
# Nova Scotia Atlee Perinatal Database

## Annual Report 2000

**Version 2.0.9**
**December 16, 2005**

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# Preface

The Reproductive Care Program of Nova Scotia is pleased to present this report describing trends in demographic characteristics, health choices, clinical interventions, and perinatal health outcomes for the Nova Scotia population. This report is a significant departure from previous Nova Scotia Atlee Perinatal Database reports, both in scope and in format. The content of the report has been expanded and an electronic version is available to download. We believe that the additional effort was well spent but acknowledge that it has had an impact on timeliness. Our goal is to produce subsequent reports using a similar format and to make them available as quickly as possible. We greatly appreciate the on-going support of our clinical, health records, and health management colleagues from all areas of the province.

Nova Scotia has nine District Health Authorities (DHAs). Each of these DHAs has a range of acute care and community-based services. In most DHAs, there is only one facility offering obstetrical and newborn care and a limited number of maternity and neonatal care providers. Every effort has been made to report data with enough detail to make the graphs and tables interesting and meaningful, while preserving RCP's commitment to protect the confidentiality of individual mothers, infants, care providers, and health care facilities. Trends in demographic information and health choices are reported by District Health Authority of mother's residence. Trends in interventions or rare outcomes are reported by the four larger Nova Scotia Health Care Regions that existed between 1996 and 1999.

# Acknowledgements

The following hospitals have contributed data to this report during 2000. Health Records personnel at many of these hospitals, with the support of administrative and medical/nursing staff, have reviewed patient health records and abstracted data. The contribution of these individuals is gratefully acknowledged.

RCP would like to recognize and thank the IWK Health Centre Prenatal Diagnosis Group for data from the Fetal Anomaly Database.

Occasionally an unanticipated birth occurs at a hospital which does not offer maternity care. Data arising from births at these hospitals have been included in this report.

| Hospital | Location | Designation |
|---|---|---|
| Aberdeen Hospital | New Glasgow | Regional |
| All Saints Hospital[1] | Springhill | Community |
| Buchanan Memorial Hospital[1] | Neil's Harbour | Community |
| Cape Breton Regional Hospital[2] | Sydney | Tertiary |
| Colchester Regional Hospital | Truro | Regional |
| Dartmouth General Hospital[1] | Dartmouth | Community |
| Digby General Hospital | Digby | Community |
| Fisherman's Memorial Hospital[1] | Lunenburg | Community |
| Glace Bay Health Care Corporation[2] | Glace Bay | Community |
| Hants Community Hospital[1] | Windsor | Community |
| Health Services Association of South Shore[3] | Bridgewater | Regional |
| Highland View Regional Hospital[4] | Amherst | Regional |
| Inverness Consolidated Memorial Hospital | Inverness | Community |
| IWK Grace Health Centre[5] | Halifax | Tertiary |
| The Moncton Hospital | Moncton, NB | Tertiary |
| Musquodoboit Valley Memorial Hospital[1] | Musquodoboit | Community |
| Northside Harbor View Hospital Corporation[2] | North Sydney | Community |
| QEII Health Science Centre[6] | Halifax | Tertiary |
| Queens General Hospital | Liverpool | Community |
| St. Martha's Regional Hospital | Antigonish | Regional |
| Sackville Memorial Hospital | Sackville, NB | Community |
| Soldier's Memorial Hospital | Middleton | Community |
| Twin Oaks Memorial Hospital[1] | Musquodoboit Harbour | Community |
| Valley Regional Hospital | Kentville | Regional |
| Western Regional Health Centre[7] | Yarmouth | Regional |

[1] Facilities without an active maternity service in 2000.

[2] Although reported separately, these hospitals have amalgamated under one administrative organization as the Cape Breton Health Care Complex.

[3] Name of facility changed to South Shore Regional Hospital in 2001.

[4] Name of facility changed to Cumberland Regional Health Care Centre in October 2002.

[5] Name of facitity changed to IWK Health Centre in November 2000.

[6] This adult tertiary hospital does not offer obstetrical services.

[7] Facility now known as Yarmouth Regional Health Centre.

# CHAPTER 1

## Introduction

Reproductive Care Program of Nova Scotia

Nova Scotia Atlee Perinatal Database

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## Reproductive Care Program of Nova Scotia

The Reproductive Care Program of Nova Scotia (RCP) is a provincial program funded by the Department of Health, supported by the Departments of Obstetrics & Gynaecology and Pediatrics at Dalhousie University, and endorsed by the Medical Society of Nova Scotia[1]. The mission of the program is "to contribute to the health of Nova Scotians by promoting excellence in the provision of maternity and newborn (perinatal) care throughout the province".

The RCP has five areas of focus: development and dissemination of perinatal clinical standards and guidelines, clinical audit and peer review, continuing education, management of the Nova Scotia Atlee Perinatal Database, and distribution and interpretation of perinatal health information.

[1]This organization has been renamed "Doctors Nova Scotia"

## Nova Scotia Atlee Perinatal Database

The Nova Scotia Atlee Perinatal Database (NSAPD) is a population-based database that contains detailed clinical and demographic information from 1988 onwards. Data are abstracted on-site in Nova Scotia health care facilities by Health Records staff and contributed to the NSAPD by these facilities. The NSAPD is managed by the RCP on behalf of the participating groups.

The population in the NSAPD includes livebirths and stillbirths born at a gestational age of at least 20 weeks or having a birth weight of at least 500 grams, all reported live born infants, births from multifetal pregnancies where at least one birth meets the preceding criteria, and mothers of births in these categories. Unless otherwise stated, pregnancy terminations are not included. Home births without hospital admission are currently not available to be entered into the database. Every effort is made to ensure that the Nova Scotia Atlee Perinatal Database includes perinatal events for all Nova Scotia residents. Events that occurred in Nova Scotia facilities that do not have active maternity services are collected as are events that occur in New Brunswick facilities where Nova Scotia residents regularly seek care. Delivery and birth events of non-Nova Scotia residents that occur in Nova Scotia facilities are also included in the NSAPD.

The objectives of the NSAPD are:

- To assist with the development and monitoring of standards of care.
- To provide health care professionals and health care administrators with information required for surveillance of key health outcomes or specific clinical issues.
- To facilitate comparison of clinical indicators among groups of like heath care facilities or across geographic areas of the province.
- To assist with facility-level peer review activities.
- To focus programs in continuing professional education.
- To contribute to research and clinical audit activities related to perinatal care and outcomes.

## Annual Report 2000

The purpose of this report is to provide an overview of selected perinatal health and clinical care issues for Nova Scotia residents.

In this report the term 'delivery' refers to a completed pregnancy, regardless of the number of infants born. The term 'birth' refers to a livebirth or stillbirth. Unless otherwise indicated, data in this report refer to infants discharged during calendar year 2000 and their mothers. This may result in apparent discrepancies in counts of births and deliveries as data pertaining to mothers of twins who are discharged in different years is tabulated for each year.

# CHAPTER 2

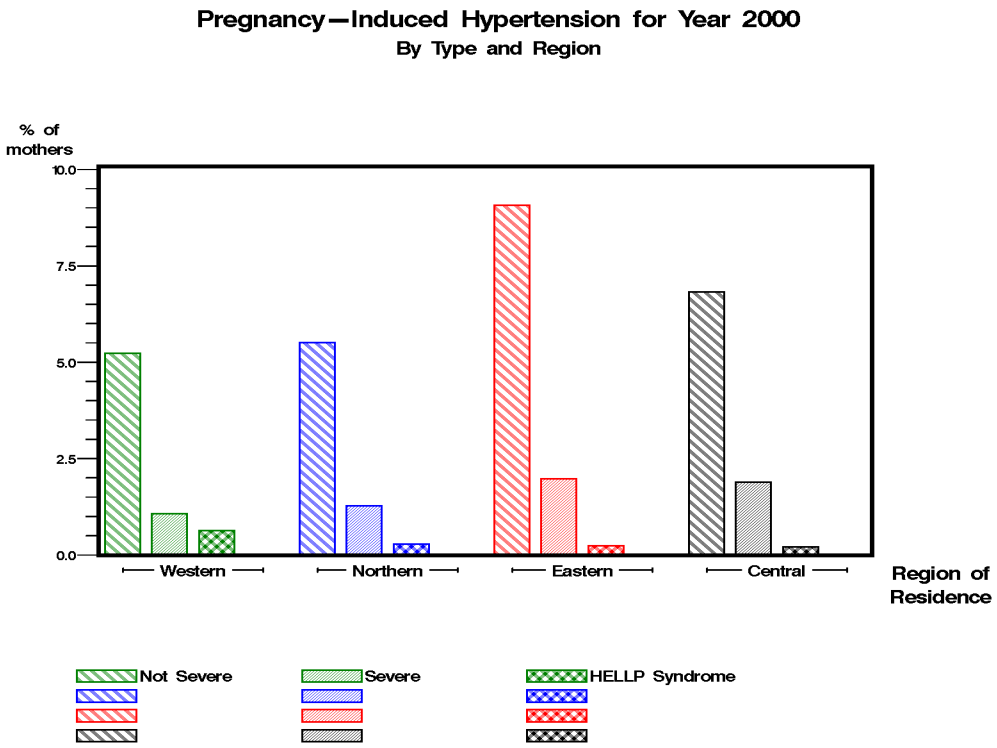
## Maternal Health

### Maternal Diseases and Complications

## Figure 2.1.1

## Maternal Diseases and Complications

Pregnancy-Induced Hypertension (PIH or 'toxemia' of pregnancy) is one of the more common complications of pregnancy. Differences in population health (e.g., proportion with diabetes), lifestyle (e.g., proportion who smoke) and characteristics such as parity and age affect the rates of PIH in the pregnant population of different regions.




* 'Not severe' PIH can be considered to closely correspond to 'gestational hypertension without significant proteinuria'. 'Severe' PIH can be considered to closely correspond to 'gestational hypertension with significant proteinuria'.

## Table 2.1.1

## Maternal Diseases and Complications

See previous commentary.

**Pregnancy-Induced Hypertension for Year 2000**
**Type / Rate by Region**

| Mother's Region of Residence | Not Severe | Severe | HELLP | All PIH |
|---|---|---|---|---|
| | % | % | % | % |
| Western | 5.2 | 1.1 | 0.6 | 6.9 |
| Northern | 5.5 | 1.3 | 0.3 | 7.1 |
| Eastern | 9.1 | 2.0 | 0.2 | 11.3 |
| Central | 6.8 | 1.9 | 0.2 | 8.9 |
| All N.S. | 6.7 | 1.6 | 0.3 | 8.7 |

# Table 2.1.2

# Maternal Diseases and Complications

PIH, especially the severe categories, occurs more frequently among women having their first baby (parity = zero) and the rate increases with maternal age.

## Pregnancy-Induced Hypertension for Year 2000
### By Parity and Maternal Age

| Parity = Zero | Not Severe | Severe | HELLP | All PIH |
|---|---|---|---|---|
| Mother's Age | | | | |
| under 20 | 7.4% | 2.2% | 0.2% | 9.8% |
| 20 - 34 | 9.7% | 2.6% | 0.6% | 13.0% |
| 35 or over | 11.7% | 4.7% | 0.9% | 17.2% |
| Total | 9.6% | 2.8% | 0.6% | 12.9% |

| Parity = One or more | Not Severe | Severe | HELLP | All PIH |
|---|---|---|---|---|
| Mother's Age | | | | |
| under 20 | 1.1% | 0.0% | 0.0% | 1.1% |
| 20 - 34 | 4.1% | 0.7% | 0.1% | 4.9% |
| 35 or over | 5.5% | 0.9% | 0.1% | 6.5% |
| Total | 4.3% | 0.7% | 0.1% | 5.1% |

| All Pregnancies | Not Severe | Severe | HELLP | All PIH |
|---|---|---|---|---|
| Mother's Age | | | | |
| under 20 | 6.5% | 1.9% | 0.2% | 8.5% |
| 20 - 34 | 6.6% | 1.6% | 0.3% | 8.5% |
| 35 or over | 7.2% | 2.0% | 0.3% | 9.6% |
| Total | 6.7% | 1.6% | 0.3% | 8.7% |

# Table 2.1.3

# Maternal Diseases and Complications

While the rates vary among regions, the incidence of the more serious types of diabetes (White's class B and beyond, see Appendix A) remains consistently below one percent of the pregnant population. The overall provincial rates of diabetes in pregnancy did not significantly change in the five year period 1996 to 2000. The overall rates of diabetes in pregnancy are affected by the population genetic propensity for the disease, age distribution, lifestyle, exercise, obesity and the proportion of known diabetics who become pregnant.

## Gestational and Pre-existing Diabetes - Five-Year Trends
### By Mother's Region of Residence

| Year = 1996 | Gestational per 1000 | Class B per 1000 | Class >= C per 1000 | Total per 1000 |
|---|---|---|---|---|
| Western | 29.2 | 0.0 | 1.9 | 31.1 |
| Northern | 43.0 | 0.6 | 1.2 | 44.6 |
| Eastern | 35.2 | 1.5 | 2.0 | 38.6 |
| Central | 22.4 | 1.5 | 2.6 | 26.6 |
| All | 29.7 | 1.1 | 2.1 | 32.8 |

| Year = 1997 | Gestational per 1000 | Class B per 1000 | Class >= C per 1000 | Total per 1000 |
|---|---|---|---|---|
| Western | 23.3 | 0.5 | 0.0 | 23.8 |
| Northern | 39.0 | 0.6 | 0.6 | 40.2 |
| Eastern | 22.3 | 1.1 | 2.7 | 26.1 |
| Central | 21.4 | 1.1 | 1.6 | 24.1 |
| All | 24.8 | 0.9 | 1.3 | 27.0 |

| Year = 1998 | Gestational per 1000 | Class B per 1000 | Class >= C per 1000 | Total per 1000 |
|---|---|---|---|---|
| Western | 24.9 | 1.6 | 0.5 | 26.8 |
| Northern | 31.0 | 0.7 | 2.0 | 33.7 |
| Eastern | 40.1 | 3.5 | 2.3 | 45.9 |
| Central | 20.7 | 3.2 | 1.8 | 25.8 |
| All | 26.7 | 2.5 | 1.7 | 30.9 |

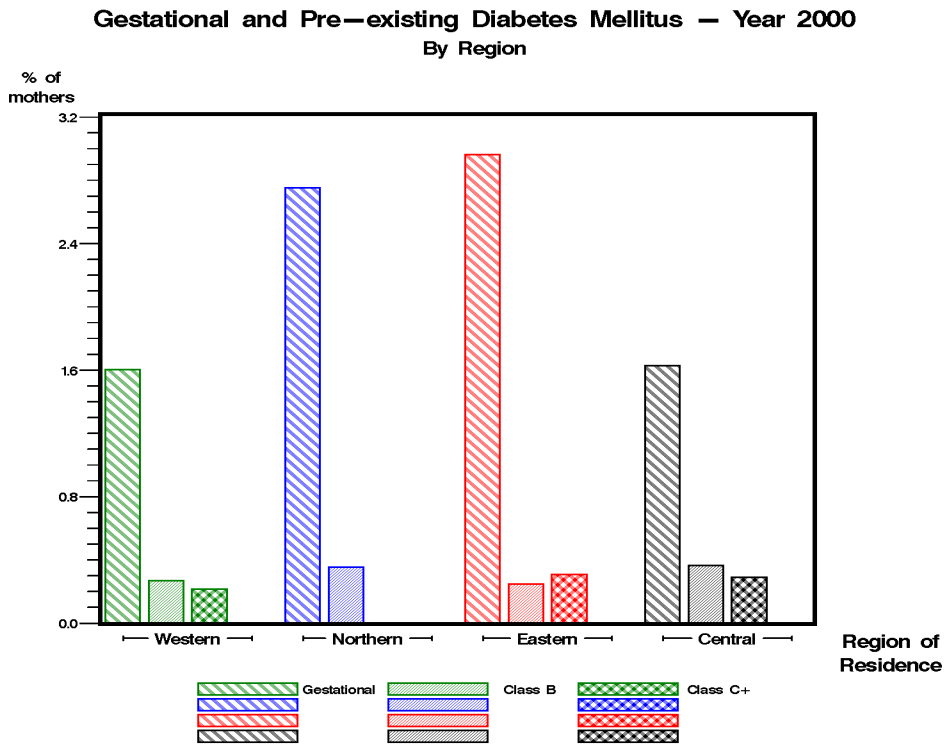
| Year = 1999 | Gestational per 1000 | Class B per 1000 | Class >= C per 1000 | Total per 1000 |
|---|---|---|---|---|
| Western | 27.1 | 3.1 | 1.0 | 31.2 |
| Northern | 34.9 | 0.7 | 2.1 | 37.6 |
| Eastern | 39.2 | 2.2 | 2.2 | 43.7 |
| Central | 19.6 | 2.4 | 0.9 | 22.8 |
| All | 27.2 | 2.2 | 1.4 | 30.8 |

| Year = 2000 | Gestational per 1000 | Class B per 1000 | Class >= C per 1000 | Total per 1000 |
|---|---|---|---|---|
| Western | 16.1 | 2.7 | 2.1 | 20.8 |
| Northern | 27.5 | 3.5 | 0.0 | 31.1 |
| Eastern | 29.6 | 2.5 | 3.1 | 35.2 |
| Central | 16.3 | 3.6 | 2.9 | 22.8 |
| All | 20.4 | 3.2 | 2.3 | 25.9 |

## Figure 2.1.2

## Maternal Diseases and Complications

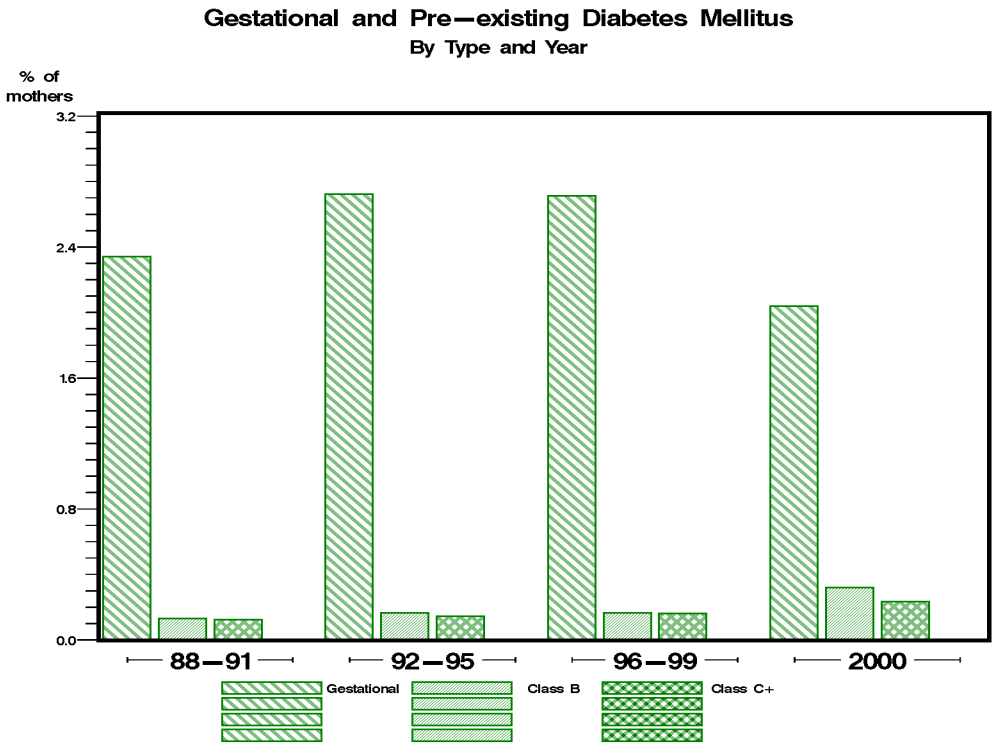
While the proportion of pregnant women with pre-existing diabetes varies from year to year among regions (the numbers are small), the Northern and Eastern regions continue to show higher overall rates of diabetes in pregnancy. (see previous table)




## Figure 2.1.3

## Maternal Diseases and Complications

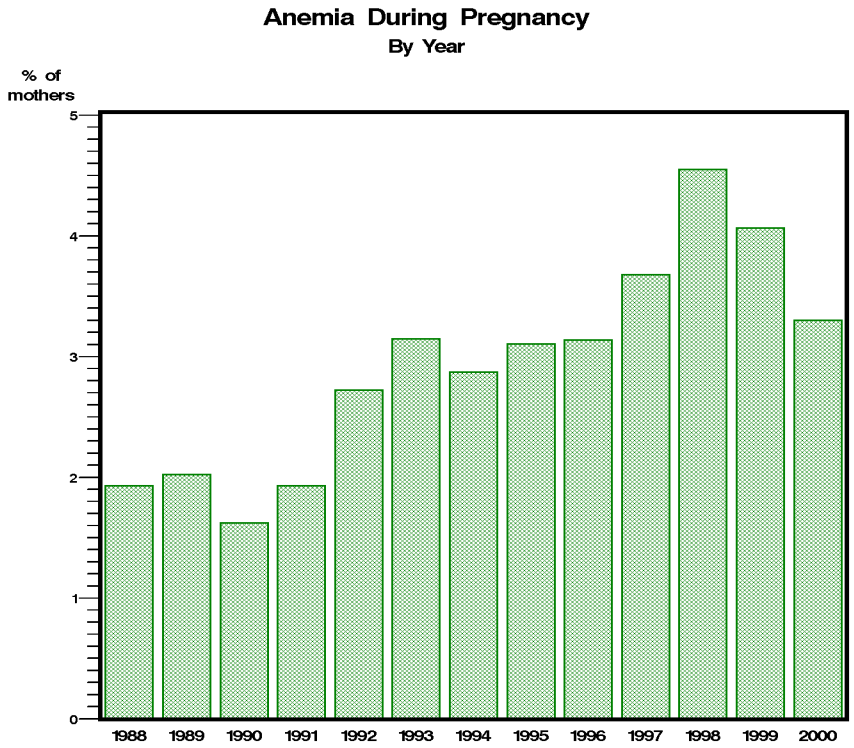
There appears to be a slight upward trend in the proportion of pregnant women with pre-existing diabetes since 1988 when provincial pregnancy data became available through the Nova Scotia Atlee Perinatal Database.



## Figure 2.1.4

## Maternal Diseases and Complications

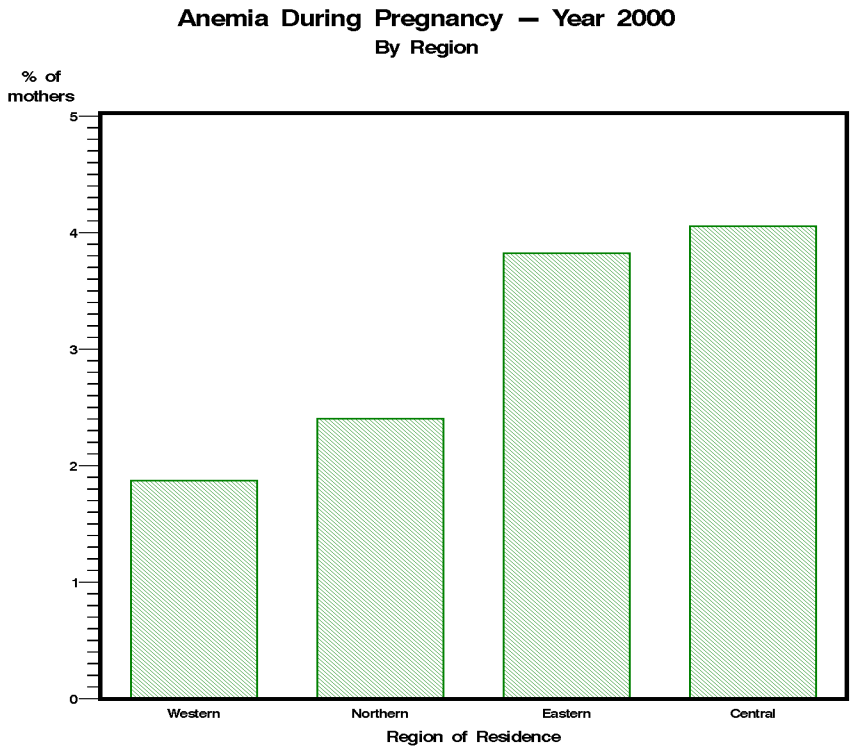
The frequency of anemia (hemoglobin less than 10.0 gm %) in the pregnant population appears to have almost doubled over the past 13 years. The increase is currently unexplained but may be a result of increased diligence on the part of health care workers to detect and document hemoglobin levels. On the other hand, it may indicate changes in overall population health, lifestyle and dietary habits.




## Figure 2.1.5

## Maternal Diseases and Complications

Please refer to commentary on table below (Table 2.1.9).



## Table 2.1.4 — Maternal Diseases and Complications

**Trends in Rate ( % ) of Anemia During Pregnancy**
**By Region, Hospital Type, Age, and Parity**

| | Region | | | | Hosp. Type | | | Age | | | Parity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Western | Northern | Eastern | Central | Tertiary | Regional | Community | under 20 | 20 - 34 | 35 or over | Zero | One or more | Total |
| Year | | | | | | | | | | | | | |
| 1988 | 0.7 | 1.8 | 2.4 | 2.4 | 2.8 | 1.2 | 0.3 | 2.4 | 1.9 | 2.0 | 1.5 | 2.3 | 1.9 |
| 1989 | 0.9 | 1.7 | 3.3 | 2.1 | 2.6 | 1.6 | 0.9 | 2.9 | 1.9 | 2.4 | 1.6 | 2.3 | 2.0 |
| 1990 | 1.1 | 1.5 | 3.2 | 1.1 | 1.8 | 1.6 | 1.1 | 2.0 | 1.6 | 1.9 | 1.2 | 2.0 | 1.6 |
| 1991 | 1.0 | 1.4 | 4.8 | 1.2 | 2.3 | 1.2 | 1.8 | 3.0 | 1.9 | 1.3 | 1.6 | 2.2 | 1.9 |
| 1992 | 1.2 | 1.2 | 4.9 | 3.0 | 3.7 | 1.3 | 1.6 | 5.0 | 2.4 | 3.2 | 2.3 | 3.1 | 2.7 |
| 1993 | 1.1 | 1.2 | 5.5 | 3.9 | 4.6 | 0.7 | 2.4 | 5.2 | 2.9 | 3.2 | 2.5 | 3.7 | 3.1 |
| 1994 | 1.3 | 1.6 | 5.5 | 3.0 | 3.9 | 1.6 | 1.5 | 5.5 | 2.7 | 2.1 | 2.3 | 3.3 | 2.9 |
| 1995 | 1.4 | 1.1 | 5.3 | 3.7 | 4.3 | 1.3 | 2.7 | 4.1 | 2.9 | 4.0 | 2.5 | 3.6 | 3.1 |
| 1996 | 1.2 | 1.7 | 4.9 | 3.8 | 4.3 | 1.1 | 3.8 | 3.4 | 3.1 | 3.6 | 2.4 | 3.7 | 3.1 |
| 1997 | 3.0 | 1.8 | 4.8 | 4.2 | 4.9 | 1.8 | 3.2 | 5.4 | 3.5 | 4.1 | 3.1 | 4.2 | 3.7 |
| 1998 | 6.3 | 2.3 | 4.8 | 4.5 | 4.9 | 4.2 | 3.3 | 7.4 | 4.3 | 4.7 | 4.1 | 4.9 | 4.6 |
| 1999 | 3.4 | 3.1 | 5.1 | 4.2 | 4.7 | 3.0 | 4.2 | 7.3 | 3.7 | 4.8 | 3.3 | 4.7 | 4.1 |
| 2000 | 1.9 | 2.4 | 3.8 | 4.1 | 4.3 | 1.6 | 3.8 | 4.6 | 3.3 | 3.0 | 2.8 | 3.7 | 3.3 |
| Total | 1.8 | 1.7 | 4.4 | 3.1 | 3.7 | 1.7 | 1.9 | 4.3 | 2.7 | 3.2 | 2.3 | 3.3 | 2.8 |

This table shows increases since 1988 across regions, hospital types, maternal age and parity. Generally higher rates of anemia occur among residents of Eastern and Central regions, mothers delivering in tertiary hospitals, mothers under 20 or 35 and older, and women who have had one or more previous children.

## Table 2.1.5 — Maternal Diseases and Complications

While the **rate** of anal sphincter laceration is increased with deliveries requiring forceps or vacuum assistance, similar **numbers** of lacerations are seen in the larger group of spontaneous vaginal deliveries. In the table, "n" refers to the number of anal sphincter lacerations, and "%" refers to the rate of anal sphincter lacerations per 100 deliveries in each category.

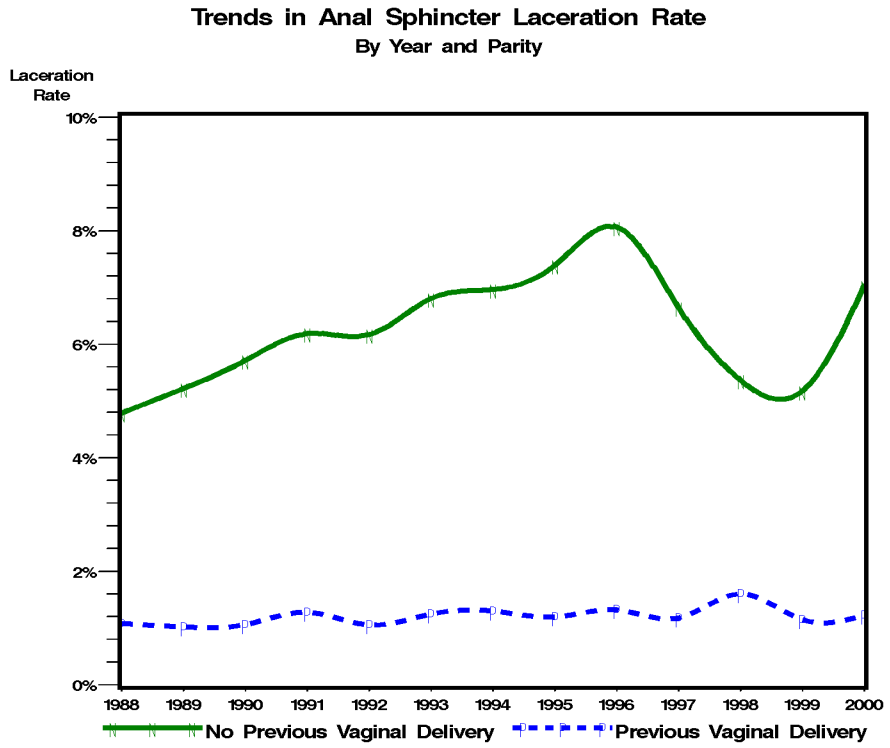
**Anal Sphincter Lacerations - Year 2000**
**By Intervention and Previous Vaginal Delivery**
**Restricted to vaginal deliveries only**

| | Intervention | | | | | |
|---|---|---|---|---|---|---|
| | Forceps | | Vacuum | | Spontaneous | |
| | # | % | # | % | # | % |
| No Previous Vaginal Delivery | 84 | 18.5 | 43 | 14.7 | 93 | 3.9 |
| Previous Vaginal Delivery | 6 | 11.8 | 8 | 7.4 | 33 | 0.9 |
| Total | 90 | 17.8 | 51 | 12.7 | 126 | 2.1 |

## Figure 2.1.6

## Maternal Diseases and Complications

An in depth analysis of factors associated with anal sphincter lacerations using the Nova Scotia data from 1988 to 1997 was recently published*. The major factors associated with increased risk of sphincter laceration were nulliparity, forceps use, birth weight greater than 3.5kg, delivery using vacuum extractor, episiotomy, fetus non-vertex presentation, and second stage greater than 4hr.




*J Obstet Gynaecol Can 2003; 25(7):587-93

# CHAPTER 3

## Maternal Health Services

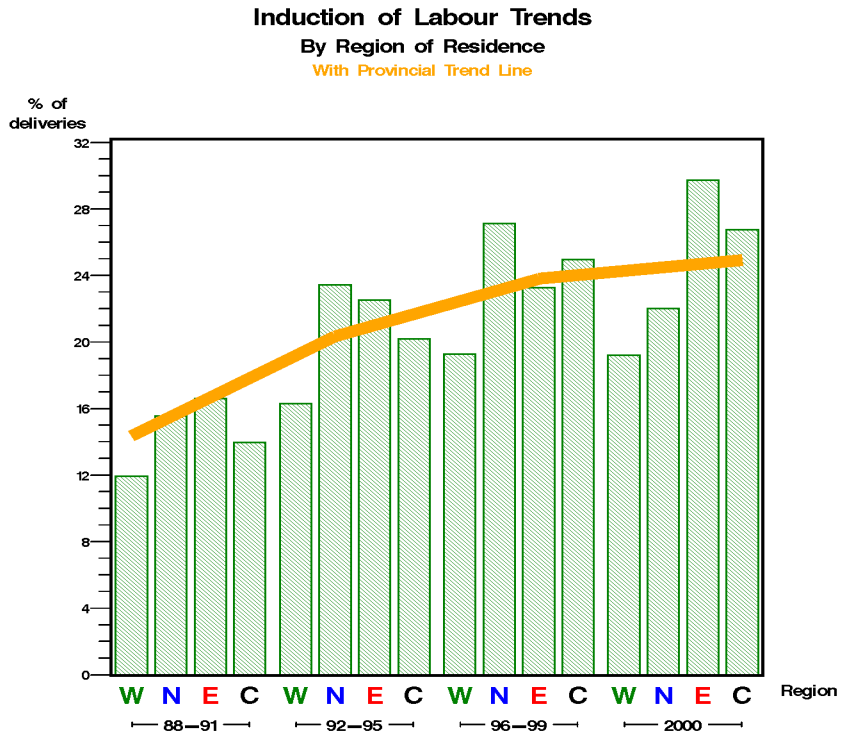
- Induction of Labour
- Epidurals
- Episiotomy
- Cesarean Delivery
- VbaC
- Length of Stay
- Regionalization Issues

***Data for this section pertain to induction of labour using oxytocic agents or cervical catheter.*** *Surgical induction of labour only (artificial rupture of membranes) is not available.*

## Figure 3.1.1

## Induction of Labour

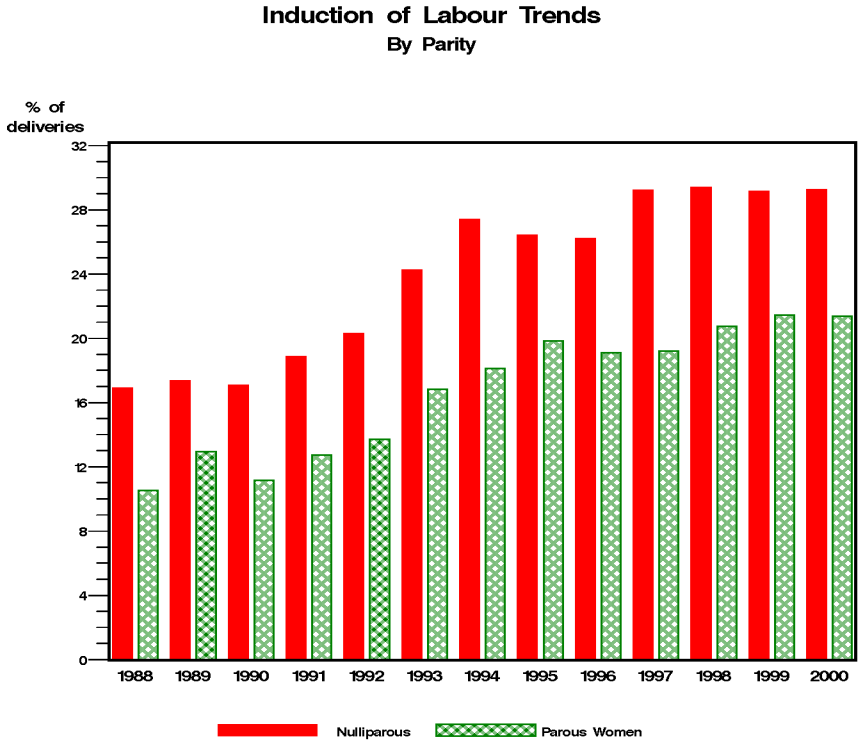
There has been a steady increase in induction of labour rates for most regions since 1988 reflecting changes in clinical practice and attitudes. Regional differences are also increasing and may be due to differences in clinical practice, availability of resources, and the incidence of medical conditions requiring induction.




