



REPORT

Alberta Reproductive Health Pregnancies & Births

Alberta Health and
Wellness



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AHW = Alberta Health and Wellness

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1.1 Executive Summary/ Highlights

Estimated pregnancies are increasing.

Increasing numbers of pregnancies have resulted in increasing spontaneous abortion rates.

The induced abortion rate declined between 2000 and 2005.

More babies are being born after labour induction.

Epidural analgesia is used in almost half of hospital deliveries in Alberta.

Overall, the reproductive health of Alberta women is excellent, but trends are evolving rapidly and it is as important as ever to track changes in pregnancies and their outcomes.

The province's growing population has resulted in an increase in overall pregnancies and births. Fertility rates, which are independent of population size, have also rebounded after years of decline. Induced abortion rates remain stable, while rates of other reproductive care services such as labour induction and cesarean section have risen. The age of women giving birth continues to shift upward, and teenage pregnancies have declined. The low birth weight rate has not decreased, and the preterm birth rate is still increasing; both of these rates are of concern. Some types of congenital anomalies show increasing trends with time. Stillbirth and infant mortality rates are stable, and maternal mortality is minimal. Postpartum depression affects almost one in ten women within 12 months of giving birth. Most newborns are breastfeeding when discharged from hospital after birth.

Pregnancies

Estimated Pregnancies

The estimated pregnancy rate increased between 2003 and 2005 after declining to 2002. The 2005 rate was 66.7 estimated pregnancies (per 1,000 women aged 15-49).

Spontaneous Abortions

Spontaneous abortion rates followed a similar pattern to estimated pregnancy rates, increasing in the last few years after a period of decline. In 2005, the rate was 6.0 (per 1,000 women aged 15-49). About 9.0% of estimated pregnancies end in spontaneous abortion.

Reproductive Care Services

Induced Abortions

The induced abortion rate did not show an overall time trend between 1996 and 2005, although the rate declined between 2000 and 2005. The induced abortion rate was 11.8 (per 1,000 women aged 15-49) in 2005; 19.6% of estimated pregnancies ended in induced abortion in 2005.

Deliveries

The induction of labour rate increased from 1995 to 2004. In 2004, about 3 in 10 deliveries at hospitals were induced.

Epidural analgesia rates increased between 2000 and 2004. 42.3% of all hospital deliveries in 2004 involved epidural analgesia. Rates varied widely among regions, with epidural analgesia most common in the two major metropolitan areas.

Vacuum extraction continued to increase in frequency, while use of forceps declined between 1995 and 2004. In 2004, 12.1% of hospital deliveries used vacuum extraction. Episiotomies were performed in 15.5% of vaginal deliveries in 2004; the episiotomy rate declined between 2000 and 2004.

Cesarean section rates continued to rise, and in 2004, one quarter of hospital deliveries were by cesarean. There was a consequent decrease in vaginal births after cesarean. In 2004 22.2% of hospital births following previous cesareans were vaginal births.

Maternal Factors

Maternal Age

Mean maternal age was 29.1 years in 2005, an increase from 28.5 in 1996 and 27.2 a decade before that. In 2005, 15.1% of women giving birth to live infants were 35 or older.

Maternal Pre-Pregnancy Conditions

8.8% of women giving birth in Alberta had a pre-pregnancy weight of more than 91 kilograms in 2004. This rate increased between 2000 and 2004.

Other pre-pregnancy conditions (including pre-existing diabetes, heart disease, pre-existing hypertension, and chronic renal disease) were rare, each affecting less than 1% of delivering women. The rates of these conditions did not vary between 2000 and 2004.

Maternal Prenatal Morbidity

Gestational diabetes was detected in 3.6% of women delivering in Alberta in 2004.

5.2% of delivering women were reported to have gestational hypertension in 2004.

Bleeding in pregnancy prior to 20 weeks gestation was reported in 5.9% of women giving birth in 2004. 3.5% of women reported bleeding at or after 20 weeks.

Maternal Prenatal Behaviours

There was a steady decline in the rate of maternal smoking, from 26.7% of live births in 1997 to 18.5% in 2004.

The rate of maternal prenatal alcohol consumption also decreased between 1997 and 2004, from 5.2% to 3.7% of live births.

More women are reporting street drug use during pregnancy. The 2004 rate was 2.3% of live births, compared with 1.5% in 1997.

Prenatal class attendance for women having live first births declined somewhat between 1997 and 2004, from 63.5% to 61.6%.

1.1 Executive Summary/ Highlights

One out of four hospital deliveries is a cesarean section delivery.

The average Albertan woman giving birth was over 29 years old in 2005.

Maternal obesity is becoming common.

One in twenty Albertans giving birth in 2004 had gestational hypertension.

Maternal prenatal smoking and alcohol consumption rates continue to decrease.

Street drug use during pregnancy is increasing.

Prenatal class attendance is declining slightly.

1.1 Executive Summary/ Highlights

Fertility rates are on the rise in Alberta.

Women 25 to 29 continue to have the highest fertility rates.

More births are being attended by midwives.

The low birth weight rate remains at a high level.

One of out every eleven live births occurred prior to term in 2005.

Births

Fertility Rates

Fertility rates rebounded in Alberta between 2003 and 2005, after a long period of decline.

The general fertility rate (number of live births per 1,000 women aged 15-49 in a given year) was 48.6 in 2005, while the total fertility rate (number of live births per 1,000 women aged 15-49 over a lifetime) was 1,775.

Women aged 25 to 29 had the highest fertility rates between 2003 and 2005, although fertility rates for women 30 to 34 followed closely behind.

Live Births

Increasing population coupled with increasing fertility has led to a jump in live births in Alberta. In 2005, there were 41,458 live births. The crude birth rate was 12.9 (live births per 1,000 population).

There were 312 live births occurring in private homes in 2005. The rate of home births was relatively stable over time.

The midwife attendance rate increased over time between 1995 and 2005. In 2005, 1.4% of live births were attended by midwives in Alberta.

Birth Weight

The small-for-gestational-age rate has leveled off, and was 7.9 (per 100 singleton live births) in 2005. The low birth weight rate was stable between 1996 and 2005, and was 6.5 in 2005.

The large-for-gestational-age rate was 11.1 (per 100 live singleton births) in 2005. This rate began to decline in 2002.

The high birth weight rate declined between 2001 and 2005. In 2005, 11.2 out of every 100 liveborn infants weighed more than 4,000 grams.

Preterm Births

The preterm birth rate reached a new peak in 2004 and 2005, at 9.1 (per 100 live births). Preterm births make up three quarters of low birth weight births and over half of multiple births.

Preterm births are more common for mothers under 20 years of age and 35 years and older.

Multiple Births

The multiple birth rate appears to be stabilizing after years of steady increase. In 2005, the multiple birth rate was 3.2 (per 100 live births).

The rate of multiple birth increases with increasing maternal age. For women 35 and over, about 5% of births were multiple births in Alberta between 2003 and 2005.

The majority of multiple births are low birth weight and/or preterm.

Infant Morbidity

Respiratory Distress Syndrome

The rate of respiratory distress syndrome was 10.8 (per 1,000 hospital deliveries) in 2004. Boys were more likely than girls to have respiratory distress syndrome. The rate was stable over time between 1995 and 2004.

Congenital Anomalies

Congenital anomalies occurred in 35.1 out of every 1,000 total births in Alberta in 2005.

The rate of all congenital anomalies combined has been relatively stable over several years, but the rates of heart septal anomalies, Down syndrome, and urinary obstructive defects increased over time between 1996 and 2005.

The risk of congenital anomaly is highest for babies born to older mothers.

Mortality

Stillbirths

The rate of stillbirth was 6.4 (per 1,000 total births) in 2005. There is no time trend in the stillbirth rate.

Stillbirth rates are higher for multiple, preterm, and low birth weight births, as well as for younger and older mothers.

Perinatal and Neonatal Mortality

There were 439 perinatal deaths in 2005 in Alberta, for a perinatal mortality rate of 10.5 (per 1,000 total births).

The neonatal mortality rate (per 1,000 live births) was 5.0 in 2005, which represents 207 neonatal deaths that year.

Perinatal and neonatal death rates are highest for very low birth weights or gestational ages. Congenital anomalies are the leading cause of perinatal and neonatal deaths.

1.1 Executive Summary/ Highlights

Just over three percent of live births are twins or triplets in Alberta.

Some congenital anomalies are increasing in frequency.

The stillbirth rate is stable.

About one in one hundred pregnancies ends in stillbirth or death prior to 7 days of life.

1.1 Executive Summary/ Highlights

276 infants died prior to their first birthday in 2005; most died prior to one month of age.

Postpartum complications, such as postpartum hemorrhage or depression, afflict about 10% of women in Alberta.

Breastfeeding rates at hospital discharge are high in Alberta.

Post-Neonatal Mortality

The post-neonatal mortality rate for 2005 was 1.7 (per 1,000 live births); the rate did not vary between 1996 and 2005.

Infant Mortality

There was no time trend in the infant mortality rate between 1996 and 2005. In 2005, there were 276 infant deaths in Alberta, a rate of 6.6 (per 1,000 live births).

Maternal Mortality

The maternal mortality rate is minimal in Alberta, and has been stable since the mid-1970s. Between 1995 and 2004, there were 24 maternal deaths (12 direct and 12 indirect).

Maternal Factors

Maternal Postnatal Morbidity

The rate of postpartum hemorrhage was stable between 1999 and 2004, after a period of increase. In 2004, 9.7% of hospital deliveries were followed by postpartum hemorrhage.

Postpartum depression is common in Alberta. By 6 months after delivery, 6.7% of women were diagnosed with depression between 2002 and 2004, increasing to 9.8% by 12 months after delivery.

Maternal Postnatal Behaviours

The rate of breastfeeding at discharge was 85.3 (per 100 newborns) in 2004. This rate did not vary with time between 1999 and 2004.

For further information on any aspect of this report, please contact the Public Health Surveillance and Environmental Health branch of Alberta Health and Wellness.

2. Introduction

2.1 Background

2.2 Methodology

2.3 Summary Table

2.1 Background

This report follows the Alberta Reproductive Health: Pregnancies and Births 2004 report, and the Alberta Reproductive Health: Pregnancies and Births Table Update 2005.

This report has been produced by Alberta Health and Wellness in collaboration with the Alberta Perinatal Health Program.

The Alberta Reproductive Health: Pregnancies and Birth report has been produced since 1997 (previously titled Reproductive Health: Pregnancy Outcomes Alberta). New editions were published in April 1999, December 1999, 2001, 2002, and 2004. An update of selected tables was published in 2005. This edition will be followed by a table update in 2007.

The report is intended to provide an overview of the reproductive health of Albertan women and their infants. Extensive data on pregnancies and births, including both outcomes and determinants, is provided.

2. Introduction

2.1 Background

2.2 Methodology

2.2.1 General Methodology Notes and Limitations

2.2.2 Contents

2.2.1 Data Sources

2.3 Summary Table

2.2.1 General Methodology Notes and Limitations

Populations Used

- Populations used for the calculations of some rates are derived from the Alberta Health Care Insurance Plan Registration Files. Population figures used in calculations are in Appendix 6.4.1. All populations are by calendar year, and were based on mid-year estimates (June 30).
- Only Alberta residents are included in analyses unless otherwise stated. Provincial rates include Alberta residents with an “unknown” regional health authority (RHA) code.

Data Sources

- National comparisons are made where possible. Where Canada and Alberta data are compared, a single data source is used to ensure that data collection and extraction are consistent. The Alberta data used in these comparisons may differ from those provided in other analyses that do not involve national comparisons.
- Live birth and some stillbirth statistics are derived from Vital Statistics Birth Registration Files and post-neonatal and infant death statistics are derived from Vital Statistics Death Registration Files. Registration of births and deaths in Alberta is legally required, and the files are believed to be virtually complete. Births, stillbirths, and deaths to non-Alberta residents occurring in Alberta have been excluded, except where otherwise mentioned.
- The Alberta Perinatal Health Program reviews cases of perinatal, neonatal and maternal mortality. Case information is received from the health records departments of Alberta hospitals, hospital perinatal review committees, offices of medical examiners, vital statistics, and physicians. Collaboration and cooperation from health records staff, hospital perinatal review committees and office of medical examiners help to ensure that case information is complete. Variables from case reviews are entered into a mortality database and form the basis for the mortality analysis part of this report. A validation process with Vital Statistics, Alberta Health and Wellness, and health records departments ensures that all cases are received for review.

Statistical Notes

- Wherever possible and appropriate, data are broken down by factors such as regional health authorities (RHAs), age groups, time periods, birth weight groupings, and risk factors. “Residence RHA” refers to the regional health authority in which the mother resided at the time of the relevant event. All analyses reflect the December 2003 RHA boundaries.
- Appendix 6.3.1 contains a detailed description of the procedure for generating maps, figures and cartograms for the interpretation of regional rates. Rates that are significantly lower than the provincial mean are denoted in green in regional maps, figures, and cartograms, while significantly higher rates are shown in red. Because more than two-thirds of all women of reproductive age in Alberta reside in either Capital or Calgary Health Region, the provincial means are strongly influenced by these two RHAs. Significant differences from the provincial mean do not necessarily indicate problems; differences must be interpreted in the context of all relevant factors.
- Statistical analyses are mainly descriptive, including frequencies, rates, percentages, means, and standard errors. Differences are interpreted in terms of confidence intervals. Confidence intervals are plotted on figures and are not always easily visible when they are very small.
- With rare events (such as mortalities) or detailed break-downs, rates may be based on small numbers, which reduces their statistical reliability. Caution should always be exercised in interpreting these rates. Data are often combined across three-year or longer periods to increase reliability of rates.
- In some cases, linear or quadratic effects are described. Linear effects refer to a straight-line relationship between two variables (either an increasing or a decreasing trend). Quadratic effects are non-linear: The relationship between two variables in this case is captured by a second-order (quadratic) polynomial. A quadratic function results in a curve with one change of direction, for example a decrease followed by an increase (a U-shaped curve).
- Because of differences in definitions and dates of extracting data for analyses, the statistics in this report may not be the same as those previously published by Alberta Health and Wellness.

2.2.1 General Methodology Notes and Limitations

2.2.1 General Methodology Notes and Limitations

Interpretation Cautions

- Beginning with April 2002 data, new coding systems for classification of diseases (International Statistical Classification of Diseases and Related Health Problems Tenth Revision, Canada (ICD-10-CA)) and interventions (Canadian Classification of Health Interventions (CCI)) are in use. For data prior to April 2002, the International Classification of Disease – 9th Revision – Clinical Modification (ICD-9-CM) Codes were used. Because the coding systems are not identical, there may be discrepancies between 2002 data and data for prior years. Comparisons of data coded with ICD-10-CA or CCI and those coded with ICD-9-CM should be undertaken with caution.
- Reporting tends to improve with time, so time trends must be interpreted with caution for those datasets in which reporting variability is possible. There may also be regional differences in reporting and coding for those data that are acquired from the health regions.
- Diagnostic criteria for diseases and conditions may change over time, affecting the interpretation of time trends.
- Increased awareness of diseases and conditions may lead to increased diagnosis rates. There is always a possibility that diseases and conditions are misdiagnosed, though such occasions are expected to be rare.
- The rates for conditions and diseases represent only those patients seeking care. The rates may therefore be expected to be underestimates of the true underlying rates.
- There may be access issues that apply to more remote regions of the province, with some services (such as epidural analgesia and induced abortions) being less available in those areas. Any known discrepancies in access should be taken into account when interpreting regional rates.
- The reader is reminded that population statistics cannot be applied to individuals. Not every member of a population will exhibit the characteristics that define the population.

2.2.2 Contents

Data consist of pregnancy and birth data primarily for the calendar years 1995 to 2004 or 1996 to 2005 (or subsets thereof), including:

- spontaneous abortions
- induced abortions
- labour inductions
- assisted/operative deliveries
- epidurals in labour
- maternal age
- maternal pre-pregnancy conditions
- maternal prenatal morbidity
- maternal prenatal behaviours
- live births
- birth weight
- preterm births
- multiple births
- infant morbidity
- stillbirths
- perinatal, neonatal, and infant mortality
- maternal mortality
- maternal postnatal morbidity
- maternal postnatal behaviours

New to the report this year are data on midwife attendance rates, home birth rates, and life expectancy (in the Live Births section).

Returning to the report are data on shoulder dystocia (in the Deliveries section), and postpartum hemorrhage and depression (in the Maternal Postnatal Morbidity section).

A number of tables on various mortality measures have been removed from the report, to avoid duplication with reporting now done by the Alberta Perinatal Health Program.

2.2.3 Data Sources

Indicators from AHCIP registry:

- Populations for rate calculations throughout the report
- Demographic information (age, gender, place of residence)

Indicators from Vital Statistics:

- Live births
- Stillbirths
- Maternal age
- General fertility
- Age-specific fertility
- Birth attendant
- Location of birth
- Life expectancy
- Birth weight
- Preterm birth
- Multiple birth
- Infant mortality (including neonatal, post-neonatal)

Indicators from ACASS:

- Congenital anomalies

Indicators from national sources:

- National comparisons throughout report

Data sources appear below; in the left column are the indicators generated from these sources.

Alberta Health Care Insurance Plan (AHCIP) Registry

The AHCIP Registry was established to enable premium collection and assessment of registrant eligibility for services claimed by medical practitioners. The current report used demographic information from this database. The **Alberta Stakeholder Registry Population Files** are derived from the Registry and were used to estimate the population of the province and its regions.

Vital Statistics

Vital Statistics data are managed by Alberta Government Services. Vital Statistics data used in this report include records of live births, stillbirths, and deaths before one year of age.

Alberta Congenital Anomalies Surveillance System (ACASS)

ACASS is a congenital anomalies registry system that is funded and maintained by the Public Health Surveillance & Environmental Health Branch, Alberta Health and Wellness. ACASS obtains information about infants (under one year of age) with congenital anomalies from a variety of sources, including the Notice of a Live birth or a Stillbirth and Newborn Record (often referred to as the Notice of Birth (NOB)), medical certificates of stillbirth, and medical certificates of death. A notification form called the Congenital Anomaly(ies) Reporting Form is completed by hospital health records personnel following the birth or an admission of an affected child. Because many children with congenital anomalies are not admitted to hospital, out-patient information is also obtained (Alberta Health and Wellness, 2001).

Statistics Canada/Public Health Agency of Canada/Health Canada

Data on a variety of topics from various branches of the federal government were used throughout the report, primarily to provide comparisons between Alberta and Canada on selected measures. Readers are referred to the cited sources for these data.

Indicators from clinic files:

- Induced abortions

Indicators from hospital inpatient files:

- Labour inductions
- Operative/assisted deliveries
- Breastfeeding at hospital discharge
- Shoulder dystocia
- Respiratory distress syndrome
- Postpartum hemorrhage
- Postpartum depression

Indicators from AHCIP Fee-for-Service Claims:

- Spontaneous abortions
- Hospital induced abortions
- Shoulder dystocia
- Respiratory distress syndrome
- Postpartum hemorrhage
- Postpartum depression

Indicators from ACCS:

- Shoulder dystocia
- Respiratory distress syndrome
- Postpartum hemorrhage
- Postpartum depression

Indicators from APHP:

- Epidural analgesia
- Maternal prenatal morbidity (diabetes, gestational diabetes, heart disease, hypertension, gestational hypertension, chronic renal disease, prenatal bleeding)
- Mortality (stillbirth, perinatal, neonatal, maternal)

Clinic Files, Alberta Health and Wellness

The Clinic files provided data on induced abortions in Alberta. This is an administrative database maintained by Alberta Health and Wellness.

Hospital Inpatient (Morbidity) Files

Hospital morbidity data consist of one record for each inpatient separation (discharge, transfer, or death) in acute care hospitals in Alberta. Prior to 2002, inpatient data was collected by hospitals and directly submitted to the Canadian Institute for Health Information (CIHI). CIHI edited and delivered files to AHW. AHW performed certain edits and appended additional data elements. In April 2002, AHW implemented a new system for collecting inpatient data, the Morbidity and Ambulatory Care Abstracting Record (MACAR) system. In MACAR, the hospitals submit data directly to AHW and an edited file is then delivered from AHW to CIHI.

Alberta Health Care Insurance Plan (AHCIP) Fee-For-Service Claims

The AHCIP registers Albertans for billable services and pays providers of those services. A detailed database of provider claims for payment is kept (the Fee-For-Service Claims database). Data on services rendered was used in several sections of this report. Note that services provided by physicians in salaried positions are not included in this database.

Ambulatory Care Classification System (ACCS)

ACCS is a system for the collection and costing of data on facility-based ambulatory care, such as same-day surgery, day procedures, emergency room visits, and community rehabilitation program services occurring in publicly-funded facilities.

Alberta Perinatal Health Program (APHP) databases

The Alberta Perinatal Health Program collects data on a number of indicators related to perinatal health and mortality. For this report, we used data provided by the APHP from delivery records and from mortality case reviews.

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Selected Indicators for Pregnancies and Births, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Live Births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Estimated Pregnancies ¹	51,126	50,960	51,921	52,458	51,576	51,971	53,205	54,969	55,578	56,965
Estimated Pregnancy Rate (per 1,000 women 15-49)	68.7	67.4	67.1	66.2	64.3	63.7	64.0	65.4	65.6	66.7
Spontaneous Abortions	4,599	4,485	4,663	4,569	4,447	4,398	4,653	4,763	4,807	5,109
Spontaneous Abortion Rate (per 1,000 women 15-49)	6.2	5.9	6.0	5.8	5.5	5.4	5.6	5.7	5.7	6.0
Spontaneous Abortion Rate (per 100 estimated pregnancies)	9.0	8.8	9.0	8.7	8.6	8.5	8.7	8.7	8.6	9.0
Induced abortions	8,819	9,676	9,539	9,845	10,267	10,112	10,010	10,078	10,195	10,042
Induced Abortion Rate (per 1,000 women 15-49)	11.8	12.8	12.3	12.4	12.8	12.4	12.0	12.0	12.0	11.8
Induced Abortion Rate (per 100 estimated pregnancies)	17.2	19.0	18.4	18.8	19.9	19.5	18.8	18.3	18.3	17.6
Total Labour Induction Rate ² (per 100 hospital deliveries)	22.9	23.6	24.1	25.4	25.9	27.0	25.8	29.0	29.2	-
Cesarean Section Rate (per 100 hospital deliveries)	16.2	16.5	17.3	19.1	20.2	22.5	23.2	24.1	25.4	-
Mean Maternal Age at Delivery	28.5	28.6	28.6	28.7	28.8	28.8	28.9	29.0	29.1	29.1
General Fertility Rate (per 1,000 women 15-49)	50.3	48.3	48.5	47.7	45.7	45.6	46.0	47.4	47.6	48.6
Total Fertility Rate (per 1,000 women 15-49)	1,757	1,708	1,728	1,717	1,661	1,670	1,687	1,736	1,740	1,775
Crude Birth Rate (per 1,000 population)	13.7	13.1	13.1	12.9	12.3	12.3	12.4	12.7	12.7	12.9
Low Birth Weight Rate (per 100 live births)	6.1	6.2	6.2	5.9	6.1	6.1	6.5	6.3	6.4	6.6
Singleton Small for Gestational Age Rate (per 100 singleton live births)	9.2	9.4	9.1	8.3	7.9	7.8	7.6	7.6	7.7	7.9
High Birth Weight Rate (per 100 live births)	11.6	11.4	12.3	12.6	12.9	12.9	12.5	12.1	11.6	11.2
Large for Gestational Age Rate (per 100 singleton live births)	11.0	10.5	11.4	11.6	12.3	12.5	12.1	11.9	11.9	11.1
Preterm Birth Rate (per 100 live births)	7.4	7.3	7.5	7.8	8.5	8.3	8.6	8.8	9.1	9.1
Multiple Birth Rate (per 100 live births)	2.4	2.5	2.7	2.7	3.0	3.1	3.2	3.2	3.4	3.2
Congenital Anomalies Rate (per 1,000 total births)	30.2	31.1	32.1	32.2	35.5	37.4	36.2	38.3	38.6	35.1
Stillbirths	236	249	190	266	237	235	249	260	285	266
Stillbirth Rate (per 1,000 total births)	6.3	6.8	5.0	7.0	6.4	6.3	6.5	6.5	7.0	6.4
Perinatal Mortality rate (per 1,000 total births)	9.6	9.8	7.2	10.0	9.7	9.2	10.6	10.5	10.9	10.5
Neonatal Mortality Rate (per 1,000 live births)	4.0	3.6	2.8	3.7	4.1	3.9	5.2	4.9	4.4	5.0
Post-Neonatal Mortality Rate (per 1,000 live births)	2.2	1.4	1.9	2.0	2.4	1.7	2.0	1.8	1.3	1.7
Infant Mortality Rate (per 1,000 live births)	6.2	4.9	4.7	5.7	6.5	5.6	7.3	6.7	5.8	6.6

Sources: Vital Statistics, Birth, Death, and Stillbirth Files, Department of Government Services, March 2006 release.

Clinics Files, Alberta Health and Wellness.

Fee-for-Services Claims Files, Alberta Health and Wellness.

Hospital Inpatient Files, Alberta Health and Wellness.

Alberta Congenital Anomalies Surveillance System, February 2006 release.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness.

Notes: 1. Estimated pregnancies include livebirths, stillbirths, spontaneous abortions, and induced abortions.

2. Labour inductions were under-reported from April 2002 to March 2003.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

3. Pregnancies

3.1 Estimated Pregnancies

3.2 Spontaneous Abortions

3.3 Reproductive Care Services

3.4 Maternal Factors

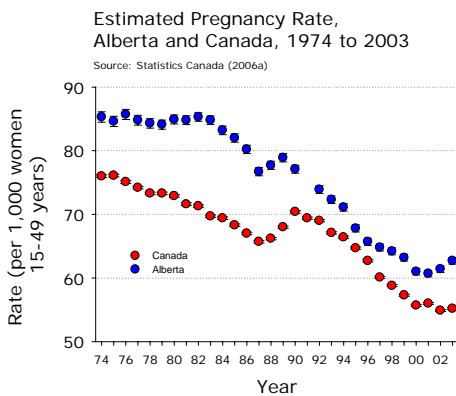
3.1.1 Estimated Pregnancies

Background

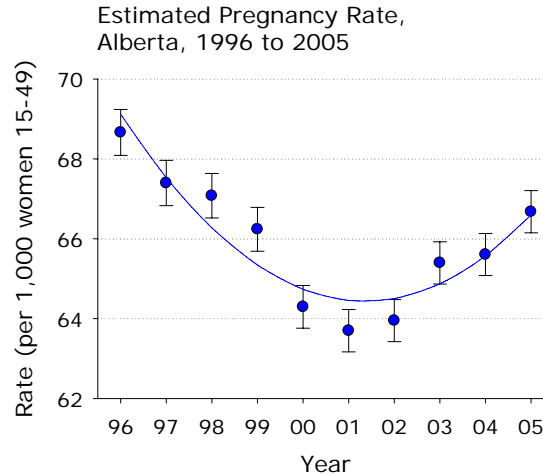
Estimated pregnancies: *The sum of live births, stillbirths, spontaneous abortions, and induced abortions in a population in a given time period.* Few live births, stillbirths, or induced abortions are unreported in Alberta. However, spontaneous abortions that have not been reported to physicians (whether physician care was not sought or the pregnancy went unnoticed) are unaccounted for. Pregnancy rate estimates therefore underestimate true pregnancy rates.

Estimated pregnancy rate: *Number of estimated pregnancies per 1,000 women between 15 and 49 years of age.*

The estimated pregnancy rate is consistently higher in Alberta than in Canada. The rate declined markedly in both Canada and Alberta between 1974 and 2000 and has increased slightly since in Alberta while remaining level in Canada. The Alberta-Canada gap narrowed in the 1990's and widened somewhat in 2002 and 2003. In 2003, the estimated pregnancy rate was 62.7 (per 1,000 women) in Alberta, compared with 55.2 in Canada (Statistics Canada, 2006a).

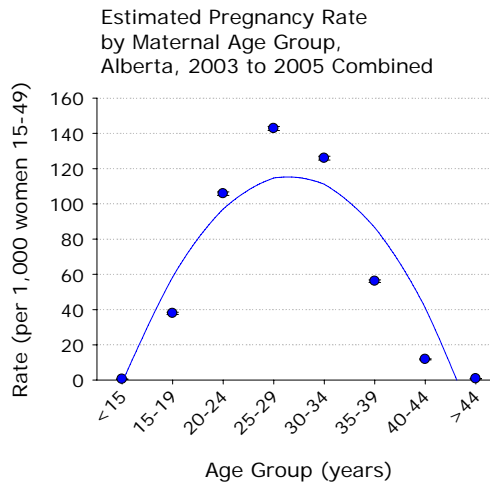


Time Trends (see Table 3.1.1.1)



- The estimated pregnancy rate in Alberta decreased in the late 1990s, and reached a low between 2000 and 2002. It rebounded in 2003 and by 2005 was back at the 1999 level.
- In 2005, there were 56,965 estimated pregnancies in Alberta, for a rate of 66.7.

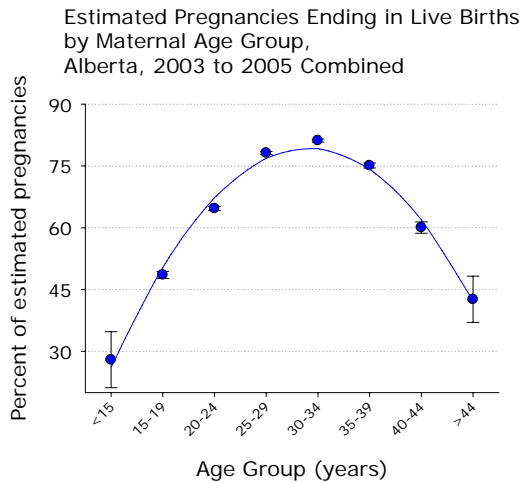
Age Effects (see Tables 3.1.1.2, 3.1.1.4, 3.1.1.6)



- Women aged 25-29 years continue to have the highest pregnancy rates of all age groups, followed by women aged 30-34.
- Pregnancy rates in the 25-29 year age group increased beginning in 2003, after a decline between 2000 and 2002. Rates for women 30 and over continued to increase, while rates decreased for women under 25.

Age Effects continued (see Tables 3.1.1.2, 3.1.1.4, 3.1.1.6)

- The biggest declines in the pregnancy rate between 1996 and 2005 were in women under 20. The teenage pregnancy rate (for 15-19 year olds) declined from 52.5 to 37.6 (per 1,000 women 15-19), a 28% reduction.



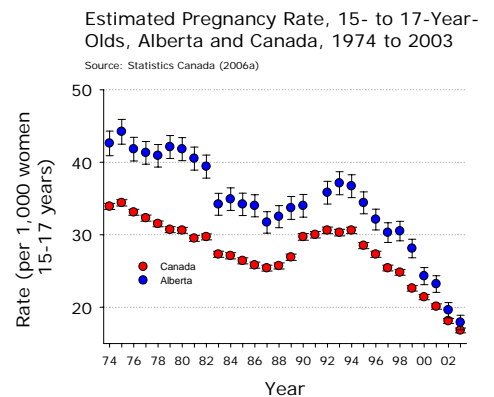
- The percentage of estimated pregnancies that end in live birth varies greatly with maternal age. For 2003 to 2005, this percentage increased from 28.0% for mothers under 15 years to 81.2% for 30 to 34 year old mothers, then dropped to 42.6% for mothers 45 and older.
- For the youngest mothers, rates of induced abortion are high, lowering the percent of live births. For the oldest mothers, rates of induced abortion are certainly higher than for younger age groups, but the rate of spontaneous abortion is highest for mothers 45 and older, again lowering the percentage of estimated pregnancies that result in live birth.

3.1.1 Estimated Pregnancies

Background (continued)

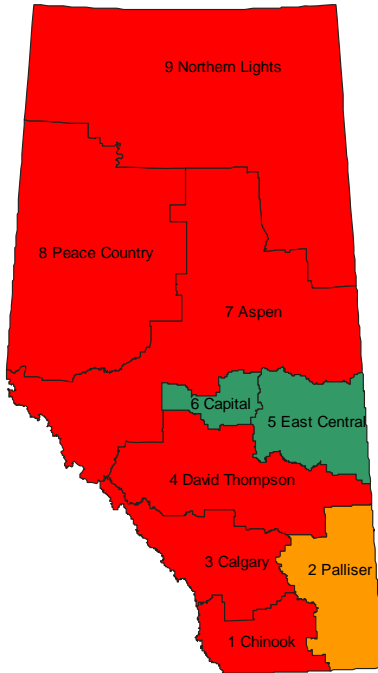
Teenage pregnancy rates are of interest because of the increased risk of adverse outcomes in pregnancies and births to teenagers. Teenage pregnancies are associated with elevated risk of poor perinatal outcomes such as low birth weight, preterm birth, and pregnancy complications. Furthermore, teenage mothers are more likely to live in poverty, be under-educated and/or under-employed, and to be single parents than non-teenage mothers (Dryburgh, 2001; Koniak-Griffin & Turner-Pluta, 2001; Tough, Svenson, & Schopflocher, 1999).

Teenage pregnancy rates in Canada and in Alberta show a continuing pattern of decline from 1995 on. Similar to overall pregnancy rates, the Alberta teenage pregnancy rate has typically been higher than Canada's, though the gap narrowed in 2000 and by 2003, the rates did not differ significantly. In 2003, the pregnancy rate for Alberta 15- to 17-year-olds was 17.9 (per 1,000 15- to 17-year olds), compared with 16.8 in Canada (Statistics Canada, 2006a).

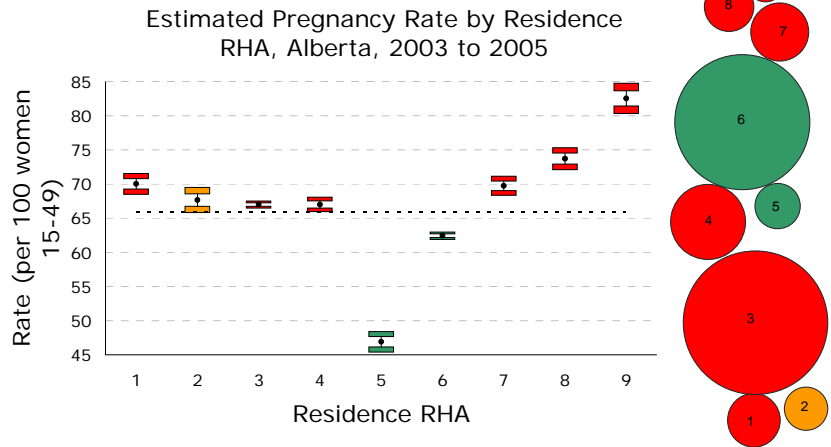


3.1.1 Estimated Pregnancies

Estimated Pregnancy Rate 2003-05



Regional Data (see Table 3.1.1.4)



- Estimated pregnancy rates vary by residence RHA in Alberta. The rate was significantly lower than the provincial average in RHAs 5 and 6 for 2003 to 2005 combined. The lowest rate was 46.9 (per 1,000 women 15-49).
- The estimated pregnancy rate was significantly higher than the provincial average in RHAs 1, 3, 4, 7, 8, and 9 between 2003 and 2005, with the highest rate in RHA 9 (82.5 per 1,000 women 15-49).
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

Limitations and Methodology Notes

See the Methodology and Limitations section in the Introduction for a caution regarding comparison of 2002 estimated pregnancy data to data from prior years due to changes in data coding systems.

Regional pregnancy estimates differ slightly from non-regional pregnancy estimates because regional induced abortion data differ from non-regional induced abortion data due to differences in source.

Table 3.1.1.1 Estimated Pregnancies and Rate by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Estimated pregnancies	51,126	50,960	51,921	52,458	51,576	51,971	53,205	54,969	55,578	56,965
Women 15-49	744,606	756,147	774,059	791,981	802,182	815,913	831,964	840,560	847,174	854,349
Rate (per 100 women 15-49)	68.7	67.4	67.1	66.2	64.3	63.7	64.0	65.4	65.6	66.7
Standard Error (SE)	0.29	0.29	0.28	0.28	0.27	0.27	0.27	0.27	0.27	0.27

Table 3.1.1.2 Estimated Pregnancies and Rate by Maternal Age Group, Alberta, 2003 to 2005 Combined

	<15	15-17	18-19	15-19	20-24	25-29	30-34	35-39	40-44	>44	Total
Estimated pregnancies	168	4,123	8,874	12,997	36,898	48,756	43,382	20,158	4,853	298	167,512
Women	334,377	204,707	138,561	343,268	348,872	341,483	344,467	359,366	414,144	390,483	2,876,460
Rate (per 100 women)	0.5	20.1	64.0	37.9	105.8	142.8	125.9	56.1	11.7	0.8	58.2
Standard Error (SE)	0.04	0.31	0.66	0.33	0.52	0.60	0.57	0.38	0.17	0.04	0.14

Table 3.1.1.3 Estimated Pregnancies and Rate by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Estimated pregnancies	7,898	5,076	63,982	14,888	3,691	49,798	9,316	7,747	5,093	167,512
Women 15-49	112,795	75,029	955,111	222,198	78,687	797,697	133,603	105,107	61,712	2,542,083
Rate (per 100 women 15-49)	70.0	67.7	67.0	67.0	46.9	62.4	69.7	73.7	82.5	65.9
Standard Error (SE)	0.76	0.92	0.26	0.53	0.75	0.27	0.70	0.81	1.11	0.16

Source: Vital Statistics, Birth and Stillbirth Files, Department of Government Services, March 2006 release.

Fee-for-Services Claims Files, Alberta Health and Wellness.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness.

Notes: Regional pregnancy estimates differ slightly from non-regional pregnancy estimates (reported in other tables)

because regional induced abortion data differ from non-regional induced abortion data (due to differences in source).

Data include Alberta residents only, with the exception of spontaneous abortion data prior to 2000, which may contain 'out of province' cases.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.1.1.4 Estimated Pregnancies and Rate by Year and Maternal Age Group, Alberta, 1996 to 2005

Estimated pregnancies	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<15	81	80	87	70	60	63	74	56	65	47
15-17	1,858	1,768	1,868	1,849	1,695	1,589	1,435	1,404	1,341	1,378
18-19	3,159	3,194	3,321	3,273	3,333	3,316	3,158	2,963	2,942	2,969
15-19	5,017	4,962	5,189	5,122	5,028	4,905	4,593	4,367	4,283	4,347
20-24	11,218	11,326	11,593	11,908	11,737	11,670	11,999	12,402	12,242	12,254
25-29	15,073	14,989	15,008	15,029	14,694	14,698	15,181	15,764	16,232	16,760
30-34	12,993	12,596	12,869	12,745	12,482	12,961	13,495	14,084	14,439	14,859
35-39	5,652	5,796	5,900	6,206	6,216	6,285	6,392	6,569	6,643	6,946
40-44	1,022	1,151	1,169	1,295	1,311	1,308	1,388	1,626	1,578	1,649
>44	70	58	94	81	48	80	83	100	96	102
All	51,126	50,960	51,921	52,458	51,576	51,971	53,205	54,969	55,578	56,965

Rate (per 1,000 women 15-49)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<15	0.8	0.8	0.8	0.6	0.5	0.6	0.7	0.5	0.6	0.4
15-17	32.0	29.4	29.9	28.7	25.9	23.9	21.3	20.8	19.7	19.9
18-19	84.5	83.8	83.8	79.9	78.0	74.7	69.4	64.5	63.6	64.0
15-19	52.5	50.5	50.8	48.6	46.5	44.2	40.6	38.5	37.5	37.6
20-24	120.8	119.1	117.8	116.6	113.3	109.4	108.6	108.9	105.0	103.5
25-29	148.8	147.3	144.1	142.1	138.6	137.6	138.3	141.4	142.7	144.2
30-34	107.1	107.2	112.3	113.1	112.5	115.7	118.9	122.9	126.0	128.8
35-39	44.0	44.3	44.4	46.3	46.9	48.5	50.6	53.7	55.8	58.9
40-44	9.1	9.8	9.5	10.1	10.0	9.8	10.1	11.8	11.4	12.0
>44	0.8	0.6	1.0	0.8	0.4	0.7	0.7	0.8	0.7	0.8
All	68.7	67.4	67.1	66.2	64.3	63.7	64.0	65.4	65.6	66.7

Table 3.1.1.5 Estimated Pregnancies and Rate by Year and Residence RHA, Alberta, 1996 to 2005

Estimated pregnancies	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	2,671	2,763	2,573	2,623	2,457	2,468	2,495	2,613	2,652	2,633
Palliser	1,482	1,526	1,567	1,557	1,636	1,596	1,617	1,655	1,674	1,747
Calgary	17,979	18,165	18,714	19,100	19,177	19,237	19,914	21,032	21,177	21,773
David Thompson	4,639	4,555	4,589	4,703	4,608	4,637	4,780	4,878	4,982	5,028
East Central	1,263	1,273	1,316	1,244	1,201	1,174	1,284	1,184	1,264	1,243
Capital	15,794	15,626	15,943	16,032	15,662	15,794	15,866	16,331	16,541	16,926
Aspen	3,221	3,169	3,278	3,270	2,982	3,094	3,147	3,107	3,092	3,117
Peace Country	2,562	2,458	2,541	2,526	2,406	2,438	2,488	2,542	2,530	2,675
Northern Lights	1,421	1,405	1,388	1,389	1,436	1,523	1,608	1,620	1,657	1,816
Alberta	51,126	50,960	51,921	52,458	51,576	51,971	53,205	54,969	55,578	56,965

Rate (per 1,000 women 15-49)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	73.5	75.6	70.2	70.7	65.7	65.9	66.6	69.6	70.5	70.0
Palliser	66.5	67.5	67.8	65.7	68.1	65.1	65.0	66.6	66.9	69.4
Calgary	68.4	67.3	66.8	66.0	65.1	63.7	64.3	66.9	66.6	67.5
David Thompson	70.8	68.7	67.3	67.5	65.2	64.6	65.5	66.3	67.2	67.4
East Central	50.0	50.3	51.3	48.4	46.5	45.0	48.7	45.0	48.2	47.5
Capital	65.2	64.2	64.8	63.9	61.8	61.5	60.7	61.8	62.2	63.3
Aspen	75.1	73.2	74.5	73.6	67.2	69.1	69.7	69.4	69.4	70.4
Peace Country	80.7	76.3	77.1	75.0	71.0	71.5	71.9	73.2	72.2	75.6
Northern Lights	90.9	85.5	81.3	79.7	80.7	83.2	83.5	80.9	80.4	86.2
Alberta	68.7	67.4	67.1	66.2	64.3	63.7	64.0	65.4	65.6	66.7

Source: Vital Statistics, Birth and Stillbirth Files, Department of Government Services, March 2006 release.

Fee-for-Service Claims Files, Alberta Health and Wellness.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness.

Notes: Regional pregnancy estimates differ slightly from non-regional pregnancy estimates (reported in other tables)

because regional induced abortion data differ from non-regional induced abortion data (due to differences in source).

Data include Alberta residents only, with the exception of spontaneous abortion data prior to 2000, which may contain 'out of province' cases.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.1.1.6 Estimated Pregnancy Rate by Residence RHA and Maternal Age Group, Alberta, 2003 to 2005

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
2003										
<15	0.3	0.0	0.4	0.5	0.2	0.6	0.3	1.5	0.7	0.5
15-17	17.1	22.1	18.3	26.4	10.4	20.2	30.7	26.3	24.6	20.8
18-19	66.4	63.7	59.6	77.8	41.3	58.4	87.4	82.1	94.6	64.5
15-19	46.5	47.3	35.1	53.3	23.0	51.9	58.7	54.3	58.2	38.5
20-24	119.8	115.6	86.6	115.3	84.6	84.7	136.1	139.7	145.3	108.9
25-29	155.8	163.4	123.4	165.4	118.8	124.7	158.1	173.5	173.3	141.4
30-34	121.4	109.5	129.0	107.6	83.5	116.6	108.1	101.8	108.5	122.9
35-39	44.6	36.2	61.4	34.2	25.1	47.8	35.4	34.0	45.7	53.7
40-44	8.7	5.5	11.3	6.7	6.5	9.5	6.7	7.0	9.8	11.8
>44	0.4	0.0	0.8	0.4	0.7	0.5	0.3	0.2	0.8	0.8
All	69.6	66.7	66.9	66.3	45.0	61.8	69.4	73.2	80.9	65.4
2004										
<15	0.7	0.3	0.5	0.6	0.2	0.7	0.7	0.2	1.0	0.6
15-17	17.8	17.4	17.4	25.1	12.7	17.7	29.4	25.5	35.3	19.7
18-19	68.8	72.9	57.1	79.9	45.2	56.0	88.8	77.7	92.1	63.6
15-19	39.2	39.7	33.6	47.6	26.2	33.6	53.0	47.9	57.8	37.5
20-24	122.1	94.6	123.1	88.8	92.7	143.4	145.5	144.4	117.6	105.0
25-29	159.7	168.2	132.0	168.0	132.6	135.2	171.1	169.3	175.1	142.7
30-34	124.2	110.1	135.7	119.1	90.9	125.5	112.0	106.2	118.2	126.0
35-39	50.1	42.0	67.6	40.3	31.3	55.2	39.6	39.7	46.6	55.8
40-44	11.2	8.3	14.4	7.4	9.6	11.0	6.0	7.2	8.3	11.4
>44	0.7	0.3	0.9	0.9	0.5	0.7	0.2	0.2	1.1	0.7
All	70.4	66.9	66.5	67.2	48.2	62.2	69.4	72.2	80.2	65.6
2005										
<15	0.4	0.3	0.3	0.6	0.2	0.4	0.4	1.2	1.0	0.4
15-17	23.0	18.8	16.4	26.9	9.9	19.1	23.5	28.0	35.1	19.9
18-19	54.5	71.0	52.1	81.4	41.4	61.6	95.6	85.0	106.3	64.0
15-19	35.5	39.7	30.3	48.7	22.1	36.2	51.5	51.4	63.2	37.4
20-24	122.0	130.3	88.4	125.0	82.2	94.1	143.3	139.4	165.8	103.5
25-29	160.1	168.5	132.7	175.3	135.3	135.6	173.6	171.5	183.5	144.2
30-34	127.2	112.4	143.3	106.7	95.6	125.3	109.7	121.5	116.4	128.8
35-39	53.8	44.2	72.5	42.6	34.3	55.8	43.2	43.1	48.2	58.9
40-44	9.8	7.9	15.4	6.3	5.0	12.0	10.0	7.6	9.3	12.0
>44	0.5	0.3	1.1	0.5	0.5	0.6	0.6	0.8	0.3	0.8
All	69.9	69.4	67.5	67.4	47.5	63.3	70.3	75.6	86.0	66.6

Source: Vital Statistics, Birth and Stillbirth Files, Department of Government Services, March 2006 release.

Fee-for-Service Claims Files, Alberta Health and Wellness.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness.

Notes: Regional pregnancy estimates differ slightly from non-regional pregnancy estimates (reported in other tables)

because regional induced abortion data differ from non-regional induced abortion data (due to differences in source).

Data include Alberta residents only, with the exception of spontaneous abortion data prior to 2000, which may contain 'out of province' cases.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

3. Pregnancies

3.1 Estimated Pregnancies

3.2 Spontaneous Abortions

3.3 Reproductive Care Services

3.4 Maternal Factors

3.2.1 Spontaneous Abortions

Background

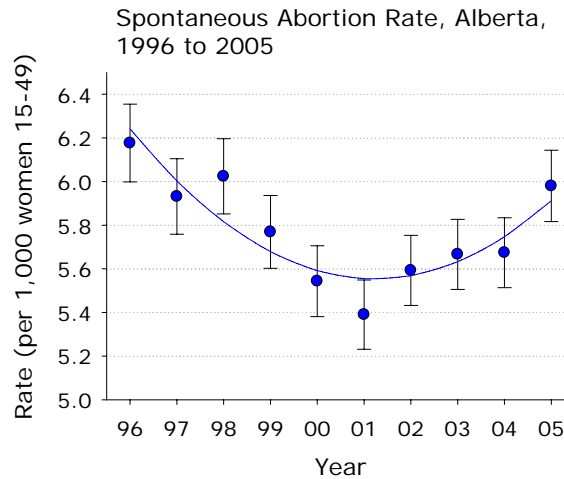
Spontaneous abortion (miscarriage): *Naturally occurring premature expulsion from the uterus of the products of conception – of the embryo, or of a nonviable fetus* (Dorland, 2000). In Alberta, the legal definition of spontaneous abortions refers to those occurring prior to 20 weeks gestation. Included in this category are clinical spontaneous abortions treated by physicians, excluding unreported or undetected spontaneous abortions. A two-month time lag between physician visits was used as the cutoff point for separate pregnancy events.

Spontaneous abortion rate: *Number of spontaneous abortions treated by physicians per 1,000 women aged 15-49, or per 100 estimated pregnancies.*

Known risk factors for spontaneous abortion include advanced maternal and paternal age, and previous history of spontaneous abortion (Andersen, Wohlfahrt, Christens et al., 2000; de la Rochebrochard & Thonneau, 2002).

Spontaneous abortion rates increase significantly with maternal age. Approximately 10 percent of pregnancies in women under 30 end in spontaneous abortion. For women over 35, the estimated rate more than doubles to 26 to 28 per cent (Goldhaber, Fireman, Saraiya, & Berg, 2000; Saraiya, Berg, Shulman, Green, & Atrash, 1999). Note that these estimates are for clinically recognized pregnancies, and they are not adjusted for spontaneous abortions that would have occurred had the induced abortions not taken place.

Time Trends (see Table 3.2.1.1)

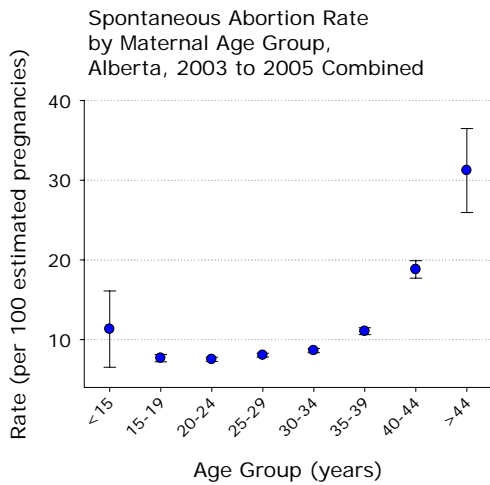


- The spontaneous abortion rate (per 1,000 women 15-49) followed a time trend similar to that for estimated pregnancies between 1996 and 2005. The spontaneous abortion rate fell to a low in 2001 and increased thereafter. In 2005, the spontaneous abortion rate was 6.0 (per 1,000 women 15-49).
- The spontaneous abortion rate (per 100 estimated pregnancies) dipped somewhat around the turn of the century. In 2005, the rate was 9.0.

Maternal Age Effects (see Tables 3.2.1.2, 3.2.1.4, 3.2.1.6, 3.2.1.7)

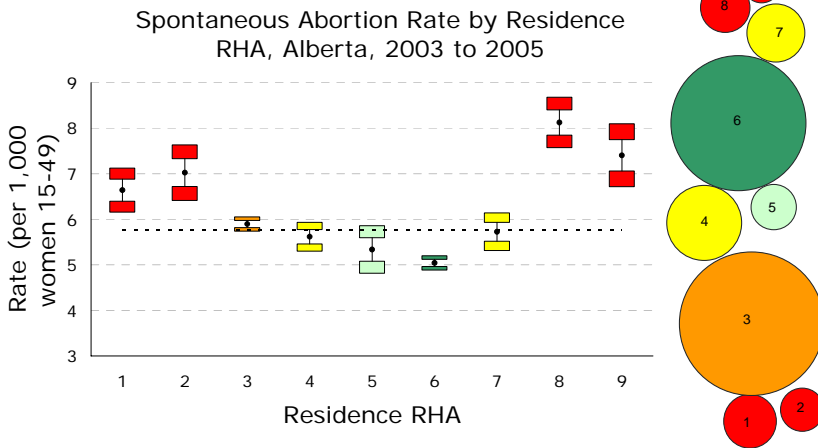
- Rates for women under 15 and over 44 years are not reliable due to low numbers of spontaneous abortions in these age groups; these rates must be interpreted with caution.
- As would be expected, the highest rates of spontaneous abortion (per 1,000 women) occur in those age groups with high rates of estimated pregnancy. The highest rate for 2003 to 2005 combined was 11.5, for 25 to 29 year old mothers.

Maternal Age Effects continued (see Tables 3.2.1.2, 3.2.1.4, 3.2.1.6, 3.2.1.7)



- The spontaneous abortion rate (per 100 estimated pregnancies), on the other hand, remains under 10% for women 15 to 35, and then increases notably with maternal age, with the rate for women 45 and older about three times that of women between 15 and 35.

