MATERNAL HEALTH

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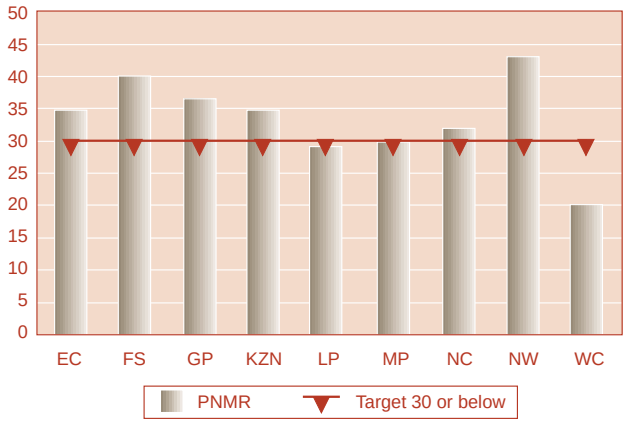
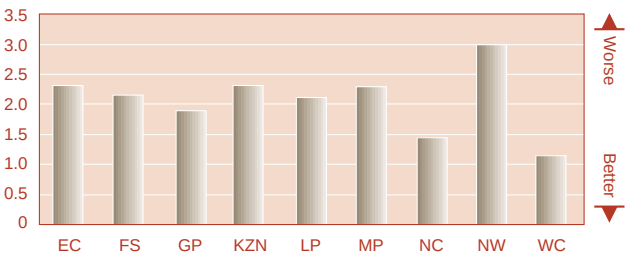
Perinatal care indices, 2002:

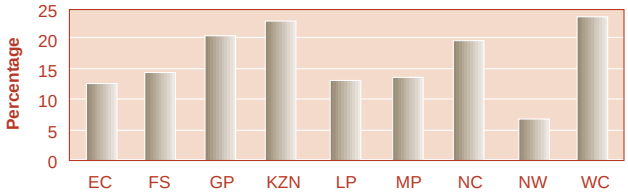
Perinatal mortality rate



Perinatal care index



Caesarean section rate (%)



Key Messages

- The available information indicates that the standard of care during pregnancy has steadily deteriorated.
- The problems within the health services regarding maternal and perinatal care have been clearly identified and recommendations to improve quality of care and reduce the relevant mortality rates are available but these have not yet been effectively implemented.

Framework for Monitoring and Evaluation

Global:

- Safe Motherhood Initiative www.safemotherhood.org
- UNICEF/WHO/UNFPA Guidelines for Monitoring the Availability and Use of Obstetric Services
- Millennium Development Goals

South Africa:

- Notification of Maternal Deaths, and various DoH guidelines on maternal health (Saving Mothers. Policy Guidelines for Common Causes of Maternal Deaths; Guidelines for Maternity Care in South Africa)
- Health Goals, Objectives and Indicators 2001-2005

Key Indicators

Maternal mortality ratio

Perinatal mortality rate (PNMR)

Neonatal death rate (NNDR)

Stillbirth rate (SBR)

Low birth weight rate (LBWR)

Perinatal Care Index (PCI)

Stillbirth: Neonatal death ratio

Caesarean section rate

Key References and Data Sources

- Saving Mothers & Saving Babies reports, compiled primarily from:
  - Notification of maternal deaths
  - Perinatal minimum data set (collected by the MCWH units in most provinces)
  - Perinatal Problem Identification Programme (PPIP)

Introduction

Maternal mortality ratios (MMR) and perinatal mortality rates (PNMR) are generally accepted measures of monitoring the care of pregnant women in a country. Perinatal deaths have been rated by the MRC in the top 5 categories of burden of disease for the country for a number of years.[1] In addition, maternal health services and the improvement of maternal mortality are internationally acknowledged as priority issues for health service development; and maternal mortality is a fairly specific indicator of health system functioning.[2]

In terms of maternal and perinatal outcomes, South Africa (SA) scores poorly compared to other upper-middle income countries, despite doing relatively well in terms of process indicators.[2]

This chapter focuses on maternal health data from the confidential enquiries into maternal deaths and the perinatal care survey. A broader overview of maternal health issues and indicators is included in the chapter on reproductive health.