## Figure 3.1.2

## Induction of Labour

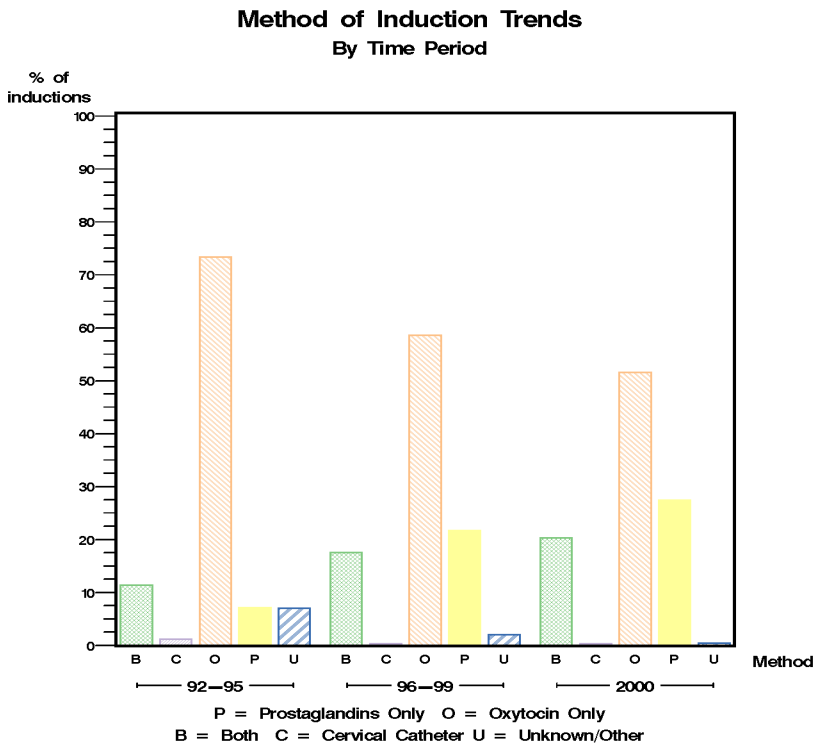
The considerable increase in induction rates seen in the early nineties was primarily due to a change in the management of post dates pregnancy (beyond 41 weeks gestation) -- see Figure 3.1.5. This change in clinical practice occurred as a result of the Canadian multicenter trial which showed improvements in pregnancy outcome if women chose to be induced once pregnancy progressed more than one week beyond the due date. [NEJM 1992; 326:1587-1592]



## Figure 3.1.3

## Induction of Labour

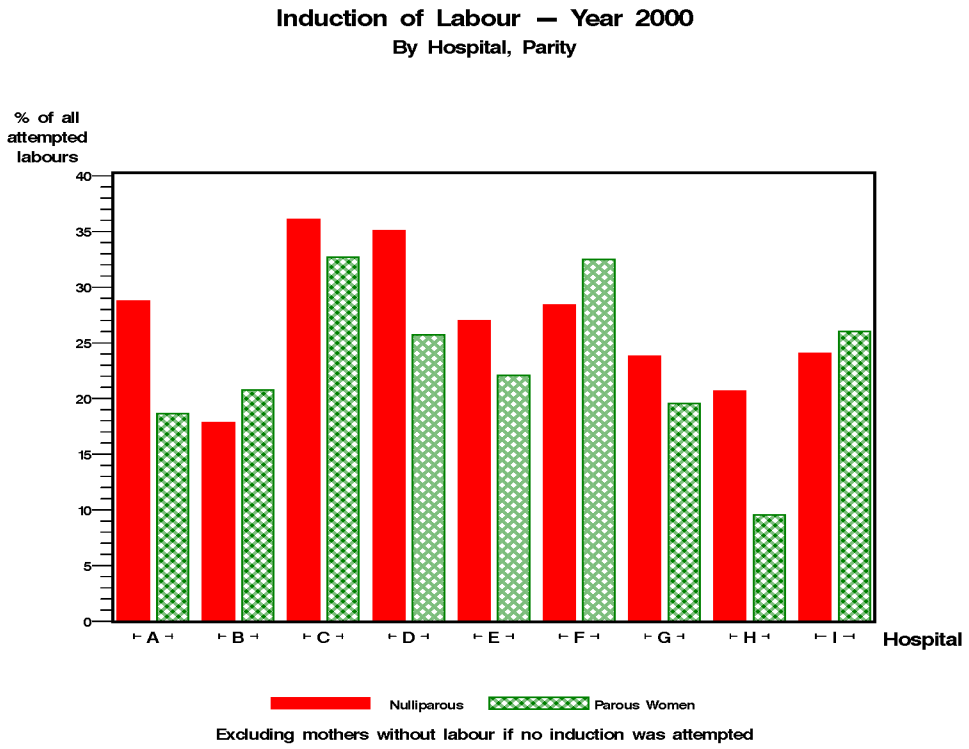
During the nineties, prostaglandin was increasingly used as an agent for making the cervix more favorable and for inducing labour. The category B (= Both) refers to the use of prostaglandin followed by oxytocin to achieve induction. Artificial rupture of membranes as a method of induction is not yet available in the database.




## Figure 3.1.4

## Induction of Labour

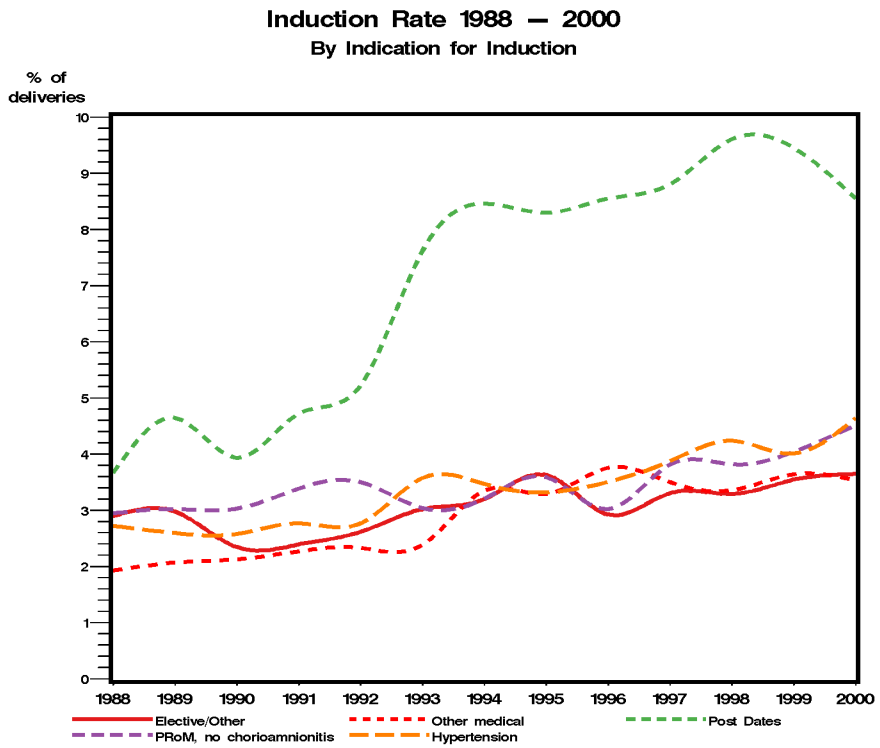
To compare induction rates among institutions, this graph excludes deliveries without labour if there was no attempt at induction. Induction rate variations among institutions reflect differences in clinical practice, availability of resources, population characteristics, and referral patterns.



## Figure 3.1.5

## Induction of Labour

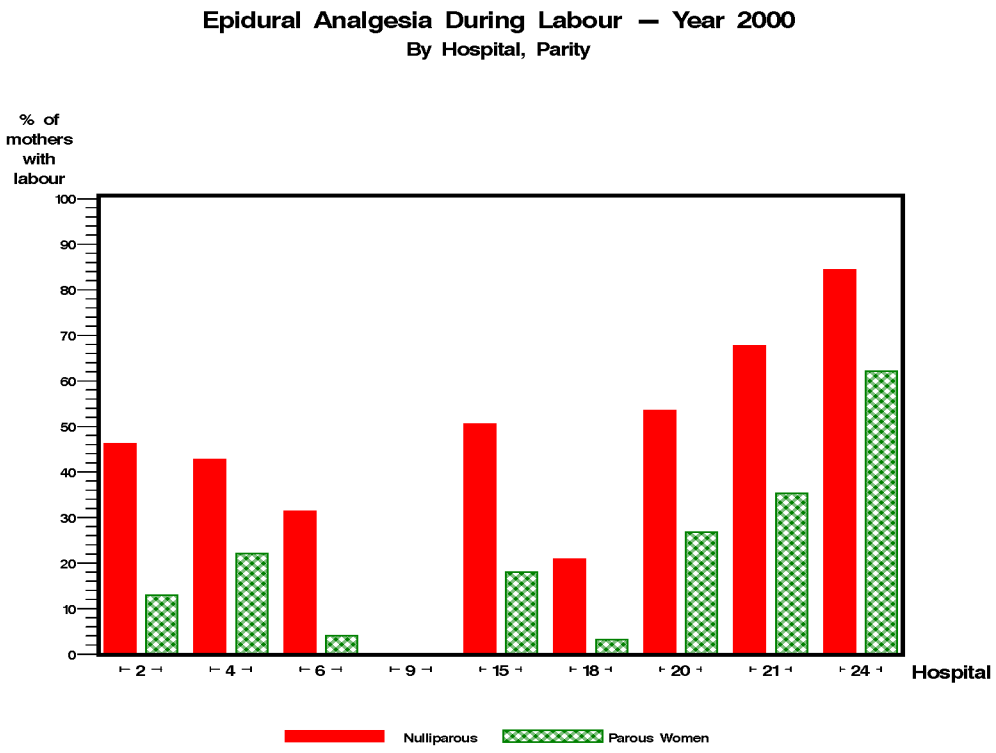
The dramatic increase in inductions for post dates pregnancies during the nineties occurred as a result of the Canadian Post Term Trial. This multicenter randomized controlled trial and other research demonstrated improved outcomes if women chose to be induced once pregnancy progressed more than one week beyond the due date. [SOGC Clinical Practice Guidelines, #15, Mar, 1997] Slight increases in induction for other medical reasons also reflect changes in clinical practice.




## Figure 3.2.1

## Epidurals

The substantial variation among institutions in the proportion of labouring women who undergo epidural analgesia reflects primarily differences in the availability of anesthetic personnel, but also differences in women's choices and clinical practice.

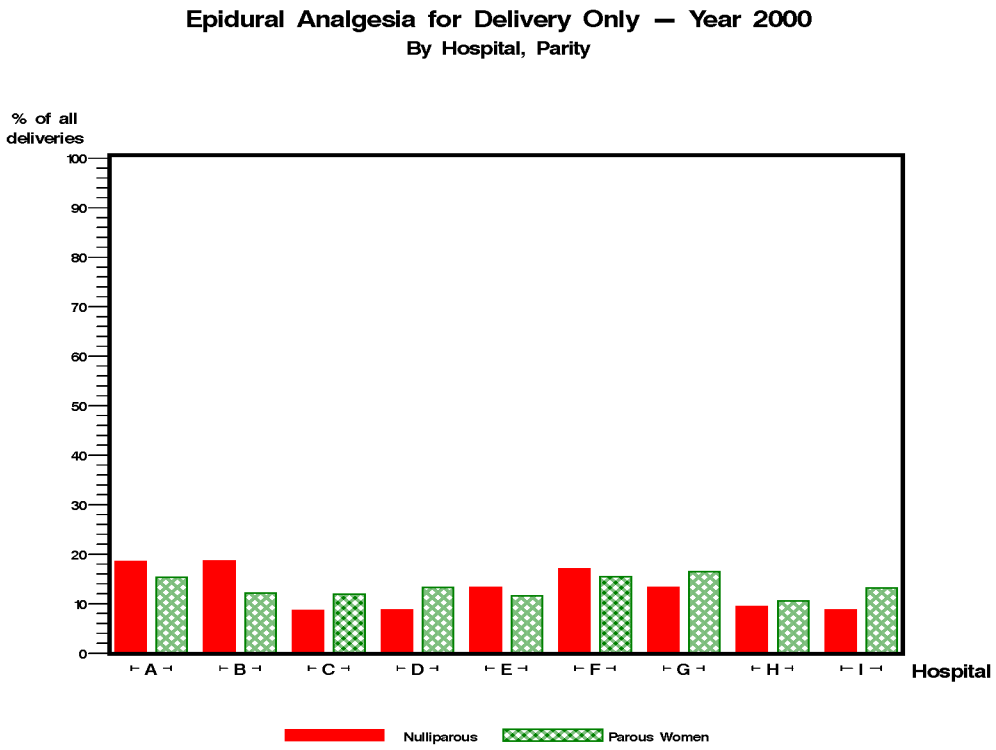



***In this and subsequent graphs of this section**, epidural analgesia includes spinal analgesia.*

## Figure 3.2.2

## Epidurals

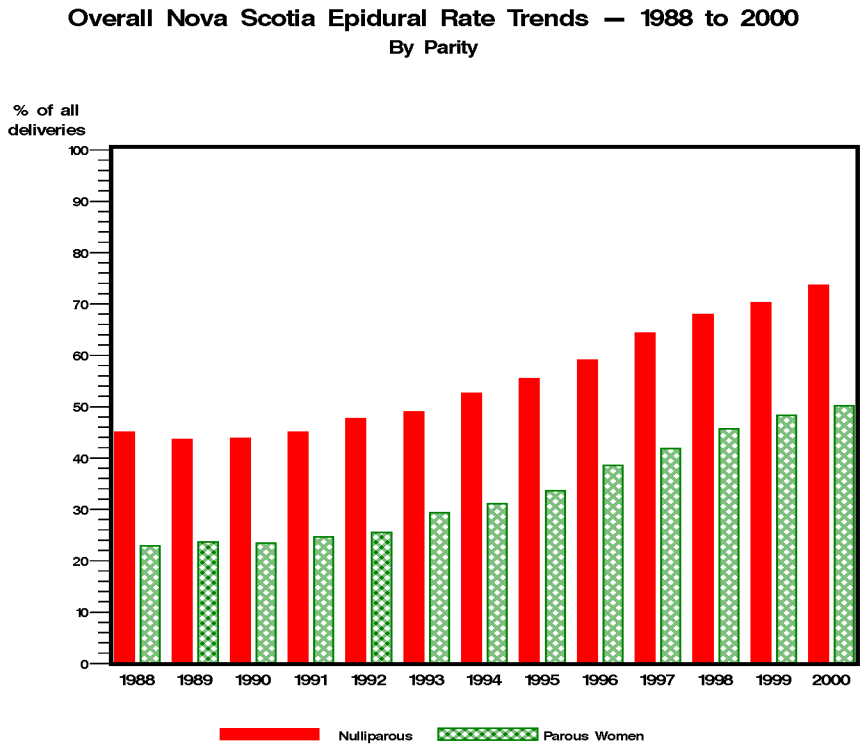
The proportion of all delivering women who undergo epidural for the delivery only is similar among institutions. Since these are primarily women having non-urgent Cesarean deliveries, the graph demonstrates the universal availability of anesthetic personnel for predictable surgical events.




## Figure 3.2.3

## Epidurals

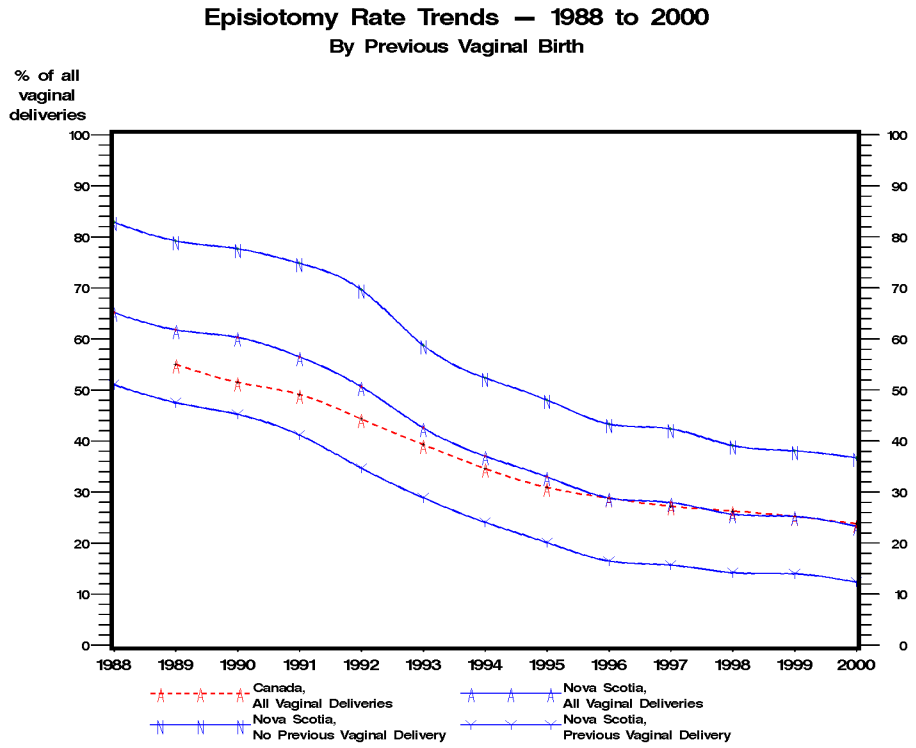
The steady increase in the use of epidural analgesia during labour and delivery reflects women's choice when the service is available.



## Figure 3.3.1

## Episiotomy

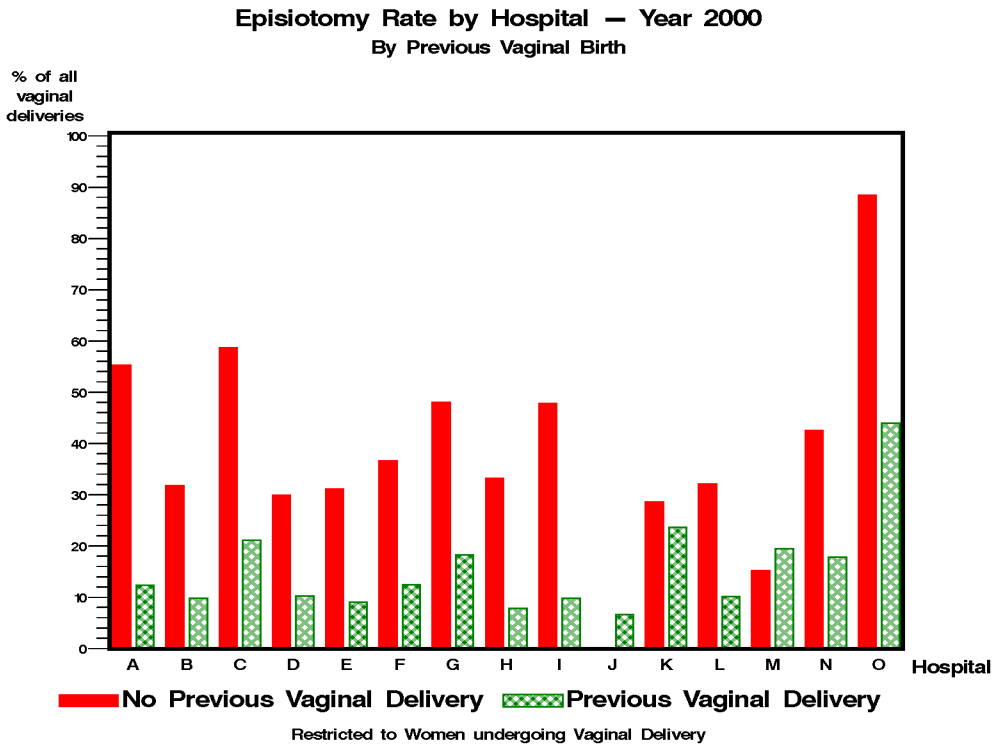
The growing awareness that episiotomy is not appropriate for most women during childbirth has resulted in a dramatic decrease in the rate of this procedure. The decrease in episiotomy rates in Nova Scotia since 1988 exceeded that of Canada. The rates are now identical at 23 percent of all vaginal deliveries. Canadian data are from the Canadian Perinatal Health Report, 2003.




## Figure 3.3.2

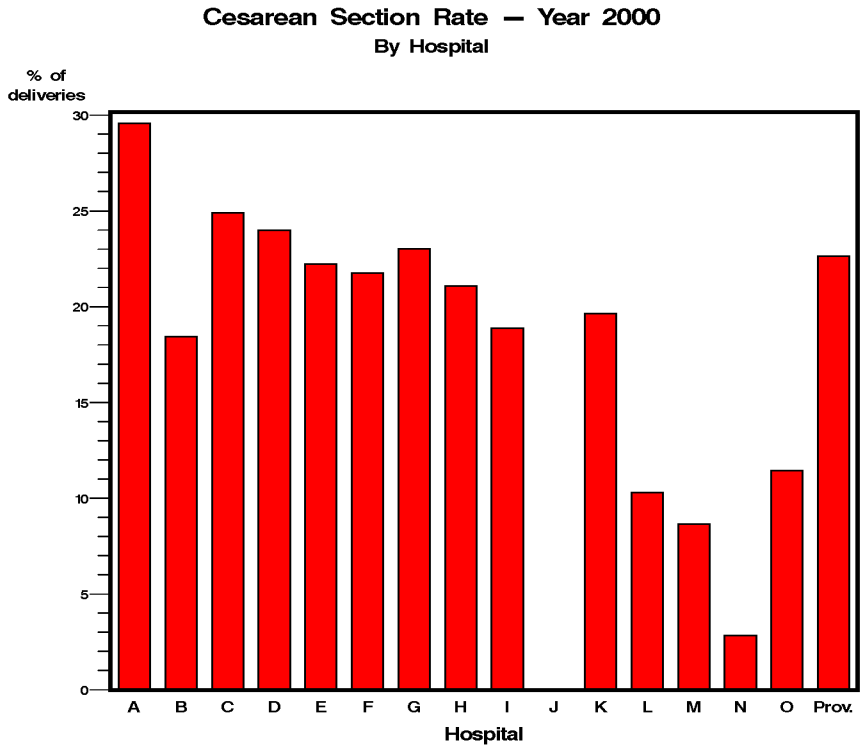
## Episiotomy

The variation in the episiotomy rate among institutions may be due in part to small numbers of deliveries, but also reflects differences in clinical practice and the need for physician continuing education in this matter.



## Figure 3.4.1 — Cesarean Delivery

Variation in c/s rates among hospitals over short time intervals can be misleading because of small numbers. Also institutional rates are affected by regional referral patterns, availability of resources, clinical practice issues, and patient demographics and characteristics.




## Table 3.4.1 — Cesarean Delivery

Primary c/s rate refers to women undergoing a first Cesarean delivery as a proportion of delivering women who have not had a previous c/s. Repeat c/s rate refers to c/s's performed on women who have undergone one or more c/s in previous pregnancies as a proportion of delivering women who have had at least one previous c/s. The primary c/s rate is consistently higher in Nova Scotia than the Canadian rates available since 1991. The repeat c/s rates are lower in Nova Scotia for most years indicating a higher proportion of women are achieving vaginal birth after c/s in Nova Scotia than in Canada as a whole. Canadian data was obtained from the Canadian Perinatal Health Report, 2003.

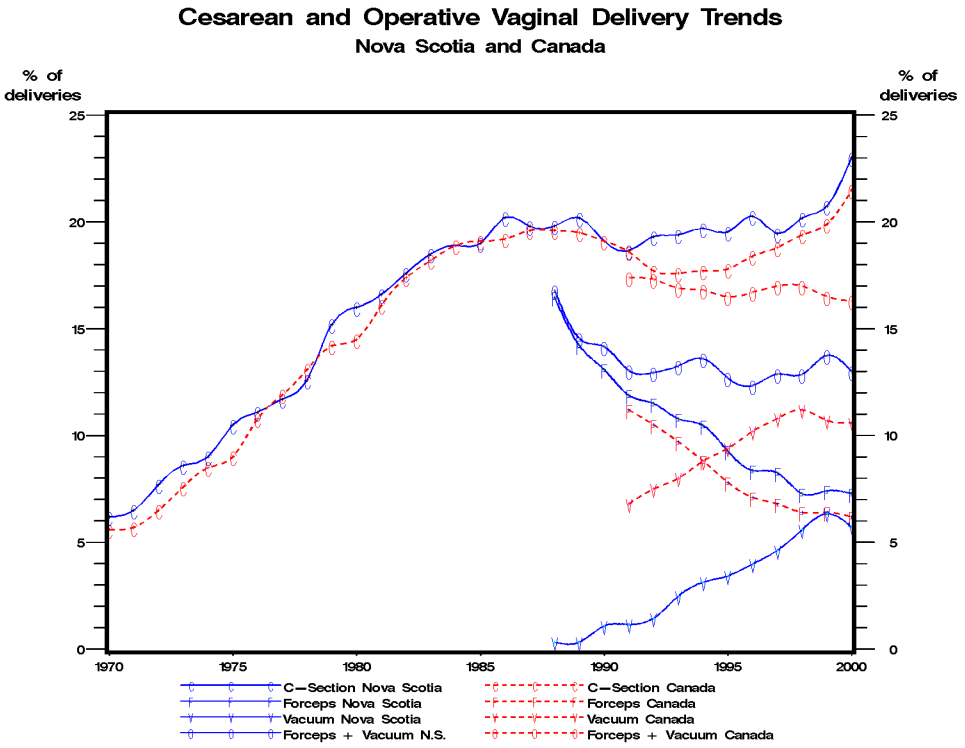
**Primary and Repeat Cesarean Rate Trends**
**Nova Scotia vs. Canada**

| | Primary C-Section | | Repeat C-Section | |
|---|---|---|---|---|
| | Canada | Nova Scotia | Canada | Nova Scotia |
| Year | % | % | % | % |
| 1988 | | 13.7 | | 77.1 |
| 1989 | | 13.8 | | 74.5 |
| 1990 | | 13.0 | | 72.4 |
| 1991 | 12.4 | 12.5 | 73.2 | 71.9 |
| 1992 | 12.3 | 13.6 | 69.7 | 67.5 |
| 1993 | 12.4 | 13.5 | 67.9 | 68.2 |
| 1994 | 12.4 | 14.2 | 66.0 | 63.9 |
| 1995 | 12.6 | 14.3 | 64.7 | 61.2 |
| 1996 | 13.1 | 14.4 | 64.9 | 65.7 |
| 1997 | 13.4 | 14.3 | 64.9 | 61.1 |
| 1998 | 13.8 | 14.7 | 65.3 | 61.2 |
| 1999 | 14.5 | 15.3 | 66.9 | 62.4 |
| 2000 | 15.6 | 17.6 | 70.1 | 65.4 |

## Figure 3.4.2

## Cesarean Delivery

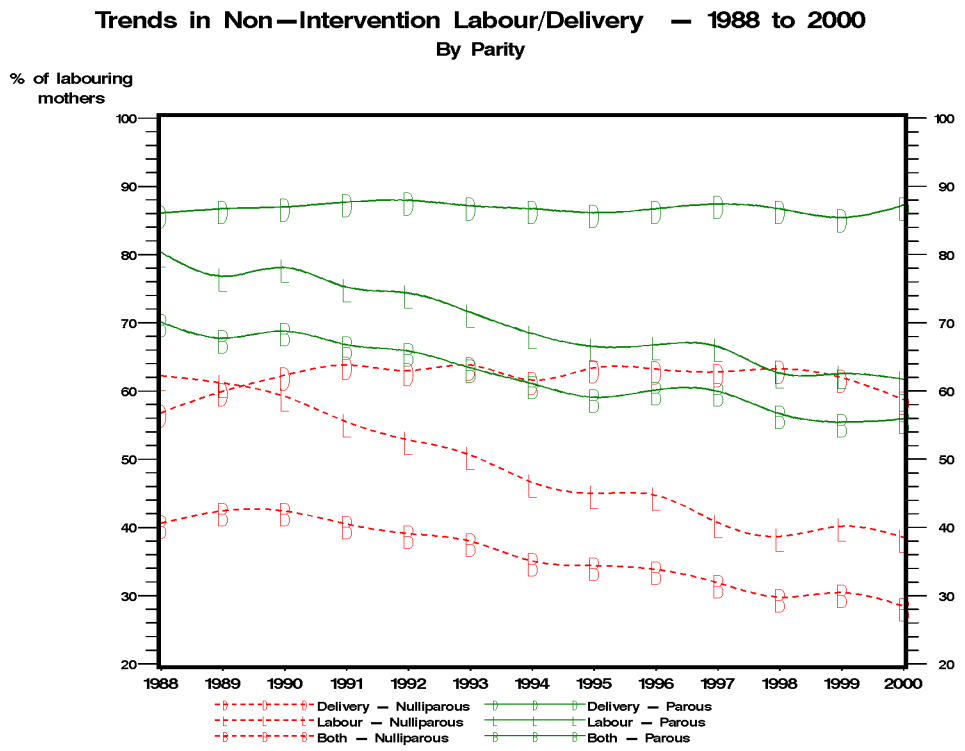
After reaching a plateau in the mid 80's and falling slightly in the late 80's, the c/s rate increased through the 90's due primarily to changes in maternal characteristics, specifically age, parity, prepregnancy weight and weight gain during pregnancy. [Obs & Gyn 2003; 102; 4:791-800] Operative vaginal delivery rates have fallen in the past 10-12 years as the dramatic decrease in the use of forceps was partially offset by an increase in vaccuum-assisted births and c/s births.




## Figure 3.4.3

## Cesarean Delivery

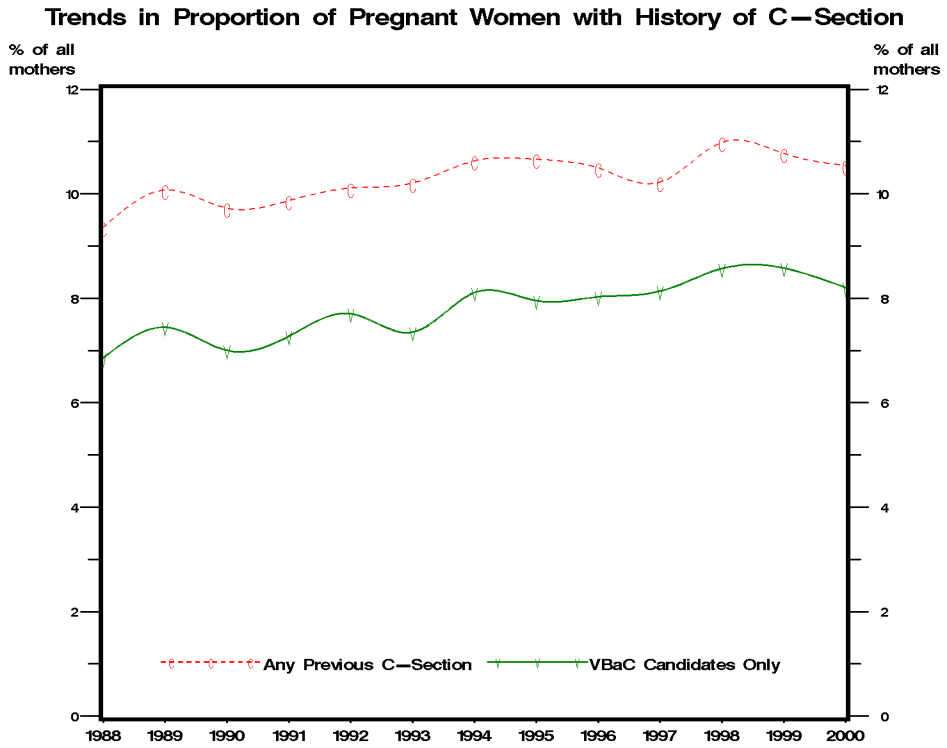
In this figure the term "non-intervention" refers to spontaneous onset of labour or spontaneous vaginal delivery. The proportion of all mothers in labour (spontaneous or induced) who delivered spontaneously remained fairly constant at 89% for parous women and 60% for nulliparous women. The proportion of labouring women who entered labour spontaneously decreased reflecting the increasing rate of labour induction (see Figure 3.1.2). Also the proportion of all mothers in labour who both entered labour spontaneously and achieved spontaneous vaginal birth decreased from 70% to 58% for parous women, and from 40% to 29% for nulliparous women.



## Figure 3.5.1

## VbaC

As expected with a rising primary c/s rate (Table 3.4.2), there is a gradual increase in the proportion of mothers who have had at least one previous c/s delivery. Approximately 80% of women with any previous c/s meet the criteria defining a "candidate" for vaginal birth after c/s (VBaC). A VBaC "candidate" is defined as a woman who has had only one previous low segment transverse c/s, who has a singleton fetus in cephalic presentation, and who has no contraindication to vaginal birth in the current pregnancy.




## Table 3.5.1

## VbaC

Overall 34.6% of women with a history of one or more c/s delivered vaginally. However, a substantial number of these women did not attempt vaginal birth; of those who did, 71% achieved vaginal birth. A VBaC "candidate" is defined as a woman who has had only one previous low segment transverse c/s, who has a singleton fetus in cephalic presentation, and who has no contraindication to vaginal birth in the current pregnancy. Of the "candidates" for VBaC, 60.7% attempted vaginal birth and, of these, 71.7% achieved vaginal birth.