Regional Data (see Table 3.2.1.4)



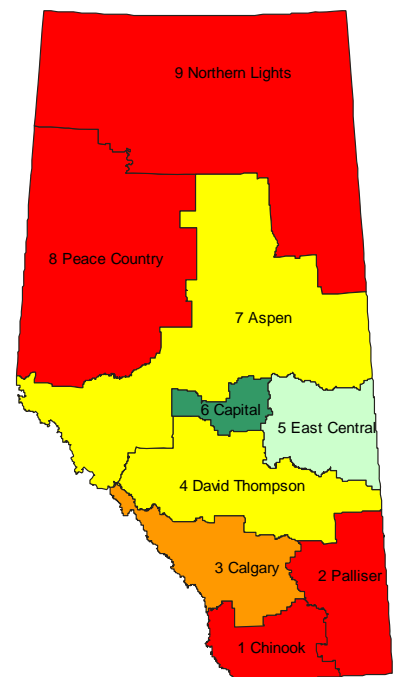
- For 2003 to 2005 combined, the spontaneous abortion rate (per 1,000 women aged 15-49) was significantly lower than the provincial average in RHA 5, and significantly higher than the provincial average in RHAs 1, 2, 8, and 9.
- The spontaneous abortion rate (per 100 estimated pregnancies) was significantly lower than the provincial average in RHA 6, and higher than the provincial average in RHAs 1, 2, 5, and 8.

3.2.1 Spontaneous Abortions

Background (continued)

The probability of conception during a menstrual cycle is about 30 percent. Only 50 to 60 percent of those conceptions last beyond 20 weeks gestation (Norwitz, Schust, & Fisher, 2001). 50 – 65 percent of spontaneous abortions result from chromosomal abnormalities; about half of these are trisomies (Reindollar, 2000).

Spontaneous Abortion Rate (per 1,000 women 15-49) 2003-05



3.2.1 Spontaneous Abortions

- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

Limitations and Methodology Notes

A two-month time lag between repeat pregnancies was used as a cutoff point to define separate pregnancy events.

See the Methodology and Limitations section in the Introduction for a caution regarding comparison of 2002 spontaneous abortion data to data from prior years due to changes in data coding systems.

Table 3.2.1.1 Spontaneous Abortions and Rates by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Spontaneous abortions	4,599	4,485	4,663	4,569	4,447	4,398	4,653	4,763	4,807	5,109
Women 15-49	744,606	756,147	774,059	791,981	802,182	815,913	831,964	840,560	847,174	854,349
Rate (per 1,000 women 15-49)	6.2	5.9	6.0	5.8	5.5	5.4	5.6	5.7	5.7	6.0
Standard Error (SE)	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08	0.08
Estimated pregnancies	51,126	50,960	51,921	52,458	51,576	51,971	53,205	54,969	55,578	56,965
Rate (per 100 estimated pregnancies)	9.0	8.8	9.0	8.7	8.6	8.5	8.7	8.7	8.6	9.0
Standard Error (SE)	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Table 3.2.1.2 Spontaneous Abortions and Rates by Maternal Age Group, Alberta, 2003 to 2005 Combined

	<15 ²	15-17	18-19	15-19	20-24	25-29	30-34	35-39	40-44	>44 ²	Total ¹
Spontaneous abortions	19	304	692	996	2,773	3,920	3,740	2,226	912	93	14,679
Women	334,377	204,707	138,561	343,268	348,872	341,483	344,467	359,366	414,144	390,483	2,542,083
Rate (per 1,000 women)	0.1	1.5	5.0	2.9	7.9	11.5	10.9	6.2	2.2	0.2	5.8
Standard Error (SE)	0.01	0.09	0.19	0.09	0.15	0.18	0.18	0.13	0.07	0.02	0.05
Estimated pregnancies	168	4,123	8,874	12,997	36,898	48,756	43,382	20,158	4,853	298	167,512
Rate (per 100 estimated pregnancies)	11.3	7.4	7.8	7.7	7.5	8.0	8.6	11.0	18.8	31.2	8.8
Standard Error (SE)	2.44	0.41	0.28	0.23	0.14	0.12	0.13	0.22	0.56	2.68	0.07

Table 3.2.1.3 Spontaneous Abortions and Rate by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Spontaneous abortions	749	527	5631	1248	420	4022	765	854	457	14,679
Women 15-49	112,795	75,029	955,111	222,198	78,687	797,697	133,603	105,107	61,712	2,542,083
Rate (per 1,000 women 15-49)	6.6	7.0	5.9	5.6	5.3	5.0	5.7	8.1	7.4	5.8
Standard Error (SE)	0.24	0.30	0.08	0.16	0.26	0.08	0.21	0.28	0.35	0.05
Estimated pregnancies	7,898	5,076	63,982	14,888	3,691	49,798	9,316	7,747	5,093	167,512
Rate (per 100 estimated pregnancies)	9.5	10.4	8.8	8.4	11.4	8.1	8.2	11.0	9.0	8.8
Standard Error (SE)	0.33	0.43	0.11	0.23	0.52	0.12	0.28	0.36	0.40	0.07

Sources: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Vital Statistics, Stillbirth File, Department of Government Services, March 2006 release.

Fee-for-Services Claims Files, Alberta Health and Wellness.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness.

Notes: 1. Total rate = total spontaneous abortions / number of women aged 15-49 x 1,000.

2. The age-specific rates for age groups <15 and >44 are calculated based on female populations in the 10-14 and 44-49 age groups, respectively.

Totals for age groups and RHAs include unknown ages or RHAs.

Data include Alberta residents only, with the exception of spontaneous abortion data prior to 2000, which may contain 'out of province' cases.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.2.1.4 Spontaneous Abortions and Rate by Year and Maternal Age Group, Alberta, 1996 to 2005

Spontaneous abortions	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<15	15	12	8	4	9	6	14	7	10	2
15-17	178	151	151	148	135	126	116	102	93	109
18-19	263	273	285	255	266	240	261	232	216	244
15-19	441	424	436	403	401	366	377	334	309	353
20-24	917	879	911	855	872	824	917	908	920	945
25-29	1,221	1,194	1,250	1,228	1,186	1,152	1,204	1,263	1,246	1,411
30-34	1,113	1,102	1,096	1,097	1,030	1,054	1,129	1,201	1,270	1,269
35-39	649	626	671	695	696	742	745	716	745	765
40-44	218	220	254	259	237	229	243	308	273	331
>44	25	28	37	28	16	25	24	26	34	33
Total	4,599	4,485	4,663	4,569	4,447	4,398	4,653	4,763	4,807	5,109

Rate (per 1,000 women)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<15	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0
15-17	3.1	2.5	2.4	2.3	2.1	1.9	1.7	1.5	1.4	1.6
18-19	7.0	7.2	7.2	6.2	6.2	5.4	5.7	5.1	4.7	5.3
15-19	4.6	4.3	4.3	3.8	3.7	3.3	3.3	2.9	2.7	3.1
20-24	9.9	9.2	9.3	8.4	8.4	7.7	8.3	8.0	7.9	8.0
25-29	12.1	11.7	12.0	11.6	11.2	10.8	11.0	11.3	11.0	12.1
30-34	9.2	9.4	9.6	9.7	9.3	9.4	9.9	10.5	11.1	11.0
35-39	5.1	4.8	5.0	5.2	5.3	5.7	5.9	5.9	6.3	6.5
40-44	1.9	1.9	2.1	2.0	1.8	1.7	1.8	2.2	2.0	2.4
>44	0.3	0.3	0.4	0.3	0.1	0.2	0.2	0.2	0.3	0.2
Total	6.2	5.9	6.0	5.8	5.5	5.4	5.6	5.7	5.7	6.0

Rate (per 100 estimated pregnancies)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<15	18.5	15.0	9.2	5.7	15.0	9.5	18.9	12.5	15.4	4.3
15-17	9.6	8.5	8.1	8.0	8.0	7.9	8.1	7.3	6.9	7.9
18-19	8.3	8.5	8.6	7.8	8.0	7.2	8.3	7.8	7.3	8.2
15-19	8.8	8.5	8.4	7.9	8.0	7.5	8.2	7.6	7.2	8.1
20-24	8.2	7.8	7.9	7.2	7.4	7.1	7.6	7.3	7.5	7.7
25-29	8.1	8.0	8.3	8.2	8.1	7.8	7.9	8.0	7.7	8.4
30-34	8.6	8.7	8.5	8.6	8.3	8.1	8.4	8.5	8.8	8.5
35-39	11.5	10.8	11.4	11.2	11.2	11.8	11.7	10.9	11.2	11.0
40-44	21.3	19.1	21.7	20.0	18.1	17.5	17.5	18.9	17.3	20.1
>44	35.7	48.3	39.4	34.6	33.3	31.3	28.9	26.0	35.4	32.4
Total	9.0	8.8	9.0	8.7	8.6	8.5	8.7	8.7	8.6	9.0

Sources: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Vital Statistics, Stillbirth File, Department of Government Services, March 2006 release.

Fee-for-Services Claims Files, Alberta Health and Wellness.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness.

Notes: 1. Total rate = total spontaneous abortions / number of women aged 15-49 x 1,000.

2. The age-specific rates for age groups <15 and >44 are calculated based on female populations in the 10-14 and 44-49 age groups, respectively.

Totals for age groups include unknown ages.

Data include Alberta residents only, with the exception of spontaneous abortion data prior to 2000, which may contain 'out of province' cases.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.2.1.5 Spontaneous Abortions and Rate by Year and Residence RHA, Alberta, 1996 to 2005

Spontaneous abortions	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	336	306	309	248	222	213	237	236	255	258
Palliser	126	131	135	141	159	147	160	174	176	177
Calgary	1,620	1,560	1,655	1,676	1,547	1,556	1,656	1,885	1,839	1,907
David Thompson	389	384	397	401	409	415	417	399	411	438
East Central	95	109	128	124	117	121	127	122	142	156
Capital	1,350	1,334	1,357	1,294	1,340	1,330	1,330	1,314	1,318	1,390
Aspen	257	264	279	287	279	272	302	263	253	249
Peace Country	253	256	275	258	242	224	257	243	277	334
Northern Lights	121	131	122	135	129	118	163	123	136	198
Alberta	4,599	4,485	4,663	4,569	4,447	4,398	4,653	4,763	4,807	5,109

Rate (per 1,000 women 15-49)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	9.2	8.4	8.4	6.7	5.9	5.7	6.3	6.3	6.8	6.9
Palliser	5.7	5.8	5.8	6.0	6.6	6.0	6.4	7.0	7.0	7.0
Calgary	6.2	5.8	5.9	5.8	5.2	5.2	5.3	6.0	5.8	5.9
David Thompson	5.9	5.8	5.8	5.8	5.8	5.8	5.7	5.4	5.5	5.9
East Central	3.8	4.3	5.0	4.8	4.5	4.6	4.8	4.6	5.4	6.0
Capital	5.6	5.5	5.5	5.2	5.3	5.2	5.1	5.0	5.0	5.2
Aspen	6.0	6.1	6.3	6.5	6.3	6.1	6.7	5.9	5.7	5.6
Peace Country	8.0	7.9	8.3	7.7	7.1	6.6	7.4	7.0	7.9	9.4
Northern Lights	7.7	8.0	7.1	7.8	7.3	6.4	8.5	6.1	6.6	9.4
Alberta	6.2	5.9	6.0	5.8	5.5	5.4	5.6	5.7	5.7	6.0

Rate (per 100 estimated pregnancies)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	12.6	11.1	12.0	9.5	9.0	8.6	9.5	9.0	9.6	9.8
Palliser	8.5	8.6	8.6	9.1	9.7	9.2	9.9	10.5	10.5	10.1
Calgary	9.0	8.6	8.8	8.8	8.1	8.1	8.3	9.0	8.7	8.8
David Thompson	8.4	8.4	8.7	8.5	8.9	8.9	8.7	8.2	8.2	8.7
East Central	7.5	8.6	9.7	10.0	9.7	10.3	9.9	10.3	11.2	12.6
Capital	8.5	8.5	8.5	8.1	8.6	8.4	8.4	8.0	8.0	8.2
Aspen	8.0	8.3	8.5	8.8	9.4	8.8	9.6	8.5	8.2	8.0
Peace Country	9.9	10.4	10.8	10.2	10.1	9.2	10.3	9.6	10.9	12.5
Northern Lights	8.5	9.3	8.8	9.7	9.0	7.7	10.1	7.6	8.2	10.9
Alberta	9.0	8.8	9.0	8.7	8.6	8.5	8.7	8.7	8.6	9.0

Source: Vital Statistics, Birth and Stillbirth Files, Department of Government Services, March 2006 release.

Fee-for-Services Claims Files, Alberta Health and Wellness.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness.

Notes: Totals for RHAs include unknown RHAs.

Data include Alberta residents only, with the exception of spontaneous abortion data prior to 2000, which may contain 'out of province' cases.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

3. Pregnancies

3.1 Estimated Pregnancies

3.2 Spontaneous Abortions

3.3 Reproductive Care Services

3.3.1 Induced abortions

3.3.2 Labour induction

3.3.3 Deliveries

3.4 Maternal Factors

3.3.1 Induced Abortions

Background

Induced abortion: *Intentional premature expulsion from the uterus of the products of conception – of the embryo, or of a nonviable fetus* (Dorland, 2000).

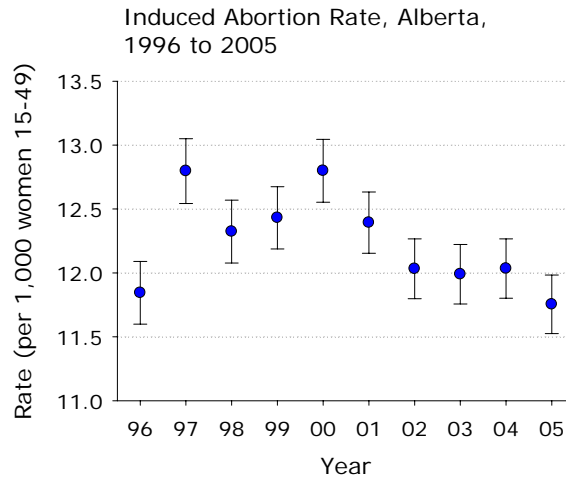
Induced abortion rate: *Number of induced abortions per 1,000 women aged 15-49, or per 100 estimated pregnancies.*

Abortions can be induced surgically or medically. Surgical abortions involve the use of instruments, including manual vacuum aspiration (up to eight weeks after the last menstrual period), suction curettage (six to 14 weeks) or dilation and evacuation (14-20 weeks). Medical abortions involve the use of drugs (methotrexate and misoprostol), and are usually done up to seven or eight weeks after the last menstrual period (Sunnybrook and Women’s College Health Sciences Centre, 2003).

Women who have induced abortions tend to be young (18 to 24 years) and in the very early stages of pregnancy (12 weeks or less) (Statistics Canada, 2006b; Grimes & Creinin, 2004).

In Alberta, induced abortions can be obtained in clinics or in hospitals. Clinics have been operating in Alberta since 1991, and the majority of induced abortions now occur in clinics.

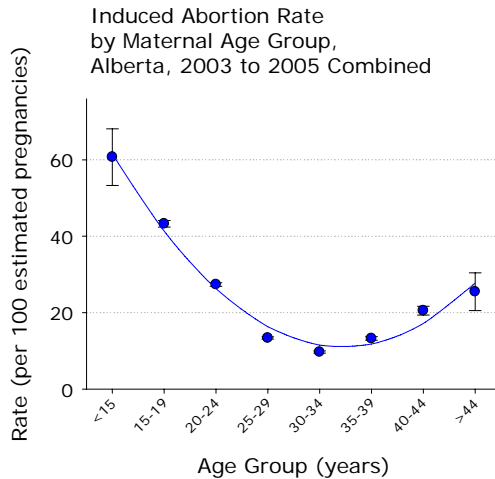
Time Trends (see Table 3.3.1.1, 3.3.1.4, 3.3.1.5)



- The induced abortion rate (per 1,000 women 15-49) did not vary systematically with time between 1996 and 2005, although the rate was lower in 2005 than in 2000. In 2005, the rate was 11.8.
- The induced abortion rate (per 100 estimated pregnancies) also did not show a significant time trend between 1996 and 2005. In 2005, 17.6% of estimated pregnancies ended in induced abortion.
- The trend toward increasing proportions of induced abortions being performed in private clinics (rather than acute care hospitals) continued. In 2005, 54.6% of induced abortions in Alberta occurred in clinics.
- Between 1996 and 2005, the proportion of induced abortions occurring in Calgary stayed stable. The proportion occurring in Edmonton increased slightly, with a corresponding decrease in induced abortions in other areas.

Maternal Age Effects (see Tables 3.3.1.2, 3.3.1.9)

- The induced abortion rate (per 1,000 women) was highest for women between 18 and 24 years of age for 2003 to 2005 combined. During this time period, 28.9 out of every 1,000 women 20-24 obtained an induced abortion.



- The induced abortion rate (per 100 estimated pregnancies), was highest for women under 15 years between 2003 and 2005. The rate declined markedly to 30 to 34 years and then increased somewhat.
- 60.7% of estimated pregnancies ended in induced abortion for women under 15 years, compared with the lowest rate of 9.7 (per 100 estimated pregnancies) for 30 to 34 year old women.

Gestational Age Data (see Tables 3.3.1.6, 3.3.1.7, 3.3.1.8)

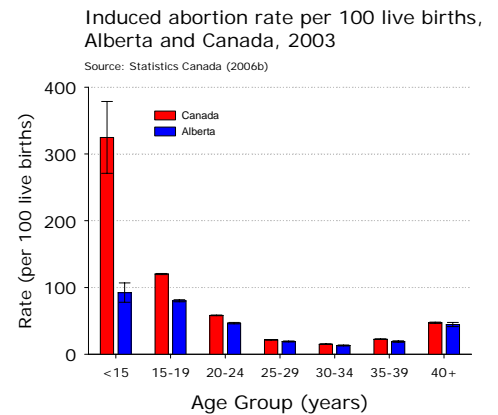
- In 2004, 85.8% of induced abortions occurred before 13 weeks gestation, and 13.4% occurred between 13 and 20 weeks gestation.
- Induced abortions in acute care hospitals occurred prior to 13 weeks 88.1% of the time in 2004, compared with 83.8% in private clinics.
- Younger women tend to have induced abortions at later gestational ages than older women.

3.3.1 Induced Abortions

Background (continued)

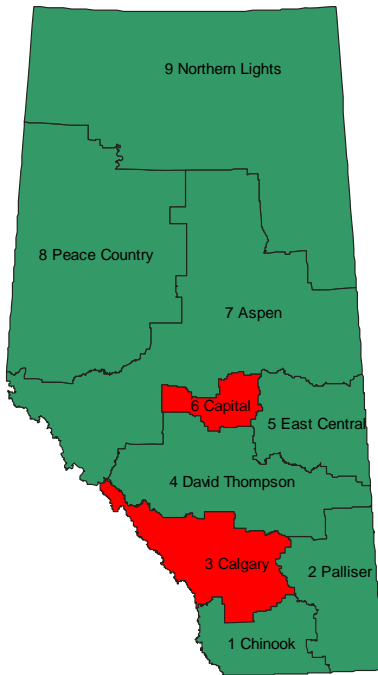
In 2003, there were 14.7 abortions for every 1,000 women aged 14 to 44 residing in Canada. The Alberta rate was also 14.7. Between 1994 and 2002, Alberta rates (per 1,000 women) were consistently lower than Canadian rates, although the size of the difference decreased with time. Abortion rates were highest in the 20 to 24 year age group (Statistics Canada, 2006b).

Induced abortion rates per 100 live births indicate a large Alberta/Canada difference for women under 20 years of age in 2003. A much higher abortion rate per 100 live births occurred in Canada, particularly in women under 15 years (Statistics Canada, 2006b).

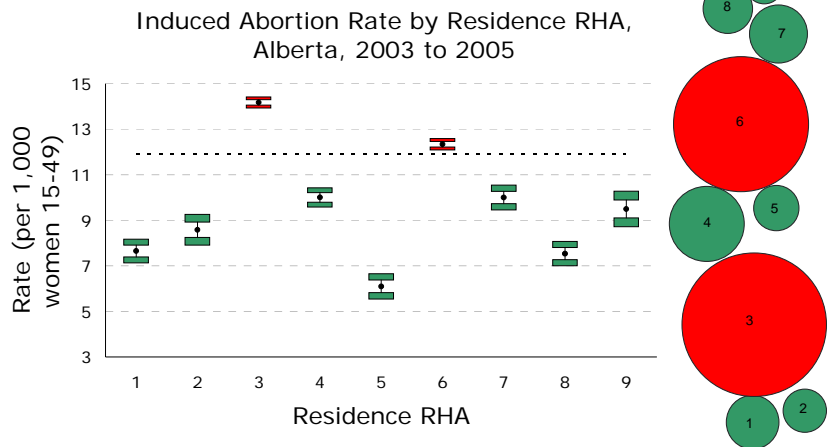


3.3.1 Induced Abortions

Induced Abortion Rate (per 1,000 women 15-49)



Regional Data (see Tables 3.3.1.3, 3.3.1.5, 3.3.1.10)



- For 2003 to 2005 combined, induced abortion rates (per 1,000 women 15-49) were significantly higher than the provincial mean in Calgary (RHA 3) and Capital (RHA 6) health regions, and significantly lower than the provincial mean in all other RHAs. As with any medical service, access affects the rate of use, and induced abortions services are clustered in Edmonton and Calgary.
- The same pattern occurred in the rate per 100 estimated pregnancies.
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

Limitations and Methodology Notes

A two-month time lag between repeat pregnancies was used as a cutoff point to define separate pregnancy events.

Regional induced abortion data differ from non-regional induced abortion data due to differences in source.

See the Methodology and Limitations section in the Introduction (page 14) for a caution regarding comparison of 2002 induced abortion data to data from prior years due to changes in data coding systems.

Table 3.3.1.1 Induced Abortions and Rates by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Induced abortions	8,819	9,676	9,539	9,845	10,267	10,112	10,010	10,078	10,195	10,042
Women 15-49	744,606	756,147	774,059	791,981	802,182	815,913	831,964	840,560	847,174	854,349
Rate (per 1,000 women 15-49)	11.8	12.8	12.3	12.4	12.8	12.4	12.0	12.0	12.0	11.8
Standard Error (SE)	0.13	0.13	0.13	0.12	0.13	0.12	0.12	0.12	0.12	0.12
Estimated pregnancies	51,126	50,960	51,921	52,458	51,576	51,971	53,205	54,969	55,578	56,965
Rate (per 100 estimated pregnancies)	17.2	19.0	18.4	18.8	19.9	19.5	18.8	18.3	18.3	17.6
Standard Error (SE)	0.17	0.17	0.17	0.17	0.18	0.17	0.17	0.17	0.16	0.16

Table 3.3.1.2 Induced Abortions and Rates by Maternal Age Group, Alberta, 2003 to 2005 Combined

	<15 ²	15-17	18-19	15-19	20-24	25-29	30-34	35-39	40-44	>44 ¹	Total ²
Induced abortions	102	2,029	3,593	5,622	10,098	6,531	4,215	2,674	997	76	30,315
Women	334,377	204,707	138,561	343,268	348,872	341,483	344,467	359,366	414,144	390,483	2,542,083
Rate (per 1,000 women)	0.3	9.9	25.9	16.4	28.9	19.1	12.2	7.4	2.4	0.2	11.9
Standard Error (SE)	0.03	0.22	0.43	0.22	0.28	0.23	0.19	0.14	0.08	0.02	0.07
Estimated pregnancies	168	4,123	8,874	12,997	36,898	48,756	43,382	20,158	4,853	298	167,512
Rate (per 100 estimated pregnancies)	60.7	49.2	40.5	43.3	27.4	13.4	9.7	13.3	20.5	25.5	18.1
Standard Error (SE)	3.77	0.78	0.52	0.43	0.23	0.15	0.14	0.24	0.58	2.52	0.09

Table 3.3.1.3 Induced Abortions and Rate by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Induced abortions	863	644	13538	2223	480	9843	1336	792	586	30,315
Women 15-49	112,795	75,029	955,111	222,198	78,687	797,697	133,603	105,107	61,712	2,542,083
Rate (per 1,000 women 15-49)	7.7	8.6	14.2	10.0	6.1	12.3	10.0	7.5	9.5	11.9
Standard Error (SE)	0.26	0.34	0.12	0.21	0.28	0.12	0.27	0.27	0.39	0.07
Estimated pregnancies	7,898	5,076	63,982	14,888	3,691	49,798	9,316	7,747	5,093	167,512
Rate (per 100 estimated pregnancies)	10.9	12.7	21.2	14.9	13.0	19.8	14.3	10.2	11.5	18.1
Standard Error (SE)	0.35	0.47	0.16	0.29	0.55	0.18	0.36	0.34	0.45	0.09

Source: Vital Statistics, Birth and Stillbirth Files, Department of Government Services, March 2006 release.

Fee-for-Services Claims Files, Alberta Health and Wellness.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness.

Notes: 1. The age-specific rates for age groups <15 and >44 are calculated based on female populations in the 10-14 and 44-49 age groups, respectively.

2. Total rate = total Induced abortions / number of women aged 15-49 x 1,000.

Totals for age groups and RHAs include unknown ages or RHAs.

Data include Alberta residents only, with the exception of spontaneous abortion data (included in estimated pregnancies) prior to 2000, which may contain 'out of province' cases.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.3.1.4 Induced Abortions by Year and Facility Type, Alberta, 1995 to 2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Induced abortions at acute care hospitals	6,607	5,955	6,353	6,053	5,904	5,895	5,447	5,169	4,809	4,918
Induced abortions at private clinics	2,299	3,285	3,960	4,293	4,260	4,522	5,142	5,377	5,747	5,918
Induced abortions at all facilities	8,906	9,240	10,313	10,346	10,164	10,417	10,589	10,546	10,556	10,836
Percent at hospitals	74.2	64.4	61.6	58.5	58.1	56.6	51.4	49.0	45.6	45.4
Percent at clinics	25.8	35.6	38.4	41.5	41.9	43.4	48.6	51.0	54.4	54.6

Table 3.3.1.5 Induced Abortions by Year and Facility Region, Alberta, 1995 to 2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Induced abortions in Edmonton	3,624	3,855	4,462	4,297	4,326	4,477	4,653	4,765	4,885	5,023
Induced abortions in Calgary	4,755	4,917	5,398	5,668	5,483	5,636	5,734	5,565	5,488	5,660
Induced abortions in other areas	527	468	453	381	355	304	202	216	183	153
Induced abortions at all facilities	8,906	9,240	10,313	10,346	10,164	10,417	10,589	10,546	10,556	10,836
Percent in Edmonton	40.7	41.7	43.3	41.5	42.6	43.0	43.9	45.2	46.3	46.4
Percent in Calgary	53.4	53.2	52.3	54.8	53.9	54.1	54.2	52.8	52.0	52.2
Percent in other areas	5.9	5.1	4.4	3.7	3.5	2.9	1.9	2.0	1.7	1.4

Source: Clinics Files, Alberta Health and Wellness.

Notes: Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.3.1.6 Induced Abortions by Week of Gestation and Facility Type, Alberta, 1995 to 2004

All Facilities	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<9	2,500	3,510	5,073	4,585	4,137	4,518	4,307	4,765	5,333	5,019
9 - 12	5,691	5,016	4,356	4,570	4,690	4,656	4,937	4,441	3,866	4,285
13 - 16	502	490	626	786	910	800	886	871	880	1,014
17 - 20	195	217	253	375	402	431	449	388	391	439
>20	18	7	5	24	25	12	9	39	56	65
Total	8,906	9,240	10,313	10,352	10,164	10,417	10,590	10,588	10,586	10,850

Acute Care Hospitals	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<9	1,550	1,938	2,907	2,338	2,053	2,424	2,068	2,160	2,416	2,204
9 - 12	4,853	3,790	2,983	3,115	3,212	2,933	2,844	2,497	1,951	2,130
13 - 16	139	151	352	380	421	342	309	255	215	343
17 - 20	53	74	108	203	197	191	222	182	167	179
>20	12	2	3	17	21	5	3	33	44	60
Total	6,607	5,955	6,353	6,053	5,904	5,895	5,448	5,211	4,825	4,920

Private Clinics	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<9	950	1,572	2,166	2,247	2,084	2,094	2,239	2,605	2,917	2,815
9 - 12	838	1,226	1,373	1,455	1,478	1,723	2,093	1,944	1,915	2,155
13 - 16	363	339	274	406	489	458	577	616	665	671
17 - 20	142	143	145	172	205	240	227	206	224	260
>20	6	5	2	7	4	7	6	6	12	5
Total	2,299	3,285	3,960	4,299	4,260	4,522	5,142	5,377	5,761	5,930

Table 3.3.1.7 Percent of Induced Abortions by Week of Gestation and Facility Type, Alberta, 1995 to 2004

All Facilities	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<9	28.1	38.0	49.2	44.3	40.7	43.4	40.7	45.0	50.4	46.3
9 - 12	63.9	54.3	42.2	44.1	46.1	44.7	46.6	41.9	36.5	39.5
13 - 16	5.6	5.3	6.1	7.6	9.0	7.7	8.4	8.2	8.3	9.3
17 - 20	2.2	2.3	2.5	3.6	4.0	4.1	4.2	3.7	3.7	4.0
>20	0.2	0.1	0.0	0.2	0.2	0.1	0.1	0.4	0.5	0.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Acute Care Hospitals	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<9	23.5	32.5	45.8	38.6	34.8	41.1	38.0	41.5	50.1	44.8
9 - 12	73.5	63.6	47.0	51.5	54.4	49.8	52.2	47.9	40.4	43.3
13 - 16	2.1	2.5	5.5	6.3	7.1	5.8	5.7	4.9	4.5	7.0
17 - 20	0.8	1.2	1.7	3.4	3.3	3.2	4.1	3.5	3.5	3.6
>20	0.2	0.0	0.0	0.3	0.4	0.1	0.1	0.6	0.9	1.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Private Clinics	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<9	41.3	47.9	54.7	52.3	48.9	46.3	43.5	48.4	50.6	47.5
9 - 12	36.5	37.3	34.7	33.8	34.7	38.1	40.7	36.2	33.2	36.3
13 - 16	15.8	10.3	6.9	9.4	11.5	10.1	11.2	11.5	11.5	11.3
17 - 20	6.2	4.4	3.7	4.0	4.8	5.3	4.4	3.8	3.9	4.4
>20	0.3	0.2	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Clinics Files, Alberta Health and Wellness.

Notes: Totals for age groups include unknown ages.

Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.3.1.8 Induced Abortions by Week of Gestation and Maternal Age Group, Alberta, 2002 to 2004

Induced abortions							Percent of induced abortions						
2002	< 9	9 -12	13 -16	17-20	>20	Alberta	2002	< 9	9 -12	13 -16	17-20	>20	Alberta
<15	12	24	7	2	0	45	<15	26.7	53.3	15.6	4.4	0.0	100.0
15-17	262	350	79	43	3	737	15-17	35.5	47.5	10.7	5.8	0.4	100.0
18-19	523	681	128	57	0	1,391	18-19	37.6	49.0	9.2	4.1	0.0	100.0
15-19	785	1,031	207	100	3	2,128	15-19	36.9	48.4	9.7	4.7	0.1	100.0
20-24	1,461	1,541	303	112	11	3,454	20-24	42.3	44.6	8.8	3.2	0.3	100.0
25-29	1,076	842	176	83	9	2,222	25-29	48.4	37.9	7.9	3.7	0.4	100.0
30-34	774	515	102	43	10	1,456	30-34	53.2	35.4	7.0	3.0	0.7	100.0
35-39	460	354	59	36	5	922	35-39	49.9	38.4	6.4	3.9	0.5	100.0
40-44	190	129	15	11	1	346	40-44	54.9	37.3	4.3	3.2	0.3	100.0
>44	7	5	2	1	0	15	>44	46.7	33.3	13.3	6.7	0.0	100.0
All	4,765	4,441	871	388	39	10,588	All	45.0	41.9	8.2	3.7	0.4	100.0

2003	< 9	9 -12	13 -16	17-20	>20	Alberta	2003	< 9	9 -12	13 -16	17-20	>20	Alberta
<15	16	7	7	2	0	32	<15	50.0	21.9	21.9	6.3	0.0	100.0
15-17	277	338	95	34	6	752	15-17	36.8	44.9	12.6	4.5	0.8	100.0
18-19	517	542	149	45	5	1,262	18-19	41.0	42.9	11.8	3.6	0.4	100.0
15-19	794	880	244	79	11	2,014	15-19	39.4	43.7	12.1	3.9	0.5	100.0
20-24	1,743	1,391	309	129	9	3,593	20-24	48.5	38.7	8.6	3.6	0.3	100.0
25-29	1,236	753	150	80	11	2,246	25-29	55.0	33.5	6.7	3.6	0.5	100.0
30-34	792	447	101	49	12	1,415	30-34	56.0	31.6	7.1	3.5	0.8	100.0
35-39	512	282	54	37	10	905	35-39	56.6	31.2	6.0	4.1	1.1	100.0
40-44	225	95	12	15	2	351	40-44	64.1	27.1	3.4	4.3	0.6	100.0
>44	15	10	2	0	0	27	>44	55.6	37.0	7.4	0.0	0.0	100.0
All	5,333	3,866	880	391	56	10,586	All	50.4	36.5	8.3	3.7	0.5	100.0

2004	< 9	9 -12	13 -16	17-20	>20	Alberta	2004	< 9	9 -12	13 -16	17-20	>20	Alberta
<15	8	18	9	4	0	39	<15	20.5	46.2	23.1	10.3	0.0	100.0
15-17	255	320	102	32	0	711	15-17	35.9	45.0	14.3	4.5	0.0	100.0
18-19	508	582	163	52	2	1,307	18-19	38.9	44.5	12.5	4.0	0.2	100.0
15-19	763	902	265	84	2	2,018	15-19	37.8	44.7	13.1	4.2	0.1	100.0
20-24	1,584	1,525	331	153	17	3,620	20-24	43.8	42.1	9.1	4.2	0.5	100.0
25-29	1,154	900	201	86	18	2,365	25-29	48.8	38.1	8.5	3.6	0.8	100.0
30-34	781	504	117	54	13	1,473	30-34	53.0	34.2	7.9	3.7	0.9	100.0
35-39	518	313	59	46	9	949	35-39	54.6	33.0	6.2	4.8	0.9	100.0
40-44	199	117	32	12	3	365	40-44	54.5	32.1	8.8	3.3	0.8	100.0
>44	12	6	0	0	0	18	>44	66.7	33.3	0.0	0.0	0.0	100.0
All	5,019	4,285	1,014	439	65	10,850	All	46.3	39.5	9.3	4.0	0.6	100.0

Source: Clinics Files, Alberta Health and Wellness.

Notes: Totals for age groups include unknown ages.

Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.3.1.9 Induced Abortions and Rate by Year and Maternal Age Group, Alberta, 1996 to 2005

Induced abortions	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<15	35	41	54	43	35	32	45	35	35	32
15-17	764	781	850	852	814	773	697	703	653	673
18-19	1,107	1,217	1,289	1,268	1,373	1,455	1,295	1,201	1,225	1,167
15-19	1,871	1,998	2,139	2,120	2,187	2,228	1,992	1,904	1,878	1,840
20-24	2,709	3,045	2,941	3,145	3,345	3,270	3,246	3,404	3,404	3,290
25-29	1,931	2,028	1,987	2,058	2,155	2,034	2,088	2,119	2,219	2,193
30-34	1,222	1,394	1,256	1,307	1,353	1,353	1,396	1,363	1,392	1,460
35-39	790	888	866	866	878	884	881	877	902	895
40-44	232	264	263	287	296	287	334	346	345	306
>44	29	18	33	19	18	24	28	30	20	26
Total	8,819	9,676	9,539	9,845	10,267	10,112	10,010	10,078	10,195	10,042

Rate (per 1,000 women)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<15	0.3	0.4	0.5	0.4	0.3	0.3	0.4	0.3	0.3	0.3
15-17	13.1	13.0	13.6	13.2	12.4	11.6	10.3	10.4	9.6	9.7
18-19	29.6	31.9	32.5	31.0	32.1	32.8	28.5	26.1	26.5	25.2
15-19	19.6	20.3	20.9	20.1	20.2	20.1	17.6	16.8	16.4	15.9
20-24	29.2	32.0	29.9	30.8	32.3	30.7	29.4	29.9	29.2	27.8
25-29	19.1	19.9	19.1	19.5	20.3	19.0	19.0	19.0	19.5	18.9
30-34	10.1	11.9	11.0	11.6	12.2	12.1	12.3	11.9	12.1	12.7
35-39	6.1	6.8	6.5	6.5	6.6	6.8	7.0	7.2	7.6	7.6
40-44	2.1	2.2	2.1	2.2	2.3	2.1	2.4	2.5	2.5	2.2
>44	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total	11.8	12.8	12.3	12.4	12.8	12.4	12.0	12.0	12.0	11.8

Rate (per 100 estimated pregnancies)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<15	43.2	51.3	62.1	61.4	58.3	50.8	60.8	62.5	53.8	68.1
15-17	41.1	44.2	45.5	46.1	48.0	48.6	48.6	50.1	48.7	48.8
18-19	35.0	38.1	38.8	38.7	41.2	43.9	41.0	40.5	41.6	39.3
15-19	37.3	40.3	41.2	41.4	43.5	45.4	43.4	43.6	43.8	42.3
20-24	24.1	26.9	25.4	26.4	28.5	28.0	27.1	27.4	27.8	26.8
25-29	12.8	13.5	13.2	13.7	14.7	13.8	13.8	13.4	13.7	13.1
30-34	9.4	11.1	9.8	10.3	10.8	10.4	10.3	9.7	9.6	9.8
35-39	14.0	15.3	14.7	14.0	14.1	14.1	13.8	13.4	13.6	12.9
40-44	22.7	22.9	22.5	22.2	22.6	21.9	24.1	21.3	21.9	18.6
>44	41.4	31.0	35.1	23.5	37.5	30.0	33.7	30.0	20.8	25.5
Total	17.2	19.0	18.4	18.8	19.9	19.5	18.8	18.3	18.3	17.6

Source: Vital Statistics, Birth and Stillbirth Files, Department of Government Services, March 2006 release.

Fee-for-Services Claims Files, Alberta Health and Wellness.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness.

Notes: 1. Total rate = total Induced abortions / number of women aged 15-49 x 1,000.

2. The age-specific rates for age groups <15 and >44 are calculated based on female populations in the 10-14 and 44-49 age groups, respectively.

Totals for age groups include unknown ages.

Data include Alberta residents only, with the exception of spontaneous abortion data (included in estimated pregnancies) prior to 2000, which may contain 'out of province' cases.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.3.110 Induced Abortions and Rate by Year and Residence RHA, Alberta, 1996 to 2005

Induced abortions	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	283	313	243	293	281	284	279	270	334	259
Palliser	176	199	182	172	245	211	222	219	214	211
Calgary	3,788	4,085	4,081	4,351	4,479	4,495	4,592	4,580	4,620	4,338
David Thompson	571	611	611	624	701	711	720	728	752	743
East Central	152	172	183	151	171	164	174	158	163	159
Capital	2,936	3,405	3,349	3,343	3,465	3,345	3,162	3,236	3,233	3,374
Aspen	341	384	392	423	403	405	425	442	425	469
Peace Country	355	336	339	305	336	292	297	252	281	259
Northern Lights	175	161	156	180	182	203	139	192	167	227
Alberta	8,819	9,676	9,539	9,845	10,267	10,112	10,010	10,078	10,195	10,042

Rate (per 1,000 women 15-49)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	7.8	8.6	6.6	7.9	7.5	7.6	7.4	7.2	8.9	6.9
Palliser	7.9	8.8	7.9	7.3	10.2	8.6	8.9	8.8	8.6	8.4
Calgary	14.4	15.1	14.6	15.0	15.2	14.9	14.8	14.6	14.5	13.4
David Thompson	8.7	9.2	9.0	90.1	9.9	9.9	9.9	9.9	10.1	10.0
East Central	6.0	6.8	7.1	5.9	6.6	6.3	6.6	6.0	6.2	6.1
Capital	12.1	14.0	13.6	13.3	13.7	13.0	12.1	12.2	12.2	12.6
Aspen	8.0	8.9	8.9	9.5	9.1	9.0	9.4	9.9	9.5	10.6
Peace Country	11.2	10.4	10.3	9.1	9.9	8.6	8.6	7.3	8.0	7.3
Northern Lights	11.2	9.8	9.1	10.3	10.2	11.1	7.2	9.6	8.1	10.8
Alberta	11.8	12.8	12.3	13.5	12.8	12.4	12.0	12.0	12.0	11.8

Rate (per 100 estimated pregnancies)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	10.6	11.3	9.4	11.2	11.4	11.5	11.2	10.3	12.6	9.8
Palliser	11.9	13.0	11.6	11.0	15.0	13.2	13.7	13.2	12.8	12.1
Calgary	21.1	22.5	21.8	22.8	23.4	23.4	23.1	21.8	21.8	19.9
David Thompson	12.3	13.4	13.3	13.3	15.2	15.3	15.1	14.9	15.1	14.8
East Central	12.0	13.5	13.9	12.1	14.2	14.0	13.6	13.3	12.9	12.8
Capital	18.6	21.8	21.0	20.9	22.1	21.2	19.9	19.8	19.5	19.9
Aspen	10.6	12.1	12.0	12.9	13.5	13.1	13.5	14.2	13.7	15.0
Peace Country	13.9	13.7	13.3	12.1	14.0	12.0	11.9	9.9	11.1	9.7
Northern Lights	12.3	11.5	11.2	13.0	12.7	13.3	8.6	11.9	10.1	12.5
Alberta	17.2	19.0	18.4	18.8	19.9	19.5	18.8	18.3	18.3	17.6

Source: Vital Statistics, Birth and Stillbirth Files, Department of Government Services, March 2006 release.

Fee-for-Services Claims Files, Alberta Health and Wellness.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness.

Notes: Totals for RHAs include unknown RHAs.

Data include Alberta residents only, with the exception of spontaneous abortion data (included in estimated pregnancies) prior to 2000, which may contain 'out of province' cases.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

3.3.2 Labour Induction

Background

Induced labour: *Initiation of labour prior to spontaneous onset, for the purpose of accomplishing delivery* (Alberta Medical Association, 2003). Inductions can be performed after admission to hospital (inpatient inductions) or prior to admission (outpatient inductions). Most outpatient inductions are medical inductions.

Medical induction: *Induction with oxytocic agents, non-pharmaceutical agents, and/or nipple stimulation.*

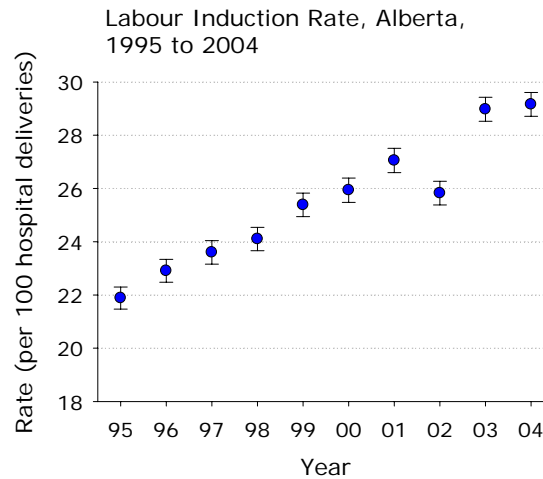
Surgical induction: *Induction of labour by membrane stripping, artificial rupture of membranes, and/or mechanical cervical ripening.*

Combined induction: *Induction by any combination of medical and surgical means.*

Rates for the above procedures are per 100 hospital deliveries.

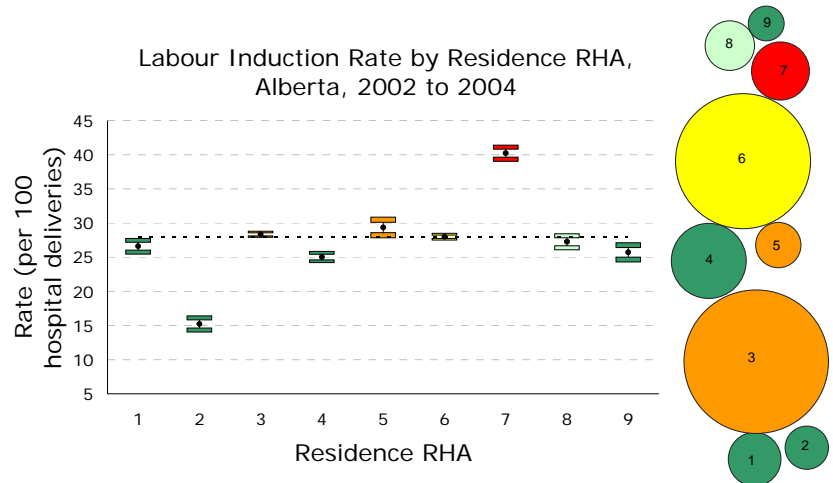
Common indications for labour induction include post-term pregnancy, pre-labour rupture of membranes, fetal compromise, and maternal medical conditions. Risks of labour induction include increased rates of cesarean birth, operative vaginal delivery, and excessive uterine activity. Induction for convenience remains a controversial issue (Crane, 2001).

Time Trends (see Table 3.3.2.1)



- The total induction rate increased from 1996 to 2004. Inductions were undercounted from April 2002 to March 2003 (see Limitations and Methodology Notes).
- Most inductions are medical inductions.

Regional Data (see Tables 3.3.2.2, 3.3.2.3)



- The rate of labour induction (total inductions) was lower than the provincial average in RHAs 1, 2, 4, and 9 for 2002 to 2004 combined. The rate was lowest in RHA 2 (15.2 per 100 hospital deliveries).
- The rate was higher than the provincial average in RHA 7 (40.2 per 100 hospital deliveries).
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

Limitations and Methodology Notes

From April 2002 to March 2003, inductions performed on outpatient bases were not captured, resulting in under-estimation of induction rates for this time period. From April 2003 onward, outpatient inductions were included in total inductions but were not categorized as medical, surgical, or combined. Consequently, "total inductions" is greater than the sum of medical, surgical, and combined from 2003 onward.

Rates are calculated based on hospital deliveries only; out-of-hospital deliveries are not included in total deliveries in this section.

Because only primary, secondary, and tertiary ICD9-CM diagnostic and procedure codes were available from 1985 to 1992, the diagnostic and procedure criteria for all years from 1995 to 2001 were based on the first three codes only. Thus, the number of procedures (especially minor procedures) may be under-counted. Detailed criteria for data extraction are provided in Appendix 6.1.1.

See the Methodology and Limitations section in the Introduction (page 14) for a caution regarding comparison of 2002 Deliveries data to data from prior years due to changes in data coding systems.

3.3.2 Labour Induction

Total Induction Rate
(per 100 hospital deliveries)

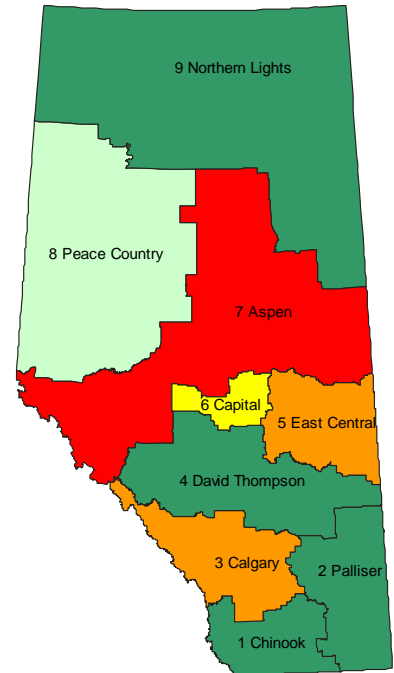


Table 3.3.2.1 Labour Inductions and Rates, Alberta, 1995 to 2004¹

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Hospital deliveries	37,926	36,899	35,553	36,672	36,985	35,825	36,315	37,351	38,865	39,377
Total inductions²	8,300	8,453	8,391	8,838	9,388	9,291	9,823	9,645	11,261	11,482
Total inductions rate (per 100 hospital deliveries)	21.9	22.9	23.6	24.1	25.4	25.9	27.0	25.8	29.0	29.2
Medical inductions	5,111	5,737	6,278	6,813	7,153	7,146	7,275	6,786	6,677	6,229
Medical induction rate (per 100 hospital deliveries)	13.5	15.5	17.7	18.6	19.3	19.9	20.0	18.2	17.2	15.8
Surgical inductions	1,571	1,083	636	546	596	532	578	717	801	654
Surgical inductions rate (per 100 hospital deliveries)	4.1	2.9	1.8	1.5	1.6	1.5	1.6	1.9	2.1	1.7
Combined inductions	1,618	1,633	1,477	1,479	1,639	1,613	1,970	2,142	2,211	2,822
Combined inductions rate (per 100 hospital deliveries)	4.3	4.4	4.2	4.0	4.4	4.5	5.4	5.7	5.7	7.2

Table 3.3.2.2 Total Labour Inductions and Rates by Residence RHA, Alberta, 2002 to 2004¹ Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Total inductions	1,586	556	11,639	2,730	1,056	9,472	2,782	1,576	991	32,388
Hospital deliveries	5,963	3,653	41,066	10,911	3,599	33,845	6,918	5,782	3,856	115,593
Rate (per 100 hospital deliveries)	26.6	15.2	28.3	25.0	29.3	28.0	40.2	27.3	25.7	28.0
Standard Error (SE)	0.57	0.59	0.22	0.41	0.76	0.24	0.59	0.59	0.70	0.13

Source: Hospital Inpatient Files, September 2006 extraction.

- Notes:
1. From April 2002 to March 2003, inductions performed on outpatient bases were not captured, resulting in under-estimation of induction rates for this time period.
 2. From April 2003 onward, outpatient inductions were included in total inductions but were not categorized as medical, surgical, or combined. Consequently, "total inductions" is greater than the sum of medical, surgical, and combined from 2003 onward.
- Totals for RHAs include unknown RHAs.
Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.3.2.3 Labour Inductions and Rates by Residence RHA and Year, Alberta, 2002 to 2004^{1,2}

2002	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Hospital deliveries	1,919	1,202	13,057	3,513	1,198	10,961	2,346	1,887	1,268	37,351
Total inductions	458	126	3,538	875	320	2,987	512	507	322	9,645
Total inductions rate (per 100 hospital deliveries)	23.9	10.5	27.1	24.9	26.7	27.3	21.8	26.9	25.4	25.8
Medical inductions	422	108	2,240	649	242	1,956	412	468	289	6,786
Medical induction rate (per 100 hospital deliveries)	22.0	9.0	17.2	18.5	20.2	17.8	17.6	24.8	22.8	18.2
Surgical inductions	24	10	354	61	32	177	26	20	13	717
Surgical inductions rate (per 100 hospital deliveries)	1.3	0.8	2.7	1.7	2.7	1.6	1.1	1.1	1.0	1.9
Combined inductions	12	8	944	165	46	854	74	19	20	2,142
Combined inductions rate (per 100 hospital deliveries)	0.6	0.7	7.2	4.7	3.8	7.8	3.2	1.0	1.6	5.7

2003	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Hospital deliveries	2,036	1,212	13,904	3,706	1,153	11,346	2,258	1,988	1,262	38,865
Total inductions	571	194	3,969	957	364	3,278	1,048	559	321	11,261
Total inductions rate (per 100 hospital deliveries)	28.0	16.0	28.5	25.8	31.6	28.9	46.4	28.1	25.4	29.0
Medical inductions	378	104	2,175	680	234	1,909	431	480	286	6,677
Medical induction rate (per 100 hospital deliveries)	18.6	8.6	15.6	18.3	20.3	16.8	19.1	24.1	22.7	17.2
Surgical inductions	38	5	352	58	44	234	31	23	16	801
Surgical inductions rate (per 100 hospital deliveries)	1.9	0.4	2.5	1.6	3.8	2.1	1.4	1.2	1.3	2.1
Combined inductions	16	14	1,075	175	49	764	65	41	12	2,211
Combined inductions rate (per 100 hospital deliveries)	0.8	1.2	7.7	4.7	4.2	6.7	2.9	2.1	1.0	5.7

2004	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Hospital deliveries	2,008	1,239	14,105	3,692	1,248	11,538	2,314	1,907	1,326	39,377
Total inductions	557	236	4,132	898	372	3,207	1,222	510	348	11,482
Total inductions rate (per 100 hospital deliveries)	27.7	19.0	29.3	24.3	29.8	27.8	52.8	26.7	26.2	29.2
Medical inductions	463	105	1,779	577	208	1,964	416	456	261	6,229
Medical induction rate (per 100 hospital deliveries)	23.1	8.5	12.6	15.6	16.7	17.0	18.0	23.9	19.7	15.8
Surgical inductions	41	8	266	52	41	171	37	23	15	654
Surgical inductions rate (per 100 hospital deliveries)	2.0	0.6	1.9	1.4	3.3	1.5	1.6	1.2	1.1	1.7
Combined inductions	18	19	1,685	195	88	685	75	19	38	2,822
Combined inductions rate (per 100 hospital deliveries)	0.9	1.5	11.9	5.3	7.1	5.9	3.2	1.0	2.9	7.2

Source: Hospital Inpatient Files, September 2006 extraction.