Framework

International

Reduction of maternal mortality is one of the major goals included in the Millennium Development Goals[3] and various consensus documents emanating from international conferences.[4] Key recommendations and guidelines have been developed as part of the Safe Motherhood Initiative,[a] a partnership of national and international agencies. UNICEF/WHO/UNFPA Guidelines for Monitoring the Availability and Use of Obstetric Services discuss approaches to monitoring and evaluation of maternal health and describe in detail the outcome and process indicators that may be used.[5]

National

Most provinces are collecting the minimum perinatal data set. This data set includes number of births, maternal and perinatal deaths and caesarean sections. Some calculations of MMR and PNMR are possible from this data source, however these data are incomplete and their accuracy not determined.

SA also has a system for conducting confidential enquiries into maternal deaths. In this system all maternal deaths should be reported and a Maternal Death Notification Form completed. Copies of the case notes plus the form are sent to the provincial Maternal Child and Women's health coordinators, who then notify the national office of the death and send the cases to provincial assessors. These assessors analyse the case with respect to primary and final causes of death, and substandard care. These assessor's reports are then sent to a national committee for collation and analysis of the deaths. Recommendations regarding the care of pregnant mothers are made by the national committee in the form of a report, with the aim of reducing the number of maternal deaths.[7] This system is primarily designed to identify problem areas in the health system and hence identify areas where improvements can be made.

The MMR cannot be calculated accurately as there is incomplete information with respect to the denominator, i.e. the number of births in the country. Furthermore it is clear there is inadequate reporting of deaths from some provinces. Cross checking the number of maternal deaths with the death certificates is not possible because of the long delay period in entering the deaths certificates into the vital registration system. The maternal deaths notification system has however collected and analysed a very large sample of maternal deaths and from these the major causes of maternal death and what the major problems are in the health system have been identified for SA.

Table 1: Selected indicators relating to maternal health identified by the national Department of Health

Indicator	Objective
Neonatal mortality rate	Reduce from 20% to 14% by end of 2005
Perinatal mortality ratio	Reduce by 25% from 40 to 30 per 1000 births by 2005
Maternal mortality ratio	Reduce by 25% from 150 to 100 per 100 000 live births, and by 50% to 75 per 100 000 when excluding deaths due to HIV/AIDS
Proportion of live births in health facilities with birth weight < 2500g	Reduce the prevalence of low birth weight from 16% to 10% by 2005

Source: Health Goals, Objectives and Indicators 2001-2005[6]

a Safe Motherhood Initiative http://www.safemotherhood.org/

The PNMR is also difficult to determine, as the number of perinatal deaths and births is not known for the country. There are some data from institutions running the Perinatal Problem Identification Programme (PPIP).[8] PPIP is a perinatal care audit system whereby all perinatal deaths (i.e. stillbirths and neonatal deaths) are analysed in the same way as for the confidential enquiry of maternal deaths and the data entered into a computer programme. The programme analyses the data and produces descriptive data that includes perinatal care indices and tables on the causes of deaths and avoidable factors. These PPIP sites provide information on the causes of death and problem areas in management similar to the confidential enquiries into maternal deaths. The data can be amalgamated to generate information for larger areas like regions and provinces.

All systems currently exclude information on home births, and most exclude births in private institutions. The Western Cape is the exception in this regard, having managed to include the births in private institutions in their system.

In essence, SA has opted for a semi-qualitative system to assess care during pregnancy as a first step in improving care. It does not have accurate data on key indices, only those inferred from the Demographic and Health Survey, but most importantly, SA knows what the causes of death are, and where there are deficiencies in the health care system.

Indicator Definitions

Maternal health: Process Indicators

Antenatal care (ANC) coverage, Antenatal visits per client and Births assisted by trained health personnel are covered in the chapter on Reproductive health.

Caesarean section (C-section) rate: Percentage of births that are by caesarean section

Maternal health: Maternal Outcome Indicators

Maternal mortality ratio (MMR): The number of maternal deaths (women who die as a result of childbearing, during the pregnancy or within 42 days of delivery or termination of pregnancy in one year) per 100 000 live births during that year.