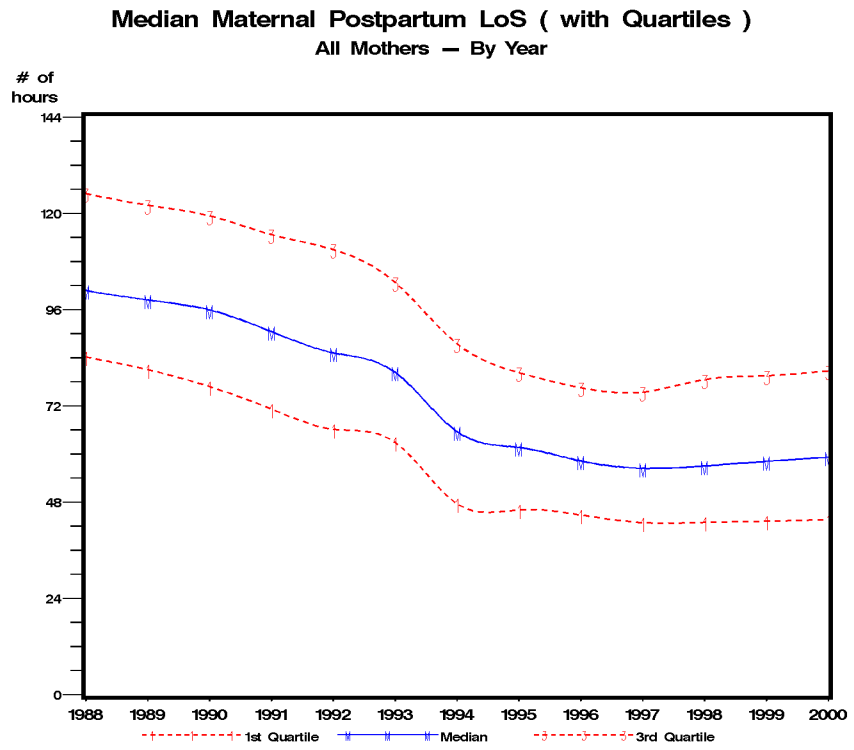
**Vaginal Birth after Cesarean - Year 2000**
**Proportion attempting and achieving vaginal birth among women with previous Cesarean delivery**

| Women with one or more previous C-Sections | Attempted Vaginal Birth | | | | Total | | |
|---|---|---|---|---|---|---|---|
| | No | | Yes | | | | |
| | # | Vag. Del. Rate | # | Vag. Del. Rate | # | Vag. Del. Rate | % Attempting |
| Not Candidate | 195 | 0.0% | 13 | 46.2% | 208 | 2.9% | 6.3% |
| VBaC Candidate | 291 | 0.0% | 449 | 71.7% | 740 | 43.5% | 60.7% |
| Total | 486 | 0.0% | 462 | 71.0% | 948 | 34.6% | 48.7% |

## Figure 3.6.1

## Length of Stay

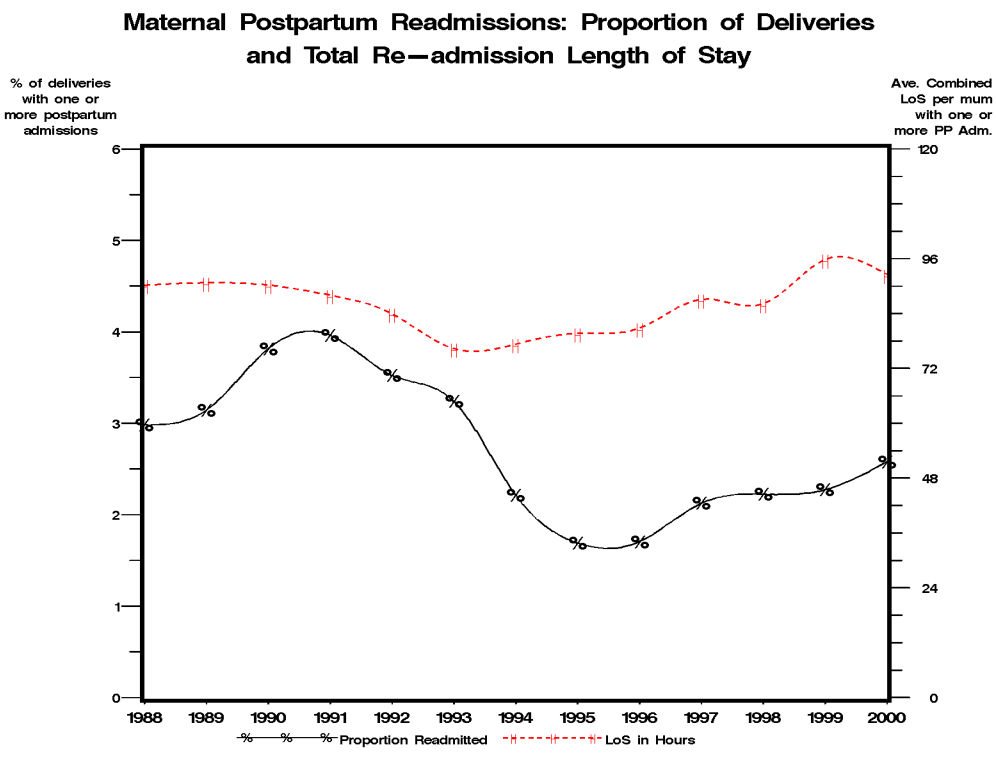
In response to public and professional efforts to enhance postpartum home suport, the in-hospital postpartum length of stay during the childbirth admission decreased substantially in the early 90's and has stabilized at a median of 60 hours. Please note, this graph refers to the postpartum stay during the admission for childbirth. Data pertaining to readmission during the postpartum period is presented in Fig 3.6.2.




## Figure 3.6.2

## Length of Stay

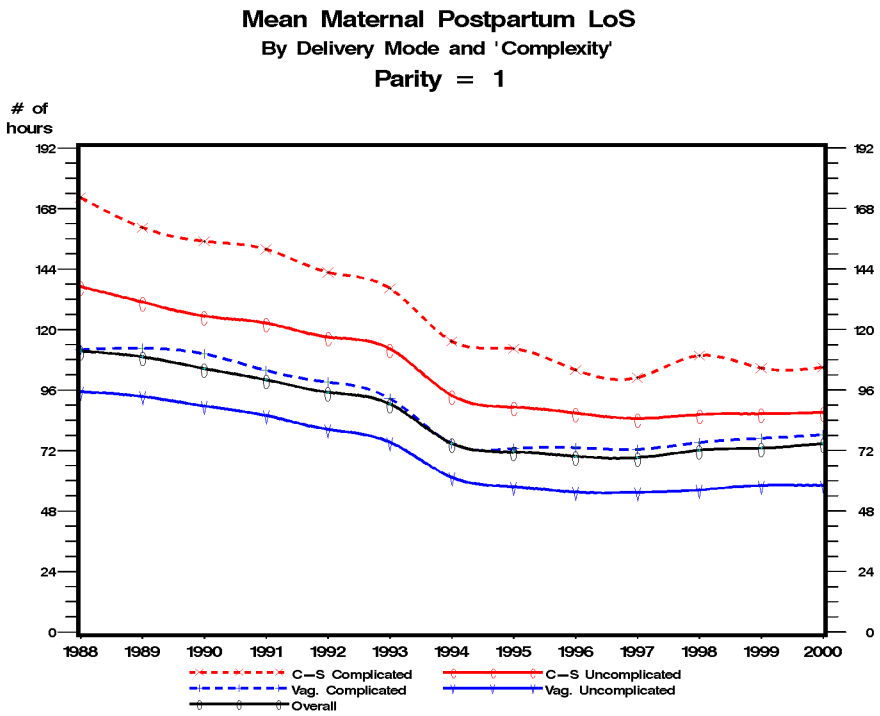
The transient increase in the proportion of women readmitted during the postpartum period reflected an early 90's practice of having some new mothers and babies readmitted to their home hospitals after a shortened stay in the larger institutions where birth took place. In the last 5 years the proportion of delivering women requiring readmission increased from 1.5% to 2.5%. The average length of stay for these women also increased in the past 6 years from 78 hours to 96 hours reflecting the increased complexity of their medical problems. In summary, compared to 1988 the median maternal length of stay after childbirth has decreased from 100 hours to 60 hours (Fig 3.6.1), while the proportion of mothers requiring postpartum readmission decreased slightly from 3% to 2.6%; the average length of stay for readmitted postpartum mothers decreased til 1993, but is now back to 1988 levels of approximately 96 hours.



## Figure 3.6.3

## Length of Stay

First-time mothers (parity=1) currently remain an average of 72 hours for in-hospital postpartum care after childbirth. Cesarean delivery adds 30-40 hours to the postpartum length of stay. Women with serious medical problems or complications remain in hospital an additional 12-24 hours whether delivery was vaginal or by Cesarean.

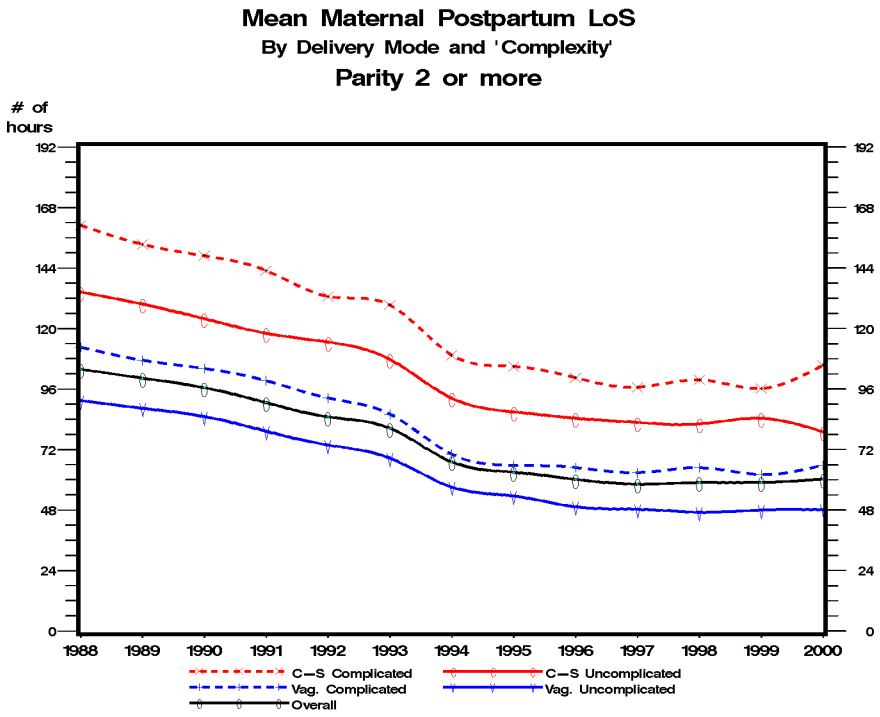



"Complicated" denotes serious obstetrical complications, interventions or underlying conditions

## Figure 3.6.4

## Length of Stay

Mothers delivering their second or subsequent child currently remain an average of 60 hours for in-hospital postpartum care after childbirth. Cesarean delivery adds 30-40 hours to the length of postpartum stay. Women with serious medical problems or complications remain in hospital an additional 12-24 hours whether delivery was vaginal or by Cesarean.

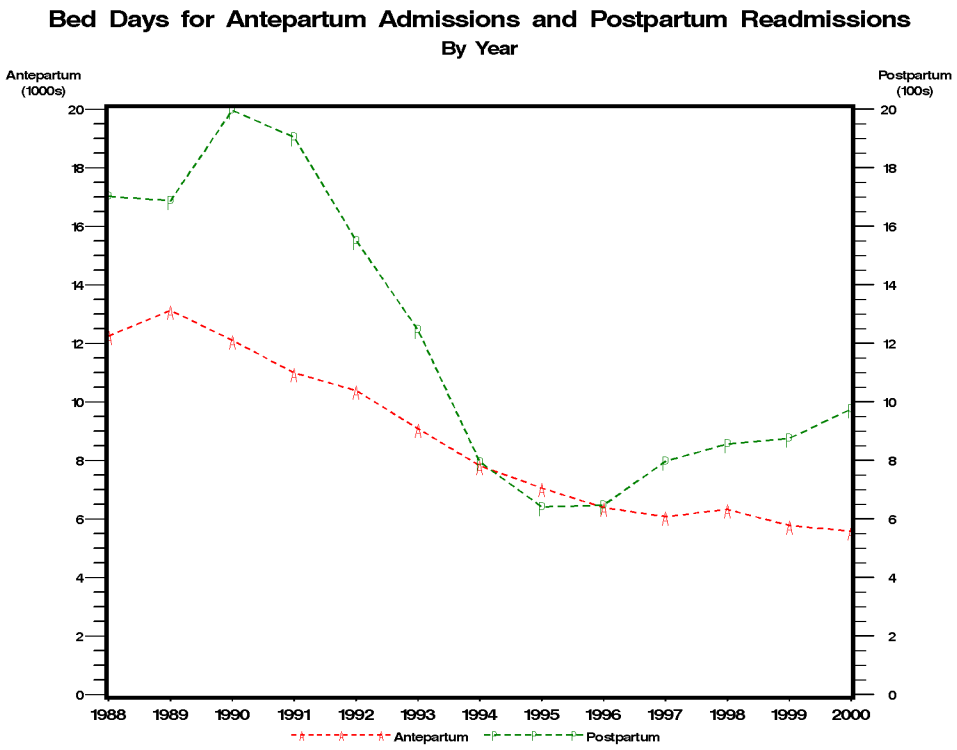



"Complicated" denotes serious obstetrical complications, interventions or underlying conditions

## Figure 3.6.5

## Length of Stay

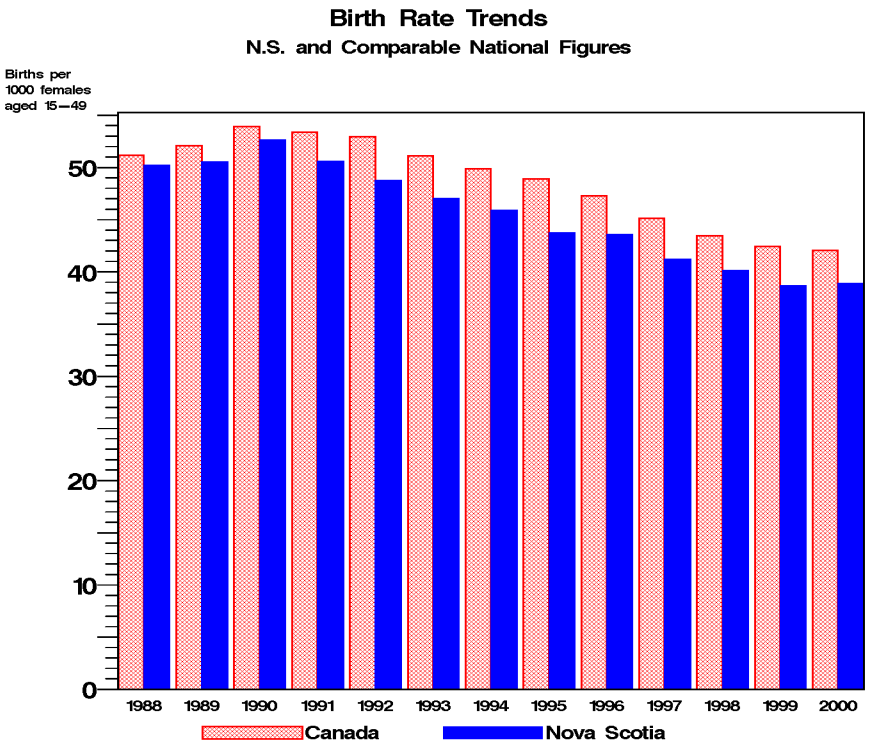
For another measure of resource utilization, this graph shows the decreases in "bed days" over the past 12 years for hospital maternity care during pregnancy before labour/delivery, and for mothers requiring readmission during the postpartum period. A "bed day" refers to a hospital bed utilized at midnight each day. Note the difference in scales -- antepartum bed days are greater by a factor of ten.




## Figure 3.7.1

## Regionalization Issues

There was a 22.6% decline in the provincial birth rate over 13 years. The comparable national figures showed a similar but less pronounced downward trend (17.8%).



## Table 3.7.1

## Regionalization Issues

One of the objectives of perinatal regionalization is that women give birth in a facility where they and their infants receive optimal care. For women and newborns with known or suspected risk factors, this may mean transfer to the nearest facility with the appropriate services, possibly in another province. In most years, the number of births to Nova Scotia residents that occur in New Brunswick and the number of women from another province who give birth in Nova Scotia is similar. In 2000 there were 6 more Nova Scotia women who gave birth in New Brunswick than non-residents who gave birth in Nova Scotia.

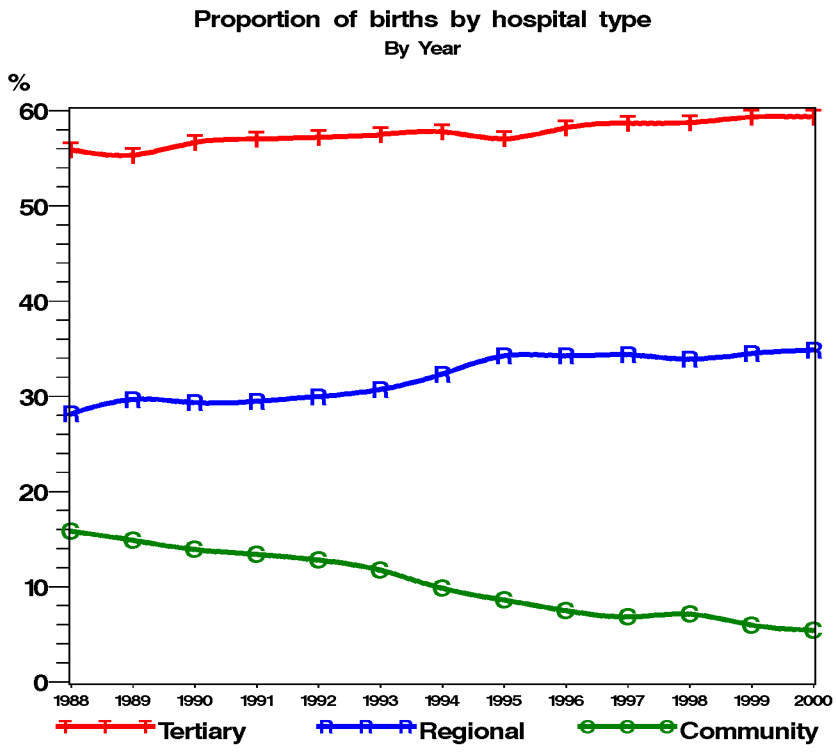
**Deliveries by Location, and Residence of Mother - Year 2000**
**All deliveries irrespective of birth weight**

| | Number of Deliveries | | | Total Deliveries in 2000 |
|---|---|---|---|---|
| | Singleton | Twins | Triplets | |
| **Location of Residence / Delivery** | | | | |
| **Nova Scotia residents who delivered in Nova Scotia** | 8825 | 120 | 4 | 8949 |
| **Nova Scotia residents who delivered in New Brunswick** | 75 | 4 | 0 | 79 |
| **Non-Nova Scotia residents who delivered in Nova Scotia** | 68 | 5 | 0 | 73 |
| **Total Deliveries in Nova Scotia** | 8893 | 125 | 4 | 9022 |
| **Total Nova Scotia residents delivered in Nova Scotia & New Brunswick** | 8900 | 124 | 4 | 9028 |

## Figure 3.7.2

## Regionalization Issues

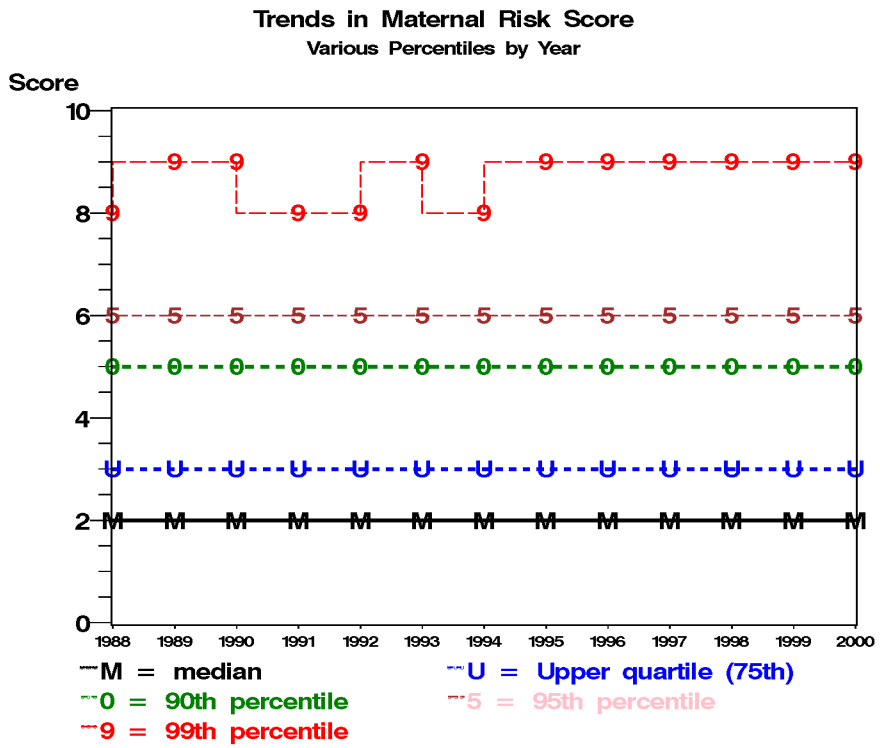
From 1988 onwards, the proportion of births in regional and tertiary facilities increased as the proportion of births in community hospitals decreased. The number of tertiary (2) and regional hospitals (7) remained constant over this time period. The number of community hospitals with active maternity services decreased from 18 to 6 over these 13 years. By 1999 almost 60% of births in Nova Scotia took place in one of the two tertiary facilities.



## Figure 3.7.3

## Regionalization Issues

Seventy-five percent of Nova Scotia women had a risk score* of three or less over all the years reported. 90% of women had a risk score of 5 or less. The other percentiles have been stable as well.

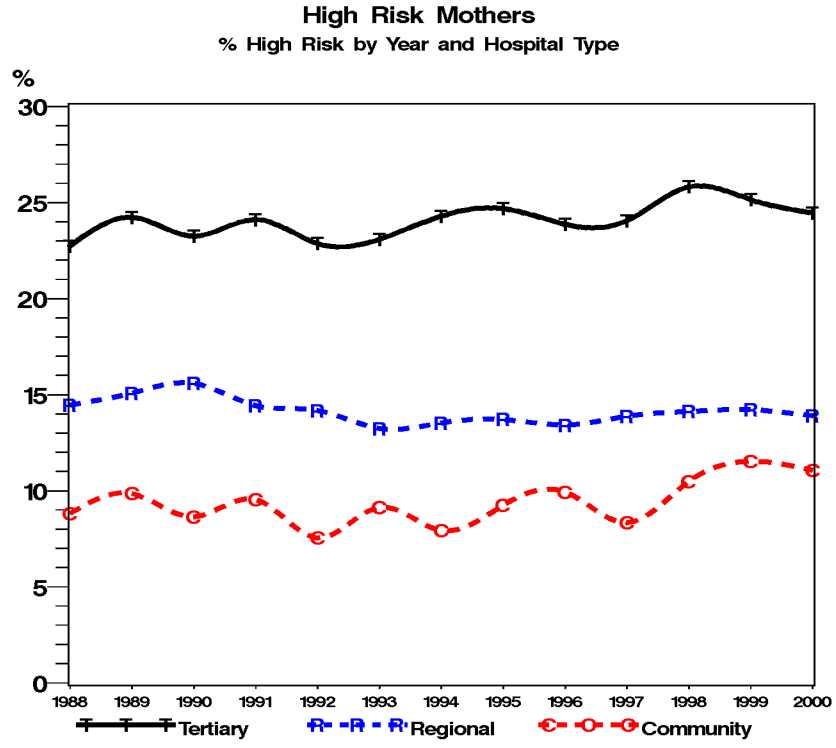



* See Appendix B for the Nova Scotia Prenatal Risk Scoring Form.

## Figure 3.7.4

## Regionalization Issues

The overall proportion of mothers at high risk* has increased slightly over the 13-year period, from 20% in 1988 to 22% in 2000. The proportion of deliveries to high-risk women remained stable at 25% in tertiary centres, 15% in regional centres and 10% in community hospitals. This trend shows appropriate transfer of care when problems are predictable and circumstances warrant. Antenatal risk scoring systems may be used to support, but are never a replacement for, clinical judgment. The designation of "high-risk" varies among tools and is somewhat arbitrary. In this report, components of the Nova Scotia Risk Score are assigned retrospectively.




* Defined as risk score of 4 or more at the time of delivery. See Appendix B.

## Table 3.7.2 — Regionalization Issues

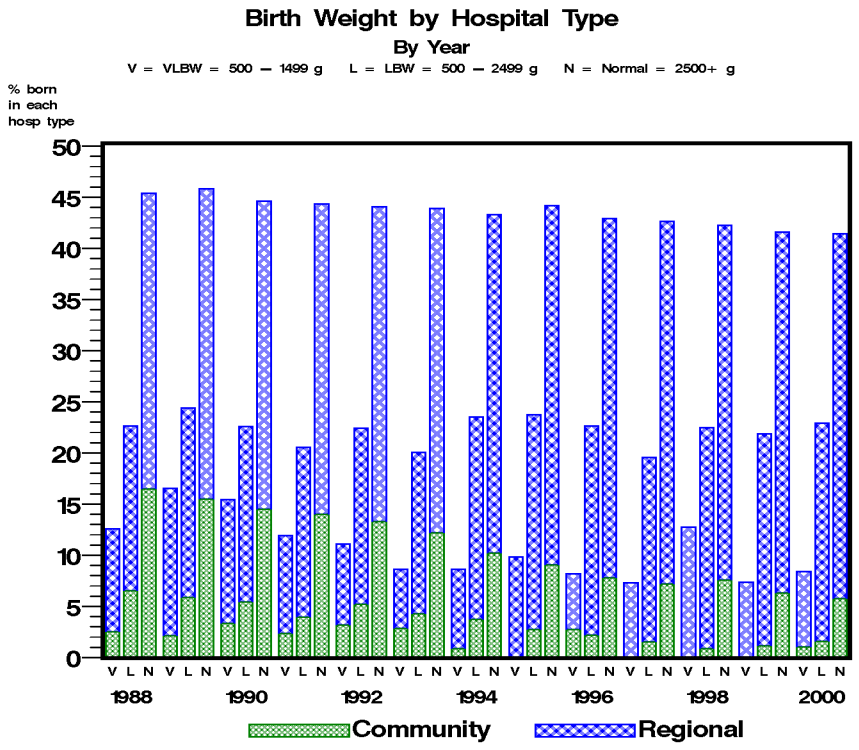
**Births Outside Hospitals with Active Maternity Services**
**By Year**

| | Birth Weight | | | | | Gestational Age | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | N/A | < 500 g | 500 - 1499 g | 1500 - 2499 g | 2500+ g | N/A | Pre-term | Not pre-term | |
| | # of births | # of births | # of births | # of births | # of births | # of births | # of births | # of births | # of births |
| Year | | | | | | | | | |
| 1988 | 0 | 1 | 3 | 3 | 31 | 0 | 9 | 29 | 38 |
| 1989 | 0 | 0 | 1 | 2 | 23 | 2 | 2 | 22 | 26 |
| 1990 | 0 | 1 | 3 | 6 | 26 | 5 | 7 | 24 | 36 |
| 1991 | 0 | 0 | 1 | 3 | 22 | 1 | 3 | 22 | 26 |
| 1992 | 0 | 0 | 1 | 3 | 10 | 2 | 2 | 10 | 14 |
| 1993 | 0 | 0 | 0 | 0 | 20 | 2 | 0 | 18 | 20 |
| 1994 | 1 | 0 | 0 | 2 | 19 | 1 | 3 | 18 | 22 |
| 1995 | 2 | 0 | 0 | 4 | 30 | 0 | 5 | 31 | 36 |
| 1996 | 1 | 1 | 0 | 2 | 17 | 1 | 3 | 17 | 21 |
| 1997 | 3 | 0 | 1 | 3 | 30 | 4 | 4 | 29 | 37 |
| 1998 | 1 | 0 | 0 | 1 | 25 | 1 | 1 | 25 | 27 |
| 1999 | 1 | 0 | 0 | 4 | 24 | 1 | 6 | 22 | 29 |
| 2000 | 4 | 0 | 0 | 2 | 24 | 2 | 7 | 21 | 30 |

The number of births outside a hospital with active maternity services has been more than 20 in most years but there has been no trend. These 'unanticipated births' may take place outside a hospital (planned home births not included) or at a facility without active maternity services. Given the decreasing number of provincial facilities with maternity services, it is important for ambulance and Emergency Room/Outpatient Department personnel to be prepared to assist with an unanticipated birth.

## Figure 3.7.5 — Regionalization Issues

In most years, more than 90% of very low birthweight infants (under 1500 grams) were born at a tertiary hospital. In all years, more than 75% of low birth weight infants* (under 2500 grams) were born at a tertiary facility and close to 20% of these infants were born at a regional hospital. With the number of community hospital closures between 1988 and 2000, births of 2500+ gram birth weight babies shifted to regional and tertiary hospitals. Most women give birth in a hospital as close to home as possible.

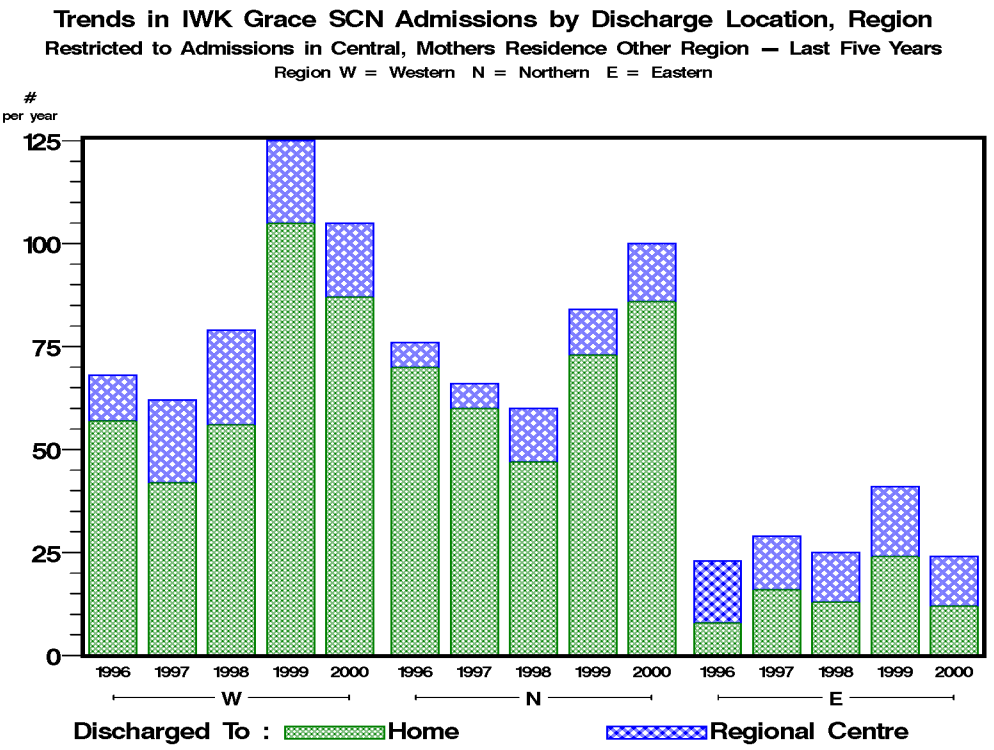



* Note that the LBW category includes VLBW infants. The third stacked bar denoting tertiary hospitals would always extend to 100%, so it has been omitted.

## Figure 3.7.6

## Regionalization Issues

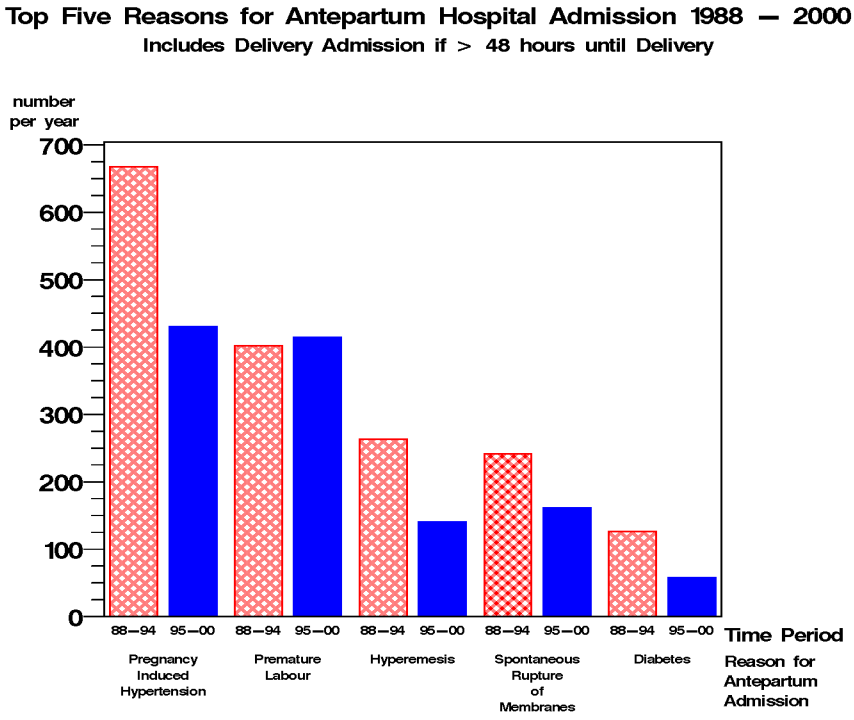
Women may give birth outside their region of residence by choice or because they have a prenatally identified pregnancy or fetal complication that requires transfer to a tertiary centre. More infants whose mothers reside in the Western and Northern Regions were born in or transferred to the IWK Health Centre compared to those from the Eastern Region. These differences reflect geographic factors as well as the availability of local neonatal intensive care in the Eastern Region. The number of infants transferred from the IWK Special Care Nursery (SCN) back to a hospital closer to home also varies by region. The differences reflect the number of births in the region as well as the availability of specialized neonatal care.




