rd regional Paediatrician

RECOMMENDATIONS FOR OUR PROVINCE

a). Provincial Recommendation

Building the ProPeMMCo

Composition –it must have representatives from all levels of staff both medical and nursing

Credibility –Yes, it is credible as 2 provincial co-ordinators attend these meetings

Function –Update on data
–Forum for problems encountered in e.g. administration, procurement etc
–Sharing of experiences
–Time to say thank you for hard work done!

Setting health priorities for the perinatal population

2009/10

- 100% birth attendants trained in neonatal resuscitation and care
- CPAP at targeted district hospitals
- Rapid and efficient transport to regional / tertiary levels

2010/11

- 3rd Regional paediatrician
- Ambulatory KMC roll out
- Neonatal nursing training 10/11

Improving quality of care for the perinatal population

Quarterly checks

Identify gaps

Respond and implement changes appropriately and at regular intervals.

QA must be integrated into clinical governance at all levels and at all times.

b). National Recommendations

How can my ProPeMMCo contribute?

- Team work and communication is vital to success, and acknowledgement of hard work and commitment to PPIP.
- While it remains outside the domain of SPMS, it is a hard slog to get motivated people to do the job, but incorporated it allows managers to see the value of good data for the institute.
- PPIP data belongs to the institute and must be viewed as such in order for it to be accepted by all and especially higher management levels.

How can my data contribute?

- Good data (quality and validity) allows for good planning and there is no substitute for that.
- More importantly the data collection is only credible if it undergoes a process of validation by people familiar with the system and the patient, and therefore clinicians are best placed to fulfil this role.
- Unfortunately, PPIP co-ordinators must do process analysis when they audit facilities.

How can my province's innovations contribute?

- While pilot projects provide evidence within a particular setting, they can be adapted for different areas and provinces.
- Furthermore, our province demonstrates that without a provincially placed person to co-ordinate all the data, it unfortunately quickly falls off the wagon.

CHAPTER 22

COUNTRY REFLECTION BASED ON PROVINCIAL REPORTS

Author: R.C. Pattinson

INTRODUCTION

The National Perinatal and Neonatal Morbidity and Mortality Committee (NaPeMMCo) was one of the Ministerial Committees established in March 2008. The terms of reference for the functioning of this committee included the following; establishing South Africa's perinatal mortality rate (PNMR), the stillbirth rate (SBR) and the neonatal death rate (NNDR); auditing stillbirths and neonatal deaths occurring in the country; identifying the causes of mortality (pathological and health systems related problems); develop recommendations that will prevent further deaths; advise on methods of strengthening clinical audit; and to monitor and evaluate with particular reference to the implementation of the recommendations.

Establishing reliable a PNMR, SBR and NNDR for the country would allow monitoring of the mortality trends and enable the Department of Health to monitor the impact of their various interventions and thus be able to intervene where problems are identified. Data flow in South Africa follows a hierarchical system where the initial data is collected at the maternity units; it is then sent to the sub-district or district; which in turn sends the data to the province and from there onto the national department of Health. The system used in most provinces is the District Health Information System (DHIS) and the various national indicators are derived from this data. If the data are collected poorly or transferred inadequately then the various indicators will be inaccurate. Thus the committee realized that it can only fulfil the terms of reference related to the establishing the mortality rates if the information is reviewed critically at the provincial level. The data would need to be reviewed at the maternity units and at the district before being submitted at the provincial level. Therefore the committee decided to establish provincial committees where all the provincial data from different maternity units and districts should be reviewed. It was agreed that these committees would be composed of a member of the NaPeMMCo from that province who will act as a facilitator or chairperson of his/her provincial sub-committee; the coordinator of the provincial maternal, child and women's health (MCWH) directorate; the provincial coordinator for Perinatal Problem and Identification Program (PPIP), the provincial coordinator for Child health Problem Identification Program (Child PIP), the provincial coordinator for the DHIS, and a member from the provincial Home Affairs. The MCWH would coordinate the organization of the meetings of these provincial committees. The coordinators of all provincial MCWH were invited to one of the NaPeMMCo meeting to present to them this idea of forming provincial committees and need for their support to co-ordinate these meetings. Letters from the Maternal, Child and Women's Health and Nutrition cluster of the National Department of Health were sent to all Provincial Director Generals of Health (or their equivalents) for their information.