Number of maternal deaths: The number of women who die as a result of childbearing, during the pregnancy or within 42 days of delivery or termination of pregnancy in one year. (Although this information is not strictly an indicator, it has been included due to the difficulty in obtaining the denominator data to calculate MMRs accurately.)

Maternal death rate: The number of maternal deaths per million women of reproductive age (15-49 years).
This indicator is often reported per 100 000 women, so careful note should be taken of the denominator when comparing data from different sources.

Maternal health: Perinatal Outcome Indicators[b]

Perinatal mortality rate (PNMR): Number of perinatal deaths per 1000 births (perinatal period is from 28 weeks gestation / 1000g to 7 days after delivery). Note that perinatal deaths are the sum of stillbirths plus early neonatal deaths.

Neonatal death (mortality) rate (NNDR): Number of deaths within the first 28 days of life per 1000 live births. Neonatal deaths are divided into early (first 7 days) and late (8-28 days).

Stillbirth rate (SBR): Number of stillbirths per 1000 births. A stillbirth is a viable baby born dead.

Low birth weight rate (LBWR): Proportion of births <2500 g.

Perinatal Care Index (PCI): PNMR divided by LBWR.

PCI can be used to compare the standard of care of various areas. It takes into account the environmental and socio-economic factors (as measured by LBWR). A low PCI indicates good care.

Stillbirth to neonatal death ratio (SB:NND): The number of stillbirths to the number of neonatal deaths.

In developing countries where there is almost no care, the ratio is around one, with as many stillbirths as neonatal deaths. As care improves, i.e. more births take place in institutions and labour, delivery and immediate care of the neonate is supervised, the NNDR declines and the SB:NND ratio increases. Finally as antenatal care improves, the number of stillbirths decline and the ratio decreases again to one.

Data

Data on the various maternal and perinatal care indices are available from two pivotal reports, the 'Saving Mothers: Second report on confidential enquiries into maternal deaths in South Africa 1999-2001'[7] and 'Saving Babies 2002: Third perinatal care survey of South Africa'.[8] These reports clearly define the challenges in maternal and perinatal care in SA.

Table 2 shows the data for 2002 based on the minimum perinatal data set for each province.[c] Table 3 shows the perinatal care indices for the PPIP sentinel sites for 2000-2002.[9] These sites were divided into three areas, metropolitan, city and town and rural. Metropolitan coincides with the mega-cities; all of which have tertiary hospitals, and most of which have medical schools. In these areas the population has relatively easy access to tertiary care. Cities and towns are those areas where there

b The PNMR, NNDR and LBWR may be given according to different categories of birth weight of babies; 1000g is the cut-off point as babies weighing less than this are regarded as late abortions.

c The national figure has not been included because the picture will be biased towards those provinces with good reporting systems and against those with poor reporting systems. The information is available in the Saving Babies report, but the validity of such an amalgamated figure is questionable.

are district or regional hospitals. In these areas the population has access to secondary care, but often only limited tertiary care because of difficulties of getting patients into the tertiary hospitals. These hospitals are often forced to provide tertiary care, but with only resources for secondary care. The rural areas are usually sub-district hospitals that provide primary level care and should refer to secondary or tertiary levels. Unfortunately, they are often required to provide secondary and sometimes tertiary levels of care even though they are only equipped for primary level care.

Table 4 gives the primary and final causes of death. The primary or underlying cause of death is the disease that ultimately led to the death of the baby. This is important as it identifies areas where prevention strategies should be targeted. The final cause of neonatal death refers to the disease that caused the death of the neonate, for example hyaline membrane disease. The importance of this classification is that it indicates what resources are required in hospitals to prevent such deaths.

Figure 1 illustrates the neonatal death rate (NNDR) per 500g weight categories. The rate is almost twice as high in the cities and towns and rural areas as that in the metropolitan areas.

