

The
Maternal and
Perinatal
Health
Standards
Committee

Annual Report

2001 and 2002



Acknowledgements

The Maternal and Perinatal Health Standards Committee (MPHSC) is pleased to present the twenty-fifth and twenty-sixth combined Annual Reports for the calendar years 2001 and 2002.

The MPHSC wishes to acknowledge the continuing support of the following organizations. The information they have provided has assisted the committee in its deliberations.

- Manitoba Health Information Systems Branch
- Manitoba Vital Statistics
- Medical Records Departments, Manitoba Hospitals
- First Nations & Inuit Health Branch, Health Canada
- Office of the Chief Medical Examiner
- College of Midwives of Manitoba

The MPHSC acknowledges the interest and cooperation of physicians and health care facilities across the province in providing information for the review process.

The committee is grateful to Manitoba Health for providing financial support.

MPHSC Executive Summary

- ❖ In 2001, the perinatal mortality rate was 8.3 per 1,000 births (>499 grams to 7 days). In 2002, the perinatal mortality rate was 7.6 per 1,000 births. The three-year average was 8.3 per 1,000 births.
- ❖ First Nations women were 2.3 times more likely in 2001 and 2.2 times more likely in 2002 to have a baby die in the perinatal period than other Manitoba women. This compares to 2.93 in 2000.
- ❖ There were no maternal deaths in 2001. There was one maternal death in 2002 that was not obstetrically related.
- ❖ In 2001, all 136 perinatal deaths were reviewed. Of these, there were 8 cases where a change in medical care might have altered the outcome and at least 11 cases where patient/family issues may have adversely affected the outcome. One case was referred to another agency for review of care provided by non-physicians. In 2002, all 121 perinatal deaths were reviewed. Of these, there were 4 cases where a change in medical care might have altered the outcome and at least 4 cases where the patient/family may have altered the outcome by a change in their actions.
- ❖ In 2001, 47 cases of neonatal morbidity and 24 cases of maternal morbidity were reviewed. In 2002, 77 cases of neonatal morbidity, 33 cases of maternal morbidity and one case of maternal mortality were reviewed.
- ❖ Educational actions were taken by the MPHSC in 4 cases in 2001. In 2002, there were 23 educational actions taken. Starting in 2002, the actions were taken at hospital level and these were included in the total count. This accounts for the increase. When hospitals were able to take action, there was a much quicker turn-around time for resolution of concerns. Also, when reviewing care in the context of their own environment, health care providers were able to identify what changes could be made and effect change quickly. Preventable features were also identified at the family/patient level. Factors such as poor attendance for prenatal care, substance abuse and non-compliance had a significant impact on the outcome.
- ❖ During the preparation of data and statistics to complete the 2001 and 2002 Annual Report, the committee continues to review current material and issues.
- ❖ The database classification system and data collection form were reviewed and revised with a focus on streamlining and harmonizing collection methods.

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Definitions

Births, Gestational Age and Birth Weight

Livebirth: The complete expulsion or extraction from its mother irrespective of the duration of pregnancy, of a product of conception in which, after such expulsion or extraction, there is breathing, beating of the umbilical cord, or unmistakable movement of voluntary muscle, whether or not the umbilical cord has been cut or the placenta attached. *The data in this report is limited to births where the birth weight was 500 grams or greater.*

Total Births: All live births and stillbirths (defined under perinatal mortality).

Gestational Age: The duration of gestation measured from the first day of the last normal menstrual period. Gestational age is expressed in completed days or completed weeks. If the date of the last menstrual period is uncertain or unknown, an age estimate based on the ultrasound will be recorded as the gestational age:

- **preterm:** less than 37 weeks of gestation (<259 full days)
- **term:** between 37 and 41 weeks of gestation (between 259 and 286 full days)
- **postterm:** more than 41 completed weeks of gestation (>286 full days)

Low Birth Weight: Deliveries (live or stillborn) weighing less than 2500 grams at birth.

Delivery: For the purposes of this report, a delivery refers to the completion of a pregnancy, regardless of how many fetuses are involved (i.e. a multiple birth is considered one delivery).

Perinatal Mortality

Abortion: The complete expulsion or extraction from its mother of a fetus or embryo of less than 20 weeks gestation, whether there is evidence of life or not, and whether the abortion was spontaneous or induced. This usually correlates with a weight of less than 500 grams.

Stillbirth (Fetal Death): The birth of a fetus weighing 500 grams or more and/or having a gestational age of ≥ 20 weeks from last normal menstrual period (LNMP), who shows no sign of life after birth.

Neonatal Death: The death of a live born infant occurring less than 28 full days after birth:

- **early:** before the 7th full day of life
- **late:** between the 8th and 28th full day of life

Perinatal Death: All stillbirths (fetal deaths) and early neonatal deaths.

Delayed Neonatal Death: The death of an infant occurring after 28 days of age who, under natural selection circumstances without the benefit of neonatal intensive care, would have died before 28 days of age.

Maternal Mortality

Maternal Death: The death of a woman known to be pregnant or within 42 days of delivery or termination of the pregnancy, irrespective of the duration of or site of the pregnancy:

- **direct obstetric:** resulting from complications of pregnancy, childbirth, or the puerperium (e.g. exsanguination from rupture of the uterus)
 - **indirect obstetric:** a non-obstetric medical or surgical condition which either antedated pregnancy or was aggravated by physiological adaptations to pregnancy (e.g. mitral stenosis)
 - **non-obstetric:** resulting from accidental or incidental causes in no way related to pregnancy (e.g. automobile accident)
-

Mortality Rates

Unless otherwise specified, overall rates are computed on the basis of births and deaths of infants weighing 500 grams or more. For purposes of international comparison, we also give “standard” mortality rates obtained from data on births and deaths of infants weighing 1,000 grams or more. These rates do not include births and deaths where the weight is unknown.

Stillbirth Rate (fetal death rate): The number of stillbirths per 1,000 total births.

Neonatal Mortality Rate: The number of neonatal deaths per 1,000 live births:

- **early:** before the 7th full day of life
- **late:** between the 8th and 28th full day of life

Perinatal Mortality Rate: The total number of stillbirths and early neonatal deaths per 1,000 total births (live births and stillbirths).

Corrected Rates: Mortality rates excluding those infants who died from a major congenital anomaly.

Maternal Mortality Rate: The number of maternal deaths that occur as a result of the reproductive process (i.e. direct and indirect maternal deaths) per 10,000 live births.

Three-Year Moving Average: Three-year averages are used to reduce large fluctuations in rates due to small numbers. The rate for each year is calculated by averaging the rate for the year preceding, the year of interest, and the year following.

Levels of Facility Service

Level 0 – No organized elective obstetrics.

Level I – Primary Care Centre: An obstetrical facility for mothers and newborns who have no detectable major risks in the prenatal period.

- ❖ Provides peripartum care for normal pregnancies.
- ❖ Ideally performs 25 or more deliveries per year.
- ❖ Ideally has the capacity to perform Caesarean section or have Caesarean section services available within 30 minutes from the determination of the need to do so.

Level II – Intermediate Care Referral Centre: A facility which has additional obstetrical and neonatal resources to a Level I hospital, and can provide treatment of mothers and newborns who present a risk.

- ❖ Meets all Level I requirements.
- ❖ Meets all considerations of the delivery of the normal to intermediate/high risk pregnancy and care of the neonate.
- ❖ Ideally performs 250 deliveries per year.
- ❖ Functionally organized to accept referred patients to a defined level of care.

Level III – Tertiary Care Referral Centre: In addition to Level I, and Level II services, supplemental technical services are available for dealing with high-risk pregnancies and for providing specialized perinatal care.

- ❖ Meets all Level I, and Level II requirements.
- ❖ Provides all associated maternal and neonatal surgical and medical services including high-risk obstetrical and neonatal services.
- ❖ Accepts transfers of infants and mothers from facility Levels I, and II.

Introduction

The College of Physicians & Surgeons of Manitoba established the Perinatal and Maternal Welfare Committee (PMWC) in 1977. Renamed the Maternal and Perinatal Health Standards Committee (MPHSC) in 2001, this committee reports to the Central Standards Committee of The College of Physicians & Surgeons of Manitoba. The major function of every standards committee is to maintain and improve quality of care through education. *These educational functions of the College are separate and distinct from its disciplinary functions.*

Educational strategies used by the MPHSC include:

- Sending letters to physicians, hospitals, Regional and Area Standards Committees.
- Publishing articles in the College Newsletter and Annual Reports to draw members' attention to important aspects of obstetrical and neonatal medical care.
- Participating in development of Statements and Clinical Practice Guidelines to enhance obstetrical and neonatal care.
- Advocating for the health of Manitoba women and babies by informing government and other public agencies of recommendations to improve legislation or public policy.

Goals and Objectives

To contribute to the monitoring and improvement of the quality of obstetrical and neonatal care in Manitoba by the following activities:

- **Review:** To collect and review relevant data pertaining to:
 - all stillbirths (>499 grams),
 - neonatal deaths (>499 grams to 28 days of life, inclusive),
 - maternal deaths,
 - specified morbidity in neonates and mothers
 - other pertinent data which the MPHSC may from time to time determine.
- **Classification:** To determine the factors responsible for all deaths and specified morbidity at family, community and medical care levels.
- **Surveillance:** To maintain a current database for the ongoing monitoring of perinatal, late neonatal and maternal mortality and specified morbidity which will allow for meaningful interpretation.