This chapter reviews the functioning of the various Provincial Perinatal Morbidity and Mortality Committees (ProPeMMCo); the progress to establishing reliable mortality rates; progress on systematically auditing information on the causes (both pathological and health system related) of perinatal deaths; and progress on implementation of the recommendations made in the previous NaPeMMCo report in 2008 and other Saving Babies reports. The information is taken from the provincial reports submitted for the 2009 NaPeMMCo report.

Table 22.1 Summary of functioning of ProPeMMCo, data sources, reliability, audit coverage and implementation of recommendations in 2009

	Eastern Cape	Free State	Gauteng	KwaZulu-Natal	Limpopo	Mpumalanga	North West	Northern Cape	Western Cape
Committee established	Yes	Maybe: Combination of 3 national committees	No	Yes	Yes	Yes	Yes	Yes	Yes
Committee functional	No	No	No	Yes	Yes	Yes	No	Yes	Yes
Meetings held 2009	Yes x3	Unknown	No	Yes x 2	Yes x3	Yes x2	Yes x1	Yes x4	Yes x5
DHIS data reliable	Available but questionable	Available but deaths correlated poorly with StatsSA.	Unknown	No	Yes	Yes	No	Available not reliable	No
PPIP sites	36 of possible 70	4	Unknown	29 of possible 54	37 of possible 37	28 of possible 28	16 sites	11 sites (2 complete)	51 of possible 51 (includes all CHCs)
Child PPIP sites (submitting data)	6	1	2	26	3	26	7	2	11
Causes available	Partly	No	No	Yes	Yes	Yes	Partly	Unreliable	Yes
Implementation recommendations	Limited	Limited	Limited	Limited	Comprehensive	Comprehensive	On track	Uncertain	Comprehensive

Maternity units include units in tertiary, regional, district hospitals and community health centres

Results

Table 22.1 summarizes the functioning of the ProPeMMCo, reliability of DHIS data, coverage of systematic auditing of perinatal deaths and implementation of the recommendations from the last NaPeMMCo report.

Establishing the ProPeMMCos has not been widely successful. National mortality rates are not possible to calculate with accuracy from the DHIS data. Only two provinces were able to report that their DHIS data was accurate. Systematic auditing of perinatal deaths using PPIP is complete in 3 provinces, on track to involve all provincial maternity units in 4 provinces and dysfunctional in 2 provinces. Child PIP is a relatively new child health care audit system and has complete penetration in 1 province, and is progressing at various speeds in the remaining 8 provinces. Audit data useable for planning is available in 5 provinces, some information in 2 and not available in 2. There has been a comprehensive attempt to implement the NaPeMMCo recommendations in 3 provinces, some progress in one and no reliable information in five provinces.

Overall three provinces, (Limpopo, Mpumalanga and the Western Cape) have managed to achieve most of the objectives of the NaPeMMCo, four provinces are showing some progress (Eastern Cape, KwaZulu-Natal, North West and Northern Cape) and two provinces have not been functional (Gauteng and Free State).

Discussion

Limpopo, Mpumalanga and the Western Cape have a complete understanding of their problems in perinatal care. The Western Cape has developed a very sophisticated system and is able to respond quickly to problems developing in their service. It is remarkable that the other two provinces (Limpopo and Mpumalanga) have managed to reach the level they have as they are generally regarded as resource-challenged provinces. Further Limpopo has initiated and sustained the Limpopo Initiative for Neonatal Care (LINC) programme which is a model programme and illustrates how change can occur if there is a concerted effort in a particular direction. It must not be under estimated the achievement of these two provinces. It also clearly demonstrates that if these two provinces can achieve this level of functioning, there should be no excuses for the other provinces.