Table 2: Perinatal care indices for the provinces for 2002

Province	PNMR (≥1000g)	NNDR (≥1000g)	LBWR (%)	C-section rate (%)	PCI (PNMR/LBWR)
Eastern Cape[i]	35	14	15.0	12.6	2.32
Free State	40.3	10.4	18.7	14.4	2.16
Gauteng	37	12.1	19.2	20.4	1.9
KwaZulu-Natal[ii]	35	10.4	18.2	22.8	2.32
Limpopo	29	12	13.8	13.1	2.12
Mpumalanga[i]	30	9	14.1	13.6	2.30
Northern Cape[i]	32	9	22.0	19.6	1.45
North West	43.3	11.5	14.4	6.8	3.0
Western Cape	20.2	5.0	17.6	23.5	1.15

Source: Saving Babies 2002[8]

Notes: i Data only from PPIP sites, all other data from the minimal perinatal data set.

ii Data from April – September 2002

Table 3: Basic data and Perinatal Care Indices for PPIP sentinel sites: 2000-2002[9]

	Metropolitan	City and Town	Rural
Total deliveries ≥1000g	52 668	117 796	62 254
Total deaths ≥1000g	1 907	4 515	1 663
PNMR (≥1000g) / 1000 deliveries	36.20	38.33	26.71
NNDR (≥1000g) / 1000 deliveries	9.91	14.52	11.31
NNDR 1000-1499g	117	238	224
NNDR 1500-1999g	35	69	77
NNDR 2000-2499g	10	14	14
NNDR 2500+g	3	5	5
LBWR (%)	19.6	16.5	13.0
SB:NND ratio	2.75:1	1.7:1	1.40:1
Caesarean section rate (%)	25.1	17.5	11.7
PCI (≥1000g)	1.85	2.32	2.06

Table 4: Pattern of disease in Metropolitan areas, Cities and Towns and Rural areas 2000-2002[9]

	Metropolitan		City and Town		Rural	
	%	rate/ 1000	%	rate/ 1000	%	rate/ 1000
Primary causes ≥1000 g	n=1 907		n=4 515		n=1 663	
Unexplained IUD	28.2	10.2	23.6	9.06	27.5	7.36
Spontaneous preterm lab.	11.1	4.01	17.7	6.79	20.1	5.37
Hypertensive disorders	14.1	5.09	13.4	5.14	6.1	1.62
Antepartum haemorrhage	19.7	7.14	14.9	5.70	6.7	1.78
IUGR	3.0	1.10	1.8	0.69	0.6	0.16
Intrapartum asphyxia	8.7	3.15	14.4	5.50	22.9	6.12
Trauma	0.8	0.30	1.9	0.71	3.0	0.80
Infections	2.1	0.76	5.0	1.90	3.7	1.00
Fetal abnormalities	8.0	2.90	4.7	1.80	4.3	1.14
Maternal disease	3.2	1.16	1.7	0.65	1.5	0.40
Other	1.1	0.40	1.0	0.39	1.1	0.30
Final causes ≥1000 g	n=508		n=1 670		n=693	
Immaturity related	28.3	2.81	41.1	6.00	32.6	3.69
Hypoxia	28.0	2.77	29.8	4.32	38.7	4.37
Trauma	0.4	0.04	0.5	0.07	1.2	0.13
Infection	18.9	1.87	14.5	2.11	9.1	1.03
Congenital abnormalities	16.5	1.64	8.3	1.21	7.9	0.90
Other	2.8	0.27	2.8	0.12	3.8	0.42
Unknown	5.1	0.51	3.0	0.43	6.8	0.77

IUD – Intrauterine death, IUGR – Idiopathic intrauterine growth retardation

Figure 1: Neonatal Mortality Rates by birthweight categories for Metropolitan, City and Town and Rural areas, 2002-2004[9]