- Notes: 1. From April 2002 to March 2003, inductions performed on outpatient bases were not captured, resulting in under-estimation of induction rates for this time period.
 2. From April 2003 onward, outpatient inductions were included in total inductions but were not categorized as medical, surgical, or combined. Consequently, "total inductions" is greater than the sum of medical, surgical, and combined from 2003 onward.

Totals for RHAs include unknown RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

3.3.3 Deliveries

Background

Epidural analgesia: *A method of pain relief consisting of continuous bathing of lumbar or thoracic nerve roots within the epidural space with an injected anesthetic solution (Dorland, 2000).*

Forceps delivery: *Extraction of a fetus by application of forceps to the child's head (Dorland, 2000).*

Vacuum extraction: *A suction cup is placed on the fetus' head and vacuum pressure is applied to pull the baby out of the vagina (Morgan, 1990).*

Cesarean section: *Incision through the abdominal and uterine walls for delivery of a fetus (Dorland, 2000).*

Shoulder dystocia: *Dystocia is defined as abnormal or difficult labour due to the shape, size or position of the fetus (Dorland, 2000). In the case of shoulder dystocia, there is an impaction of the shoulder of the fetus against the symphysis pubis after the head has been delivered.*

Rates for the above procedures are per 100 hospital deliveries.

Episiotomy: *Surgical incision into the perineum and vagina to facilitate delivery.*

Episiotomy rate: *Number of episiotomies per 100 vaginal deliveries.*

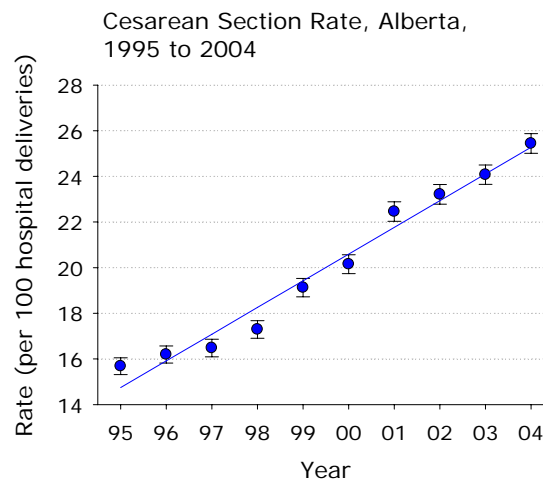
Vaginal birth after cesarean section (VBAC): *A vaginal birth in which the mother has previously given birth by cesarean.*

VBAC attempt rate: *Number of attempted VBACs per 100 repeat cesareans + VBACs.*

VBAC occurrence rate: *Number of VBACs per 100 repeat cesareans + VBACs.*

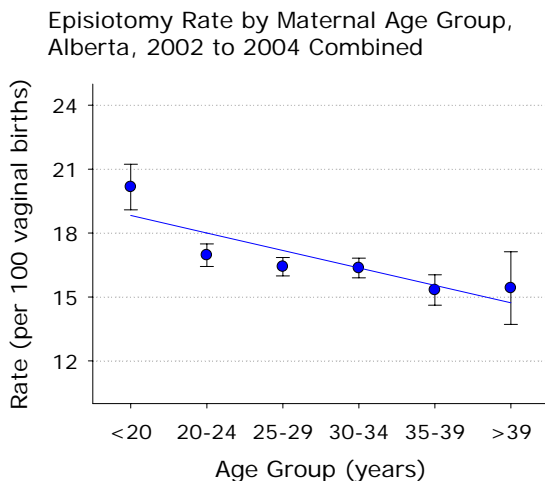
Time Trends (see Tables 3.3.3.1, 3.3.3.4, 3.3.3.7, 3.3.3.10)

- The epidural analgesia rate increased over time between 2000 and 2004. In 2004, 42.3% of hospital deliveries involved epidural analgesia, compared with 36.0% in 2000.
- Between 1995 and 2004, the forceps delivery rate decreased and the vacuum extraction rate increased. In 2004, the forceps rate was 5.6 (per 100 hospital deliveries) and the vacuum extraction rate was 12.1.
- The episiotomy rate decreased between 2000 and 2004. The 2004 episiotomy rate was 15.5 (per 100 vaginal deliveries).



- The cesarean section rate increased between 1995 and 2004. In 2004, there were 10,017 cesarean sections performed in Alberta, for a rate of 25.4 (per 100 hospital deliveries). About two-thirds of all cesareans were primary cesareans.
- Vaginal births after cesarean sections declined over time between 1995 and 2004. This applies to both the VBAC attempt rate and the VBAC occurrence rate. In 2004, VBACs were attempted after 31.3% of cesareans. VBACs actually occurred after 22.2% of cesareans.
- The VBAC success rate was stable from 1995 to 1998 and decreased from 1999 to 2004. In 2004, 71.0% of attempted VBACs were successful, down from 81.7% in 1995.
- The shoulder dystocia rate increased linearly with time between 1995 and 2004. The rate in 2004 was more than twice that of 1995. In 2004, there were 1,312 cases of shoulder dystocia, for a rate of 3.3 (per 100 hospital deliveries).

Maternal Age Effects (see Tables 3.3.3.8, 3.3.3.11)



- Teenage mothers are most likely to have an episiotomy, and the episiotomy rate decreases as maternal age increases. For 2002 to 2004 combined, the rate for women under 20 was 20.2 (per 100 vaginal deliveries).
- The shoulder dystocia rate was highest for mothers between 25 and 34, although the variation with maternal age group was not large.
- Maternal age data are not available for the other delivery indicators.

Regional Data (see Tables 3.3.3.2, 3.3.3.3, 3.3.3.5, 3.3.3.6, 3.3.3.9)

- Epidural rates vary widely by residence RHA. For 2002 to 2004 combined, the epidural analgesia rate was higher than the provincial average in RHAs 3 and 6, and lower in all other RHAs. The rate varied from 7.2% (RHA 2) of hospital deliveries to 53.2% (RHA 6).
- For 2002 to 2004 combined, episiotomy rates were lower than the provincial average in RHAs 1, 2, 3, and 7, and higher than the provincial average in RHAs 5, 6, and 9. Regional rates ranged from 11.8% of hospital deliveries (RHA 1) to 27.1% (RHA 9). The cesarean section rate was higher than the provincial average in RHAs 3, 4, and 5, and lower in the remaining RHAs for 2002 to 2004 combined. The rate varied from 20.5 (per 100 hospital deliveries) in RHA 2 to 27.3 in RHA 5.

3.3.3 Deliveries

Background (continued)

VBAC success rate: *Number of VBACs per 100 trials of labour.*

About half of all vaginal deliveries in Canada involve epidural analgesia (CIHI, 2004). Epidural analgesia tends to be most common in large urban hospitals (Truman, Jin, & Johnson, 2002). Epidurals are more common in first births, older mothers, and Caucasian mothers (Canadian Institute for Health Information, 2004).

Maternal injury is more common with forceps than with vacuum extraction. Cephalohematomas and retinal hemorrhages occur more often after vacuum extraction, while external ocular injuries and facial nerve palsies are more frequent following forceps use (Cargill, MacKinnon, et al., 2004).

The Society of Obstetricians and Gynaecologists of Canada states that routine episiotomy “does not reduce and may increase the incidence of maternal trauma”. Episiotomy is indicated in the rare case where the perineum is preventing delivery (Cargill, MacKinnon, et al., 2004).

The appropriate use of cesarean section is a current topic of debate, with many professional associations endorsing the provision of elective cesarean sections in the absence of medical indication (Anderson, 2004). Cesarean section rates show an increasing trend over the last several years in many industrialized countries

VBAC success rates are lower in the case of dystocia in a prior delivery, labour induction, and maternal obesity, and higher with a previous vaginal delivery (Landon, Leindecker, Spong, et al., 2005).

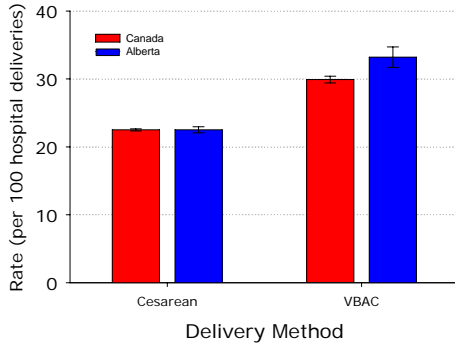
3.3.3 Deliveries

Background (continued)

The cesarean section rate was similar in Alberta and Canada in 2004, but the VBAC rate was higher in Alberta (Statistics Canada, 2006c).

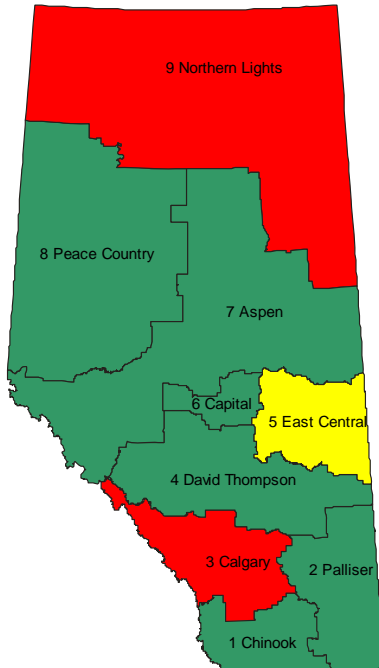
Cesarean and VBAC Delivery Rates, Canada and Alberta, 2004

Source: Statistics Canada (2006c)



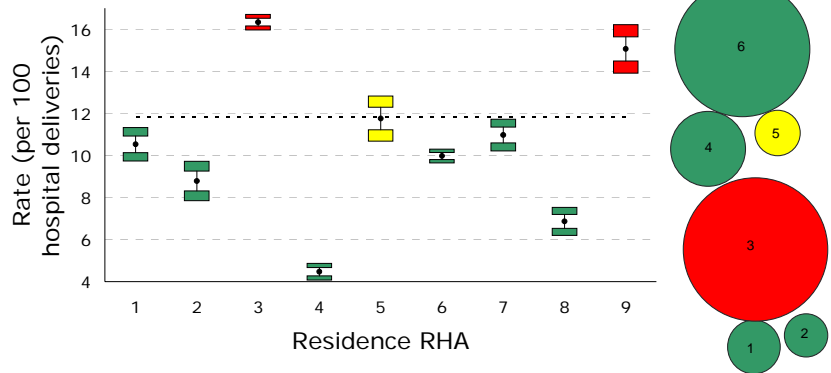
Shoulder dystocia is often associated with macrosomic infants. Prediction of macrosomia is unreliable; unexpected cases of shoulder dystocia often occur. Nerve damage and even death can result, but most cases do not result in chronic morbidity (Benjamin, 2005; Chauhan et al., 2005; Gherman, 2005).

Vacuum Extraction Rate 2002-04



Regional Data continued (see Tables 3.3.3.2, 3.3.3.3, 3.3.3.5, 3.3.3.6, 3.3.3.9)

Vacuum Extraction Rate by Residence RHA, Alberta, 2002 to 2004



- The vacuum extraction rate was significantly lower than the provincial average in RHAs 1, 2, 4, 6, 7, and 8 for 2002 to 2004 combined. The lowest rate was in RHA 4 (4.5 per 100 hospital deliveries). The vacuum extraction rate was significantly higher than the provincial average in RHAs 3 and 9, with the highest rate (16.3) in RHA 3.
- VBAC occurrence rates were lower than the provincial average in RHAs 2 and 8 between 2002 and 2004. The rate was higher than the provincial average in RHA 9 during that time period. Rates varied from 1.9 (per 100 VBACs + repeat cesareans) in RHA 8 to 3.8 in RHA 9.
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

Limitations and Methodology Notes

Maternal age data are unavailable for all measures except episiotomy and shoulder dystocia.

Because only primary, secondary, and tertiary ICD9-CM diagnostic and procedure codes were available from 1985 to 1992, the diagnostic and procedure criteria for all years from 1995 to 2001 were based on the first three codes only. Thus, the number of procedures (especially minor procedures) may be under-counted. Detailed criteria for data extraction are provided in Appendix 6.1.1.

See the Methodology and Limitations section in the Introduction (page 14) for a caution regarding comparison of 2002 deliveries data to data from prior years due to changes in data coding systems.

Table 3.3.3.1 Epidural Analgesia, Forceps and Vacuum Extraction Deliveries Cases and Rates, Alberta, 1995 to 2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Hospital deliveries	37,926	36,899	35,553	36,672	36,985	35,825	36,315	37,351	38,865	39,377
Epidural analgesia cases	-	-	-	-	-	12,904	13,958	14,781	16,253	16,651
Epidural analgesia rate (per 100 hospital deliveries)	-	-	-	-	-	36.0	38.4	39.6	41.8	42.3
Forceps deliveries	2,759	2,638	2,573	2,384	2,389	2,180	2,001	2,001	2,174	2,215
Forceps delivery rate (per 100 hospital deliveries)	7.3	7.1	7.2	6.5	6.5	6.1	5.5	5.4	5.6	5.6
Vacuum extraction deliveries	3,596	3,696	3,817	4,015	4,083	3,826	3,867	4,226	4,688	4,768
Vacuum extraction rate (per 100 hospital deliveries)	9.5	10.0	10.7	10.9	11.0	10.7	10.6	11.3	12.1	12.1

Table 3.3.3.2 Epidural Analgesia and Vacuum Extraction Deliveries and Rates by Residence RHA, Alberta, 2002 to 2004 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Hospital deliveries	5,963	3,653	41,066	10,911	3,599	33,845	6,918	5,782	3,856	115,593
Epidural analgesia cases	1,849	262	21,352	1,626	952	18,016	1,846	513	1,269	47,685
Epidural analgesia rate (per 100 hospital deliveries)	31.0	7.2	52.0	14.9	26.5	53.2	26.7	8.9	32.9	41.3
Standard Error (SE)	0.60	0.43	0.25	0.34	0.74	0.27	0.53	0.37	0.76	0.14
Vacuum extractions	628	321	6,709	488	423	3,376	759	397	581	13,682
Vacuum extraction rate (per 100 hospital deliveries)	10.5	8.8	16.3	4.5	11.8	10.0	11.0	6.9	15.1	11.8
Standard Error (SE)	0.40	0.47	0.18	0.20	0.54	0.16	0.38	0.33	0.58	0.10

Source: Epidural analgesia: Alberta Perinatal Health Program, June 2006 extraction.

Forceps, Vacuum extraction: Hospital Inpatient Files, June 2006 extraction.

Notes: Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.3.3.3 Epidural Analgesia, Forceps, and Vacuum Extraction Deliveries and Rates by Residence RHA and Year, Alberta, 2002 to 2004

<u>2002</u>	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Hospital deliveries	1,919	1,202	13,057	3,513	1,198	10,961	2,346	1,887	1,268	37,351
Epidural analgesia cases	565	92	6,727	425	262	5,592	569	172	377	14,781
Epidural analgesia rate (per 100 hospital deliveries)	29.4	7.7	51.5	12.1	21.9	51.0	24.3	9.1	29.7	39.6
Forceps deliveries	63	16	659	168	52	764	131	23	125	2,001
Forceps delivery rate (per 100 hospital deliveries)	3.3	1.3	5.0	4.8	4.3	7.0	5.6	1.2	9.9	5.4
Vacuum extraction deliveries	207	90	1,903	131	140	1,128	261	157	209	4,226
Vacuum extraction rate (per 100 hospital deliveries)	10.8	7.5	14.6	3.7	11.7	10.3	11.1	8.3	16.5	11.3

<u>2003</u>	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Hospital deliveries	2,036	1,212	13,904	3,706	1,153	11,346	2,258	1,988	1,262	38,865
Epidural analgesia cases	647	78	7,299	560	278	6,155	635	153	448	16,253
Epidural analgesia rate (per 100 hospital deliveries)	31.8	6.4	52.5	15.1	24.1	54.2	28.1	7.7	35.5	41.8
Forceps deliveries	58	12	674	237	67	871	108	32	115	2,174
Forceps delivery rate (per 100 hospital deliveries)	2.8	1.0	4.8	6.4	5.8	7.7	4.8	1.6	9.1	5.6
Vacuum extraction deliveries	209	118	2,343	181	123	1,135	258	134	187	4,688
Vacuum extraction rate (per 100 hospital deliveries)	10.3	9.7	16.9	4.9	10.7	10.0	11.4	6.7	14.8	12.1

<u>2004</u>	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Hospital deliveries	2,008	1,239	14,105	3,692	1,248	11,538	2,314	1,907	1,326	39,377
Epidural analgesia cases	637	92	7,326	641	412	6,269	642	188	444	16,651
Epidural analgesia rate (per 100 hospital deliveries)	31.7	7.4	51.9	17.4	33.0	54.3	27.7	9.9	33.5	42.3
Forceps deliveries	68	28	705	221	84	901	90	21	97	2,215
Forceps delivery rate (per 100 hospital deliveries)	3.4	2.3	5.0	6.0	6.7	7.8	3.9	1.1	7.3	5.6
Vacuum extraction deliveries	212	113	2,463	176	160	1,113	240	106	185	4,768
Vacuum extraction rate (per 100 hospital deliveries)	10.6	9.1	17.5	4.8	12.8	9.6	10.4	5.6	14.0	12.1

Source: Epidural analgesia: Alberta Perinatal Health Program, June 2006 extraction.

Forceps, Vacuum extraction: Hospital Inpatient Files, June 2006 extraction.

Notes: Totals for RHAs include unknown RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.3.3.4 Primary and Repeat Cesareans and VBACs and Rates, Alberta, 1995 to 2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Hospital deliveries	37,926	36,899	35,553	36,672	36,985	35,825	36,315	37,351	38,865	39,377
Cesarean sections	5,947	5,976	5,858	6,340	7,073	7,219	8,154	8,669	9,355	10,017
Cesarean rate (per 100 hospital deliveries)	15.7	16.2	16.5	17.3	19.1	20.2	22.5	23.2	24.1	25.4
Primary cesareans	3,887	3,975	3,848	4,177	4,719	4,829	5,401	5,655	6,088	6,395
Primary cesarean rate (per 100 hospital deliveries)	10.2	10.8	10.8	11.4	12.8	13.5	14.9	15.1	15.7	16.2
Repeat cesareans	2,060	2,001	2,010	2,163	2,354	2,390	2,753	3,014	3,267	3,622
Repeat cesarean rate (per 100 hospital deliveries)	5.4	5.4	5.7	5.9	6.4	6.7	7.6	8.1	8.4	9.2
VBAC attempts	1,915	1,930	1,836	1,880	1,702	1,594	1,594	1,445	1,511	1,458
VBAC attempt rate (per 100 VBACs and repeat cesareans)	52.8	54.0	52.3	51.0	45.6	43.8	40.1	35.6	34.7	31.3
VBAC occurrences	1,565	1,575	1,503	1,522	1,378	1,246	1,227	1,046	1,091	1,035
VBAC occurrence rate (per 100 VBACs and repeat cesareans)	43.2	44.0	42.8	41.3	36.9	34.3	30.8	25.8	25.0	22.2
VBAC success rate (per 100 attempted VBACs)	81.7	81.6	81.9	81.0	81.0	78.2	77.0	72.4	72.2	71.0

Table 3.3.3.5 VBACs and Cesarean Sections and Rate by Residence RHA, Alberta, 2002 to 2004 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Hospital deliveries	5,963	3,653	41,066	10,911	3,599	33,845	6,918	5,782	3,856	115,593
Cesarean sections	1,263	748	10,550	2,745	983	8,012	1,602	1,305	833	28,041
Rate (per 100 hospital deliveries)	21.2	20.5	25.7	25.2	27.3	23.7	23.2	22.6	21.6	24.3
Standard Error (SE)	0.53	0.67	0.22	0.42	0.74	0.23	0.51	0.55	0.66	0.13
VBAC occurrences	173	76	1,138	307	106	929	186	110	147	3,187
Rate (per 100 hospital deliveries)	2.9	2.1	2.8	2.8	2.9	2.7	2.7	1.9	3.8	2.8
Standard Error (SE)	0.22	0.24	0.08	0.16	0.28	0.09	0.19	0.18	0.31	0.05

Source: Hospital Inpatient Files, June 2006 extraction.

Notes: VBAC = vaginal birth after cesarean section.

Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.3.3.6 Primary and Repeat Cesareans and VBACs and Rates, by Residence RHA, Alberta, 2002 to 2004

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
2002										
Hospital deliveries	1,919	1,202	13,057	3,513	1,198	10,961	2,346	1,887	1,268	37,351
Cesarean sections	388	224	3,186	863	328	2,460	527	431	262	8,669
Cesarean rate (per 100 hospital deliveries)	20.2	18.6	24.4	24.6	27.4	22.4	22.5	22.8	20.7	23.2
Primary cesareans	245	143	2,157	556	205	1,571	340	279	159	5,655
Primary cesarean rate (per 100 hospital deliveries)	12.8	11.9	16.5	15.8	17.1	14.3	14.5	14.8	12.5	15.1
Repeat cesareans	143	81	1,029	307	123	889	187	152	103	3,014
Repeat cesarean rate (per 100 hospital deliveries)	7.5	6.7	7.9	8.7	10.3	8.1	8.0	8.1	8.1	8.1
VBAC attempts	67	45	583	120	30	411	85	45	59	1,445
VBAC attempt rate (per 100 VBACs and repeat cesareans)	34.2	39.5	41.5	30.0	20.0	34.2	33.2	23.4	40.7	35.6
VBAC occurrences	53	33	376	93	27	313	69	40	42	1,046
VBAC occurrence rate (per 100 VBACs and repeat cesareans)	27.0	28.9	26.8	23.3	18.0	26.0	27.0	20.8	29.0	25.8
VBAC success rate (per 100 attempted VBACs)	79.1	73.3	64.5	77.5	90.0	76.2	81.2	88.9	71.2	72.4

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
2003										
Hospital deliveries	2,036	1,212	13,904	3,706	1,153	11,346	2,258	1,988	1,262	38,865
Cesarean sections	429	232	3,607	863	291	2,684	535	438	276	9,355
Cesarean rate (per 100 hospital deliveries)	21.1	19.1	25.9	23.3	25.2	23.7	23.7	22.0	21.9	24.1
Primary cesareans	258	145	2,449	542	184	1,748	339	265	158	6,088
Primary cesarean rate (per 100 hospital deliveries)	12.7	12.0	17.6	14.6	16.0	15.4	15.0	13.3	12.5	15.7
Repeat cesareans	171	87	1,158	321	107	936	196	173	118	3,267
Repeat cesarean rate (per 100 hospital deliveries)	8.4	7.2	8.3	8.7	9.3	8.2	8.7	8.7	9.4	8.4
VBAC attempts	77	37	562	159	44	436	81	43	72	1,511
VBAC attempt rate (per 100 VBACs and repeat cesareans)	32.8	34.3	36.4	36.0	30.1	34.9	31.0	20.8	43.4	34.7
VBAC occurrences	64	21	386	121	39	313	65	34	48	1,091
VBAC occurrence rate (per 100 VBACs and repeat cesareans)	27.2	19.4	25.0	27.4	26.7	25.1	24.9	16.4	28.9	25.0
VBAC success rate (per 100 attempted VBACs)	83.1	56.8	68.7	76.1	88.6	71.8	80.2	79.1	66.7	72.2

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
2004										
Hospital deliveries	2,008	1,239	14,105	3,692	1,248	11,538	2,314	1,907	1,326	39,377
Cesarean sections	446	292	3,757	1,019	364	2,868	540	436	295	10,017
Cesarean rate (per 100 hospital deliveries)	22.2	23.6	26.6	27.6	29.2	24.9	23.3	22.9	22.2	25.4
Primary cesareans	265	187	2,488	613	222	1,851	320	266	183	6,395
Primary cesarean rate (per 100 hospital deliveries)	13.2	15.1	17.6	16.6	17.8	16.0	13.8	13.9	13.8	16.2
Repeat cesareans	181	105	1,269	406	142	1,017	220	170	112	3,622
Repeat cesarean rate (per 100 hospital deliveries)	9.0	8.5	9.0	11.0	11.4	8.8	9.5	8.9	8.4	9.2
VBAC attempts	69	36	543	127	45	446	70	48	74	1,458
VBAC attempt rate (per 100 VBACs and repeat cesareans)	29.1	28.3	33.0	25.5	24.7	33.8	25.7	23.3	43.8	31.2
VBAC occurrences	56	22	376	93	40	303	52	36	57	1,050
VBAC occurrence rate (per 100 VBACs and repeat cesareans)	23.6	17.3	22.9	18.6	22.0	23.0	19.1	17.5	33.7	22.5
VBAC success rate (per 100 attempted VBACs)	81.2	61.1	69.2	73.2	88.9	67.9	74.3	75.0	77.0	72.0

Source: Hospital Inpatient Files, June 2006 extraction.

Notes: VBAC = vaginal birth after cesarean section.

Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.3.3.7 Episiotomy Cases and Rate by Year, Alberta, 2000 to 2004

	2000	2001	2002	2003	2004
Number of cases	5,875	5,625	5,171	4,975	4,641
Number of vaginal deliveries	28,865	28,468	29,075	30,076	29,896
Rate (per 100 vaginal deliveries)	20.4	19.8	17.8	16.5	15.5
Standard Error (SE)	0.24	0.24	0.22	0.21	0.21

Table 3.3.3.8 Episiotomy Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	15-19	20-24	25-29	30-34	35-39	40-44	All
Number of cases	1,091	3,246	4,650	4,004	1,502	265	14,787
Number of vaginal deliveries	5,411	19,137	28,314	24,476	9,800	1,719	89,047
Rate (per 100 vaginal deliveries)	20.2	17.0	16.4	16.4	15.3	15.4	16.6
Standard Error (SE)	0.55	0.27	0.22	0.24	0.36	0.87	0.12

Table 3.3.3.9 Episiotomy Cases and Rate by Residence RHA, Alberta, 2002 to 2004 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Number of cases	559	427	4,499	1,359	550	5,074	730	667	806	14,787
Number of vaginal deliveries	4,721	2,944	31,019	8,417	2,578	26,001	5,386	4,395	2,973	89,047
Rate (per 100 vaginal deliveries)	11.8	14.5	14.5	16.1	21.3	19.5	13.6	15.2	27.1	16.6
Standard Error (SE)	0.47	0.65	0.20	0.40	0.81	0.25	0.47	0.54	0.82	0.12

Source: Alberta Perinatal Health Program, April 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.3.3.10 Shoulder Dystocia Cases and Rate by Year, Alberta, 1995 to 2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Shoulder dystocia cases	559	467	525	623	752	926	1,059	1,133	1,305	1,312
Hospital deliveries	38,398	37,274	36,304	37,419	37,841	36,647	37,180	38,146	39,675	40,233
Rate (per 100 hospital deliveries)	1.5	1.3	1.4	1.7	2.0	2.5	2.8	3.0	3.3	3.3
Standard Error (SE)	0.06	0.06	0.06	0.07	0.07	0.08	0.09	0.09	0.09	0.09

Table 3.3.3.11 Shoulder Dystocia Cases and Rate by Maternal Age Group, Alberta, 1995 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Shoulder dystocia cases	444	1,697	2,835	2,566	972	147	8,661
Hospital deliveries	25,131	77,816	118,802	105,667	44,260	7,438	379,117
Rate (per 100 hospital deliveries)	1.8	2.2	2.4	2.4	2.2	2.0	2.3
Standard Error (SE)	0.08	0.05	0.04	0.05	0.07	0.16	0.02

Source: Fee-For-Service Claims Files, Alberta Health and Wellness, extracted May 2006.

Ambulatory Care Classification System (ACCS), Alberta Health and Wellness, extracted May 2006.

Hospital Inpatient Files, Alberta Health and Wellness, May 2006 extraction.

Notes: Diagnostic codes: ICD-9=660.4, ICD-10=O66.0

Data include Alberta residents only.

Totals for age groups include unknown ages.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

3. Pregnancies

3.1 Estimated Pregnancies

3.2 Spontaneous Abortions

3.3 Reproductive Care Services

3.4 Maternal Factors

3.4.1 Maternal Age

3.4.2 Maternal Pre-Pregnancy Conditions

3.4.3 Maternal Prenatal Morbidity

3.4.4 Maternal Prenatal Smoking

3.4.5 Maternal Prenatal Alcohol Consumption

3.4.6 Maternal Prenatal Street Drug Use

3.4.1 Maternal Age

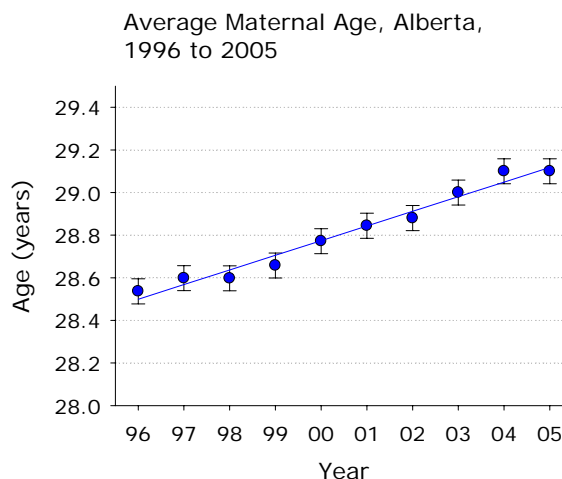
Background

Maternal age refers to *the age of the mother in years at the time of the event in question (i.e., live birth, stillbirth, spontaneous abortion, etc.)*. Average maternal age calculations used exact maternal age (e.g., 28.2 years), whereas groupings by maternal age group used mother's age at last birthday (e.g., 28 years).

Early childbearing (under age 20) is associated with many of the risk factors for poor birth outcome, including poor prenatal care, inadequate weight gain during pregnancy, and maternal smoking. There are higher rates of preterm birth, low birth weight, and infant mortality in babies born to adolescent mothers. Teenage mothers also have increased risk of maternal morbidity, including anemia, hypertension, renal disease, eclampsia, and depressive disorders (Dryburgh, 2001; Menacker, Marton, McDorman, & Ventura, 2004). U.S. data suggest that adolescents are delaying sexual activity longer, using contraception more often, and using more effective methods of contraception, resulting in declining teen pregnancy rates (Abma, Martinez, Mosher, & Dawson, 2004).

Delayed childbearing (past the age of 35) comes with decreased fertility and increased rates of spontaneous abortion, chromosomal abnormalities, hypertensive complications, and stillbirth (Heffner, 2004). Infants born to older mothers are more likely to be low birth weight, preterm, or multiples (Tough, Newburn-Cook, Johnston, Svenson, Rose, & Belik, 2002).

Time Trends (see Table 3.4.1.1)



- The average maternal age for all live births increased steadily between 1996 and 2005. In 2005, the average age of a woman giving birth to a live infant in Alberta was 29.1 years.
- The average age at first live birth was 27.4 years in 2005.
- In 2005, the average age for women having multiple live births was 1.6 years higher than the average for all live births.
- The percent of women over 35 giving birth to live infants also increased between 1996 and 2005. In 2005, 15.1% of women having live births were at least 35 years old; this is up from 12.7% in 1996.

Maternal Age Effects (see Table 3.4.1.2)

- Some measures decrease with maternal age for women under 35. This applies to smoking and alcohol consumption. Teen mothers are most likely to engage in these risk behaviours, and the rate decreases up to the 30-34 age group.
- Some indicators show an increase with increasing maternal age. This can be seen in the rates of multiple birth and midwife attendance, both of which are most common in the oldest mothers.
- Other indicators have a U-shaped relationship with maternal age, such as small-for-gestational age, low birth weight, preterm birth, and stillbirth. In these cases, the highest rates occur in the younger and older mothers, with lower rates for intermediate maternal age groups.
- In general, the most positive outcomes occur with maternal ages between 25 and 34.

Regional Data (see Tables 3.4.1.3, 3.4.1.4)

- Average maternal age was lower than the provincial average in all RHAs except RHAs 3 and 6 (the major metropolitan areas), where it was higher than the provincial mean for 2003 to 2005 combined.
- The highest average maternal age was in RHA 3. The average age in RHA 3 was more than three years higher than the average in RHA 8 between 2003 and 2005.

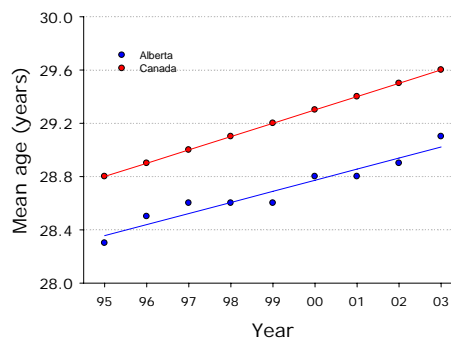
3.4.1 Maternal Age

Background (continued)

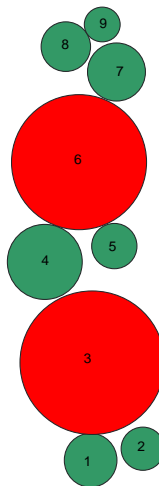
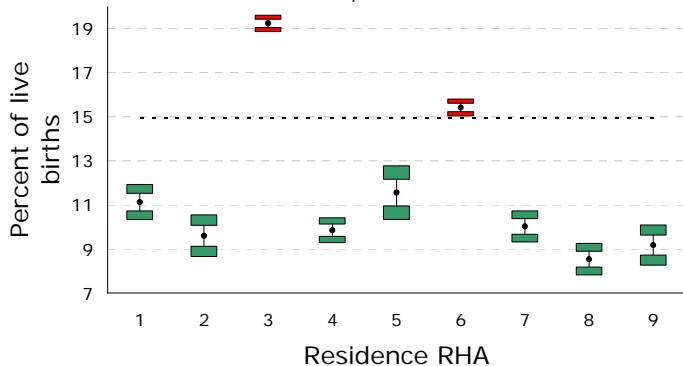
Maternal age continues to increase in both Alberta and Canada. Women giving birth to live infants are about 6 months younger in Alberta than in Canada, on average. In 2003, the mean maternal age was 29.6 years in Canada and 29.1 years in Alberta (Statistics Canada, 2005b).

Mean maternal age, Alberta and Canada, 1995 to 2003

Source: Statistics Canada (1997, 1999a, b, 2000, 2002, 2005b)



Percent of Live Births to Women 35 and Over, by Residence RHA, Alberta, 2003 to 2005



- The percent of live births to women 35 and over showed a similar pattern by residence RHA for 2003 to 2005 combined; the highest percentage was in RHAs 3 and 6, particularly 3, where almost one in five women giving birth in 2005 was at least 35 years old.
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

Percent of Live Births to Women 35 and Over, 2003-05

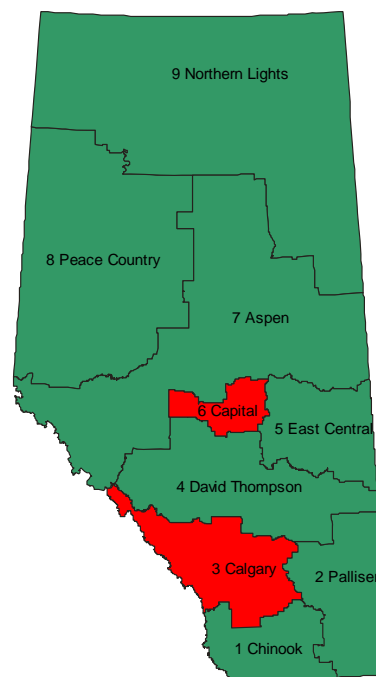


Table 3.4.1.1 Mean Maternal Age for Selected Types of Birth and Percent of Women 35 and Older Giving Birth to Live Infants, by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
All live births	28.5	28.6	28.6	28.7	28.8	28.8	28.9	29.0	29.1	29.1
First live birth	26.6	26.8	26.7	26.7	26.9	27.0	27.0	27.3	27.4	27.4
Singleton live birth	28.5	28.6	28.5	28.6	28.7	28.8	28.8	29.0	29.0	29.1
Multiple live birth	29.3	30.3	30.4	30.6	30.5	30.6	30.5	30.6	30.9	30.7
Stillbirth	29.0	28.9	28.7	29.1	28.9	29.8	29.5	28.7	29.2	29.5
Percent of live births to women 35+	12.7	13.4	13.3	14.2	14.7	14.6	14.5	14.9	14.8	15.1

Table 3.4.1.2 Selected Indicators by Maternal Age Group, Alberta, 2003 - 2005 Combined

	<20	20-24	25-29	30-34	35-39	>39	Total
Smoking during pregnancy rate (per 100 live births) ¹	53.3	36.0	17.7	11.3	12.1	12.3	20.5
Alcohol consumption during pregnancy rate (per 100 live births) ¹	10.9	5.9	3.2	2.5	3.2	3.4	3.9
Small-for-gestational-age singleton rate (per 100 singleton live births)	8.7	8.5	7.6	7.0	7.8	9.7	7.7
Large for gestational age singleton rate (per 100 singleton live births)	10.8	10.5	11.3	12.5	12.4	12.6	11.6
Mean birth weight for singleton term births	3,468	3,458	3,473	3,490	3,467	3,439	3,473
Low birth weight rate (per 100 live births)	7.2	6.4	5.8	6.1	7.8	9.8	6.4
High birth weight rate (per 100 live births)	12.1	11.2	11.5	12.1	11.6	11.2	11.6
Preterm rate (per 100 live births)	9.5	8.7	8.5	8.7	10.5	12.7	9.0
Multiple birth rate (per 100 live births)	1.7	2.3	2.8	3.9	4.9	5.1	3.3
Midwife attendant rate (per 1,000 live births)	3.9	6.9	12.4	16.4	17.6	18.8	12.8
Stillbirths (per 1,000 total births)	10.5	7.0	5.4	6.2	7.9	10.9	6.7

Table 3.4.1.3 Mean Maternal Age and Percent of Live Births to Women 35 and Older, by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
All live births	27.8	27.8	30.3	27.6	28.3	29.3	27.4	27.2	27.3	29.1
Percent of live births to women 35+	11.1	9.6	19.2	9.9	11.6	15.4	10.0	8.5	9.2	14.9

Source: Vital Statistics, Birth and Stillbirth Files, Department of Government Services, March 2006 release.

Alberta Perinatal Health Program, April 2006 release.

Notes: Only births for which maternal age is known are included.

1. Only live births with available information on maternal smoking or alcohol consumption are included.

Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.4.1.4 Mean Maternal Age and Percent of Births to Women 35 and Older by Residence RHA, Alberta, 1996 to 2005

Mean maternal age	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	27.4	27.4	27.4	27.4	27.8	27.6	27.7	27.7	27.8	27.9
Palliser	27.5	27.6	27.5	27.4	27.4	27.6	27.5	27.8	27.7	27.8
Calgary	29.7	29.7	29.7	29.8	29.8	30.0	30.0	30.2	30.2	30.4
David Thompson	27.5	27.4	27.6	27.4	27.5	27.4	27.7	27.5	27.7	27.6
East Central	27.8	28.3	28.4	28.4	28.4	28.5	28.6	28.3	28.4	28.3
Capital	28.9	28.9	28.8	29.0	29.0	29.1	29.1	29.3	29.3	29.3
Aspen	27.0	27.1	27.2	27.0	27.3	27.3	27.4	27.4	27.2	27.4
Peace Country	26.8	27.0	26.7	26.9	26.9	27.1	27.1	27.0	27.3	27.3
Northern Lights	26.5	26.6	26.7	26.6	27.0	27.1	26.9	27.4	27.3	27.3
Alberta	28.5	28.6	28.6	28.7	28.8	28.8	28.9	29.0	29.1	29.1

Percent of live births to women 35+	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	9.2	11.2	9.3	9.7	11.4	10.8	11.4	10.7	11.5	11.3
Palliser	8.6	8.3	8.9	8.3	7.9	8.9	10.0	9.1	9.9	9.8
Calgary	16.8	17.4	17.1	18.5	18.6	18.7	18.3	19.3	18.7	19.7
David Thompson	9.2	9.6	9.5	9.8	10.0	10.0	10.5	9.5	10.1	9.9
East Central	8.0	11.9	11.1	11.0	12.9	12.2	12.2	11.7	11.6	11.4
Capital	13.1	13.9	14.1	15.6	15.3	15.2	15.3	15.6	15.5	15.2
Aspen	8.3	8.1	8.7	8.1	11.0	9.4	9.7	10.1	9.2	10.7
Peace Country	7.8	7.6	8.0	8.6	9.2	9.0	8.5	8.2	9.0	8.4
Northern Lights	7.3	9.2	8.5	6.8	9.6	9.6	7.9	9.8	8.9	8.8
Alberta	12.7	13.4	13.3	14.2	14.7	14.6	14.5	14.9	14.8	15.1

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

3.4.2 Maternal Pre-Pregnancy Conditions

Background

Maternal obesity: *Pre-pregnancy weight of more than 91 kg.*

Diabetes (diabetes mellitus): *A chronic syndrome of impaired carbohydrate, protein, and fat metabolism owing to insufficient secretion of insulin or to target tissue insulin resistance. Diabetes occurs in two major forms: Type 1 diabetes mellitus and Type 2 diabetes mellitus (Dorland, 2000).*

Heart disease: *Any organic, mechanical, or functional abnormality of the heart, its structures, or the coronary arteries (Dorland, 2000).* This category includes women with asymptomatic or symptomatic heart disease.

Hypertension: *High arterial blood pressure, diagnosed prior to pregnancy.* In this case, this includes women who had blood pressure of 140/90 or higher, or women who were using antihypertensive drugs.

Chronic renal disease: *Any disease of the kidney persisting over a long period of time.*

Rates for the above measures are expressed in terms of percent of women (with a completed antenatal risk assessment) delivering.

Prepregnancy maternal obesity is associated with increased rates of pregnancy-induced hypertension, antepartum venous thromboembolism, labour induction, cesarean delivery, and wound infection (Robinson et al., 2005). There is increased fetal risk, including macrosomia, neural tube defects, stillbirth, and neonatal death (Kristensen et al., 2005; Ray et al., 2005; Rosenberg et al., 2003).

Maternal obesity (see Tables 3.4.2.1 to .3)

- Maternal obesity is common in Alberta. 8.8% of Alberta women (one of out every 11 women) giving birth in 2004 weighed more than 91 kg prior to pregnancy. This rate increased between 2000 and 2004.
- The rate of maternal obesity was lowest in mothers under the age of 25 between 2002 and 2004.
- Maternal obesity was below the provincial mean in RHA 3, and above the mean in RHA 2 and the northern parts of the province (RHAs 5 through 9).

Pre-pregnancy diabetes (see Tables 3.4.2.4 to.5)

- Pre-conception diabetes was reported in 0.6% of women giving birth in Alberta. This rate did not vary with time between 2000 and 2004.
- The rate of pre-conception diabetes increased steadily with maternal age for women under 40 between 2002 and 2004, and was markedly higher for women over the age of 39. The rate was 1.5% for women over 39 years, compared with 0.3% for women under 20.

Pre-pregnancy heart disease (see Tables 3.4.2.6 to .7)

- The rate of heart disease in women giving birth was 0.7% in 2004; the rate did not vary with time between 2000 and 2004.
- Heart disease was more common in older mothers. The rate for women over 39 was 1.1%, compared with 0.4% for women under 20.

Pre-pregnancy hypertension (see Tables 3.4.2.8 to .9)

- Pre-existing hypertension occurred in 0.7% of Alberta women giving birth in 2004; the rate did not vary with time.
- Between 2002 and 2004, the rate of pre-existing hypertension increased with maternal age, with rates notably higher in women 35 and older. The rate was 1.7% for women over 39, and 0.4% for women under 20.

Pre-pregnancy renal disease (see Table 3.4.2.10)

- Chronic renal disease was rare, with a rate of 0.1% and no significant variations with time, maternal age, or region.

Limitations and Methodology Notes

Note that rates include only women with a completed antenatal risk assessment on the Alberta Delivery Record. For 2002 to 2004 combined, less than 1% of women delivering did not have a completed risk assessment.

Regional data were excluded for all measures except Maternal Obesity due to low numbers of cases.

3.4.2 Maternal Pre-Pregnancy Conditions

Background (continued)

Pre-conception diabetes is associated with increased risk during pregnancy, including diabetic complications, preeclampsia, gestational hypertension, cesarean section, congenital anomalies, macrosomia, and neonatal hypoglycemia (Ryan, 1998).

Women with heart disease have elevated rates of neonatal risk and cardiac events during pregnancy. In one study of Canadian women with cardiac disease, 13% had a cardiac event during pregnancy (primarily pulmonary edema or cardiac arrhythmia), and the rates of fetal or neonatal death and preterm birth were elevated (Siu et al., 2001).

Hypertension in pregnancy is a risk factor for preeclampsia, gestational diabetes, and placental abruption (Zetterstrom et al., 2005). Rates of perinatal mortality, preterm birth, and low birth weight are increased in the case of maternal hypertension (Livingston & Sibai, 2001).

Kidney disease can result in maternal morbidity (including maternal hypertension, pre-eclampsia, and abruptio placenta), perinatal morbidity (e.g., preterm birth, low birth weight) or mortality (maternal or perinatal). Risks are proportional to the severity of renal dysfunction (Fischer et al., 2004; Sanders & Lucas, 2001). Maternal renal function may decline after pregnancy in women with kidney disease (Davison, 2001).

Table 3.4.2.1 Maternal Obesity Cases and Rate by Year, Alberta, 2000 to 2004

	2000	2001	2002	2003	2004
Number of cases	2,619	2,939	3,216	3,294	3,510
Number of women	35,114	36,215	37,675	39,283	39,662
Rate (per 100 women delivering)	7.5	8.1	8.5	8.4	8.8
Standard Error (SE)	0.14	0.14	0.14	0.14	0.14

Table 3.4.2.2 Maternal Obesity Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Number of cases	357	1,879	3,367	2,950	1,255	201	10,020
Number of women	6,383	23,313	36,241	33,316	14,347	2,783	116,620
Rate (per 100 women delivering)	5.6	8.1	9.3	8.9	8.7	7.2	8.6
Standard Error (SE)	0.29	0.18	0.15	0.16	0.24	0.49	0.08

Table 3.4.2.3 Maternal Obesity Cases and Rate by Residence RHA, Alberta, 2002 to 2004 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Number of cases	536	398	2,903	958	388	3,161	705	540	364	10,020
Number of women	6,010	3,713	41,628	10,959	3,475	33,991	6,702	5,625	3,740	116,620
Rate (per 100 women delivering)	8.9	10.7	7.0	8.7	11.2	9.3	10.5	9.6	9.7	8.6
Standard Error (SE)	0.37	0.51	0.12	0.27	0.53	0.16	0.37	0.39	0.48	0.08

Source: Alberta Perinatal Health Program, April 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.4.2.4 Pre-Conception Diabetes Cases and Rate by Year, Alberta, 2000 to 2004

	2000	2001	2002	2003	2004
Number of cases	257	279	217	233	236
Number of women	35,114	36,215	37,675	39,283	39,662
Rate (per 100 women delivering)	0.7	0.8	0.6	0.6	0.6
Standard Error (SE)	0.05	0.05	0.04	0.04	0.04

Table 3.4.2.5 Pre-Conception Diabetes Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Number of cases	19	89	190	226	119	41	686
Number of women	6,383	23,313	36,241	33,316	14,347	2,783	116,620
Rate (per 100 women delivering)	0.3	0.4	0.5	0.7	0.8	1.5	0.6
Standard Error (SE)	0.07	0.04	0.04	0.04	0.08	0.23	0.02

Source: Alberta Perinatal Health Program, April 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.4.2.6 Heart Disease Cases and Rate by Year, Alberta, 2000 to 2004

	2000	2001	2002	2003	2004
Number of cases	246	284	272	320	283
Number of women	35,114	36,215	37,675	39,283	39,662
Rate (per 100 women delivering)	0.7	0.8	0.7	0.8	0.7
Standard Error (SE)	0.04	0.05	0.04	0.05	0.04

Table 3.4.2.7 Heart Disease Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Number of cases	23	142	238	290	149	31	875
Number of women	6,383	23,313	36,241	33,316	14,347	2,783	116,620
Rate (per 100 women delivering)	0.4	0.6	0.7	0.9	1.0	1.1	0.8
Standard Error (SE)	0.07	0.05	0.04	0.05	0.08	0.20	0.03

Source: Alberta Perinatal Health Program, April 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.4.2.8 Hypertension Cases and Rate by Year, Alberta, 2000 to 2004

	2000	2001	2002	2003	2004
Number of cases	227	289	275	281	268
Number of women	35,114	36,215	37,675	39,283	39,662
Rate (per 100 women delivering)	0.6	0.8	0.7	0.7	0.7
Standard Error (SE)	0.04	0.05	0.04	0.04	0.04

Table 3.4.2.9 Hypertension Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Number of cases	25	112	228	250	160	48	824
Number of women	6,383	23,313	36,241	33,316	14,347	2,783	116,620
Rate (per 100 women delivering)	0.4	0.5	0.6	0.8	1.1	1.7	0.7
Standard Error (SE)	0.08	0.05	0.04	0.05	0.09	0.25	0.02

Source: Alberta Perinatal Health Program, April 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.4.2.10 Renal Disease Cases and Rate by Year, Alberta, 2000 to 2004

	2000	2001	2002	2003	2004
Number of cases	39	34	41	33	39
Number of women	35,114	36,215	37,675	39,283	39,662
Rate (per 100 women delivering)	0.1	0.1	0.1	0.1	0.1
Standard Error (SE)	0.02	0.02	0.02	0.01	0.02

Source: Alberta Perinatal Health Program, April 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

3.4.3 Maternal Prenatal Morbidity

Background

Gestational diabetes: *Diabetes mellitus with onset or first recognition during pregnancy; this category does not include diabetics who become pregnant* (Dorland, 2000).

Pregnancy-induced hypertension: *High arterial blood pressure with onset during pregnancy.*

Prenatal bleeding: *Vaginal bleeding during pregnancy.* In this case, bleeding is classified as occurring prior to 20 weeks gestation, at 20 weeks gestation or later, or at both before and after 20 weeks gestation.

Rates for the above measures are expressed in terms of percent of women (with a completed antenatal risk assessment) delivering.

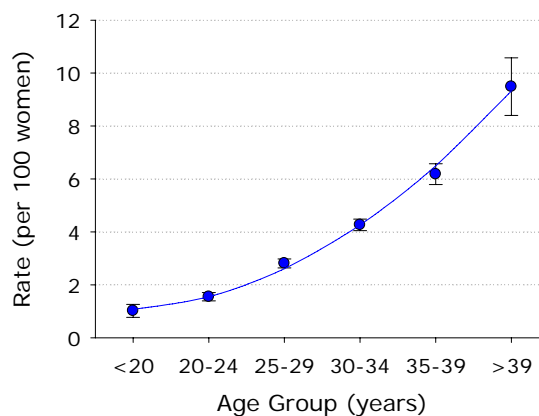
The primary infant morbidities linked with gestational diabetes are macrosomia (and associated birth injuries) and neonatal hypoglycemia (Ryan, 1998). Risk factors include obesity, age over 25 years, previous history of abnormal glucose metabolism, familial history of diabetes, and membership in an ethnic group with a high diabetes rate (Jovanovic & Pettitt, 2001).

Bleeding during early pregnancy may be indicative of ectopic pregnancy, spontaneous abortion, incompetent cervix, placental abnormalities, genital infection, trauma or systemic disease. Adverse outcomes include preterm birth, low birth weight, and perinatal death. Older mothers, mothers with prior preterm births, and women exposed to cigarette smoke are at risk (Yang et al., 2005).

Gestational diabetes (see Tables 3.4.3.1 to .3)

- The provincial gestational diabetes rate was 3.6% in 2004. This rate was somewhat higher in 2002 and 2004 than the other years between 1999 and 2004.

Gestational Diabetes Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined



- Gestational diabetes was far more common in older mothers (9.5% for women over 39) than in younger mothers (1.0% for women under 20) between 2002 and 2004.
- The rate of gestational diabetes was higher than the provincial average in RHAs 3 and 6 (where average maternal age is higher) and lower than the provincial average in all other RHAs except RHA 2.

Pregnancy-Induced hypertension (see Tables 3.4.3.4 to .6)

- Pregnancy-induced hypertension occurred in 5.2% of Alberta women giving birth in 2004. The rate was lower in 2000 than in the succeeding four years.
- The rate of pregnancy-induced hypertension increased with maternal age for 2002 to 2004 combined, from 4.4% in women under 20 to 6.9% in women over 39.
- Relative to the provincial average, the rate was higher in RHAs 3 and 5 and lower in RHAs 1 and 2.

Prenatal bleeding (see Tables 3.4.3.7 to .12)

- In 2004, prenatal bleeding before 20 weeks gestation was reported in 5.9% of women giving birth, and in 3.5% of women at or after 20 weeks gestation. Just 0.8% of women experienced prenatal bleeding both before and after 20 weeks gestation.
- Bleeding before 20 weeks was reported less often by women under 20 years than women in other age groups, while bleeding after 20 weeks was more common in women over 39 years for 2002 to 2004 combined. Rate of bleeding both before and after 20 weeks did not vary systematically with maternal age.

Limitations and Methodology Notes

Note that rates include only women with a completed antenatal risk assessment on the Alberta Delivery Record. For 2002 to 2004 combined, less than 1% of women delivering did not have a completed risk assessment.