The Eastern Cape, KwaZulu-Natal, North West and Northern Cape all show promise and appear to be on track to emulate the top three. However, each has their own specific problems, mostly related to capacity and understanding, but some also have managerial or political problems.

The Free State has been administratively dysfunctional for some time and this has led to the loss of what was once a functioning system. The DHIS data in the Free State was once the most reliable in the country, and with the help of the medical school, regular reporting and auditing of care was developing. However, due to provincial political problems and the inability of administrators to make and carry out decisions and appointments, the system collapsed. The infrastructure still remains, as does a willing spirit amongst the health care providers previously involved in the system, so once there is political stability in the province, the Free State should be able to rebound quickly.

Perhaps most surprising and most disappointing has been the lack of any significant participation by Gauteng. Gauteng does not have any capacity problems with three medical schools within its borders, but has had major organizational problems within the MCWH unit. In the early and mid part of the decade Gauteng was developing a functional organized maternal and perinatal service with monitoring and evaluation included. However in the latter part of the decade all this was reversed. In late 2009 the MCWH coordinator was removed and recently a permanent a replacement was appointed. It is hoped this will allow Gauteng to come back on track. Only in 2010, that Gauteng has started putting the ProPeMMCo together.

What does this mean nationally? South Africa cannot report accurate national perinatal mortality rates so cannot assess whether there is national progress or not. One of the focus points must be to support the four provinces that are on track (but with significant hurdles ahead), to ensure the two poorly functioning provinces are turned around and the three successful provinces continue to receive the support and acclaim that is their due.

However this does not mean there should be no concerted national effort in 2011 and beyond to improve the quality of perinatal care. In other words we do not have to wait for complete information before starting to tackle some problems.

President Zuma on the 1st December 2009 announced radical changes to the way HIV infected women and their babies were to be managed. He broadcast this to the nation so all citizens were informed and all health care providers knew what was expected of them. There was no ambiguity in the statement. The President had by-passed the usual mechanisms of communication within the health system and the health care managers suddenly had to meet the expectations of not only their senior managers but the demands for resources, skills and knowledge from the health care providers below. They had to and to their credit did scramble to meet the deadline of 31st March 2010. Although not all targets have been met yet there has been a concerted and sustained effort to get the systems, knowledge and skills in place. This focused approach has brought about a major improvement in managing HIV infected women and their babies.

The Saving Babies reports since 2000 have listed the major pathological causes and health system failure in perinatal care and the findings are in line in what is being reported by the provinces. It is known that birth asphyxia is a major cause of perinatal death and is the most avoidable cause of perinatal death. We know prematurity is responsible for the majority of neonatal deaths.

The synthesis of the maternal and perinatal causes of death demonstrated by Mpumalanga show that almost half of perinatal deaths and 20% of maternal deaths are related to labour. Deaths due to complications of hypertension and antepartum haemorrhage are mostly obstetric emergencies and also occur in labour wards. Thus if perinatal and maternal deaths related to hypertension and antepartum haemorrhage (25% and 15% respectively) are added to the labour related deaths then three quarters of perinatal deaths and a third of maternal deaths are concentrated around the labour ward and are obstetric emergencies. Improving the clinical management of obstetric emergencies will have a large and immediate impact on the maternal and perinatal mortality rates. It is calculated that almost 6300

neonatal and 900 maternal deaths in South Africa can be prevented if emergency obstetric care is improved. (*Kinney MV, Lawn JE, Kerber KJ, eds. Science in action: Saving lives of Africa's mothers, newborns and children. Cape Town, South Africa. Report for the African Academy Science Development Initiative, 2009*)

The major health care providers involved in the HIV focused programme are those in the clinics and the health care providers in the labour wards have had to only make relatively minor adjustments to their care. This means that another focused programme on emergency obstetric care will not divert attention from the HIV programme but the two together will address issues related to three quarters of all maternal deaths and three quarters of all perinatal deaths. The two together will have a major impact on maternal and perinatal mortality.