## Figure 3.7.7

## Regionalization Issues

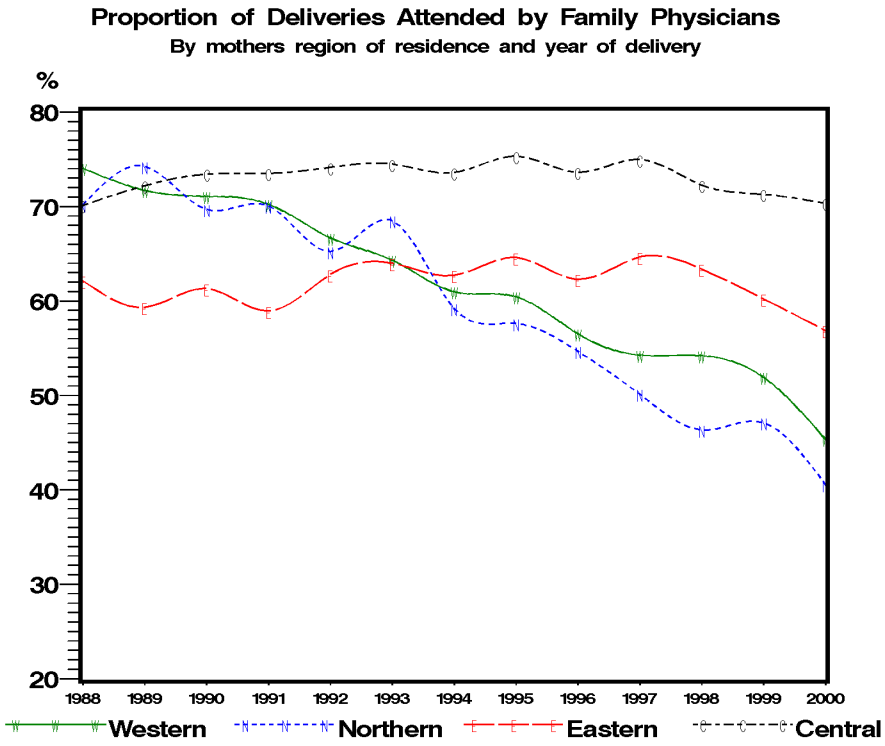
The most common reasons for antepartum admission did not change during 1988 to 2000, although admission for spontaneous rupture of membranes was more common than admission for hyperemesis recently. The number of women admitted decreased markedly for most conditions. Reasons for these changes likely include a decrease in the number of births in the province, practice changes, improvements in treatment for some conditions, reduction in the availability of maternity unit beds and more emphasis on ambulatory rather than inpatient care. The exception to this trend was admissions for preterm labour which have increased.



## Figure 3.7.8

## Regionalization Issues

The overall proportion of deliveries attended by family physicians has decreased steadily over the last 13 years from 70% in 1988 to 58% in 2000. Two regions, Northern and Western, have shown a dramatic decrease in family physician-attended deliveries from 70% to approximately 40%. These differences and trends are the result of complex regional issues including physician and patient choice, and availability of health care personnel and resources. When family physician involvement in maternity delivery services decreases, regional obstetrics and gynecology specialists increasingly function in the role of primary caregivers for maternity care.

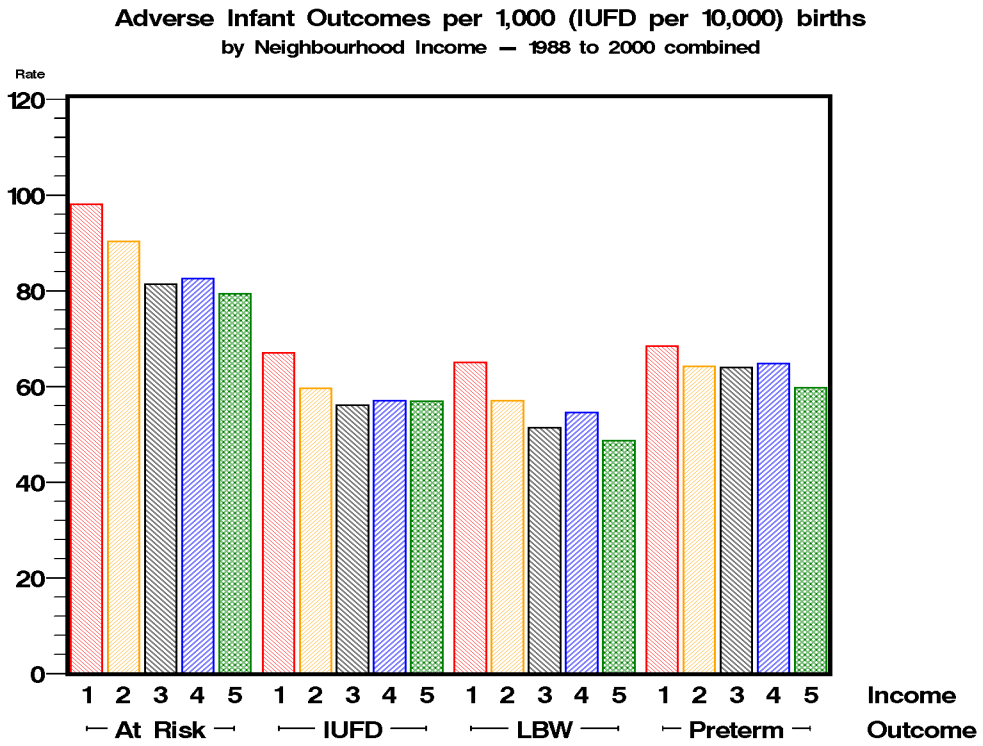


***The next three figures describe maternal behaviours and infant outcomes by neighbourhood income category (quintile).*** *Quintiles are specific to each neighbourhood and adjusted for household size. Separately for each of six areas in the province, all the neighbourhoods are ranked from lowest average income to highest. The quintile is then assigned with each category representing one-fifth of the households. Quintile 1 represents the lowest average household income, using the area-specific thresholds, and quintile 5 the highest.* See Statistics Canada Catalogue No. 82F0086-XDB.

## Figure 3.7.9

## Regionalization Issues

Adverse infant outcomes vary somewhat by neighborhood income category. For all outcomes the differences between quintiles 3, 4, and 5 were small with more noticeable differences between the three highest quintiles and the lowest two. The difference between the lowest quintile rate and the highest quintile rate varied from 1 per 1,000 for stillbirths (IUFD) to 19 per 1,000 for at-risk* infants. Since the number of adverse outcomes was small each year, this graph includes data for 1988-2000.

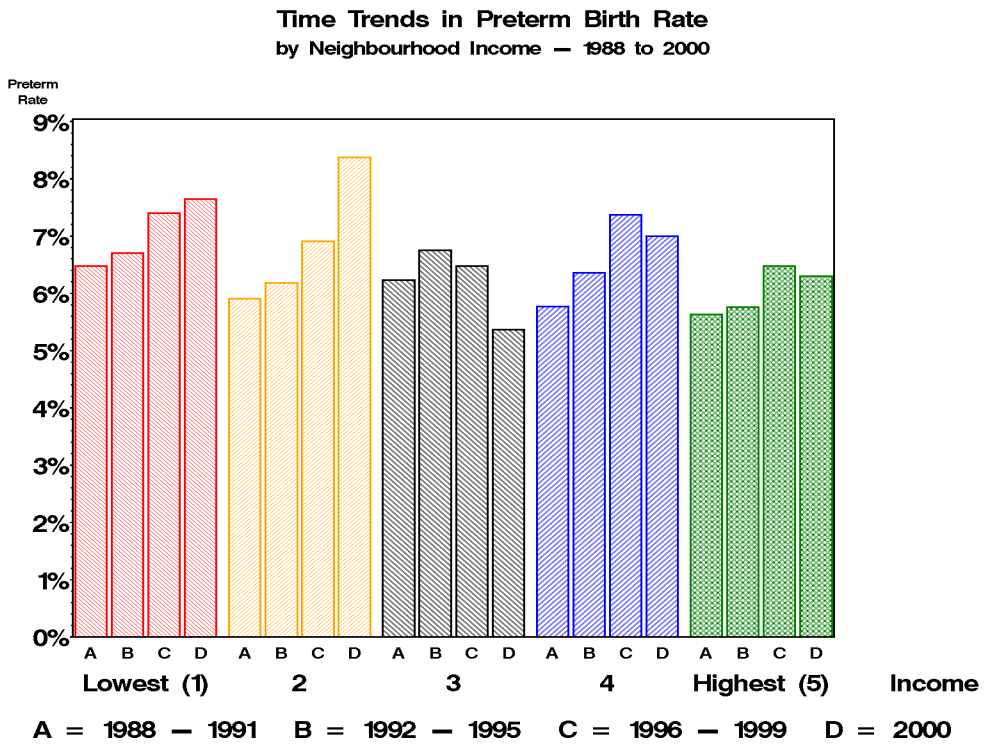



* Infant risk reflects the characteristics/diagnoses identified as contributors to compromised developmental outcome in the Nova Scotia Healthy Beginnings Screening Tool, i.e. very low birth weight (less than 1500 grams), 1500-2500 grams at term, requiring exchange transfusion, birth asphyxia, major congenital anomaly, severe respiratory disease, meningitis, seizures, intrauterine infection, maternal history of depression, anxiety or other psychiatric illness.

## Figure 3.7.10

## Regionalization Issues

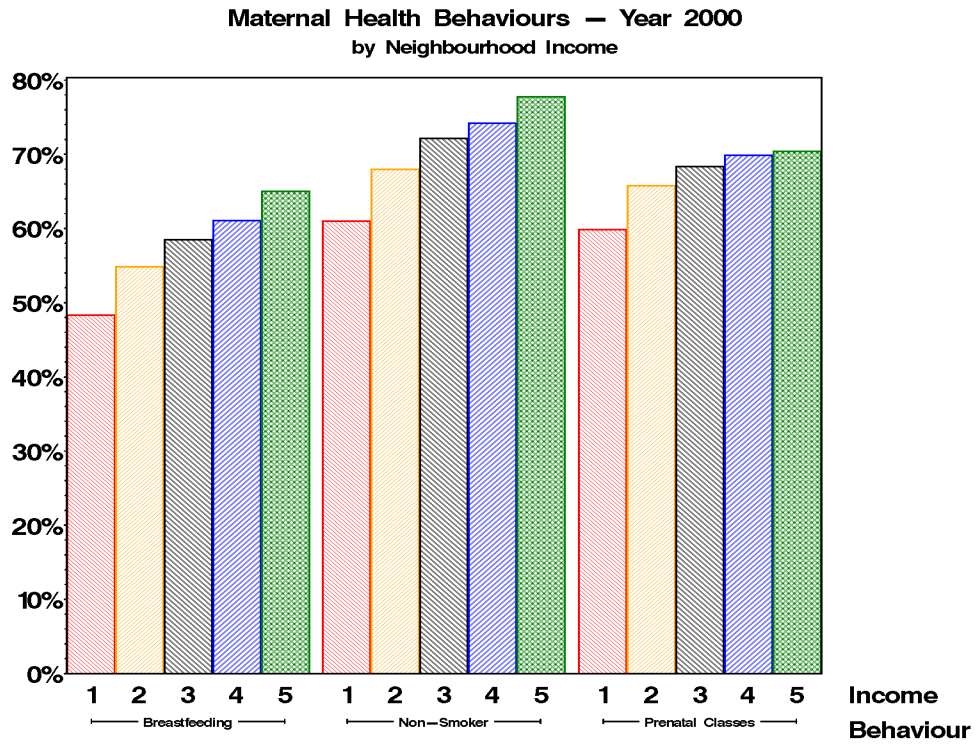
Unlike the other adverse infant outcomes in the previous figure, the preterm birth rate in Nova Scotia has increased between 1988 and 2000. The increases were greatest in the two lowest income quintiles and the second highest income quintile. Note: the first three bars in each quintile represent four years of data. The fourth bar depicts the preterm birth rate in 2000.




## Figure 3.7.11

## Regionalization Issues

Maternal health behaviours vary by neighborhood income category. Rates of breastfeeding, abstinence from smoking, and attendance at prenatal classes all increase as neighbourhood income category increases. The increase in women choosing healthy behaviours between quintiles 1 and 5 varies from 10% for prenatal class attendance to 15% for non-smoking to 17% for breastfeeding at hospital discharge.



# CHAPTER 4

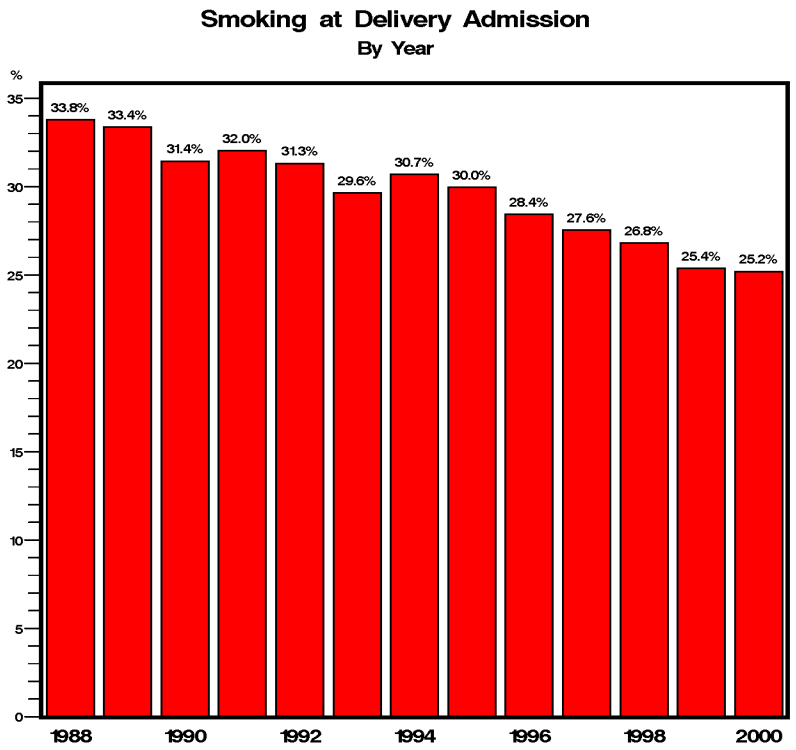
## Maternal Behaviour and Lifestyle

- Smoking
- Breastfeeding
- Maternal Age 19 and Under
- Maternal Age 35 and Over
- Prenatal Classes

## Figure 4.1.1

## Smoking

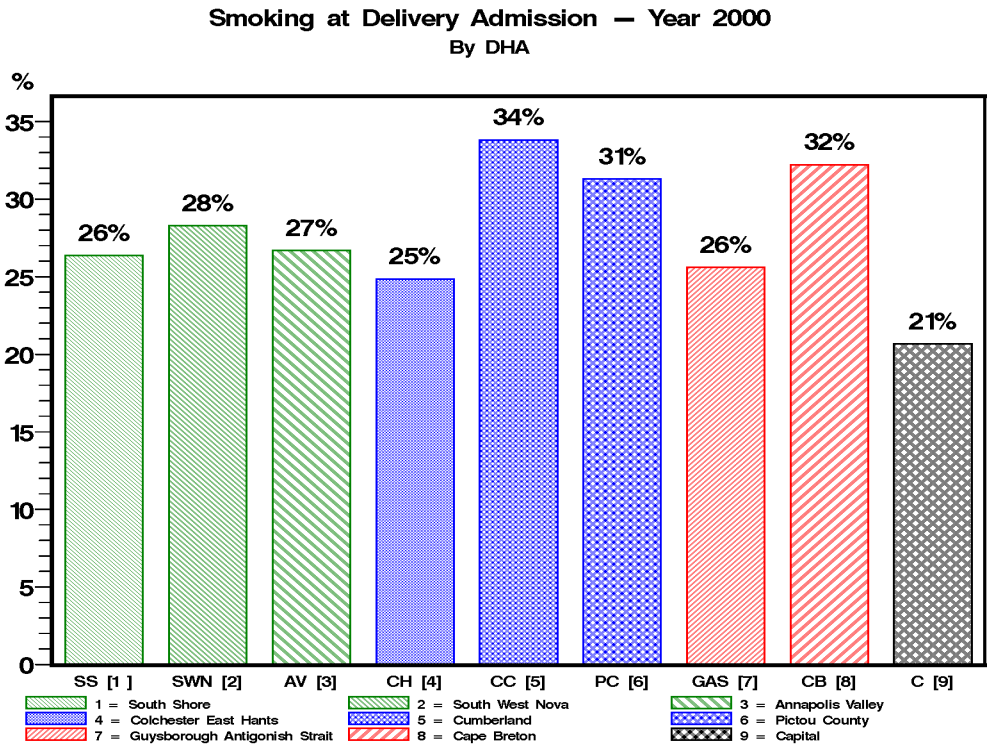
The proportion of women who were smokers at the time of admission for delivery has dropped steadily from 1988 to 2000.




## Figure 4.1.2

## Smoking

The proportion of women who were smokers at the time of admission for delivery ranged from 21% in DHA 9 (Capital District) to 34% in DHA 5 (Cumberland).



## Table 4.1.1

# Smoking

A considerable majority of women delivering in Nova Scotia during 2000 were non-smokers (i.e., 74.7% of those for whom smoking status could be ascertained). There is an inverse relationship between maternal age and likelihood of being a smoker at the time of admission for delivery. For most categories of smoking, the youngest mothers have the largest proportion of smokers.

**Smoking Status at Delivery Admission - Year 2000**
**By Maternal Age**

| Age Group | Amount | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-smoker | | 1 - 12 / day | | 13 - 24 / day | | 25+ / day | | Smoker: Amt. Unknown | | Status Unknown | | |
| | # | % | # | % | # | % | # | % | # | % | # | % | # |
| **< 20** | 283 | 48.3 | 131 | 22.4 | 68 | 11.6 | 10 | 1.7 | 45 | 7.7 | 49 | 8.4 | 586 |
| **20 - 24** | 1070 | 56.6 | 317 | 16.8 | 250 | 13.2 | 54 | 2.9 | 78 | 4.1 | 121 | 6.4 | 1890 |
| **25 - 29** | 2104 | 73.3 | 254 | 8.8 | 194 | 6.8 | 52 | 1.8 | 87 | 3.0 | 180 | 6.3 | 2871 |
| **30 - 34** | 1960 | 79.5 | 153 | 6.2 | 123 | 5.0 | 44 | 1.8 | 56 | 2.3 | 130 | 5.3 | 2466 |
| **35+** | 913 | 75.1 | 77 | 6.3 | 81 | 6.7 | 31 | 2.6 | 28 | 2.3 | 85 | 7.0 | 1215 |
| **Total** | 6330 | 70.1 | 932 | 10.3 | 716 | 7.9 | 191 | 2.1 | 294 | 3.3 | 565 | 6.3 | 9028 |

# Table 4.1.2 Smoking

## Change in Amount Smoked - Year 2000
### During Pregnancy

| | At Admission | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-smoker | | 1 - 12 / day | | 13 - 24 / day | | 25+ / day | | Smoker: Amt. Unknown | | Status Unknown | | |
| Pre-pregnancy | # | % | # | % | # | % | # | % | # | % | # | % | # |
| Non-smoker | 5235 | 93.1 | 46 | 0.8 | 20 | 0.4 | 3 | 0.1 | 22 | 0.4 | 296 | 5.3 | 5622 |
| 1 - 12 / day | 257 | 35.4 | 297 | 40.9 | 57 | 7.8 | 12 | 1.7 | 57 | 7.8 | 47 | 6.5 | 727 |
| 13 - 24 / day | 141 | 21.9 | 163 | 25.3 | 231 | 35.9 | 19 | 3.0 | 58 | 9.0 | 32 | 5.0 | 644 |
| 25+ / day | 80 | 15.0 | 137 | 25.6 | 147 | 27.5 | 90 | 16.8 | 46 | 8.6 | 35 | 6.5 | 535 |
| Smoker: Amt. Unknown | 283 | 29.1 | 246 | 25.3 | 225 | 23.1 | 56 | 5.8 | 101 | 10.4 | 61 | 6.3 | 972 |
| Status Unknown | 334 | 63.3 | 43 | 8.1 | 36 | 6.8 | 11 | 2.1 | 10 | 1.9 | 94 | 17.8 | 528 |
| Total | 6330 | 70.1 | 932 | 10.3 | 716 | 7.9 | 191 | 2.1 | 294 | 3.3 | 565 | 6.3 | 9028 |

| | At Admission | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-smoker | | 1 - 12 / day | | 13 - 24 / day | | 25+ / day | | Smoker: Amt. Unknown | | Status Unknown | | |
| 1st Pre-natal Visit | # | % | # | % | # | % | # | % | # | % | # | % | # |
| Non-smoker | 5717 | 91.7 | 85 | 1.4 | 38 | 0.6 | 5 | 0.1 | 44 | 0.7 | 343 | 5.5 | 6232 |
| 1 - 12 / day | 188 | 17.1 | 557 | 50.7 | 142 | 12.9 | 31 | 2.8 | 103 | 9.4 | 78 | 7.1 | 1099 |
| 13 - 24 / day | 26 | 4.9 | 77 | 14.6 | 305 | 57.7 | 49 | 9.3 | 46 | 8.7 | 26 | 4.9 | 529 |
| 25+ / day | 7 | 5.5 | 12 | 9.4 | 33 | 26.0 | 60 | 47.2 | 10 | 7.9 | 5 | 3.9 | 127 |
| Smoker: Amt. Unknown | 69 | 13.1 | 160 | 30.3 | 163 | 30.9 | 33 | 6.3 | 82 | 15.5 | 21 | 4.0 | 528 |
| Status Unknown | 323 | 63.0 | 41 | 8.0 | 35 | 6.8 | 13 | 2.5 | 9 | 1.8 | 92 | 17.9 | 513 |
| Total | 6330 | 70.1 | 932 | 10.3 | 716 | 7.9 | 191 | 2.1 | 294 | 3.3 | 565 | 6.3 | 9028 |

| | 1st Pre-natal Visit | | | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Non-smoker | | 1 - 12 / day | | 13 - 24 / day | | 25+ / day | | Smoker: Amt. Unknown | | Status Unknown | | |
| Pre-pregnancy | # | % | # | % | # | % | # | % | # | % | # | % | # |
| Non-smoker | 5572 | 99.1 | 4 | 0.1 | 1 | 0.0 | . | . | 5 | 0.1 | 40 | 0.7 | 5622 |
| 1 - 12 / day | 195 | 26.8 | 464 | 63.8 | 6 | 0.8 | 2 | 0.3 | 52 | 7.2 | 8 | 1.1 | 727 |
| 13 - 24 / day | 109 | 16.9 | 226 | 35.1 | 254 | 39.4 | 3 | 0.5 | 45 | 7.0 | 7 | 1.1 | 644 |
| 25+ / day | 53 | 9.9 | 195 | 36.4 | 162 | 30.3 | 98 | 18.3 | 22 | 4.1 | 5 | 0.9 | 535 |
| Smoker: Amt. Unknown | 242 | 24.9 | 194 | 20.0 | 101 | 10.4 | 22 | 2.3 | 399 | 41.0 | 14 | 1.4 | 972 |
| Status Unknown | 61 | 11.6 | 16 | 3.0 | 5 | 0.9 | 2 | 0.4 | 5 | 0.9 | 439 | 83.1 | 528 |
| Total | 6232 | 69.0 | 1099 | 12.2 | 529 | 5.9 | 127 | 1.4 | 528 | 5.8 | 513 | 5.7 | 9028 |

Typically, women who do not smoke before pregnancy also do not smoke during pregnancy. For those who reported that they were smokers before pregnancy, the amount smoked usually dropped between the first prenatal visit and admission for delivery. [Kirkland SA, Dodds LA, Brosky G. The natural history of smoking during pregnancy among women in Nova Scotia. CMAJ 2000; 163 (3):281-2].

# Table 4.1.3 — Smoking

## Smoking Status at Delivery Admission - Year 2000
### By DHA and Prenatal Class Attendance - Nulliparous Women Only

| Attended Prenatal Classes | | At Admission: Non-smoker # | Non-smoker % | Smoker # | Smoker % | Unknown # | Unknown % | Total # | Total % |
|---|---|---|---|---|---|---|---|---|---|
| **Mother's Residence DHA** | | | | | | | | | |
| **South Shore** | **Yes** | 104 | 63.8 | 24 | 44.4 | 3 | 50.0 | 131 | 58.7 |
| | **No** | 26 | 16.0 | 21 | 38.9 | 1 | 16.7 | 48 | 21.5 |
| | **Not Recorded** | 33 | 20.2 | 9 | 16.7 | 2 | 33.3 | 44 | 19.7 |
| | **Total** | 163 | 100.0 | 54 | 100.0 | 6 | 100.0 | 223 | 100.0 |
| **South West Nova** | **Yes** | 147 | 70.7 | 38 | 52.1 | 1 | 100.0 | 186 | 66.0 |
| | **No** | 53 | 25.5 | 31 | 42.5 | 0 | 0 | 84 | 29.8 |
| | **Not Recorded** | 8 | 3.8 | 4 | 5.5 | 0 | 0 | 12 | 4.3 |
| | **Total** | 208 | 100.0 | 73 | 100.0 | 1 | 100.0 | 282 | 100.0 |
| **Annapolis Valley** | **Yes** | 204 | 75.6 | 37 | 42.5 | 1 | 16.7 | 242 | 66.7 |
| | **No** | 47 | 17.4 | 39 | 44.8 | 1 | 16.7 | 87 | 24.0 |
| | **Not Recorded** | 19 | 7.0 | 11 | 12.6 | 4 | 66.7 | 34 | 9.4 |
| | **Total** | 270 | 100.0 | 87 | 100.0 | 6 | 100.0 | 363 | 100.0 |
| **Colchester East Hants** | **Yes** | 143 | 65.0 | 24 | 37.5 | 2 | 15.4 | 169 | 56.9 |
| | **No** | 41 | 18.6 | 32 | 50.0 | 1 | 7.7 | 74 | 24.9 |
| | **Not Recorded** | 36 | 16.4 | 8 | 12.5 | 10 | 76.9 | 54 | 18.2 |
| | **Total** | 220 | 100.0 | 64 | 100.0 | 13 | 100.0 | 297 | 100.0 |
| **Cumberland** | **Yes** | 39 | 56.5 | 14 | 34.1 | 0 | 0 | 53 | 47.3 |
| | **No** | 22 | 31.9 | 24 | 58.5 | 2 | 100.0 | 48 | 42.9 |
| | **Not Recorded** | 8 | 11.6 | 3 | 7.3 | 0 | 0 | 11 | 9.8 |
| | **Total** | 69 | 100.0 | 41 | 100.0 | 2 | 100.0 | 112 | 100.0 |
| **Pictou County** | **Yes** | 89 | 67.9 | 28 | 49.1 | 2 | 100.0 | 119 | 62.6 |
| | **No** | 25 | 19.1 | 24 | 42.1 | 0 | 0 | 49 | 25.8 |
| | **Not Recorded** | 17 | 13.0 | 5 | 8.8 | 0 | 0 | 22 | 11.6 |
| | **Total** | 131 | 100.0 | 57 | 100.0 | 2 | 100.0 | 190 | 100.0 |
| **Guysborough Antigonish Strait** | **Yes** | 90 | 67.2 | 11 | 22.9 | 0 | 0 | 101 | 55.2 |
| | **No** | 35 | 26.1 | 24 | 50.0 | 0 | 0 | 59 | 32.2 |
| | **Not Recorded** | 9 | 6.7 | 13 | 27.1 | 1 | 100.0 | 23 | 12.6 |
| | **Total** | 134 | 100.0 | 48 | 100.0 | 1 | 100.0 | 183 | 100.0 |
| **Cape Breton** | **Yes** | 215 | 67.6 | 41 | 31.8 | 1 | 20.0 | 257 | 56.9 |
| | **No** | 69 | 21.7 | 68 | 52.7 | 2 | 40.0 | 139 | 30.8 |
| | **Not Recorded** | 34 | 10.7 | 20 | 15.5 | 2 | 40.0 | 56 | 12.4 |
| | **Total** | 318 | 100.0 | 129 | 100.0 | 5 | 100.0 | 452 | 100.0 |
| **Capital** | **Yes** | 967 | 69.2 | 144 | 45.0 | 103 | 42.2 | 1214 | 61.9 |
| | **No** | 204 | 14.6 | 125 | 39.1 | 7 | 2.9 | 336 | 17.1 |
| | **Not Recorded** | 226 | 16.2 | 51 | 15.9 | 134 | 54.9 | 411 | 21.0 |
| | **Total** | 1397 | 100.0 | 320 | 100.0 | 244 | 100.0 | 1961 | 100.0 |
| **Total** | **Yes** | 1998 | 68.7 | 361 | 41.4 | 113 | 40.4 | 2472 | 60.8 |
| | **No** | 522 | 17.9 | 388 | 44.4 | 14 | 5.0 | 924 | 22.7 |
| | **Not Recorded** | 390 | 13.4 | 124 | 14.2 | 153 | 54.6 | 667 | 16.4 |
| | **Total** | 2910 | 100.0 | 873 | 100.0 | 280 | 100.0 | 4063 | 100.0 |

In every DHA, the majority of nulliparous women attended prenatal classes. The proportion of smokers attending classes was noticeably smaller than the proportion of non-smokers.

## Table 4.1.4

## Smoking

The rate of abruptio placentae was about 1% in the total pregnant population. There was a significant (p<0.001) association between the number of cigarettes smoked as reported at the first pre-natal visit and the occurrence of abruption.

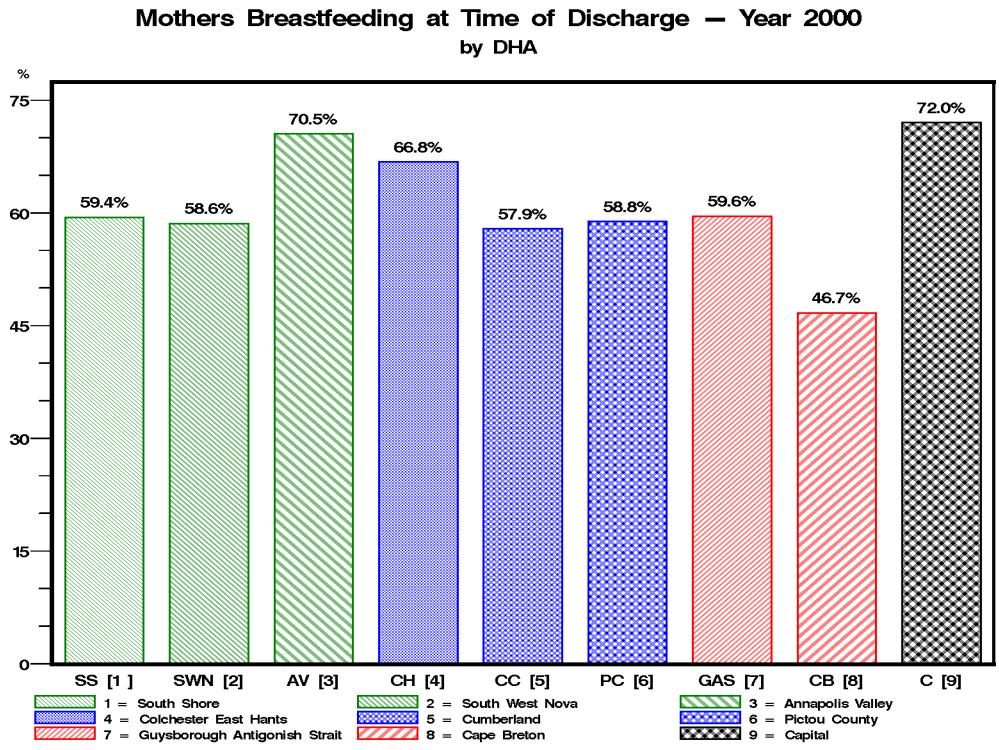
**Risk of Abruptio Placentae**
**By Amount Smoked at 1st Prenatal Visit**
**For 1996 - 2000 combined**

| Amount Smoked | Abruptio Placenta | | | | Total |
|---|---|---|---|---|---|
| | Yes | | No | | |
| | # | % | # | % | # |
| Non-smoker | 192 | 0.7 | 25516 | 99.3 | 25708 |
| 1 - 12 / day | 48 | 1.1 | 4515 | 98.9 | 4563 |
| 13 - 24 / day | 30 | 1.3 | 2207 | 98.7 | 2237 |
| 25+ / day | 14 | 2.1 | 660 | 97.9 | 674 |
| Smoker: Amt. Unknown | 89 | 1.1 | 7780 | 98.9 | 7869 |
| Status Unknown | 110 | 1.5 | 7172 | 98.5 | 7282 |
| Total | 483 | 1.0 | 47850 | 99.0 | 48333 |

## Figure 4.2.1

## Breastfeeding

Overall, 65 percent of Nova Scotia mothers were breastfeeding at the time of discharge after childbirth in 2000.



# Table 4.2.1

# Breastfeeding

For the province as a whole, the number of primiparous women breastfeeding at discharge outnumbered those who were not by a ratio of 2 to 1. The difference was less pronounced in some DHAs (e.g., South Shore, Cumberland, Guysborough Antigonish Strait) and more pronounced in others (e.g., Annapolis Valley, Capital). In all DHAs, those who attended prenatal classes were much more likely to be breastfeeding at discharge than those who did not attend prenatal classes. This association reflects a self-selection process that influences both class attendance and breastfeeding behaviour.