- **Analysis:** To examine trends in perinatal and maternal mortality and morbidity in the province.
- **Education:** To ensure that education is provided to practitioners and agencies where need has been identified.
- **Recommendation:** To explore policy development related to prevention, and make appropriate recommendations.
- **Publication:** To produce an annual report outlining activities of the committee, data reviewed and recommendations for improvement of outcome, as a public document.

Sources of Information

The MPHSC is notified of all stillbirths, neonatal deaths, and maternal deaths via Manitoba Vital Statistics and Manitoba Health Information Systems. Selected morbidities are identified by hospital-based standards committees using International Classification of Diseases, (ICD•9•CM). Where there are maternal and perinatal standards committees (St. Boniface General Hospital, Health Sciences Centre, Victoria General Hospital, and Brandon General Hospital), all mortalities and selected morbidities are reviewed by the hospital committee regarding the quality of care provided in that facility. Cases are referred to the MPHSC when care involved more than one facility and/or is of a nature that requires the expertise of the MPHSC.

Several differences exist in criteria as defined by various agencies for data collection. These differences include:

- Vital Statistics defines a stillbirth by weight and/or gestational age (>499 grams or ≥ 20 weeks), whereas the MPHSC reviews stillbirths by weight only (>499 grams).
- Vital Statistics includes all neonatal deaths regardless of weight and gestational age for rate calculations, whereas the MPHSC includes only those neonatal deaths >499 grams.
- Vital Statistics counts all deaths occurring in Manitoba regardless of the place of birth, whereas the MPHSC records those born out of province separately.
- Manitoba Health reports their figures by fiscal year (1st April to 31st March), whereas data collection by the College, Vital Statistics and most hospital committees is by calendar year.

This results in minor discrepancies between the rates compiled by the above-mentioned agencies and the MPHSC.

Committee Activities

The MPHSC held five meetings in 2001 and five meetings in 2002. They actively reviewed perinatal and maternal mortality and specified neonatal and maternal morbidity. Educational action was taken where appropriate, in addition to the development of Clinical Practice Guidelines and Newsletter items.

Statements/Guidelines/Newsletter Items

Topical issues are communicated to the medical profession through the development of Statements and Clinical Practice Guidelines and/or the publication of an item in the College Newsletters. A guideline is practice generally recommended.

The MPHSC participated in the revision of 12 guidelines in 2001 and 2002:

- Neonatal Resuscitation #1705
- Intrapartum Fetal Surveillance #1693
- Fetal Movement Counting #1686
- Recommended Standards for Hospital Resources, Maternal and Newborn Care #1680
- Physician Attendance and Transfer of Care at Delivery #1692
- Management of Meconium Staining #1690
- Indications for Fetal Assessment
- Varicella-Zoster Immune Globulin (VZIG) #1584
- Operative Vaginal Delivery: The Use of Forceps or Vacuum Extractor #1674
- Hepatitis B During Pregnancy: Perinatal Management & Treatment
- Prevention of Iatrogenic Prematurity #1685
- Induction of Labour #1703

The MPHSC recommended deletion of one guideline in 2002:

- Home Deliveries # 623

The MPHSC developed seven Newsletter items in 2001 and 2002:

- Healthy Baby: Manitoba's Prenatal Benefit & Community Support Program
- Prophylactic Antibiotic Use for Caesarean Section
- BCG Vaccination for First Nations Newborns Who Are Not Immunocompromised
- Maternal Hepatitis B Surface Antigen Status
- Availability and Indications for Administration of Rh Immune Globulin
- Prenatal HIV Testing
- Cardiac Arrest in Pregnancy

The MPHSC participated in the review of two Statements in 2001 and 2002:

- Planned Home Deliveries #1681
- Defined Registration – No Obstetrics #503

The committee participated with Brandon Regional Health Centre in the review of a Caesarean Section audit. Rising Caesarean section rates observed in previous years showed the beginnings of a higher than provincial average, even upon comparison with the regionalization of the three Winnipeg hospitals performing deliveries. As a result, in 2002, Brandon Regional Health Centre undertook a Caesarean section audit, and identified that the statistics reflected different backgrounds, training, and experience in newly recruited physicians. The Brandon Regional Health Centre initiated educational action, ensuring that evidence-based national standards of care are utilized at the centre.

Other topics considered by the MPHSC as listed in the 2001/2002 Report are discussed further in this report. Some topics of interest for further exploration may include resources, transportation issues, recognition of pregnancy induced hypertension, public education on the value of ultrasound, Caesarean section rates (audits), availability of monitor tracings, prenatal record, SIDS prevention, Congenital Anomaly Register and HIV testing in pregnancy.

Report from The College of Midwives of Manitoba

For the years 2001/2002 and 2002/2003
Submitted by Gisele Fontaine, Registrar

The College of Midwives of Manitoba (CMM) expresses appreciation to the CPSM for the invitation to submit its Annual Report for publication in the Annual Report of the Maternal and Perinatal Health Standards Committee. To facilitate the process the CMM had requested data from Manitoba Health regarding numbers of births attended by midwives, including home and hospital, consultations and transfers of care. Unfortunately the data was not available to the CMM at the time of this report. It is the CMM's understanding that the data collection process is evolving and work continues towards an enhanced data collection system that will allow immediate access. We are however pleased to provide you with highlights of the work that the CMM has accomplished over the fiscal years 2001/2002 and 2002/2003.

2001/2002

The **Complaints Committee** investigates and responds to complaints brought to the College concerning the professional conduct or competence of a midwife. Members were appointed and began work on reviewing the first four complaints in July 2001.

The **Standards Committee** defines, drafts and reviews the Standards of Practice to which every midwife is responsible to adhere. The Standards Committee also sets guidelines that midwives may follow in certain areas of practice.

2002/2003

CMM members have reviewed the Midwifery Regulation, now 3 years post proclamation. Recommended amendments have been written and reviewed by members. This has proceeded to the formal drafting process and public consultation phase.

The first meeting of the **Perinatal Review Committee** was held December 2002, at which time the work of developing the terms of reference began. This committee is intended to be one of the avenues by which the educational needs of individual midwifery practitioners and of the profession as a whole can be addressed.

A rigorous **Prior Learning and Experience Assessment (PLEA)** process was developed by the College in order to facilitate the opportunity for candidates wishing to pursue a career as a midwife in Manitoba. Without a formal education program in Manitoba, the routes of entry into the midwifery profession are limited. The inaugural trial of the PLEA program enabled two candidates to be assessed for their eligibility to meet Manitoba's requirements for registration as midwives. Both midwives were successful and are employed in rural practices in the province.

The **Quality Assurance Committee** developed 3 of the 5 Quality Assurance mechanisms for the purpose of measuring the skills of midwifery practitioners in the field.

The Registrar and committees developed the following policies and standards which were approved by Council: *Standards* – Supervised Practice; Currency of Practice; Professional Development; Peer Review; Preterm Rupture of Membranes; Vaginal Birth After Cesarean Section; Postpartum Care. *Policies*: Length of Student Status; Change of Registration status; Prior Learning & Experience Assessment; Reporting Requirements for Infant & Maternal Death; Continuing Certification in NRP & CPR for Non-Practising Midwives; Approving Assessment Programs; Refund of Registration Fees.

The CMM held its first Annual Public meeting in April 2002 as required by legislation.

Statistical Summary

In 2001, the MPHSC reviewed 136 cases of perinatal and late neonatal (death occurring between the 8th and 28th full day of life) mortality, of which 129 were Manitoba residents and seven were from out of province who delivered in Manitoba. An additional two deaths occurred beyond 28 days of age from conditions arising in the perinatal period. These cases were classified as delayed neonatal deaths and were reviewed by the MPHSC with regard to perinatal care.

In 2002, the MPHSC reviewed 121 cases of perinatal and late neonatal (death occurring between the 8th and 28th full day of life) mortality, of which 112 were Manitoba residents and nine were from out of province who delivered in Manitoba. An additional death occurred beyond 28 days of age from conditions arising in the perinatal period.

There were no maternal deaths in 2001. There was one maternal death in 2002 that was not obstetrically related. (The maternal death was due to ruptured aneurysm of the middle cerebral artery not related to pregnancy.)

In 2001, 23 cases of maternal morbidity were reported to the committee for review as follows:

- 19 because of admission to an Intensive Care Unit
 - postpartum bleed (5), hysterectomy (4), after emergency caesarean section (1), hypertensive crisis (2), seizures (1), disseminated intravascular coagulation (1), pulmonary embolus (1), pulmonary edema (2), post motor vehicle accident (1), inadvertent spinal anaesthetic at time of epidural (1).
- 4 for other significant morbidity
 - uterine rupture or dehiscence (1), reproductive organ injury (1), HELPP Syndrome (1), ICU admission weeks before delivery due to community acquired pneumonia in an asthmatic patient (1).

In 2001, 47 cases of perinatal morbidity were reported to the committee for review as follows:

- 20 for Apgar scores <6 at 5 minutes
- 12 for meconium aspiration
- 8 for birth trauma
- 4 for neonatal seizure activity
- 2 for respiratory distress
- 1 for congenital heart defect

In 2002, 33 cases of maternal morbidity were reported to the committee for review as follows:

- 18 because of admission to an Intensive Care Unit

- postpartum haemorrhage (5), intercurrent disease (2), uterine rupture (2), infection (2), postpartum hysterectomy (2), pre-eclampsia (2), pregnancy induced hypertension (1), gestational hypertension (1), fluid overload (1).
- 15 for other significant morbidity, not requiring ICU admission
 - pulmonary edema (4), reproductive organ damage (3), intercurrent disease (3), hypovolemic shock (1), thromboembolism (1), transfer because of fluid overload (1), postpartum hemorrhage (1), pre-eclampsia (1).