3.4.3 Maternal Prenatal Morbidity

Table 3.4.3.1 Gestational Diabetes Cases and Rate by Year, Alberta, 2000 to 2004

	2000	2001	2002	2003	2004
Number of cases	1,133	1,123	1,348	1,247	1,425
Number of women	35,114	36,215	37,675	39,283	39,662
Rate (per 100 women delivering)	3.2	3.1	3.6	3.2	3.6
Standard Error (SE)	0.09	0.09	0.10	0.09	0.09

Table 3.4.3.2 Gestational Diabetes Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Number of cases	65	362	1,019	1,422	887	264	4,020
Number of women	6,383	23,313	36,241	33,316	14,347	2,783	116,620
Rate (per 100 women delivering)	1.0	1.6	2.8	4.3	6.2	9.5	3.4
Standard Error (SE)	0.13	0.08	0.09	0.11	0.20	0.56	0.05

Table 3.4.3.3 Gestational Diabetes Cases and Rate by Residence RHA, Alberta, 2002 to 2004 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Number of cases	162	125	1,647	311	94	1,263	180	145	70	4,020
Number of women	6,010	3,713	41,628	10,959	3,475	33,991	6,702	5,625	3,740	116,620
Rate (per 100 women delivering)	2.7	3.4	4.0	2.8	2.7	3.7	2.7	2.6	1.9	3.4
Standard Error (SE)	0.21	0.30	0.10	0.16	0.28	0.10	0.20	0.21	0.22	0.05

Source: Alberta Perinatal Health Program, April 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.4.3.4 Pregnancy-Induced Hypertension Cases and Rate by Year, Alberta, 2000 to 2004

	2000	2001	2002	2003	2004
Number of cases	1,716	1,955	1,942	2,053	2,046
Number of women	35,114	36,215	37,675	39,283	39,662
Rate (per 100 women delivering)	4.9	5.4	5.2	5.2	5.2
Standard Error (SE)	0.12	0.12	0.11	0.11	0.11

Table 3.4.3.5 Pregnancy-Induced Hypertension Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Number of cases	279	1,108	1,933	1,725	801	191	6,041
Number of women	6,383	23,313	36,241	33,316	14,347	2,783	116,620
Rate (per 100 women delivering)	4.4	4.8	5.3	5.2	5.6	6.9	5.2
Standard Error (SE)	0.26	0.14	0.12	0.12	0.19	0.48	0.06

Table 3.4.3.6 Pregnancy-Induced Hypertension Cases and Rate by Residence RHA, Alberta, 2002 to 2004 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Number of cases	241	138	2,304	595	225	1,704	317	275	192	6,041
Number of women	6,010	3,713	41,628	10,959	3,475	33,991	6,702	5,625	3,740	116,620
Rate (per 100 women delivering)	4.0	3.7	5.5	5.4	6.5	5.0	4.7	4.9	5.1	5.2
Standard Error (SE)	0.25	0.31	0.11	0.22	0.42	0.12	0.26	0.29	0.36	0.06

Source: Alberta Perinatal Health Program, April 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.4.3.7 Bleeding Before 20 Weeks Cases and Rate by Year, Alberta, 2000 to 2004

	2000	2001	2002	2003	2004
Number of cases	2,072	2,021	2,162	2,346	2,349
Number of women	35,114	36,215	37,675	39,283	39,662
Rate (per 1,000 women)	5.9	5.6	5.7	6.0	5.9
Standard Error (SE)	0.13	0.12	0.12	0.12	0.12

Table 3.4.3.8 Bleeding Before 20 Weeks Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Number of cases	267	1,298	2,221	2,035	851	179	6,857
Number of women	6,383	23,313	36,241	33,316	14,347	2,783	116,620
Rate (per 1,000 women)	4.2	5.6	6.1	6.1	5.9	6.4	5.9
Standard Error (SE)	0.25	0.15	0.13	0.13	0.20	0.47	0.07

Source: Alberta Perinatal Health Program, April 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.4.3.9 Bleeding After 20 Weeks Cases and Rate by Year, Alberta, 2000 to 2004

	2000	2001	2002	2003	2004
Number of cases	1,195	1,172	1,186	1,470	1,400
Number of women	35,114	36,215	37,675	39,283	39,662
Rate (per 100 women delivering)	3.4	3.2	3.1	3.7	3.5
Standard Error (SE)	0.10	0.09	0.09	0.10	0.09

Table 3.4.3.10 Bleeding After 20 Weeks Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Number of cases	270	832	1,195	1,110	506	141	4,056
Number of women	6,383	23,313	36,241	33,316	14,347	2,783	116,620
Rate (per 100 women delivering)	4.2	3.6	3.3	3.3	3.5	5.1	3.5
Standard Error (SE)	0.25	0.12	0.09	0.10	0.15	0.42	0.05

Source: Alberta Perinatal Health Program, April 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.4.3.11 Bleeding Before and After 20 Weeks Cases and Rate by Year, Alberta, 2000 to 2004

	2000	2001	2002	2003	2004
Number of cases	249	239	240	314	305
Number of women	35,114	36,215	37,675	39,283	39,662
Rate (per 100 women delivering)	0.7	0.7	0.6	0.8	0.8
Standard Error (SE)	0.04	0.04	0.04	0.04	0.04

Table 3.4.3.12 Bleeding Before and After 20 Weeks Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Number of cases	39	159	278	240	110	32	859
Number of women	6,383	23,313	36,241	33,316	14,347	2,783	116,620
Rate (per 100 women delivering)	0.6	0.7	0.8	0.7	0.8	1.1	0.7
Standard Error (SE)	0.10	0.05	0.05	0.05	0.07	0.20	0.03

Source: Alberta Perinatal Health Program, April 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

3.4.4 Maternal Prenatal Smoking

Background

Smokers are *women who reported smoking cigarettes at some point during pregnancy.*

The rate of maternal prenatal smoking is reported as percent of live births.

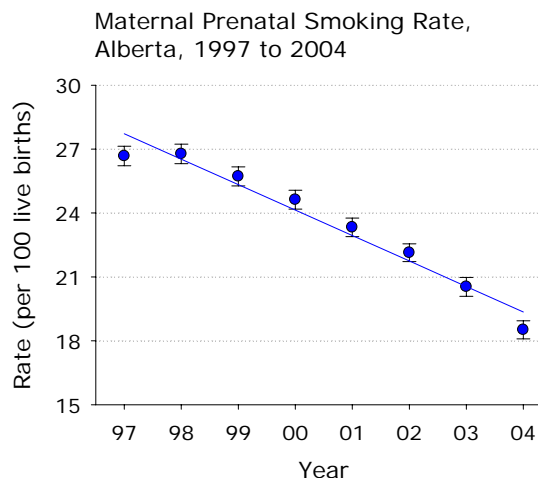
Fertility rates are lower while rates of ectopic pregnancy and spontaneous abortion are higher among smokers than among non-smokers. Smoking during pregnancy substantially increases the risk of placental abruption and placenta previa. Adverse pregnancy outcomes include fetal growth restriction, preterm birth, perinatal and neonatal mortality, oral-facial clefts, and sudden infant death syndrome (Cnattingus, 2004).

Risk factors for smoking during pregnancy in Canada include Aboriginal ethnicity, low income, young maternal age (particularly under 20), and heavy smoking prior to pregnancy (Devries & Greaves, 2004). Although smoking during pregnancy is considered the most preventable cause of perinatal morbidity and mortality, smoking cessation programs have met with limited results (Cnattingus, 2004).

In 2000/01, 19% of Albertan women and 17% of Canadian women who had given birth during the previous five years reported smoking. In addition, 19% of Albertan women and 17% of Canadian women were regularly exposed to smoking during or after pregnancy even though they did not smoke during pregnancy.

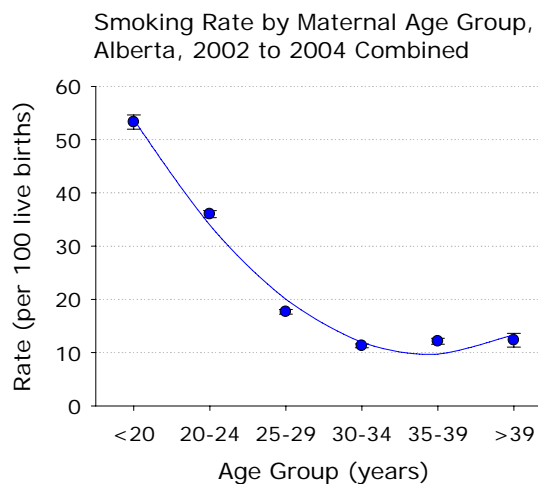
This means that more than one third of pregnant women regularly inhaled cigarette smoke (Millar & Hill, 2004).

Time Trends (see Table 3.4.4.1)



- The maternal prenatal smoking data shows a steady rate of decline between 1997 and 2004.
- In 1997, 26.7% of mothers having live births reported smoking at some point during pregnancy, compared with 18.5% in 2004.

Maternal Age Trends (see Table 3.4.4.2)

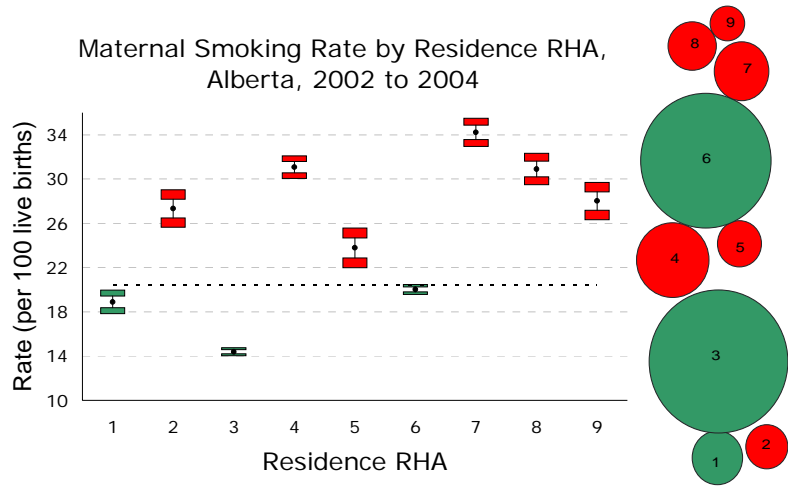


- Young mothers are most likely to smoke during pregnancy in Alberta. For 2002 to 2004 combined, more than half of teenage mothers smoked during pregnancy.
- In contrast, just over one in ten mothers age 30 and over smoked during pregnancy.

Relationship to Other Indicators (see Table 3.4.4.4)

- Women who smoke during pregnancy are younger, and are more likely to have low birth weight or preterm babies, than women who do not smoke during pregnancy.
- In 2002 to 2004, the average birth weight for live babies born to smokers was 3,259 grams, compared with 3,397 for non-smokers.

Regional Data (see Table 3.4.4.3)



- For 2002 to 2004 combined, maternal prenatal smoking rates were lower than the provincial average in RHAs 1, 3, and 6, with the lowest rate in RHA 3 (14.4 per 100 live births).
- The rate was higher than the provincial average in the remaining RHAs. The highest rate was 34.2, in RHA 7.
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

Limitations and Methodology Notes

Maternal prenatal smoking data are self-reported, and thus are subject to the biases inherent in such data (e.g., inaccurate reporting due to social desirability issues).

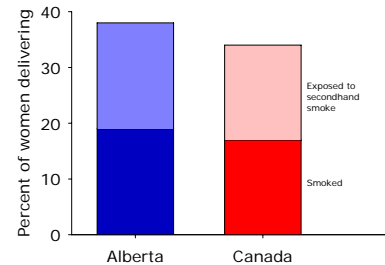
Data on maternal smoking, alcohol consumption, street drug use, and prenatal class attendance for live births are derived from the Vital Statistics Notice of Live Birth or Stillbirth. This information is not complete for all births; analyses include only those births for which the relevant information is available.

3.4.4 Maternal Prenatal Smoking

Background (continued)

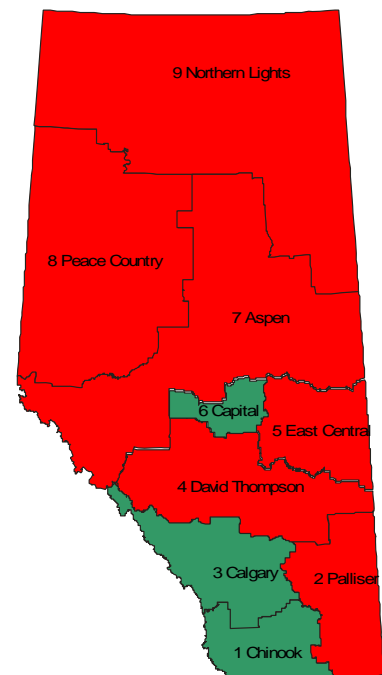
Women Smoking or Exposed to Secondhand Smoke While Pregnant, Alberta and Canada, 2000/01

Source: Millar & Hill (2004)



In a 2004 study, 21% of 15-24 year old women who had been pregnant in the last five years reported smoking during pregnancy, compared with 7% of women over 25 (Health Canada, 2004).

Maternal Prenatal Smoking Rate (per 100 live births)



3.4.4 Maternal Prenatal Smoking

Limitations and Methodology Notes (continued)

On new Notice of Live Birth or Stillbirth forms distributed in 2000, the “Quit” option for the question “During this pregnancy did mother smoke?” was not available, leaving “Yes” and “No” as the only options. In order to allow comparison of data for 2000 through 2004, all “Yes” and “Quit” responses were grouped into a single category (representing smokers), and “No” responses into another (representing non-smokers).

Data entry is incomplete for 2003 and 2004 maternal smoking, alcohol, and street drug use, as well as prenatal class attendance. Rates for these two years are thus based on fewer births.

Table 3.4.4.1 Maternal Prenatal Smoking Cases and Rate by Year, Alberta, 1997 to 2004

	1997	1998	1999	2000	2001	2002	2003	2004
Women smoking prenatally	9,387	9,629	9,361	8,777	8,491	8,261	6,445	5,988
Live births	35,192	35,967	36,399	35,644	36,404	37,324	31,393	32,344
Rate (per 100 live births)	26.7	26.8	25.7	24.6	23.3	22.1	20.5	18.5
Standard Error (SE)	0.24	0.23	0.23	0.23	0.22	0.21	0.23	0.22

Table 3.4.4.2 Maternal Prenatal Smoking Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Women smoking prenatally	2,869	7,135	5,522	3,318	1,547	303	20,694
Live births	5,384	19,816	31,261	29,394	12,748	2,458	101,061
Rate (per 100 live births)	53.3	36.0	17.7	11.3	12.1	12.3	20.5
Standard Error (SE)	0.68	0.34	0.22	0.18	0.29	0.66	0.13

Table 3.4.4.3 Maternal Prenatal Smoking Cases and Rate by Residence RHA, Alberta, 2002 to 2004 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Women smoking prenatally	1,048	764	5,495	2,530	537	6,310	1,896	1,312	801	20,694
Live births	5,545	2,795	38,162	8,140	2,258	31,511	5,541	4,245	2,859	101,061
Rate (per 100 live births)	18.9	27.3	14.4	31.1	23.8	20.0	34.2	30.9	28.0	20.5
Standard Error (SE)	0.53	0.84	0.18	0.51	0.90	0.23	0.64	0.71	0.84	0.13

Source: Vital Statistics, Birth File, Department of Government Services, August 2006 release.

Notes: Data include Alberta residents only.

Only live births with available information on the relevant maternal behaviour are included.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 3.4.4.4 Selected Indicators for Live Births, by Maternal Prenatal Behaviours, Alberta, 2002 to 2004 Combined

Indicator	Smoking During Pregnancy		Alcohol Consumption During Pregnancy		Street Drug Use During Pregnancy		Prenatal Class Attendance ¹	
	No	Yes and/or Quit	No	Yes	No	Yes	No	Yes
Mean Maternal Age (years)	29.8	26.3	29.2	26.8	29.2	24.2	25.9	28.2
Mean Birth Weight (grams)	3,397	3,259	3,372	3,305	3,373	3,172	3,227	3,396
Low Birth Weight Rate (per 100 Live Births)	5.9	9.0	6.3	8.5	6.3	12.5	2.1	1.6
Preterm Birth Rate (per 100 Live Births)	8.5	10.9	8.8	10.4	8.7	15.1	-	-

Source: Vital Statistics, Birth File, Department of Government Services, August 2006 release.

Notes: 1. Prenatal class attendance data are for first births only. Data are not provided for preterm births due to the relationship between week of gestation and opportunity to attend prenatal classes. Low birth weight rates by prenatal class attendance are for term births only to avoid this bias.

Only live births with available information on the relevant maternal behaviour are included.

Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

3.4.5 Maternal Prenatal Alcohol Consumption

Background

Maternal prenatal alcohol consumption: *Self-report of alcohol consumption of any amount at any time during pregnancy.* The rate of maternal prenatal alcohol consumption is reported as percent of live births.

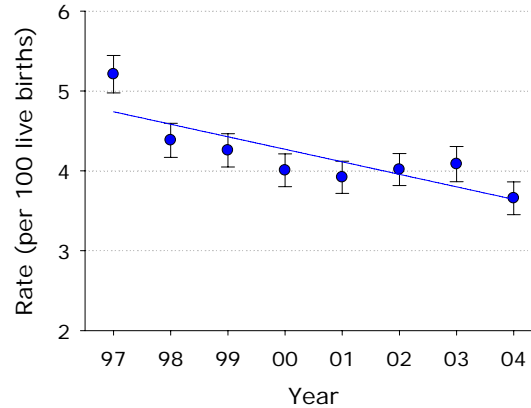
The proportion of infants exposed to alcohol prenatally is substantial. A majority of women of reproductive age in Canada consume alcohol at least occasionally, and up to half of pregnancies are unplanned (Koren et al., 2003). Furthermore, some women consume alcohol after they are aware they are pregnant. Tough et al. (2005) found that 50.9% of first-time Alberta mothers reported alcohol consumption before their pregnancies were recognized, and 18.3% consumed alcohol even after pregnancy was confirmed.

Among the most severe outcomes of maternal prenatal alcohol consumption is fetal alcohol spectrum disorder (FASD). FASD can result in lifelong physical, mental, behavioural, and learning disabilities, including growth restriction, intellectual disability, birth defects, and dysmorphic facial features (Chudley et al., 2005).

Risk factors for maternal prenatal alcohol consumption include higher maternal age, lower education level, maternal or paternal prenatal smoking and drug use, and low socioeconomic status (Chudley et al., 2005). The most important risk factors for FASD are the timing of exposure, pattern of consumption, and frequency of consumption (Chudley et al., 2005).

Time Trends (see Table 3.4.5.1)

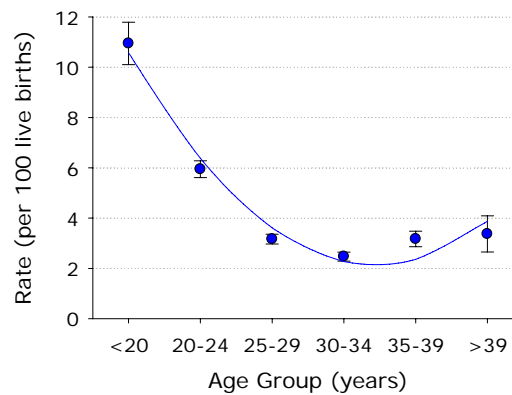
Maternal Prenatal Alcohol Consumption Rate, Alberta, 1997 to 2004



- About 4% of Alberta mothers report consuming alcohol during pregnancy. The rate decreased from 5.2% in 1997 to 3.7% in 2004.
- These rates are lower than figures reported in the Background. This is likely due in part to differences in data collection methods and definitions of alcohol use.

Age Effects (see Table 3.4.5.2)

Maternal Prenatal Alcohol Consumption Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

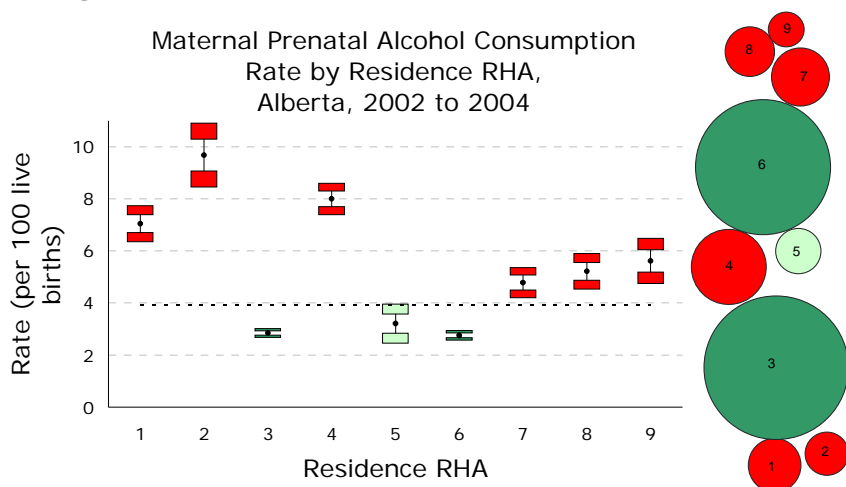


- Young mothers are most likely to drink alcohol when pregnant.
- In 2002 to 2004 combined, 10.9% of teenage mothers reported drinking while pregnant, compared with 3.4% or less for mothers 25 and older.

Relationship to Other Indicators (see Table 3.4.4.4)

- As with prenatal smoking, women who consume alcohol during pregnancy are younger, and are more likely to have low birth weight or preterm babies, than women who do not consume alcohol during pregnancy.

Regional Data (See Table 3.4.5.3)



- The rate of alcohol consumption during pregnancy was lower than the provincial average in the major metropolitan areas (RHAs 3 and 6; 2.8% of live births), and higher than the provincial average in all other RHAs except RHA 5. The highest rate was in RHA 2 (9.7% of live births).
- See Appendix 7.2.1 for methodology and interpretation of maps, graphs, and cartograms.

Limitations and Methodology Notes

Maternal prenatal alcohol consumption data are self-reported, and thus are subject to the biases inherent in such data (e.g., inaccurate reporting due to social desirability issues).

Data on maternal smoking, alcohol consumption, street drug use, and prenatal class attendance for live births are derived from the Vital Statistics Notice of Live Birth or Stillbirth. This information is not complete for all births; analyses include only those births for which the relevant information is available.

Data entry is incomplete for 2003 and 2004 maternal smoking, alcohol, and street drug use, as well as prenatal class attendance. Rates for these two years are thus based on fewer births.

3.4.5 Maternal Prenatal Alcohol Consumption

Background (continued)

Women in Alberta report lower rates of maternal prenatal alcohol consumption than women in Canada as a whole. In 2000/01, 9.2% of women age 18 to 44 years in Alberta reported alcohol consumption during their last pregnancy, compared with 13.7% of Canadian women. When pregnant women (age 18 to 44) were asked about their alcohol consumption in the week prior to being surveyed, 1.5% of Albertan women reported consuming 1 to 9 drinks, compared to 12.5% of pregnant Canadian women (Alberta Alcohol and Drug Abuse Commission, 2005). These data may reflect reporting biases that vary across provinces.

Maternal Prenatal Alcohol Consumption Rate 2002-04



Table 3.4.5.1 Maternal Prenatal Alcohol Consumption Cases and Rate by Year, Alberta, 1997 to 2004

	1997	1998	1999	2000	2001	2002	2003	2004
Women consuming alcohol prenatally	1,813	1,556	1,530	1,408	1,406	1,475	1,267	1,171
Live births	34,806	35,510	35,950	35,152	35,883	36,732	31,022	32,023
Rate (per 100 live births)	5.2	4.4	4.3	4.0	3.9	4.0	4.1	3.7
Standard Error (SE)	0.12	0.11	0.11	0.10	0.10	0.10	0.11	0.10

Table 3.4.5.2 Maternal Prenatal Alcohol Consumption Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Women consuming alcohol prenatally	576	1,158	978	719	400	82	3,913
Live births	5,261	19,473	30,873	29,124	12,615	2,431	99,777
Rate (per 100 live births)	10.9	5.9	3.2	2.5	3.2	3.4	3.9
Standard Error (SE)	0.43	0.17	0.10	0.09	0.16	0.37	0.06

Table 3.4.5.3 Maternal Prenatal Alcohol Consumption Cases and Rate by Residence RHA, Alberta, 2002 to 2004 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Women consuming alcohol prenatally	387	225	1,079	646	72	862	261	220	160	3,913
Live births	5,494	2,325	37,868	8,079	2,244	31,240	5,455	4,219	2,848	99,777
Rate (per 100 live births)	7.0	9.7	2.8	8.0	3.2	2.8	4.8	5.2	5.6	3.9
Standard Error (SE)	0.35	0.61	0.09	0.30	0.37	0.09	0.29	0.34	0.43	0.06

Source: Vital Statistics, Birth File, Department of Government Services, August 2006 release.

Notes: Data include Alberta residents only.

Only live births with available information on the relevant maternal behaviour are included.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

3.4.6 Maternal Prenatal Street Drug Use

Background

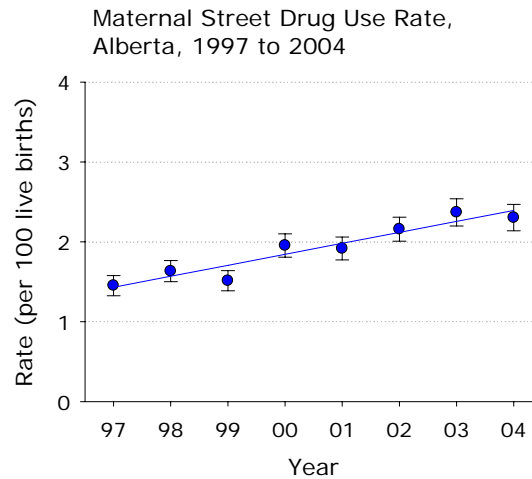
Maternal prenatal street drug use: *Self-report of street drug use at any time during pregnancy.* The rate of maternal prenatal street drug use is reported as percent of live births.

Marijuana and cocaine are the drugs used most commonly by Alberta women who use street drugs during pregnancy.

Street drug use by mothers is associated with ongoing health, social, mental health, and legal problems for the women and their children. Street drug use often occurs in the context of other risk factors for poor pregnancy and birth outcomes (Alberta Alcohol and Drug Abuse Commission, 2004). For example, risk factors for marijuana use during pregnancy include low socioeconomic status, non-Caucasian ethnicity, lower education level, young age, non-married status, and abuse of other drugs (Lee, 1998).

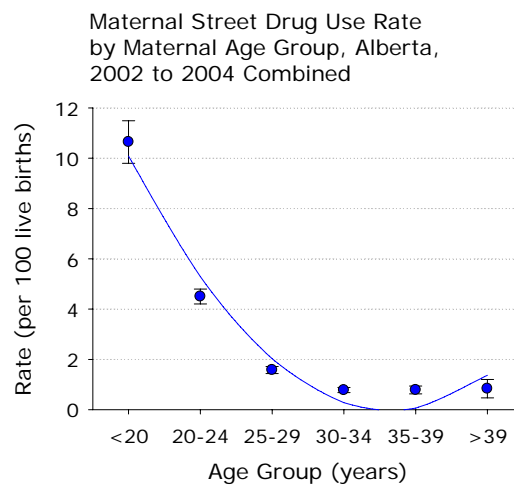
Infants born to marijuana users may be lethargic, with impaired visual responses, and decreased startle reflexes (Wagner et al., 1998). Tetrahydrocannabinol (THC; the active ingredient in marijuana) crosses the placenta and levels in breast milk are up to eight times higher than in maternal blood. There is limited evidence of neurodevelopmental effects of THC, which may be partially a function of the socioeconomic and behavioural characteristics of women who consume marijuana prenatally (Kozer & Koren, 2001).

Time Trends (see Table 3.4.6.1)



- The rate of street drug use reported by pregnant women is increasing in Alberta. In 1997, 1.5% of women giving birth to live infants reported using street drugs while pregnant. In 2004, the rate was 2.3%. This rate is approaching the rate of women reporting alcohol consumption during pregnancy (3.7% in 2004).
- Marijuana was the street drug whose use was most commonly reported by women giving birth, followed by cocaine/crack cocaine. As of 2000, reports of ecstasy use during pregnancy appeared, and as of 2002, mothers began reporting use of crystal methamphetamine during pregnancy.

Age Effects (see Table 3.4.6.2)

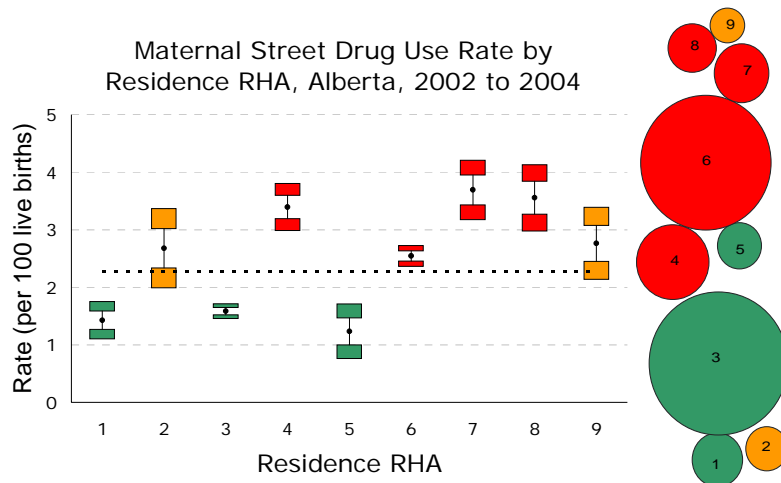


- One in ten women giving birth under the age of 20 reported street drug use between 2002 and 2004. For women 30 and older, the rate was below 1%.

Relationship to Other Indicators (see Table 3.4.4.4)

- Women who reported street drug use during pregnancy had babies weighing about 200 grams less than women who did not use street drugs. The low birth weight and preterm birth rates were much higher in street drug users.

Regional Data (See Table 3.4.6.3)



- The rate of maternal street drug use was lower than the provincial average in RHAs 1, 3, and 5, with the lowest rate in RHA 5 (1.2%).
- The rate was higher than the provincial average in RHAs 4, 6, 7, and 8. RHA 7 had the highest rate (3.7%).
- See Appendix 7.2.1 for methodology and interpretation of maps, graphs, and cartograms.

Limitations and Methodology Notes

Street drug use data are self-reported, and thus are subject to the biases inherent in such data (e.g., inaccurate reporting due to social desirability issues).

Data on maternal smoking, alcohol consumption, street drug use, and prenatal class attendance for live births are derived from the Vital Statistics Notice of Live Birth or Stillbirth. This information is not complete for all births; analyses include only those births for which the relevant information is available.

Data entry is incomplete for 2003 and 2004 maternal smoking, alcohol, and street drug use, as well as prenatal class attendance. Rates for these two years are thus based on fewer births.

3.4.6 Maternal Prenatal Street Drug Use

Background (continued)

Pregnancy increases the toxicity of cocaine, via increased hypertensive response. Cocaine use is associated with spontaneous abortion, placental abruption, preterm birth and fetal growth restriction (Plessinger & Woods, 1998). Neurobehavioural and developmental deficits subsequent to cocaine use during pregnancy are well-documented, as are increased risks of sudden infant death syndrome and abnormal respiratory patterns (Wagner et al., 1998).

A significant problem in the determination of the effects of drug use on fetal and infant development is the widespread use of multiple substances by drug users, making it difficult to associate outcomes with the use of a single drug.

Maternal Street Drug Use Rate 2002-04

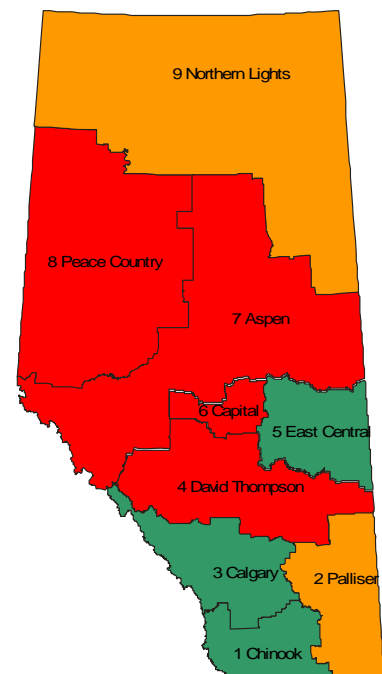


Table 3.4.6.1 Maternal Street Drug Use Cases and Rate by Year, Alberta, 1997 to 2004

	1997	1998	1999	2000	2001	2002	2003	2004
Women using street drugs prenatally	503	577	539	671	673	775	720	727
Live births	34,652	35,332	35,630	34,353	35,116	35,910	30,404	31,573
Rate (per 100 live births)	1.5	1.6	1.5	2.0	1.9	2.2	2.4	2.3
Standard Error (SE)	0.06	0.07	0.06	0.07	0.07	0.08	0.09	0.08

Table 3.4.6.2 Maternal Street Drug Use Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Women using street drugs prenatally	544	859	478	224	97	20	2,222
Live births	5,110	19,073	30,283	28,664	12,363	2,394	97,887
Rate (per 100 live births)	10.6	4.5	1.6	0.8	0.8	0.8	2.3
Standard Error (SE)	0.43	0.15	0.07	0.05	0.08	0.19	0.05

Table 3.4.6.3 Maternal Street Drug Use Cases and Rate by Residence RHA, Alberta, 2002 to 2004 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Women using street drugs prenatally	77	59	593	267	27	779	197	147	76	2,222
Live births	5,390	2,203	37,401	7,866	2,186	30,615	5,337	4,135	2,750	97,887
Rate (per 100 live births)	1.4	2.7	1.6	3.4	1.2	2.5	3.7	3.6	2.8	2.3
Standard Error (SE)	0.16	0.34	0.06	0.20	0.24	0.09	0.26	0.29	0.31	0.05

Source: Vital Statistics, Birth File, Department of Government Services, August 2006 release.

Notes: Data include Alberta residents only.

Only live births with available information on the relevant maternal behaviour are included.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

3.4.7 Prenatal Class Attendance

Background

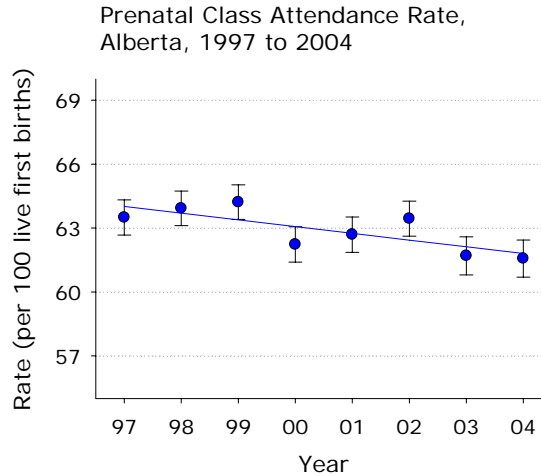
Prenatal class attendance refers to a positive response from the mother when asked if she attended prenatal classes during pregnancy. No definition of prenatal classes was provided. The rate of prenatal class attendance is reported as percent of first live births. Prenatal class attendance data for second and subsequent births are excluded.

First-time mothers are more likely to attend prenatal classes if they are 25 or older, or have completed university (Region of Peel Health Department, 2004).

In one study of First Nations communities, prenatal class attendance was “significantly more likely among women who lived in non remote communities; women whose main language was not an Aboriginal one; women who had graduated from high school; women who felt cared for during pregnancy; women whose partners were supportive during their pregnancies and those who had access to child care. These are neither the most vulnerable, nor those most in need of care. Only one in five of the most vulnerable First Nations women actually received prenatal care classes or nutrition counseling” (Andersson et al., 2003).

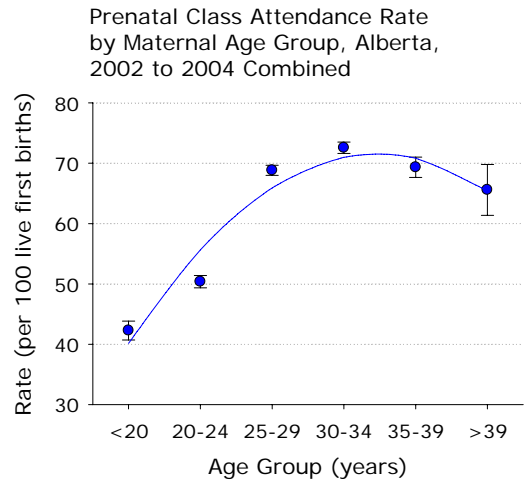
Benefits of prenatal class attendance are difficult to summarize, given the huge variety in prenatal education programs. As suggested above, the biggest benefits likely accrue to mothers with fewer resources—those who are low socioeconomic status or have low levels of education. Those are the women who are less likely to attend classes, however.

Time Trends (see Table 3.4.7.1)



- The rate of attendance at prenatal classes by first-time mothers declined slightly between 1997 and 2004 in Alberta.
- In 2004, 61.6% of women giving birth for the first time attended prenatal classes. In 1997, the rate was 63.5%.

Age Effects (see Table 3.4.7.2)

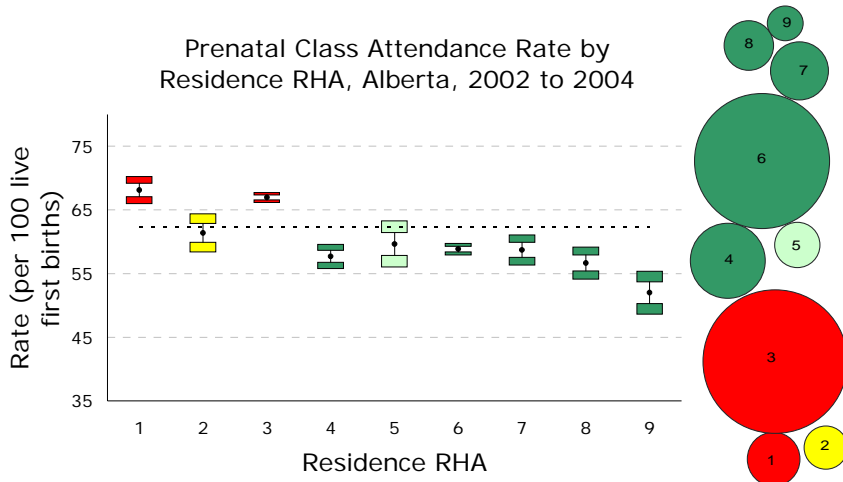


- Just 42.3% of teen mothers giving birth for the first time reported attending prenatal classes in 2002 to 2004, compared with over 70% of mothers 25 and older. The rate was highest (72.6%) for women 30 to 34.

Relationship to Other Indicators (see Table 3.4.4.4)

- Women who reported prenatal class attendance prior to a live first birth that occurred at term had babies that were 169 grams heavier on average than women who did not attend prenatal classes. The low birth weight rate was also lower for women attending prenatal classes.

Regional Data (See Table 3.4.7.3)



- The rate of prenatal class attendance for first-time mothers giving birth to live infants was lower than the provincial average in RHAs 4, 6, 7, 8, and 9. The lowest rate was in RHA 9 (52.0% of first time mothers).
- The rate was higher than the provincial average in RHAs 1 and 3. The highest rate was in RHA 1 (68.1% of first time mothers).
- See Appendix 7.2.1 for methodology and interpretation of maps, graphs, and cartograms.

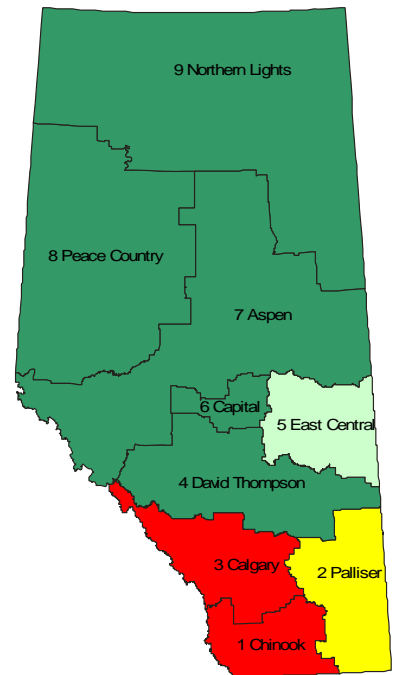
Limitations and Methodology Notes

Prenatal class attendance data are self-reported, and thus are subject to the biases inherent in such data (e.g., inaccurate reporting due to social desirability issues).

Data on maternal smoking, alcohol consumption, street drug use, and prenatal class attendance for live births are derived from the Vital Statistics Notice of Live Birth or Stillbirth. This information is not complete for all births; analyses include only those births for which the relevant information is available.

3.4.7 Prenatal Class Attendance

Prenatal Class Attendance Rate 2002-04



3.4.4 Prenatal Class Attendance

Limitations and Methodology Notes (continued)

Data entry is incomplete for 2003 and 2004 maternal smoking, alcohol, and street drug use, as well as prenatal class attendance. Rates for these two years are thus based on fewer births

Table 3.4.7.1 Prenatal Class Attendance Cases and Rate by Year, Alberta, 1997 to 2004

	1997	1998	1999	2000	2001	2002	2003	2004
Women attending prenatal classes	8,315	8,556	8,688	8,150	8,162	8,375	7,016	7,417
Live births	13,095	13,384	13,529	13,096	13,019	13,201	11,372	12,047
Rate (per 100 live births)	63.5	63.9	64.2	62.2	62.7	63.4	61.7	61.6
Standard Error (SE)	0.42	0.42	0.41	0.42	0.42	0.42	0.46	0.44

Table 3.4.7.2 Prenatal Class Attendance Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Women attending prenatal classes	1,603	4,664	8,043	6,216	1,962	320	22,808
Live births	3,791	9,258	11,687	8,566	2,830	488	36,620
Rate (per 100 live births)	42.3	50.4	68.8	72.6	69.3	65.6	62.3
Standard Error (SE)	0.80	0.52	0.43	0.48	0.87	2.15	0.25

Table 3.4.7.3 Prenatal Class Attendance Cases and Rate by Residence RHA, Alberta, 2002 to 2004 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Women attending prenatal classes	1,310	647	9,699	1,558	442	6,797	1,022	876	454	22,808
Live births	1,923	1,054	14,486	2,700	741	11,552	1,741	1,546	873	36,620
Rate (per 100 live births)	68.1	61.4	67.0	57.7	59.6	58.8	58.7	56.7	52.0	62.3
Standard Error (SE)	1.06	1.50	0.39	0.95	1.80	0.46	1.18	1.26	1.69	0.25

Source: Vital Statistics, Birth File, Department of Government Services, August 2006 release.

Notes: Data include Alberta residents only.

Only first births are included in prenatal class attendance data.

Only live births with available information on the relevant maternal behaviour are included.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4. Births

4.1 Fertility Rates

4.2 Live Births

4.3 Birth Weight

4.4 Preterm Births

4.5 Multiple Births

4.6 Infant morbidity

4.7 Mortality

4.8 Maternal factors

4.1.1 Fertility

Background

General fertility rate: *Number of live births per 1,000 women aged 15-49 in a given year.*

Age-specific fertility rate: *Number of live births per 1,000 women in a given age group in a given year.*

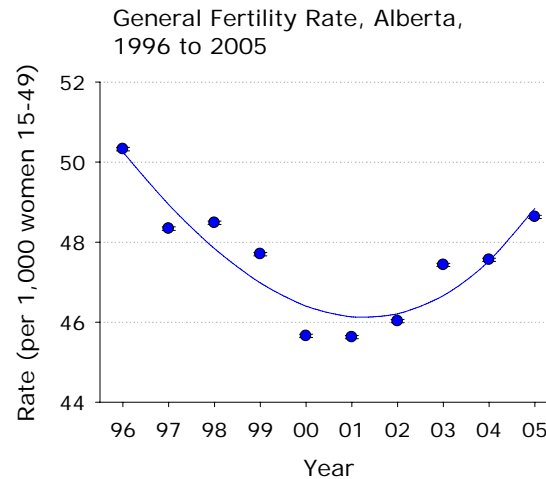
Total fertility rate: *Number of live births per 1,000 women aged 15-49 over a lifetime.* This rate is equal to the sum of the age-specific fertility rates for each year of age between 15 and 49. Total fertility rate provides an estimate of “the average number of children that would be born to each woman if all women lived to the end of their childbearing years and bore children according to the fertility patterns of the current year” (Health Canada, 2006, p. 2). For example, a total fertility rate of 1,500 would represent an average of 1.5 live births per woman. Total fertility rates differ from *completed fertility rates*, which describe the actual number of children born to women who have completed their childbearing.

All live births are included, regardless of birth weight or gestational age.

A total fertility rate of 2,100 is the “replacement rate” needed to maintain the current population. Canada’s total fertility rate has been below 2,100 since the end of the 1960s. (Health Canada, 2006).

Age-specific fertility rates for women over 30 have increased since the late 1970s, while rates for women under 30 have decreased. The average age of first-time fathers born between 1941 and 1960 is 31.7 years, compared with 28.1 for first-time fathers born between 1922 and 1940 (Health Canada, 2006).

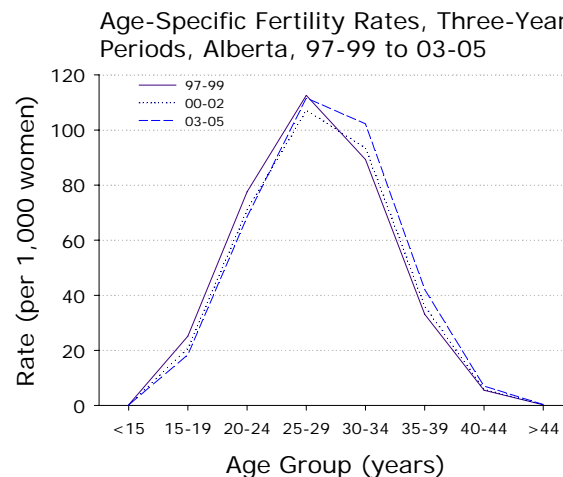
Time Trends (see Tables 4.1.1.1, 4.1.1.4)



- The general fertility rate in Alberta dipped between 2000 and 2002 and rose thereafter. In 2005, the general fertility rate was 48.6 (per 1,000 women 15-49 years).
- The total fertility rate followed a similar pattern to the general fertility rate between 1996 and 2005. The total fertility rate was 1,775 in 2005, the highest level since 1996.

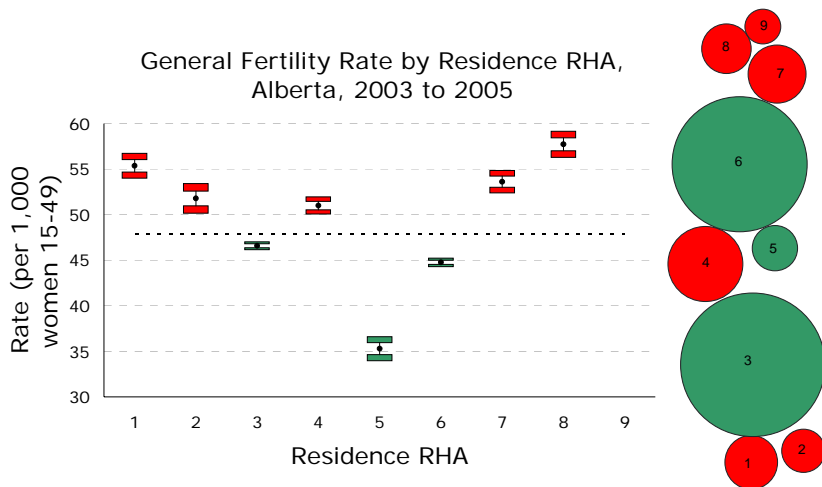
Age Effects (see Tables 4.1.1.2, 4.1.1.4, and 4.1.1.6)

- Age-specific fertility rates were highest for women between 25 and 29 between 2003 and 2005 (111.6 per 1,000 women), followed closely by women between 30 and 34 (102.2).



- In 2000-02, age-specific fertility rates were lower than those for 1997-99 for women under 30, and higher for women over 30. In 2003-05, fertility rates for women 25 to 29 recovered, and rates for women 30 and over surpassed those of the other two time periods.

Regional Data (see Tables 4.1.1.3, 4.1.1.5, 4.1.1.6)



- For 2003 to 2005 combined, the general fertility rate was lower than the provincial average in RHAs 3, 5, and 6, and higher than the provincial average in the remaining RHAs. The lowest rate occurred in RHA 5 (35.3) and the highest was in RHA 9 (65.2).
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

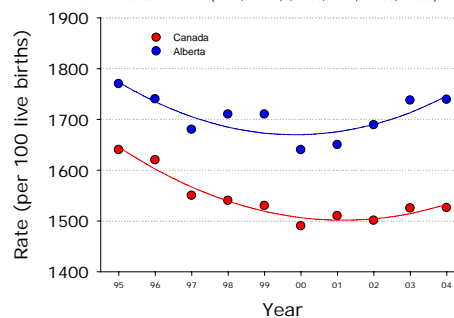
4.1.1 Fertility

Background (continued)

Alberta's total fertility rate is characteristically higher than Canada's, though both showed steady decline through the 1990s. In 2004, Canada's total fertility rate was 1,523 and Alberta's was 1,739. Fertility rates are higher in Alberta than in Canada for women in all age groups, but particularly for women under 35 (Statistics Canada, 2006d).

Total Fertility Rate, Alberta and Canada, 1995 to 2004

Source: Statistics Canada (1997, 1999a,b, 2000, 2002, 2005b, 2006d)



General Fertility Rate 2003-05

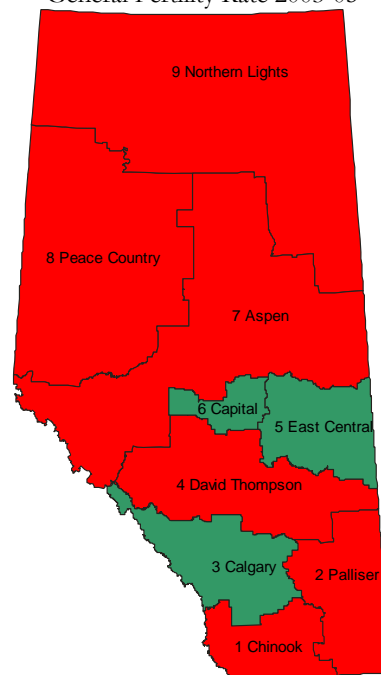


Table 4.1.1.1 Live Births, General Fertility Rate, and Total Fertility Rate by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Women 15-49	744,606	756,147	774,059	791,981	802,182	815,913	831,964	840,560	847,174	854,349
General Fertility Rate (per 1,000 women 15-49)	50.3	48.3	48.5	47.7	45.7	45.6	46.0	47.4	47.6	48.6
Standard Error (SE)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Total Fertility Rate (per 1,000 women 15-49)	1,757	1,708	1,728	1,717	1,661	1,670	1,687	1,736	1,740	1,775

Table 4.1.1.2 Live Births and Age-Specific Fertility Rate by Maternal Age Group, Alberta, 2003 to 2005 Combined

	<15	15-17	18-19	15-19	20-24	25-29	30-34	35-39	40-44	>44
Live births	47	1,771	4,541	6,311	23,859	38,100	35,209	15,138	2,913	127
Women 15-49	334,377	204,707	138,561	343,268	348,872	341,483	344,467	359,366	414,144	390,483
General Fertility Rate (per 1,000 women 15-49)	0.1	8.7	32.8	18.4	68.4	111.6	102.2	42.1	7.0	0.3
Standard Error (SE)	0.02	0.20	0.48	0.23	0.43	0.54	0.52	0.34	0.13	0.03

Table 4.1.1.3 Live Births, General Fertility Rate, and Total Fertility Rate by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Live births	6,245	3,885	44,497	11,334	2,777	35,711	7,163	6,067	4,021	121,707
Women 15-49	112,795	75,019	955,111	222,208	78,687	797,697	133,603	105,107	61,712	2,542,083
General Fertility Rate (per 1,000 women 15-49)	55.4	51.8	46.6	51.0	35.3	44.8	53.6	57.7	65.2	47.9
Standard Error (SE)	0.68	0.81	0.22	0.47	0.66	0.23	0.62	0.72	0.99	0.13
Total Fertility Rate (per 1,000 women 15-49)	2,030	1,905	1,659	1,940	1,412	1,634	2,045	2,060	2,236	1,750

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness, March 2006 release.

Notes: 1. Age-specific fertility rates for age groups <15 and >44 are calculated based on female populations in the 10-14 and 45-49 age groups, respectively.

Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.1.1.4 Live Births and Age-Specific Fertility Rate by Year and Maternal Age Group, and Total Fertility Rate by Year, Alberta, 1996 to 2005

Number of live births	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<15	31	27	25	23	16	24	14	14	20	13
15-17	914	828	862	842	740	685	615	592	593	586
18-19	1,770	1,696	1,731	1,737	1,680	1,608	1,589	1,518	1,481	1,542
15-19	2,684	2,524	2,593	2,579	2,420	2,293	2,204	2,110	2,074	2,128
20-24	7,551	7,351	7,709	7,857	7,476	7,530	7,791	8,029	7,861	7,969
25-29	11,851	11,690	11,718	11,664	11,287	11,461	11,829	12,310	12,692	13,098
30-34	10,598	10,044	10,464	10,275	10,032	10,491	10,902	11,454	11,697	12,058
35-39	4,175	4,237	4,338	4,606	4,613	4,618	4,724	4,945	4,957	5,236
40-44	566	663	646	738	768	778	799	961	948	1,004
>44	16	12	24	34	13	30	30	44	42	41
All	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548

Age Specific Fertility Rate (per 1,000 women)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<15	0.3	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.2	0.1
15-17	15.7	13.8	13.8	13.0	11.3	10.3	9.1	8.8	8.7	8.5
18-19	47.3	44.5	43.7	42.4	39.3	36.2	34.9	33.0	32.0	33.3
15-19	28.1	25.7	25.4	24.4	22.4	20.7	19.5	18.6	18.1	18.4
20-24	81.3	77.3	78.4	77.0	72.2	70.6	70.5	70.5	67.4	67.3
25-29	117.0	114.9	112.5	110.3	106.5	107.3	107.8	110.4	111.6	112.7
30-34	87.3	85.5	91.3	91.2	90.4	93.6	96.1	100.0	102.1	104.6
35-39	32.5	32.4	32.6	34.4	34.8	35.6	37.4	40.4	41.6	44.4
40-44	5.0	5.6	5.2	5.8	5.9	5.8	5.8	7.0	6.8	7.3
>44	0.2	0.1	0.2	0.3	0.1	0.3	0.2	0.3	0.3	0.3
Total Fertility Rate (per 1,000 women 15-49)	1,757	1,708	1,728	1,717	1,661	1,670	1,687	1,736	1,740	1,775

Table 4.1.1.5 Live Births and General Fertility Rate by Year and Residence RHA, Alberta, 1996 to 2005

Live births	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	2,038	2,135	2,018	2,064	1,945	1,960	1,969	2,093	2,047	2,105
Palliser	1,172	1,186	1,243	1,232	1,221	1,230	1,226	1,258	1,278	1,349
Calgary	12,489	12,437	12,900	12,990	13,064	13,109	13,588	14,473	14,606	15,418
David Thompson	3,661	3,533	3,567	3,648	3,474	3,482	3,616	3,727	3,786	3,821
East Central	1,008	978	996	961	908	882	971	898	954	925
Capital	11,443	10,823	11,189	11,320	10,790	11,054	11,293	11,702	11,915	12,094
Aspen	2,602	2,501	2,594	2,540	2,285	2,404	2,408	2,386	2,396	2,381
Peace Country	1,942	1,851	1,918	1,947	1,818	1,907	1,921	2,037	1,958	2,072
Northern Lights	1,117	1,106	1,101	1,070	1,116	1,192	1,299	1,292	1,348	1,381
Alberta	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548

General Fertility Rate (per 1,000 women 15-49)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	56.1	58.5	55.0	55.6	52.0	52.3	52.6	55.8	54.4	56.0
Palliser	52.6	52.5	53.8	52.0	50.9	50.2	49.3	50.7	51.1	53.6
Calgary	47.5	46.1	46.0	44.9	44.3	43.4	43.9	46.0	45.9	47.8
David Thompson	55.8	53.3	52.3	52.3	49.1	48.5	49.6	50.7	51.1	51.3
East Central	39.9	38.6	38.8	37.4	35.1	33.8	36.9	34.1	36.4	35.3
Capital	47.2	44.5	45.5	45.1	42.6	43.0	43.2	44.3	44.8	45.2
Aspen	60.7	57.8	59.0	57.2	51.5	53.7	53.4	53.3	53.8	53.8
Peace Country	61.2	57.5	58.2	57.8	53.7	55.9	55.5	58.7	55.9	58.6
Northern Lights	71.5	67.3	64.5	61.4	62.8	65.1	67.4	64.5	65.4	65.5
Alberta	50.3	48.3	48.5	47.7	45.7	45.6	46.0	47.4	47.6	48.6

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.1.1.6 General Fertility Rate by Residence RHA and Maternal Age Group and Total Fertility Rate by Residence RHA, Alberta, 2003 to 2005

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
2003										
<15	0.3	-	0.1	0.2	-	0.1	0.1	0.4	0.3	0.1
15-17	10.8	9.6	5.2	13.7	3.2	7.4	17.4	19.4	12.9	8.8
18-19	43.8	36.2	20.8	47.3	20.9	31.1	51.1	56.5	66.7	33.0
15-19	24.2	20.7	11.5	27.1	10.6	17.0	30.7	34.6	34.3	18.6
20-24	101.1	90.8	54.0	93.4	67.3	59.1	111.0	113.9	119.3	70.5
25-29	137.6	137.7	96.8	141.4	100.2	101.4	138.5	150.0	151.2	110.4
30-34	104.1	95.0	106.9	92.5	69.9	98.9	91.6	88.3	94.0	100.0
35-39	37.1	30.3	49.6	28.1	20.1	39.7	29.9	28.1	38.1	40.4
40-44	6.1	3.0	8.5	4.9	5.3	6.8	4.8	5.3	7.1	7.0
>44	0.2	-	0.5	0.3	0.5	0.3	0.2	0.2	0.4	0.3
Total Fertility Rate	2,052	1,887	1,639	1,938	1,369	1,616	2,033	2,102	2,222	1,736
2004										
<15	0.3	0.3	0.2	0.2	-	0.1	0.4	-	0.3	0.2
15-17	10.3	9.4	4.9	13.9	5.3	6.9	18.3	16.1	23.2	8.7
18-19	42.9	46.5	21.0	43.2	25.0	26.2	59.3	51.2	68.9	32.0
15-19	23.6	24.1	11.3	25.7	13.3	14.8	34.6	30.8	41.8	18.1
20-24	92.8	88.8	51.6	90.5	61.3	57.1	106.5	108.7	112.8	67.4
25-29	130.0	138.2	97.9	136.5	113.4	106.0	142.1	136.2	150.2	111.6
30-34	104.2	88.0	108.6	98.4	74.4	101.1	93.2	88.4	102.8	102.1
35-39	39.7	31.0	49.4	31.8	22.8	41.4	29.6	31.7	36.7	41.6
40-44	7.0	5.5	8.1	5.0	5.6	7.0	4.1	4.3	5.3	6.8
>44	0.7	-	0.5	0.4	-	0.2	-	0.2	-	0.3
Total Fertility Rate	1,990	1,878	1,637	1,941	1,454	1,638	2,051	2,001	2,249	1,740
2005										
<15			0.0		0.0	0.1	0.1	0.8	0.3	0.1
15-17	12.2	6.9	5.3	14.2	2.4	7.2	13.7	18.4	17.0	8.5
18-19	35.6	41.4	20.4	45.4	21.9	29.8	61.6	61.4	73.5	33.3
15-19	21.8	20.7	11.2	26.9	10.0	16.4	32.6	36.1	40.0	18.4
20-24	95.3	95.7	50.3	89.6	58.0	57.8	105.3	105.0	120.9	67.3
25-29	136.8	139.4	99.5	145.4	113.9	104.3	143.1	137.5	145.3	112.7
30-34	106.8	95.1	115.2	88.6	72.4	101.7	89.1	101.0	98.1	104.6
35-39	41.5	32.8	54.6	33.7	25.4	41.6	32.9	32.1	38.2	44.4
40-44	7.3	6.4	9.1	3.9	2.7	7.3	7.0	3.7	5.0	7.3
>44	0.2	0.0	0.5	0.1		0.3	0.2	0.4	0.0	0.3
Total Fertility Rate	2,048	1,951	1,702	1,941	1,412	1,646	2,051	2,079	2,237	1,775

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4. Births

4.1 Fertility Rates

4.2 Live Births

4.3 Birth Weight

4.4 Preterm Births

4.5 Multiple Births

4.6 Infant morbidity

4.7 Mortality

4.8 Maternal factors

4.2.1 Live Births

Background

Live birth: *“The complete expulsion or extraction from the mother, irrespective of the duration of the pregnancy, of a fetus in which, after expulsion or extraction, there is breathing, beating of the heart, pulsation of the umbilical cord or unmistakable movement of voluntary muscle, whether or not the umbilical cord has been cut or the placenta is attached.”* (Alberta Vital Statistics Act, RSA 1980 cV-4 s1).

Total births: *The sum of live births and stillbirths in a given year.*

Crude birth rate: *Number of live births per 1,000 population in a given year.*

Life expectancy: *The expected number of years of life remaining to a person of a given age if current mortality rates continue to apply.*

Home birth: *A birth for which the location is listed on the Notice of Birth as “home” (rather than hospital, en route, or some other location). This variable does not distinguish between planned and unplanned home births. Only live births are included.*

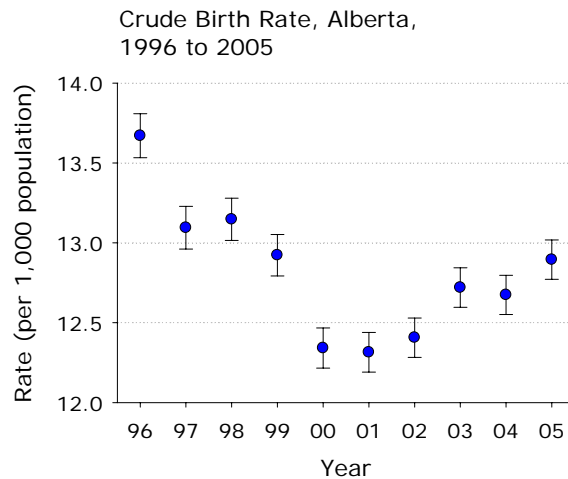
Home birth rate: *Number of live home births per 100 live births.*

Midwife-attended birth: *A birth in which the primary attendant at birth is listed on the Notice of Birth as “midwife”. Only live births are included.*

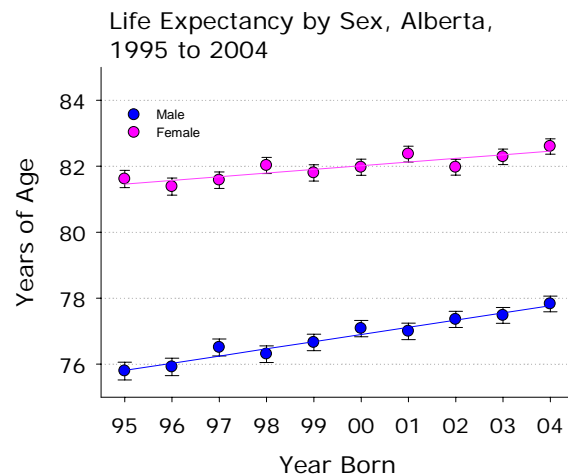
Midwife-attended birth rate: *Number of live births with midwife as attendant, per 100 live births.*

Time Trends (see Tables 4.2.1.1, 4.2.1.3, 4.2.1.4, 4.2.1.7, 4.2.1.10)

- There were 41,548 live births in Alberta in 2005, the largest number since 1992. This number reflects both increasing fertility in recent years (see previous section) and increased migration into the province, resulting in a growing population.



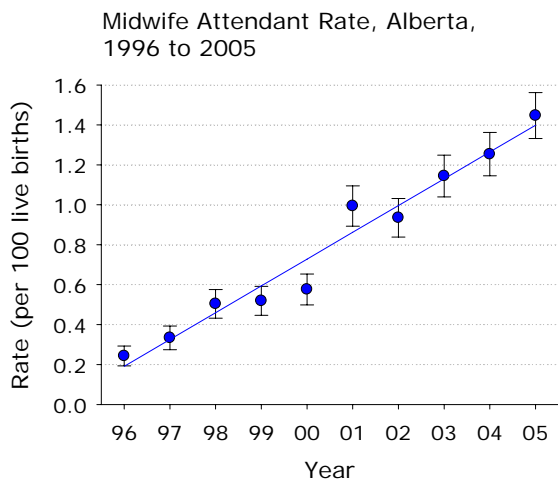
- The crude birth rate was at a low point between 2000 and 2002 after declining throughout the 1990s. In 2005, the crude birth rate was 12.9 (per 1,000 population).



- The life expectancy of a female infant born in Alberta in 2004 is 82.6 years, up from 81.6 in 1995. Males born in 2004 can expect to live 77.8 years, up from 75.8 in 1995. Life expectancy increased at a faster rate for males than for females between 1995 and 2004.

Time Trends continued (see Tables 4.2.1.1, 4.2.1.3, 4.2.1.4, 4.2.1.7, 4.2.1.10)

- The home birth rate did not vary significantly with time between 1996 and 2005. In 2005, there were 312 live home births in Alberta, for a rate of 0.8 (per 100 live births).



- The midwife attendant rate showed an increasing trend with time between 1996 and 2005. In 1996, about 2 out of every 1,000 live births were attended by midwives, compared with about 14 out of every 1,000 in 2005.
- Midwives attend births in hospitals, birth centres, and private homes. Hospital admitting privileges were extended to midwives in some RHAs in 1999. Prior to 2001, the percentage of midwife-attended live births that occurred in hospitals was less than 10%. By 2005, 57.2% of midwife-attended live births occurred in hospitals.
- Mean birth weight for live births in Alberta was 3,352 grams in 2005. Mean birth weight decreased by 37 grams between 2001 and 2005.

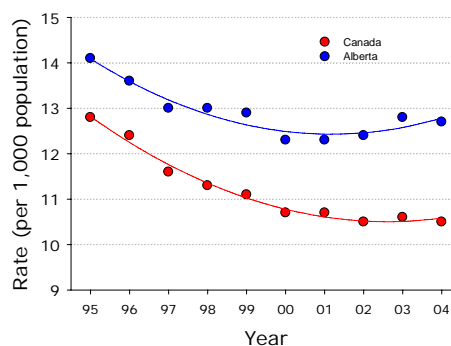
4.2.1 Live Births

Background (continued)

Crude birth rates are historically higher in Alberta than in Canada as a whole. In 2004, the Canadian crude birth rate was 10.5, and the Albertan rate was 12.7 (Statistics Canada, 2006d). The gap between the Canadian and Albertan rates widened between 1995 and 2004.

Crude Birth Rate, Alberta and Canada, 1995 to 2004

Source: Statistics Canada (1997, 1999a,b, 2000, 2002, 2005b, 2006d)



A British Columbia study comparing planned home births with registered midwives to planned hospital births with midwives or physicians found that women giving birth at home had significantly fewer labour interventions and had similar rates of adverse maternal and neonatal outcomes compared to women giving birth in hospital (Janssen et al., 2002; see also Johnson & Daviss, 2005 for similar findings in a large American study).

Midwifery is not publicly funded in Alberta, so midwifery services are paid for privately by individual clients. Midwives have hospital admitting privileges in some RHAs. As of May 2006 there were 25 actively practicing registered midwives in Alberta (Alberta Association of Midwives, 2006).

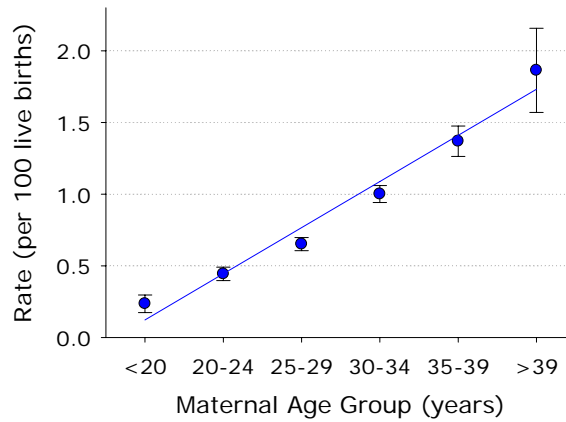
4.2.1 Live Births

Background (continued)

In Canada in 2003, mean birth weight was 3,395 grams; the mean for Alberta was 3,375 grams (Statistics Canada, 2005b). Male babies weighed a little more than 100 grams more than female babies on average.

Age Effects (see Tables 4.2.1.5, 4.2.1.8)

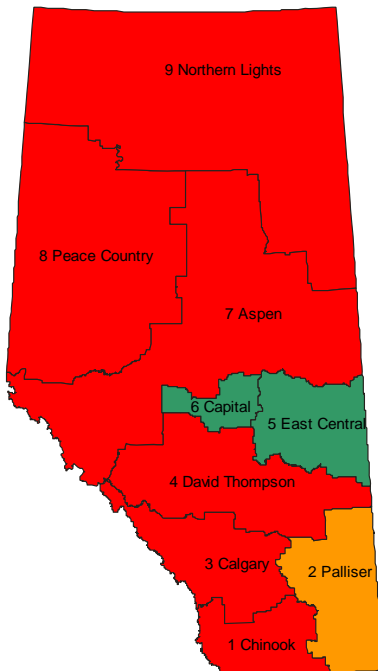
Home Birth Rate by Maternal Age Group, Alberta, 1996 to 2005



- The home birth rate for 1996 to 2005 combined increased linearly with increasing maternal age. Mothers in their 40s had a home birth rate of 1.9 (per 100 live births), compared with 0.2 for teen mothers.
- The midwife attendant rate followed a similar pattern, with a rate of 1.6 (per 100 live births) for women over 39 and a rate of 0.2 for women under 20.

Regional Data (see Tables 4.2.1.2, 4.2.1.6, 4.2.1.9)

Crude Birth Rate 2003-05



Crude Birth Rate by Residence RHA, Alberta, 2003 to 2005



- Crude birth rates vary considerably across Alberta. For 2003 to 2005 combined, the crude birth rate was lower than the provincial average in RHAs 5 and 6, with the lowest rate in RHA 5 (8.4 per 1,000 population).
- The crude birth rate was significantly higher than the provincial average in all other RHAs, except RHA 2, in 2003 to 2005 combined. The highest rate was 18.7, in RHA 9.

Regional Data continued (see Tables 4.2.1.2, 4.2.1.6, 4.2.1.9)

- For 1996 to 2005, the home birth rate was significantly lower than the provincial average in RHAs 1, 2, 7, 8, and 9. The rate of home births was higher than the provincial average in the major metropolitan centres (RHAs 3 and 6) during that time period.
- The pattern for midwife-attended births was very similar, with lower than average rates in RHAs 1, 2, 5, 7, 8, and 9 and higher than average rates in RHAs 3 and 6. In the Capital and Calgary regions, one out of every 100 live births was attended by a midwife between 1996 and 2005.
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

4.2.1 Live Births

Table 4.2.1.1 Live Births and Crude Birth Rate by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Total population	2,741,189	2,791,334	2,854,621	2,923,449	2,967,755	3,022,891	3,086,646	3,134,337	3,179,036	3,222,191
Crude Birth Rate (per 100 live births)	13.7	13.1	13.1	12.9	12.3	12.3	12.4	12.7	12.7	12.9
Standard Error (SE)	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06

Table 4.2.1.2 Live Births and Crude Birth Rate by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Live births	6,245	3,885	44,497	11,334	2,777	35,711	7,163	6,067	4,021	121,707
Total population	461,840	299,017	3,448,820	870,184	330,398	2,980,984	528,863	399,566	215,216	9,535,564
Crude Birth Rate (per 100 live births)	13.5	13.0	12.9	13.0	8.4	12.0	13.5	15.2	18.7	12.8
Standard Error (SE)	0.17	0.21	0.06	0.12	0.16	0.06	0.16	0.19	0.29	0.04

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.2.1.3 Life Expectancy by Year and Sex, Alberta, 1995 to 2004

Females	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Life Expectancy	81.6	81.4	81.6	82.0	81.8	82.0	82.4	82.0	82.3	82.6
Standard Error (SE)	0.13	0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12
Males	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Life Expectancy	75.8	75.9	76.5	76.3	76.7	77.1	77.0	77.4	77.5	77.8
Standard Error (SE)	0.14	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.12	0.12

Source: Vital Statistics, Death File, Department of Government Services, extracted January 2006.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness, extracted January 2006.

Notes: Data include Alberta residents only.

Totals for RHAs include unknown RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.2.1.4 Home Births and Rate by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Home births	263	288	283	304	302	349	332	341	273	312
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.7	0.8
Standard Error (SE)	0.04	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.04	0.04

Table 4.2.1.5 Home Births and Rate by Maternal Age Group, Alberta, 1996 to 2005 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Home births	56	342	779	1,081	636	152	3,047
Live births	23,816	77,124	119,600	108,015	46,449	8,157	383,180
Rate (per 100 live births)	0.2	0.4	0.7	1.0	1.4	1.9	0.8
Standard Error (SE)	0.03	0.02	0.02	0.03	0.05	0.15	0.01

Table 4.2.1.6 Home Births and Rate by Residence RHA, Alberta, 1996 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Home births	70	32	1,310	292	64	1,072	109	69	29	3,047
Live births	20,374	12,395	135,074	36,315	9,481	113,623	24,497	19,371	12,022	383,180
Rate (per 100 live births)	0.3	0.3	1.0	0.8	0.7	0.9	0.4	0.4	0.2	0.8
Standard Error (SE)	0.04	0.05	0.03	0.05	0.08	0.03	0.04	0.04	0.04	0.01

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.2.1.7 Midwife-attended Births and Rate by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Midwife-attended live births	91	122	189	196	211	370	358	456	505	601
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Midwife attendant rate (per 100 live births)	0.2	0.3	0.5	0.5	0.6	1.0	0.9	1.1	1.3	1.4
Standard Error (SE)	0.03	0.03	0.04	0.04	0.04	0.05	0.05	0.05	0.06	0.06
Midwife-attended live hospital births	9	1	12	5	18	91	92	186	279	344
% of midwife-attended live births occurring in hospital	9.9	0.8	6.3	2.6	8.5	24.6	25.7	40.8	55.2	57.2

Table 4.2.1.8 Midwife-attended Births and Rate by Maternal Age Group, Alberta, 1996 to 2005 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Midwife-attended live births	42	338	872	1,115	601	131	3,099
Live births	23,816	77,124	119,600	108,015	46,449	8,157	383,180
Rate (per 100 live births)	0.2	0.4	0.7	1.0	1.3	1.6	0.8
Standard Error (SE)	0.03	0.02	0.02	0.03	0.05	0.14	0.01

Table 4.2.1.9 Midwife-attended Births and Rate by Residence RHA, Alberta, 1996 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Midwife-attended live births	20	10	1,326	265	46	1,270	104	38	20	3,099
Live births	20,374	12,395	135,074	36,315	9,481	113,623	24,497	19,371	12,022	383,180
Rate (per 100 live births)	0.1	0.1	1.0	0.7	0.5	1.1	0.4	0.2	0.2	0.8
Standard Error (SE)	0.02	0.03	0.03	0.04	0.07	0.03	0.04	0.03	0.04	0.01

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.2.1.10 Mean Birth Weight for Selected Categories of Live Births, Alberta, 1996 to 2005

Mean birth weight (in grams)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
All Live Births	3,370	3,368	3,377	3,388	3,386	3,389	3,380	3,374	3,362	3,352
Preterm Births	2,320	2,303	2,328	2,333	2,360	2,365	2,339	2,349	2,359	2,323
Term Births	3,453	3,452	3,462	3,477	3,481	3,483	3,478	3,473	3,463	3,454
Singleton Births	3,395	3,395	3,405	3,415	3,417	3,421	3,414	3,409	3,398	3,384
Multiple Births	2,342	2,359	2,363	2,401	2,363	2,387	2,331	2,342	2,343	2,372

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release

Notes: Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.2.1.11 Live Births by Year and Maternal Age Group, Alberta, 1996 to 2005

Number of indicator	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<15	31	27	25	23	16	24	14	14	20	13
15-17	914	828	862	842	740	685	615	592	593	586
18-19	1,770	1,696	1,731	1,737	1,680	1,608	1,589	1,518	1,481	1,542
15-19	2,684	2,524	2,593	2,579	2,420	2,293	2,204	2,110	2,074	2,128
20-24	7,551	7,351	7,709	7,857	7,476	7,530	7,791	8,029	7,861	7,969
25-29	11,851	11,690	11,718	11,664	11,287	11,461	11,829	12,310	12,692	13,098
30-34	10,598	10,044	10,464	10,275	10,032	10,491	10,902	11,454	11,697	12,058
35-39	4,175	4,237	4,338	4,606	4,613	4,618	4,724	4,945	4,957	5,236
40-44	566	663	646	738	768	778	799	961	948	1,004
>44	16	12	24	34	13	30	30	44	42	41
All	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548

Table 4.2.1.12 Live Births by Year and Residence RHA, Alberta, 1996 to 2005

Number of indicator	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	2,038	2,135	2,018	2,064	1,945	1,960	1,969	2,093	2,047	2,105
Palliser	1,172	1,186	1,243	1,232	1,221	1,230	1,226	1,258	1,278	1,349
Calgary	12,489	12,437	12,900	12,990	13,064	13,109	13,588	14,473	14,606	15,418
David Thompson	3,661	3,533	3,567	3,648	3,474	3,482	3,616	3,727	3,786	3,821
East Central	1,008	978	996	961	908	882	971	898	954	925
Capital	11,443	10,823	11,189	11,320	10,790	11,054	11,293	11,702	11,915	12,094
Aspen	2,602	2,501	2,594	2,540	2,285	2,404	2,408	2,386	2,396	2,381
Peace Country	1,942	1,851	1,918	1,947	1,818	1,907	1,921	2,037	1,958	2,072
Northern Lights	1,117	1,106	1,101	1,070	1,116	1,192	1,299	1,292	1,348	1,381
Alberta	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.2.1.13 Live Births by Residence RHA and Maternal Age Group, Alberta, 2003 to 2005

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
2003										
<15	2	0	3	2	0	3	1	2	1	14
15-17	38	20	118	95	8	153	76	61	23	592
18-19	105	54	321	216	37	437	145	124	79	1,518
15-19	143	74	439	311	45	590	221	185	102	2,110
20-24	593	329	2,160	961	230	2,174	650	574	357	8,029
25-29	652	439	4,194	1,250	297	3,604	739	697	438	12,310
30-34	480	301	4,884	848	221	3,508	533	411	267	11,454
35-39	187	103	2,320	293	79	1,514	205	139	105	4,945
40-44	35	12	449	59	24	297	36	28	21	961
>44	1	0	23	3	2	12	1	1	1	44
All	2,093	1,258	14,473	3,727	898	11,702	2,386	2,037	1,292	39,868
2004										
<15	2	1	6	2	0	5	3	0	1	20
15-17	36	20	113	96	13	144	79	50	42	593
18-19	103	65	325	201	42	376	169	114	86	1,481
15-19	139	85	438	297	55	520	248	164	128	2,074
20-24	558	330	2,121	954	214	2,138	643	562	340	7,861
25-29	639	461	4,308	1,241	338	3,853	745	642	465	12,692
30-34	474	275	5,003	909	236	3,554	536	414	294	11,697
35-39	191	104	2,277	317	86	1,535	191	152	104	4,957
40-44	40	22	428	62	25	302	30	23	16	948
>44	4	0	25	4	0	8	0	1	0	42
All	2,047	1,278	14,606	3,786	954	11,915	2,396	1,958	1,348	40,291
2005										
<15	0	0	0	2	0	5	1	4	1	13
15-17	43	15	126	97	6	150	60	57	31	586
18-19	87	60	318	214	35	427	176	133	92	1,542
15-19	130	75	444	311	41	577	236	190	123	2,128
20-24	569	354	2,105	966	206	2,200	637	558	374	7,969
25-29	686	480	4,459	1,351	345	3,887	750	668	471	13,098
30-34	483	308	5,372	812	228	3,585	502	478	290	12,058
35-39	195	107	2,536	330	92	1,515	202	152	107	5,236
40-44	41	25	479	48	12	312	52	20	15	1,004
>44	1	0	23	1	1	12	1	2	0	41
All	2,105	1,349	15,418	3,821	925	12,094	2,381	2,072	1,381	41,548

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4. Births

4.1 Fertility Rates

4.2 Live Births

4.3 Birth Weight

4.3.1 Small-for-gestational-age

4.3.2 Low birth weight

4.3.3 Large-for-gestational-age

4.3.4 High birth weight

4.4 Preterm Births

4.5 Multiple Births

4.6 Infant morbidity

4.7 Mortality

4.8 Maternal factors

4.3.1 Small-for-Gestational-Age

Background

Small-for-gestational-age infants *have a birth weight below the 10th percentile of appropriate for gestational age infants* (see Alberta norms in Robertson, Svenson, & Kyle, 2002). Some infants are simply genetically small; others are affected by intrauterine growth restriction.

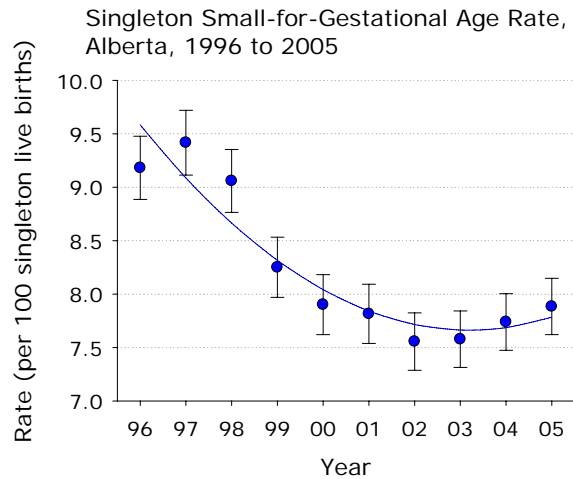
Singleton small-for-gestational-age rate: *Number of singleton small-for-gestational-age live births per 100 singleton live births.* Rates may also be calculated for multiple births.

In a study of 76,444 Alberta births, researchers found that small-for-gestational-age births were associated with a number of modifiable risk factors, including maternal prenatal smoking, multiple gestation (which may be modifiable in pregnancies involving assisted reproduction), low pre-pregnancy weight, inadequate prenatal weight gain, and older maternal age (35 years or older) (Newburn-Cook et al., 2002). Multiple gestations and older maternal age are both increasing in frequency.

Maternal smoking is the biggest contributor to intrauterine growth restriction (Health Canada, 2003). In the Newburn-Cook et al. (2002) study, Alberta infants born to women who smoked during pregnancy weighed 157 grams less than infants born to non-smoking mothers.

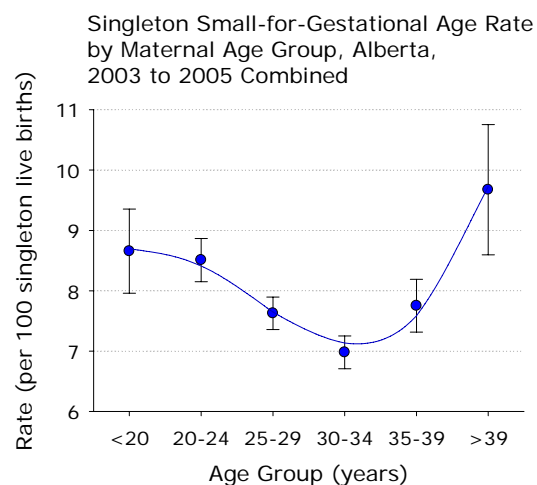
Millar and Chen (1998) found that small-for-gestational age births were more prevalent among women with low levels of education, even when maternal smoking (which tends to be more prevalent among women with low education) was factored out.

Time Trends (see Table 4.3.1.1, 4.3.1.2, 4.3.1.3)



- The singleton small-for-gestational-age rate declined between 1996 and 2002 and leveled off thereafter. In 2005, the rate was 7.9 (per 100 live singleton births).
- The singleton small-for-gestational-age rate is lower for term births than for preterm births. In 2005, the rate was 10.2 (per 100 singleton live births) for preterm births, compared with 7.7 for term births.
- The small-for-gestational-age rate for multiples is quite variable due to the small number of multiple births, and there are no significant effects of plurality on small-for-gestational age rates between 1996 and 2005. In 2005, the rate for multiples was 6.7 (per 100 multiple live births).

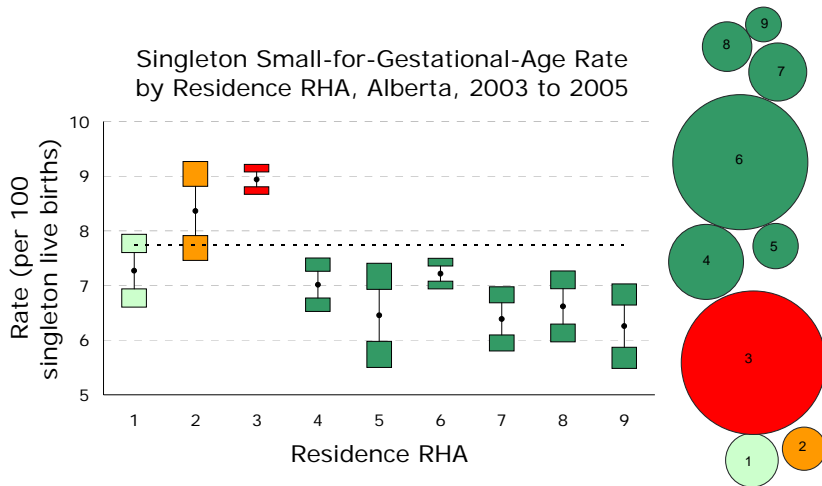
Age Effects (see Tables 4.3.1.4, 4.3.1.6)



Age Effects continued (see Tables 4.3.1.4, 4.3.1.6)

- The small-for-gestational-age rate is lowest for women between 30 and 34, and highest for women over 39. The rate is elevated for younger mothers compared with those in the 30 to 34 age group. Between 2003 and 2005, the rate was 7.0 (per 100 singleton live births) for women 30 to 34, and 9.7 for women over 39.

Regional Data (see Tables 4.3.1.5, 4.3.1.7)



- The small-for-gestational-age rate was significantly lower than the provincial average in RHAs 4 through 9. The lowest rate was 6.3 (per 100 singleton live births) in RHA 9.
- The rate was significantly higher than the provincial average in RHA 3 (8.9 per 100 singleton live births).
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

4.3.1 Small-for-Gestational-Age

Background (continued)

Strauss (2000) followed a cohort of children born in 1970. Small deficits in standardized tests of academic abilities were observed in school-age children who had been small-for-gestational-age at birth. Social and emotional development did not differ from children who were appropriate-for-gestational age. In adulthood (26 years of age), persons born small-for-gestational age were less likely to be in professional or managerial occupations and more likely to be in unskilled, semiskilled or manual labour positions than appropriate-for-gestational-age persons. However, social and emotional outcomes did not vary between these groups. Strauss noted that family environment also played a critical role in outcomes.

Small-for-Gestational-Age Rate 2003-05

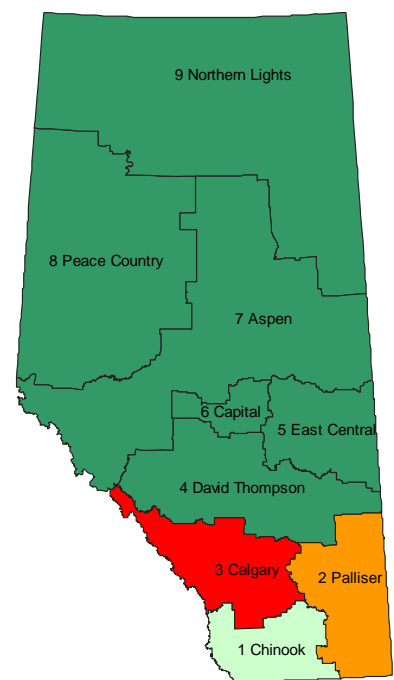


Table 4.3.1.1 Singleton Small-for-Gestational-Age Births and Rate by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Singleton small-for-gestational-age live births	3,360	3,356	3,311	3,035	2,813	2,825	2,803	2,923	3,015	3,171
Singleton live births	36,585	35,618	36,527	36,749	35,527	36,086	37,072	38,574	38,932	40,210
Rate (per 100 live births)	9.2	9.4	9.1	8.3	7.9	7.8	7.6	7.6	7.7	7.9
Standard Error (SE)	0.15	0.15	0.15	0.14	0.14	0.14	0.14	0.13	0.14	0.13

Table 4.3.1.2 Singleton Small-for-Gestational-Age Births and Rate by Preterm/Term, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Preterm Singleton small-for-gestational-age preterm live births	235	235	242	244	228	239	245	233	283	311
Singleton preterm live births	2,258	2,143	2,281	2,393	2,487	2,488	2,604	2,712	2,854	3,047
Rate (per 100 live births)	10.4	11.0	10.6	10.2	9.2	9.6	9.4	8.6	9.9	10.2
Standard Error (SE)	0.64	0.67	0.64	0.62	0.58	0.59	0.57	0.54	0.56	0.55

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Term Singleton small-for-gestational-age term live births	3,124	3,119	3,067	2,788	2,579	2,581	2,556	2,690	2,730	2,859
Singleton term live births	34,317	33,449	34,221	34,331	33,009	33,577	34,451	35,843	36,064	37,144
Rate (per 100 live births)	9.1	9.3	9.0	8.1	7.8	7.7	7.4	7.5	7.6	7.7
Standard Error (SE)	0.16	0.16	0.15	0.15	0.15	0.15	0.14	0.14	0.14	0.14

Table 4.3.1.3 Multiple Small-for-Gestational-Age Births and Rate, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Multiple small-for-gestational-age live births	93	66	91	80	95	90	107	81	87	90
Multiple live births	887	932	1,002	1,029	1,098	1,140	1,221	1,294	1,359	1,338
Rate (per 100 live births)	10.5	7.1	9.1	7.8	8.7	7.9	8.8	6.3	6.4	6.7
Standard Error (SE)	1.03	0.84	0.91	0.83	0.85	0.80	0.81	0.67	0.66	0.68

Table 4.3.1.4 Singleton Small-for-Gestational-Age Births and Rate by Maternal Age Group, Alberta, 2003 to 2005 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Singleton small-for-gestational-age live births	541	1,984	2,824	2,364	1,117	279	9,109
Singleton live births	6,250	23,305	37,028	33,851	14,396	2,884	117,716
Rate (per 100 live births)	8.7	8.5	7.6	7.0	7.8	9.7	7.7
Standard Error (SE)	0.36	0.18	0.14	0.14	0.22	0.55	0.08

Table 4.3.1.5 Singleton small-for-Gestational-Age Births and Rate by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Singleton small-for-gestational-age live births	441	314	3,844	768	172	2,490	444	390	246	9,109
Singleton live births	6,066	3,755	42,996	10,949	2,665	34,502	6,950	5,894	3,932	117,716
Rate (per 100 live births)	7.3	8.4	8.9	7.0	6.5	7.2	6.4	6.6	6.3	7.7
Standard Error (SE)	0.33	0.45	0.14	0.24	0.48	0.14	0.29	0.32	0.39	0.08

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.3.1.6 Singleton Small-for-Gestational-Age Live Births and Rates by Year and Maternal Age Group, Alberta, 1996 to 2005

Singleton Small-for-Gestational-Age Live Births	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<20	295	302	294	237	238	214	195	189	179	173
20-24	741	744	719	706	620	644	628	661	645	677
25-29	994	1,015	1,004	898	844	818	824	883	947	994
30-34	903	836	831	722	702	725	718	750	769	844
35-39	372	379	392	393	346	335	354	345	373	398
>39	54	78	67	74	57	84	82	95	100	84
All	3,359	3,354	3,309	3,032	2,807	2,820	2,801	2,923	3,013	3,170

Rate (per 100 singleton live births)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<20	11.0	12.0	11.4	9.2	9.9	9.4	8.9	9.1	8.7	8.2
20-24	10.0	10.3	9.5	9.1	8.5	8.8	8.3	8.4	8.4	8.7
25-29	8.6	8.9	8.8	7.9	7.7	7.3	7.2	7.4	7.7	7.8
30-34	8.8	8.6	8.2	7.3	7.2	7.2	6.9	6.8	6.9	7.3
35-39	9.2	9.3	9.4	8.9	7.9	7.6	7.9	7.4	7.9	8.0
>39	9.5	12.0	10.4	9.9	7.7	10.9	10.3	9.8	10.7	8.6
All	9.2	9.4	9.1	8.3	7.9	7.8	7.6	7.6	7.7	7.9

Table 4.3.1.7 Singleton Small-for-Gestational-Age Live Births and Rates by Year and Residence RHA, Alberta, 1996 to 2005

Singleton Small-for-Gestational-Age Live Births	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	158	164	151	149	117	137	115	142	142	157
Palliser	102	121	134	105	105	105	98	102	95	117
Calgary	1,295	1,265	1,298	1,133	1,074	1,113	1,113	1,215	1,243	1,386
David Thompson	334	306	313	260	251	224	261	254	262	252
East Central	68	66	73	74	66	65	76	41	68	63
Capital	942	926	924	888	830	827	773	810	843	837
Aspen	199	244	193	182	143	162	149	137	164	143
Peace Country	182	159	139	141	146	121	140	133	121	136
Northern Lights	80	105	86	102	80	71	78	89	77	80
Alberta	3,360	3,356	3,311	3,035	2,813	2,825	2,803	2,923	3,015	3,171

Rate (per 100 singleton live births)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	7.9	7.9	7.6	7.4	6.3	7.2	6.0	7.0	7.2	7.7
Palliser	8.9	10.4	11.0	8.8	8.9	8.8	8.3	8.4	7.7	9.0
Calgary	10.7	10.5	10.4	9.0	8.5	8.8	8.5	8.7	8.8	9.3
David Thompson	9.4	8.9	9.0	7.3	7.4	6.6	7.5	7.0	7.2	6.9
East Central	6.8	6.9	7.4	8.0	7.6	7.6	8.0	4.7	7.4	7.1
Capital	8.4	8.8	8.5	8.1	7.9	7.7	7.0	7.1	7.3	7.2
Aspen	7.8	10.0	7.6	7.3	6.4	6.9	6.3	6.0	7.0	6.2
Peace Country	9.5	8.7	7.5	7.4	8.2	6.5	7.5	6.7	6.4	6.8
Northern Lights	7.3	9.8	8.0	9.7	7.4	6.1	6.2	7.1	5.8	5.9
Alberta	9.2	9.4	9.1	8.3	7.9	7.8	7.6	7.6	7.7	7.9

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4.3.2 Low Birth Weight

Background

Low birth weight: *Birth weight of less than 2,500 grams.*

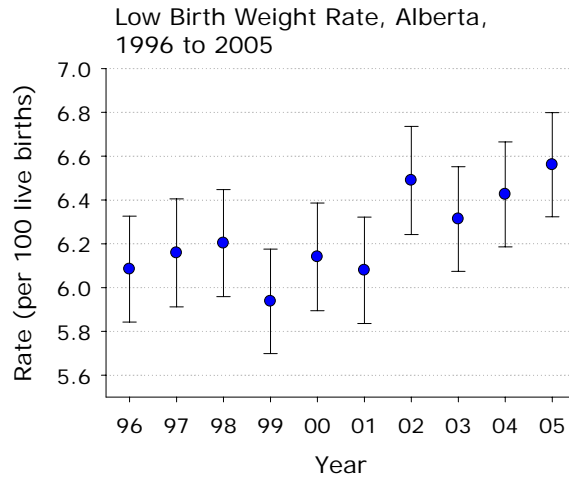
Low birth weight rate: *Number of low birth weight live births per 100 live births.* Since 1990, the rate has included birth weights under 500 grams.

Low birth weight infants may be small-for-gestational-age, or preterm, or both (Wen, Kramer, Platt, et al., 2003; Wilcox, 2001). These types of low birth weight have different underlying causes and different effects on later development (Millar & Chen, 1998; Wallace & McCarton, 1997). Care should be taken in the interpretation of simple low birth weight rates, which reflect the combined effects of restricted growth for gestational age and preterm birth.

Low birth weight is associated with a host of negative outcomes, including fetal and neonatal morbidity and mortality, restricted growth, impaired cognitive development, and chronic diseases in later life (such as asthma, diabetes, hypertension, and cardiovascular disease) (United Nations Children's Fund and World Health Organization, 2004; Wilcox, 2001).

Fetal, maternal, and environmental factors can all impact birth weight. In developing countries, maternal health and diet are often sub-optimal and physically demanding work is common, resulting in high rates of low birth weight. In developed countries, smoking and other lifestyle factors (alcohol consumption, street drug use) are major risk factors for low birth weight (United Nations Children's Fund and World Health Organization, 2004).

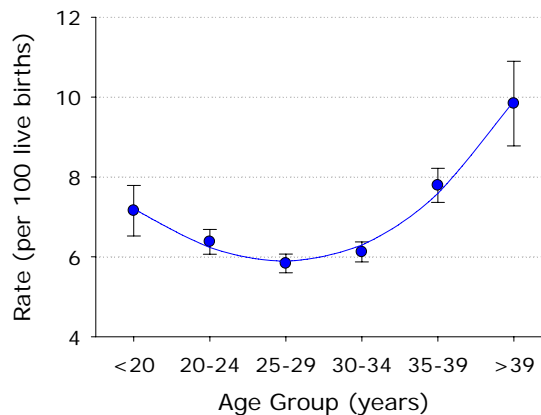
Time Trends (see Tables 4.3.2.1, 4.3.2.2, 4.3.2.3, 4.3.2.6)



- Between 1996 and 2001, the low birth weight rate fluctuated between 5.9 and 6.2 (per 100 live births). The rate was 6.3 or higher for each year after 2001. Although there was not a significant linear increase over time, the higher rates after 2001 may indicate a developing trend and are of concern.
- Preterm births and low birth weight are strongly associated. In 2005, 53.8% of preterm births were low birth weight, compared with just 1.8% of term births.
- Low birth weight is strongly associated with multiple birth. In 2005, the low birth weight rate was 52.0 (per 100 live births) for multiple births, and 5.0 for singleton births.

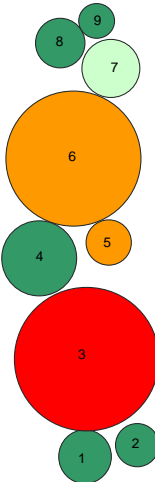
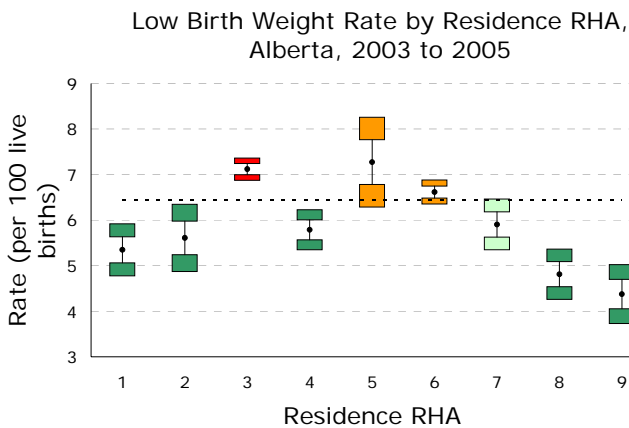
Age Effects (see Table 4.3.2.4, 4.3.2.7)

Low Birth Weight Rate by Maternal Age Group, Alberta, 2003 to 2005 Combined



- Low birth weight rates are highest for older mothers and are elevated for teen mothers as well. For mothers over 39, the rate was 9.8 (per 100 live births) for 2003 to 2005 combined.

Regional Data (see Table 4.3.2.5, 4.3.2.8)



- For 2003 to 2005 combined, the low birth weight rate was significantly lower than the provincial average in RHAs 1, 2, 4, 8, and 9, with the lowest rate in RHA 9 (4.4 per 100 live births).
- The rate was significantly higher than the provincial average in RHA 3, where 7.1% of live births were low birth weight during that time period.
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

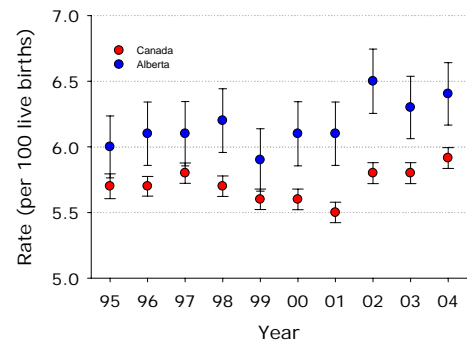
4.3.2 Low Birth Weight

Background (continued)

Alberta's low birth weight rate is higher than Canada's. In 2004, the rate was 6.4 (per 100 live births) in Alberta and 5.9 in Canada (Statistics Canada, 2006d). Canada's low birth weight rate increased after 2001.

Low Birth Weight Rate, Alberta and Canada, 1995 to 2004

Source: Statistics Canada (1997, 1998, 1999a,b, 2000, 2002, 2005b, 2006d)



Low Birth Weight 2003-05

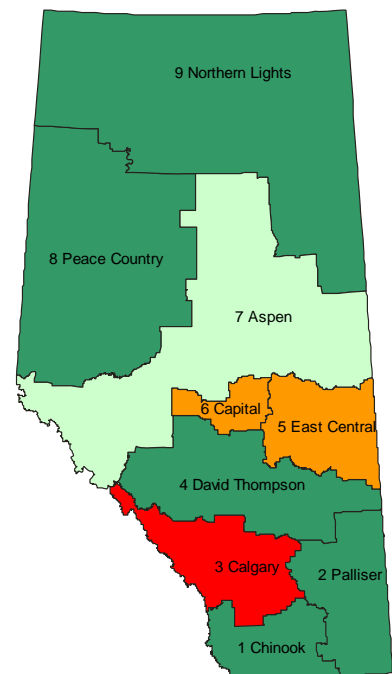


Table 4.3.2.1 Low Birth Weight Births and Rate by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Low birth weight live births	2,280	2,251	2,328	2,243	2,250	2,265	2,486	2,517	2,589	2,726
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	6.1	6.2	6.2	5.9	6.1	6.1	6.5	6.3	6.4	6.6
Standard Error (SE)	0.12	0.13	0.12	0.12	0.13	0.12	0.13	0.12	0.12	0.12

Table 4.3.2.2 Low Birth Weight Births and Rate by Preterm/Term, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Preterm										
Low birth weight preterm live births	1,537	1,523	1,578	1,605	1,619	1,632	1,777	1,896	1,929	2,030
Preterm live births	2,769	2,655	2,815	2,936	3,098	3,108	3,298	3,521	3,666	3,775
Rate (per 100 live births)	55.5	57.4	56.1	54.7	52.3	52.5	53.9	53.8	52.6	53.8
Standard Error (SE)	0.94	0.96	0.94	0.92	0.90	0.90	0.87	0.84	0.82	0.81

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Term										
Low birth weight term live births	743	728	750	638	630	631	708	621	660	696
Term live births	34,693	33,869	34,689	34,817	33,496	34,097	34,978	36,328	36,611	37,754
Rate (per 100 live births)	2.1	2.1	2.2	1.8	1.9	1.9	2.0	1.7	1.8	1.8
Standard Error (SE)	0.08	0.08	0.08	0.07	0.07	0.07	0.08	0.07	0.07	0.07

Table 4.3.2.3 Low Birth Weight Births and Rate by Plurality, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Multiple										
Low birth weight multiple live births	485	514	535	510	565	576	679	702	720	696
Multiple live births	887	932	1,002	1,029	1,098	1,140	1,221	1,294	1,359	1,338
Rate (per 100 live births)	54.7	55.2	53.4	49.6	51.5	50.5	55.6	54.3	53.0	52.0
Standard Error (SE)	1.67	1.63	1.58	1.56	1.51	1.48	1.42	1.38	1.35	1.37

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Singleton										
Low birth weight singleton live births	1,795	1,737	1,793	1,733	1,685	1,689	1,807	1,815	1,869	2,030
Singleton live births	36,585	35,618	36,527	36,749	35,527	36,086	37,072	38,574	38,932	40,210
Rate (per 100 live births)	4.9	4.9	4.9	4.7	4.7	4.7	4.9	4.7	4.8	5.0
Standard Error (SE)	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11

Table 4.3.2.4 Low Birth Weight Births and Rate by Maternal Age Group, Alberta, 2003 to 2005 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Low birth weight live births	455	1,521	2,223	2,155	1,179	299	7,832
Live births	6,359	23,859	38,100	35,209	15,138	3,040	121,707
Rate (per 100 live births)	7.2	6.4	5.8	6.1	7.8	9.8	6.4
Standard Error (SE)	0.32	0.16	0.12	0.13	0.22	0.54	0.07

Table 4.3.2.5 Low Birth Weight Births and Rate by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Low birth weight live births	334	218	3,168	656	202	2,363	423	292	176	7,832
Live births	6,245	3,885	44,497	11,334	2,777	35,711	7,163	6,067	4,021	121,707
Rate (per 100 live births)	5.3	5.6	7.1	5.8	7.3	6.6	5.9	4.8	4.4	6.4
Standard Error (SE)	0.28	0.37	0.12	0.22	0.49	0.13	0.28	0.27	0.32	0.07

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.3.2.6 Low Birth Weight Live Births by Birth Weight Categories, Alberta, 1996 to 2005

<500 grams	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Live births <500 grams	35	34	28	31	47	43	64	65	75	71
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	0.09	0.09	0.07	0.08	0.13	0.12	0.17	0.16	0.19	0.17
Standard Error (SE)	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02

<1000 grams	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Live births <1000 grams	184	159	164	184	213	194	226	214	230	265
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	0.5	0.4	0.4	0.5	0.6	0.5	0.6	0.5	0.6	0.6
Standard Error (SE)	0.04	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04

<1500 grams	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Live births <1500 grams	388	368	367	375	423	410	448	442	453	521
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	1.0	1.0	1.0	1.0	1.2	1.1	1.2	1.1	1.1	1.3
Standard Error (SE)	0.05	0.05	0.05	0.05	0.06	0.05	0.05	0.05	0.05	0.05

<2500 grams	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Live births <2500 grams	2,280	2,251	2,328	2,243	2,250	2,265	2,486	2,517	2,589	2,726
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	6.1	6.2	6.2	5.9	6.1	6.1	6.5	6.3	6.4	6.6
Standard Error (SE)	0.12	0.13	0.12	0.12	0.13	0.12	0.13	0.12	0.12	0.12

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.3.2.7 Low Birth Weight Births and Rates by Year and Maternal Age Group, Alberta, 1996 to 2005

Low birth weight live births	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<20	198	192	206	152	170	159	155	154	136	165
20-24	494	424	449	451	447	458	537	532	531	458
25-29	624	673	650	614	604	605	677	691	710	822
30-34	630	588	622	651	599	583	679	699	688	768
35-39	295	312	340	317	352	383	360	352	417	410
>39	39	62	59	57	77	75	77	89	107	103
All	2,280	2,251	2,328	2,243	2,249	2,263	2,485	2,517	2,589	2,726

Rate (per 100 live births)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<20	7.3	7.5	7.9	5.8	7.0	6.9	7.0	7.3	6.5	7.7
20-24	6.5	5.8	5.8	5.7	6.0	6.1	6.9	6.6	6.8	5.7
25-29	5.3	5.8	5.5	5.3	5.4	5.3	5.7	5.6	5.6	6.3
30-34	5.9	5.9	5.9	6.3	6.0	5.6	6.2	6.1	5.9	6.4
35-39	7.1	7.4	7.8	6.9	7.6	8.3	7.6	7.1	8.4	7.8
>39	6.7	9.2	8.8	7.4	9.9	9.3	9.3	8.9	10.8	9.9
All	6.1	6.2	6.2	5.9	6.1	6.1	6.5	6.3	6.4	6.6

Table 4.3.2.8 Low Birth Weight Births and Rates by Year and Residence RHA, Alberta, 1996 to 2005

Low birth weight live births	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	114	111	95	128	118	114	99	111	111	112
Palliser	66	61	72	75	58	73	82	82	57	79
Calgary	817	846	891	806	861	873	992	990	1,046	1,132
David Thompson	238	215	210	199	184	215	229	204	214	238
East Central	52	54	49	49	56	57	65	66	73	63
Capital	708	675	711	670	676	669	722	753	774	836
Aspen	132	133	138	148	136	120	138	149	155	119
Peace Country	105	92	105	100	103	91	94	95	106	91
Northern Lights	48	64	56	68	57	53	65	67	53	56
Alberta	2,280	2,251	2,328	2,243	2,250	2,265	2,486	2,517	2,589	2,726

Rate (per 100 live births)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	5.6	5.2	4.7	6.2	6.1	5.8	5.0	5.3	5.4	5.3
Palliser	5.6	5.1	5.8	6.1	4.8	5.9	6.7	6.5	4.5	5.9
Calgary	6.5	6.8	6.9	6.2	6.6	6.7	7.3	6.8	7.2	7.3
David Thompson	6.5	6.1	5.9	5.5	5.3	6.2	6.3	5.5	5.7	6.2
East Central	5.2	5.5	4.9	5.1	6.2	6.5	6.7	7.3	7.7	6.8
Capital	6.2	6.2	6.4	5.9	6.3	6.1	6.4	6.4	6.5	6.9
Aspen	5.1	5.3	5.3	5.8	6.0	5.0	5.7	6.2	6.5	5.0
Peace Country	5.4	5.0	5.5	5.1	5.7	4.8	4.9	4.7	5.4	4.4
Northern Lights	4.3	5.8	5.1	6.4	5.1	4.4	5.0	5.2	3.9	4.1
Alberta	6.1	6.2	6.2	5.9	6.1	6.1	6.5	6.3	6.4	6.6

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4.3.3 Large-for-Gestational-Age

Background

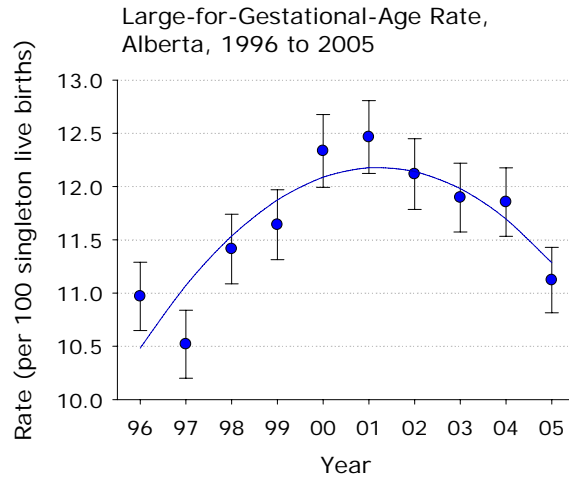
Large-for-gestational-age infants have a birth weight above the 90th percentile of appropriate for gestational age infants (see Alberta norms in Robertson, Svenson, & Kyle, 2002 for Alberta norms).