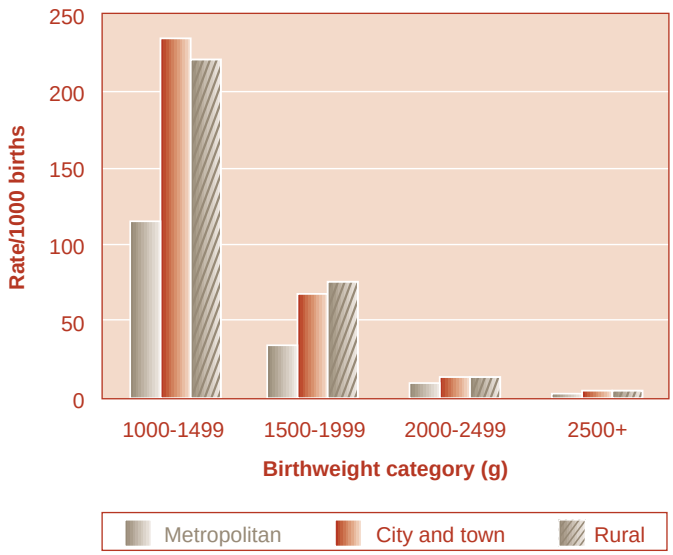


Table 5: A comparison between all and probable avoidable factors, missed opportunities and substandard care in perinatal deaths for the different areas[10]

Avoidable factors	Metropolitan %		City and Town %		Rural %	
	All	Probable	All	Probable	All	Probable
Patient Related	31.5	6.5	40.6	14.7	47.5	16.2
Administrative Factors	10.1	4.3	12.1	4.4	31.1	8.1
Health Worker Related	28.6	16.0	28.4	12.1	36.0	13.5

Table 5 gives the proportions of substandard care in the various areas as recorded by the PPIP sites.[10] Probable factors indicate that the clinicians evaluating the case felt that if the factor had been avoided, the baby would most likely have survived. Deaths were thought to be clearly preventable within the health system in 63.1%, 34.4% and 35.7% of cases due to intrapartum asphyxia and birth trauma in the metropolitan, cities and towns and rural areas respectively. Deaths due to hypertension and antepartum haemorrhage were thought to be clearly preventable within the health system in 18.7%, 15.4% and 20.0% of cases in the metropolitan, city and towns and rural areas respectively. Far fewer preventable deaths were recorded in the spontaneous preterm labour category, as it seems the patients presented in advanced labour leaving little opportunity to prevent delivery, transfer the patient or give corticosteroids. However, the institution was faced with having to deal with small premature infants.

Table 6 gives are comparison of the care indices in Gauteng for the period 1998/99 and 2001/02. Both time periods included the births from the midwife obstetric units.

There has been approximately a 15% increase in the PNMR. This is almost entirely due to the increase in the stillbirth rate that has increased by 50%. The HIV infection rate from the antenatal clinic services surveys was around 18% in 1998 and was close to 30% in 2001 for Gauteng. This is an increase of almost 12%. There is a 4 fold increase in the relative risk of having a stillbirth in women who are HIV infected. The impact of the increased prevalence of HIV infection on the stillbirth rate can be estimated if the assumption is made that the stillbirth rate for non-HIV infected patients remained the same over the period. Using this assumption, the stillbirth rate would be estimated at 25.4/1000 births. This is still way short of the observed 31.6/1000 births. As the stillbirth rate reflects the quality of antenatal care, this difference may indicate deteriorating antenatal care. This is supported by the finding that the unknown syphilis serology rate is 18.9% in the province.[8]

Table 7 gives the primary causes of maternal death per provinces as a percentage of all maternal deaths in the province. Areas where the primary obstetric causes were 20% above the national average are highlighted. In this way the priority conditions for each province can be identified. Table 8 expresses the primary obstetric cause of death as a rate per million women of reproductive age. The number of women in the reproductive age was extrapolated from the 1996 census. This was done as the number of births per province was not known and a maternal mortality ratio could not be determined. Instances where the disease rate (primary obstetric cause of death) was more than 20% above the national average are highlighted. This determines the problem areas for each condition in the country. Not

Table 6: Gauteng provincial Perinatal Care indices (>1000g)

	Aug 1998 - July 1999	Aug 2001 - July 2002
PNMR /1000 births	32.1	37.0
NNDR /1000 births	12.1	12.1
SBR /1000 births	20.6	31.6
LBWR (%)	18.4	19.2
Caesarean section rate (%)	15.0	20.4
Perinatal Care Index	1.7	1.9
SB: NND	1.7: 1	2.8: 1
Teenage Pregnancies (%)	6.0	6.4
Positive syphilis serology (%)	4.0	5.0
Antenatal Clinic Attendance (%)	93.5	94.0

Source: Saving Babies 2002[8]

unexpectedly the rural provinces have higher rates generally that the more urban provinces. There was under-reporting of deaths in Limpopo province that possibly explains its low rates.