In 2002, 77 cases of perinatal morbidity were reported to the committee for review as follows:

- 33 for Apgar scores <6 at 5 minutes
- 16 for seizures due to hypoglycemia
- 10 for birth trauma
- 7 for respiratory distress
- 6 for meconium aspiration
- 2 because the baby required resuscitation
- 1 for severe intrauterine growth restriction
- 1 for Apgar scores <6 at 5 minutes and seizures
- 1 for pneumonia

The following statistical calculations are based on births to Manitoba residents and non-residents who delivered in Manitoba. Prior to 1994, the MPHSC reported statistics based on births to Manitoba residents only. The data is limited to births where the birth weight was 500 grams or greater. In 2001, there were an additional 33 stillbirths and nine neonatal deaths where the birth weight reported by Manitoba Vital Statistics was <500 grams. In 2002, there were an additional 48 stillbirths and 18 neonatal deaths where the birth weight reported by Manitoba Vital Statistics was <500 grams. These were not included in the review process or in the statistics.

Regional mortality rates are reported using the boundaries of the Manitoba Regional Health Authorities. Three-year moving averages, used in some calculations, eliminate large fluctuations in rates from year to year which sometimes occur when studying small populations. The rate for each year is calculated by averaging the rate for the year preceding, the year of note, and the year following.

This report deals with care provided by physicians only. If concerns are raised regarding care provided by non-physician health care providers, review of that care is referred to the appropriate regulatory body.

Births

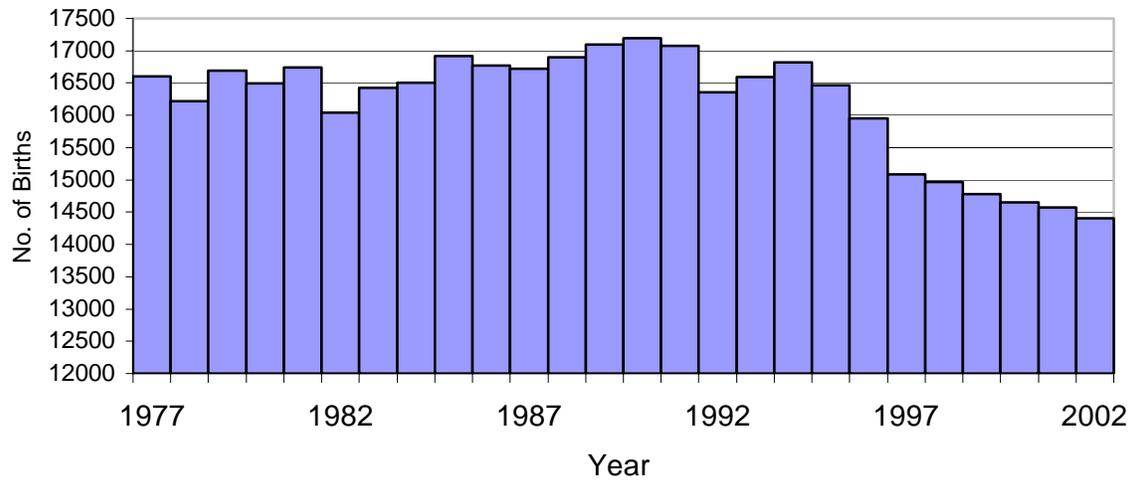


Figure 1 – BIRTHS IN MANITOBA (1977-2002)

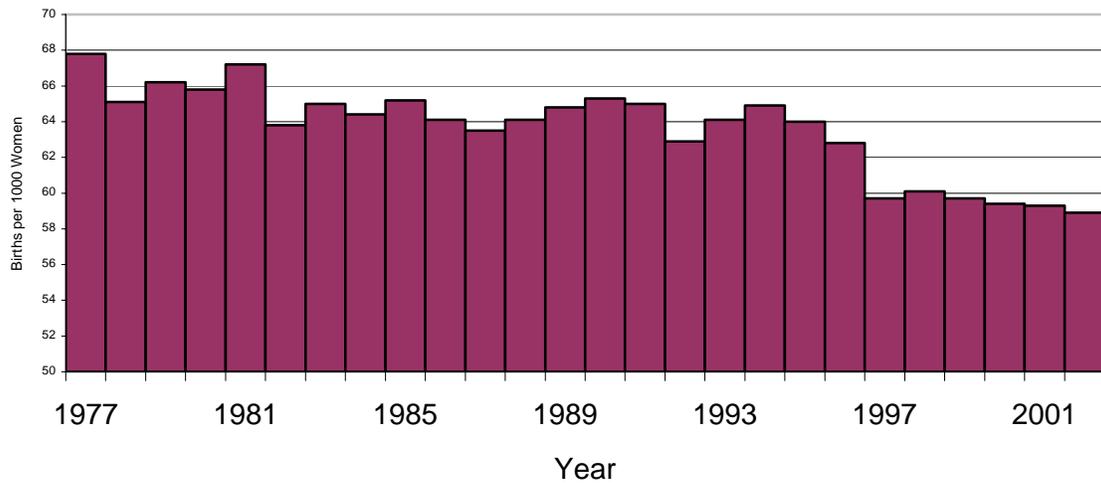


Figure 2 – MANITOBA BIRTH RATE (Births per 1,000 Women)

Note: The denominator for these calculations was the number of women 15 to 44 years of age.

Distribution of Births – Hospital Type

Table 1 – NUMBERS OF HOSPITALS BY DELIVERIES PER YEAR			
Number of Deliveries Per Year	Number of Hospitals		
	Level I: Primary Care Centre*	Level II: Intermediate Care Centre	Level III: Tertiary Care Centre
1 – 25	16 [♦]	-	-
26 – 50	2	-	-
51 – 100	4	-	-
101 – 500	6	-	-
501 – 1,000	-	2	-
1,001+	-	2	2
TOTAL	28	4	2

[♦] Includes 8 Level 0 Hospitals where emergency deliveries occurred.

* In addition, deliveries occurred at 9 nursing stations.

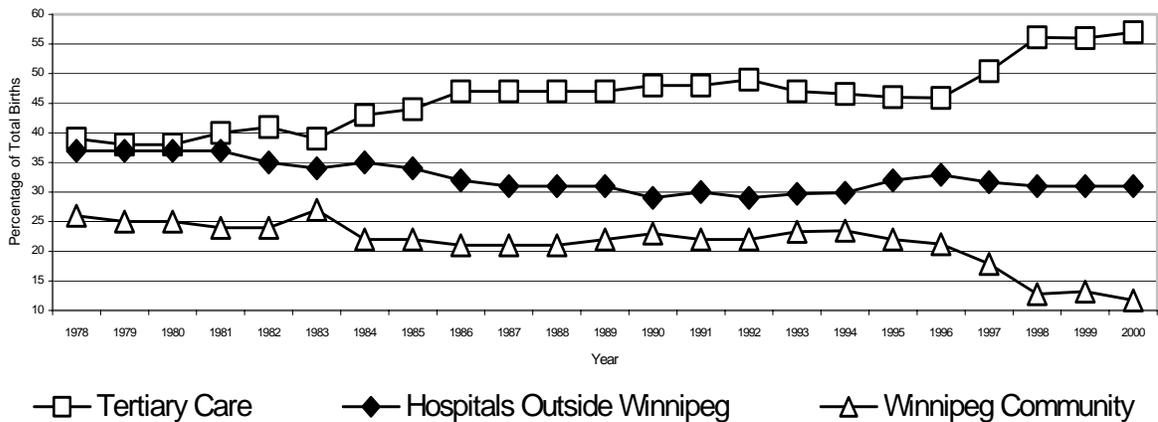


Figure 3 - DISTRIBUTION OF BIRTHS BY HOSPITAL TYPE

Births in the only Winnipeg community hospital, i.e. Victoria General Hospital, continue to decrease in number. Births outside Winnipeg remain stable in number.

When Level II hospitals outside Winnipeg are included with the one Winnipeg community hospital, the distribution of births is:

- Level I: Primary Care Centres – 15 %
- Level II: Intermediate Care Referral Centres – 24 %
- Level III: Tertiary Care Referral Centres – 61 %

Distribution of Births – Out-of-Hospital

Table 2a – OUT-OF-HOSPITAL BIRTHS 2001

Place of Birth	Attendant				Total
	Unattended	Midwife	Physician/ Nurse	Ambulance Attendant	
Home	27	111	1	5	144
En route to hospital	1	0	8	4	13
Nursing Station	0	0	2	0	2
TOTAL	28	111	11	9	159

Table 2b – OUT-OF-HOSPITAL BIRTHS 2002

Place of Birth	Attendant				Total
	Unattended	Midwife	Physician/ Nurse	Ambulance Attendant	
Home	23	108	0	11	142
En route to hospital	3	0	6	3	12
TOTAL	26	108	6	14	154