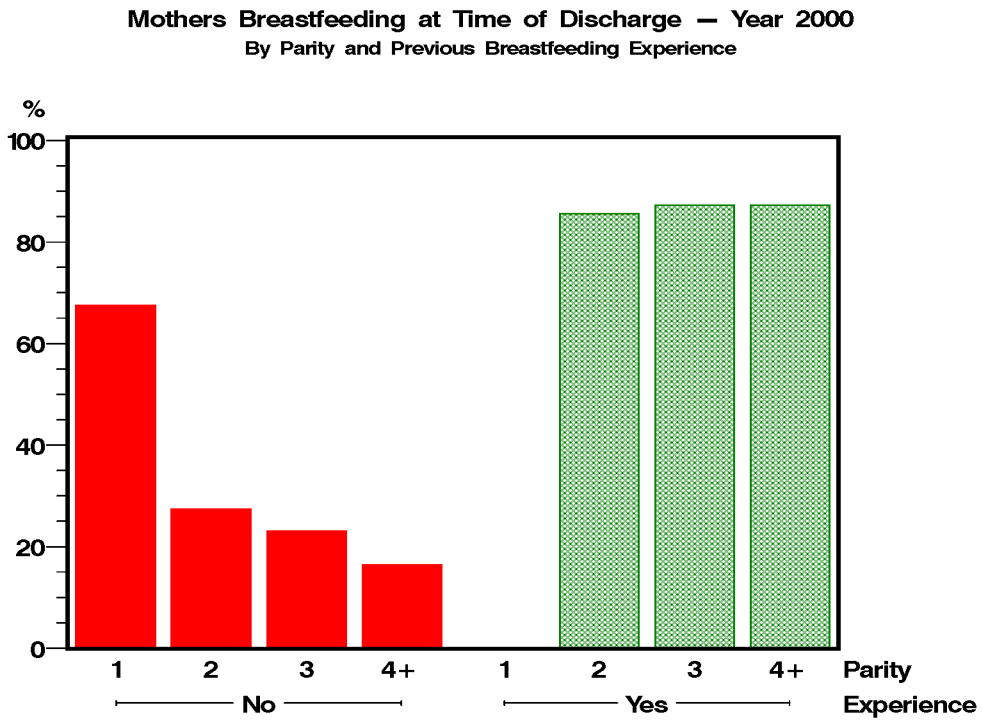
**Breastfeeding among Primiparous Women - Year 2000**
**By Prenatal Class Attendance and DHA**

| Attended Prenatal Classes | | Breastfeeding at Discharge: No % | No # | Yes % | Yes # | Total # | Total % |
|---|---|---|---|---|---|---|---|
| **Mother's Residence DHA** | | | | | | | |
| **South Shore** | **Yes** | 33.6 | 44 | 66.4 | 87 | 131 | 59.3 |
| | **No** | 66.7 | 32 | 33.3 | 16 | 48 | 21.7 |
| | **Not Recorded** | 38.1 | 16 | 61.9 | 26 | 42 | 19.0 |
| | **Total** | 41.6 | 92 | 58.4 | 129 | 221 | 100.0 |
| **South West Nova** | **Yes** | 28.0 | 52 | 72.0 | 134 | 186 | 66.4 |
| | **No** | 53.0 | 44 | 47.0 | 39 | 83 | 29.6 |
| | **Not Recorded** | 45.5 | 5 | 54.5 | 6 | 11 | 3.9 |
| | **Total** | 36.1 | 101 | 63.9 | 179 | 280 | 100.0 |
| **Annapolis Valley** | **Yes** | 17.4 | 42 | 82.6 | 199 | 241 | 67.1 |
| | **No** | 34.9 | 30 | 65.1 | 56 | 86 | 24.0 |
| | **Not Recorded** | 28.1 | 9 | 71.9 | 23 | 32 | 8.9 |
| | **Total** | 22.6 | 81 | 77.4 | 278 | 359 | 100.0 |
| **Colchester East Hants** | **Yes** | 32.1 | 54 | 67.9 | 114 | 168 | 57.1 |
| | **No** | 43.8 | 32 | 56.2 | 41 | 73 | 24.8 |
| | **Not Recorded** | 28.3 | 15 | 71.7 | 38 | 53 | 18.0 |
| | **Total** | 34.4 | 101 | 65.6 | 193 | 294 | 100.0 |
| **Cumberland** | **Yes** | 26.4 | 14 | 73.6 | 39 | 53 | 47.3 |
| | **No** | 60.4 | 29 | 39.6 | 19 | 48 | 42.9 |
| | **Not Recorded** | 36.4 | 4 | 63.6 | 7 | 11 | 9.8 |
| | **Total** | 42.0 | 47 | 58.0 | 65 | 112 | 100.0 |
| **Pictou County** | **Yes** | 33.9 | 40 | 66.1 | 78 | 118 | 63.4 |
| | **No** | 64.6 | 31 | 35.4 | 17 | 48 | 25.8 |
| | **Not Recorded** | 40.0 | 8 | 60.0 | 12 | 20 | 10.8 |
| | **Total** | 42.5 | 79 | 57.5 | 107 | 186 | 100.0 |
| **Guysborough Antigonish Strait** | **Yes** | 34.0 | 34 | 66.0 | 66 | 100 | 55.6 |
| | **No** | 59.3 | 35 | 40.7 | 24 | 59 | 32.8 |
| | **Not Recorded** | 42.9 | 9 | 57.1 | 12 | 21 | 11.7 |
| | **Total** | 43.3 | 78 | 56.7 | 102 | 180 | 100.0 |
| **Cape Breton** | **Yes** | 35.6 | 89 | 64.4 | 161 | 250 | 56.9 |
| | **No** | 70.9 | 95 | 29.1 | 39 | 134 | 30.5 |
| | **Not Recorded** | 45.5 | 25 | 54.5 | 30 | 55 | 12.5 |
| | **Total** | 47.6 | 209 | 52.4 | 230 | 439 | 100.0 |
| **Capital** | **Yes** | 20.9 | 253 | 79.1 | 958 | 1211 | 62.2 |
| | **No** | 45.5 | 150 | 54.5 | 180 | 330 | 17.0 |
| | **Not Recorded** | 27.7 | 112 | 72.3 | 293 | 405 | 20.8 |
| | **Total** | 26.5 | 515 | 73.5 | 1431 | 1946 | 100.0 |
| **Total** | **Yes** | 25.3 | 622 | 74.7 | 1836 | 2458 | 61.2 |
| | **No** | 52.6 | 478 | 47.4 | 431 | 909 | 22.6 |
| | **Not Recorded** | 31.2 | 203 | 68.8 | 447 | 650 | 16.2 |
| | **Total** | 32.4 | 1303 | 67.6 | 2714 | 4017 | 100.0 |

## Figure 4.2.2

## Breastfeeding

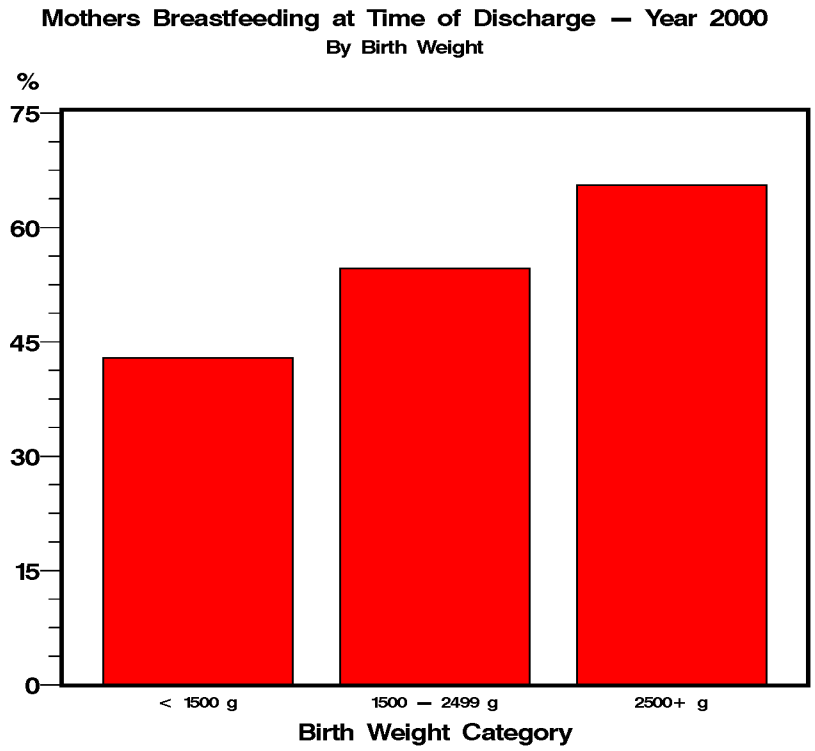
Previous breastfeeding experience is a strong determinant of breastfeeding in multiparous women. Rate of breastfeeding remains above 80% for subsequent children in women with previous breastfeeding experience while it drops sharply for women with no previous experience as the number of subsequent children increases. It is interesting to note however, that over 20% of women having a third child and no previous breastfeeding experience are breastfeeding at discharge.




## Figure 4.2.3

## Breastfeeding

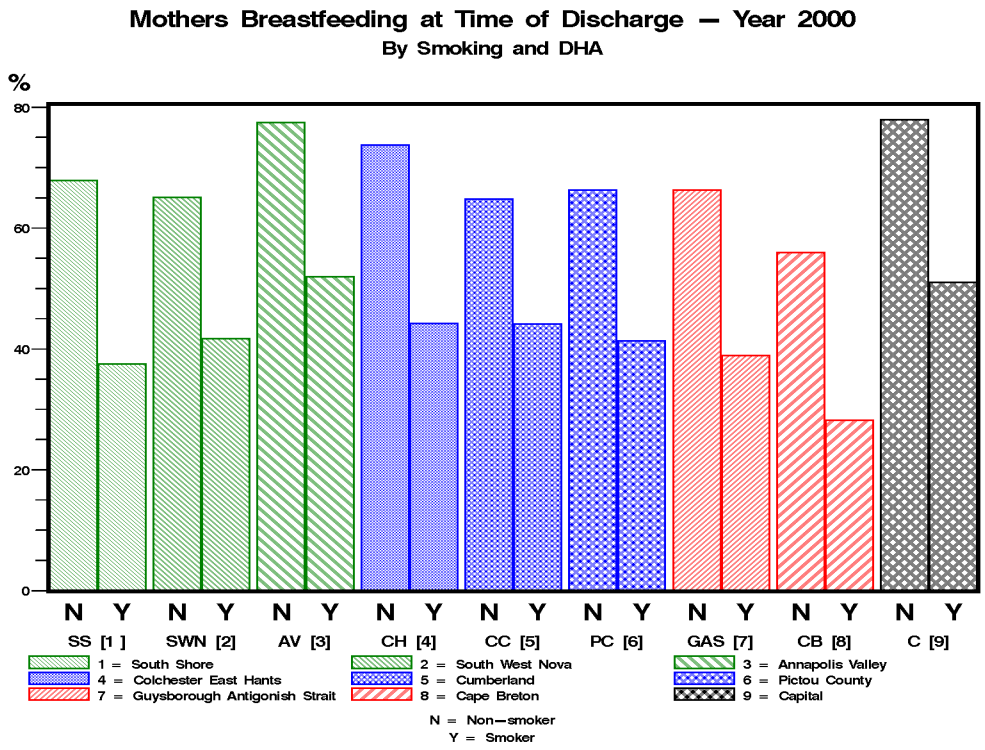
The likelihood of being breastfed at discharge is positively related to a child's weight at birth. It is perhaps encouraging to note that close to 45% of babies in the smallest weight category (<1500 grams), who experience the longest hospitalization and likely benefit most from being breastfed, are still being breastfed at discharge.



## Figure 4.2.4

## Breastfeeding

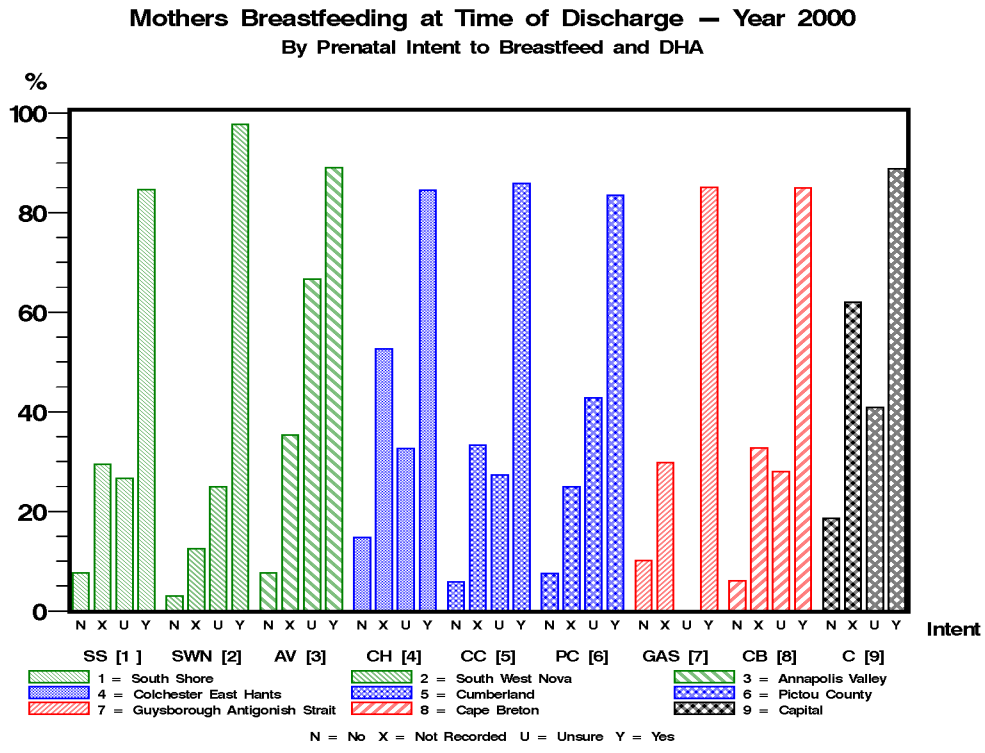
In every DHA, smokers (Y) were less likely to breastfeed than were non-smokers (N).




## Figure 4.2.5

## Breastfeeding

In every DHA, over 80% of those who stated an intention to breastfeed and at least 20% of those who were unsure were breastfeeding at discharge.



## Table 4.2.2

## Breastfeeding

Women who delivered at term were the most likely to be breastfeeding at discharge. There was no substantial difference in the proportion breastfeeding at discharge between those delivering at term and those delivering post-term.

**Breastfeeding at Discharge - Year 2000**
**By Gestational Age**

| | Breastfeeding at Discharge | | | | Total |
|---|---|---|---|---|---|
| | No | | Yes | | |
| | # | % | # | % | # |
| **Gestational Age** | | | | | |
| **Pre-term** | 208 | 40.1 | 311 | 59.9 | 519 |
| **Term** | 2763 | 34.6 | 5232 | 65.4 | 7995 |
| **Post dates** | 108 | 35.9 | 193 | 64.1 | 301 |

## Table 4.2.3

## Breastfeeding

Trend analysis indicates that the proportion of women breastfeeding increased with the length of their post-partum stay. This association is not fully understood and deserves closer study.

**Breastfeeding at Discharge - Year 2000**
**By Postpartum Length of Stay**

| | Breastfeeding at Discharge | | | | Total |
|---|---|---|---|---|---|
| | No | | Yes | | |
| | # | % | # | % | # |
| **Days from Delivery to Discharge** | | | | | |
| **< 1 day** | 172 | 45.4 | 207 | 54.6 | 379 |
| **[ 1, 2 ) days** | 934 | 39.9 | 1409 | 60.1 | 2343 |
| **[ 2, 3 ) days** | 1094 | 35.4 | 1997 | 64.6 | 3091 |
| **>= 3 days** | 929 | 29.7 | 2197 | 70.3 | 3126 |

## Table 4.2.4

## Breastfeeding

Breastfeeding is associated with maternal age. The oldest age category had the largest proportion of breastfeeding women. Breastfeeding is not common among teenage first-time mothers.

**Breastfeeding among Primiparous Women - Year 2000**
**By Maternal Age**

| | Breastfeeding at Discharge | | | | Total |
|---|---|---|---|---|---|
| | No | | Yes | | |
| | # | % | # | % | # |
| **Mother's Age** | | | | | |
| **under 20** | 293 | 59.6 | 199 | 40.4 | 492 |
| **20 - 34** | 936 | 29.4 | 2252 | 70.6 | 3188 |
| **35 or over** | 75 | 22.1 | 265 | 77.9 | 340 |

## Table 4.2.5

## Breastfeeding

Regardless of method of delivery, more than 85% of women who had indicated an intention to breastfeed were doing so at discharge. Those who had spontaneous vaginal deliveries were more likely than the others to be breastfeeding at discharge.

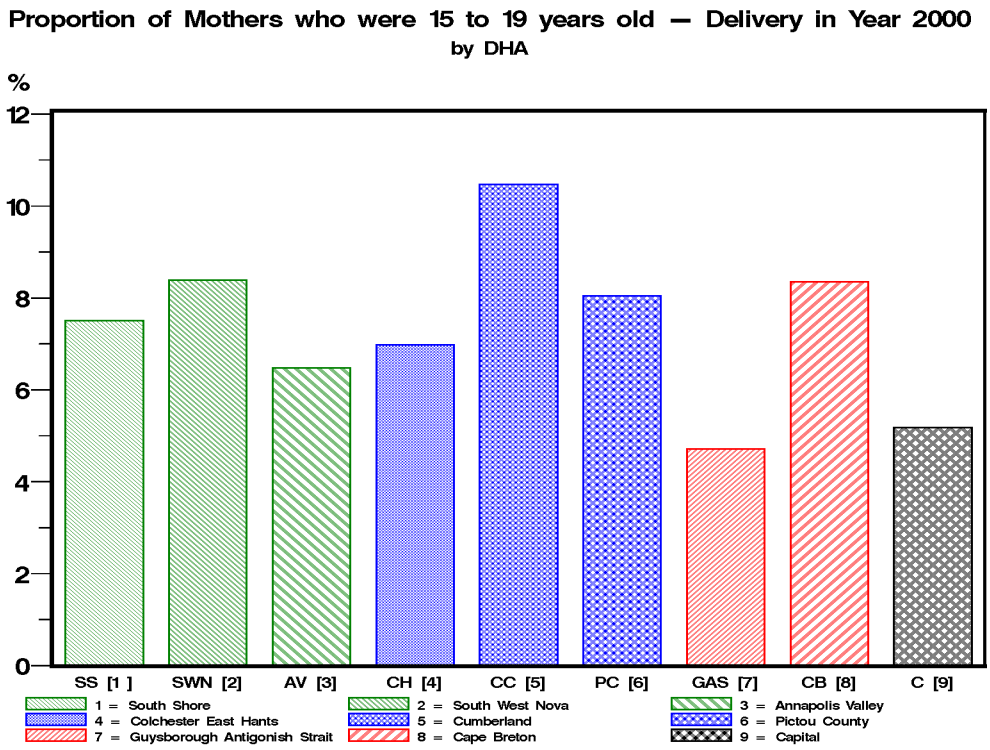
**Breastfeeding among those with prenatal intent to breastfeed - Year 2000**
**By Method of Delivery**

| | Breastfeeding at Discharge | | | | Total |
|---|---|---|---|---|---|
| | No | | Yes | | |
| | # | % | # | % | # |
| **Delivery Method** | | | | | |
| **Assisted Vaginal** | 88 | 14.4 | 525 | 85.6 | 613 |
| **Caesarean Section** | 189 | 14.2 | 1146 | 85.8 | 1335 |
| **Spontaneous Vaginal** | 447 | 11.1 | 3584 | 88.9 | 4031 |

## Figure 4.3.1

## Maternal Age 19 and Under

The smallest proportion of adolescent mothers was seen in Guysborough Antigonish Strait and the largest proportion was seen in Cumberland.




## Table 4.3.1

## Maternal Age 19 and Under

**Deliveries by Maternal Age**
**1988-2000 combined**

| | | Mother's Residence DHA | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | South Shore | South West Nova | Annapolis Valley | Colchester East Hants | Cumberland | Pictou County | Guysborough Antigonish Strait | Cape Breton | Capital | All |
| Mother's Age | | | | | | | | | | | |
| under 15 | N | 4 | 14 | 16 | 11 | 6 | 3 | 4 | 26 | 44 | 128 |
| | % | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 |
| 15 - 19 | N | 562 | 1079 | 993 | 890 | 486 | 633 | 495 | 2407 | 4072 | 11617 |
| | % | 7.5 | 10.9 | 7.9 | 7.9 | 10.6 | 9.1 | 7.0 | 11.6 | 6.6 | 8.2 |
| 20 - 24 | N | 1841 | 2964 | 3054 | 2766 | 1368 | 1928 | 1606 | 5243 | 11869 | 32639 |
| | % | 24.6 | 30.0 | 24.4 | 24.6 | 29.8 | 27.6 | 22.6 | 25.2 | 19.2 | 22.9 |
| 25 or older | N | 5076 | 5828 | 8434 | 7572 | 2736 | 4421 | 4988 | 13123 | 45895 | 98073 |
| | % | 67.8 | 59.0 | 67.5 | 67.4 | 59.5 | 63.3 | 70.3 | 63.1 | 74.2 | 68.8 |

The proportion of teenage deliveries ranged from 6.7 to 11.7 per 100 total deliveries. This diversity has associated implications for differing resource needs in each DHA.

## Figure 4.3.2

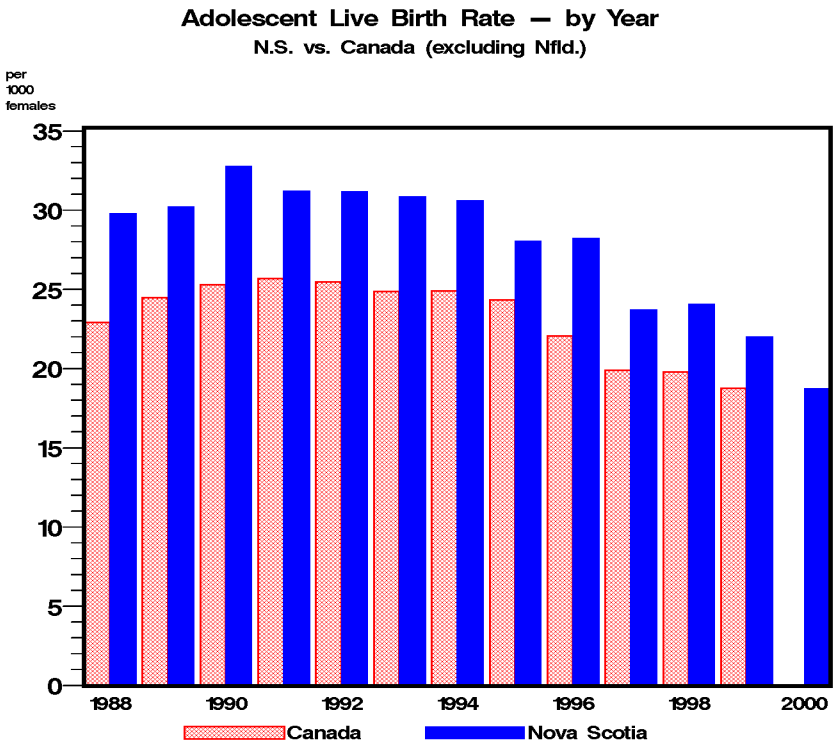
## Maternal Age 19 and Under

The proportion of the 15-19 year old female population giving birth has decreased over time.


## Figure 4.3.3

## Maternal Age 19 and Under

While the adolescent live birth rate in Nova Scotia has been consistently higher than the rate for all of Canada, it must be noted that the adolescent birth rate is dropping and the gap between provincial and national figures is narrowing. (Canadian data from Statistics Canada website, CANSIM Table 051-0001)



## Table 4.3.2

## Maternal Age 19 and Under

Most adolescent mothers had no previous childbirth experience.

**Maternal Age - Year 2000**
**by Parity**

| | Parity | | | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | | 1 | | 2 | | 3+ | | | |
| Mother's Age | N | % | N | % | N | % | N | % | N | % |
| < 18 | 189 | 4.6 | 7 | 0.2 | 0 | 0 | 0 | 0 | 196 | 2.2 |
| 18 - 19 | 309 | 7.6 | 70 | 2.2 | 11 | 0.9 | 0 | 0 | 390 | 4.3 |
| 20+ | 3568 | 87.8 | 3090 | 97.6 | 1258 | 99.1 | 525 | 100.0 | 8441 | 93.5 |
| Total | 4066 | 100.0 | 3167 | 100.0 | 1269 | 100.0 | 525 | 100.0 | 9027 | 100.0 |

## Table 4.3.3

## Maternal Age 19 and Under

Adolescent mothers were less likely than their older counterparts to attend prenatal classes.

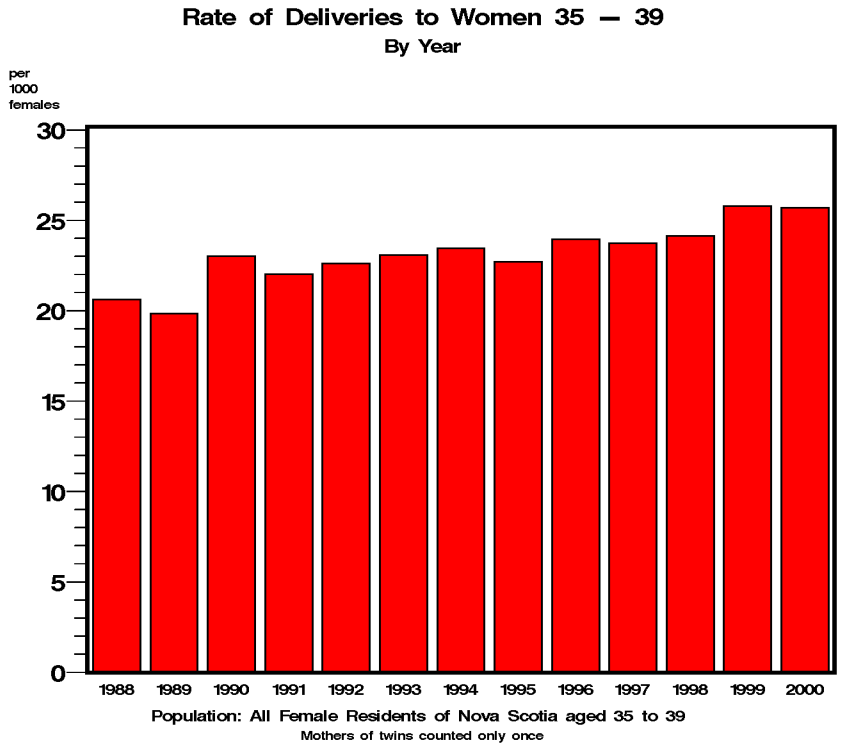
**Proportion of Nulliparous Mothers Attending Prenatal Classes - Year 2000**
**by Age Group**

| | Attended Prenatal Classes | | | | | | All |
|---|---|---|---|---|---|---|---|
| | Yes | | No | | Not Recorded | | |
| Mother's Age | N | % | N | % | N | % | N |
| under 20 | 238 | 47.8 | 189 | 38.0 | 71 | 14.3 | 498 |
| 20 - 34 | 2005 | 62.2 | 682 | 21.1 | 538 | 16.7 | 3225 |
| 35 or over | 229 | 66.8 | 54 | 15.7 | 60 | 17.5 | 343 |

## Figure 4.4.1

## Maternal Age 35 and Over

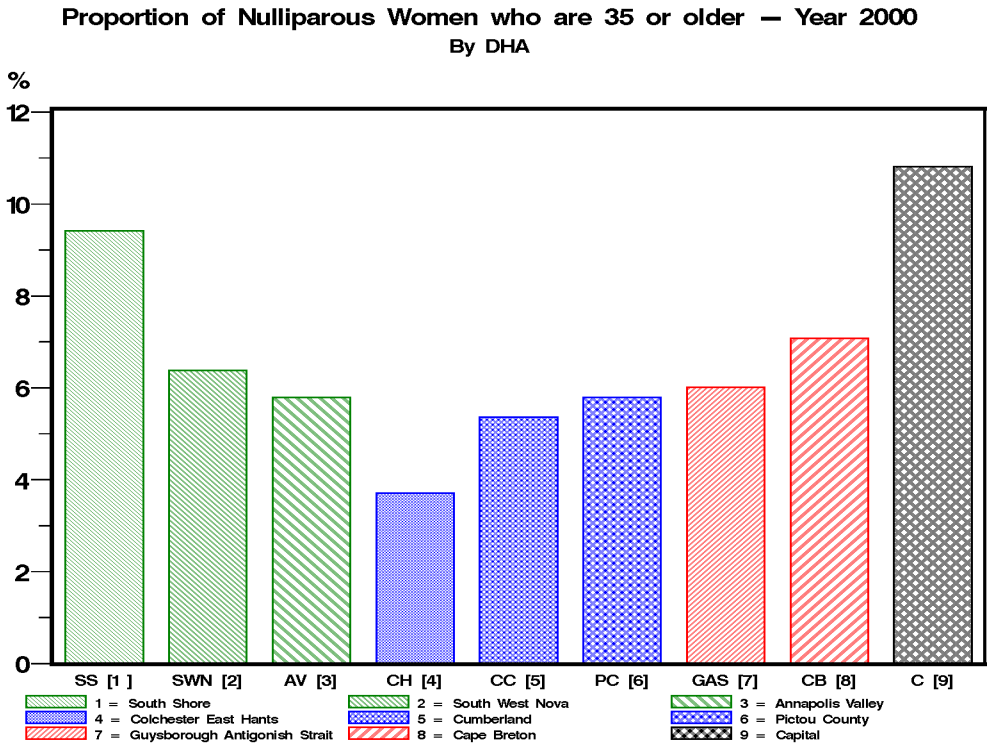
These rates refer to all deliveries to Nova Scotia residents in this age group. There has been a gradual increase from 20.9 per 1000 women age 35 to 39 in 1988 to 25.7 in 2000.



## Figure 4.4.2

## Maternal Age 35 and Over

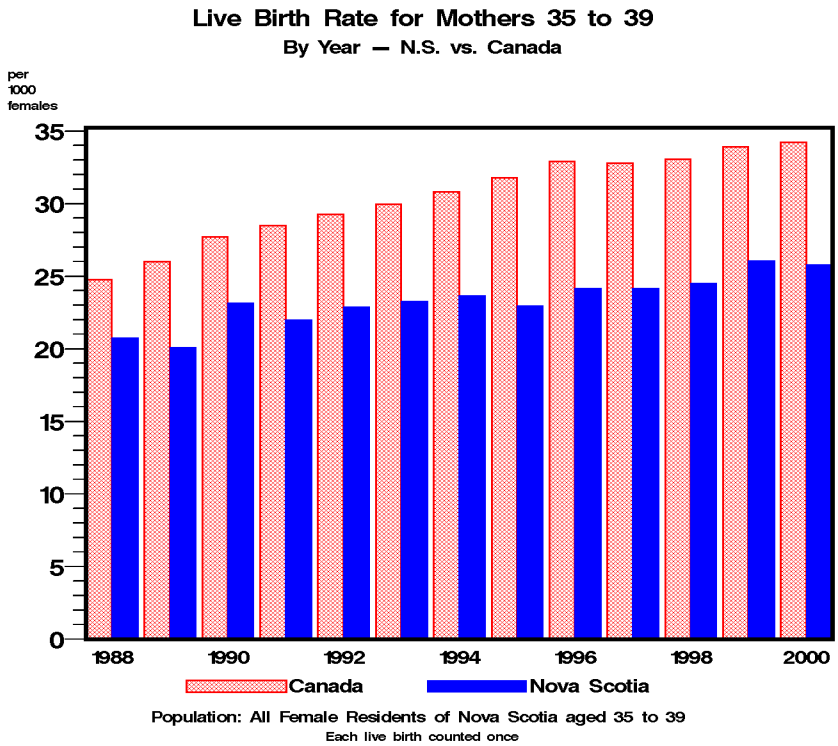
The highest proportion of nulliparous women who fall into the 35 and over age group is in the Capital DHA (10.7%), while the lowest proportion is in the Colchester East Hants DHA (3.6%). The overall provincial rate is 8.4%. As with the issue of adolescent mothers, this variation in rates suggests differing resource needs in each DHA.




## Figure 4.4.3

## Maternal Age 35 and Over

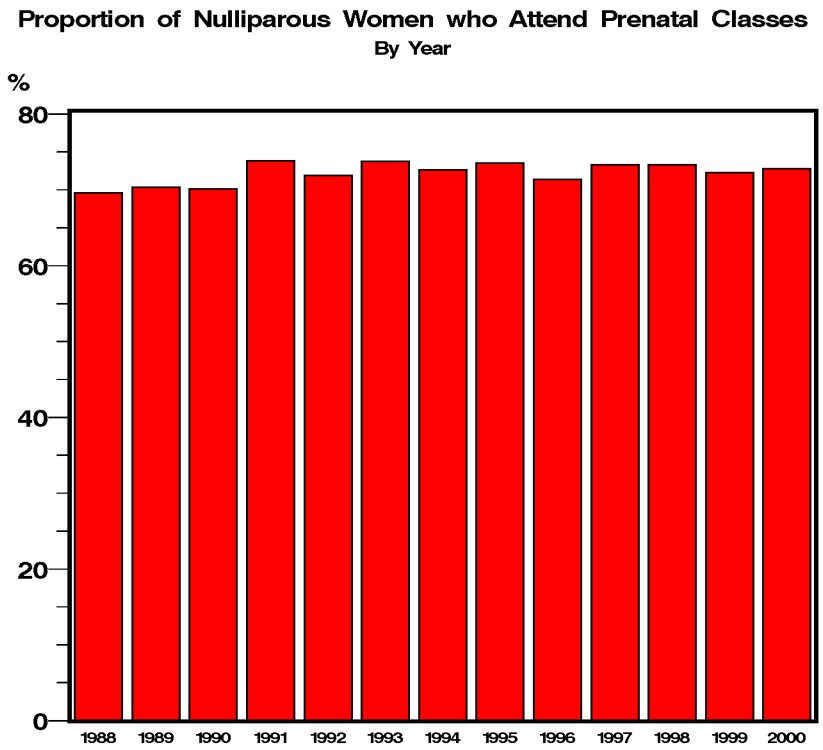
The live birth rate for women in the 35-39 age group (all parities) has risen steadily on a national level from 24.74 per 1000 women in 1988 to 33.90 per 1000 women in 1999. The change over time in Nova Scotia has been much more gradual, from 20.7 per 1000 women in 1988 to 25.8 per 1000 women in 2000. Note: national figures do not include Newfoundland. (Canadian data from Statistics Canada website, CANSIM Table 051-0001)



## Figure 4.5.1

## Prenatal Classes

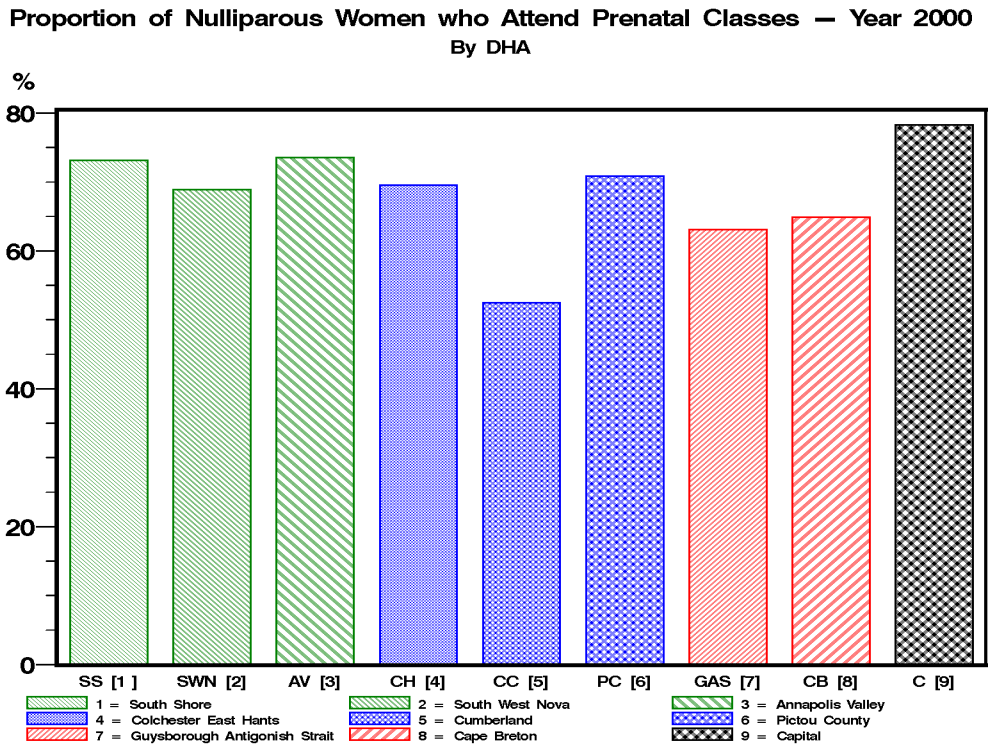
Prenatal classes are primarily directed to women having their first baby. There was very little change in attendance between 1991 and 2000. Women access prenatal education through classes offered by Public Health Services, health care facilities or health centres, private agencies, or classes designed for special populations, e.g. teen classes.