Members of the National Committee for the Confidential Enquiry into Maternal Deaths (NCCEMD) and the NaPeMMCo along with all medical schools and input from various other stakeholders like the professional bodies (Midwife Association of South Africa, South African Society of Obstetricians and Gynaecologists, the South African Paediatric Association, the South African Anaesthetic Association and the Colleges of Medicine) have developed a training programme aimed at improving the knowledge and skills in managing obstetric emergencies of health care providers. The programme Essential Steps in Managing Obstetric Emergencies (ESMOE) has been shown to improve knowledge and skills when tested on interns. The programme concentrates in improving knowledge and skills of health care providers working in labour wards and includes modules on neonatal resuscitation, maternal resuscitation, managing obstetric complications and conditions such as eclampsia and postpartum haemorrhage. It is been scaled up throughout the country at present and has three objectives:

- Ensure all pre-service learners at medical schools and nursing departments and colleges have all the elements of ESMOE in their undergraduate curricula.
- Ensure all interns are trained in ESMOE before starting their community service year.
- Ensure all maternity units (664 in South Africa) run emergency obstetric simulation training exercises at least monthly and that the personnel involved in and the score for each exercise are documented and given to the CEO of each of the institutions.

Funding has been obtained from various donor agencies such as the WHO, UNFPA, UNICEF and from private institutions such as Discovery Health. It is possible to meet all these objectives by December 2012.

The HIV programme announced by President Zuma has demonstrated the value of concentrating on a single intervention that has a big impact which will save a lot of lives. Other than managing women and children with HIV infection, obtaining the "biggest bang for your buck" in maternal, neonatal and child health care is in investing in improving emergency obstetric care. It will result in a rapid reduction of maternal and perinatal deaths. It has the further major advantage of being imminently achievable.

It is the recommendation of the current NaPeMMCo that (other than actively supporting the various women and child HIV programmes) the introduction of ESMOE and emergency obstetric simulation training exercises throughout the country should be focused on until 2012. By 2012 all maternity units should have members trained in ESMOE and all these units should be conducting regular (monthly) emergency obstetric simulation training exercises.

The second intervention that the committee is recommending is for each province to have regional clinicians who can develop outreach program in perinatal/neonatal services for the district and regional hospitals.

APPENDIX

Appendix 1

Comparison of Neonatal Data from DHIS accessed from Provinces compared to the one accessed from National DHIS for the years 2007-2009

		Total Births			Stillbirths			Early Neonatal Deaths		
		2007	2008	2009	2007	2008	2009	2007	2008	2009
Eastern Cape	Provincial	120375	119261	124978	3109	2687	2773	1433	1697	1436
	National	113564	121132	133609	2935	2659	2966	1468	1536	1461
	% Diff.*	5.7	-1.6	-6.9	5.6	1.0	-7.0	-2.4	9.5	-1.7
	Diff.	6811	-1871	-8631	174	28	-193	-35	161	-25
Free State	Provincial	58952	59931	55140	1872	1746	1657	562	550	560
	National	59843	60066	55470	1873	1739	1659	562	532	542
	%Diff.	-1.5	-0.2	-0.6	-0.1	0.4	-0.1	0.0	3.3	3.2
	Diff.	-891	-135	-330	-1	7	-2	0	18	18
Gauteng	Provincial	164369	192280	193887	3360	4394	4202	1260	1631	1774
	National	203055	205287	211507	4020	4279	2141	1478	1576	1809
	% Diff.	-23.5	-6.8	-9.1	-19.6	2.6	49.0	-17.3	3.4	-2.0
	Diff.	-38686	-13007	-17620	-660	115	2061	-218	55	-35
KwaZulu-Natal	Provincial	194885	204007		4929	4584		1098	1256	
	National	207532	217364	214713	5180	4910	5088	1098	1256	1053
	% Diff.	-6.5	-6.5		-5.1	-7.1		0.0	0.0	
	Diff.	-12647	-13357	-214713	-251	-326	-5088	0	0	-1053