Canadian Perinatal Mortality

Table 3 - PERINATAL MORTALITY RATES (PMR) BY PROVINCE AND TERRITORY (28 weeks gestation to 7 days) (Rates/1,000 Births)									
Province/Territory	1994 PMR	1995 PMR	1996 PMR	1997 PMR	1998 PMR	1999 PMR	2000 PMR	2001 PMR	Average PMR 1994-2001
Canada	7.0	6.9	6.7	6.6	6.2	6.2	6.1	6.3	6.5
Quebec	5.9	5.9	5.7	5.9	6.3	5.4	5.5	5.8	5.8
British Columbia	7.0	6.5	6.2	6.0	5.1	4.9	4.4	5.5	5.7
New Brunswick	7.2	5.2	6.2	6.4	5.8	7.2	5.6	6.0	6.2
Nova Scotia	7.0	6.5	6.2	6.3	6.5	4.7	5.7	7.5	6.3
Alberta	7.5	7.8	7.0	6.2	4.7	6.7	6.7	6.5	6.6
Yukon	4.5	8.5	4.5	8.4	7.6	12.9	8.0	5.8	7.5
Ontario	7.2	7.1	7.2	7.0	7.0	6.5	6.7	6.5	6.9
Manitoba	7.4	7.7	7.6	7.3	7.6	8.7	7.6	7.8	7.7
Newfoundland	7.7	8.3	6.9	7.4	7.2	6.9	5.9	5.7	7.0
Prince Edward Island	9.3	9.1	7.7	5.0	8.0	8.5	5.5	9.4	7.8
Saskatchewan	8.9	8.6	7.1	8.7	7.2	7.3	7.4	7.5	7.8
Northwest Territories	13.2	8.0	7.6	10.2	9.6	14.4	13.3	6.5	10.4
Nunavut							4.1	11.2	

Source: Statistics Canada, Catalogue No. 84F0210XPB, *Births and Deaths, 1994-98.*; Statistics Canada, Catalogue No. 84F0211XPB: *Deaths 1999*; Statistics Canada Table 102-0508 – *Perinatal mortality and components 2003.*

The perinatal mortality rate for Manitoba continues to be higher than the Canadian average. This presents a challenge to health care providers, especially in regard to our demographics as well as the presence of a number of at-risk groups, e.g. diabetics in the First Nations population.

Manitoba Perinatal Mortality

Table 4a – PERINATAL & STANDARD PERINATAL MORTALITY 2001

	No. of Deaths	Total No. of Births	Perinatal Mortality Rate/1,000 Births
Perinatal Mortality >499 grams, living up to 7 days	121	14,573	8.3
Standard Perinatal Mortality >999 grams, living up to 7 days	80	14,493	5.5

Table 4b – PERINATAL & STANDARD PERINATAL MORTALITY 2002

	No. of Deaths	Total No. of Births	Perinatal Mortality Rate/1,000 Births
Perinatal Mortality >499 grams, living up to 7 days	109	14,402	7.6
Standard Perinatal Mortality >999 grams, living up to 7 days	69	14,336	4.8

In 2000, the perinatal mortality rate in Manitoba was 8.9 per 1,000 births. The three-year moving average was 8.3 per 1000, which corrects for any single year since the numbers are small. **The perinatal mortality rate decreased slightly over the past eight years.**

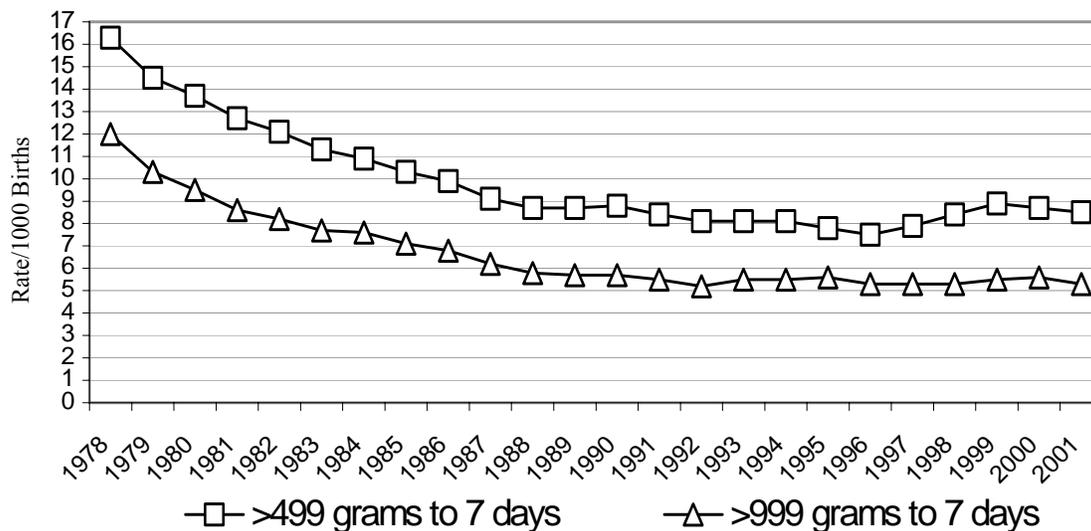


Figure 4 - PERINATAL MORTALITY RATES/1,000 BIRTHS BY WEIGHT (Three-Year Moving Average)

Perinatal Mortality – Stillbirths

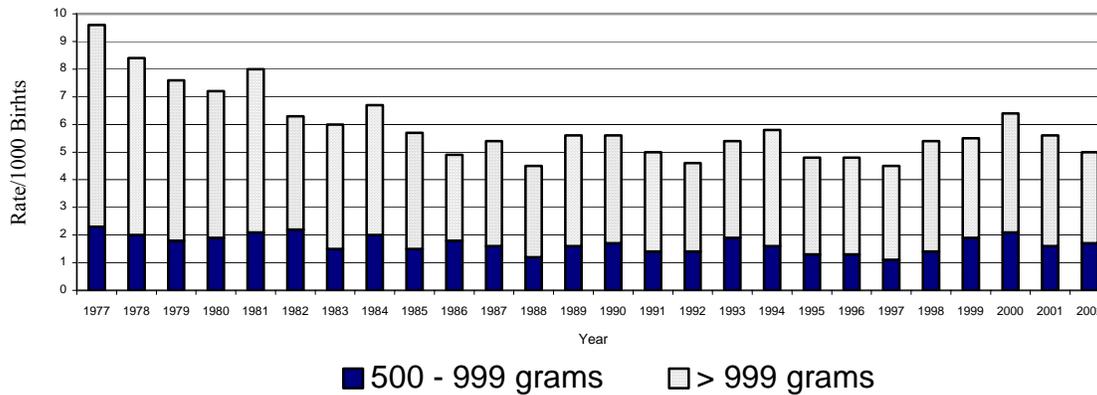


Figure 5 – STILLBIRTH RATES/1,000 BIRTHS BY WEIGHT

Table 5 –STILLBIRTHS 2001 and 2002						
	2001			2002		
	No. of Stillbirths	Total No. Of Births	Stillbirth Rate/1,000 Births	No. of Stillbirths	Total No. Of Births	Stillbirth Rate/1,000 Births
Stillbirths >499 grams	82	14,573	5.6	73	14,402	5.1
Stillbirths >999 grams	58	14,493	4	48	14,336	3.4

The stillbirth rate in Manitoba has remained fairly constant over the last 20 years. Stillbirths accounted for 68% of all perinatal deaths in 2001. Twenty-nine percent of all stillbirths weighed between 500 and 999 grams.

Stillbirths accounted for 67% of all perinatal deaths in 2002. Thirty-four percent of all stillbirths weighed between 500 and 999 grams.

Perinatal Mortality – Neonatal Deaths

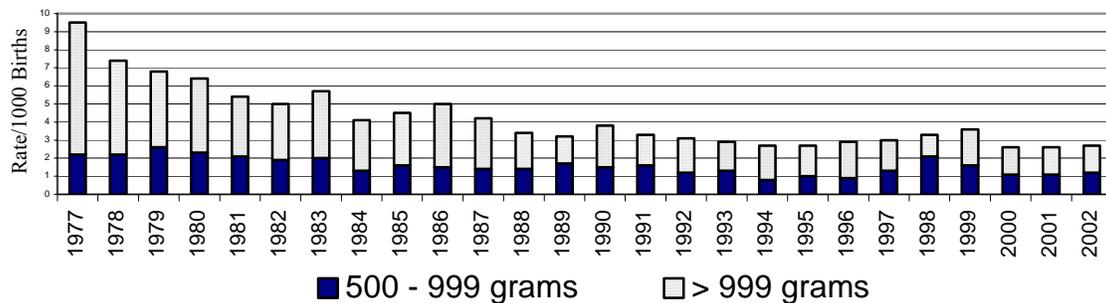


Figure 6 – EARLY NEONATAL DEATH RATES/1,000 BIRTHS BY WEIGHT

Table 6a – EARLY NEONATAL & LATE NEONATAL MORTALITY 2001

	No. of Deaths	Total No. of Live Births	Neonatal Mortality Rate/1,000 Births
Early Neonatal Mortality >499 grams, living up to 7 days	38	14,491	2.6
Late Neonatal Mortality >499 grams, living 8 to 28 days	16	14,491	1.1
Standard Early Neonatal Mortality >999 grams, living up to 7 days	22	14,435	1.5
Standard Late Neonatal Mortality >999 grams, living 8 to 28 days	10	14,435	0.7

Table 6b – EARLY NEONATAL & LATE NEONATAL MORTALITY 2002

	No. of Deaths	Total No. of Live Births	Neonatal Mortality Rate/1,000 Births
Early Neonatal Mortality >499 grams, living up to 7 days	38	14,329	2.7
Late Neonatal Mortality >499 grams, living 8 to 28 days	10	14,329	0.7
Standard Early Neonatal Mortality >999 grams, living up to 7 days	21	14,272	1.5
Standard Late Neonatal Mortality >999 grams, living 8 to 28 days	10	14,272	0.7

There were 16 deaths of newborns weighing between 500 and 999 grams in 2001 and 17 in 2002. This accounted for 42% of all early neonatal deaths in 2001 and 45% of all early neonatal deaths in 2002.