Large-for-gestational-age rate: *Number of singleton large-for-gestational-age live births per 100 singleton live births.*

Macrosomic infants have increased risk of infant mortality and shoulder dystocia (which can lead to clavicle and humerus fractures and brachial or facial paralysis). Macrosomic infants are more likely than normal weight infants to become overweight children. Maternal morbidity associated with delivery of a macrosomic infant includes genital tract injury, prolonged labour, postpartum bleeding, and cesarean delivery (Surkan, Chung-Cheng, Johansson, Dickman, & Cnattingius, 2005).

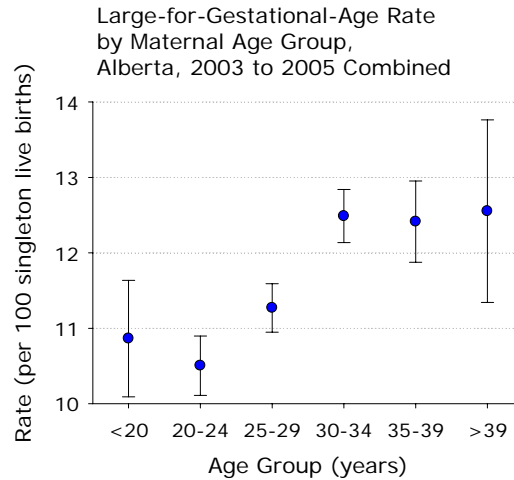
Risk factors for macrosomia include maternal obesity, excessive maternal weight gain, maternal diabetes (whether pre-existing or gestational), prolonged pregnancy, (Haram, Pirhonen, and Bergsjö, 2002), and First Nations ethnicity (Armstrong, Robinson, and Gray-Donald (1998).

Time Trends (see Tables 4.3.3.1)



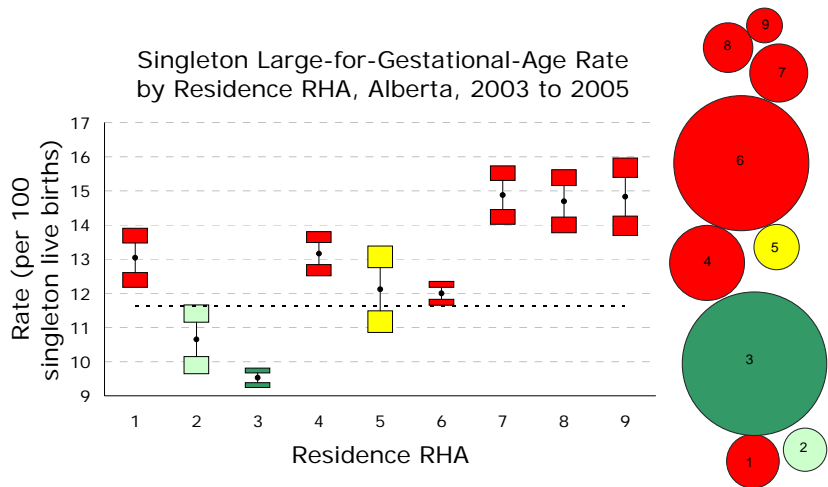
- The large-for-gestational-age rate in Alberta rose through the late 1990s and then began to decline in 2002. In 2005, the rate was 11.1 (per 100 singleton live births).

Age Effects (see Table 4.3.3.2)



- Between 2003 and 2005, mothers age 30 and older were more likely to give birth to a large-for-gestational-age infant than mothers under age 30.

Regional Data (see Table 4.3.3.3)



- The large-for-gestational-age rate was significantly lower than the provincial average in RHA 3 for 2003 to 2005 combined. The rate was 9.5 (per 100 singleton live births).
- The rate was significantly higher than the provincial average in RHAs 1, 4, 6, 7, 8, and 9 during that time period, with the highest rate in RHA 7 (14.9 per 100 singleton live births).
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

4.3.3 Large-for-Gestational-Age

Background (continued)

Kramer, Morin, Yang, Platt, Usher, McNamara et al. (2002) showed that the increase in large-for-gestational-age birth in Canada between 1976 and 1996 was associated with increases in maternal weight, weight gain during pregnancy, and gestational diabetes rates, in concert with decreasing maternal smoking and post-term delivery rates. Surkan et al. (2005) found similar results with a large cohort of Swedish women. Given well-documented trends toward increasing obesity, large-for-gestational-age infants and associated complications and risks are expected to increase.

Large-for-Gestational-Age Rate 2003-05

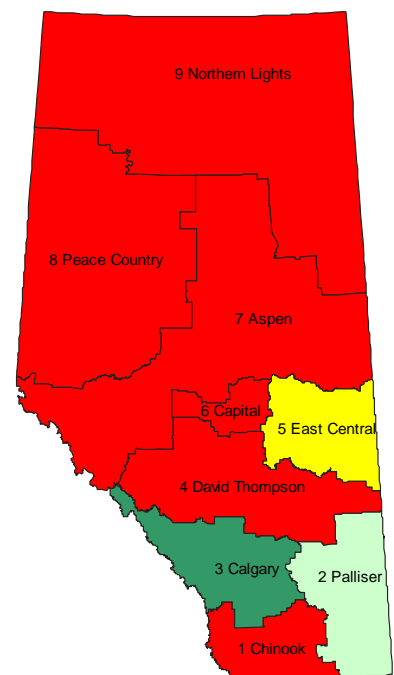


Table 4.3.3.1 Singleton Large-for-Gestational-Age Births and Rate by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Singleton large-for-gestational-age live births	4,013	3,747	4,169	4,278	4,382	4,498	4,492	4,589	4,615	4,472
Singleton live births	36,585	35,618	36,527	36,749	35,527	36,086	37,072	38,574	38,932	40,210
Rate (per 100 live births)	11.0	10.5	11.4	11.6	12.3	12.5	12.1	11.9	11.9	11.1
Standard Error (SE)	0.16	0.16	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.16

Table 4.3.3.2 Singleton Large-for-Gestational-Age Births and Rate by Maternal Age Group, Alberta, 2003 to 2005 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Singleton large-for-gestational-age live births	679	2,448	4,173	4,227	1,787	362	13,676
Live births	6,250	23,305	37,028	33,851	14,396	2,884	117,716
Rate (per 100 live births)	10.9	10.5	11.3	12.5	12.4	12.6	11.6
Standard Error (SE)	0.39	0.20	0.16	0.18	0.27	0.62	0.09

Table 4.3.3.3 Singleton Large-for-Gestational-Age Births and Rate by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Singleton large-for-gestational-age live births	791	400	4,097	1,441	323	4,140	1,034	866	583	13,676
Live births	6,066	3,755	42,996	10,949	2,665	34,502	6,950	5,894	3,932	117,716
Rate (per 100 live births)	13.0	10.7	9.5	13.2	12.1	12.0	14.9	14.7	14.8	11.6
Standard Error (SE)	0.43	0.50	0.14	0.32	0.63	0.17	0.43	0.46	0.57	0.09

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.3.3.4 Singleton Large-for-Gestational-Age Live Births and Rates by Year and Maternal Age Group, Alberta, 1996 to 2005

Singleton large-for-gestational-Age live births	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<20	237	219	240	222	240	249	217	211	227	241
20-24	728	666	711	788	789	814	842	827	800	821
25-29	1,252	1,167	1,359	1,352	1,363	1,416	1,368	1,389	1,422	1,362
30-34	1,217	1,143	1,233	1,263	1,293	1,327	1,371	1,450	1,447	1,330
35-39	500	479	530	554	581	610	592	582	612	593
>39	79	72	93	99	116	81	102	130	107	125
All	4,013	3,747	4,169	4,278	4,382	4,498	4,492	4,589	4,615	4,472

Rate (per 100 singleton live births)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<20	8.9	8.7	9.3	8.6	10.0	10.9	9.9	10.1	11.0	11.5
20-24	9.8	9.2	9.4	10.2	10.8	11.1	11.1	10.6	10.4	10.5
25-29	10.8	10.2	11.9	11.9	12.4	12.7	11.9	11.6	11.5	10.7
30-34	11.8	11.7	12.2	12.8	13.3	13.1	13.1	13.2	12.9	11.5
35-39	12.3	11.8	12.7	12.5	13.2	13.9	13.2	12.4	13.0	11.9
>39	13.9	11.1	14.5	13.3	15.6	10.5	12.8	13.4	11.5	12.7
All	11.0	10.5	11.4	11.6	12.3	12.5	12.1	11.9	11.9	11.1

Table 4.3.3.5 Singleton Large-for-Gestational-Age Live Births and Rates by Year and Residence RHA, Alberta, 1996 to 2005

Singleton large-for-gestational-Age live births	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	253	231	274	253	290	237	251	258	270	263
Palliser	121	123	119	120	141	142	143	139	127	134
Calgary	1,062	1,034	1,186	1,271	1,329	1,317	1,316	1,375	1,370	1,352
David Thompson	419	367	443	445	460	518	483	481	491	469
East Central	123	117	125	104	102	111	118	112	114	97
Capital	1,288	1,217	1,310	1,362	1,327	1,332	1,376	1,387	1,388	1,365
Aspen	343	298	356	339	337	348	364	360	357	317
Peace Country	239	205	217	225	226	305	259	299	294	273
Northern Lights	165	155	138	158	170	188	181	178	203	202
Alberta	4,013	3,747	4,169	4,278	4,382	4,498	4,492	4,589	4,615	4,472

Rate (per 100 singleton live births)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	12.7	11.1	13.8	12.6	15.5	12.5	13.2	12.6	13.6	12.9
Palliser	10.5	10.6	9.8	10.0	12.0	12.0	12.1	11.4	10.3	10.3
Calgary	8.7	8.6	9.5	10.1	10.5	10.4	10.0	9.9	9.7	9.0
David Thompson	11.8	10.7	12.8	12.6	13.6	15.3	13.9	13.3	13.4	12.8
East Central	12.3	12.3	12.7	11.2	11.7	13.0	12.4	12.9	12.5	11.0
Capital	11.5	11.5	12.0	12.3	12.7	12.4	12.5	12.2	12.1	11.7
Aspen	13.5	12.2	14.0	13.7	15.1	14.9	15.5	15.7	15.3	13.6
Peace Country	12.5	11.2	11.6	11.9	12.7	16.4	13.9	15.1	15.4	13.6
Northern Lights	15.0	14.5	12.8	15.0	15.7	16.0	14.5	14.2	15.3	14.9
Alberta	11.0	10.5	11.4	11.6	12.3	12.5	12.1	11.9	11.9	11.1

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4.3.4 High Birth Weight

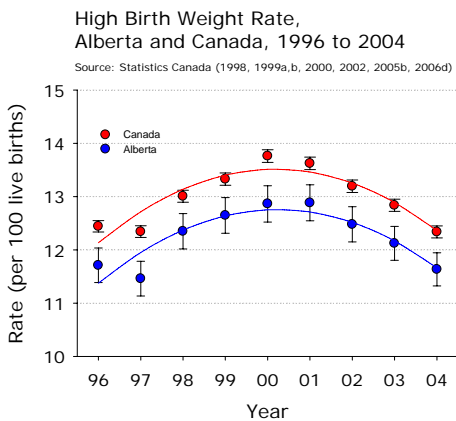
Background

High birth weight infants weigh 4,000 grams or more at birth.

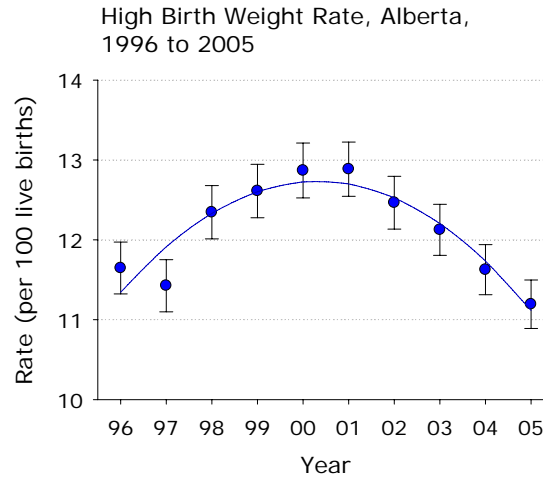
High birth weight rate: Number of high birth weight live births per 100 live births.

Almost three-quarters of high birth weight infants are large-for-gestational-age; the remaining one-quarter of high birth weight infants are between the 50th and 90th percentiles of weight for gestational age. Virtually all high birth weight infants are born at term or post-term, whereas large-for-gestational-age infants span the range of gestational ages.

The high birth weight rate followed a similar trend in Alberta and Canada between 1996 and 2003, but the Alberta rate was consistently lower than the overall rate for Canada. The rate peaked in 2000 and 2001, and declined thereafter. In 2003, the high birth weight rate was 12.1 in Alberta and 12.8 in Canada (Statistics Canada, 2005b).

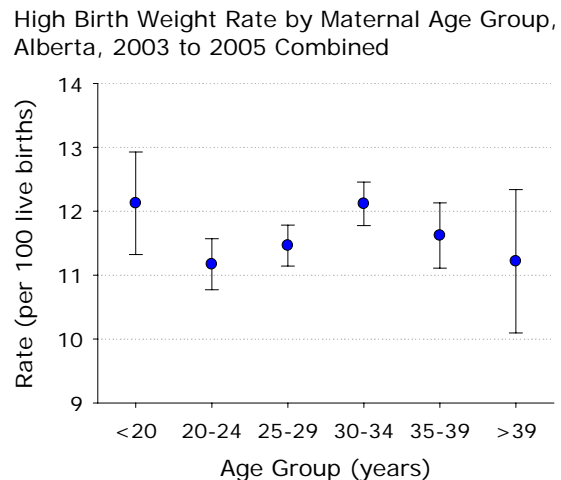


Time Trends (see Table 4.3.4.1)



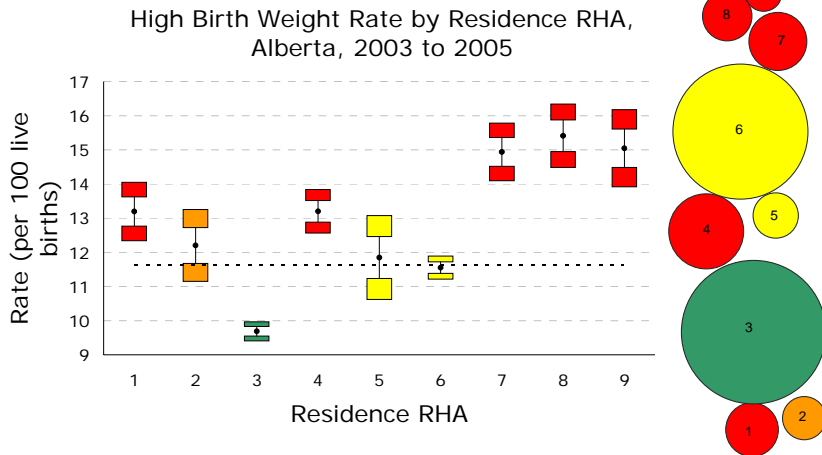
- After increasing in the last 1990s, the high birth weight rate declined steadily between 2001 and 2005. In 2005, the rate was 11.2 (per 100 live births).
- The rate of births 4500 grams or over showed a similar pattern, with a rate of 1.6 in 2005.

Age Effects (see Table 4.3.4.2)



- The high birth weight rate did not vary in a consistent pattern with maternal age group for 2003 to 2005 combined.

Regional Data (see Table 4.3.4.3)



- The high birth weight rate was significantly lower than the provincial average in RHA 3 (9.7 per 100 live births).
- In RHAs 1, 4, 7, 8, and 9, the rate was significantly higher than the provincial average, with the highest rate (15.4) in RHA 8.
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

Limitations and Methodology Notes

Opinions vary as to what birth weight is best termed "high birth weight". Some sources use 4,500 grams as the cutoff.

4.3.4 High Birth Weight

High Birth Weight 2003-05

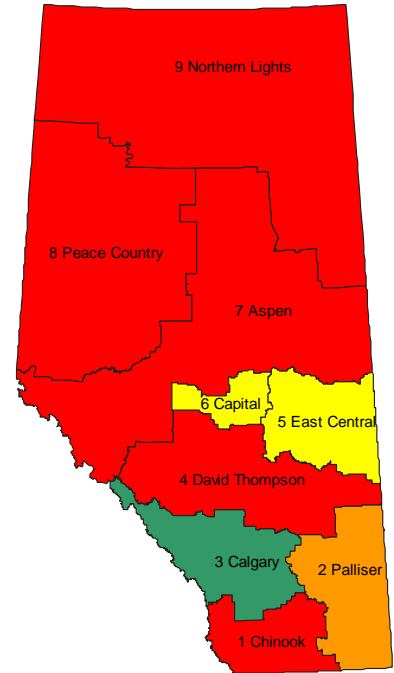


Table 4.3.4.1 High Birth Weight Births and Rate by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
High birth weight live births	4,364	4,176	4,633	4,764	4,713	4,796	4,773	4,834	4,684	4,651
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	11.6	11.4	12.3	12.6	12.9	12.9	12.5	12.1	11.6	11.2
Standard Error (SE)	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.16	0.16	0.15
>4499 grams live births	697	635	642	766	778	796	741	780	697	680
>4499 grams rate (per 100 live births)	1.9	1.7	1.7	2.0	2.1	2.1	1.9	2.0	1.7	1.6
Standard Error (SE)	0.07	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.06	0.06

Table 4.3.4.2 High Birth Weight Births and Rate by Maternal Age Group, Alberta, 2003 to 2005 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
High birth weight live births	771	2,665	4,367	4,266	1,759	341	14,169
Live births	6,359	23,859	38,100	35,209	15,138	3,040	121,707
Rate (per 100 live births)	12.1	11.2	11.5	12.1	11.6	11.2	11.6
Standard Error (SE)	0.41	0.20	0.16	0.17	0.26	0.57	0.09

Table 4.3.4.3 High Birth Weight Births and Rate by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
High birth weight live births	824	474	4,311	1,496	329	4,125	1,070	935	605	14,169
Live births	6,245	3,885	44,497	11,334	2,777	35,711	7,163	6,067	4,021	121,707
Rate (per 100 live births)	13.2	12.2	9.7	13.2	11.8	11.6	14.9	15.4	15.0	11.6
Standard Error (SE)	0.43	0.53	0.14	0.32	0.61	0.17	0.42	0.46	0.56	0.09

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.3.4.5 High Birth Weight Births and Rates by Year and Maternal Age Group, Alberta, 1996 to 2005

High birth weight live births	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<20	255	249	274	237	247	291	240	245	258	268
20-24	821	765	819	925	894	914	928	902	869	894
25-29	1,401	1,353	1,518	1,530	1,461	1,494	1,470	1,481	1,441	1,445
30-34	1,306	1,228	1,373	1,363	1,409	1,417	1,433	1,473	1,435	1,358
35-39	503	507	554	599	602	600	600	613	581	565
>39	78	74	93	110	100	80	102	120	100	121
All	4,364	4,176	4,633	4,764	4,713	4,796	4,773	4,834	4,684	4,651

Rate (per 100 live births)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<20	9.4	9.8	10.5	9.1	10.1	12.6	10.8	11.5	12.3	12.5
20-24	10.9	10.4	10.6	11.8	12.0	12.1	11.9	11.2	11.1	11.2
25-29	11.8	11.6	13.0	13.1	12.9	13.0	12.4	12.0	11.4	11.0
30-34	12.3	12.2	13.1	13.3	14.0	13.5	13.1	12.9	12.3	11.3
35-39	12.0	12.0	12.8	13.0	13.1	13.0	12.7	12.4	11.7	10.8
>39	13.4	11.0	13.9	14.2	12.8	9.9	12.3	11.9	10.1	11.6
All	11.6	11.4	12.3	12.6	12.9	12.9	12.5	12.1	11.6	11.2

Table 4.3.4.6 High Birth Weight Births and Rates by Year and Residence RHA, Alberta, 1996 to 2005

High birth weight live births	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	257	231	290	283	318	269	286	282	264	278
Palliser	151	155	142	150	171	162	173	160	153	161
Calgary	1,252	1,241	1,381	1,456	1,427	1,414	1,387	1,490	1,380	1,441
David Thompson	444	438	507	509	487	553	509	490	527	479
East Central	134	129	135	115	115	110	123	120	105	104
Capital	1,301	1,254	1,364	1,430	1,363	1,371	1,395	1,408	1,359	1,358
Aspen	382	329	400	378	369	367	387	373	361	336
Peace Country	275	239	266	278	262	337	300	316	322	297
Northern Lights	168	160	147	164	201	212	212	195	213	197
Alberta	4,364	4,176	4,633	4,764	4,713	4,796	4,773	4,834	4,684	4,651

Rate (per 100 live births)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	12.6	10.8	14.4	13.7	16.3	13.7	14.5	13.5	12.9	13.2
Palliser	12.9	13.1	11.4	12.2	14.0	13.2	14.1	12.7	12.0	11.9
Calgary	10.0	10.0	10.7	11.2	10.9	10.8	10.2	10.3	9.4	9.3
David Thompson	12.1	12.4	14.2	14.0	14.0	15.9	14.1	13.1	13.9	12.5
East Central	13.3	13.2	13.6	12.0	12.7	12.5	12.7	13.4	11.0	11.2
Capital	11.4	11.6	12.2	12.6	12.6	12.4	12.4	12.0	11.4	11.2
Aspen	14.7	13.2	15.4	14.9	16.1	15.3	16.1	15.6	15.1	14.1
Peace Country	14.2	12.9	13.9	14.3	14.4	17.7	15.6	15.5	16.4	14.3
Northern Lights	15.0	14.5	13.4	15.3	18.0	17.8	16.3	15.1	15.8	14.3
Alberta	11.6	11.4	12.3	12.6	12.9	12.9	12.5	12.1	11.6	11.2

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4. Births

- 4.1 Fertility Rates*
- 4.2 Live Births*
- 4.3 Birth Weight*
- 4.4 Preterm Births*
- 4.5 Multiple Births*
- 4.6 Infant morbidity*
- 4.7 Mortality*
- 4.8 Maternal factors*

4.4.1 Preterm Births

Background

Preterm births occur prior to 37 completed weeks of gestation (Dorland, 2000). Gestation is measured in complete weeks from the date of the last menstrual period. Ultrasound is typically used to determine gestational age and is generally more accurate than other methods.

Preterm birth rate: *Number of preterm births per 100 live births in a given year.*

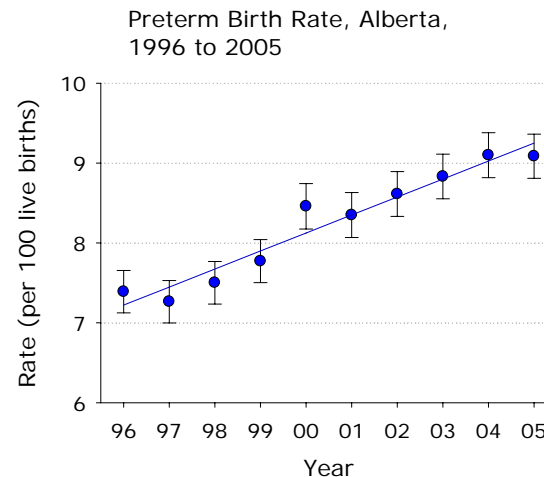
Preterm births comprise 70% of deaths and 75% of morbidity in neonates. Births prior to 32 weeks gestation are at highest risk. Preterm infant intensive care costs are a huge burden on the health care system (Wen, Smith, Yang, and Walker, 2004).

In the short term, the primary morbidity for preterm babies is respiratory distress syndrome. Long-term morbidities are neurosensory (e.g., cerebral palsy, visual system disorders, hearing disorders), neurocognitive (e.g., lower IQ, lower academic achievement), or respiratory (Gilbert, Nesbitt, and Danielson, 2003; Kramer, Platt, Yang, Joseph, Wen, Morin, & Usher, 1998; Slattery and Morrison, 2002). Medical advances have resulted in higher survival rates, at the cost of increased severe morbidity rates (Wen, Smith, Yang, and Walker, 2004).

Risk factors for preterm birth include maternal smoking, genital tract infection, preeclampsia, incompetent cervix, prior preterm birth, placental abruption, high maternal age, assisted reproduction, multiple pregnancy, low socioeconomic status, substance abuse, and psychological factors such as stress and depression (Health Canada, 2002a; Slattery and Morrison, 2002; Tough et al., 2003).

Time Trends (see Tables 4.4.1.1, 4.4.1.2, 4.4.1.3, 4.4.1.6)

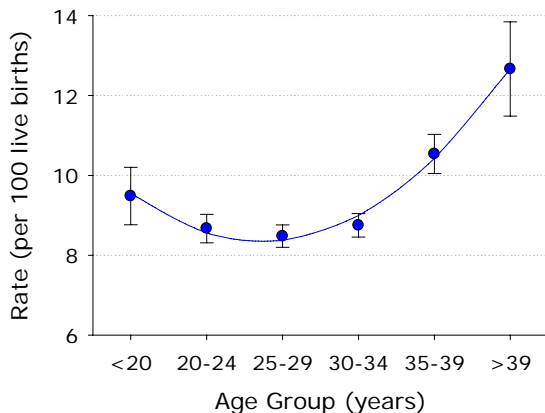
- Nine out of ten live births in Alberta are term births, and just under one percent are post-term (42 weeks gestation or later). The remaining 9% of births are preterm.
- Almost all of these preterm births occur between 27 and 36 weeks gestation, and the vast majority consists of births at 35 or 36 weeks gestation.



- The preterm birth rate has been climbing steadily in Alberta. The rate was 7.4 (per 100 live births) in 1996 and was 9.1 in 2005—a rate increase of 23% over 10 years. This is a disquieting trend.
- Three out of every four low birth weight births were preterm births in 2005, compared with 4.5% of non-low birth weight births. The preterm rate increased between 1996 and 2005 for both low-birth weight and non-low birth weight births.
- More than half of multiple births occur prior to term. In 2005, 54.4 out of every 100 live multiple births were preterm. The 2005 rate for singleton births was 7.6 (per 100 live singleton births).

Age Effects (see Tables 4.4.1.4, 4.4.1.7)

Preterm Birth Rate by Maternal Age Group, Alberta, 2003 to 2005 Combined



- Preterm births are most common in mothers 35 and older. The lowest rates are for women between 20 and 39 years of age.
- For 2003 to 2005 combined, the preterm birth rate was 12.7 (per 100 live births) for mothers over 39, and 8.5 for mothers 25 to 29 years of age.

4.4.1 Preterm Births

Background (continued)

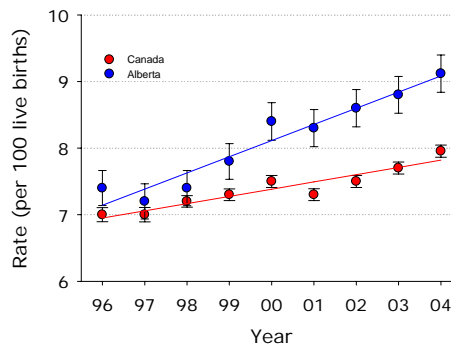
Most preterm births occur after spontaneous and unexplained preterm labour (40-50%). Other causes include preterm rupture of membranes, multiple pregnancies, and maternal or fetal complications (Tucker and McGuire, 2004; Wen, Smith, Yang, and Walker, 2004).

Rising preterm birth rates are partially due to increases in rates of assisted and multiple pregnancy, accuracy of estimations of gestational age, and rates of registration of extremely preterm or extremely low birth weight infants, as well as changes in maternal risk factor patterns (Wen, Smith, Yang, and Walker, 2004).

Preterm birth rates are increasing in both Canada and Alberta, but at a faster rate in Alberta. From 1996 to 1998, the preterm birth rate was similar in Canada and Alberta, but from 1999 to 2004 the Alberta rate was higher than the Canada rate. In 2004, the preterm birth rate was 9.1 (per 100 live births) in Alberta and 8.0 in Canada (Statistics Canada, 2006d).

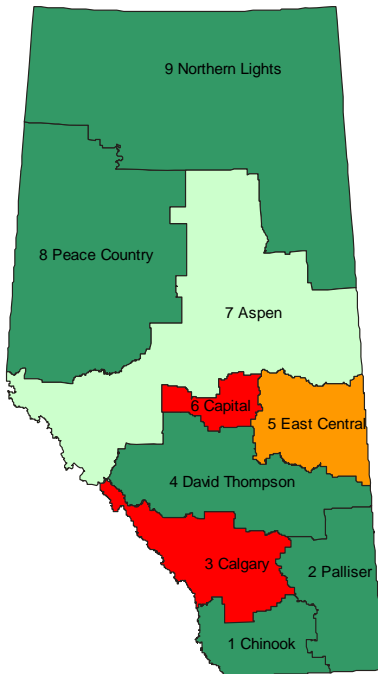
Preterm Birth Rate, Alberta and Canada, 1996 to 2004

Source: Statistics Canada (1998, 1999a,b, 2000, 2002, 2005b, 2006d)

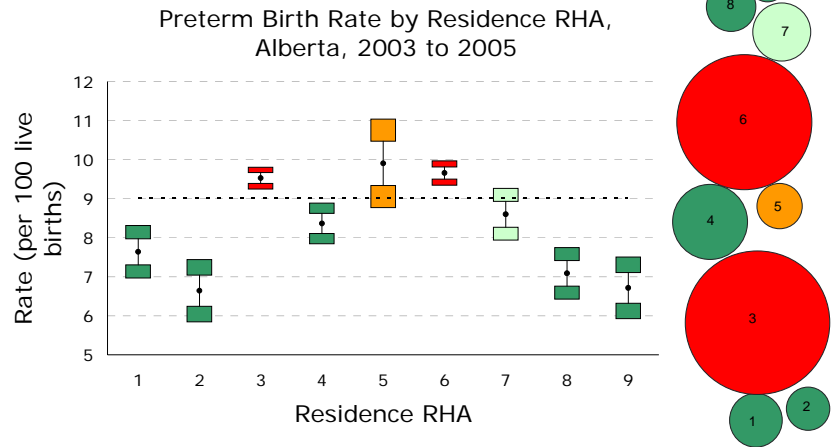


4.4.1 Preterm Births

Preterm Births 2003-05



Regional Data (see Table 4.4.1.5, 4.4.1.8)



- Preterm birth rates were significantly lower than the provincial average in RHAs 1, 2, 4, 8, and 9 for 2003 to 2005 combined, with the lowest rate of 6.6 (per 100 live births) in RHA 2.
- The preterm birth rate was significantly higher than the provincial average in the two major metropolitan areas (RHAs 3 and 6) during that time period. The highest rate was 9.9, in RHA 5, although this rate was not significantly above the provincial average.
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

Table 4.4.1.1 Preterm Births and Rate by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Preterm live births	2,769	2,655	2,815	2,936	3,098	3,108	3,298	3,521	3,666	3,775
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	7.4	7.3	7.5	7.8	8.5	8.3	8.6	8.8	9.1	9.1
Standard Error (SE)	0.14	0.14	0.14	0.14	0.15	0.14	0.14	0.14	0.14	0.14

Table 4.4.1.2 Preterm Births and Rate by Low Birth Weight Status, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Birth weight <2500 grams										
Preterm low birth weight live births	1,537	1,523	1,578	1,605	1,619	1,632	1,777	1,896	1,929	2,030
Low birth weight live births	2,280	2,251	2,328	2,243	2,250	2,265	2,486	2,517	2,589	2,726
Rate (per 100 live births)	67.4	67.7	67.8	71.6	72.0	72.1	71.5	75.3	74.5	74.5
Standard Error (SE)	0.98	0.99	0.97	0.95	0.95	0.94	0.91	0.86	0.86	0.84

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Birth weight >2499 grams										
Preterm non-low birth weight live births	1,232	1,132	1,237	1,331	1,478	1,476	1,521	1,625	1,737	1,745
Non-low birth weight live births	35,192	34,299	35,199	35,535	34,374	34,959	35,807	37,351	37,702	38,822
Rate (per 100 live births)	3.5	3.3	3.5	3.7	4.3	4.2	4.2	4.4	4.6	4.5
Standard Error (SE)	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.11

Table 4.4.1.3 Preterm Births and Rate by Plurality, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Multiple										
Preterm multiple live births	511	512	534	543	611	620	694	809	812	728
Multiple live births	887	932	1,002	1,029	1,098	1,140	1,221	1,294	1,359	1,338
Rate (per 100 live births)	57.6	54.9	53.3	52.8	55.6	54.4	56.8	62.5	59.7	54.4
Standard Error (SE)	1.66	1.63	1.58	1.56	1.50	1.48	1.42	1.35	1.33	1.36

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Singleton										
Preterm singleton live births	2,258	2,143	2,281	2,393	2,487	2,488	2,604	2,712	2,854	3,047
Singleton live births	36,585	35,618	36,527	36,749	35,527	36,086	37,072	38,574	38,932	40,210
Rate (per 100 live births)	6.2	6.0	6.2	6.5	7.0	6.9	7.0	7.0	7.3	7.6
Standard Error (SE)	0.13	0.13	0.13	0.13	0.14	0.13	0.13	0.13	0.13	0.13

Table 4.4.1.4 Preterm Births and Rate by Maternal Age Group, Alberta, 2003 to 2005 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Preterm live births	603	2,068	3,230	3,080	1,595	385	10,962
Live births	6,359	23,859	38,100	35,209	15,138	3,040	121,707
Rate (per 100 live births)	9.5	8.7	8.5	8.7	10.5	12.7	9.0
Standard Error (SE)	0.37	0.18	0.14	0.15	0.25	0.60	0.08

Table 4.4.1.5 Preterm Births and Rate by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Preterm live births	477	258	4,239	948	275	3,448	616	430	270	10,962
Live births	6,245	3,885	44,497	11,334	2,777	35,711	7,163	6,067	4,021	121,707
Rate (per 100 live births)	7.6	6.6	9.5	8.4	9.9	9.7	8.6	7.1	6.7	9.0
Standard Error (SE)	0.34	0.40	0.14	0.26	0.57	0.16	0.33	0.33	0.39	0.08

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.4.1.6 Live Births by Gestational Age Categories, Alberta, 1996 to 2005

20 - 27 weeks	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Live births 20 to 27 weeks	173	163	162	173	207	180	221	216	224	268
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	0.46	0.45	0.43	0.46	0.57	0.48	0.58	0.54	0.56	0.65
Standard Error (SE)	0.04	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04
28 - 36 weeks	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Live births 28 to 36 weeks	2,592	2,489	2,649	2,757	2,886	2,921	3,067	3,298	3,431	3,497
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	6.9	6.8	7.1	7.3	7.9	7.8	8.0	8.3	8.5	8.4
Standard Error (SE)	0.13	0.13	0.13	0.13	0.14	0.14	0.14	0.14	0.14	0.14
37 - 41 weeks (term)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Live births 37 to 41 weeks	33,969	33,185	34,057	34,214	32,964	33,635	34,548	35,943	36,286	37,473
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	90.7	90.8	90.7	90.6	90.0	90.4	90.2	90.2	90.1	90.2
Standard Error (SE)	0.15	0.15	0.15	0.15	0.16	0.15	0.15	0.15	0.15	0.15
42 weeks or more (post-term)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Live births 42 weeks or more	734	708	656	624	561	477	445	404	338	300
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	2.0	1.9	1.7	1.7	1.5	1.3	1.2	1.0	0.8	0.7
Standard Error (SE)	0.07	0.07	0.07	0.07	0.06	0.06	0.05	0.05	0.05	0.04

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.4.1.7 Preterm Live Births and Rates by Year and Maternal Age Group, Alberta, 1996 to 2005

Preterm live births	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<20	221	217	241	193	215	193	204	193	188	222
20-24	543	501	545	614	576	616	712	702	713	653
25-29	814	798	801	832	870	892	936	1,018	1,063	1,149
30-34	780	705	755	821	865	838	934	1,000	1,009	1,071
35-39	360	359	410	398	474	475	432	494	554	547
>39	51	74	62	77	98	94	80	114	139	132
All	2,769	2,655	2,815	2,936	3,098	3,108	3,298	3,521	3,666	3,775

Rate (per 100 live births)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<20	8.1	8.5	9.2	7.4	8.8	8.3	9.2	9.1	9.0	10.4
20-24	7.2	6.8	7.1	7.8	7.7	8.2	9.1	8.7	9.1	8.2
25-29	6.9	6.8	6.8	7.1	7.7	7.8	7.9	8.3	8.4	8.8
30-34	7.4	7.0	7.2	8.0	8.6	8.0	8.6	8.7	8.6	8.9
35-39	8.6	8.5	9.5	8.6	10.3	10.3	9.1	10.0	11.2	10.4
>39	8.8	11.0	9.3	10.0	12.5	11.6	9.7	11.3	14.0	12.6
All	7.4	7.3	7.5	7.8	8.5	8.3	8.6	8.8	9.1	9.1

Table 4.4.1.8 Preterm Live Births and Rates by Year and Residence RHA, Alberta, 1996 to 2005

Preterm live births	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	142	131	130	143	149	142	135	161	169	147
Palliser	69	69	98	77	79	88	93	105	68	85
Calgary	910	917	994	1,045	1,131	1,126	1,242	1,349	1,383	1,507
David Thompson	274	246	229	257	257	278	299	279	319	350
East Central	69	56	70	59	84	82	84	99	86	90
Capital	927	875	920	952	1,019	986	1,024	1,095	1,177	1,176
Aspen	182	163	176	199	187	192	207	192	232	192
Peace Country	122	116	116	121	112	141	123	144	149	137
Northern Lights	74	82	81	83	80	73	90	97	82	91
Alberta	2,769	2,655	2,815	2,936	3,098	3,108	3,298	3,521	3,666	3,775

Rate (per 100 live births)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	7.0	6.1	6.4	6.9	7.7	7.2	6.9	7.7	8.3	7.0
Palliser	5.9	5.8	7.9	6.3	6.5	7.2	7.6	8.3	5.3	6.3
Calgary	7.3	7.4	7.7	8.0	8.7	8.6	9.1	9.3	9.5	9.8
David Thompson	7.5	7.0	6.4	7.0	7.4	8.0	8.3	7.5	8.4	9.2
East Central	6.8	5.7	7.0	6.1	9.3	9.3	8.7	11.0	9.0	9.7
Capital	8.1	8.1	8.2	8.4	9.4	8.9	9.1	9.4	9.9	9.7
Aspen	7.0	6.5	6.8	7.8	8.2	8.0	8.6	8.0	9.7	8.1
Peace Country	6.3	6.3	6.0	6.2	6.2	7.4	6.4	7.1	7.6	6.6
Northern Lights	6.6	7.4	7.4	7.8	7.2	6.1	6.9	7.5	6.1	6.6
Alberta	7.4	7.3	7.5	7.8	8.5	8.3	8.6	8.8	9.1	9.1

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4. Births

4.1 Fertility Rates

4.2 Live Births

4.3 Birth Weight

4.4 Preterm Births

4.5 Multiple Births

4.6 Infant morbidity

4.7 Mortality

4.8 Maternal factors

4.5.1 Multiple Births

Background

Multiple pregnancy: *Pregnancy in which two or more fetuses exist simultaneously* (Dorland, 2000).

Multiple birth: *The birth of two or more offspring produced in the same gestation period* (Dorland, 2000). This includes both live births and stillbirths.

Multiple birth rate: *Number of multiple live births per 100 live births.*

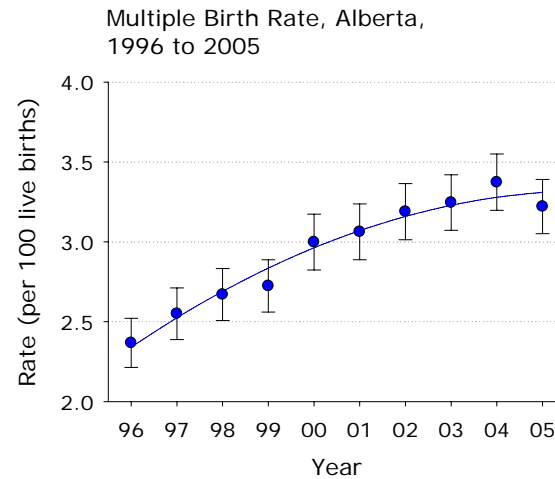
Risk factors for multiple pregnancy include ovulation-stimulating medications, assisted reproductive technologies, higher maternal age, and obesity (Reddy, Branum, and Klebanoff, 2005).

Multiple pregnancy is associated with adverse maternal outcomes, including maternal cardiovascular morbidity, haematologic morbidity, amniotic fluid embolus, pre-eclampsia, gestational diabetes, postpartum hemorrhage, prolonged hospital stay, operative delivery, hysterectomy, and blood transfusion. Rates of uterine rupture and vaginal tearing are lower in multiple pregnancies, owing to the high rates of cesarean section in multiple births (Walker, Murphy, Pan, Yang, and Wen, 2004).

The majority of multiples are born preterm or low birth weight or both, resulting in increased incidence of morbidity and mortality. There is risk of umbilical cord entanglement, Twin-to-Twin Transfusion Syndrome, restricted growth, and fetal death. Long-term disabilities known to occur in multiples include cerebral palsy, difficulties with language development, behavioural disorders, challenges in school, and relationship difficulties (Best Start, 2005).

Time Trends (see Tables 4.5.1.1, 4.5.1.4, 4.5.1.5, 4.5.1.6)

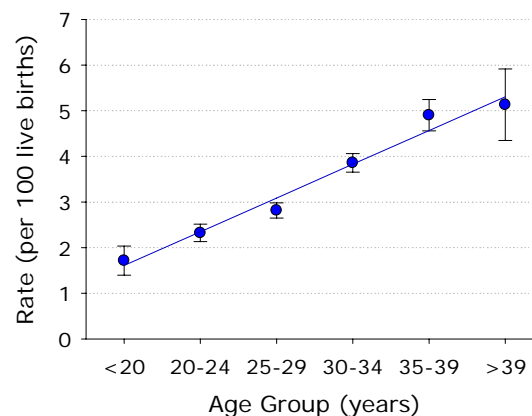
- About 97% of multiple births are twin births, and the increasing multiple birth rate seen in recent years is due to increasing twin births in Alberta.



- After years of steady increase, the multiple birth rate in Alberta may be stabilizing. In 2005, the rate was 3.2 (per 100 live births).
- For 2003 to 2005 combined, 93.3% of singleton liveborns but just 46.9% of multiple liveborns weighed between 2,500 and 4,499 grams. Singleton births were at term 92.4% of the time, compared with 41.2% of multiple births.

Maternal Age Effects (see Tables 4.5.1.2, 4.5.1.7)

Multiple Birth Rate by Maternal Age Group, Alberta, 2003 to 2005 Combined

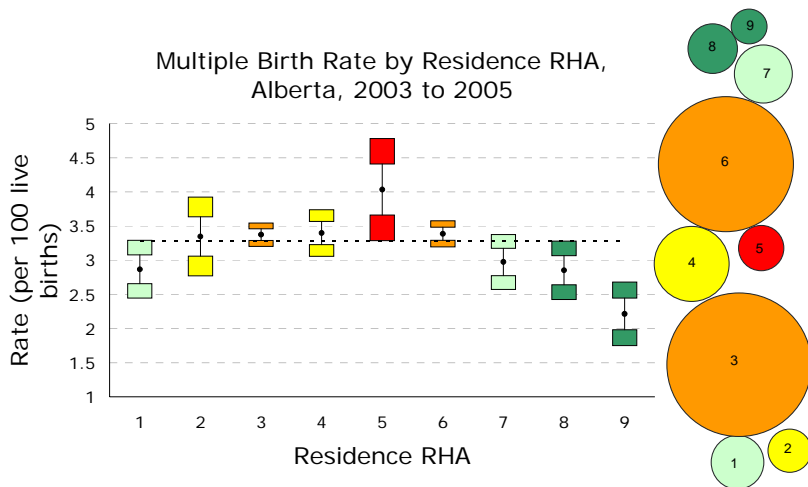


- Multiple births increase in frequency with increasing maternal age.

Maternal Age Effects continued (see Tables 4.5.1.2, 4.5.1.7)

- For 2003 to 2005 combined, the multiple birth rate varied from 1.7 (per 100 live births) for mothers under 20 to 5.1 for mothers in their 40s.

Regional Data (see Table 4.5.1.3, 4.5.1.8)



- RHAs 8 and 9 had multiple birth rates that were significantly lower than the provincial average, with RHA 9 having the lowest rate (2.2 per 100 live births).
- The provincial rate was exceeded in RHA 5, where there were 4 multiple births in every 100 live births for 2003 to 2005 combined.
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

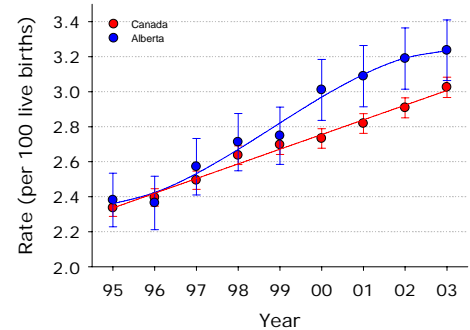
4.5.1 Multiple Births

Background (continued)

In 2002, there were about 48,000 multiple birth children age 5 and under in Canada. (Best Start, 2005). Prior to 2000, Canada and Alberta had very similar rates of multiple births. From 2000 to 2002, the Alberta rate was significantly higher than the Canada rate. In 2003, the multiple birth rate was 3.0 in Canada and 3.2 in Alberta, a non-significant difference (Statistics Canada, 2005b).