		Total Births			Stillbirths			Early Neonatal Deaths		
		2007	2008	2009	2007	2008	2009	2007	2008	2009
Limpopo	Provincial	120900	126565	123479	2652	2808	2670	1378	1287	1289
	National	128297	134680	129568	2888	3145	2970	1378	1287	1320
	% Diff.	-6.1	-6.4	-4.9	-8.9	-12.0	-11.2	0.0	0.0	-2.4
	Diff.	-7397	-8115	-6089	-236	-337	-300	0	0	-31
Mpumalanga	Provincial	69518	75880	73365	1660	1817	1815	809	735	810
	National	73044	79461	78463	1844	1896	2063	794	793	788
	%Diff.	-5.1	-4.7	-6.9	-11.1	-4.3	-13.7	1.9	-7.9	2.7
	Diff.	-3526	-3581	-5098	-184	-79	-248	15	-58	22
North West	Provincial	61108	65078	63342	1461	1485	1488	590	628	594
	National	65588	68004	63908	1596	1649	1791	590	619	586
	% Diff.	-7.33	-4.5	-0.9	-9.24	-11.0	-20.4	0.00	1.4	1.3
	Diff.	-4480	-2926	-566	-135	-164	-303	0	9	8
N. Cape	Provincial	21503	22020		505	517		291		
	National	23379	23914	23254	572	586	520	304	242	212
	% Diff.	-8.72	-8.6		-13.27	-13.3		-4.47		
	Diff.	-1876	-1894	-23254	-67	-69	-520	-13	-242	-212
Western Cape	Provincial	98348	103106	103926	2202	2184	2554	581		690
	National	103961	99581	104295	2202	1818	2828	518	398	455
	% Diff.	-5.71	3.4	-0.4	0.00	16.8	-10.7	10.84		34.1
	Diff.	-5613	3525	-369	0	366	-274	63	-398	235

		Total Births			Stillbirths			Early Neonatal Deaths		
		2007	2008	2009	2007	2008	2009	2007	2008	2009
TOTALS	Provincial	909958	968128		21750	22222		8002		
	National	978263	1009489	1014787	23110	22681	22026	8190	8239	8226
	% Diff.	-7.51	-4.3		-6.25	-2.1		-2.35		
	Diff.	-68305	-41361		-1360	-459		-188		

* - Difference

Appendix 2: DHIS STATISTICS

Province:
Health District:
Institutional/Facility Births

Weight Category	Total Births(Babies)	Stillborn		Neonatal death	
		Fresh	Macerated	Early	Late
500 –999g					
1000 – 1499					
1500 – 1999					
2000 – 2499					
2500 +					
TOTAL					

Born Before Arrival in Hospital

Weight Category	Total Births(Babies)	Stillborn		Neonatal death	
		Fresh	Macerated	Early	Late
500 –999g					
1000 – 1499					
1500 – 1999					
2000 – 2499					
2500 +					
TOTAL					

Multiple pregnancies: Twins _____
Triplet's _____

Total Number of deliveries (mothers): _____
Number Women <18 years: _____
Number Women >34 years: _____

Syphilis status: Number Negative _____
Positive _____
Unknown _____
HIV status: Number Negative _____
Positive _____
Unknown _____

Route of delivery: Number
Normal vaginal birth: _____
Breech _____
Assisted birth – Vacuum: _____
Forceps: _____
Total: _____
Caesarean Sections _____

Number attended antenatal care (first visit): _____
Number Antenatal care started before 20 weeks: _____

PMTCT Data

Number women tested for HIV at antenatal clinic _____
Number women testing HIV positive _____
Number women on AZT _____
Number women on HAART _____
Number Neonates given NVP _____
Number HIV exposed babies that receive PCR test at 6 weeks _____