Perinatal Mortality – Hospital Type

Table 7a – PERINATAL MORTALITY BY HOSPITAL TYPE 2001

Type of Hospital	Stillbirths >499 gm	Early Neonatal Deaths >499 gm, living up to 7 days	Total Perinatal Deaths	No. of Births	Perinatal Mortality Rate (PMR)/1,000 Births
Tertiary Care Hospitals Level III	63	32	95	8,448	11.2
Intermediate Care Hospitals Level II	5	2	7	3,077	2.3
Primary Care Hospitals Level I	13	1	14	2,707	5.2

Number of Deliveries >499 grams reported by Manitoba Health, 2001/2002.

Table 7b – PERINATAL MORTALITY BY HOSPITAL TYPE 2002

Type of Hospital	Stillbirths >499 gm	Early Neonatal Deaths >499 gm, living up to 7 days	Total Perinatal Deaths	No. of Births	Perinatal Mortality Rate (PMR)/1,000 Births
Tertiary Care Hospitals Level III	50	26	76	8,469	9.0
Intermediate Care Hospitals Level II	13	3	16	2,842	5.6
Primary Care Hospitals Level I	5	10	15	2,666	5.6

Number of Deliveries >499 grams reported by Manitoba Health, 2002/2003.

Perinatal Mortality – Hospital Type (continued)

Table 8 – CORRECTED PERINATAL MORTALITY RATES[♦] (C-PMR) AND PERINATAL MORTALITY RATES (PMR) BY HOSPITAL TYPE (Rates/1,000 Births)								
Type of Hospital	1996 C-PMR	1997 C-PMR	1998 C-PMR	1999 C-PMR	2000 C-PMR	2001 C-PMR	2002 C-PMR	1998-2002 C-PMR
Tertiary Care Level III	7.8	8.0	9.5	8.1	7.1	7.5	6.7	7.8
Intermediate Care Level II	3.3	3.0	1.7	5.0	4.6	1.3	5.3	3.5
Primary Care Level I	5.4	4.8	5.5	4.2	4.6	3.7	2.6	4.4

[♦] Mortality rates excluding those stillbirths and neonatal deaths as a result of a lethal congenital anomaly.

Thirty-two of 39 deaths in 2001 and 19 of 28 deaths in 2002 in Manitoba due to lethal congenital anomalies were delivered in Level III hospitals.

Perinatal Mortality – Maternal Age

Table 9a – PERINATAL MORTALITY RATES (PMR) BY MATERNAL AGE 2001 (>499 grams, living up to 7 days)			
Maternal Age	No. of Deliveries for Maternal Age*	No. of Deaths	PMR/1,000
<18	524	8	15.3
18 – 34	11,937	102	8.5
>34	1,778	26	14.6
TOTAL	14,239	134	9.4

* Number of deliveries >499 grams for maternal age reported by Manitoba Health, 2001/2002 fiscal year.

Table 9b – PERINATAL MORTALITY RATES (PMR) BY MATERNAL AGE 2002 (>499 grams, living up to 7 days)			
Maternal Age	No. of Deliveries for Maternal Age*	No. of Deaths	PMR/1,000
<18	481	2	4.2
18 – 34	11,743	97	8.3
>34	1,753	22	12.5
TOTAL	13,977	121	8.7

* Number of deliveries >499 grams for maternal age reported by Manitoba Health, 2002/2003 fiscal year.

Perinatal Mortality – Maternal Age (continued)

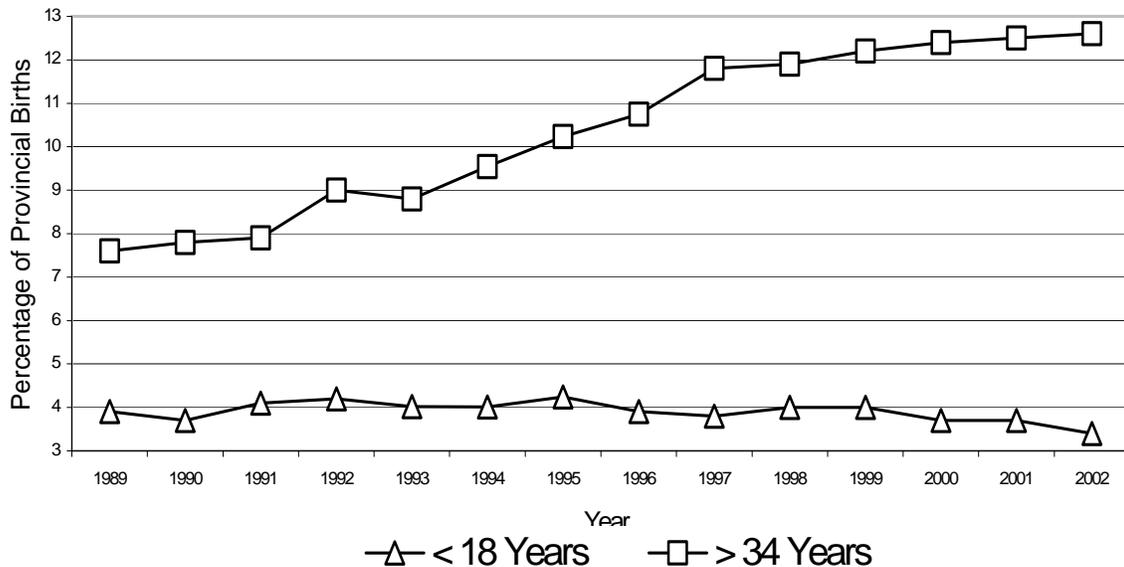


Figure 7 - DISTRIBUTION OF BIRTHS BY MATERNAL AGE

The percentage of births to women under 18 years of age has decreased slightly. Women who are older continue to contribute a slightly increasing percentage of births. **Figure 7** shows that the percentage of births in Manitoba has increased in women aged 35 years or older in the past decade with 13% of all births in 2002 occurring in women aged 35 years or older. It is also notable that the perinatal mortality rate in women aged 40 years or older is significantly higher than the majority of the population.

Perinatal Mortality – First Nations¹

There were a total of 136 perinatal deaths in Manitoba in 2001, resulting in a perinatal mortality rate of 8.3 per 1,000 births. (Seven of these deaths were not residents of Manitoba.) Thirty-seven deaths were among the 2,020 babies born to First Nations women, a rate of 18.3 per 1,000 births. For non-First Nations women, there were 99 perinatal deaths among the 12,219 births, a rate of 8.1 per 1,000 births.

First Nations women were found to be 2.3 times more likely to experience a perinatal death than other Manitoba women in 2001. This is higher than the average from the previous three years (1998-2000) of 2.1. The Maternal and Perinatal Health Standards Committee and the Child Health Standards Committee identified some factors associated with increased perinatal mortality among this population, many of which are related to socio-economic conditions, jurisdictionally and geographically limited access to appropriate health care services.

There were a total of 121 perinatal deaths in Manitoba in 2002, resulting in a perinatal mortality rate of 7.6 per 1,000 births. (Eight of these deaths were non-resident.) Thirty-three deaths were among the 2,020 babies born to First Nations women, a rate of 16.3 per 1,000 births. For non-First Nations women, there were 88 perinatal deaths among the 11,957 births, a rate of 7.4 per 1,000 births.

First Nations women were found to be 2.2 times more likely to experience a perinatal death than other Manitoba women in 2002. This is the same as the average from the previous three years (1999-2001) of 2.2.

¹ Defined as an individual who is registered under *The Indian Act of Canada*.

Perinatal Mortality – Regional

Table 10a –REGIONAL STANDARD PERINATAL MORTALITY RATES 2001 (Rate/1,000 Births >999 grams, living up to 7 days)				
Regional Health Authority (RHA)	No. of Deaths	Rate/1,000	Corrected Rate*/1,000	3-Year Average (Corrected Rate)
All Manitoba	90	6.2	4.2	5.8 (4)
Assiniboine	0	0.0	0.0	0.0
Central	3	3.2	3.2	3.7 (3.3)
Parkland	2	5.1	2.6	5.0 (3.4)
Interlake	1	3.3	3.3	3.0 (3.0)
Burntwood	4	6.2	3.2	8.6 (7.6)
Brandon	4	3.8	2.9	5.5 (4.0)
Winnipeg	71	7.2	4.9	6.3 (4.1)
NorMan	2	3.9	0.0	2.6 (1.3)
SouthEastman	2	5.8	2.9	4.9(2.9)

Table 10b –REGIONAL STANDARD PERINATAL MORTALITY RATES 2002 (Rate/1,000 Births >999 grams, living up to 7 days)				
Regional Health Authority (RHA)	No. of Deaths	Rate/1,000	Corrected Rate*/1,000	3-Year Average (Corrected Rate)
All Manitoba	78	5.5	4.5	5.8 (4.2)
Assiniboine	3	21.3	14.2	7.1 (4.7)
Central	4	4.2	2.1	3.6 (2.9)
Parkland	3	7.4	2.5	6.7 (4.2)
Interlake	2	7.1	3.6	3.5 (2.3)
Burntwood	6	9.5	7.9	10.2 (8.6)
Brandon	4	3.6	2.7	5.2 (3.7)
Winnipeg	52	5.5	2.7	6.1 (3.7)
NorMan	3	6.5	4.3	3.5 (1.4)
SouthEastman	0	0.0	0.0	2.9 (1.9)

*Mortality rates excluding those stillbirths and neonatal deaths that were the result of a lethal congenital malformation. North Eastman and Churchill RHAs are not included due to small number of deliveries in these regions.