Table 9 and Table 10 give the avoidable factors per province. The most notable finding is that the main problems, not unexpectedly, appear in the rural provinces. The avoidable factors identified indicate where interventions must be made. The National Committee for the Confidential Enquiries into Maternal Deaths has analysed the data and the avoidable factors identified and put forward ten key recommendations which they believe, if implemented, will lower the MMR. These are discussed below.

Table 11 gives the MMR for the provinces. As is seen the data are incomplete but where there are data, the MMR has generally increased.

Table 7: Identification of provinces with distribution of primary obstetric cause of death 20% above the national average[7]

Primary Obstetric Cause %	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA
Direct										
Hypertension	28.3	22.2	20.2	21.6	17.8	13.6	23.8	18.8	23.0	20.7
Obstetric Haem.	15.5	11.9	15.2	10.5	27.0	17.1	19.1	13.4	7.1	13.9
Early Preg. Death	3.8	2.7	7.7	7.0	9.5	7.4	9.5	3.5	4.4	6.0
Preg. Sepsis	4.9	7.3	7.9	9.6	9.2	9.3	4.8	7.9	9.7	8.6
Anaesthetic	1.5	5.4	1.6	1.0	8.6	3.5	3.2	1.5	2.7	3.1
Emb. & acute coll.	10.1	7.3	8.8	5.8	4.9	8.6	8.0	8.9	4.4	7.5
Indirect										
Non preg. Infect.	24.2	31.8	30.9	38.0	13.8	31.1	22.2	40.6	30.1	31.4
Pre-exist Med Dis	9.4	8.0	6.7	6.2	8.6	4.7	6.3	4.5	14.2	7.0
Unknown	2.3	3.4	0.9	0.4	0.7	4.7	3.2	1.0	4.4	1.8
Total	100	100	100	100	100	100	100	100	100	100

Note: Shaded cells represent values that are more than 20% above the national average.

Table 8: Annual rate per million women in the reproductive age of the primary obstetric cause of death per province[7]

Primary Obstetric Cause Rate	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA
Direct										
Hypertension	13.4	24.6	13.1	18.9	6.1	13.9	20.5	12.9	7.2	13.9
Obstetric Haem.	7.3	13.1	9.7	9.1	9.2	17.4	12.3	9.2	2.2	9.3
Early Preg. Death	1.7	3.0	5.0	6.1	2.9	7.5	8.2	2.3	1.3	4.0
Preg. Sepsis	2.3	8.0	5.1	8.4	3.2	9.5	4.1	5.4	3.1	5.7
Anaesthetic	0.7	5.9	1.1	0.9	2.9	3.6	2.7	1.0	0.8	2.1
Emb. & acute coll.	4.8	8.0	5.7	5.1	2.0	8.7	6.8	6.1	1.4	5.0
Indirect										
Non preg. Infect.	11.4	35.1	20.0	33.3	4.7	31.7	19.2	27.9	9.4	21.0
Pre-exist Med Dis	4.5	8.9	4.3	5.4	2.9	4.8	5.5	3.1	4.4	4.7
Unknown	1.1	3.8	0.6	0.4	0.2	4.8	2.7	0.7	1.3	1.2
Total	47.2	110.5	64.6	87.7	34.3	101.8	86.3	68.6	31.4	66.8

Note: Shaded cells represent values that are more than 20% above the national average.

Table 9: Identification of provinces with distribution of avoidable factors 10% above the national average[7]

Avoidable factors %	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA
Patient related	51.2	45.0	49.0	65.4	58.2	60.6	55.8	54.3	62.5	54.1
Administrative	57.4	40.6	39.9	50.0	55.3	37.3	42.6	40.8	37.6	41.5
Health care provider related										
Level 1	69.2	70.9	67.9	74.3	83.0	68.7	72.7	78.9	78.8	73.3
Level 2	54.5	63.7	63.2	70.3	71.4	56.7	66.7	62.1	67.9	67.0
Level 3	52.8	33.3	51.0	48.6	62.1	-	80.0	50.0	20.5	46.7
Resuscitation	30.4	32.5	22.1	25.7	47.6	26.9	35.2	26.0	13.8	27.4

% - *Percent of assessable deaths*

Note: Shaded cells represent values that are more than 10% above the national average.