Indicators

Weight category	Stillbirth rate	Neonatal Death Rate	Perinatal Mortality rate
500-999g			
1000-1499g			
1500-1999g			
2000-2499g			
2500g+			
Overall (500g+)			
Overall (1000g+)			

Low Birth Weight Rate (%) _____
Perinatal Care Index _____
Caesarean section rate (%) _____
Assisted delivery rate (%) _____
Proportion teenage pregnancies (%) _____
Prevalence Syphilis _____
Prevalence HIV positive women _____
Proportion women attending Antenatal Care _____
Proportion women starting antenatal care <20 weeks _____
PMTCT indicators
Proportion women HIV tested at antenatal clinic _____
Proportion women testing HIV positive _____
Proportion HIV infected women on AZT _____
Proportion HIV infected women on HAART _____
Proportion HIV exposed Neonates given NVP _____
Proportion HIV exposed babies
that receive PCR test at 6 weeks _____

Indicator definitions

Stillbirth rate: SB/All births (in 500g birth weight categories from 500g)

Neonatal death rate: NND/Live births (in 500g birth weight categories from 500g)

Perinatal mortality rate: SB+NND/All births (in 500g birth weight categories from 500g)

Low birth weight: All births < 2500 (including SB and NND)/ All births

Perinatal care index: Overall PNMR (/1000)/LBWR (%)

Caesarean section rate: Number C/S/all births (babies)

Assisted delivery rate: Number assisted delivery/All births (babies)

Proportion of teenage pregnancies: Number women <18 years/all deliveries (mothers)

Prevalence of syphilis: Number Syphilis positive/number positive +number negative

HIV prevalence: Number HIV positive/number HIV negative + number positive

Proportion of women who attended ANC: Number attended/number deliveries (mothers)

Proportion of women starting antenatal care before 20 weeks: Number attended/number deliveries

Proportion women tested for HIV at antenatal clinic: Number/All attended antenatal clinic

Proportion women testing HIV positive: Number/Number tested

Proportion HIV infected women on AZT: Number/Number tested positive

Proportion HIV infected women on HAART: Number/Number tested positive

Proportion HIV exposed Neonates given NVP: Number/Number mothers tested HIV+

Proportion HIV exposed babies that receive PCR test at 6 weeks: Number/mothers tested HIV +

Appendix 3

SUGGESTED STAFFING NORMS FOR NURSES (Adopted from Fifth Perinatal Care Survey of South Africa 2003-2005).

1. Maternity
These are conservative calculations
i. Antenatal care: 2-3 midwives per 100 bookings per month on the staff establishment
ii. Labour Ward and postnatal wards: 16 midwives per 100 deliveries per month on the staff establishment at a level I health care facility

2. Newborn Care
i. Intensive care (Level 3):
Ideal: 1 nurse to 1 patient
Acceptable: 1 nurse to 2 patients
(These need to be Professional Nurses, preferably with Neonatal Training)
ii. High care (Level 2):
Ideal: 1 nurse to 2 patients
Acceptable: 1 nurse to 3 patients
[These could be Enrolled Nurses or Enrolled Nursing Assistants. But there would need to be a Professional cover (2 per 12-15 patients)]
iii. Level 1:
Ideal: 1 nurse to 4 patients
Acceptable: 1 nurse to 6 patients
[These could be Enrolled Nurses or Enrolled Nursing Assistants with Professional Cover (1 per 12-15 patients)]

Appendix 4

EQUIPMENT REQUIRED FOR LEVEL 1 AND LEVEL 2 HOSPITALS

1. Resuscitation

General

Clock
Overhead radiant warmer with surface for the infant
Clean towels or receiving blankets
Stethoscopes
Gloves
Alcohol swabs
Sterile gauze
Scissors
Scalpel blade
Adhesive tape
Intravenous solutions: Normal saline, Non-potassium neonatalyte or 5% dextrose water
Intravenous giving sets and buretrol (50-100 ml)
Intravenous rate controller or "dial-a-flow"
Syringes: 1; 2.5; 5; 10 and 20 ml
Needles: 18, 21, 25 G
Intravenous catheter: 24 G
Feeding tubes: 5 and 8 F