Causes of Death

In 2001, there were 82 stillbirths, 38 early neonatal deaths, and 16 late neonatal deaths. In 2002, there were 73 stillbirths, 38 early neonatal deaths, and 10 late neonatal deaths. The causes of death were as follows:

In 2001, 33% (27/82) of all stillbirths were unexplained and 27% (22/82) were due to congenital malformation. Prematurity accounted for 19% (10/54) of neonatal deaths and 31% (17/54) were secondary to congenital malformation.

In 2002, 41% (30/73) of all stillbirths were unexplained and 25% (18/73) were due to congenital malformation. Prematurity accounted for 27% (13/48) of neonatal deaths and 35% (17/48) were secondary to congenital malformation.

In 2001, the overall autopsy rate was 44% (51% for stillbirths and 33% for neonatal deaths). Forty-eight percent of unexplained stillbirths had autopsies performed. In 2002, the overall autopsy rate was 43% (51% for stillbirths and 31% for neonatal deaths). Sixty percent of unexplained stillbirths had autopsies performed. It is anticipated that autopsies performed in the remaining cases may have resulted in a better understanding of their causes.

Maternal Mortality

Table 11 - MATERNAL DEATHS BY FIVE YEAR TRENDS									
Type of Death	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000	2001	2002	Total
Direct Obstetric*	5	4	4	1	1	1	0	0	16
Indirect Obstetric*	4	5	2	7	0	1	0	0	19
Non-Obstetric*	1	2	4 [♦]	2	1	0	0	1	11
No. of Births*	84,248	82,216	84,402	84,037	77,249	14,656	14,573	14,402	455,783

*See Appendix for definitions.

[♦]Two of these were N.W.T. residents whose deaths were registered in Manitoba.

Caesarean Section

In 2002/2003, there was an overall provincial Caesarean section rate of 18.9%, based on the total number of deliveries in Manitoba. Thirty-one Manitoba hospitals offered obstetrical services in 2002. Only 16 had the capability to perform Caesarean sections.

Table 12 – PERCENTAGE OF CAESAREAN SECTIONS BY HOSPITAL TYPE						
Type of Hospital	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
Level I: (with Surgical Capability)	17.4	16.1	17.5	15.4	18.1	17.1
Level II:	15.1	16.3	17.5	18.3	17.3	17.3
Level III:	18.7	18.8	19.4	19.1	18.7	21.2
Overall Provincial Total	16.4	17.2	18.0	18.2	18.0	18.9

The Canadian Caesarean section rates were: in 2001 - 19.2, in 2002 - 19.9, and in 2003 - 21.2 per 100 hospital deliveries.

(Source: Canadian Institute for Health Information (CIHI), Health Indicators June 2004 Catalogue no. 82-221-XIE, Vol. 2004, No. 1.)

Caesarean Section (continued)

Table 13 – REGIONAL CAESAREAN SECTION NUMBERS AND RATES 2002/2003					
RHA	# of Deliveries*	Total # C/S	# Primary C/S (%)	# Repeat C/S (%)	%
Provincial Total	13,895	2,629	1741 (66)	888 (34)	18.9
Interlake	280	39	26 (67)	13 (33)	13.9
South Eastman	355	53	33 (62)	20 (38)	14.9
Burntwood	632	98	59 (60)	39 (40)	15.5
Central	961	171	105 (61)	66 (39)	17.8
Assiniboine	141	35	21 (60)	14 (40)	24.8
Winnipeg	9,504	1854	1263 (68)	591 (32)	13.3
Parkland	406	69	33 (48)	36 (52)	16.9
Norman	460	88	55 (63)	33 (37)	19.1
Brandon	1,106	222	146 (66)	76 (34)	20.1
North Eastman	No Caesarean section capability				
Churchill	No Caesarean section capability				

* Number of deliveries >499 grams reported by Manitoba Health, 2002/2003 fiscal year, at hospitals with Caesarean section capabilities.

There are marked variations in Caesarean section rates between regions. Some of these differences may be accounted for by out-of-province patients delivering in a particular centre, referral patterns within the province, reluctance to leave a remote community for trial of labour, and lack of facility/staffing appropriate to conduct a trial of labour. The College Standards Committee is conducting a long-term review of indications for Caesarean Section to evaluate practice patterns between regions and over time.

Educational Action

There is a downward trend in overall perinatal mortality rates over the past 20 years in Manitoba.

Figure 8 illustrates the trend over time for **preventable** perinatal mortality in Manitoba. During case reviews, factors were identified which may decrease both mortality and morbidity if interventions had occurred. The focus of the MPHSC is to reduce preventable mortality and morbidity through a multifaceted approach. This approach includes better prenatal care, educational programs (e.g. nutrition, smoking cessation), improved technology (e.g. ultrasound, fetal monitoring), and advances in prenatal care.



Figure 8 - PERINATAL MORTALITY RATES/1,000 BIRTHS FOR PREVENTABLE DEATHS (>499 grams to 7 days) Three-Year Moving Average

Educational actions were taken by the MPHSC in four cases in 2001. In 2002, there were 23 educational actions taken. Starting in 2002, the actions taken at hospital level were included in the total count and this accounts for the apparent increase. Actions include a letter of education to an individual or forwarding of information to a specific individual or group so that changes could occur. An example of this was when a poor quality test result with the resultant miss of significant anomalies was forwarded to the individual involved. New equipment and methods of transmission together with audits were put in place. Where necessary, other regulatory bodies were informed of situations so that they could take actions. As well, the Chairs of Standards Committees and appropriate individuals in the regional health authorities, and government including Manitoba Health, have been apprised of our concerns.

Summaries, Comments & Recommendations

The MPHSC was involved in the following perinatal and maternal issues arising from case reviews. Cases are used as examples and are not intended to be all-inclusive.

Transfer of a Seriously Ill Patient

A gravida 1 para 0 patient was transferred to a regional centre at 29+ weeks gestation with 3+ proteinuria and blood pressure of 130/90. On arrival, urine showed 500 mg. protein per litre. Blood pressure was 130/90. She was taken to the labour suite. A non-stress test was reactive. The patient was pale, but had no other symptoms, and had an unfavourable cervix. Routine pregnancy induced hypertension blood work was ordered, but not drawn until later in the evening, and results were delayed by two more hours. Lab results showed a uric acid of 440, platelets of 8, and hemoglobin of 64. The low platelets were thought to be due to “clumping”. Meanwhile, the patient had been transferred to the ward for observation. A diagnosis of severe pre-eclampsia resulted in the decision to transfer to a tertiary centre the next day. Early the next morning, the patient was transferred to the labour suite for a non-stress test, at which time she vomited and was noted to be markedly edematous, appeared congested, and had bruising below her left knee. She complained of frontal headache, epigastric pain, and her attending physician was notified. Fifteen minutes later, progress notes recorded decreased fetal heart variability and oozing at IV sites. Warm blankets and a cool facecloth were applied, and 15 minutes later a heparin lock was established. The attending physician was present 35 minutes later. Oozing at IV sites had stopped and the fetal heart variability had improved. After 10 minutes, another IV was started and air flight arrangements to a tertiary care centre were arranged. The patient was noted to have more bruising. On arrival at the tertiary care centre, she had an emergency Caesarean section for a three-pound baby. The mother had a lengthy period where she was comatose, required ventilation, and tracheostomy. She developed subglottic stenosis, cerebral infarcts, and had a myocardial infarction. There was right hemiplegia, right facial and hand weakness, and she continued therapy. A final diagnosis of thrombotic thrombocytopenic purpura was eventually made.

Comment: An educational process for identification of patients requiring prompt transfer and process for repeating of ominous blood work was initiated.

Recommendation: *Immediate follow-up of lab results and immediate transfer to a tertiary care centre are critical in these types of cases.*

Blood Sugar Monitoring in Patients

1. A primipara was delivered of a 3300+ gram male infant at term with Apgars 1¹ and 9⁵. The baby subsequently was transferred to a tertiary care centre because of seizures, likely secondary to hypoglycemia. There appeared to be inadequate

blood sugar monitoring of the baby after birth. Additionally, review of the patient's prenatal record shows that she initially attended a physician in Winnipeg, was subsequently lost to follow-up, but reappeared at a rural facility where she was followed from 34 weeks onward. She had a positive family history of diabetes and was obese. Two random blood sugars and a hemoglobin A1C were performed after 34 weeks. No further glucose challenge tests were given. A physician ordered a glucose challenge test early in the pregnancy, but the patient did not attend.

2. A gravida 3 para 2 patient was delivered of a 5000 gram infant at term after two previous Caesarean sections, one for a large baby. Prenatal blood sugar monitoring was not done. The newborn developed respiratory distress and was transferred to a tertiary care centre where a subsequent workup showed a hepatic AV malformation. The baby was in cardiac failure and had associated hemangiomatosis covering the body. The baby was subsequently treated at The Toronto Hospital for Sick Children where an unsuccessful attempt at vascular occlusion of the malformation was performed. The baby was transferred back to Winnipeg for terminal care.

Comment: This represents a common theme seen throughout our chart reviews in that glucose monitoring as recommended is not adequate in many cases. Elevated sugars can have profound effects on pregnancy, both during and after delivery, and readers are referred to the guidelines identified below.