Table 10: Identification of provinces with distribution of specific avoidable factors 10% above the national average[7]

Avoidable factors %	EC	FS	GP	KZN	LP	MP	NC	NW	WC	SA
Patient related										
No/infrequent ANC	25.6	28.6	24.4	31.4	36.1	27.8	27.0	29.1	29.2	28.8
Delay in seeking help	27.4	25.9	26.1	38.7	27.0	37.9	30.8	34.3	37.5	32.6
Unsafe abortion	22.2	-	57.1	25.6	9.1	7.7	50.0	-	-	29.9
Administrative										
Transport – home to	13.0	1.0	2.5	6.6	4.9	5.3	11.1	7.5	3.0	5.8
Transport – instit. to	21.6	5.3	11.0	12.7	13.6	15.7	20.7	16.9	6.6	12.9
Lack of facilities	10.4	7.4	11.2	12.9	20.2	6.7	13.0	8.0	15.9	11.2
Lack trained staff	34.3	21.8	18.9	25.5	24.4	16.3	13.0	17.8	12.9	22.3
Health care provider										
Initial assessment	16.0	26.1	17.2	24.2	20.1	18.1	25.8	19.0	12.1	23.8
Problem Recognition	24.4	28.5	24.9	34.1	39.6	27.2	22.6	32.7	18.1	34.1
Delay in referring	11.8	22.9	9.2	17.2	17.4	13.8	19.4	10.2	9.5	17.0
Managed inapp. level	8.4	22.1	8.0	16.7	20.1	16.9	12.9	16.1	9.5	17.0
Incorrect management	8.8	12.0	7.1	8.4	14.6	8.3	25.8	8.8	6.9	10.9
Substandard management	37.4	34.5	32.0	37.0	43.1	33.1	35.5	29.8	19.8	40.1
Not/infreq. monitoring	19.8	12.4	10.1	23.9	18.1	10.6	9.7	12.7	7.8	18.7
Prolonged abnormal mon.	3.1	4.8	2.1	4.2	3.5	0.8	3.2	2.0	0.9	3.5

% - Percent of assessable deaths

Note: Shaded cells represent values that are more than 10% above the national average.

Table 11: Maternal Mortality Ratio (MMR) estimated by each province[7]

Province	1998	1999	2000	2001
Eastern Cape	-	-	-	-
Free State	135	-	199	-
Gauteng	67.4	-	112	-
KwaZulu-Natal	-	-	-	144
Limpopo	-	-	-	-
Mpumalanga	-	-	-	-
Northern Cape	-	-	168	-
North West	-	-	-	-
Western Cape[i]	49.8	-	68.4	57.5

Note: i Excludes the births in private hospitals, but if included the MMR falls below 50/100 000 births.

Analysis

Information exists regarding the major causes of maternal and perinatal deaths for SA. It is also known where the major problem in the health services lie with respect to maternal care. This is a major success story, and ultimately is more important than knowing precisely what the specific maternal care indices are. It allows for action to be taken immediately, but also implies that not to act on these problems violates the patients' right to health.

Unfortunately SA does not have accurate national maternal care indices, although some provinces have some reliable data. Knowing the specific rates will identify trends and determine the success or otherwise of specific interventions. There has been some progress in terms of collecting useable data to calculate health care indices. From the reliable provincial data available it appears that the MMR is increasing, the PNMR is high, and the NNDR is much higher in the areas outside of the metropoles.

Where serial data are available (Table 6 and Table 11), an obvious deterioration in indices has been observed. This deterioration cannot be explained by the increasing HIV epidemic alone. The implication is that there has been a steady deterioration of maternal health care services over the past few years. This is further evidenced by the increase of avoidable factors, missed opportunities and substandard care related to administrative factors from 33.2% of assessable maternal deaths in 1998 to 41.5% of assessable deaths in the 1999-2001 triennium.[6] Furthermore, the health care workers' avoidable factors, missed opportunities and substandard care also appear to have increased, although a direct comparison cannot be made as a slightly different method was used in calculating the proportions.