Suction (Airway)

Suction apparatus: either wall unit or mobile/ portable unit with pressure manometer and tubing
Suction catheters: 8 F or larger

Bag and Mask (For Ventilation/ Breathing)

Self inflating resuscitation bag (Ambu/ Laerdal): Neonatal size with oxygen reservoir
Round face masks (Bennett type): different sizes for term and preterm infants
Oxygen supply (wall supply or cylinder) with flow meter and tubing
Pulse oximeter

Drugs (Circulation and Drugs)

Normal saline: 10 ml ampoules
Sterile water for injection: 5 or 10 ml ampoules
Adrenaline (1:1000): 1 ml ampoules
Adult naloxone (Narcan): 0.4mg/ ml ampoules

Intubation

Laryngoscopes with straight neonatal blades: sizes 00 and 0
Extra bulbs and batteries for laryngoscope
Magill's forceps
Endotracheal tubes: 2.5 to 4 mm sizes
Introducer (stylet)

(*All the Above Equipment is Required at Every Resuscitation Area: Labour Ward, Theatre, and Neonatal Wards*)

2. Equipment Required for Nursery/ Baby Care Area

Hand washing

Hand wash basin, preferable with elbow operated taps
Antiseptic soap/ solution (e.g. chlorhexidine)
Alcohol hand lotion (e.g. D-germ) for each infant
Paper hand towels

Place for infant

Bassinettes
Incubators (closed)
Mattresses for incubators and bassinettes
Linen for these

Oxygen supply and monitoring

Source of oxygen (wall point or cylinder)
Source of medical air and oxygen blenders/ mixers in all hospitals delivering more than 100 babies per month
Head boxes for oxygen administration
Venturis: range 23-80%
Nasal prongs
Tubing for oxygen administration
Pulse oximeter with neonatal probe
Apnoea monitor
CPAP apparatus at all hospitals delivering more than 100 babies per month

Intravenous fluids, feeds and fluid monitoring

Intravenous giving sets (60 drops/ mL)
Intravenous fluids: Potassium free Neonatalyte or Neonatalyte (200 mL)
Dextrose 5% (200 mL)
Dextrose 50% ampoules
Intravenous cannulae: 24 G
Buretrol (100 ml)
IV infusion rate controllers/ Infusion pumps. Minimum requirement is “dial-a-flow”.
Syringes: 1; 2.5; 5; 10 and 20 ml
Needles for injection: 18; 21; 25 G
Alcohol swabs
Strapping/ adhesive elastoplasts
Feeding tubes: 5 and 8 F
Urine bags

Blood sampling for glucose monitoring and other blood tests

Blood lancets
Reagent strips for measuring blood glucose
Glucometer
Heparinised capillary tubes

Microtainers for blood sampling
Alcohol swab or cotton wool with chlorhexidine

Suction
Suction apparatus: either wall unit or mobile/ portable unit with pressure manometer and tubing
Suction catheters: 6 to 10 F

Temperature monitoring
Thermometers (low reading)

Transport incubator

Records
Infant record charts/ observation charts
HIE score charts
Scoring charts for gestational age/ Ballard score
KMC discharge score charts
Road to health charts

Measuring
Infant scale- a digital scale (to measure in 10 g intervals) is ideal
Tape measure

EQUIPMENT REQUIRED FOR LEVEL 2 FACILITIES
All of the equipment for level 1 must be in place
In addition:
Place/ bed for infant
Open servo-controlled incubators (Radiant warmers)

Oxygen supply

CPAP is essential
Oxygen/ air blenders or mixers
Ventilators

Intravenous fluids

Intravenous fluid flow regulators/ infusion pumps
Syringe drivers