Recommendation: *The MPHSC refers physicians to the Society of Obstetrics and Gynaecology Clinical Practice Guideline No. 121, November 2002, entitled "Screening for Gestational Diabetes Mellitus", and the Canadian Diabetes Association 2003 Clinical Practice Guidelines entitled "Pre-existing Diabetes in Pregnancy", and "Gestational Diabetes Mellitus".*

Eclampsia And Pregnancy Induced Hypertension

A young primigravida patient was admitted to hospital at 30 weeks gestation with frontal headache, epigastric pain, and abdominal discomfort. Her blood pressure was 190/120. The baby was found to have good fetal heart variability. She had edema of her feet, but not her hands and face. A preeclampsia workup was performed and a referral was made to a second physician. Blood pressure was 124/113 at that time and Apresoline and magnesium sulphate was started. The hypertension persisted. Prostaglandins were used to initiate cervical ripening and/or labour. Three hours later, the patient had a grand mal seizure and underwent a lower segment Caesarean section for delivery of a 2600+ gram infant with Apgars of 8¹ and 9⁵. The patient was continued on magnesium sulphate and Apresoline and subsequently did well.

Comment: Eclampsia and Pregnancy Induced Hypertension remain significant causes of maternal and fetal morbidity and mortality.

Fetal Monitoring

1. A primipara at 40 weeks gestation was brought to hospital for induction of labour for chronic hypertension controlled with two antihypertensives. She had been in the antenatal home care program since 32 weeks gestation and had serial exams by the fetal assessment unit. At 40 weeks gestation, the fetal assessment unit suggested induction of labour. The patient presented in spontaneous labour the following day and artificial rupture of membranes was done, showing thick meconium. The patient was noted to have frequent late decelerations at that time. One and one-half hours later the repetitive late decelerations continued. Six hours after that, a fetal scalp sample was done which showed a value of 7.16. The patient had a lower segment Caesarean section for an infant with Apgars 4 at one minute and 3 at five minutes. There was thick meconium below the cords and the cord artery pH was 7.12. The hospital initiated an educational process to promote appropriate and timely use of fetal scalp sampling when patients demonstrate persistent recurrent late decelerations.
2. A gravida 3 para 1 was admitted to hospital at 27 weeks gestation in pre-term labour. The patient had a history of Crohn's disease. The cervix was 80% effaced and 2 cms. dilated with intact membranes. There was a history of smoking and drug abuse during the pregnancy. The fetal heart rate was auscultated at mid morning. There was no record of repeat fetal heart auscultation until later the same evening, at which time the fetal heart was not heard. The patient subsequently delivered a stillborn infant.

Comment: A process was established regarding fetal heart rate monitoring and documentation.

3. A primipara was induced because of high blood pressure and following slow progress underwent a Caesarean section. The baby weighed 3200+ grams with Apgars of 5 at one minute and 7 at five minutes. Thick meconium was noted at the time of delivery. The paediatric team intubated the baby. No meconium was found below the cords. The baby was given positive pressure ventilation for mild distress and at one hour of age was on C-PAP. An arterial pH was 6.93. The base deficit was 12.3 and a PCO₂ of 93. The baby was reintubated, received bicarbonate, and subsequently had a stormy course with persistent pulmonary hypertension needing high frequency ventilation and Dopamine. Ultimately, the baby did well.

Comment: Delay in reintubating the baby was a factor.

4. A gravida 1 para 0 patient was induced at 41 weeks gestation. Early in the morning, a resident was called to evaluate the fetal heart rate tracing. The patient was 7-8 centimetres dilated and an artificial rupture of membranes was performed, showing clear fluid. The variability was good and was to be reassessed in one hour. Again the tracing was assessed and thought to be good.

At staff turnover, the oncoming attendant immediately did fetal scalp sampling, which came back at 7.04 to 7.07. The patient at this time was fully dilated and a decision was made to proceed to a trial of vacuum delivery. The head was ROP position at +2 and delivery occurred after 4 contractions with one failed vacuum attempt. The baby weighed 3000 grams with Apgars 2, 8, and umbilical artery cord pH of 6.99. The baby had a rocky post neonatal course.

Comment: The indication for vacuum delivery and the technique utilized was appropriate. However, there was a delay in acting on a poor fetal heart rate tracing.

5. A gravida 5 para 1 patient was admitted in labour at 38 weeks gestation. On admission, a fetal heart rate was recorded at 160 beats per minute. The baby was born 43 minutes later with Apgars of 1 at one minute and 5 at five minutes and subsequently required intubation and transportation to a tertiary care hospital where the baby succumbed to complications related to severe hypoxic ischemic birth injury after five months of age. A single fetal heart rate monitoring of 160 is the only recorded fetal heart rate monitoring in this short labour.

Comment: There was a lack of fetal heart rate monitoring in labour. The facility initiated a process that resulted in nurse retraining, and labour floor staff receiving neonatal resuscitation program courses, and new graduate nurses receiving orientation and training at a tertiary care centre before starting to work. The WRHA care map for labour and delivery was adopted. A new nursing position was created for day and evening shifts.

Recommendation: Patients should be monitored closely during pregnancy and labour, including ultrasounds to monitor fetal growth. These actions are only of benefit if attention is paid to the results and observations. Proper training of staff and vigilance is required in what often is a stressful working environment.

Management of Breech Presentation

A primipara was admitted at 36 weeks 5 days gestation, with spontaneous rupture of membranes two hours previously. She was not in labour. A pelvic exam was not done. She was encouraged to walk around, and contractions gradually picked up. Her first pelvic exam was performed 4 hours after admission. She was fully dilated with a breech presentation. Shortly thereafter, the attending arrived and attempted delivery. There was entrapment of the after coming head and finally forceps were applied on a third attempt. The 3000+ gram infant had Apgars of 1 at five minutes and 2 at ten minutes. The baby required resuscitation and, in NICU developed seizure activity. The baby was subsequently discharged in good condition on oral Phenobarb.

Comment: A process was initiated by the facility regarding complete examination on admission of a patient presenting with ruptured membranes.

Referral to Another Regulatory Body

A maternal morbidity from a rural area was reviewed after a patient was transferred to a tertiary centre. There were concerns in regard to fluid replacement, use of diuretics, monitoring of fluid volumes given, time courses, and treatments for fluid overload. This case was subsequently referred to the College of Registered Nurses of Manitoba for review of the accuracy and legibility of the fluid balance sheets in this case.

Comment: This case is an example of a referral to another regulatory body.

Recommendation: Referral to appropriate regulatory bodies or agencies by Standards Committees must occur when concerns arise regarding patient safety.

VBAC Uterine Dehiscence

A 3600+ gram infant was born to a gravida 2 para 1 patient who had adequate antenatal care. A VBAC followed an induction of labour with Syntocinon eight days past due. The fetal heart rate tracing became non-reassuring, and was not acted upon. Forty-five minutes later there was complete rupture of the uterus with extrusion of the baby into the abdomen. An emergency Caesarean section was carried out. Apgars were 1 at one minute, 3 at five minutes, with a cord pH of 6.69 and a base deficit of 19.5.

Comment: There may be a risk performing induction of labour at eight days post dates. It would have been appropriate to act expediently to a non-reassuring fetal heart rate tracing.

Recommendation: Physicians are again reminded that induction of labour with Syntocinon approximately doubles the risk of a ruptured uterus in a patient with a previous Caesarean section.

Prenatal Care

The following cases were reviewed:

1. A gravida 3 para 2 was delivered of a 4800+ gram female infant at a nursing station by a visiting obstetrician. The patient was a known diabetic who was hypertensive and had inadequate prenatal care. A severe shoulder dystocia was encountered. Apgars were 2 at one minute and 5 at nine minutes. The baby had seizures in the newborn period, but subsequently resolved.
2. A gravida 6 para 5 patient with a history of previous Caesarean section presented in labour having had little prenatal care. At presentation her blood pressure was

- 176/110 and the fetal heart rate was absent. She was known to have increased blood pressure, was not on any medications, and was also known to be a gestational diabetic with questionable control. It was felt the fetal death was a consequence of chronic hypertension and diabetes with a subsequent abruption. She was delivered of a stillborn 3200+ gram infant.
3. The body of a neonate was found in a freezer. A post-mortem revealed a post term well formed infant weighing 3500 grams with no evidence of trauma and no evidence of natural disease process. Partial expansion of the lungs suggested some breathing efforts in keeping with this infant being born alive. The original owner of the freezer acknowledged having an unattended birth at home approximately four years earlier. Police investigated this case.
 4. A gravida 2 para 1 patient was seen in consultation at 10 weeks gestation with type II diabetes and hypertension. The patient was advised to begin taking insulin and was given diabetic education. She returned at 17 weeks gestation without having started her insulin, was switched to Glyburide as a compromise. At 24 weeks she was seen again and was found to have an elevated blood sugar and, therefore, her Glyburide was increased. She was also started on Aldomet for hypertension. She subsequently missed appointments and was seen again at 36 weeks gestation. An intrauterine fetal death was confirmed. She was induced and delivered a 3500+-gram infant.
 5. A primipara presented with a concealed pregnancy, having had no prenatal care. Upon presentation, she had severe abdominal pain as well as hypertension. There was a past history of von Willebrand's disease and heart surgery for ventricular septal defect. A stillborn infant was delivered.

Recommendation: Social issues, compliance, community education, and aggressive follow-up remain serious concerns in good prenatal care.

Diagnosis of Pregnancy

A gravida 4 para 3 patient with a past history of having twins presented at a rural hospital having had no prenatal care. She was transferred to a regional centre where she was found to have an increased fundal height compared to the estimated gestational age of 28 weeks. She was fully dilated with a breech presentation and delivered a 3000-gram infant. The baby had low Apgars at birth and was transferred to a tertiary centre. The baby succumbed at one week of age. Autopsy showed huge microcystic kidneys consistent with an autosomal recessive polycystic kidney disease. A physician saw her during the pregnancy for colitis, and menstrual disorder, but the pregnancy was not diagnosed.