In 1998 it was 56.8% of all deaths and in the triennium 1999-2001 at primary level of care it was 73.3%, secondary level 67.0% and tertiary level 46.7% of women who had health care during their pregnancy at that level of care.[11] There are many possible reasons for the deterioration; for example loss of staff to foreign countries, poverty, lack of transport and financial constraints. However, these do not excuse not acting on the areas where action is possible.

The HIV epidemic is having a major impact on mortality indices. The women who will appear in the mortality indices due to HIV infection for the next few years have already contracted the disease, and most will have progressed to AIDS. There can be no improvement of maternal and perinatal mortality indices without antiretroviral therapy for these women. It is of utmost importance that the antiretroviral treatment programme is rolled out with great urgency.

Inequity related to rural and urban areas still clearly exists, as demonstrated by the NNDR and rates of maternal death per million women in the reproductive years per province.

Recommendations

There must be a major effort to improve data collection and its accuracy so that rates can be determined and progress measured.

Sets of recommendations to improve quality of care and hence reduce mortality rates are available,[7,8] but have not been effectively implemented as yet. These recommendations include the following:

Ten key recommendations to reduce maternal mortality[7]

1. Make the guidelines on managing conditions that commonly result in maternal death operational.
2. Referral routes and criteria established.
3. Emergency transport facilities must be available for all pregnant women with complications (at any site).
4. Blood must be available at every institution where caesarean sections are performed.
5. Establishing staffing and equipment norms per level of care must be performed for every health institution concerned with the care of pregnant women.
6. The distribution of the public sector Termination of Pregnancy (TOP) services (especially with respect to second trimester TOP's) must be expanded and the sites must be advertised to the public.

7. A quality assurance programme on the use of the partogram should be implemented at each institution conducting births. The quality assurance tool should provide a score on the quality of the use of partograms.
8. Skills in anaesthesia should be improved at all levels of care. Regional anaesthesia should be promoted in all sites performing caesarean sections.
9. Contraceptive services must intensively educate all women, particularly those 30 years and older or with 5 or more children, about the dangers of pregnancy. Contraceptive use should be actively promoted in this group of women and their families.
10. Voluntary counselling and HIV testing for all pregnant women should be made operational.

Of note is that at least 6 of these key recommendations relate to responsibilities of health management.

Five key strategies for decreasing perinatal mortality[8]

1. Ensure each site conducting births has the necessary equipment and protocols and that the health care providers are appropriately trained to manage labour and are especially trained in the use of the partogram. Introduce a quality assurance tool to assess the success of the training.
2. Ensure each site conducting births has the necessary equipment and protocols and appropriately trained staff to manage asphyxiated neonates. See that training programmes in neonatal resuscitation are accessible to all staff involved with conducting childbirth.
3. Ensure each site caring for premature infants has the necessary equipment and protocols appropriate to the level of care and that the health care workers are appropriately trained in care for the premature infant including kangaroo mother care. Implementation programmes must be available to the staff.
4. Ensure each site providing antenatal care has protocols in place for where to and when to refer patients and the health care providers are appropriately trained therein. Introduce a quality assurance tool to assess the success of the training.
5. Move to a system where the time and point at which the woman confirms she is pregnant also becomes the woman's first antenatal visit, where she can be classified according to risk and where her further antenatal care is specifically planned. If this is not practice, establish what the barriers are and develop strategies to overcome these.

Conclusions

The National Department of Health chose a pragmatic approach to identifying problems in the health system (by using mortality audits) and immediately tackling those problems identified. These systems are in place and are working well. Other systems for accurately calculating care indices are not in place or are not working.

So, although the various maternal care indices are not known or only estimated, the problems within the health service regarding maternal and perinatal care have been clearly identified. Strategies have been developed to tackle these, but unfortunately these strategies have yet to be fully implemented. In the meantime, from available knowledge, the standard of care during pregnancy has steadily deteriorated.

The continued non-implementation of these solutions within the health services in maternal and infant care can be regarded as an infringement on the rights of pregnant women and their children. The onus is on the health care administrators and workers to turn this deterioration in care around.

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