## Figure 4.5.2

## Prenatal Classes

The highest proportion of nulliparous women attending prenatal classes was in the Capital Health District (78.7%). The lowest proportion was in Cumberland County Health District (53.4%).



# CHAPTER 5

## Fetal and Infant Mortality

- Mortality Tables
- Fetal Death
- Mortality Trends
- Cause of Death
- McCarthy Diagrams

## Table 5.1.1 — Mortality Tables

**Mortality Table for Year 2000**
**All Births ( Birth Weight of 500 g or more, or Gestational Age of 20 weeks or more, or liveborn )**

| Birth Weight Category (g) | All Births | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | Fetal Death | | Infant Death | | Survived | | |
| | # | Rate per 1000 | # | Rate per 1000 | # | Rate per 1000 | # |
| Missing | 2 | 333.3 | 0 | 0.0 | 4 | 666.7 | 6 |
| < 500 g | 9 | 473.7 | 7 | 368.4 | 3 | 157.9 | 19 |
| 500 - 749 g | 6 | 272.7 | 7 | 318.2 | 9 | 409.1 | 22 |
| 750 - 999 g | 1 | 58.8 | 0 | 0.0 | 16 | 941.2 | 17 |
| 1000 - 1499 g | 10 | 204.1 | 2 | 40.8 | 37 | 755.1 | 49 |
| 1500 - 2499 g | 7 | 17.7 | 5 | 12.7 | 383 | 969.6 | 395 |
| 2500+ g | 5 | 0.6 | 13 | 1.5 | 8631 | 997.9 | 8649 |
| Total | 40 | 4.4 | 34 | 3.7 | 9083 | 991.9 | 9157 |

In this and the following table, the traditional model for expressing fetal and infant mortality rates is used. In this model, the total births within a birth weight group is used as the denominator for calculating the fetal and infant mortality rates for the specific birth weight groups. Although mortality is more closely related to gestational age, birth weight is usually known and recorded for all births and thus is usually used as a surrogate for gestational age. Using this model, fetal and infant mortality rates decreased with increasing gestational age and birth weight [J Obstet Gynaecol Can 2004;26(11):953-6]. Fetal mortality **500g or more** of 3.2 per 1000 total births in Nova Scotia compares favourably with other available Canadian data for which the rate was 4.5 per 1000 total births in 2000 (Canadian Perinatal Health Report 2003, pp 87 and 146). Infant mortality **500g or more** was 3.0 per 1000 live births in Nova Scotia in 2000 and also compares favourably with other available Canadian data for which the rate was 4.5 per 1000 live births in 2000 (Statistics Canada).

## Table 5.1.2 — Mortality Tables

**Mortality Table for Year 2000**
**Live Births ( Birth Weight of 500 g or more )**

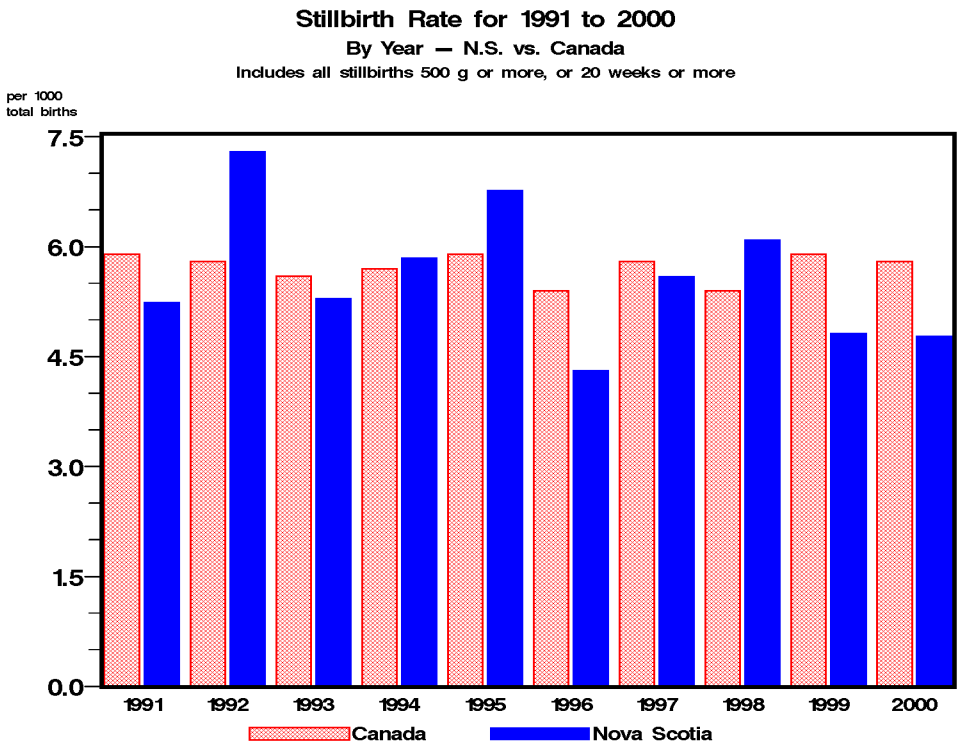
| Birth Weight Category (g) | Live Births | | | | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Early Neonatal Death - 0 to 6 days | | Late Neonatal Death - 7 to 27 days | | Post-Neonatal Death - 28 to 364 days | | Infant Death - 0 to 364 days | | Survived at least one year | | |
| | # | Rate per 1000 | # | Rate per 1000 | # | Rate per 1000 | # | Rate per 1000 | # | Rate per 1000 | # |
| 500 - 749 g | 6 | 375.0 | 0 | 0.0 | 1 | 62.5 | 7 | 437.5 | 9 | 562.5 | 16 |
| 750 - 999 g | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 16 | 1000. | 16 |
| 1000 - 1499 g | 1 | 25.6 | 1 | 25.6 | 0 | 0.0 | 2 | 51.3 | 37 | 948.7 | 39 |
| 1500 - 2499 g | 3 | 7.7 | 0 | 0.0 | 2 | 5.2 | 5 | 12.9 | 383 | 987.1 | 388 |
| 2500+ g | 3 | 0.3 | 2 | 0.2 | 8 | 0.9 | 13 | 1.5 | 8631 | 998.5 | 8644 |
| Total | 13 | 1.4 | 3 | 0.3 | 11 | 1.2 | 27 | 3.0 | 9076 | 997.0 | 9103 |

Neonatal mortality for infants with birth weights of 500g or more was 1.76 per 1000 live births in Nova Scotia in 2000 compared to 2.64 per 1000 live births in Canada in 1999. In addition, the post-neonatal mortality was 1.21 per 1000 live births in Nova Scotia in 2000 compared to 1.71 per 1000 live births in other available Canadian data in 1999. (Canadian Perinatal Health Report 2003)

## Figure 5.2.1

## Fetal Death

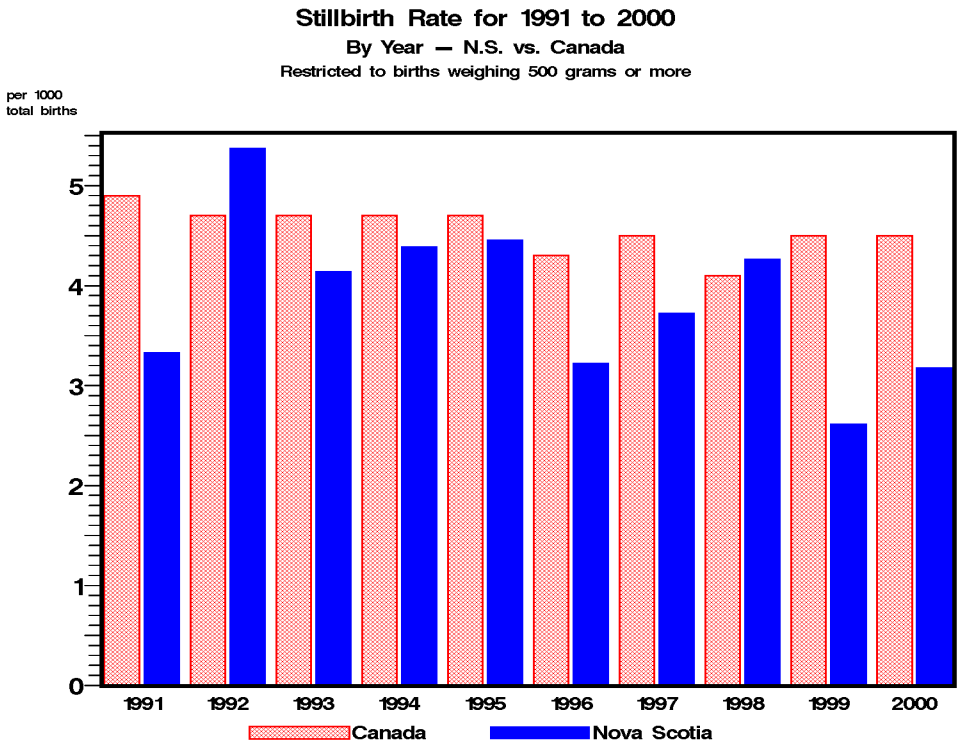
A modest decline in stillbirth rates was observed in Nova Scotia between 1991 and 2000. There is evidence to suggest that the uptake of prenatal diagnosis has been higher in Nova Scotia than in other parts of Canada [JAMA 2002;287:1561-7]. Prenatal diagnosis and pregnancy termination tends to increase rates of early fetal death and to decrease rates of late fetal death and infant death due to congenital anomalies. Canadian data are from the Canadian Perinatal Health Report 2003. Some provincial components of the Canadian rate may include stillbirths following pregnancy terminations.




## Figure 5.2.2

## Fetal Death

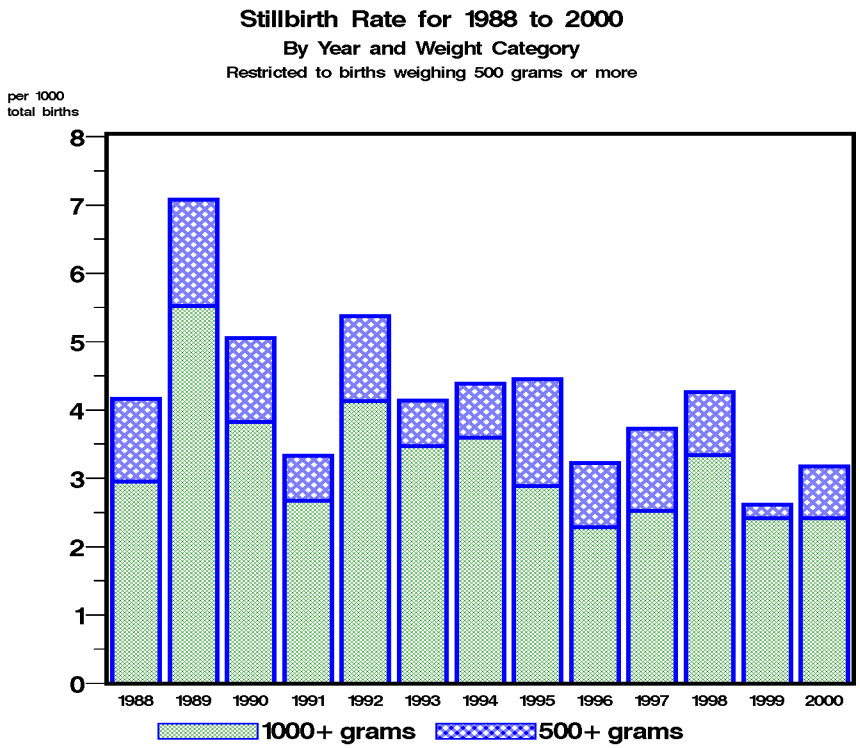
Comparisons of stillbirth rates among births with a birth weight of 500g or more helps to avoid artifacts that can arise due to inconsistent birth registration at birth weights under 500g. The temporal decline in stillbirth rates in Nova Scotia is more evident in this analysis and Nova Scotia compares favourably with the rest of Canada. Canadian data are from the Canadian Perinatal Health Report 2003. Some provincial components of the Canadian rate may include stillbirths following pregnancy terminations.



## Figure 5.2.3

## Fetal Death

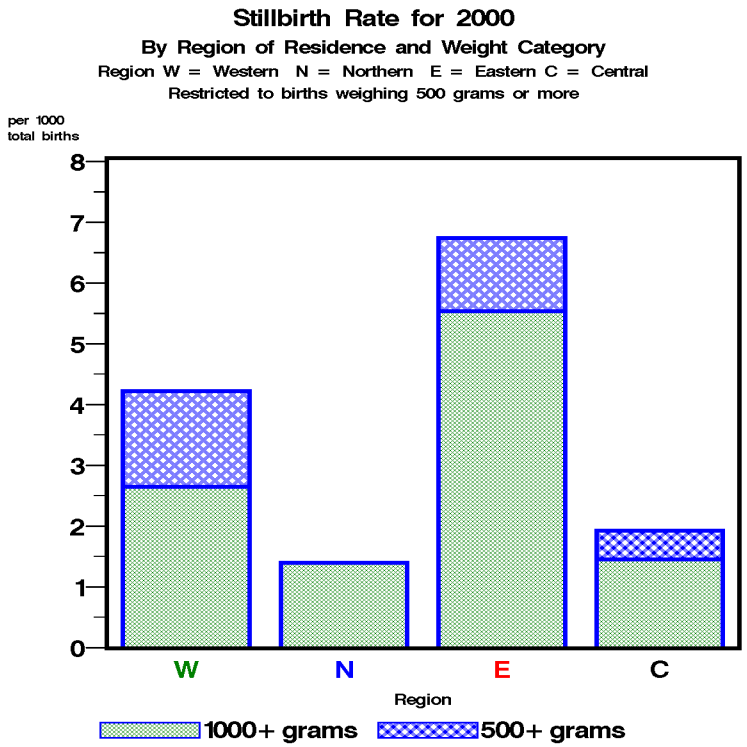
Comparisons of stillbirth rates among births with a birth weight 1,000g or more can be helpful from a health care (obstetric) standpoint. A birth weight of 1,000g corresponds to a gestational age of approximately 28 weeks. Thus, the focus in this analysis is on (mostly) preventable late fetal death. The temporal decline in stillbirth rates in Nova Scotia is evident in this analysis as well, and reflects increased obstetric intervention [Semin Perinatol 2002;26:250-9] and increases in prenatal diagnosis [JAMA 2002;287:1561-7].




## Figure 5.2.4

## Fetal Death

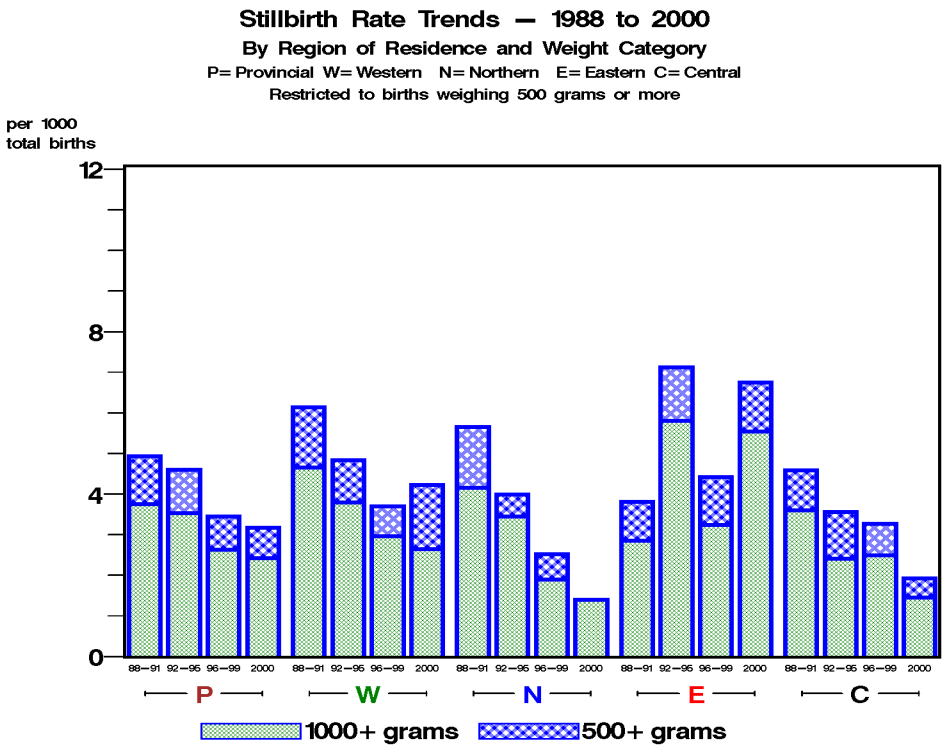
Differences in stillbirth rates 500g or more and 1,000g or more are evident between regions and may reflect chance variation. Factors that contribute to higher rates of stillbirth include increases in the proportion of older mothers, higher pre-pregnancy weight, multi-fetal pregnancy and medical complications of pregnancy.



## Figure 5.3.1

## Mortality Trends

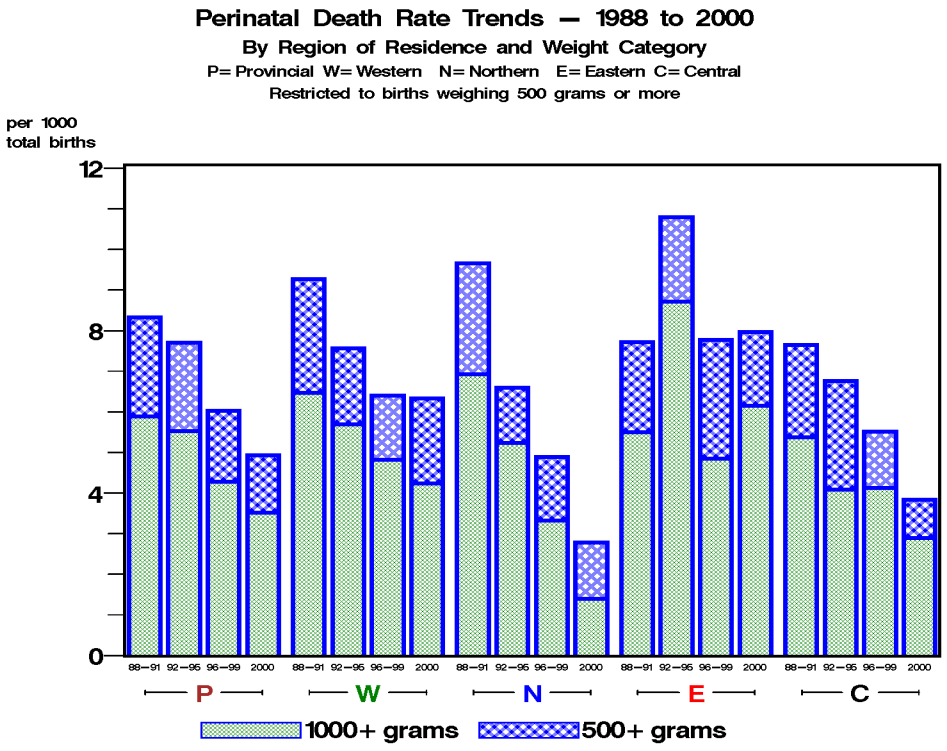
The fetal death rate in Nova Scotia has fallen steadily in both birth weight categories, 500 g or more and 1000 g or more. Furthermore, the most vulnerable birth weight group, 500-999 g (top hatched area of the graph), also decreased steadily during the time period, 1988-2000. The regional variations may have been due to small numbers; however, the changes in the Central and Northern Regions reflected those seen in the province as a whole.




## Figure 5.3.2

## Mortality Trends

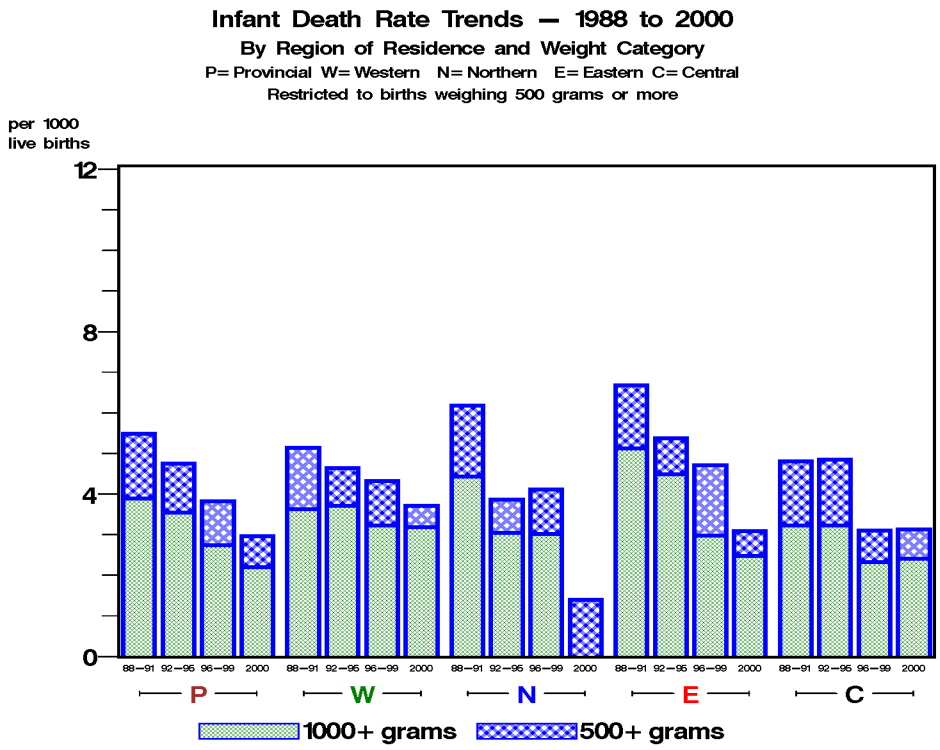
The perinatal death rate in Nova Scotia has fallen steadily in the two weight categories, 500 g or more and 1000 g or more. Again, the most vulnerable birth weight category, 500-999 g (top hatched area of the graph), has also decreased steadily. The Northern and Central Regions reflected the changes seen in the province as a whole.



## Figure 5.3.3

## Mortality Trends

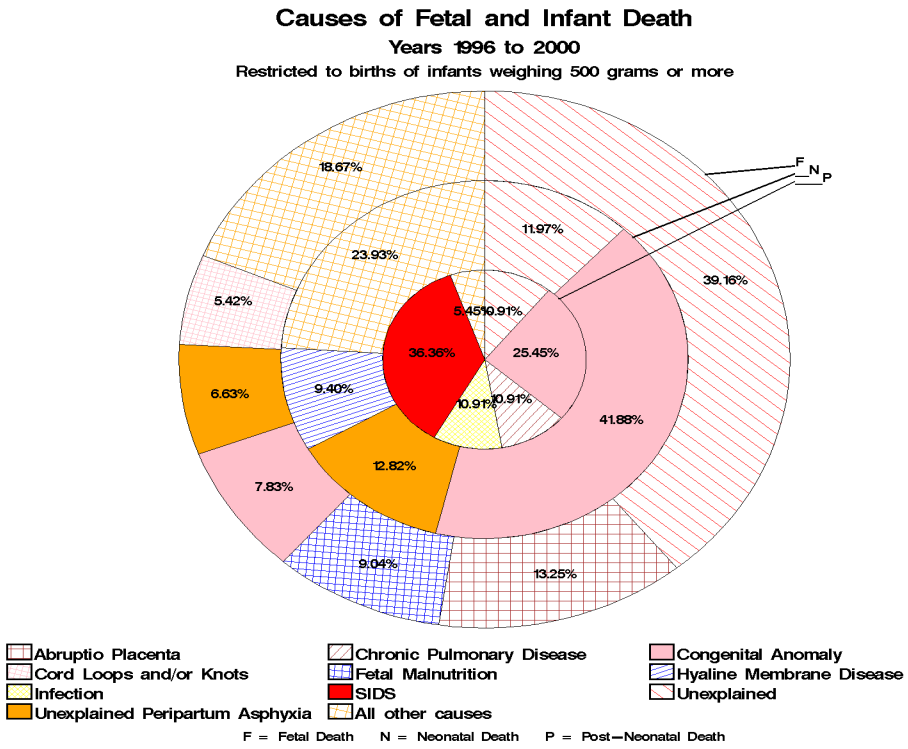
The infant death rate in Nova Scotia has decreased steadily in both birth weight categories, 500 g or more and 1000 g or more, and the vulnerable birth weight group, 500-999 g (top hatched area of the graph), has also decreased steadily over the time period, 1988-2000. The changes in infant mortality rates in all regions reflected those of the province as a whole.




## Figure 5.4.1

## Cause of Death

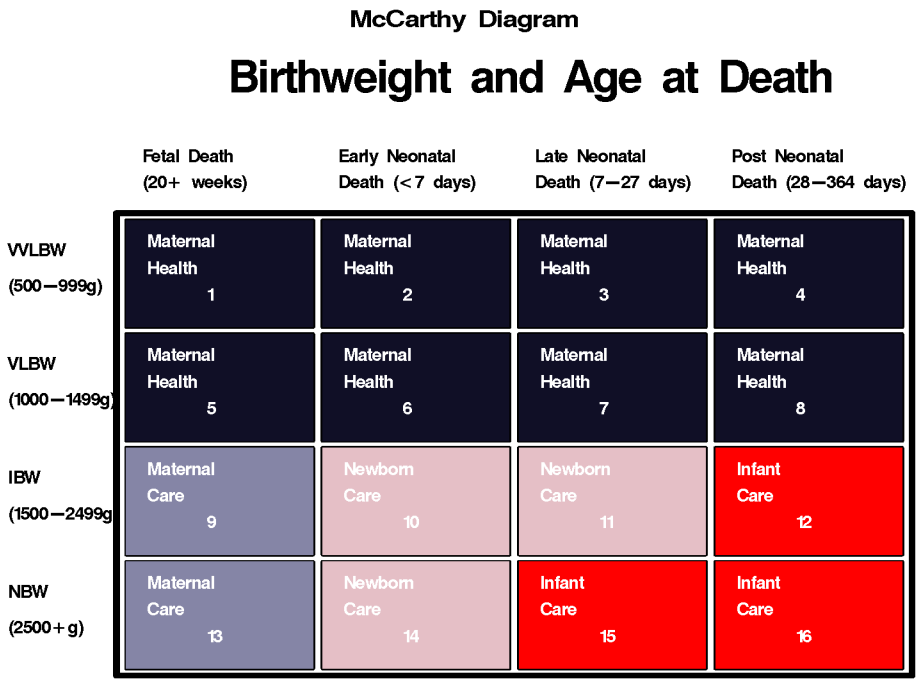
The inner circle of the pie chart represents the proportion of the causes of the 55 post-neonatal infant deaths, the intermediate circle the proportion of causes of the 116 neonatal deaths and the outer circle the proportion of the causes of the 166 fetal deaths that occurred during the years, 1996 to 2000. As an example, congenital anomalies caused 8% of the fetal deaths, 42% of the neonatal deaths and 25% of the post-neonatal deaths. See Appendix D for detailed explanation of causes of perinatal death.



## Figure 5.5.1

## McCarthy Diagrams

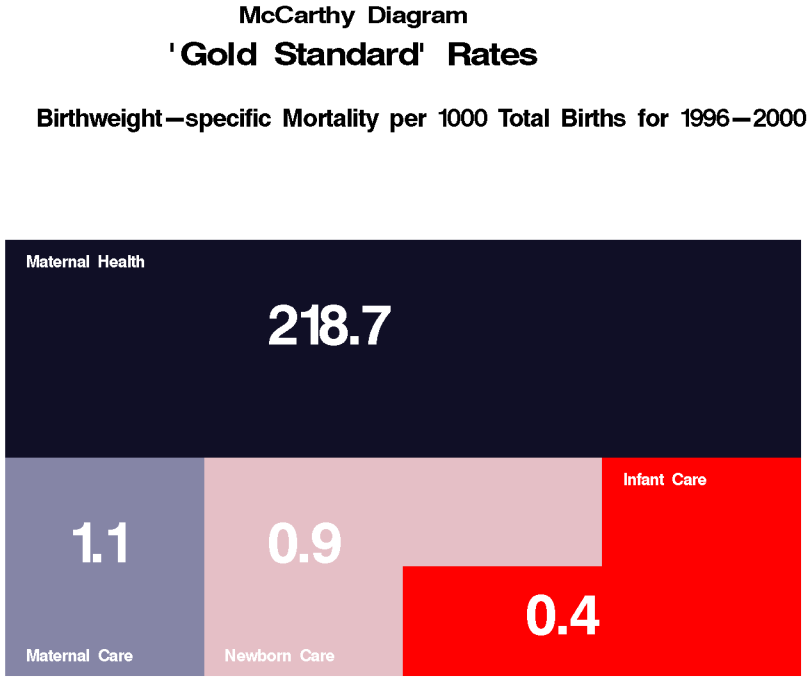
This figure and the following three figures represent a method, described by BJ McCarthy ("The Healthy Newborn", CCHI, 2004), for determining "excess mortality" that could be avoided if the favourable outcomes achieved by one segment of the population were achieved by the whole population. The conceptual framework of this approach is based on a 16-cell table of four birth weight groups and four age at death groups. This 16-cell table is then aggregated into four categories of Maternal Health, Maternal Care, Newborn Care and Infant Care as depicted. The aim is to identify categories where the feto-infant mortality is potentially modifiable and then to focus on these categories to see where improvements in health and care might be made.




## Figure 5.5.2

## McCarthy Diagrams

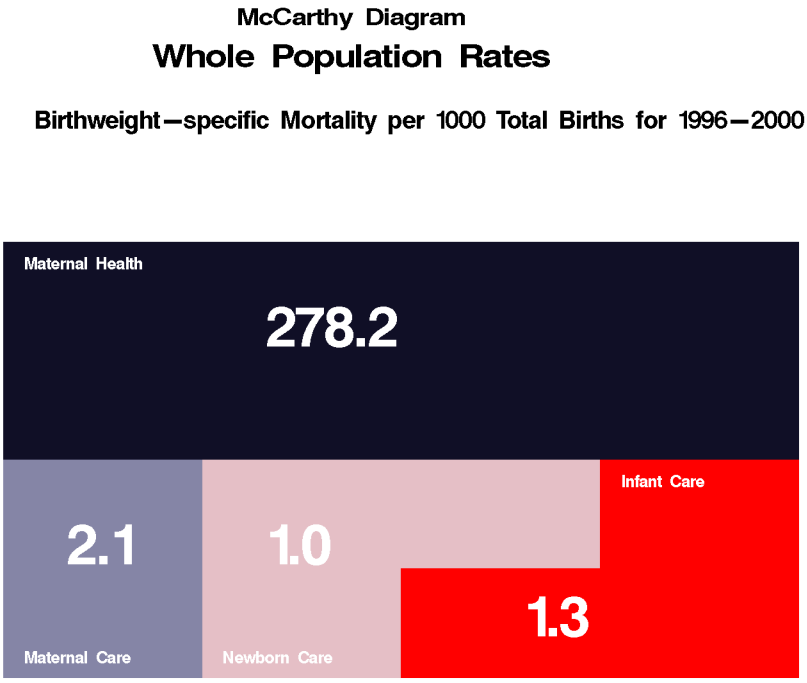
In order to calculate "excess mortality", a "Gold Standard" needs to be identified; i.e., a subpopulation with better feto-infant mortality than the population as a whole. In this case, the "Gold Standard" subpopulation for the Maternal Health and Maternal Care is: mother's residence in Halifax, Dartmouth or Bedford; maternal age of 20 years or more; non-smoker; pre-pregnant weight of 115-165 lbs. The "Gold Standard" subpopulation for Newborn Care and Infant Care categories included an additional restriction to married mothers. The feto-infant mortality rates depicted in this figure are representative of the outcomes of mothers with better health and mothers and infants who in general have accessed optimum care.



## Figure 5.5.3

## McCarthy Diagrams

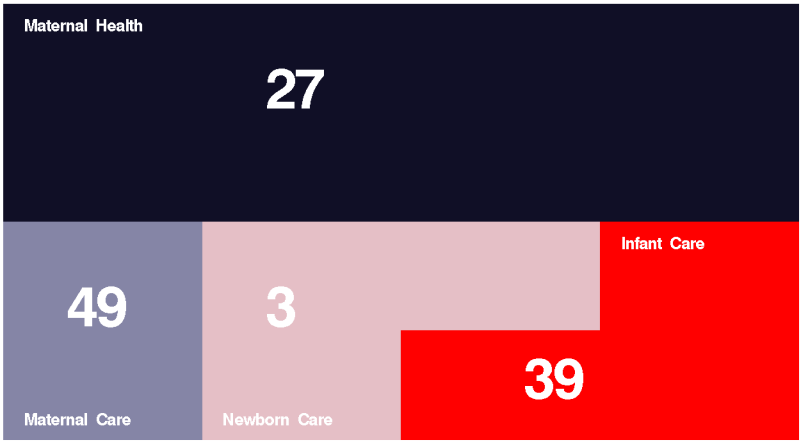
This figure represents the actual feto-infant mortality in the four categories for the whole population as described in figures 5.5.1 and 5.5.2.




## Figure 5.5.4

## McCarthy Diagrams

By subtracting the feto-infant mortality rates of the "Gold Standard" from the actual feto-infant mortality rates and multiplying this by the number of infants in each category, the "excess" deaths can be computed and are depicted in the figure. The two categories which would have the greatest impact on feto-infant survival are Maternal Care and Infant Care if the outcomes of the "Gold Standard" population could be achieved by the population as a whole. The fact that these outcomes could be achieved by a subpopulation suggests that they are potentially achievable and well worth examining in greater detail to see how this might be accomplished.