Comment: It was felt that the care did not meet a minimal standard of prenatal care.

Documentation

A gravida 2 patient was admitted at 30+ weeks gestation to a rural hospital with a confirmed intrauterine fetal death. Prenatal care had been received in a rural community, and an ultrasound was performed during the pregnancy to confirm a normal 21-week gestation. The patient did not appear to have any form of prenatal record filled out, nor was there a record that triple testing was offered. There was no record that blood sugar testing was done, or Rh blood testing.

Comment: It was felt that the care did not meet a minimal standard of prenatal care.

Quality of Ultrasound

A gravida 3 para 2 morbidly obese mother delivered an infant at 40+ weeks gestation. The baby's Apgars were 2 at one minute and 4 at five minutes. The baby was subsequently intubated and given 100% oxygen but continued to be cyanotic. There was marked hepatomegaly and the baby was microcephalic, and had clear features of Down syndrome. The baby also had a major endocardial cushion defects with ASD, VSD, and valvular incompetence and subsequently died.

Comment: The mother had a late ultrasound, which missed major congenital anomalies. Education was initiated with regard to ultrasound, resulting in improved imaging and quality control.

Iatrogenic Prematurity

A gravida 5 para 4 female saw her physician at 12 weeks gestation by dates. An ultrasound was performed confirming an expected date of confinement. When transcribing the expected date of confinement, an error was made that was not noted by the consultant or the surgeon who managed the patient. Appropriately, the consultant advised the Caesarean section be done in the patient's 39th week. This occurred at the 29th week because of the transcription error. The patient underwent a Caesarean section for a 1600+ gram infant with Apgars of 5 at one minute and 6 at five minutes. The baby was transported to an NICU and required Intensive Care management.

Comment: Confirmation of dates is critical when early intervention is anticipated. All documentation and testing should be reviewed by all involved parties.

Use of Experimental Monitoring Devices

A gravida 1 para 0 patient weighing in excess of 300 pounds presented with ruptured membranes at term. An Oxytocin augmentation was started the next day but by midday

the fetal heart tracing was non-reassuring. The patient underwent fetal scalp sampling showing a normal pH. The patient was enrolled in a fetal pulse oximetry study at that time. The patient progressed to full dilatation and it was noted that the fetal heart rate tracing showed good variability with occasional late decelerations. The patient was then taken to the case room to push. The fetal pulse oximeter continued to show acceptable readings. After approximately three hours of pushing with no appreciable descent, an unsuccessful trial of vacuum delivery was attempted. A Caesarean section was subsequently done and a 4000-gram infant was born with Apgars of 1 at one minute, 3 at five minutes and 3 at 10 minutes. Cord pH was 6.73 and the base deficit was -20. The baby was intubated twice because of meconium below the cords and subsequently had to be re-intubated. The baby's first breath was at eight minutes and the baby subsequently had pulmonary hypertension, metabolic acidosis, and seizures controlled with Phenobarbital. There was a concave displaced fracture of the left and right occipital bones probably due to the failed vacuum delivery. The baby also developed E. coli bacteremia and was on intravenous therapy for fourteen days.

Because of the patient's weight, there was reluctance to risk Caesarean section. This resulted in a prolonged attempt at vaginal delivery. There was also reliance on the fetal pulse oximeter readings in the latter first stage and during the second stage of labour. Further scalp pHs which likely would have been done if pulse oximetry meter readings were not available. Maternal morbidity included septic shock, pulmonary edema, and necrotizing fasciitis of the wound requiring several debridements.

Comment: There is some question regarding the use of pulse oximetry readings, as they can be reassuring despite the possibility of having an acidotic baby. Educational action was taken with regards to the use of fetal pulse oximetry for monitoring fetal well-being.

Recommendation: *Fetal pulse oximetry should not be used as the primary measure of fetal well-being.*

Resource Issues

A gravida 7 para 3 was booked for induction of labour at 41 weeks. Her induction was deferred as a low priority on a day when the labour floor was overbooked. She was given an appointment for a non-stress test for the next day but did not keep this appointment. The patient ignored decreased fetal movements for approximately two days. At 41 weeks two days gestation, she presented with contractions and an intrauterine fetal death was confirmed on ultrasound.

Comment: Had appropriate resources been in place, the induction of labour would have been carried out as scheduled, and a live birth most likely would have occurred.

A process was implemented at St. Boniface General Hospital to manage the process of prioritization for induction. This process was recommended for use in both tertiary care hospitals. The use of this process is being monitored for improved outcomes.

Current Actions

In 2003 and 2004, the Maternal and Perinatal Health Standards Committee continued harmonizing and streamlining reviews and reporting processes to improve timeliness of reviews and to be proactive. The Committee commented on the following:

1. Concerns about Resource Issues specifically related to induction of labour, have been followed by our committee. There have been five fetal deaths attributable to lack of staff and/or beds necessary for inductions to be carried out in a timely manner. Concerns have been forwarded to the WRHA, Manitoba Health, and section heads in the tertiary care hospitals for action. The committee will continue to review this situation.
2. Caesarean Section Audit Tool. In response to the MPHSC 1999 Annual Report statistics on rising Caesarean Section rates, Brandon Regional Health Authority and St. Boniface General Hospital conducted Caesarean Section audits reviewed by the committee in November 2002. The St. Boniface General Hospital audit was recognized as having the potential to become a valuable information collection tool for Caesarean Sections for establishing a baseline provincial rate, and a Caesarean Section Audit Tool is being used for follow-up audits, and for analysis in determining a provincial baseline.
3. St. Boniface General Hospital is currently adopting a review mechanism for attending physicians to review charts, tracings, and lab results of the assessment in the obstetrical triage area within a 12-hour period of time.
4. A recurrent observation throughout our review of cases is that appropriate fetal monitoring is being carried out. However, non-reassuring tracings and/or test results are not consistently recognized. The “misses,” in general, are attributed to inattention, lack of training, poor staffing, and poor communication. Where these occurrences have been recognized, appropriate educational actions have been taken.
5. Social issues such as drug abuse, lack of patient compliance and motivation, inadequate health education, and lack of appropriate transportation are recurring themes. Public education and support, as well as aggressive follow-up with patients is required, in order to bring down the morbidities and mortalities. Currently, organizations such as Healthy Child are identifying mothers at risk, and run prenatal programs for mothers with regards to vitamins and food. While there are programs in place targeting some specific groups in the population, social issues remain one of the major causes of morbidity and mortality.
6. MPHSC has seen a trend in a number of cases where patient obesity has had a profound effect on both the management of labour and the complications resulting from labour. Wound infection and subsequent break down and debridement are well recognized in this group. Obesity remains a significant risk factor in pregnant women, and unfortunately is appearing more frequently.

7. The committee reviewed several cases where patients were transferred to Intensive Care Units with pulmonary edema which appeared to be attributed to fluid overload, especially during the intrapartum and immediate postpartum period. Most occurred in the context of gestational hypertension where the women were undergoing induction of labour over a protracted period of time. In most cases, accurate input and output sheets had been filled out, but excessive fluid overload had not been identified and acted upon. Large boluses of fluid during spinal anaesthesia or administered to combat intrapartum haemorrhage pushed these patients into acute fluid overload. An accurate intake-output sheet should be maintained and reviewed periodically by all attending health care providers. Pulmonary status through clinical evaluation of the patient is always important during the intrapartum and postpartum period, when indicated.
8. The MPHSC addressed a concern about the availability of diabetic education on federal reserve lands. The RHAs indicate that their responsibilities do not include jurisdiction over federal land. The MPHSC contacted the rural and northern RHAs and First Nations and Inuit Health Branch raising this concern.
9. The MPHSC addressed a concern regarding assisted reproductive technology. This included a review of potential complications associated with reproductive technology, and we continue to monitor this area. We are grateful for the cooperation of the Heartland Fertility and Gynecology Clinic in this matter.
10. The MPHSC had significant concerns about SIDS prevention. MPHSC conducted a survey of facilities across Manitoba in an effort to determine what educational material is available for SIDS prevention in First Nations communities and health centres during the postpartum period. A number of nursing stations (provincial and federal) identified a lack of literature, teaching programs, and materials relating to SIDS prevention. Some also reported distributing outdated 1997 SIDS pamphlets rather than *Back to Sleep* pamphlets published in 2000. Some nursing stations reported having outdated information dating back to 1989. It was noted that some nursing stations have no active teaching programs or talk about SIDS with new mothers during well baby care visits. Since the Child Health Standards Committee Annual Reports consistently show higher SIDS rates among First Nations population, there is concern about unavailability of current SIDS prevention education materials at nursing stations. Dr. J. Carson, former Medical Consultant to the Child Health Standards Committee made a slide presentation available to the First Nations Inuit and Health Branch for use in training nurses who are moving to Northern Manitoba to work.
A SIDS education package was distributed which included a 2000 Health Canada pamphlet entitled *Back to Sleep*, WRHA pamphlet *Caring for your Newborn Baby at Home*, The College of Physicians & Surgeons of Manitoba Newsletter item from May 2001 entitled *SIDS Prevention* (identifying preventable risk factors for SIDS including the new risks of antenatal smoking, co-sleeping with smokers). This information was referred to the Deputy Minister of Health Programs at Manitoba Health, the Director of Aboriginal Health at Manitoba Health, and the Nursing Officer for Northern Nurses at First Nations and Inuit Health Branches.

Maternal and Perinatal Health Standards Committee

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Dr. W. Smith, Family Physician (from October 2002)
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