# CHAPTER 6

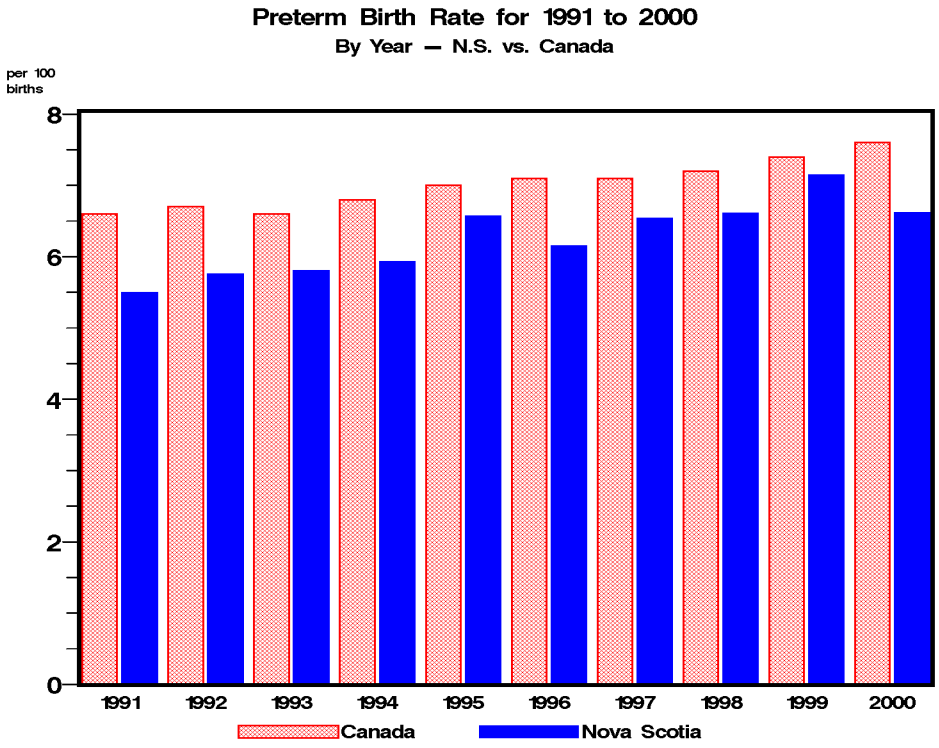
## Infant Morbidity

- Preterm Birth
- Small for Gestational Age
- Large for Gestational Age
- Congenital Anomalies
- Other Infant Morbidities

## Figure 6.1.1

## Preterm Birth

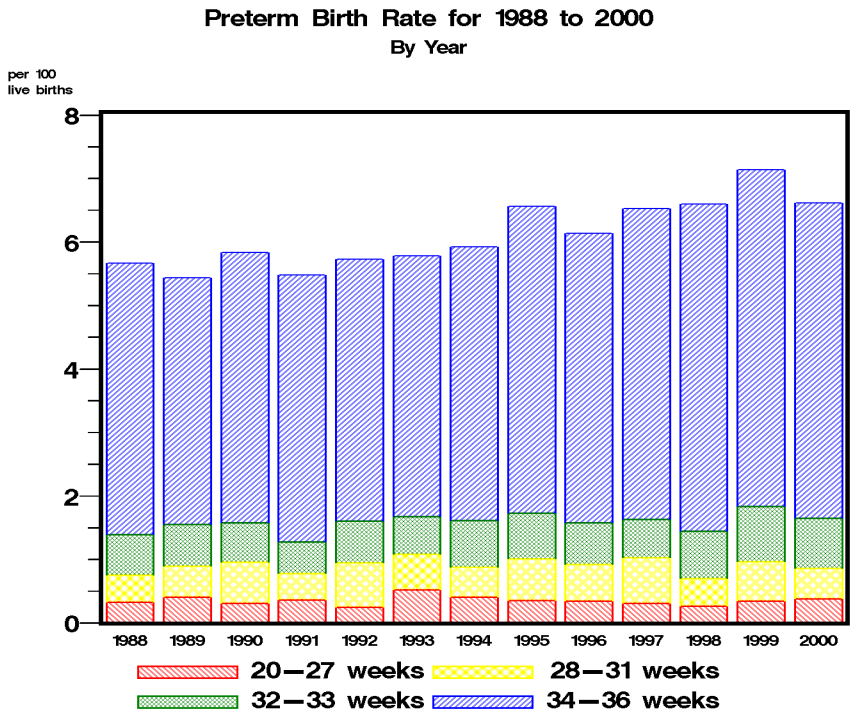
Preterm birth rates have been increasing in Nova Scotia in recent years. This trend is consistent with trends in the rest of Canada and other industrialized countries. The temporal increase in preterm birth in Canada has been shown to be inversely associated with declines in stillbirth rates [N Engl J Med 1998;339:1434-9]. The rise in preterm birth is secondary to increases in obstetric intervention (labour induction in high risk pregnancy), increases in multi-fetal births and changes in the modality of gestational age assessment. Canadian data are from the Canadian Perinatal Health Report 2003.




## Figure 6.1.2

## Preterm Birth

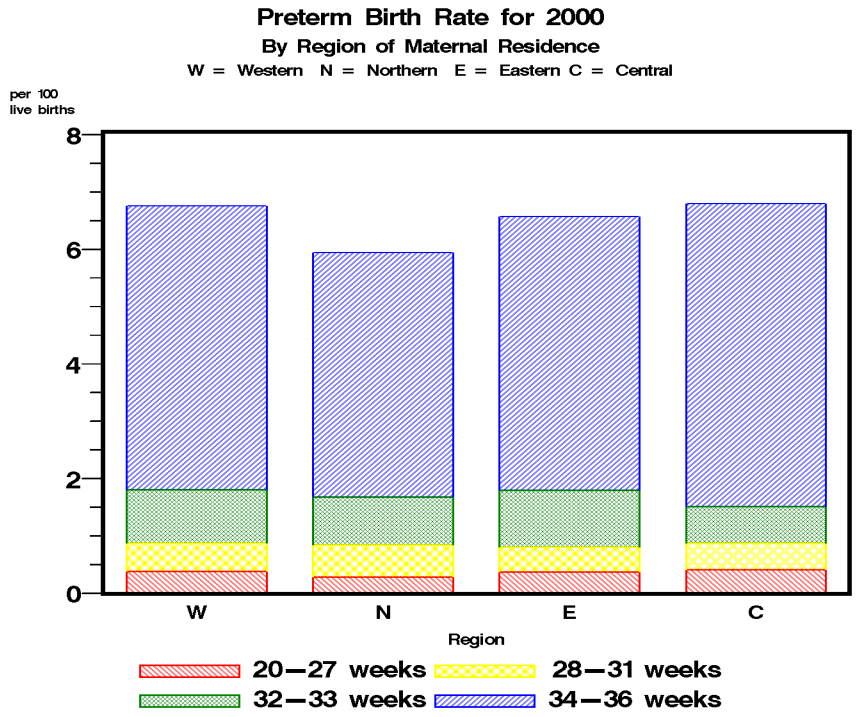
The increase in preterm birth is generally restricted to mild preterm birth (34-36 weeks). The rate of severe preterm birth (less than 32 weeks) and moderate preterm birth (32-33 weeks), which carry the highest risks of neonatal and infant mortality and serious morbidity have remained relatively constant.



## Figure 6.1.3

## Preterm Birth

There was little variation in regional rates of preterm birth in 2000.

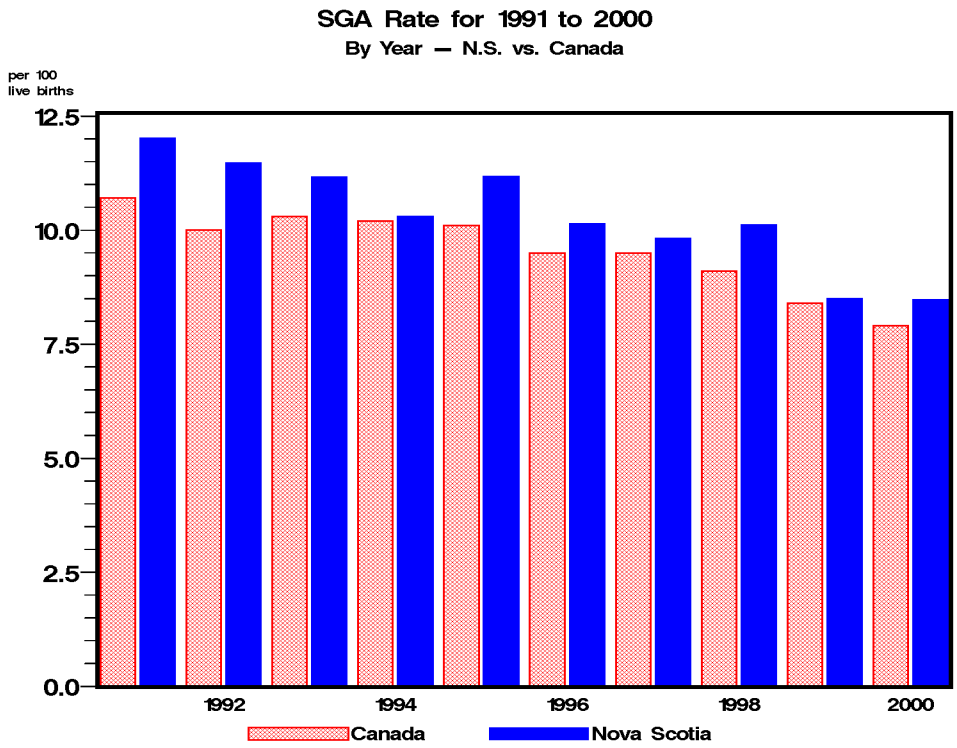


***The reference for the Canadian Standard*** *used in the following six figures (6.2.1 to 6.3.3) is: [Pediatrics 2001; 108: e35]*

## Figure 6.2.1

## Small for Gestational Age

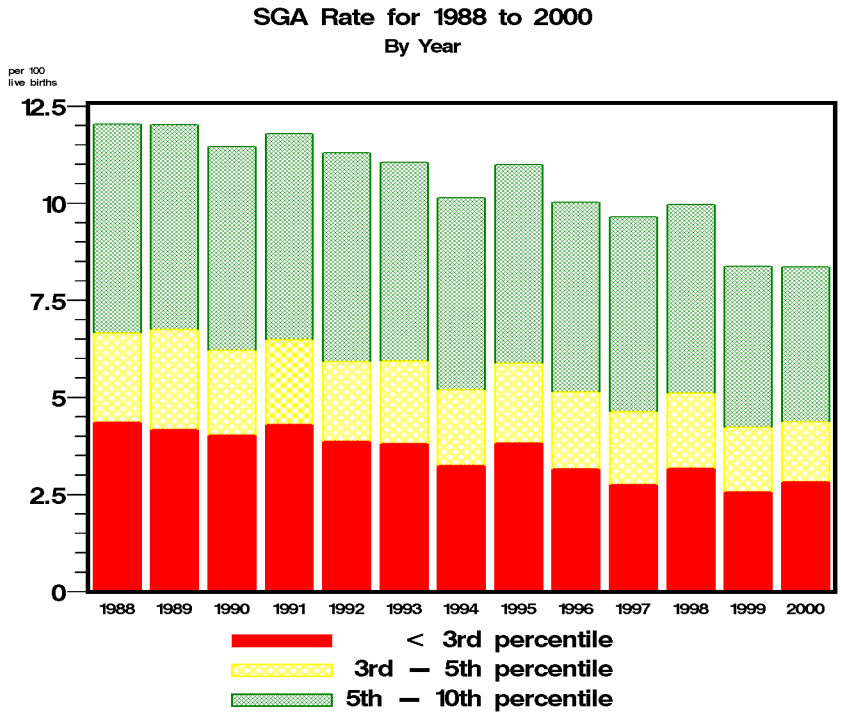
Small-for-gestational age (SGA) births are those with a birth weight less than the 10th percentile of birth weight for gestation age as per a standard Canadian reference.
Small-for-gestational age babies experience higher rates of morbidity and mortality compared with babies who are appropriate-for-gestational age. Rates of small-for-gestational age births have declined in Nova Scotia and in Canada over the last decade. This has been attributed to increases in maternal pre-pregnancy body mass index, reductions in cigarette smoking and changes in factors such as maternal age, parity and weight gain in pregnancy [Paediatr Perinat Epidemiol 2003;17:347-354]. Canadian data are from the Canadian Perinatal Health Report 2003.




## Figure 6.2.2

## Small for Gestational Age

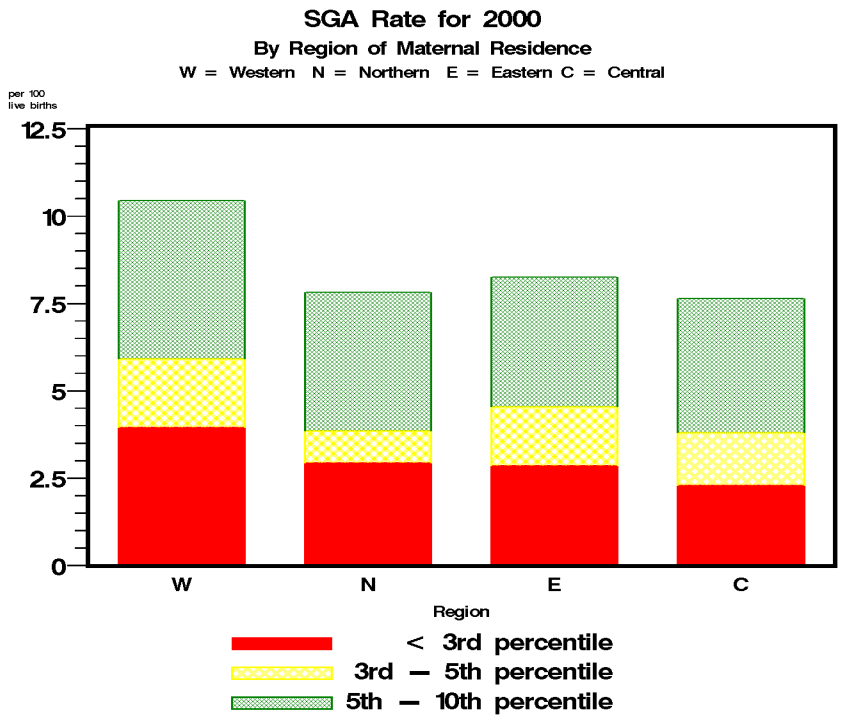
Small-for-gestational age (SGA) births of differing severity can be identified using alternative cut-offs such as the 10th percentile, the 5th percentile and the 3rd percentile of birth weight for gestation age as per a standard Canadian reference. Trends in small-for-gestational age as measured using these alternative cutoffs are similar.



## Figure 6.2.3

## Small for Gestational Age

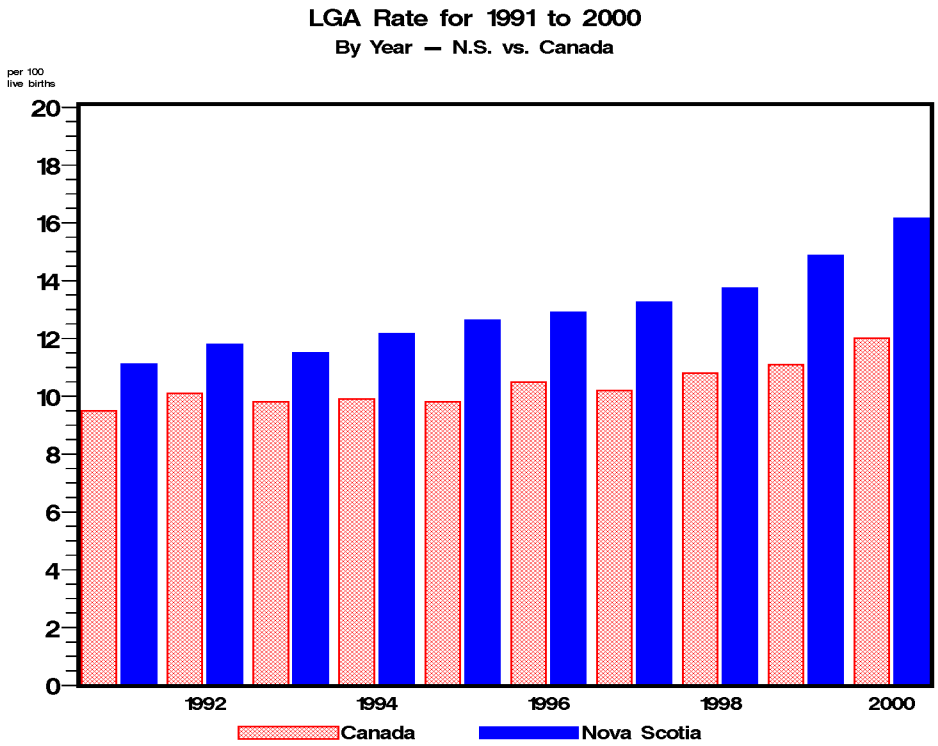
A higher rate of small-for-gestational age births (using the 10th percentile of the Canadian standard) is evident in the Western region. Small-for-gestational age rates depend on rates of cigarette smoking, genetic factors, maternal short stature, nutritional factors (such as pre-pregnancy weight, weight gain in pregnancy) and maternal morbidity.




## Figure 6.3.1

## Large for Gestational Age

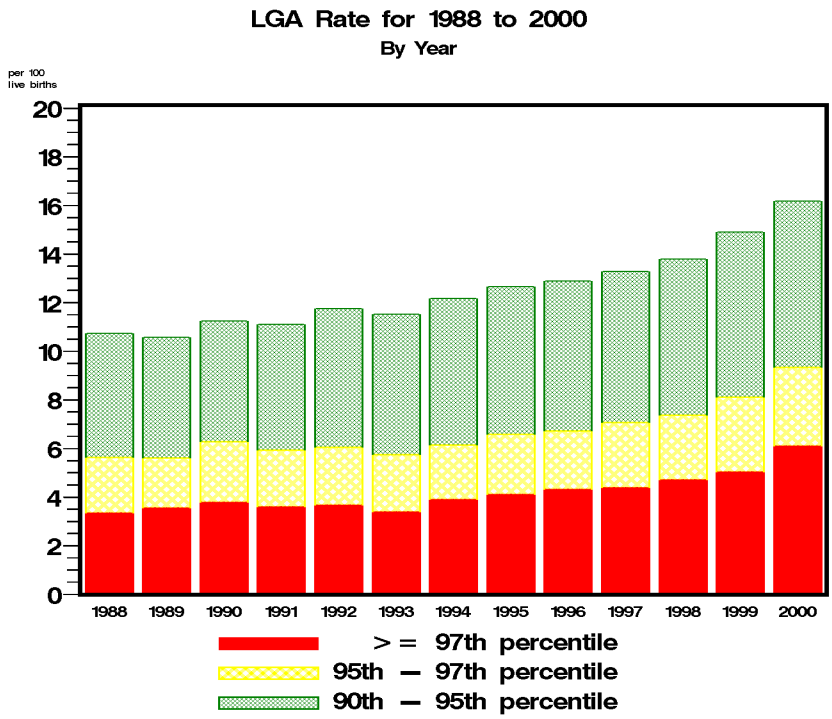
Large-for-gestational (LGA) age births are those with a birth weight greater than the 90th percentile of birth weight for gestation age as per a standard Canadian reference. Large-for-gestational age babies experience higher rates of morbidity and mortality compared with babies who are appropriate-for-gestational age. Rates of large-for-gestational age births have increased in Nova Scotia and in Canada over the last decade. These trends appear to be due primarily to increased fetal growth among term live births [Paediatr Perinat Epidemiol 2003;17:347-354].



## Figure 6.3.2

## Large for Gestational Age

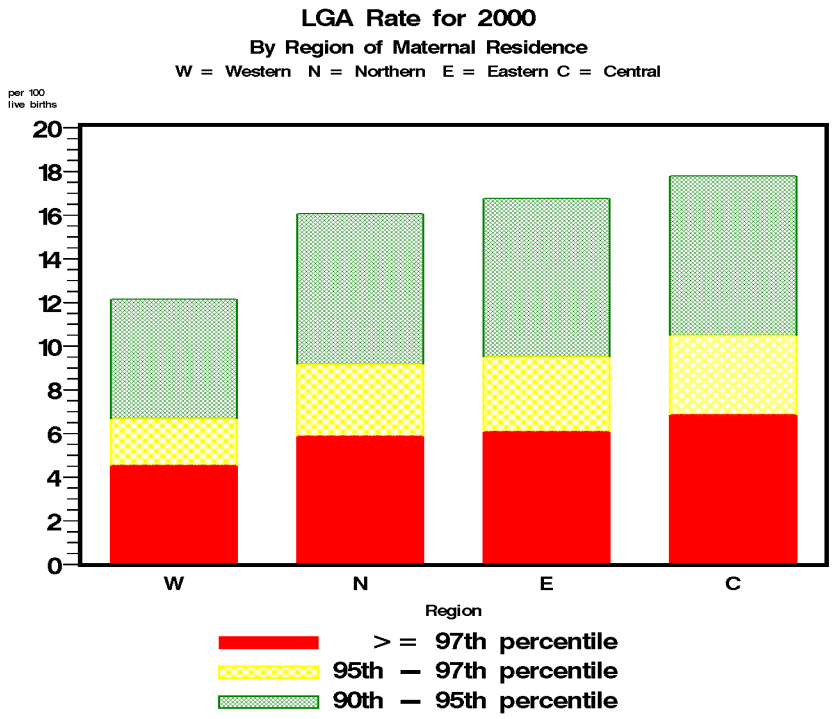
Large-for-gestational age (LGA) births of differing severity can be identified using alternative cut-offs such as the 90th percentile, the 95th percentile and the 97th percentile of birth weight for gestation age as per a standard Canadian reference. Trends in large-for-gestational age as measured using these alternative cutoffs are similar.




## Figure 6.3.3

## Large for Gestational Age

A lower rate of large-for-gestational age births (using the 90th percentile of the Canadian standard) is evident in the Western region. Large-for-gestational age live births are related to maternal diabetes and genetic predisposition.

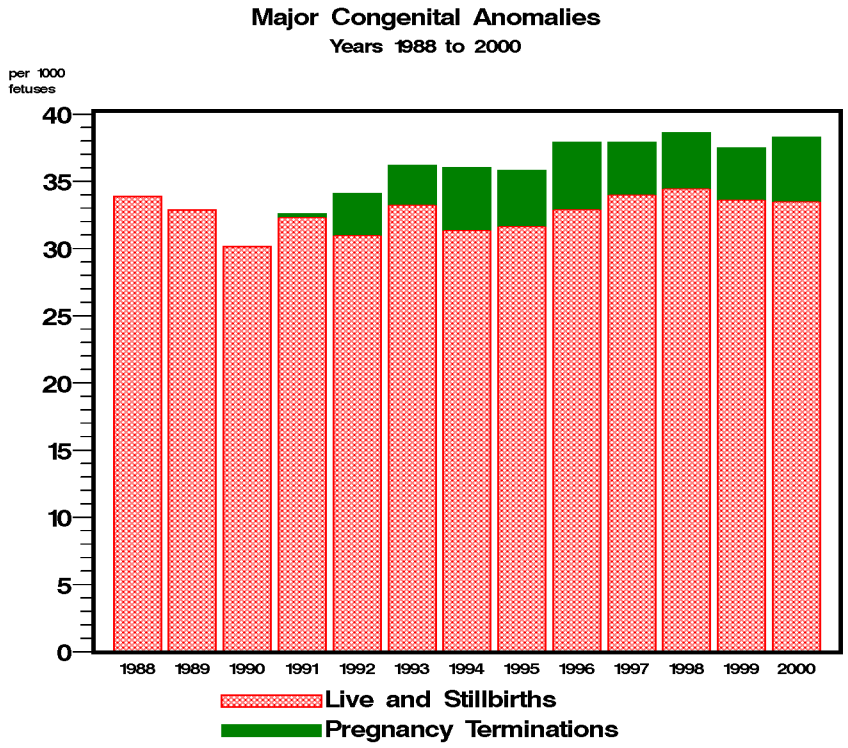


***In the following Congenital Anomaly section**, small inconsistencies with data presented in previous reports are due to slight changes in the definitions of major and minor anomalies.*

## Figure 6.4.1

## Congenital Anomalies

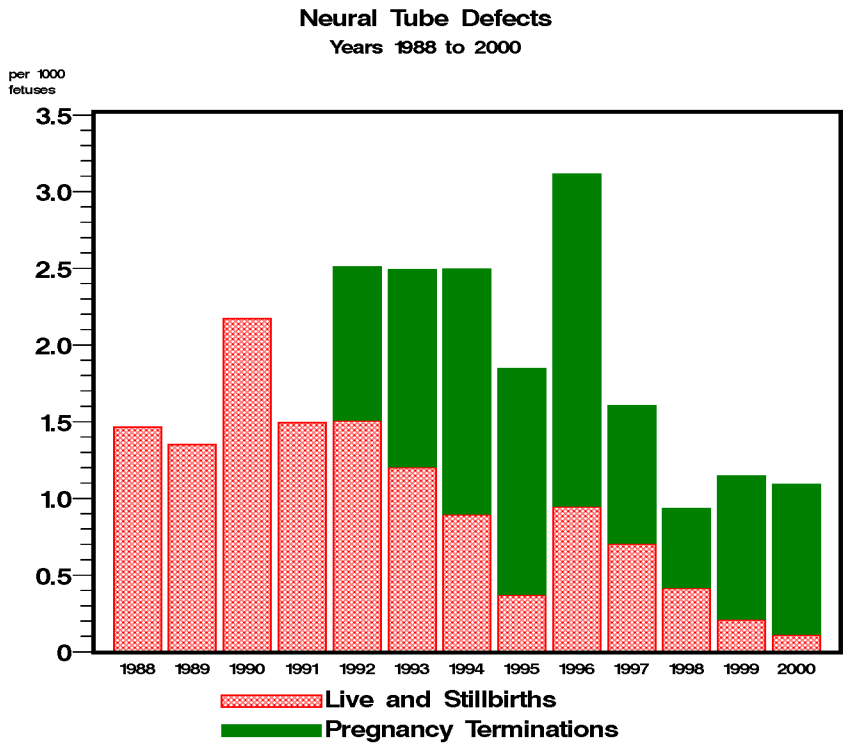
The rates of major congenital anomalies among live births and stillbirths have been relatively stable between 1988 and 2000. A small rise in the rate of major congenital anomalies is seen starting in 1992 when data on pregnancy terminations for prenatally diagnosed major congenital anomalies are included. The anomalies classified as "major", are shown in Appendix C.




## Figure 6.4.2

## Congenital Anomalies

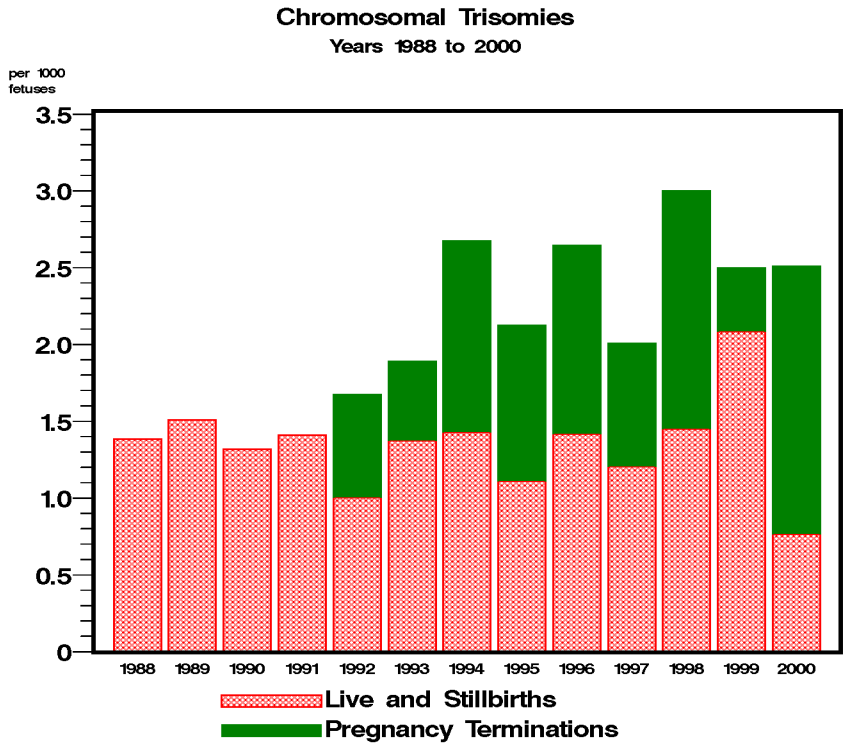
The rate of live births and stillbirths with neural tube defects has fallen dramatically, primarily as a result of pregnancy termination for prenatal diagnosis of a neural tube defect. A drop in total incidence (live births, stillbirths and pregnancy terminations) began in 1998, which coincides with the time when Canada began fortification with folate of all enriched grain products [CMAJ 2002;167:241-5]. This does not necessarily prove that fortification reduced the incidence of neural tube defects, but it is very suggestive. If these rates remain at the same low level as observed since 1998, fortification will prove to have been a very successful public health initiative.



## Figure 6.4.3

## Congenital Anomalies

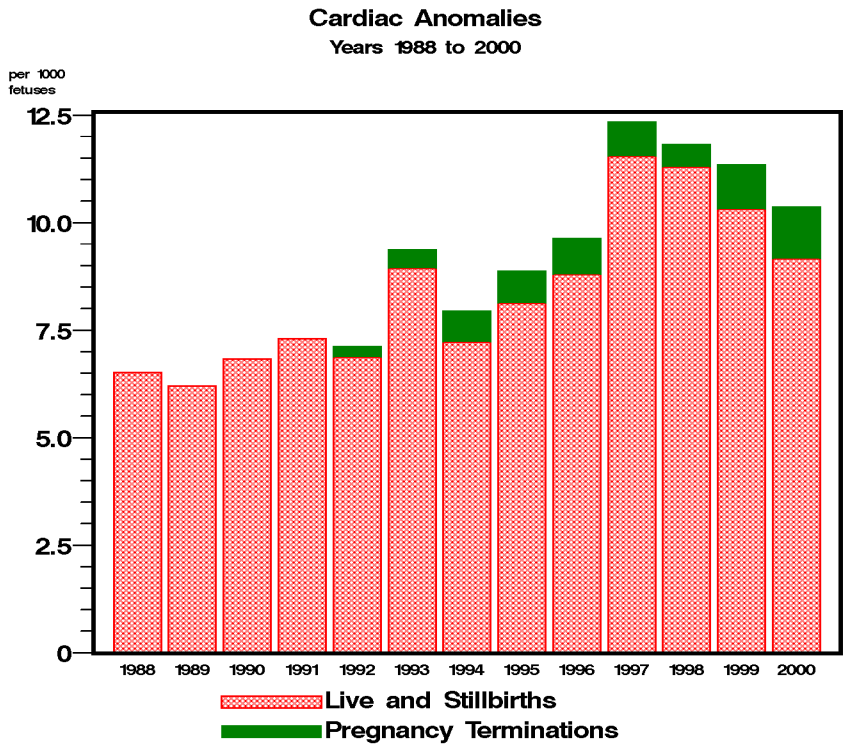
The overall rate of chromosomal trisomies, including live births, stillbirths and pregnancy terminations, has increased slightly since the early 1990's. This may reflect the known trends in advanced maternal age, a risk factor for chromosomal trisomies.




## Figure 6.4.4

## Congenital Anomalies

The graph indicates that the rate of major cardiac anomalies has increased since the early 1990's. Although there is no known explanation for this increase, the availability of fetal echocardiography has expanded in Nova Scotia. This technology may be shifting the time of the diagnosis from the post-natal period (e.g., after discharge from hospital where they would not appear in the perinatal database) to the prenatal period.



# Table 6.5.1 Other Infant Morbidities

## Respiratory Distress Trends by Region
### Live Births Only

| Mother's Residence of Residence | | Type of Respiratory Distress | | | | |
|---|---|---|---|---|---|---|
| | | Transient Respiratory Distress | Transient Tachypnea of the Newborn | Mild / Moderate Respiratory Distress | Severe Respiratory Distress | No Respiratory Distress |
| | | per 1000 | per 1000 | per 1000 | per 1000 | per 1000 |
| Year | | | | | | |
| 88-91 | Western | 11.9 | 6.8 | 14.8 | 8.1 | 958.4 |
| | Northern | 9.7 | 14.8 | 16.8 | 6.7 | 952.1 |
| | Eastern | 5.1 | 13.5 | 10.3 | 5.6 | 965.5 |
| | Central | 19.5 | 2.4 | 13.3 | 5.5 | 959.2 |
| | Total | 13.4 | 7.6 | 13.6 | 6.3 | 959.2 |
| 92-95 | Western | 8.5 | 14.5 | 9.3 | 6.5 | 961.1 |
| | Northern | 9.2 | 19.4 | 13.2 | 7.4 | 950.8 |
| | Eastern | 5.4 | 13.4 | 7.6 | 7.2 | 966.9 |
| | Central | 20.4 | 2.3 | 11.4 | 7.4 | 958.6 |
| | Total | 13.2 | 9.8 | 10.5 | 7.2 | 959.5 |
| 96-99 | Western | 5.9 | 20.0 | 9.4 | 8.6 | 956.0 |
| | Northern | 11.5 | 28.9 | 11.8 | 7.7 | 940.0 |
| | Eastern | 6.2 | 12.2 | 7.7 | 8.7 | 965.2 |
| | Central | 20.5 | 5.0 | 8.2 | 7.3 | 959.1 |
| | Total | 13.4 | 13.2 | 8.9 | 7.9 | 956.5 |
| 2000 | Western | 10.6 | 18.0 | 8.5 | 9.5 | 954.0 |
| | Northern | 15.3 | 17.4 | 12.5 | 12.5 | 942.2 |
| | Eastern | 17.8 | 14.8 | 9.8 | 10.5 | 947.1 |
| | Central | 20.4 | 4.1 | 6.5 | 9.6 | 959.4 |
| | Total | 17.1 | 11.0 | 8.4 | 10.2 | 953.4 |

Transient respiratory distress is the diagnosis given to infants with respiratory distress developing shortly after birth and lasting for no longer than age 6 hours without other specific cause found. Transient tachypnoea of the newborn begins shortly after birth having the major clinical sign of tachypnoea reaching levels of 90-110 bpm, never requiring an inspired oxygen concentration greater than 35% ($FiO_2$ greater than 0.35) and having chest x-ray features of increased lung volume, extra fluid in the fissures, increased bronchovascular markings and generous-sized cardiothymic shadow, and never requiring assisted ventilation. Respiratory distress syndrome (RDS) begins shortly after birth and is characterized by grunting, decreased air entry and respiratory distress with moderate to marked subcostal and intercostal retraction. $FiO_2$ needs are often greater than 0.40. Mild RDS has mild retractions and does not require assisted ventilation. Moderate RDS has moderate retractions and may require nasal CPAP and $FiO_2$ greater than 0.40. Severe RDS requires intermittent positive pressure assisted ventilation and endotracheal surfactant. The incidence of severe RDS in Nova Scotia has been rising since 1988-91 when it was 6.2 per 1000 to 7.9 in 1996-99 and 10.1 per 1000 in the year 2000. RDS is the result of preterm delivery and the incidence and severity are increased by Cesarean section. This rising incidence of severe RDS happened despite the increased use of antenatal corticosteroids. It is possible that changing maternal characteristics and the need for obstetrical intervention may have had an adverse impact on the incidence of severe RDS during this time period. In contrast, the incidence of mild/moderate RDS declined during the same time period.

## Table 6.5.2

## Other Infant Morbidities

There was considerable variation in the use of neonatal assisted ventilation among regions, based on mother's residence irrespective of place of delivery. The increased use of high frequency oscillatory ventilation (HFOV) in 1996-99 and 2000 was due to the availability of this modality of respiratory support.

### Assisted Ventilation Trends by Region
**Live Births Only**

| Mother's Residence of Residence | | Assisted Ventilation | | | | |
|---|---|---|---|---|---|---|
| | | I.P.P.V. | Nasal C.P.A.P. | C.P.A.P. | High Frequency | None |
| | | per 1000 | per 1000 | per 1000 | per 1000 | per 1000 |
| Year | | | | | | |
| 88-91 | Western | 11.9 | 6.4 | 0.0 | 0.0 | 985.3 |
| | Northern | 9.5 | 5.4 | 0.0 | 0.0 | 987.8 |
| | Eastern | 8.7 | 3.4 | 0.3 | 0.0 | 988.4 |
| | Central | 11.3 | 5.6 | 0.2 | 0.0 | 985.8 |
| | Total | 10.6 | 5.3 | 0.2 | 0.0 | 986.5 |
| 92-95 | Western | 11.3 | 5.0 | 0.1 | 0.0 | 986.7 |
| | Northern | 11.7 | 4.8 | 0.8 | 0.0 | 985.2 |
| | Eastern | 9.5 | 4.7 | 1.0 | 0.0 | 986.4 |
| | Central | 11.8 | 6.4 | 0.4 | 0.0 | 984.6 |
| | Total | 11.2 | 5.5 | 0.5 | 0.0 | 985.5 |
| 96-99 | Western | 14.8 | 5.7 | 0.5 | 0.1 | 981.6 |
| | Northern | 17.2 | 9.2 | 1.3 | 0.5 | 977.7 |
| | Eastern | 13.8 | 6.3 | 0.5 | 0.3 | 981.7 |
| | Central | 14.3 | 7.9 | 0.3 | 0.2 | 981.5 |
| | Total | 14.8 | 7.4 | 0.6 | 0.3 | 981.0 |
| 2000 | Western | 12.2 | 5.8 | 0.0 | 1.1 | 985.2 |
| | Northern | 18.1 | 6.3 | 2.8 | 0.7 | 977.0 |
| | Eastern | 12.3 | 8.0 | 0.0 | 1.2 | 982.2 |
| | Central | 14.2 | 5.8 | 0.0 | 0.7 | 982.9 |
| | Total | 14.0 | 6.3 | 0.4 | 0.9 | 982.3 |

## Table 6.5.3

## Other Infant Morbidities

There was little change in infectious morbidity over the entire time period, 1988 to 2000, although there was a modest decline in the overall systemic bacterial infection rate from 15.9 to 12.3 per 1000 live born infants.

### Infection Trends by Region
**Live Births Only**

| Mother's Residence of Residence | | Intra-uterine pneumonia | Systemic Group B Strep Infection | Any bacterial infection |
|---|---|---|---|---|
| | | per 1000 | per 1000 | per 1000 |
| Year | | | | |
| 88-91 | Western | 2.0 | 2.8 | 22.9 |
| | Northern | 2.3 | 0.8 | 11.3 |
| | Eastern | 0.5 | 1.2 | 10.0 |
| | Central | 2.5 | 1.1 | 17.0 |
| | Total | 1.9 | 1.4 | 15.9 |
| 92-95 | Western | 1.3 | 1.4 | 19.7 |
| | Northern | 3.5 | 1.0 | 14.1 |
| | Eastern | 2.0 | 1.0 | 8.0 |
| | Central | 1.5 | 0.8 | 13.1 |
| | Total | 1.9 | 1.0 | 13.6 |
| 96-99 | Western | 6.4 | 2.2 | 22.4 |
| | Northern | 3.1 | 1.0 | 16.3 |
| | Eastern | 4.6 | 0.7 | 12.1 |
| | Central | 2.5 | 1.4 | 9.9 |
| | Total | 3.8 | 1.3 | 13.9 |
| 2000 | Western | 2.1 | 0.5 | 18.5 |
| | Northern | 0.7 | 0.7 | 13.3 |
| | Eastern | 0.0 | 0.6 | 10.5 |
| | Central | 2.9 | 0.2 | 10.1 |
| | Total | 1.9 | 0.4 | 12.4 |

# Table 6.5.4 Other Infant Morbidities

## Trends in Hypoxic Ischemic Encephalopathy by Region
### Live Births Only

| Mother's Region of Residence | | Hypoxic Ischemic Encephalopathy | Neonatal Post-Asphyctic Sequelae |
|---|---|---|---|
| | | per 1000 | per 1000 |
| Year | | | |
| 88-91 | Western | 2.0 | 2.2 |
| | Northern | 1.0 | 1.1 |
| | Eastern | 1.1 | 1.3 |
| | Central | 2.6 | 2.8 |
| | Total | 1.9 | 2.1 |
| 92-95 | Western | 0.8 | 1.1 |
| | Northern | 1.5 | 1.7 |
| | Eastern | 1.0 | 1.7 |
| | Central | 2.4 | 2.7 |
| | Total | 1.7 | 2.0 |
| 96-99 | Western | 1.2 | 1.4 |
| | Northern | 1.5 | 1.6 |
| | Eastern | 1.1 | 1.5 |
| | Central | 3.8 | 3.8 |
| | Total | 2.4 | 2.5 |
| 2000 | Western | 1.1 | 1.1 |
| | Northern | 0.0 | 0.7 |
| | Eastern | 1.2 | 1.2 |
| | Central | 1.7 | 1.9 |
| | Total | 1.2 | 1.4 |

# *GLOSSARY*

# Glossary

**Cesarean Section Rate (%)**

(Total # of women undergoing cesarean section x 100) / (Total # of women giving birth)

**Community Hospital**

Community hospitals provide care for low-risk patients and refer moderate and high risk patients to appropriate levels of care whenever possible

**Gestational Age**

Duration of gestation calculated from the first day of the last normal menstrual period; expressed in completed days or weeks. When last normal menstrual period is not known, the gestational age has been determined by the physical examination of the infant shortly after birth

**Induction of Labour**

Induction of labour refers to inductions undertaken using an oxytocic agent, for example oxytocin and prostaglandin, or by using an intracervical catheter. Inductions using only artificial rupture of membranes are not included

**Infant Death**

Death of a liveborn infant occurring at any time from birth to the end of the first year after birth ( 0 - 364 days )

**Live Birth**

Birth of an infant with signs of life regardless of gestational age or birth weight

**Neonatal Death, Early**

Death of a liveborn infant, occurring during the first seven days after birth (at or before 6 days, 23 hours, and 59 minutes)

**Neonatal Death, Early, Rate (per 1000 live births)**

(Total # early neonatal deaths x 1000) / Total # live births

**Neonatal Death, Late**

Death of a liveborn infant, occurring from the seventh completed day to the twenty-seventh completed day after birth (27 days, 23 hours and 59 minutes)

**Neonatal Mortality**

Total number of deaths of liveborn infants, occurring before the twenty-eighth completed day after birth, per 1000 live births

**Parity**

Parity is defined as the number of pregnancies, excluding the present pregnancy, which progressed to or beyond 20 weeks gestation or which resulted in one or more births with a birth weight of 500 grams or over. Nulliparity (Parity = 0) refers to women who have not completed a pregnancy meeting the criteria, primiparity (Parity = 1) refers to mothers having completed one pregnancy meeting the criteria, and multiparity (Parity = 1+) refers to women who have completed more than one pregnancy meeting the criteria.

**Perinatal Mortality**

The total number of stillbirths and neonatal deaths of infants per 1000 total births (total # of stillbirths + total # of livebirths)

**Perinatal Mortality Rate (per 1000 births)**

(Total # stillbirths + total # neonatal deaths x 1000) / (Total # stillbirths + Total # of live births)

**Placentae, Abruptio**

Bleeding from the placental site due to the partial or complete separation of the placenta (diagnosis not made on ultrasound alone - must be confirmed clinically)

**Placenta Previa**

Placenta entirely or partially covering the internal os (diagnosis not made on ultrasound alone - must be confirmed clinically)

**Premature Birth**

Birth before 37 completed weeks gestation

**Regional Hospital**

Regional hospitals provide care for low- and moderate-risk patients and refer higher risk patients to a tertiary centre whenever possible

**Stillbirth**

Birth of a non-living fetus weighing 500 grams or more at birth, or if gestation is at or beyond 20 weeks

**Stillbirth Rate (per 1000 births)**

(Total # stillbirths x 1000) / (Total # stillbirths + Total # of live births)

**Tertiary Hospital**

Tertiary hospitals provide all levels of care, ranging from low-risk to intensive care management

**Trial of Labour after Cesarean Section**

A planned attempt, irrespective of success, for a vaginal delivery after a previous cesarean section; does not include patients who, despite going into labour unexpectedly, undergo an elective repeat cesarean section without attempting a vaginal birth

# *APPENDICES*

Appendix A - White's Classification of Diabetes in Pregnancy

Appendix B - Nova Scotia Prenatal Risk Score

Appendix C - Major and Minor Anomalies

Appendix D - Causes of Perinatal Death

# Appendix A - White's Classification of Diabetes in Pregnancy

| Class | Description |
|---|---|
| A | Gestational or chemical diabetic; asymptomatic |
| B | Overt diabetes, onset after age 20, duration less than 10 years |
| C | Overt diabetes, onset before age 20, duration 10 to 20 years |
| D | Overt diabetes, duration more than 20 years or onset before age 10, benign retinopathy |
| E* | Calcified pelvic vessels |
| F | Nephropathy (proteinuria, azotemia) |
| R | Malignant (proliferative) retinopathy (retinitis proliferans) |

* This classification is generally not employed in current practice.

Source: After White (1965; 1971).

# Appendix B - Nova Scotia Prenatal Risk Score

Antenatal risk scoring systems may be used to support, but are never a replacement for, clinical judgment. The designation of "high-risk" varies among tools and is somewhat arbitrary. In this report, components of the Nova Scotia Risk Score are assigned retrospectively and are used as an objective means of comparing the proportion of women with "high-risk" pregnancies between types of health care facilities.

## NOVA SCOTIA PRENATAL SCORING FORM

1) Score each question as indicated
2) Total each category score at first visit
3) Repeat at 36 weeks
4) Record on Prenatal Record

### I REPRODUCTIVE HISTORY

| | | |
|---|---|---|
| Age | < 16 = 1 | ☐ |
| | 16 - 35 = 0 | ☐ |
| | > 35 = 2 | ☐ |
| Parity | 0 = 1 | ☐ |
| | 1 - 4 = 0 | ☐ |
| | 5 + = 2 | ☐ |

### PAST OBSTETRICAL HISTORY

| | | |
|---|---|---|
| Habitual Abortion/Infertility | = 1 | ☐ |
| PPH / Manual Removal | = 1 | ☐ |
| Baby >9 lbs. (4086 g.) | = 1 | ☐ |
| Baby <5.5 lbs. (2500 g.) | = 1 | ☐ |
| PET / Hypertension | = 1 | ☐ |
| Previous Cesarean | = 2 | ☐ |
| Stillbirth or Neonatal Death | = 3 | ☐ |
| Prolonged Labour or Difficult Delivery | = 1 | ☐ |

### II ASSOCIATED CONDITIONS

| | | |
|---|---|---|
| Previous Gynecologic Surgery | = 1 | ☐ |
| Chronic renal disease | = 2 | ☐ |
| Gestational diabetes | = 1 | ☐ |
| Diabetes mellitus | = 3 | ☐ |
| Cardiac disease | = 3 | ☐ |

### OTHER MEDICAL DISORDERS

Chronic bronchitis, lupus, etc.
Score according to severity (1-3) ☐

### III PRESENT PREGNANCY

| | | 1st Visit | 36 Wks |
|---|---|---|---|
| Bleeding < 20 weeks | = 1 | ☐ | ☐ |
| Bleeding > 20 weeks | = 3 | ☐ | ☐ |
| Anemia < 10 gm % | = 1 | ☐ | ☐ |
| Pregnancy > 42 weeks | = 1 | ☐ | ☐ |
| Hypertension | = 2 | ☐ | ☐ |
| Premature rupture of membranes | = 2 | ☐ | ☐ |
| Polyhydramnios | = 2 | ☐ | ☐ |
| Small for dates | = 3 | ☐ | ☐ |
| Multiple pregnancy or Breech or Malpresentation | = 3 | ☐ | ☐ |
| Isoimmunization | = 3 | ☐ | ☐ |

| | | |
|---|---|---|
| CATEGORY I SCORE | CATEGORY II SCORE | CATEGORY III SCORE |

**TOTAL RISK SCORE** ☐ 1st Visit ☐ 36 Weeks Note: Low Risk = 0-2 High Risk = 3-6 Extreme Risk = > 7

**COMMENTS** _____

REV. 01/2003

**NOVA SCOTIA PRENATAL SCORING FORM**

# Appendix C - Major and Minor Anomalies

## Major Anomalies

### Cardiovascular

- Absence pericardium/pericardial defect
- Acardia
- Aneurysm of vein of Galen
- Anomalous pulmonary venous return
- Aortic arch stenosis/ascending aorta stenosis
- Aortic valve stenosis
- Aortico-pulmonary window
- Arterio-venous mal of lung
- Asplenia
- Bicuspid aortic valve
- CHD, suspected
- CHD, type unknown
- CHD, unclassifiable
- Coarctation of the aorta
- Congenital cardiomyopathy
- Corrected left transposition
- Dextrocardia
- Double Outlet right ventricle
- Double aortic arch
- Double outlet left ventricle
- Dysplastic pulmonary valve
- Ebstein's malformation of tricuspid valve
- Endocardial cushion defect
- Endocardial fibroelastosis
- Hypoplastic left heart synd
- Insufficiency/cleft of mitral valve
- Interrupted aortic arch
- Intracardiac Mass
- Intrathoracic (Vascular) Ring
- Isolated ostium primum defect
- Isolated ostium secund defect
- Mitral atresia
- Mitral stenosis
- Patent ductus arteriosis
- Premature closure of foramen ovale
- Pseudotruncus
- Pulmonary artery atresia
- Pulmonary artery stenosis (pathologic)
- Pulmonary valve insufficiency
- Pulmonary valve stenos/atresia
- Pulmonary vein atresia
- Single atrium
- Single ventricle
- Tetralogy of Fallot
- Translocation great arteries/vessels
- Tricuspid atresia
- Tricuspid insufficiency
- Truncus arteriosus
- Ventricular septal defect

### Central Nervous System

- Agenesis of corpus callosum
- Anencephaly

- Arachnoid cyst
- Arhinencephaly
- Arthrogryposis/Contractures
- Brain Hypoplasia
- Cebocephaly
- Cerebellar hypoplasia
- Cerebro-retinal angiomatosis
- Cortical Dysplasia
- Cranium bifidum
- Cyclops
- Dandy-Walker Syndrome
- Dermal fistula
- Diastematomyelia
- Encephalocele
- Holoprosencephaly
- Hydranencephaly
- Hydrocephalus
- Lipomeningocele
- Lissencephaly
- Meningocele
- Meningomyelocele
- Moebius syndrome
- Neurofibromatosis
- Non-specific brain anomalies
- Pachygyria
- Polymicrogyria
- Rachischisis
- Schizencephaly
- Spina bifida
- Sturge-Webber
- Tuberous sclerosis
- Werdnig - Hoffmann Disease

## Eye, Ear, Nose, Mouth, Throat

- Aniridia
- Anophthalmia
- Branchial Cleft Anomaly
- Cataracts
- Central Blindness
- Choanal atresia
- Cleft Lip and/or Palate
- Corneal Opacities (congenital)
- Eyelid Fibrous Bands (Palpebral Fissure Band)
- Facial Cleft
- Glaucoma
- Hypoplastic Ears
- Laryngeal Atresia/Severe Congenital Laryngeal Stenosis
- Laryngeal Diverticulum
- Microphthalmia
- Microstomia
- Opacities Vitreous Humor/hyper Prim.vit
- Optic Atresia or Optic Nerve Hypoplasia
- Peter anomaly
- Radicular Cysts (Apex of Tooth
- Retinal Dysplasia
- Scleralization of cornea
- Stenosis/Atresia External Auditory Meatus/Canal
- Thyroglossal cyst

## Gastrointestinal

- Alagilles' syndrome
- Annular pancreas
- Biliary Atresia
- Duplication of bowel
- Extrinsic Intestinal Obstruct
- Hepato-venous-occlusion disease liver
- Hirschsprung's disease
- Imperforate anus
- Intestinal Atresia
- Intestinal malrotation
- Intrinsic Intestinal Stenosis
- Meckel's Diverticulum
- Microcolon
- Microcolon-Megacystis-Hypoperistalsis Syndrome
- Paucity of intrahep bile duct
- Pyloric stenosis
- Tracheo-Esoph Fistula/Atresia
- Volvulus

## Genitourinary

- Absent uterus/Fallopian tubes
- Agenesis of Bladder
- Agenesis/Hypoplasia/Atrophy Kidney
- Bicornuate uterus
- Bladder neck obstruction
- Cloacal exstrophy
- Congenital vaginal cyst
- Double Urinary System
- Double vagina
- Epispadias
- Exstrophy of Bladder
- Genital agenesis/hypoplasia
- Horseshoe kidney
- Hydronephrosis/Hydroureter/Renal Pelvis Distortion
- Hypoplasia of uterus
- Hypospadias Complex
- Imperforate hymen
- Large echodense kidneys,UNK
- Nephrotic syndrome
- Ovarian cyst
- Patent (persistent) urachus
- Pelvic Kidney
- Polycystic Kidney
- Posterior urethral valve
- Rectal-ano-urethral fistula
- Rectovaginal fistula
- Renal Dysplasia
- Torsion of ovary
- Torsion of testis
- Transposition of the scrotum
- Urachal cyst
- Ureteral atresia/stenosis
- Ureteral diverticulum
- Ureterocele
- Ureteropelvic junction obst
- Urethral obstruction
- Urogenital sinus

## Inguinal Canal

- Cryptorchidism
- Femoral Hernia
- Inguinal Hernia

## Metabolic

- Zellweger Syndrome

## Multiple Anomalies due to Chromosomal Aberrations

- 13Q- Syndrome
- 18 P- syndrome
- 18q- syndrome
- 2q+ syndrome
- 2q- syndrome
- 47Xy
- 4Q+ Syndrome
- 4q- syndrome
- 5 to 7 translocation
- 5q+ syndrome
- 6q+ syndrome
- 7 to 9 translocation
- 9q+ syndrome
- Chromosome 1p+
- Chromosome 9p+
- Chromosome Ring 13
- Chromosome Ring 14
- Chromosome Ring 15
- Cri-du-chat syndrome
- Deletion of part of # 14 chrom
- Down's Syndrome (trisomy 21)
- Extra material on P (# 15 chromos)
- Gonosomal intersex
- Klinefelters Syndome
- Marker chromosome (female)
- Marker chromosome (male)
- Mosaic 13 syndrome
- Mosaic Down's syndrome
- Mosaic Turner's syndrome
- Mosaic trisomy 12
- Prader-Willi Syndrome
- Ring 5
- Tetrasomy 12p
- Translocation 13
- Translocation 21
- Triploidy
- Trisomy 13
- Trisomy 14
- Trisomy 18
- Trisomy 19
- Trisomy 22
- Trisomy 7
- Trisomy 9
- Trisomy C group (incl tri 8)
- Turner's syndrome
- Unknown type
- Wolf syndrome
- X chromosome Q+
- XYY syndrome

## Multiple Anomalies not due to Chromosomal Aberrations

- Adams-Oliver syndrome
- Apert's syndrome
- Asplenia syndrome
- Beckwith's syndrome
- Body Stalk Anomaly
- Branchio-oto-renal syndrome
- Camptomelic syndrome
- Carpenter syndrome
- Charcot-Marie-Tooth Syndrome
- Charge association
- Cleido-cranial dysostosis
- Conradi's disease
- Cornelia De Lange syndrome
- DiGeorge syndrome
- Ectrodactyly-ectodermal dys
- Fetal alcohol syndrome
- Fetal hydantoin syndrome
- Fraser's syndrome
- Frontal-nasal dysplasia seq
- Goldenhar syndrome
- Holt Oram syndrome
- Hypomandibular faciocranial
- Klippel/Trenaunay/Weber syn
- Lowe's syndrome
- Marfan's syndrome
- Meckel-Gruber syndrome
- Multiple Pterygium syndrome
- Noonan syndrome
- Oromandibular limb hypogen syn
- Oto-facial-digital
- Otocephaly
- Pena Shokeir, type 1 phenotype
- Pena Shokeir, type 2 phenotype
- Pentalogy of Cantrell
- Phenocopy
- Pierre-Robin syndrome
- Poland syndrome
- Polysplenia syndrome
- Prune belly syndrome
- Rhizomelic dwarfism
- Roberts' syndrome
- Rubinstein-Taybi
- Russell-Silver syndrome
- Simpson-Golabi-Behemel synd
- Smith-Lemli-Opitz syndrome
- Stickler's syndrome
- Townes-Brock syndrome
- Treacher-Collins' syndrome
- Unclassifiable
- Vater association
- Walker-Warbury syndrome
- Williams' syndrome

## Musculoskeletal

- Absence abdom wall
- Absence/Hypoplasia Pectoralis Major
- Absent ulna

- Achondroplasia
- Bifid thumb
- Camptodactyly
- Chondrodystrophy
- Claw hand,anoms hand/foot
- Club Foot
- Congenital Hip Dislocation
- Craniosynostosis/Cran'stenosis
- Crouzon's Disease
- Diastrophic dysplasia syndrome
- Dislocation of knee
- Dislocation of radial heads
- Epigastric hernia
- Fractures-cause unknown
- Gastroschisis
- Hemihypertrophy
- Hypoplastic calvaria
- Hypoplastic disease,small dig
- Iniencephalus
- Kleeblattschadel Syndrome
- Klippel-Feil syndrome
- Myasthenia gravis-newborn
- Myopathy
- Myotonic dystrophy
- Omphalocele
- Omphalomesenteric cyst
- Osteogenesis imperfecta
- Phocomelia/amelia/limb reduct
- Polydactyly
- Radial Aplasia/Hypoplasia
- Sacrococcygeal agenesis/bifid sacrum
- Short femur
- Sirenomelus
- Skull depression,unk etiology
- Sprengel's deform shoulder
- Syndactyly
- Thanatophoric dwarfism
- Torticollis
- Trigonocephaly
- Triphalangeal thumb
- Vertebral Anomalies

## Oligohydramnios Syndrome

- Oligohydramnios, cause unk
- Potter's with oligohydramnios
- Potter's without oligohydram
- Urinary anomalies excluding renal agenesis

## Respiratory

- Acinar dysplasia
- Bronchogenic cyst
- Diaphragmatic Hernia
- Hypoplasia of Diaphragm
- Pulmonary Hypoplasia/Agenesis
- Pulmonary Sequestria
- Pulmonary hyperplasia
- Tracheal agenesis
- Tracheal atresia

### Skin

- Absent Breasts
- Amniotic Bands Deformity/Syndrome
- Anhidrotic ectodermal dysplasia
- Bullous, type Unknown
- Cutis Hyperelastica
- Cutis Laxa
- Cutis aplasia
- Cutis marmorata congenital
- Epidermolysis bullosa
- Goltz syndrome
- Ichthyosis
- Incontinentia pigmenti
- Non-bullous Dermatosis, type unknown
- Urticaria pigmentosa

## Minor Anomalies

### Cardiovascular

- Right aortic arch

### Central Nervous System

- Dermal sinus

### Eye, Ear, Nose, Mouth, Throat

- Coloboma
- Corneal dermoid
- Impatent Naso-Lacrimal Duct
- Macrostomia
- Micrognathia
- Pre-auricular Skin Tag, Pit, Sinus
- Ranula
- Skin tag

### Gastrointestinal

- Multiple echoes peritoneal cavity/liver, unexplained

### Genitourinary

- Hypospadias Complex, first degree or unknown

### Multiple Anomalies due to Chromosomal Aberrations

- 12/21 balanced translocation
- 13 Balanced translocation
- 14/21 balanced translocation
- 18 Balanced translocation

### Musculoskeletal

- Absent/hypoplasia depressor ang
- Bifid rib
- Block vertebra
- Eleven ribs
- Genu recurvatum
- Supernumerary vertebra
- Thirteen ribs
- Umbilical Hernia

## Skin

- Cafe-au-lait Spot
- Dermatographia
- Dysplastic or absent nails
- Hemangioma
- Inclusion cyst of skin
- Nevus anemicus
- Pigmented nevus
- Sebaceous Nevus
- Supernumerary Nipple

# Appendix D - Causes of Perinatal Death

Source: *Guide to the Study of Perinatal Mortality and Morbidity (4th edition)*, prepared by the Comité d'enquête sur la mortalité et la morbidité périnatales, October 1987

**EXPLANATORY NOTES ON ATTRIBUTION OF PRIMARY CAUSE OF PERINATAL DEATH**

1. CONGENITAL MALFORMATION

This category is reserved for:

- All lethal malformations;
- any medical or surgical complications secondary to a malformation: for example, death occurring following the correction of a congenital malformation, infection complicating a malformation, etc;
- all lethal malformations, even if there exists another specific cause of death; for example, respiratory distress syndrome in an infant with a lethal congenital malformation.

When death is attributed to congenital malformation, the precise malformation responsible must be specified.

2. INFECTION

This category is used only if the infection has been serious enough to be the direct cause of death. When infection complicates an underlying disease (pneumonia complicating respirator therapy for hyaline membrane disease), the death is attributed to the underlying disease rather than to infection. Aspiration pneumonia secondary to peripartum asphyxia should be classified as ASPHYXIA, under the specific cause. The localization of the infection, the time of onset (intra-uterine or postnatal) and the micro-organism involved (if known) must be recorded.

3. ISO - IMMUNIZATION

This category is used only if iso - immunization per se is the cause of death. The Mechanism involved (still birth, hydrops fetalis, anemia, kernicterus) must be specified, as well as the type of iso- immunization. (Rh(D), ABO, etc.).

A death secondary to a respiratory distress syndrome following induction of labor in a case of iso-immunization should be classified as RESPIRATORY DISTRESS SYNDROME, not as ISO-IMMUNIZATION.

Kernicterus, hydrops fetalis or hemolytic diseases not secondary to iso-immunization should be classified under OTHER SPECIFIC CAUSES.

4. OBSTETRICAL TRAUMA

This category is used when there is an evident traumatic lesion (e.g skull fracture with intracranial hemmorhage, rupture of the liver) and this lesion has been the cause of death. A death resulting from a difficult delivery without a specific lethal traumatic lesion should be classified as ASPHYXIA secondary to labor and delivery.

5. RESPIRATORY DISTRESS SYNDROME

This category is limited to cases in which the respiratory distress syndrome has been the direct cause of death, regardless of the cause of the preterm delivery. Even if the respiratory distress syndrome has been complicated by an intracranial hemorrhage or by a pneumonia, the death must nevertheless be classified as RESPIRATORY DISTRESS SYNDROME.

6. INTRA-UTERINE GROWTH RETARDATION

This Category is limited to fetal (intra - Uterine) and neonatal deaths where the birth weight falls below the third percentile for the gestational age ( i.e. age at the time of intra-uterine death in the case of a Stillbirth, and age at the time of delivery in the case of a neonatal death), if death can be attributed to a chronic insufficiency of oxygenation and of nutrition during intra-uterine life.

In this group should also be included perinatal deaths where the cause of death is an otherwise unexplained asphyxia (occurring antepartum, intrapartum or postpartum) or a postnatal hypoglycemia. In such circumstances the intra-uterine growth retardation is considered to be the cause of death even if the cause of the growth retardation is known (e.g. toxemia, postmaturity, maternal diabetes). When there is an associated toxemia of pregnancy, a sub-classification should be used (see below). On the other hand, when there is a specific cause of death such as a congenital malformation, prolapse of the umbilical cord, etc., cases of intra-uterine growth retardation should be classified under that specific cause and not as INTRA-UTERINE GROWTH RETARDATION.

Deaths due to intra-uterine growth retardation should be classified in the following sub-categories:

A. Still birth (fetal death), cause otherwise unknown;
B. Neonatal death associated with otherwise unexplained peripartum asphyxia, including meconium aspiration;
C. Neonatal death associated with hypoglycemia;
D. Neonatal deaths from other causes attributable to chronic fetal deprivation or from unknown cause.

For each category, a distinction is made as to whether maternal toxemia of pregnancy was present or absent.

7. ASPHYXIA

Asphyxia remains one of the most frequent causes of perinatal mortality. The underlying pathologic conditions which may cause perinatal asphyxia are extremely varied and sometimes difficult to evaluate. If, therefore, the medical record indicates that asphyxia may have been the cause of death, it is important to seek out the primary cause of asphyxia.

Perinatal asphyxia often results in serious complications which may directly contribute to the infant's death, such as massive aspiration of meconium by the fetus, or anoxic intra cranial hemorrhage in the newborn infant.

Such deaths are still attributed to the primary cause of ASPHYXIA and not to the secondary asphyxic result in the infant.

In order to clarify the complex problem of asphyxia, certain explanations are required. Deaths resulting from asphyxia are classified as follows:

(a) Asphyxia secondary to placental lesions:

The most frequent and most readily defined placental causes of fatal asphyxia are hemorrhages secondary to premature separation of the normally implanted placenta (abruptio placentae) or to placenta praevia. In the cases of other placental lesions less clearly related to fetal asphyxia (such as infarcts of the placenta) the death should also be classified under the above sub-heading if there is another evident cause of asphyxia except when the infant is underweight (above third percentile) for the gestation age, in which case it should be classified as INTRA-UTERINE GROWTH RETARDATION.

(b) Asphyxia secondary to umbilical cord complications:

In this category, the complication most clearly identified as a cause of asphyxia is prolapse of the umbilical cord. Other complications, such as knotting of the cord or strangulation by loops of the cord around the infant's neck, are more difficult to evaluate causally; in these cases, the death may be classified under the above sub-heading, except in the presence of intra-uterine growth retardation, when the death should be classified as INTRA-UTERINE GROWTH RETARDATION.

(c) Asphyxia secondary to medical (fetopelvic ) or contractile dystocia:

This category includes deaths from asphyxia caused by fetopelvic disproportin, contractile dysocia or prolong labor without fetopelvic disproportion, dystocia at the shoulders in an occipital presentation, or abnormal presentations ( breech, brow, face, transverse or complex). However, if the dystocia has given rise to obvious trauma, such as a fracture if the skull with intracranial hemorrhage, the death should be classified as OBSTETRICAL TRAUMA.

(d) Asphyxia secondary to obstetrical anesthesia or analgesia:

This category is used when the medical record indicates that the death may have been caused by excessive analgesia or general anesthesia, or complications of anesthesia or analgesia such as, for example, arterial hypotension during a regional block. If, however, the fetus or newborn infant is underweight for gestational age, the death should be attributed to INTRA-UTERINE GROWTH RETARDATION rather than to anesthesia or analgesia.

(e) Asphyxia secondary to maternal diseases:

Death may be attributed to asphyxia secondary to a maternal disease only if that maternal condition has been sufficiently serious to have caused the death of "the infant and if no other specific cause can be identified. Thus, for example, if a death resulting from a premature separation of the normally implanted placenta (abruptio placentae) or from cephalopelvic disproportion, it is not classified as ASPHYXIA_secondary to maternal secondary to a placental lesion or ASPHYXIA_secondary to maternal illness but, accordi to the case, as ASPHYXIA secondary to a placental lesion or ASPHYXIA secondary to dystocia during labor or delivery. As well, cases of intra-uterine growth retardation associated with maternal illness are classified as ITRA - UTERINE GROWTH RETARDATION rather than under the above sub-heading. Moreover, a neonatal death occurring after a preterm induction of labor in a diabetic or toxemic mother should not b attributed to a maternal cause if there exists another specific cause such as a respiratory distress syndrome.

On the other hand, since toxemia of pregnancy is the maternal illness most frequently associated with intra - uterine growth retardation, a death classified as INTRA - UTERIN GROWTH RETARDATION should have a sub - classification indication whether or not the intra-uterine growth retardation is associated with maternal toxemia.

(f) Intrapartum asphyxic stillbirth, cause unknown:

This category includes deaths occurring during labor without an identifiable cause. Considering that labor itself occasions a certain degree of asphyxia, it ha

been decided to group these intrapartum deaths of unknown cause under the heading of asphyxia. If, however, the stillborn fetus shows evidence of intra-uterine growth retardation, the death should be classified as INTRA-UTERINE GROWTH RETARDATION.

(g) Neonatal death from peripartum asphyxia, cause unknown:

When the medical record indicates signs of asphyxia (dyspnea, cyanosis, massive aspiration of amniotic fluid, cerebromeningeal hemorrhage, etc.), a neonatal death in which the cause of the asphyxia cannot be establ ished should be classified under this heading. If, however, the infant shows evidence of intra-uterine growth retardation, the death should be classified as INTRA-UTERINE GROWTH RETARDATION.

8. OTHER SPECIFIC CAUSES:

This heading is reserved for those rare cases where the cause of death, although known, cannot be classified in any of the preceding categories. The commonest such conditions are:

(a) Necrotizing enterocolitis;
(b) Intractable diarrhea of undetermined etiology;
(c) Hemorrhages associated with defects of coagulation (hemorrhages secondary to asphyxia or to respiratory distress syndrome should be classified under the appropriate specific heading rather then here);
(d) Hypovolemia or hypervolemia secondary to a transfusion syndrome in a multiple pregnancy (feto-maternal or materno-fetal transfusion, etc.);
(e) Patent ductus arteriosus causing left ventricular insufficiency;
(f) Fetal and neonatal cardiac arrhythmias of unknown etiology;
(g) Hydrops fetalis, cause unknown, not associated with. any known pathology such as iso-immunization, hemoglobinopathies, etc.;
(h) Idiopathic pneumothorax (unrelated to meconium aspiration or to a respiratory distress syndrome);
(i) Idiopathic massive pulmonary hemorrhage (unrelated to a respiratory distress syndrome, asphyxia, persistence of the ductus arteriosus or a coagulation defect);
(j) Idiopathic intracranial hemorrhage (unrelated to birth asphyxia, obstetrical trauma, respiratory distress syndrome or a coagulation defect);
(k) External hemorrhage secondary to, as for example, vasa praevia, incision of the placenta during a caesarian section, etc.

9. FETAL DEATH (in utero) OF UNKNOWN CAUSE:

This category is used only if the five following conditions are fulfilled:

(a) The fetal death has occurred before the onset of labor or before admission of the mother to hospital;
(b) There is no evident explanation for the fetal death;
(c) There is no evident maternal disorders which might have compromised the fetus;
(d) The fetus is normally formed or, if abnormal, has no evident malformation which might have been potentially lethal or debilitant if the infant has been born alive;
(e) The weight of the fetus at the time of death - if the date of death can be accurately determined - was not below the third percentile for the gestational age.

If anyone of the above conditions is not fulfilled, -the death must be classified under a specific cause such as intra-uterine growth retardation, maternal toxemia, unexplained intrapartum asphyxia, congenital malformation, etc.

10. NEONATAL DEATH OF UNKNOWN CAUSE

This category is used only if the three following conditions are fulfilled:

(a) The death cannot in any way be attributed to perinatal asphyxia, not even to unexplained peripartum asphyxia;
(b) The newborn infant is normally formed, or at least shows no evident malformation which could have compromised its survival;
(c) The weight of the newborn infant is not below the third percentile for the gestational age;

Most neonatal deaths of unknown cause occur in very premature newborn infants who breathe normally immediately after birth but who may die some hours or days later without any specific cause of death, other than prematurity, being apparent.