Multiple Birth Rate, Alberta and Canada, 1995 to 2003

Source: Statistics Canada (1997, 1998, 1999a,b, 2000, 2002, 2005b)



Multiple Birth 2003-05

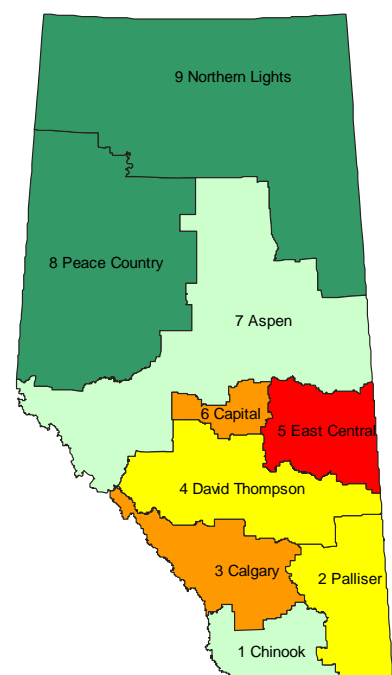


Table 4.5.1.1 Multiple Births and Rate by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Multiple live births	887	932	1,002	1,029	1,098	1,140	1,221	1,294	1,359	1,338
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	2.4	2.5	2.7	2.7	3.0	3.1	3.2	3.2	3.4	3.2
Standard Error (SE)	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09

Table 4.5.1.2 Multiple Births and Rate by Maternal Age Group, Alberta, 2003 to 2005 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Multiple live births	109	554	1,072	1,358	742	156	3,991
Live births	6,359	23,859	38,100	35,209	15,138	3,040	121,707
Rate (per 100 live births)	1.7	2.3	2.8	3.4	4.9	5.1	3.3
Standard Error (SE)	0.16	0.10	0.08	0.10	0.18	0.40	0.05

Table 4.5.1.3 Multiple Births and Rate by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Multiple live births	179	130	1,501	385	112	1,209	213	173	89	3,991
Live births	6,245	3,885	44,497	11,334	2,777	35,711	7,163	6,067	4,021	121,707
Rate (per 100 live births)	2.9	3.3	3.4	3.4	4.0	3.4	3.0	2.9	2.2	3.3
Standard Error (SE)	0.21	0.29	0.09	0.17	0.37	0.10	0.20	0.21	0.23	0.05

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.5.1.4 Twin, Triplet and Quadruplet Live Births and Percent of Live Births, Alberta, 1995 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Live twins	861	875	965	997	1,053	1,092	1,188	1,237	1,304	1,298
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	2.3	2.4	2.6	2.6	2.9	2.9	3.1	3.1	3.2	3.1
Standard Error (SE)	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09
Live triplets	26	57	34	32	45	43	29	57	52	40
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Standard Error (SE)	0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.02	0.02
Live quadruplets	0	0	3	0	0	5	4	0	3	0
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Standard Error (SE)	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release

Notes: Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction

Table 4.5.1.5 Live Births and Percent of Births by Plurality and Birth Weight Category (grams), Alberta, 2003 to 2005 Combined

	<500	500-749	750-999	1000-1249	1250-1499	1500-2499	2500-4499	>4499	Total	Average (grams)
Live births	211	249	249	312	395	6,416	111,718	2,157	121,707	3,363
Multiple live births	53	67	70	84	129	1,715	1,873	0	3,991	2,353
% of multiple live births	1.3	1.7	1.8	2.1	3.2	43.0	46.9	0.0	100.0	-
Singleton live births	158	182	179	228	266	4,701	109,845	2,157	117,716	3,397
% of singleton live births	0.1	0.2	0.2	0.2	0.2	4.0	93.3	1.8	100.0	-

Table 4.5.1.6 Live Births and Percent of Births by Plurality and Gestational Age Category (weeks), Alberta, 2003 to 2005 Combined

	20-27	28-36	37-42	>42	Total	Average (weeks)
Live births	708	10,226	110,693	51	121,678	38.8
Multiple live births	180	2,160	1,642	0	3,982	35.0
% of multiple live births	4.5	54.2	41.2	0.0	100.0	-
Singleton live births	528	8,066	109,051	51	117,969	39.0
% of singleton live births	0.4	6.8	92.4	0.0	100.0	-

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release

Notes: Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction

Table 4.5.1.7 Multiple Births and Rates by Year and Maternal Age Group, Alberta, 1996 to 2005

Multiple live births	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<20	44	24	28	27	35	38	33	41	30	38
20-24	150	133	128	139	159	175	192	202	185	167
25-29	271	268	295	277	311	292	310	322	362	388
30-34	289	312	358	384	344	378	430	440	472	446
35-39	119	171	165	174	211	218	224	255	252	235
>39	14	24	28	28	38	39	32	34	58	64
All	887	932	1,002	1,029	1,098	1,140	1,221	1,294	1,359	1,338

Rate (per 100 live births)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<20	1.6	0.9	1.1	1.0	1.4	1.6	1.5	1.9	1.4	1.8
20-24	2.0	1.8	1.7	1.8	2.1	2.3	2.5	2.5	2.4	2.1
25-29	2.3	2.3	2.5	2.4	2.8	2.5	2.6	2.6	2.9	3.0
30-34	2.7	3.1	3.4	3.7	3.4	3.6	3.9	3.8	4.0	3.7
35-39	2.9	4.0	3.8	3.8	4.6	4.7	4.7	5.2	5.1	4.5
>39	2.4	3.6	4.2	3.6	4.9	4.8	3.9	3.4	5.9	6.1
All	2.4	2.5	2.7	2.7	3.0	3.1	3.2	3.2	3.4	3.2

Table 4.5.1.8 Multiple Births and Rates by Year and Residence RHA, Alberta, 1996 to 2005

Multiple live births	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	42	49	34	63	74	66	62	53	64	62
Palliser	23	25	26	36	46	42	41	39	44	47
Calgary	334	347	383	370	385	452	468	529	494	478
David Thompson	106	89	102	104	95	96	140	107	127	151
East Central	12	26	14	36	34	29	22	32	40	40
Capital	266	283	308	289	335	322	319	347	444	418
Aspen	53	55	55	59	60	67	60	87	68	58
Peace Country	33	23	53	53	34	46	61	61	54	58
Northern Lights	18	35	27	19	35	20	48	39	24	26
Alberta	887	932	1,002	1,029	1,098	1,140	1,221	1,294	1,359	1,338

Rate (per 100 live births)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	2.1	2.3	1.7	3.1	3.8	3.4	3.1	2.5	3.1	2.9
Palliser	2.0	2.1	2.1	2.9	3.8	3.4	3.3	3.1	3.4	3.5
Calgary	2.7	2.8	3.0	2.8	2.9	3.4	3.4	3.7	3.4	3.1
David Thompson	2.9	2.5	2.9	2.9	2.7	2.8	3.9	2.9	3.4	4.0
East Central	1.2	2.7	1.4	3.7	3.7	3.3	2.3	3.6	4.2	4.3
Capital	2.3	2.6	2.8	2.6	3.1	2.9	2.8	3.0	3.7	3.5
Aspen	2.0	2.2	2.1	2.3	2.6	2.8	2.5	3.6	2.8	2.4
Peace Country	1.7	1.2	2.8	2.7	1.9	2.4	3.2	3.0	2.8	2.8
Northern Lights	1.6	3.2	2.5	1.8	3.1	1.7	3.7	3.0	1.8	1.9
Alberta	2.4	2.5	2.7	2.7	3.0	3.1	3.2	3.2	3.4	3.2

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4. Births

4.1 Fertility Rates

4.2 Live Births

4.3 Birth Weight

4.4 Preterm Births

4.5 Multiple Births

4.6 Infant morbidity

4.6.1 Respiratory Distress Syndrome

4.6.2 Congenital Anomalies

4.7 Mortality

4.8 Maternal factors

4.6.1 Respiratory Distress Syndrome

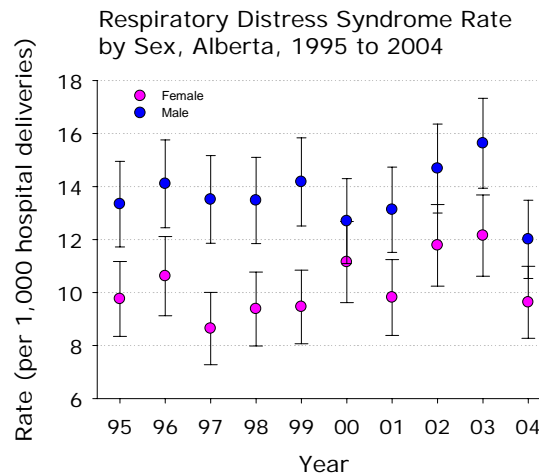
Background

Respiratory distress syndrome: *A lung disorder that causes difficulty in breathing due to lack of surfactant in an infant's lungs.* Respiratory distress syndrome results in a life-threatening deficiency of blood oxygen (Morgan, 1990).

Respiratory distress syndrome rate: *Number of cases of respiratory distress syndrome per 1,000 hospital deliveries in a given year.*

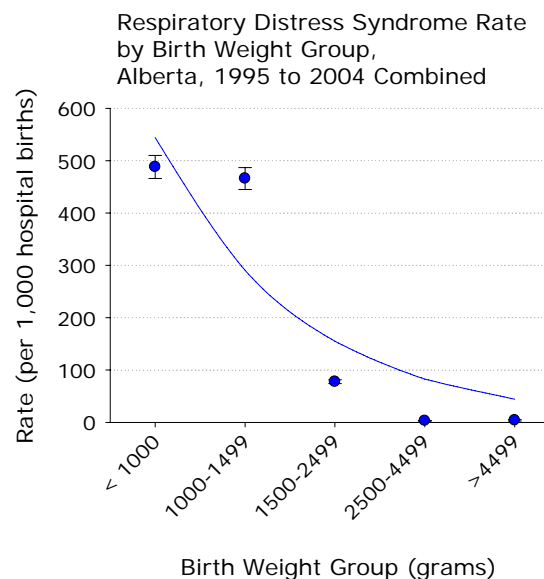
Respiratory distress syndrome of the newborn results from a surfactant deficiency in the lungs, mainly in preterm babies born prior to approximately 36 weeks gestation. Surfactant keeps the lungs from collapsing and preventing oxygen intake. Complications of respiratory distress syndrome include death, bronchopulmonary dysplasia and intraventricular bleeding and the development of chronic lung disease. Use of antenatal steroids and surfactant treatments has been successful in reducing mortality and morbidity (Editorial Board Respiratory Diseases in Canada, 2001).

Time Trends (see Tables 4.6.1.1, 4.6.1.2)



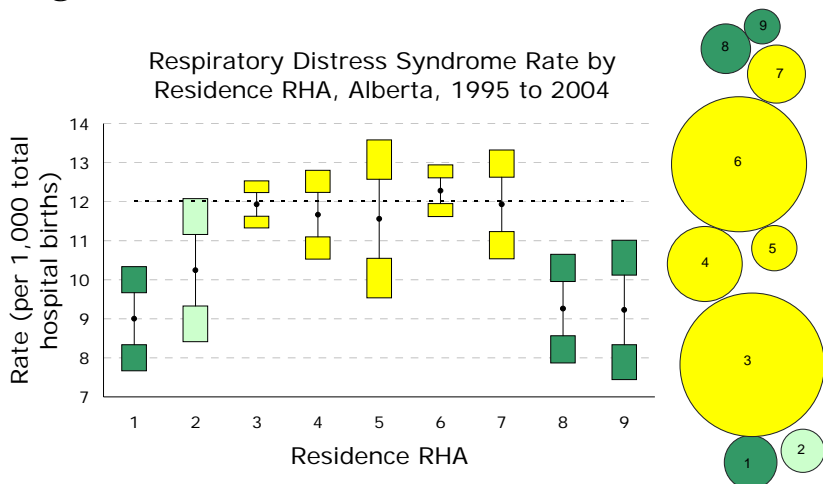
- The respiratory distress syndrome rate did not vary systematically with time between 1995 and 2004. In 2004, the rate was 10.8 (per 1,000 hospital deliveries).
- The rate was generally higher for male babies than for female babies. In 2004, the rate for males was 12.0, and the female rate was 9.6.

Birth Weight Effects (see Tables 4.6.1.3)



- For babies with birth weights less than 1,500 grams, almost half were diagnosed with respiratory distress syndrome between 1995 and 2004. The respiratory distress syndrome rate decreased markedly for babies between 1,500 and 2,499 grams, and again for babies between 2,500 and 4,499 grams.

Regional Data (see Table 4.6.1.4)



- The respiratory distress syndrome rate was lower than the provincial average in RHAs 1, 8, and 9 between 1995 and 2004. The rate did not differ from the provincial average in the remaining RHAs.

Limitations and Methodology Notes

See the Methodology and Limitations section in the Introduction (page 14) for a caution regarding comparison of 2002 respiratory distress syndrome data to data from prior years due to changes in data coding systems.

4.6.1 Respiratory Distress Syndrome

Respiratory Distress Syndrome 1995-2004



Table 4.6.1.1 Respiratory Distress Cases and Rate by Year, Alberta, 1995 to 2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Respiratory distress cases	441	466	406	433	452	440	432	512	560	442
Total hospital births	38,069	37,505	36,429	37,709	38,114	36,863	37,515	38,599	40,184	40,739
Rate (per 1,000 total hospital births)	11.6	12.4	11.1	11.5	11.9	11.9	11.5	13.3	13.9	10.8
Standard Error (SE)	0.55	0.57	0.55	0.55	0.55	0.57	0.55	0.58	0.58	0.51

Table 4.6.1.2 Respiratory Distress Cases and Rate by Sex, Alberta, 1995 to 2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Female										
Respiratory distress cases	182	192	153	172	177	202	179	222	238	191
Total hospital births	18,650	18,077	17,704	18,341	18,716	18,116	18,241	18,843	19,588	19,833
Rate (per 1,000 total hospital births)	9.8	10.6	8.6	9.4	9.5	11.2	9.8	11.8	12.2	9.6
Standard Error (SE)	0.72	0.76	0.70	0.71	0.71	0.78	0.73	0.79	0.78	0.69
Male										
Respiratory distress cases	259	274	253	261	275	238	253	290	322	251
Total hospital births	19,419	19,428	18,725	19,368	19,398	18,747	19,274	19,755	20,596	20,903
Rate (per 1,000 total hospital births)	13.3	14.1	13.5	13.5	14.2	12.7	13.1	14.7	15.6	12.0
Standard Error (SE)	0.82	0.85	0.84	0.83	0.85	0.82	0.82	0.86	0.86	0.75

Table 4.6.1.3 Respiratory Distress Cases and Rate by Birth Weight Group, Alberta, 1995 to 2004 Combined

	< 1000	1000-1499	1500-2499	2500-4499	>4499	All
Respiratory distress cases	971	1,015	1,535	1,024	28	4,584
Total hospital births	1,990	2,179	19,757	350,638	7,092	381,726
Rate (per 1,000 total hospital births)	487.9	465.8	77.7	2.9	3.9	12.0
Standard Error (SE)	11.21	10.69	1.90	0.09	0.74	0.18

Table 4.6.1.4 Respiratory Distress Cases and Rate by Residence RHA, Alberta, 1995 to 2004 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Respiratory distress cases	181	124	1,542	415	129	1,361	290	176	106	4,584
Hospital deliveries	20,107	12,105	129,259	35,572	11,160	110,829	24,308	19,004	11,486	381,726
Rate (per 1,000 hospital deliveries)	9.0	10.2	11.9	11.7	11.6	12.3	11.9	9.3	9.2	12.0
Standard Error (SE)	0.67	0.92	0.30	0.57	1.01	0.33	0.70	0.69	0.89	0.18

Source: Fee-For-Service Claims Files, Alberta Health and Wellness, extracted May 2006.

Ambulatory Care Classification System (ACCS), Alberta Health and Wellness, extracted May 2006.

Hospital Inpatient Files, Alberta Health and Wellness, extracted May 2006.

Notes: Diagnostic codes: ICD-9=769, ICD-10=P22.0 (P22.1, P22.8, P22.9 were excluded).

Data include Alberta residents only.

Totals for weight groups and RHAs include unknown weights or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4.6.2 Congenital Anomalies

Background

Congenital anomaly: *An abnormality of body structure, function, or metabolism that results in a physical or mental disability or is fatal.* (Pastuszak, 2005). Terminated pregnancies, stillbirths, and live births (diagnosed prior to one year of age), are collectively referred to as “total births” in this section.

Neural tube defects included in the following analyses *occur when the neural tube fails to close properly during early pregnancy (25 to 27 days after conception).* They are anencephaly (lack of cranial vault and cerebral hemispheres), spina bifida (open and closed defects in the spinal column), and encephalocele (lack of closure in the skull).

Heart septal defect: *A congenital defect in the septum, which separates the two sides of the heart, allowing blood to flow between the two atria or the two ventricles.*

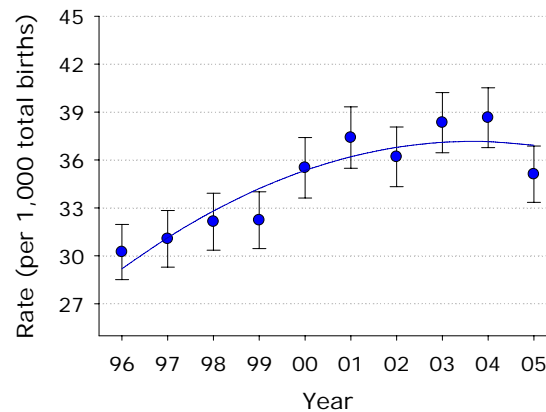
Down syndrome: *A condition characterised by neonatal hypotonia, flat facial features, brachycephaly, Brushfield spots in the iris, moderate mental retardation and a high prevalence of heart defects(30-40%). Down Syndrome is the result of abnormalities of chromosome 21* (Lowry, 2006).

Rates for all congenital anomalies are *per 1,000 total births (total births includes live births, stillbirths, and terminated pregnancies) in a given year.*

Maternal risk factors for congenital anomalies include high maternal age, obesity, epilepsy controlled with anticonvulsant medications, and insulin-dependent diabetes (Health Canada, 2002b).

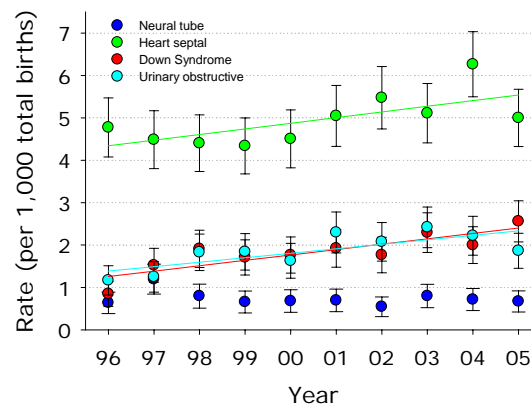
Time Trends (see Table 4.6.2.1)

All Congenital Anomalies Combined Rate, Alberta, 1996 to 2005



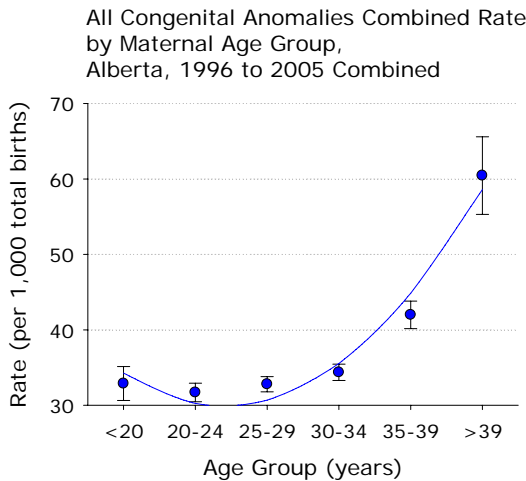
- When all congenital anomalies are combined, the pattern over time shows that the rate increased in 2000 and 2001 and appears to have stabilized after that. In 2005, the rate of all congenital anomalies combined for Alberta was 35.1 (per 1,000 total births).

Congenital Anomalies Rates, Alberta, 1996 to 2005



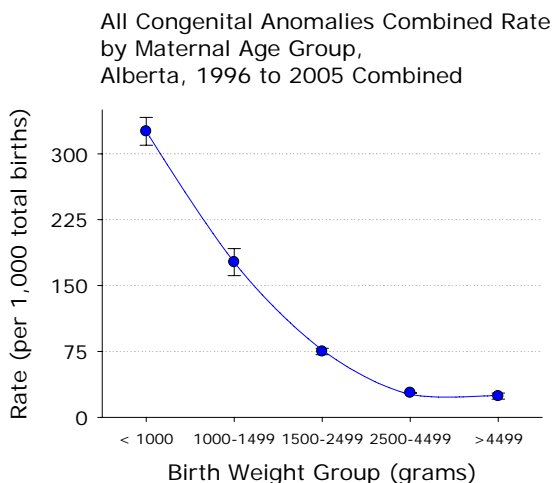
- Rates for selected congenital anomalies between 1996 and 2005 are shown above. Heart septal defects, Down Syndrome, and urinary obstructive defects all showed significant linear increasing trends over time.

Maternal Age Effects (see Table 4.6.2.2)



- For mothers under 35 years, the rate of all congenital anomalies combined did not vary significantly with maternal age group. The rate increased for 35 to 39 year old mothers, and was higher still for mothers over 39. Given increasing average maternal age in Alberta, these data are of concern.
- This maternal age effect is evident in the rates for heart septal defects, Down Syndrome, and urinary obstructive defects. Neural tube defects, however, were more common in younger mothers than older mothers.

Birth Weight Effects (see Table 4.6.2.3)



- Congenital anomalies are far more common in extremely low birth weight babies than in heavier babies.

4.6.2 Congenital Anomalies

Background (continued)

High maternal age is a risk factor for Down syndrome. Children with Down syndrome have distinctive facial features (see Definition), cognitive deficits (most often they have a mild to moderate developmental delay) and increased risk of major congenital malformations such as congenital heart defects, gastrointestinal anomalies, or endocrine, visual or auditory dysfunction (Kohut, 2003).

Maternal risk factors for neural tube defects include maternal diabetes, obesity, and epilepsy (Health Canada, 2002). Outcomes include miscarriage, stillbirth, infant or early childhood death, or lifelong disability (Health Canada, 2002b). Maternal folic acid supplementation prior to conception reduces the occurrence of neural tube defects by 60% or more, and folic acid flour fortification has been shown to reduce neural tube defects by more than 50% (Persad, Van den Hof, Dubé, and Zimmer, 2002).

Spina bifida is the most common neural tube disorder. Outcomes of spina bifida can include severe physical disabilities and developmental delay. The most common effects are limited use of the lower limbs, and bowel and bladder dysfunction (Health Canada, 2002).

Heart septal defects are a common anomaly and can often be repaired in infancy or early childhood. Untreated septal defects can lead to pulmonary hypertension.

4.6.2 Congenital Anomalies

Background (continued)

In urinary obstructive defects, the flow of urine from the kidneys is obstructed. Urine cannot drain into the bladder and can back up into the kidneys, which can lead to persistent urinary tract infections and kidney damage or failure (Better Health Channel, 2006). This defect is often treatable, thus early detection is important to prevent kidney damage.

Birth Weight Effects continued (see Table 4.6.2.3)

- For 1996 to 2005 combined, the rate of all congenital anomalies combined decreased dramatically with birth weight group for birth weights less than 4500 grams. The rate for the 2,500 to 4,499 grams group was similar to the rate for the greater than 4,499 grams group.
- More than three out of every ten babies with birth weights less than 1,000 grams had a congenital anomaly

Limitations and Methodology Notes

See the Methodology and Limitations section in the Introduction (page 14) for a caution regarding comparison of 2002 congenital anomalies data to data from prior years due to changes in data coding systems.

Table 4.6.2.1 Congenital Anomalies and Rates, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total births	37,708	36,799	37,719	38,044	36,862	37,461	38,542	40,119	40,552	41,814
All anomalies combined	1,140	1,143	1,212	1,226	1,309	1,401	1,395	1,538	1,567	1,468
All anomalies combined rate (per 1,000 total births)	30.2	31.1	32.1	32.2	35.5	37.4	36.2	38.3	38.6	35.1
Neural tube defect cases	24	44	30	25	25	26	21	32	29	28
Neural tube defect rate (per 1,000 total births)	0.6	1.2	0.8	0.7	0.7	0.7	0.5	0.8	0.7	0.7
Heart septal defect cases	180	165	166	165	166	189	211	205	254	209
Heart septal defect rate (per 1,000 total births)	4.8	4.5	4.4	4.3	4.5	5.0	5.5	5.1	6.3	5.0
Down Syndrome cases	32	56	72	65	65	72	68	92	81	107
Down Syndrome rate (per 1,000 total births)	0.8	1.5	1.9	1.7	1.8	1.9	1.8	2.3	2.0	2.6
Urinary obstruction defect cases	44	46	69	70	60	86	80	97	90	78
Urinary obstruction defect rate (per 1,000 total births)	1.2	1.3	1.8	1.8	1.6	2.3	2.1	2.4	2.2	1.9

Table 4.6.2.2 Congenital Anomalies and Rates by Maternal Age Group, Alberta, 1996 to 2005 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Total births	24,022	77,590	120,248	108,657	46,824	8,255	385,620
All anomalies combined	790	2,459	3,944	3,734	1,966	499	13,399
All anomalies combined rate (per 1,000 total births)	32.9	31.7	32.8	34.4	42.0	60.4	34.7
Neural tube defect cases	23	68	94	61	36	2	284
Neural tube defect rate (per 1,000 total births)	1.0	0.9	0.8	0.6	0.8	0.2	0.7
Heart septal defect cases	129	331	555	520	294	81	1,910
Heart septal defect rate (per 1,000 total births)	5.4	4.3	4.6	4.8	6.3	9.8	5.0
Down Syndrome cases	21	41	117	170	231	130	710
Down Syndrome rate (per 1,000 total births)	0.9	0.5	1.0	1.6	4.9	15.7	1.8
Urinary obstruction defect cases	38	124	223	208	107	19	720
Urinary obstruction defect rate (per 1,000 total births)	1.6	1.6	1.9	1.9	2.3	2.3	1.9

Table 4.6.2.3 Congenital Anomalies and Rates by Birth Weight Group, Alberta, 1996 to 2005 Combined

	< 1000	1000-1499	1500-2499	2500-4499	>4499	All
Total births	3,357	2,349	20,087	352,547	7,234	385,620
All anomalies combined	1,093	415	1,505	9,806	174	13,399
All anomalies combined rate (per 1,000 total births)	45.5	5.3	12.5	90.2	3.7	34.7
Neural tube defect cases	123	10	29	83	0	284
Neural tube defect rate (per 1,000 total births)	5.1	0.1	0.2	0.8	0.0	0.7
Heart septal defect cases	110	48	314	1,383	32	1,910
Heart septal defect rate (per 1,000 total births)	4.6	0.6	2.6	12.7	0.7	5.0
Down Syndrome cases	118	16	97	357	4	710
Down Syndrome rate (per 1,000 total births)	4.9	0.2	0.8	3.3	0.1	1.8
Urinary obstruction defect cases	69	19	84	522	14	720
Urinary obstruction defect rate (per 1,000 total births)	2.9	0.2	0.7	4.8	0.3	1.9

Source: Alberta Congenital Anomalies Surveillance System, 1980-2005, April 26, 2006 release.

Notes: 1. Includes all congenital anomalies in and outside ICD-9 Chapter XIV or outside ICD-10 XVII. The number of patients was counted; one patient could belong to more than one diagnostic category.

2. Diagnostic codes: ICD-9 = 740.0-742.0; ICD-10 = Q00, Q01, Q05.

3. Diagnostic codes: ICD-9 = 745.0-745.9; ICD-10 = Q20-Q21.

4. Diagnostic codes: ICD-9 = 758.0; ICD-10 = Q90.

5. Diagnostic codes: ICD-9 = 753.2; ICD-10 = Q62.

Totals for age and weight groups include unknown ages and weights.

Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction and improvement in data quality.

4. Births

4.1 Fertility Rates

4.2 Live Births

4.3 Birth Weight

4.4 Preterm Births

4.5 Multiple Births

4.6 Infant morbidity

4.7 Mortality

4.7.1 Stillbirths

4.7.2 Perinatal mortality

4.7.3 Neonatal mortality

4.7.4 Post-neonatal mortality

4.7.5 Infant mortality

4.7.6 Maternal Mortality

4.8 Maternal factors

4.7.1 Stillbirths

Background

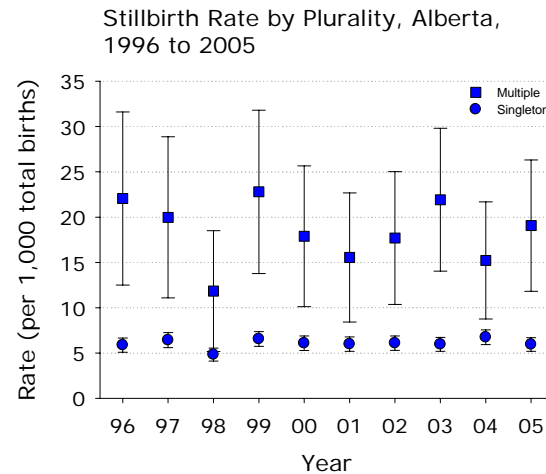
Stillbirths refer to *births with “the complete expulsion or the extraction from the mother after at least 20 weeks pregnancy, or after attaining a weight of 500 grams or more, of a fetus in which, after the expulsion or the extraction, there is no breathing, beating of the heart, pulsation of the umbilical cord or unmistakable movement of voluntary muscle”* (Alberta Vital Statistics Act, RHA 1980, cV-4 s1). Note that definitions of stillbirth differ between jurisdictions, making inter-jurisdictional comparisons difficult.

Stillbirth rate: *Number of stillbirths per 1,000 total births in a given year (total births is equal to the sum of live births and stillbirths)*

Causal factors in stillbirth are not well understood, but include fetal growth restriction, congenital anomalies, placental abruption, and intrauterine infection (Surkan, Stephansson, Dickman and Cnattingius, 2004). Identified risk factors include history of stillbirth or small-for-gestational-age birth, low family income, maternal age over 35 years, fertility treatment, and smoking during the first trimester (Dodds, King, Fell, Armson, Allen, and Nimrod, 2006).

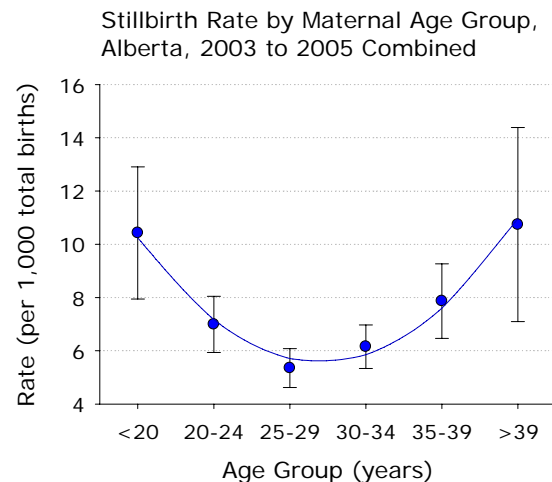
Stillbirth rates must be interpreted with caution due to the low number of cases in many categories.

Time Trends (see Tables 4.7.1.1, 4.7.1.2, 4.7.1.3, 4.7.1.4)



- The stillbirth rate varied between 5.0 and 7.0 (per 1,000 total births) from 1996 to 2005. There was no significant time trend in the rate.
- The stillbirth rate for multiples is generally more than three times that for singletons. In 2005, the stillbirth rate for multiples was 19.1 (per 1,000 total births), compared with 5.9 for singletons.

Maternal Age Effects (see Tables 4.7.1.5, 4.7.1.6)

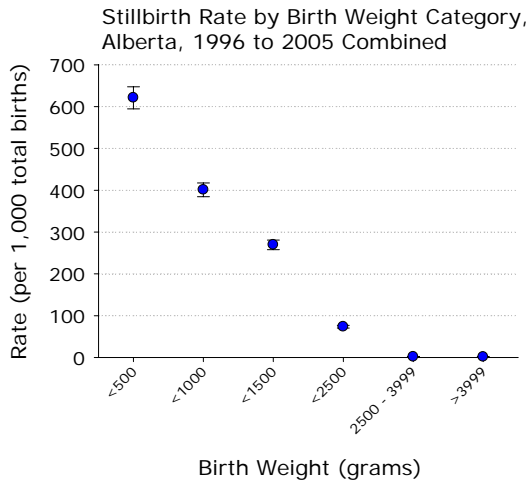


- The stillbirth rate is lowest for mothers who are 25 to 34 years of age, and is highest for mothers under 20 or over 39.

Gestational Age Effects (see Table 4.7.1.3)

- Stillbirths are far more common in preterm births than term births. In 2005, the stillbirth rate was 57.4 (per 1,000 total births) for preterm births, compared with 1.0 for term births.

Birth Weight Effects (see Table 4.7.1.4)



- For 1996 to 2005, for birth weights less than 1,500 grams, more than 600 out of 1,000 total births were stillbirths. The stillbirth rate fell to 2.0 or less (per 1,000 total births) for birth weights 2,500 grams and over.

Congenital Anomalies (see Tables 4.7.1.7, 4.7.1.8)

- Between 2000 and 2004, chromosomal anomalies accounted for 37.2% of stillbirths due to major anomalies. The majority of such stillbirths occurred with birth weights under 500 grams.

Limitations and Methodology Notes

See Appendix 6.2.1 for comparative mortality definitions.

Stillbirth rates must be interpreted with caution due to the low number of cases in many categories.

4.7.1 Stillbirths

Background (continued)

Between 1995 and 2003, there was no significant time trend in the stillbirth rate in Alberta or Canada, and Alberta and Canada rates did not differ from one another. In 2003, the stillbirth rate was 6.4 (per 1,000 total births) in Canada and 6.5 in Alberta (Statistics Canada, 2005b).

Stillbirth Rate, Alberta and Canada, 1995 to 2003

Source: Statistics Canada (1997, 1998, 1999a,b, 2000, 2002, 2005b)

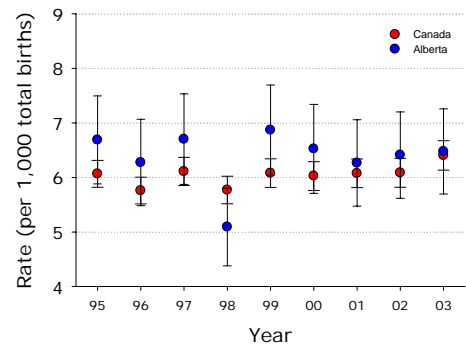


Table 4.7.1.1 Stillbirths and Rate by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Stillbirths	236	249	190	266	237	235	249	260	285	266
Total births	37,708	36,799	37,719	38,044	36,862	37,461	38,542	40,128	40,576	41,814
Rate (per 1,000 total births)	6.3	6.8	5.0	7.0	6.4	6.3	6.5	6.5	7.0	6.4
Standard Error (SE)	0.41	0.43	0.36	0.43	0.42	0.41	0.41	0.40	0.41	0.39

Table 4.7.1.2 Stillbirths and Rate by Plurality, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Multiple										
Stillbirths	20	19	12	24	20	18	22	29	21	26
Total births	907	951	1,014	1,053	1,118	1,158	1,243	1,323	1,380	1,364
Rate (per 1,000 total births)	22.1	20.0	11.8	22.8	17.9	15.5	17.7	21.9	15.2	19.1
Standard Error (SE)	4.88	4.54	3.40	4.60	3.96	3.64	3.74	4.03	3.30	3.70

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Singleton										
Stillbirths	216	230	177	242	217	217	227	231	264	240
Total births	36,801	35,848	36,704	36,991	35,744	36,303	37,299	38,805	39,196	40,450
Rate (per 1,000 total births)	5.9	6.4	4.8	6.5	6.1	6.0	6.1	6.0	6.7	5.9
Standard Error (SE)	0.40	0.42	0.36	0.42	0.41	0.40	0.40	0.39	0.41	0.38

Table 4.7.1.3 Stillbirths and Rates by Preterm/Term, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<37 weeks (preterm)										
Stillbirths	172	189	145	195	179	174	197	204	216	230
Total births	2,941	2,844	2,960	3,131	3,277	3,282	3,495	3,725	3,882	4,005
Rate (per 1,000 total births)	58.5	66.5	49.0	62.3	54.6	53.0	56.4	54.8	55.6	57.4
Standard Error (SE)	4.3	4.7	4.0	4.3	4.0	3.9	3.9	3.7	3.7	3.7

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
37-41 weeks (term)										
Stillbirths	64	60	45	71	58	61	51	56	69	36
Total births	34,033	33,245	34,102	34,285	33,022	33,696	34,599	35,999	36,355	37,509
Rate (per 1,000 total births)	1.9	1.8	1.3	2.1	1.8	1.8	1.5	1.6	1.9	1.0
Standard Error (SE)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Vital Statistics, Stillbirth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.7.1.4 Stillbirths and Rates by Birth Weight Categories, Alberta, 1996 to 2005

<500 grams	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Stillbirths	69	72	72	90	74	60	77	86	93	115
Total births	104	106	100	121	121	103	141	151	168	186
Rate (per 1,000 total births)	663.5	679.2	720.0	743.8	611.6	582.5	546.1	569.5	553.6	618.3
Standard Error (SE)	46.33	45.34	44.90	39.68	44.31	48.59	41.93	40.29	38.35	35.62
<1000 grams	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Stillbirths	116	133	105	138	132	116	136	155	159	170
Total births	300	292	269	322	345	310	362	369	389	435
Rate (per 1,000 total births)	386.7	455.5	390.3	428.6	382.6	374.2	375.7	420.1	408.7	390.8
Standard Error (SE)	28.12	29.14	29.74	27.58	26.17	27.48	25.45	25.69	24.93	23.39
<1500 grams	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Stillbirths	134	153	116	159	145	135	157	178	179	191
Total births	522	521	483	534	568	545	605	620	632	712
Rate (per 1,000 total births)	256.7	293.7	240.2	297.8	255.3	247.7	259.5	287.1	283.2	268.3
Standard Error (SE)	19.12	19.95	19.44	19.79	18.29	18.49	17.82	18.17	17.92	16.60
<2500 grams	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Stillbirths	173	191	144	197	169	172	193	209	224	226
Total births	2,453	2,442	2,472	2,440	2,419	2,437	2,679	2,726	2,813	2,952
Rate (per 1,000 total births)	70.5	78.2	58.3	80.7	69.9	70.6	72.0	76.7	79.6	76.6
Standard Error (SE)	5.17	5.43	4.71	5.52	5.18	5.19	5.00	5.10	5.10	4.89
2500 - 3999 grams	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Stillbirths	54	51	39	62	57	57	50	50	56	37
Total births	30,882	30,174	30,605	30,833	29,718	30,220	31,084	32,567	33,074	34,208
Rate (per 1,000 total births)	1.7	1.7	1.3	2.0	1.9	1.9	1.6	1.5	1.7	1.1
Standard Error (SE)	0.24	0.24	0.20	0.26	0.25	0.25	0.23	0.22	0.23	0.18
>3999 grams	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Stillbirths	7	6	7	7	11	6	6	1	5	3
Total births	4,371	4,182	4,640	4,771	4,724	4,802	4,779	4,835	4,689	4,654
Rate (per 1,000 total births)	1.6	1.4	1.5	1.5	2.3	1.2	1.3	0.2	1.1	0.6
Standard Error (SE)	0.60	0.59	0.57	0.55	0.70	0.51	0.51	0.21	0.48	0.37

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Vital Statistics, Stillbirth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.7.1.5 Stillbirths and Rate by Maternal Age Group, Alberta, 2003 to 2005 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Stillbirths	67	168	205	218	120	33	811
Total births	6,426	24,027	38,305	35,427	15,258	3,073	122,518
Rate (per 1,000 total births)	10.4	7.0	5.4	6.2	7.9	10.7	6.6
Standard Error (SE)	1.27	0.54	0.37	0.42	0.72	1.86	0.23

Table 4.7.1.6 Stillbirths and Rates by Year and Maternal Age Group, Alberta, 1996 to 2005

Stillbirths	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<20	21	16	21	20	20	19	21	19	22	26
20-24	41	51	32	51	44	46	45	61	57	50
25-29	70	77	53	79	66	51	60	72	75	58
30-34	60	56	53	66	67	63	68	66	80	72
35-39	38	45	25	39	29	41	42	31	39	50
>39	6	4	6	11	11	15	13	11	12	10
All	236	249	190	266	237	235	249	260	285	266

Rate (per 1,000 total births)	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<20	7.7	6.2	8.0	7.6	8.1	8.1	9.4	8.9	10.4	12.0
20-24	5.4	6.9	4.1	6.4	5.9	6.1	5.7	7.5	7.2	6.2
25-29	5.9	6.5	4.5	6.7	5.8	4.4	5.0	5.8	5.9	4.4
30-34	5.6	5.5	5.0	6.4	6.6	6.0	6.2	5.7	6.8	5.9
35-39	9.0	10.5	5.7	8.4	6.2	8.8	8.8	6.2	7.8	9.5
>39	10.2	5.9	8.9	14.0	13.9	18.2	15.4	10.8	12.0	9.5
All	6.3	6.8	5.0	7.0	6.4	6.3	6.5	6.5	7.0	6.4

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.
Vital Statistics, Stillbirth File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.
Totals for age groups include unknown ages.
Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.7.1.7 Major Anomalies as Cause of Death by Type of Death, Stillbirths and Neonatal Deaths, Alberta, 2000 to 2004

	2000			2001			2002			2003			2004		
	Stillbirths	Neonatal Deaths	% of All Deaths	Stillbirths	Neonatal Deaths	% of All Deaths	Stillbirths	Neonatal Deaths	% of All Deaths	Stillbirths	Neonatal Deaths	% of All Deaths	Stillbirths	Neonatal Deaths	% of All Deaths
Neural Tube Defects/ Other Central Nervous System	9	8	4.3	5	8	3.4	6	8	3.1	13	12	5.5	10	13	4.9
Cardio-Respiratory	7	20	6.8	8	14	5.7	11	12	5.1	8	12	4.4	11	12	4.9
Gastrointestinal / Musculoskeletal / Integument	7	6	3.3	4	7	2.8	2	13	3.3	9	10	4.2	8	7	3.2
Genitourinary	3	1	1.0	5	5	2.6	6	13	4.2	7	12	4.2	6	9	3.2
Chromosomal	21	11	8.1	24	15	10.1	30	21	11.2	13	15	6.2	32	15	10.0
Unspecified Congenital/Multiple Systems	14	21	8.8	13	14	7.0	7	9	3.5	14	9	5.1	10	10	4.3
Total	61	67	32.3	59	63	31.4	62	76	30.3	64	70	29.5	77	66	30.6

Source: Statistics reported to the Alberta Perinatal Health Program by Medical Records Departments of the hospitals, March 2006 release.

Notes: Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.7.1.8 Major Anomalies as Cause of Death by Type of Death and Birth Weight Category (grams), Alberta, 2003, 2004

	Stillbirths			Early Neonatal Deaths			Late Neonatal Deaths			Total Deaths		
	<500	500-999	>999	<500	500-999	>999	<500	500-999	>999	Stillbirths	Early Neonatal	Late Neonatal
2003												
Neural Tube Defects	4	1	1	3	1	2	0	0	1	7	6	1
Other Central Nervous System	2	3	0	2	1	1	0	0	1	6	4	1
Heart	1	1	1	0	1	1	0	0	2	3	2	2
Circulatory System	1	1	0	0	1	2	0	0	1	2	3	1
Respiratory System	2	0	1	0	0	3	0	0	1	3	3	1
Gastrointestinal System	0	0	1	0	0	0	0	0	0	2	0	0
Genital Organs	0	0	0	0	0	0	0	0	0	0	0	0
Urinary System	2	3	2	4	0	7	0	0	1	7	11	1
Musculoskeletal Deformity	1	3	0	4	0	5	0	0	1	7	9	1
Integument	0	0	0	0	0	0	0	0	0	0	0	0
Chromosomal	7	2	2	8	2	3	0	0	2	13	13	2
Other/Unspecified Congenital	10	2	2	1	2	5	0	1	0	14	8	1
Total	30	16	10	22	8	29	0	1	10	64	59	11
2004												
Neural Tube Defects	4	0	0	5	1	1	0	0	0	5	7	0
Other Central Nervous System	2	2	1	3	0	2	0	0	1	5	5	1
Heart	1	3	2	3	1	3	0	0	1	6	7	1
Circulatory System	1	0	0	0	0	1	0	0	1	1	1	1
Respiratory System	2	1	1	0	0	1	0	0	1	4	1	1
Gastrointestinal System	1	0	0	0	0	1	0	0	0	1	1	0
Genital Organs	0	0	0	0	0	0	0	0	0	0	0	0
Urinary System	3	2	1	4	1	4	0	0	0	6	9	0
Musculoskeletal Deformity	5	1	1	2	1	3	0	0	0	7	6	0
Integument	0	0	0	0	0	0	0	0	0	0	0	0
Chromosomal	14	8	7	4	4	5	0	0	2	32	13	2
Other/Unspecified Congenital	6	4	0	4	1	4	0	0	1	10	9	1
Total	39	21	13	25	9	25	0	0	7	77	59	7

Source: Statistics reported to the Alberta Perinatal Health Program by Medical Records Departments of the hospitals, March 2006 release.

Notes: Eight 2003 stillbirths with congenital anomalies had no weight documented; there were four stillbirths with no weight documented in 2004.

Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4.7.2 Perinatal Mortality

Background

Perinatal deaths include stillbirths and early neonatal deaths (deaths before seven days of age). A fetal death is registered as a stillbirth in Alberta if delivery occurs at or after 20 weeks of pregnancy or if the fetal weight is 500 grams or greater and gestational age is not known.

Perinatal mortality rate: Number of perinatal deaths per 1,000 total births in a given year (total births is equal to the sum of live births and stillbirths).

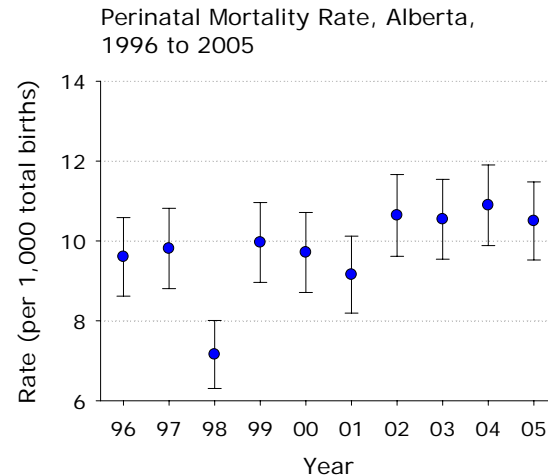
Male gender, maternal smoking, black race, low gestational age, fetal growth restriction, and multiple birth are risk factors for perinatal death (Joseph et al., 2004, 2005).

Comparisons of birth weight-specific perinatal mortality rates must be made with caution. A recent study of Canadian births showed that birth weight information was most likely to be missing for fetal deaths, and least likely to be missing in infants surviving to at least one year of age. Thus, bias occurs in calculating weight-specific mortality rates (Wen, Chen, Li, Kramer, & Allen, 2002).

The 2003 perinatal mortality rate was 10.3 in Canada and 11.3 in Alberta (see figure on next page; Statistics Canada, 2005b). The Albertan rate is consistently higher than the Canadian rate, though generally not significantly so. Registration of live births under 500 grams has been routine in Alberta since 1990, elevating the perinatal, neonatal, and infant mortality rates in Alberta relative to the rest of Canada, where such births are not universally registered.

Perinatal mortality rates must be interpreted with caution due to the low number of cases in many categories.

Time Trends (see Table 4.7.2.1)

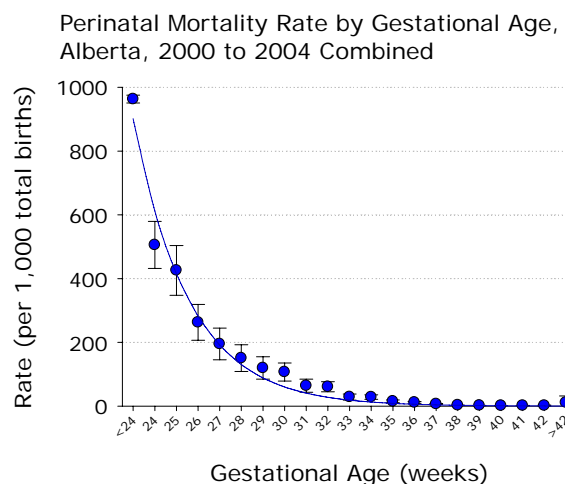


- The perinatal mortality rate in Alberta did not show a time trend between 1996 and 2005. In 2005, there were 439 perinatal deaths, for a rate of 10.5 (per 1,000 total births).

Maternal Age Effects (see Tables 4.7.2.2, 4.7.2.3)

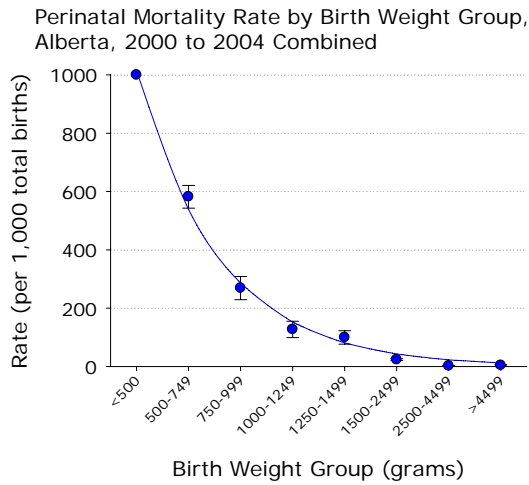
- Perinatal mortality rates are somewhat elevated for mothers under 18 and over 39, but there are no significant differences between maternal age groups.

Gestational Age Effects (see Tables 4.7.2.4 and 4.7.2.5)



- Perinatal mortality rates by gestational age for 2000 to 2004 combined show an exponential decline with increasing gestational age. The rates ranged from 963.1 (per 1,000 total births) at less than 24 weeks gestation, to 1.5 for gestational age of 40 weeks.

Birth Weight Effects (see Table 4.7.2.6)



- Perinatal mortality rates for 2000 to 2004 combined show an exponential decline with increasing birth weight.
- All infants under 500 grams died before birth or before 7 days of life. The lowest perinatal mortality rate occurred in infants with birth weights in the “normal” range (2,500 to 4,499 grams). The rate in this group for 2000 to 2004 was 2.3 (per 1,000 total births). When corrected for major congenital anomalies, the rate for 2,500 to 4,499 gram births was 1.8 (per 1,000 total births).

Congenital Anomalies (see Table 4.7.1.7, 4.7.1.8)

- Chromosomal anomalies were the leading cause of perinatal deaths due to major anomalies between 2000 and 2004. Perinatal deaths involving chromosomal anomalies occurred most often with birth weights of less than 500 grams.

Limitations and Methodology Notes

See Appendix 6.2.1 for comparative mortality definitions.

Perinatal mortality rates must be interpreted with caution due to the low number of cases in many categories.

4.7.2 Perinatal Mortality

Background (continued)

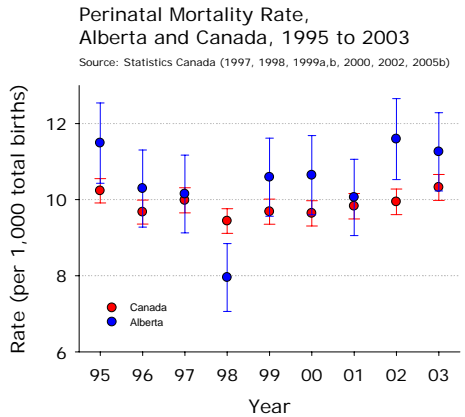


Table 4.7.2.1 Perinatal Deaths and Rate by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Perinatal Deaths	362	361	270	379	358	343	410	423	442	439
Total births	37,708	36,799	37,719	38,044	36,862	37,461	38,542	40,128	40,576	41,814
Rate (per 1,000 total births)	9.6	9.8	7.2	10.0	9.7	9.2	10.6	10.5	10.9	10.5
Standard Error (SE)	0.50	0.51	0.43	0.51	0.51	0.49	0.52	0.51	0.52	0.50

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.
 Vital Statistics, Stillbirth File, Department of Government Services, March 2006 release.
 Vital Statistics, Death File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.
 Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.7.2.2 Perinatal and Neonatal Deaths and Rates by Maternal Age Group, Alberta, 2003, 2004

	<18	18-29	30-39	>34	>39	Total
2003						
Stillbirths	7	150	96	42	12	265
Early neonatal deaths	4	89	54	30	11	158
Late neonatal deaths	1	19	7	9	4	31
% of deaths¹	2.6	56.8	34.6	17.8	5.9	100.0
Live births	606	21,857	16,399	5,950	1,005	39,868
Perinatal mortality rate (per 1,000 total births)²	17.9	10.9	9.1	12.0	22.6	10.5
Perinatal mortality rate standard error (SE)	5.4	0.7	0.7	1.4	4.7	0.5
Corrected perinatal mortality rate⁴	9.9	8.2	6.1	7.4	11.9	7.5
Corrected perinatal mortality rate SE	4.0	0.6	0.6	1.1	3.4	0.4
Neonatal mortality rate (per 1,000 live births)³	8.3	4.9	3.7	6.6	14.9	4.7
Neonatal mortality rate SE	3.7	0.5	0.5	1.0	3.8	0.3
Corrected neonatal mortality rate⁴	3.3	3.5	2.2	3.0	4.0	3.0
Corrected neonatal mortality rate SE	2.3	0.4	0.4	0.7	2.0	0.3
2004						
Stillbirths	2	156	119	52	12	289
Early neonatal deaths	2	107	49	22	4	162
Late neonatal deaths	1	10	6	4	0	17
% of deaths¹	1.1	58.3	37.2	16.7	3.4	100.0
Live births	613	22,034	16,654	5,947	990	40,291
Perinatal mortality rate (per 1,000 total births)²	6.5	11.9	10.0	12.3	16.0	11.1
Perinatal mortality rate standard error (SE)	3.2	0.7	0.8	1.4	4.0	0.5
Corrected perinatal mortality rate⁴	6.5	8.4	7.0	7.9	8.0	7.8
Corrected perinatal mortality rate SE	3.2	0.6	0.6	1.1	2.8	0.4
Neonatal mortality rate (per 1,000 live births)³	4.9	5.3	3.3	4.4	4.0	4.4
Neonatal mortality rate SE	2.8	0.5	0.4	0.9	2.0	0.3
Corrected neonatal mortality rate⁴	4.9	3.4	2.0	2.2	1.0	2.8
Corrected neonatal mortality rate SE	2.8	0.4	0.3	0.6	1.0	0.3

Source: Statistics reported to the Alberta Perinatal Health Program by Medical Records Departments of the hospitals, March 2006 release.
 Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: 1. % of deaths = (total deaths for a given age group) / (total deaths for all ages) x 100.
 2. ((stillbirths + early neonatal deaths) / (stillbirths + live births)) x 1000.
 3. ((early neonatal deaths + late neonatal deaths) / live births) x 1000.
 4. Corrected rates exclude deaths due to major congenital anomalies.
 Total columns include unknown maternal ages.
 Data include Alberta residents only.
 Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.7.2.3 Perinatal and Neonatal Deaths and Rates by Maternal Age Group, excluding <500 grams, Alberta, 2003, 2004

2003	<18	18-29	30-39	>34	>39	Total
Stillbirths	2	91	51	24	8	152
Early neonatal deaths	2	51	34	20	9	96
Late neonatal deaths	1	19	7	9	4	31
% of deaths ¹	1.8	57.7	33.0	19.0	7.5	100.0
Live births	604	21,817	16,378	5,940	1,003	39,802
Perinatal mortality rate (per 1,000 total births) ²	6.6	6.5	5.2	7.4	16.8	6.2
Perinatal mortality rate standard error (SE)	3.3	0.5	0.6	1.1	4.0	0.4
Corrected perinatal mortality rate ⁴	5.0	5.3	3.5	4.7	9.0	4.6
Corrected perinatal mortality rate SE	2.9	0.5	0.5	0.9	3.0	0.3
Neonatal mortality rate (per 1,000 live births) ³	5.0	3.2	2.5	4.9	13.0	3.2
Neonatal mortality rate SE	2.9	0.4	0.4	0.9	3.6	0.3
Corrected neonatal mortality rate ⁴	1.7	2.3	1.5	2.5	4.0	2.0
Corrected neonatal mortality rate SE	1.7	0.3	0.3	0.7	2.0	0.2

2004	<18	18-29	30-39	>34	>39	Total
Stillbirths	2	102	79	32	5	188
Early neonatal deaths	1	58	26	12	1	86
Late neonatal deaths	1	10	6	4	0	17
% of deaths ¹	1.4	58.4	38.1	16.5	2.1	100.0
Live births	612	21,985	16,632	5,938	987	40,216
Perinatal mortality rate (per 1,000 total births) ²	4.9	7.2	6.3	7.4	6.0	6.8
Perinatal mortality rate standard error (SE)	2.8	0.6	0.6	1.1	2.5	0.4
Corrected perinatal mortality rate ⁴	4.9	5.4	4.8	5.4	4.0	5.1
Corrected perinatal mortality rate SE	2.8	0.5	0.5	0.9	2.0	0.4
Neonatal mortality rate (per 1,000 live births) ³	3.3	3.1	1.9	2.7	1.0	2.6
Neonatal mortality rate SE	2.3	0.4	0.3	0.7	1.0	0.3
Corrected neonatal mortality rate ⁴	3.3	1.9	1.1	1.5	0.0	1.5
Corrected neonatal mortality rate SE	2.3	0.3	0.3	0.5	0.0	0.2

Source: Statistics reported to the Alberta Perinatal Health Program by Medical Records Departments of the hospitals, March 2006 release.

Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: 1. % of deaths = (total deaths for a given age group) / (total deaths for all ages) x 100.

2. ((stillbirths + early neonatal deaths) / (stillbirths + live births)) x 1000.

3. ((early neonatal deaths + late neonatal deaths) / live births) x 1000.

4. Corrected rates exclude deaths due to major congenital anomalies.

Total columns include unknown maternal ages.

Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.7.2.4 Perinatal and Neonatal Deaths and Rate by Length of Gestation (weeks), Alberta, 2003, 2004, and 2000 to 2004 Combined

2003	<24*	24	25	26	27	28	29	30	31	32	33
Stillbirths	110	8	6	6	11	5	6	8	4	11	8
Early neonatal deaths	82	11	7	5	0	5	3	4	0	1	1
Late neonatal deaths	4	3	3	4	1	1	0	0	0	0	2
% of deaths ¹	43.2	4.8	3.5	3.3	2.6	2.4	2.0	2.6	0.9	2.6	2.4
Live births	91	33	26	38	35	54	54	93	120	188	251
Perinatal mortality rate (per 1,000 total births) ²	955.2	463.4	406.3	250.0	239.1	169.5	150.0	118.8	32.3	60.3	34.7
Perinatal mortality rate standard error (SE)	14.6	77.9	86.8	65.3	62.9	48.8	46.1	32.2	15.9	16.9	11.4
Neonatal mortality rate (per 1,000 live births) ³	945.1	424.2	384.6	236.8	28.6	111.1	55.6	43.0	0.0	5.3	12.0
Neonatal mortality rate standard error (SE)	23.9	86.0	95.4	69.0	28.2	42.8	31.2	21.0	0.0	5.3	6.9
2003 continued	34	35	36	37	38	39	40	41	42	>42	Total
Stillbirths	6	6	11	18	11	11	13	5	0	0	265
Early neonatal deaths	5	2	5	5	6	9	3	4	0	0	158
Late neonatal deaths	2	1	2	0	2	3	2	0	0	0	31
% of deaths ¹	2.9	2.0	4.0	5.1	4.2	5.1	4.0	2.0	0.0	0.0	100.0
Live births	423	676	1,439	2,692	6,365	9,254	11,590	6,042	385	19	39,868
Perinatal mortality rate (per 1,000 total births) ²	25.6	11.7	11.0	8.5	2.7	2.2	1.4	1.5	0.0	0.0	10.5
Perinatal mortality rate standard error (SE)	7.6	4.1	2.7	1.8	0.6	0.5	0.3	0.5	0.0	0.0	0.5
Neonatal mortality rate (per 1,000 live births) ³	16.5	4.4	4.9	1.9	1.3	1.3	0.4	0.7	0.0	0.0	4.7
Neonatal mortality rate standard error (SE)	6.2	2.6	1.8	0.8	0.4	0.4	0.2	0.3	0.0	0.0	0.3
2004	<24*	24	25	26	27	28	29	30	31	32	33
Stillbirths	120	10	8	7	6	9	5	7	6	9	3
Early neonatal deaths	100	6	10	7	4	1	2	2	1	1	1
Late neonatal deaths	1	0	0	2	1	0	1	1	0	1	0
% of deaths ¹	47.2	3.4	3.8	3.4	2.4	2.1	1.7	2.1	1.5	2.4	0.9
Live births	99	22	24	53	37	58	55	93	115	177	258
Perinatal mortality rate (per 1,000 total births) ²	1,000.0	500.0	562.5	233.3	232.6	149.3	116.7	90.0	57.9	53.8	15.3
Perinatal mortality rate standard error (SE)	0.0	88.4	87.7	54.6	64.4	43.5	41.4	28.6	21.2	16.5	7.6
Neonatal mortality rate (per 1,000 live births) ³	1,000.0	272.7	416.7	169.8	135.1	17.2	54.5	32.3	8.7	11.3	3.9
Neonatal mortality rate standard error (SE)	0.0	95.0	100.6	51.6	56.2	17.1	30.6	18.3	8.7	7.9	3.9
2004 continued	34	35	36	37	38	39	40	41	42	>42	Total
Stillbirths	13	10	10	15	18	17	12	4	0	0	289
Early neonatal deaths	0	0	7	2	4	7	4	3	0	0	162
Late neonatal deaths	1	1	2	1	1	0	2	2	0	0	17
% of deaths ¹	3.0	2.4	4.1	3.8	4.9	5.1	3.8	1.9	0.0	0.0	100.0
Live births	462	688	1,525	2,894	6,655	9,768	11,370	5,599	325	13	40,291
Perinatal mortality rate (per 1,000 total births) ²	27.4	14.3	11.1	5.8	3.3	2.5	1.4	1.2	0.0	0.0	11.1
Perinatal mortality rate standard error (SE)	7.5	4.5	2.7	1.4	0.7	0.5	0.4	0.5	0.0	0.0	0.5
Neonatal mortality rate (per 1,000 live births) ³	2.2	1.5	5.9	1.0	0.8	0.7	0.5	0.9	0.0	0.0	4.4
Neonatal mortality rate standard error (SE)	2.2	1.5	2.0	0.6	0.3	0.3	0.2	0.4	0.0	0.0	0.3
2000 to 2004 combined	<24*	24	25	26	27	28	29	30	31	32	33
Stillbirths	482	51	37	40	36	30	30	38	27	42	27
Early neonatal deaths	405	38	29	22	12	12	9	11	8	11	7
Late neonatal deaths	18	11	12	11	5	4	2	4	0	4	6
% of deaths ¹	41.9	4.6	3.6	3.4	2.5	2.1	1.9	2.5	1.6	2.6	1.9
Live births	439	125	118	196	210	249	296	420	520	830	1,162
Perinatal mortality rate (per 1,000 total births) ²	963.1	505.7	425.8	262.7	195.1	150.5	119.6	107.0	64.0	60.8	28.6
Perinatal mortality rate standard error (SE)	6.2	37.7	39.7	28.6	25.3	21.4	18.0	14.4	10.5	8.1	4.8
Neonatal mortality rate (per 1,000 live births) ³	963.6	392.0	347.5	168.4	81.0	64.3	37.2	35.7	15.4	18.1	11.2
Neonatal mortality rate standard error (SE)	8.9	43.7	43.8	26.7	18.8	15.5	11.0	9.1	5.4	4.6	3.1
2000 to 2004 combined continued	34	35	36	37	38	39	40	41	42	>42	Total
Stillbirths	49	43	56	72	72	64	54	34	3	1	1289
Early neonatal deaths	12	7	23	14	21	30	29	17	1	0	719
Late neonatal deaths	8	9	9	6	13	14	12	4	0	0	153
% of deaths ¹	3.2	2.7	4.1	4.3	4.9	5.0	4.4	2.5	0.2	0.0	100.0
Live births	2,103	3,267	6,756	12,843	30,318	44,615	56,763	28,837	2,134	91	192,292
Perinatal mortality rate (per 1,000 total births) ²	28.3	15.1	11.6	6.7	3.1	2.1	1.5	1.8	1.9	10.9	10.4
Perinatal mortality rate standard error (SE)	3.6	2.1	1.3	0.7	0.3	0.2	0.2	0.2	0.9	10.8	0.2
Neonatal mortality rate (per 1,000 live births) ³	9.5	4.9	4.7	1.6	1.1	1.0	0.7	0.7	0.5	0.0	4.5
Neonatal mortality rate standard error (SE)	2.1	1.2	0.8	0.3	0.2	0.1	0.1	0.2	0.5	0.0	0.2

Source: Statistics reported to the Alberta Perinatal Health Program by Medical Records Departments of the hospitals, March 2006 release.

Vital Statistics, Birth File, Department of Government Services, January 2006 release.

Notes: 1. % of deaths = (total deaths for a given gestational age) / (total deaths at all gestational ages) x 100.

2. ((stillbirths + early neonatal deaths) / (stillbirths + live births)) x 1000.

3. ((early neonatal deaths + late neonatal deaths) / live births) x 1000.

Total columns include unknown gestational ages.

* There may be more deaths than births in this category due to the fact that some live births and stillbirths are inconsistently registered. Total birth numbers are from the

Vital Statistics database, in which some births < 500 grams are apparently not registered. The perinatal deaths come from the Medical Records departments, which have the death records for these unregistered births. The rates have consequently been adjusted downward to 1,000 where necessary to correct for this fact.

Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.7.2.5 Perinatal and Neonatal Deaths and Rate by Length of Gestation (weeks), excluding births <500 grams, Alberta, 2003, 2004, and 2000 to 2004 Combined

2003	<24*	24	25	26	27	28	29	30	31	32	33
Stillbirths	17	2	0	4	10	4	6	8	4	11	7
Early neonatal deaths	23	10	6	5	0	4	3	4	0	1	1
Late neonatal deaths	4	3	3	4	1	1	0	0	0	0	2
% of deaths ¹	15.8	5.4	3.2	4.7	3.9	3.2	3.2	4.3	1.4	4.3	3.6
Live births	29	32	26	36	35	54	54	93	120	188	251
Perinatal mortality rate (per 1,000 total births) ²	869.6	352.9	230.8	225.0	222.2	137.9	150.0	118.8	32.3	60.3	31.0
Perinatal mortality rate standard error (SE)	49.7	82.0	82.6	66.0	62.0	45.3	46.1	32.2	15.9	16.9	10.8
Neonatal mortality rate (per 1,000 live births) ³	931.0	406.3	346.2	250.0	28.6	92.6	55.6	43.0	0.0	5.3	12.0
Neonatal mortality rate standard error (SE)	47.1	86.8	93.3	72.2	28.2	39.4	31.2	21.0	0.0	5.3	6.9
2003 continued	34	35	36	37	38	39	40	41	42	>42	Total
Stillbirths	6	6	11	18	9	10	13	5	0	0	152
Early neonatal deaths	5	2	5	5	6	9	3	4	0	0	96
Late neonatal deaths	2	1	2	0	2	3	2	0	0	0	31
% of deaths ¹	4.7	3.2	6.5	8.2	6.1	7.9	6.5	3.2	0.0	0.0	100.0
Live births	423	676	1,439	2,692	6,365	9,254	11,590	6,042	385	19	39,803
Perinatal mortality rate (per 1,000 total births) ²	25.6	11.7	11.0	8.5	2.4	2.1	1.4	1.5	0.0	0.0	6.2
Perinatal mortality rate standard error (SE)	7.6	4.1	2.7	1.8	0.6	0.5	0.3	0.5	0.0	0.0	0.4
Neonatal mortality rate (per 1,000 live births) ³	16.5	4.4	4.9	1.9	1.3	1.3	0.4	0.7	0.0	0.0	3.2
Neonatal mortality rate standard error (SE)	6.2	2.6	1.8	0.8	0.4	0.4	0.2	0.3	0.0	0.0	0.3
2004	<24*	24	25	26	27	28	29	30	31	32	33
Stillbirths	29	8	7	6	4	8	4	7	6	9	3
Early neonatal deaths	26	5	9	7	4	1	2	2	1	1	1
Late neonatal deaths	1	0	0	2	1	0	1	1	0	1	0
% of deaths ¹	19.2	4.5	5.5	5.2	3.1	3.1	2.4	3.4	2.4	3.8	1.4
Live births	27	21	23	53	37	58	55	93	115	177	258
Perinatal mortality rate (per 1,000 total births) ²	982.1	448.3	533.3	220.3	195.1	136.4	101.7	90.0	57.9	53.8	15.3
Perinatal mortality rate standard error (SE)	17.7	92.3	91.1	54.0	61.9	42.2	39.3	28.6	21.2	16.5	7.6
Neonatal mortality rate (per 1,000 live births) ³	1,000.0	238.1	391.3	169.8	135.1	17.2	54.5	32.3	8.7	11.3	3.9
Neonatal mortality rate standard error (SE)	0.0	92.9	101.8	51.6	56.2	17.1	30.6	18.3	8.7	7.9	3.9
2004 continued	34	35	36	37	38	39	40	41	42	>42	Total
Stillbirths	12	10	10	15	17	17	12	4	0	0	188
Early neonatal deaths	0	0	7	2	4	7	4	3	0	0	86
Late neonatal deaths	1	1	2	1	1	0	2	2	0	0	17
% of deaths ¹	4.5	3.8	6.5	6.2	7.6	8.2	6.2	3.1	0.0	0.0	100.0
Live births	462	688	1,525	2,893	6,655	9,768	11,370	5,599	325	13	40,216
Perinatal mortality rate (per 1,000 total births) ²	25.3	14.3	11.1	5.8	3.1	2.5	1.4	1.2	0.0	0.0	6.8
Perinatal mortality rate standard error (SE)	7.2	4.5	2.7	1.4	0.7	0.5	0.4	0.5	0.0	0.0	0.4
Neonatal mortality rate (per 1,000 live births) ³	2.2	1.5	5.9	1.0	0.8	0.7	0.5	0.9	0.0	0.0	2.6
Neonatal mortality rate standard error (SE)	2.2	1.5	2.0	0.6	0.3	0.3	0.2	0.4	0.0	0.0	0.3
2000 to 2004 combined	<24*	24	25	26	27	28	29	30	31	32	33
Stillbirths	105	29	23	31	28	26	28	36	25	42	24
Early neonatal deaths	133	33	27	22	12	9	9	11	8	11	7
Late neonatal deaths	14	11	12	11	4	4	2	4	0	4	6
% of deaths ¹	17.7	5.1	4.4	4.5	3.1	2.7	2.7	3.6	2.3	4.0	2.6
Live births	160	121	117	194	208	247	295	420	520	830	1,162
Perinatal mortality rate (per 1,000 total births) ²	898.1	413.3	357.1	235.6	169.5	128.2	114.6	103.1	60.6	60.8	26.1
Perinatal mortality rate standard error (SE)	18.6	40.2	40.5	28.3	24.4	20.2	17.7	14.2	10.2	8.1	4.6
Neonatal mortality rate (per 1,000 live births) ³	918.8	363.6	333.3	170.1	76.9	52.6	37.3	35.7	15.4	18.1	11.2
Neonatal mortality rate standard error (SE)	21.6	43.7	43.6	27.0	18.5	14.2	11.0	9.1	5.4	4.6	3.1
2000 to 2004 combined continued	34	35	36	37	38	39	40	41	42	>42	Total
Stillbirths	48	43	55	71	68	62	53	34	3	1	836
Early neonatal deaths	12	7	23	14	21	30	29	17	1	0	436
Late neonatal deaths	8	9	9	6	13	14	12	4	0	0	148
% of deaths ¹	4.8	4.2	6.1	6.4	7.2	7.5	6.6	3.9	0.3	0.1	100.0
Live births	2,103	3,267	6,756	12,842	30,318	44,615	56,761	28,837	2,134	91	192,009
Perinatal mortality rate (per 1,000 total births) ²	27.9	15.1	11.5	6.6	2.9	2.1	1.4	1.8	1.9	10.9	6.6
Perinatal mortality rate standard error (SE)	3.6	2.1	1.3	0.7	0.3	0.2	0.2	0.2	0.9	10.8	0.2
Neonatal mortality rate (per 1,000 live births) ³	9.5	4.9	4.7	1.6	1.1	1.0	0.7	0.7	0.5	0.0	3.0
Neonatal mortality rate standard error (SE)	2.1	1.2	0.8	0.3	0.2	0.1	0.1	0.2	0.5	0.0	0.1

Source: Statistics reported to the Alberta Perinatal Health Program by Medical Records Departments of the hospitals, March 2006 release.

Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Notes: 1. % of deaths = (total deaths for a given gestational age) / (total deaths at all gestational ages) x 100.

2. ((stillbirths + early neonatal deaths) / (stillbirths + live births)) x 1000.

3. ((early neonatal deaths + late neonatal deaths) / live births) x 1000.

Total columns include unknown gestational ages.

* There may be more deaths than births in this category due to the fact that some live births and stillbirths are inconsistently registered. Total birth numbers are from the

Vital Statistics database, in which some births < 500 grams are apparently not registered. The perinatal deaths come from the Medical Records departments, which have the death records for these unregistered births. The rates have consequently been adjusted downward to 1,000 where necessary to correct for this fact.

Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.7.2.6 Weight-Specific Perinatal Deaths and Rates by Birth Weight Category (grams), Alberta, 2003, 2004, and 2000 to 2004 Combined

	<500*	500-749	750-999	1000-1249	1250-1499	1500-2499	2500-4499	>4499	Total
2003									
Perinatal deaths	165	63	25	16	12	49	82	1	423
Total births ¹	151	128	90	111	140	2,106	36,622	780	40,128
Perinatal mortality rate ² (per 1,000 total births)	1000.0	492.2	277.8	144.1	85.7	23.3	2.2	1.3	10.5
Standard Error (SE)	0.00	44.19	47.21	33.34	23.66	3.28	0.25	1.28	0.51
Corrected perinatal mortality rate ³ (per 1,000 total births)	1000.0	419.6	207.3	112.1	72.5	14.8	1.8	1.3	7.5
Standard Error (SE)	0.00	46.63	44.77	30.51	22.07	2.65	0.22	1.28	0.43
2004									
Perinatal deaths	172	82	28	17	14	52	80	1	451
Total births ¹	168	134	87	112	131	2,181	37,065	698	40,576
Perinatal mortality rate ² (per 1,000 total births)	1000.0	611.9	321.8	151.8	106.9	23.8	2.2	1.4	11.1
Standard Error (SE)	0.00	42.10	50.09	33.90	26.99	3.27	0.24	1.43	0.52
Corrected perinatal mortality rate ³ (per 1,000 total births)	1000.0	522.9	280.5	103.8	85.9	17.5	1.8	1.4	7.8
Standard Error (SE)	0.00	47.84	49.61	29.62	24.77	2.82	0.22	1.43	0.44
2000 to 2004 Combined									
Perinatal deaths	707	358	128	69	65	237	399	16	2,008
Total births ¹	684	615	476	543	652	10,104	176,688	3,804	193,569
Perinatal mortality rate ² (per 1,000 total births)	1000.0	582.1	268.9	127.1	99.7	23.5	2.3	4.2	10.4
Standard Error (SE)	0.00	19.89	20.32	14.29	11.73	1.51	0.11	1.05	0.23
Corrected perinatal mortality rate ³ (per 1,000 total births)	1000.0	501.9	209.1	83.2	65.3	15.5	1.8	4.2	7.3
Standard Error (SE)	0.00	22.01	19.39	12.14	9.86	1.23	0.10	1.05	0.19

Source: Statistics reported to the Alberta Perinatal Health Program by Medical Records Departments of the hospitals, March 2006 release.

Vital Statistics, Birth File, Department of Government Services, January 2006 release.

Notes: 1. Total births = live births + stillbirths.

2. $((\text{stillbirths} + \text{early neonatal deaths}) / (\text{stillbirths} + \text{live births})) \times 1000$.

Total columns include unknown weights.

3. Corrected rates exclude deaths due to major congenital anomalies.

* There may be more deaths than births in this category due to the fact that some live births and stillbirths are inconsistently registered. Total birth numbers are from the Vital Statistics database, in which some births < 500 grams are apparently not registered. The perinatal deaths come from the Medical Records departments, which have the death records for these unregistered births. The rates have consequently been adjusted downward to 1,000 where necessary to correct for this fact.

Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4.7.3 Neonatal Mortality

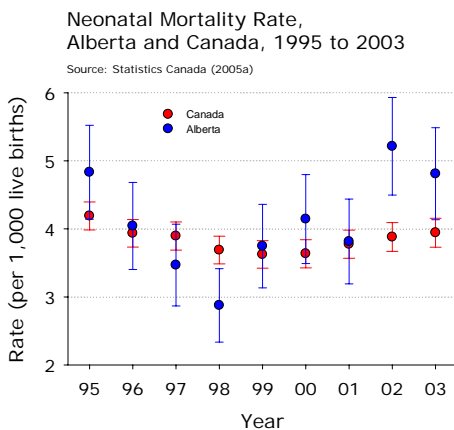
Background

A neonatal death *occurs when an infant is born alive but dies before 28 days of age.*

Neonatal mortality rate: *Number of neonatal deaths per 1,000 live births in a given year.*

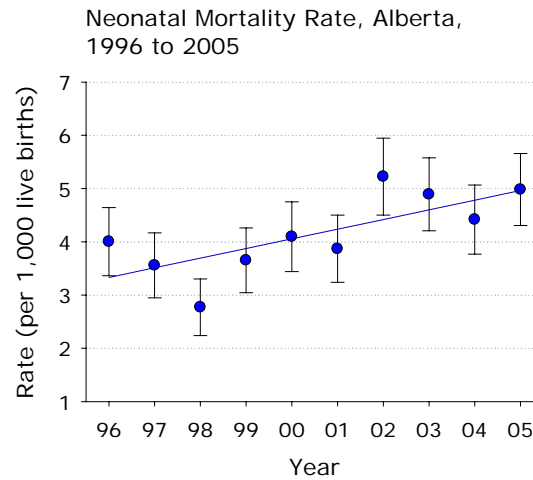
The leading causes of neonatal death in Canada in 1999 were immaturity (32.6% of neonatal deaths), congenital anomalies (28.5%), and asphyxia (14.7%) (Health Canada, 2003). Risk factors for neonatal mortality are similar to those for perinatal mortality.

Generally, Albertan and Canadian neonatal mortality rates did not differ significantly between 1991 and 2003. The lowest rates occurred in the late 1990s. In 2003, the neonatal mortality rate was 4.8 (per 1,000 live births) in Alberta and 3.9 in Canada (Statistics Canada, 2005a). Registration of live births under 500 grams has been routine in Alberta since 1990, elevating the perinatal, neonatal, and infant mortality rates in Alberta relative to the rest of Canada, where such births are not universally registered.



Neonatal mortality rates must be interpreted with caution due to the low number of cases in many categories.

Time Trends (see Table 4.7.3.1)

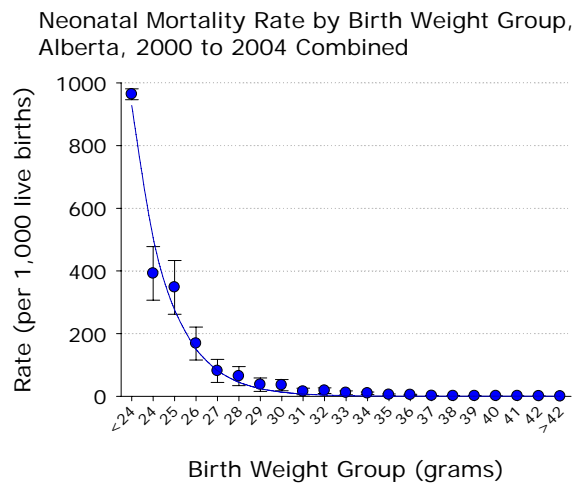


- The neonatal mortality rate (per 1,000 live births) increased between 1996 and 2005, although the rate was stable between 2002 and 2005. In 2005, there were 207 neonatal deaths, for a rate of 5.0 (per 1,000 live births).

Maternal Age Effects (see Tables 4.7.2.2, 4.7.2.3)

- Neonatal mortality rates were lowest for mothers between 30 and 39 years of age in 2003 and 2004, but there was no significant effect of maternal age due to small numbers of deaths in total.

Gestational Age Effects (see Tables 4.7.2.4, 4.7.2.5)

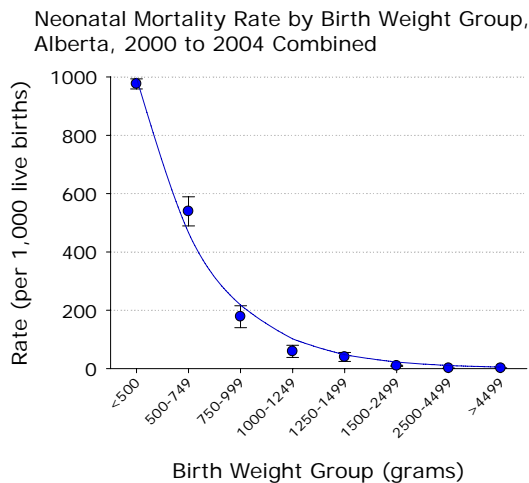


- Neonatal deaths also follow a decreasing exponential function with increasing gestational age.

Gestational Age Effects *continued* (see Tables 4.7.2.4, 4.7.2.5)

- Almost all babies born alive prior to 24 weeks gestation die before 28 days of life. For infants born at or after 28 weeks gestation, the neonatal mortality rate is less than one tenth of what it was for infants born prior to 24 weeks. The rate reaches a low level (1.1 per 1,000 live births) at 38 weeks gestation.

Birth Weight Effects (see Table 4.7.2.6)



- Neonatal mortality rates decrease exponentially with increasing birth weight. For 2000 to 2004 combined, the neonatal mortality rate ranged from 976.2 (per 1,000 live births) for births under 500 grams to 0.9 for births between 2,500 and 4,499 grams.

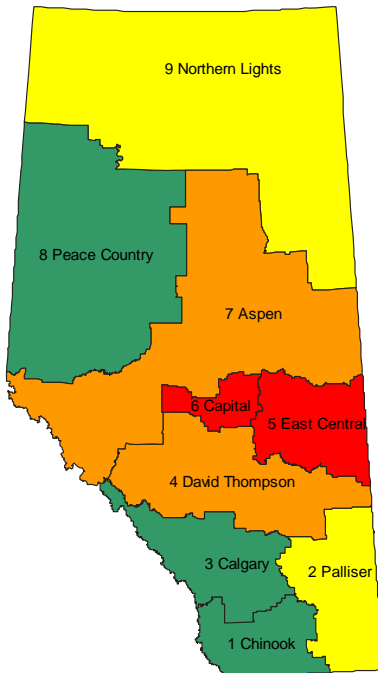
Congenital Anomalies (see Tables 4.7.1.7, 4.7.1.8)

- Chromosomal anomalies comprised the largest category of neonatal deaths due to major anomalies. For 2000 to 2004 combined, 22.5% of neonatal deaths due to major anomalies were due to chromosomal anomalies, and 20.5% were due to cardio-respiratory anomalies.

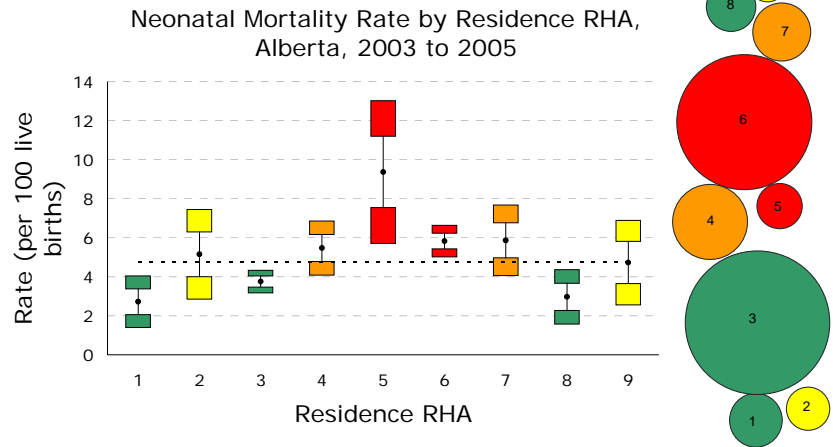
4.7.3 Neonatal Mortality

4.7.3 Neonatal Mortality

Neonatal Mortality 2003-05



Regional Data (see Table 4.7.3.2)



- The neonatal mortality rate for 2003 to 2005 combined was significantly lower than the provincial average in RHAs 1, 3, and 8. RHA 1 had the lowest rate (2.7 per 1,000 live births).
- The rate was significantly higher than the provincial average in RHAs 5 and 6, with the highest rate (9.4) in RHA 5.
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

Limitations and Methodology Notes

See Appendix 6.2.1 for comparative mortality definitions.

Neonatal mortality rates must be interpreted with caution due to the low number of cases in many categories.

Table 4.7.3.1 Neonatal Deaths and Rate, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Neonatal deaths	150	130	104	138	150	144	200	195	178	207
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 1,000 live births)	4.0	3.6	2.8	3.7	4.1	3.9	5.2	4.9	4.4	5.0
Standard Error (SE)	0.33	0.31	0.27	0.31	0.33	0.32	0.37	0.35	0.33	0.35

Table 4.7.3.2 Neonatal Deaths and Rate by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Neonatal deaths	17	20	167	62	26	208	42	18	19	580
Live births	6,245	3,885	44,497	11,334	2,777	35,711	7,163	6,067	4,021	121,707
Rate (per 100 live births)	2.7	5.1	3.8	5.5	9.4	5.8	5.9	3.0	4.7	4.8
Standard Error (SE)	0.66	1.15	0.29	0.69	1.83	0.40	0.90	0.70	1.08	0.20

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Vital Statistics, Death File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for RHAs include unknown RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.7.3.3 Weight-Specific Neonatal Deaths and Rates by Birth Weight Category (grams), Alberta, 2003, 2004, and 2000 to 2004 Combined

2003	<500*	500-749	750-999	1000-1249	1250-1499	1500-2499	2500-4499	>4499	Total
Neonatal deaths	61	41	18	7	2	24	34	1	189
Live births	65	72	77	98	130	2,075	36,571	780	39,868
Neonatal mortality rate¹ (per 1,000 total births)	938.5	569.4	233.8	71.4	15.4	11.6	0.9	1.3	4.7
Standard Error (SE)	29.81	58.35	48.23	26.02	10.79	2.35	0.16	1.28	0.34
Corrected Neonatal mortality rate² (per 1,000 total births)	907.0	530.3	202.7	52.1	7.8	2.9	0.4	1.3	3.0
Standard Error (SE)	44.30	61.43	46.73	22.68	7.72	1.19	0.11	1.28	0.27
2004	<500*	500-749	750-999	1000-1249	1250-1499	1500-2499	2500-4499	>4499	Total
Neonatal deaths	76	38	14	8	5	9	28	1	179
Live births	75	85	70	102	121	2,136	37,005	697	40,291
Neonatal mortality rate¹ (per 1,000 total births)	1000.0	447.1	200.0	78.4	41.3	4.2	0.8	1.4	4.4
Standard Error (SE)	0.00	53.93	47.81	26.62	18.09	1.40	0.14	1.43	0.33
Corrected Neonatal mortality rate² (per 1,000 total births)	1000.0	389.6	188.4	40.8	25.2	0.9	0.2	1.4	2.8
Standard Error (SE)	0.00	55.57	47.08	19.99	14.37	0.66	0.08	1.43	0.26
2000 to 2004 Combined	<500*	500-749	750-999	1000-1249	1250-1499	1500-2499	2500-4499	>4499	Total
Neonatal deaths	287	207	71	29	24	93	155	5	872
Live births	294	384	399	494	605	9,931	176,401	3,792	192,303
Neonatal mortality rate¹ (per 1,000 total births)	976.2	539.1	177.9	58.7	39.7	9.4	0.9	1.3	4.5
Standard Error (SE)	8.89	25.44	19.15	10.58	7.94	0.97	0.07	0.59	0.15
Corrected Neonatal mortality rate² (per 1,000 total births)	1000.0	495.7	148.1	35.3	13.6	1.7	0.4	1.3	2.8
Standard Error (SE)	0.00	26.69	18.10	8.40	4.77	0.42	0.05	0.59	0.12

Source: Statistics reported to the Alberta Perinatal Health Program by Medical Records Departments of the hospitals, March 2006 release.

Vital Statistics, Birth File, Department of Government Services, January 2006 release.

Notes: 1. (neonatal deaths / live births) x 1000.

2. Corrected rates exclude deaths due to major congenital anomalies.

* There may be more deaths than births in this category due to the fact that some live births and stillbirths are inconsistently registered. Total birth numbers are from the Vital Statistics database, in which some births < 500 grams are apparently not registered. The Neonatal deaths come from the Medical Records departments, which have the death records for these unregistered births. The rates have consequently been adjusted downward to 1,000 where necessary to correct for this fact.

Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4.7.4 Post-neonatal Mortality

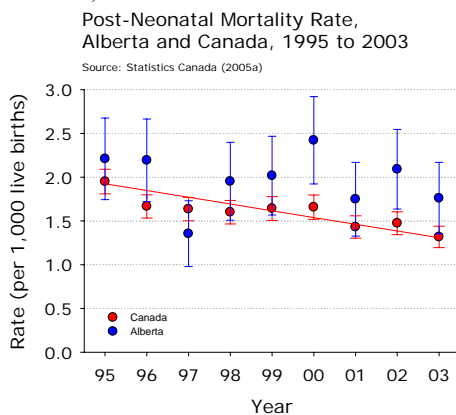
Background

A post-neonatal death *occurs when an infant is born alive but dies between 28 days and one year of age.*

Post-neonatal mortality rate: *Number of post-neonatal deaths per 1,000 live births in a given year.*

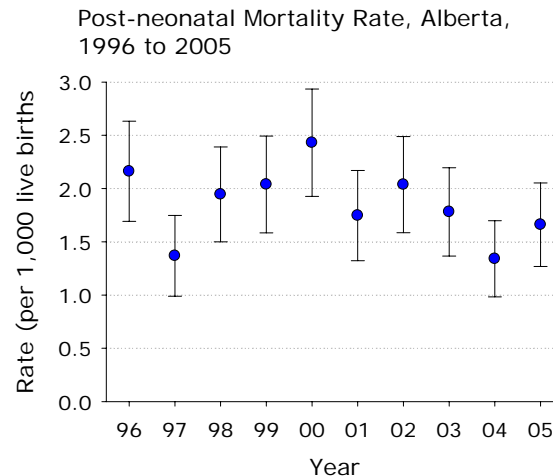
Sudden infant death syndrome and congenital anomalies are the leading causes of post-neonatal death in Canada (Health Canada, 2003). To reduce risk of sudden infant death syndrome, parents are encouraged to have infants sleep on their backs, to breastfeed their infants, to maintain a smoke-free environment, to avoid overheating, and to provide firm, flat bedding without products to maintain sleeping position (Canadian Foundation for the Study of Infant Deaths, Canadian Institute of Child Health, Canadian Paediatric Society, and Health Canada (1999).

Between 1995 and 2003, post-neonatal mortality rates declined in Canada as a whole; the rate in Alberta showed no time trend. In 2003, the post-neonatal mortality rate was 1.8 (per 1,000 live births) in Alberta and 1.3 in Canada (Statistics Canada, 2005a).



Post-neonatal mortality rates must be interpreted with caution due to the low number of cases in many categories.

Time Trends (see Table 4.7.4.1)



- The post-neonatal mortality rate did not vary significantly with time between 1996 and 2005. There were 69 post-neonatal deaths in Alberta in 2005, for a rate of 1.7 (per 1,000 live births).

Regional Data (see Table 4.7.4.2)

- Post-neonatal mortality rates by residence RHA for 2003 to 2005 combined are in Table 4.7.4.2. The number of cases is too small to make inter-regional comparisons.

Limitations and Methodology Notes

See Appendix 6.2.1 for comparative mortality definitions.

Post-neonatal mortality rates must be interpreted with caution due to the low number of cases in many categories.

Table 4.7.4.1 Post-neonatal Deaths and Rate, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Post-neonatal deaths	150	130	104	138	150	144	200	195	178	207
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 1,000 live births)	4.0	3.6	2.8	3.7	4.1	3.9	5.2	4.9	4.4	5.0
Standard Error (SE)	0.33	0.31	0.27	0.31	0.33	0.32	0.37	0.35	0.33	0.35

Table 4.7.4.2 Post-neonatal Deaths and Rate by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Post-neonatal deaths	17	20	167	62	26	208	42	18	19	580
Live births	6,245	3,885	44,497	11,334	2,777	35,711	7,163	6,067	4,021	121,707
Rate (per 100 live births)	2.7	5.1	3.8	5.5	9.4	5.8	5.9	3.0	4.7	4.8
Standard Error (SE)	0.66	1.15	0.29	0.69	1.83	0.40	0.90	0.70	1.08	0.20

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Vital Statistics, Death File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for RHAs include unknown RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4.7.5 Infant Mortality

Background

An infant mortality *occurs when an infant dies before reaching 12 months of age*. This includes neonatal and post-neonatal deaths.

Infant mortality rate: *Number of infant deaths per 1,000 live births*.

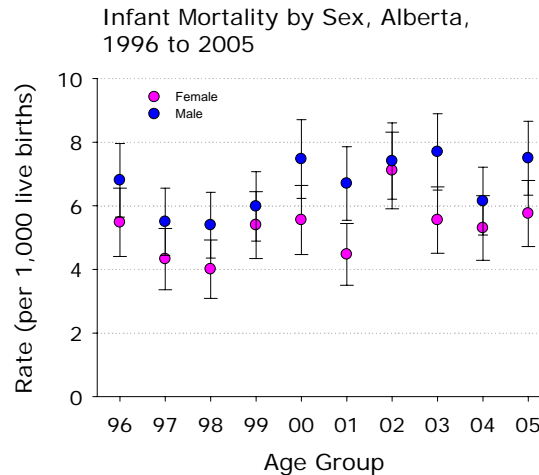
Prematurity and low birth weight are the two strongest predictors of infant mortality; most infant deaths are preterm or low birth weight or both. Other risk factors for infant death include maternal smoking, low maternal education, low or high maternal age, and male gender (Chen et al., 1998; Nault, 1997; Pollack, Lantz, and Frohna, 2000).

Throughout the world, infant mortality declined dramatically in the 1900s. In Canada, the rate has stabilized in recent years, but regional variation persists due to variability in demographics, quality of obstetric and infant care, and differences in registration practices (Wen, Kramer, Liu, Dzakpasu, & Sauvé, 2000). Deaths due to congenital anomalies have decreased in Canada, which can be partially attributed to increased incidence of pregnancy termination after prenatal screening (Liu, Joseph, Kramer, Allen, Sauve, Rusen, & Wen, 2002).

The leading causes of infant mortality in Canada in 1999 were congenital anomalies (26.5%), immaturity (23.4%), sudden infant death syndrome (11.2%), and asphyxia (10.1%) (Health Canada, 2003).

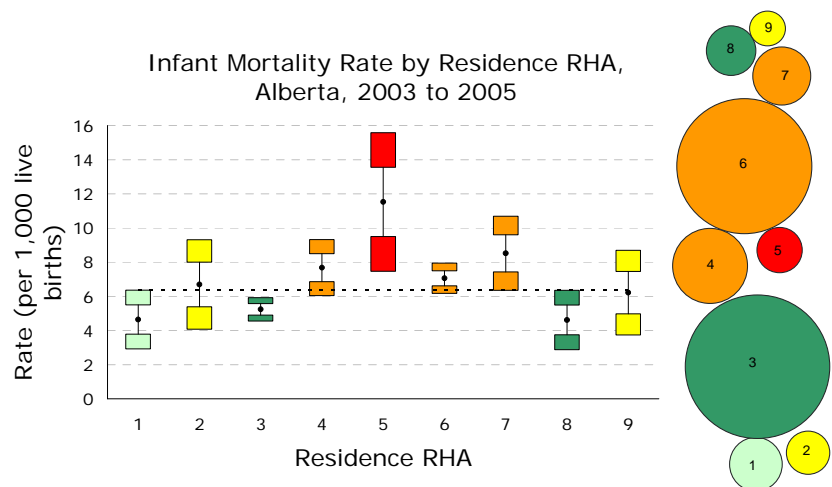
Infant mortality rates reported below must be interpreted with caution due to the low number of cases in many categories.

Time Trends (see Tables 4.7.5.1, 4.7.5.2)



- There is no time trend in the infant mortality rate between 1996 and 2005. The rate was higher for females than for males in each year, though the difference was not significant most years.
- In 2005, there were 276 infant deaths in Alberta, resulting in a rate of 6.6 (per 1,000 live births).

Regional Data (see Tables 4.7.5.3, 4.7.5.4)



- In 2003 to 2005 combined, the infant mortality rate was significantly lower than the provincial rate in RHAs 3 and 8, with the lowest rates in RHAs 6 and 8 (4.6 per 1,000 live births).

Regional Data continued (see Table 4.7.5.3, 4.7.5.4)

- The provincial infant mortality rate was exceeded in RHA 5 (11.5 per 1,000 live births) for 2003 to 2005 combined.
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

Limitations and Methodology Notes

See Appendix 6.2.1 for comparative mortality definitions.

Infant mortality rates must be interpreted with caution due to the low number of cases in many categories.

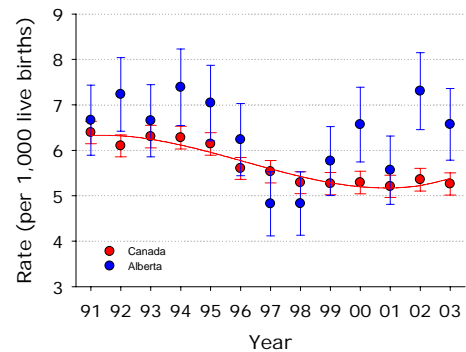
4.7.5 Infant Mortality

Background (continued)

Canadian infant mortality rates declined in the late 1990s and then stabilized. In 2003, the infant mortality rate was 6.6 (per 1,000 live births) in Alberta and 5.3 in Canada. Registration of live births under 500 grams has been routine in Alberta since 1990, elevating the perinatal, neonatal, and infant mortality rates in Alberta relative to the rest of Canada, where such births are not universally registered.

Infant Mortality Rate,
Alberta and Canada, 1995 to 2003

Source: Statistics Canada (2005a)



Infant Mortality 2003-05

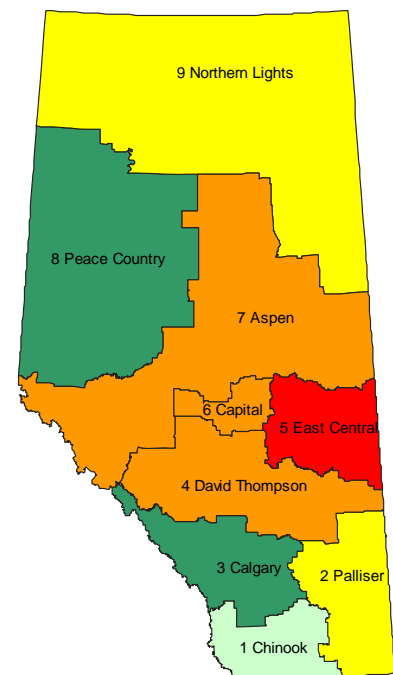


Table 4.7.5.1 Infant Deaths and Rate by Year, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Infant Deaths	231	180	177	215	239	209	278	266	232	276
Live births	37,472	36,550	37,529	37,778	36,625	37,226	38,293	39,868	40,291	41,548
Rate (per 100 live births)	6.2	4.9	4.7	5.7	6.5	5.6	7.3	6.7	5.8	6.6
Standard Error (SE)	0.40	0.37	0.35	0.39	0.42	0.39	0.43	0.41	0.38	0.40

Table 4.7.5.2 Infant Deaths and Rate by Sex, Alberta, 1996 to 2005

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Female										
Infant Deaths	99	77	73	100	100	81	133	108	104	117
Live births	18,066	17,808	18,234	18,547	18,009	18,116	18,709	19,455	19,623	20,331
Rate (per 100 live births)	5.5	4.3	4.0	5.4	5.6	4.5	7.1	5.6	5.3	5.8
Standard Error (SE)	0.55	0.49	0.47	0.54	0.55	0.50	0.61	0.53	0.52	0.53
Male										
Infant Deaths	132	103	104	115	139	128	145	157	127	159
Live births	19,406	18,742	19,295	19,231	18,616	19,110	19,584	20,412	20,667	21,216
Rate (per 100 live births)	6.8	5.5	5.4	6.0	7.5	6.7	7.4	7.7	6.1	7.5
Standard Error (SE)	0.59	0.54	0.53	0.56	0.63	0.59	0.61	0.61	0.54	0.59

Table 4.7.5.3 Infant Deaths and Rate by Residence RHA, Alberta, 2003 to 2005 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Infant Deaths	29	26	233	87	32	252	61	28	25	774
Live births	6,245	3,885	44,497	11,334	2,777	35,711	7,163	6,067	4,021	121,707
Rate (per 100 live births)	4.6	6.7	5.2	7.7	11.5	7.1	8.5	4.6	6.2	6.4
Standard Error (SE)	0.86	1.31	0.34	0.82	2.03	0.44	1.09	0.87	1.24	0.23

Source: Vital Statistics, Birth File, Department of Government Services, March 2006 release.

Vital Statistics, Death File, Department of Government Services, March 2006 release.

Notes: Data include Alberta residents only.

Totals for RHAs include unknown RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.7.5.4 Infant Deaths and Rates by Year and Residence RHA, Alberta, 1996 to 2005

Infant deaths	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	14	15	8	11	13	18	13	16	7	6
Palliser	10	6	11	3	3	8	11	12	6	8
Calgary	65	47	49	70	70	62	96	79	60	94
David Thompson	26	18	17	23	23	22	28	32	24	31
East Central	10	5	4	4	3	5	14	16	7	9
Capital	60	61	52	68	79	72	56	77	86	89
Aspen	16	13	10	20	23	11	28	15	25	21
Peace Country	19	10	10	9	15	6	15	9	10	9
Northern Lights	11	5	14	4	10	5	15	10	6	9
Alberta	231	180	177	215	239	209	276	266	232	276

Source: Vital Statistics, Death File, Department of Government Services, March 2006 release.

Notes: Number of infant deaths is too low to provide rates in many cells.

Notes: Data include Alberta residents only.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4.7.6 Maternal Mortality

Background

The Alberta Perinatal Health Program reviews reported maternal deaths that occur during pregnancy and up to 90 days post-delivery. These deaths are classified according to the Council on Medical Service, American Medical Association, Committee on Maternal and Child Care (1964). This classification includes three categories:

Direct obstetric deaths: Maternal deaths resulting from complications of pregnancy, childbirth or puerperium, including intervention, omission, incorrect treatment, or from chain of events resulting from above.

Indirect obstetric deaths: Maternal deaths resulting from previous existing diseases or diseases that developed during pregnancy, childbirth or the puerperium which are not due to a direct obstetric cause.

Unrelated deaths: Maternal deaths not related to pregnancy, childbirth or puerperium, but occurring within the defined time frame. These deaths are not reported here.

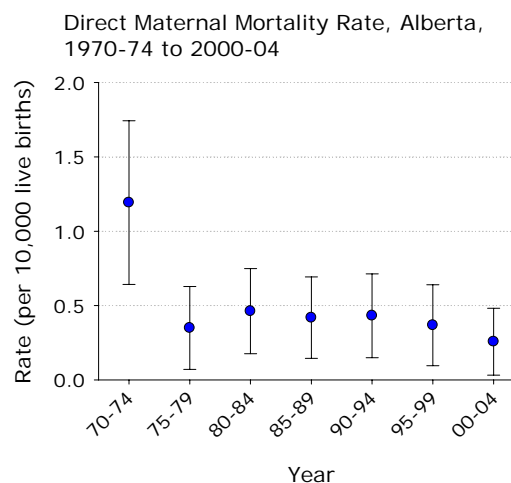
Maternal mortality rate: Number of maternal deaths per 10,000 live births in a given year (includes direct, indirect, and unrelated deaths).

Maternal mortality rates are used worldwide as an indicator of the status of women, their ability to access care, and the ability of health care systems to provide care. More than one half million maternal deaths occur across the world each year; two-thirds of these deaths occur in just 13 countries. Canada's maternal mortality rate is one of the lowest in the world, but risk varies across sub-populations of women. (Health Canada, 2004a).

Maternal mortality rates must be interpreted with caution due to the low number of cases in many categories.

Time Trends (see Table 4.7.6.1)

- Maternal mortality rates in Alberta are minimal.



- The direct maternal mortality rate for five-year periods is shown in the figure above. The rate for 1970-74 was elevated relative to later years. The rate has been stable since 1975-79.
- During the ten-year period between 1995 and 2004, there were 12 direct and 12 indirect maternal deaths in Alberta out of a total of 385,021 live births.
- In 2004, there was one indirect maternal death. There were no direct maternal deaths in Alberta in 2004.

Limitations and Methodology Notes

Maternal mortality rates must be interpreted with caution due to the low number of cases in many categories.

4.7.6 Maternal Mortality

Background (continued)

Maternal deaths are underreported, and recent changes in coding systems for deaths alter the patterns of reporting (Turner, Cyr, Kinch, Liston, Kramer, Fair and Heaman, 2002).

The risk of maternal death is higher for older mothers, in particular mothers over 40 years of age, regardless of parity, prenatal care, or education. Causes of death associated with increased maternal age include abnormalities of placentation and hypertensive disorders (Callaghan & Berg, 2003).

The most common causes of direct maternal mortality from 1997 to 2000 in Canada were pulmonary embolism and pre-eclampsia/pregnancy-induced hypertension. Cardiovascular disease accounted for 60% of indirect maternal deaths between 1997 and 2000. The most common cause of maternal death unrelated to pregnancy was motor vehicle collisions, accounting for 50% of unrelated maternal deaths (Health Canada, 2004a).

Between 1997 and 2000, there were 64 maternal deaths in Canada, 44 direct and 20 indirect. The overall maternal mortality rate was 6.1 (per 100,000 live births), with direct and indirect rate of 4.2 and 1.9, respectively. About three quarters of maternal deaths occurred at 24 weeks' gestation or later, with almost half of these deaths occurring in the post-partum period (Health Canada, 2004a).

Table 4.7.6.1 Maternal Deaths and Rates by Cause, Alberta, 1970 to 2004

	Deaths				Rates (per 10,000 live births)		
	Direct	Indirect	Total (Direct + Indirect)	Unrelated	Direct	Indirect	Total (Direct + Indirect)
1970	4	1	5	6	1.3	0.3	1.6
1971	3	2	5	8	1.0	0.7	1.6
1972	5	0	5	5	1.7	0.0	1.7
1973	5	2	7	10	1.7	0.7	2.4
1974	1	1	2	3	0.3	0.3	0.7
1975	1	2	3	3	0.3	0.6	0.9
1976	1	1	2	2	0.3	0.3	0.6
1977	1	4	5	4	0.3	1.2	1.5
1978	1	2	3	2	0.3	0.6	0.8
1979	2	1	3	6	0.5	0.3	0.8
1980	2	1	3	0	0.5	0.3	0.8
1981	2	4	6	2	0.5	0.9	1.4
1982	1	4	5	4	0.2	0.9	1.1
1983	5	1	6	2	1.1	0.2	1.3
1984	0	1	1	4	0.0	0.2	0.2
1985	2	0	2	6	0.5	0.0	0.5
1986	0	0	0	7	0.0	0.0	0.0
1987	0	0	0	7	0.0	0.0	0.0
1988	4	3	7	6	1.0	0.7	1.7
1989	3	2	5	2	0.7	0.5	1.2
1990	3	0	3	3	0.7	0.0	0.7
1991	1	3	4	1	0.2	0.7	0.9
1992	2	3	5	1	0.5	0.7	1.2
1993	1	1	2	2	0.2	0.2	0.5
1994	2	0	2	1	0.5	0.0	0.5
1995	2	2	4	0	0.5	0.5	1.0
1996	2	2	4	2	0.5	0.5	1.1
1997	1	0	1	0	0.3	0.0	0.3
1998	2	5	7	1	0.5	1.3	1.8
1999	0	0	0	1	0.0	0.0	0.0
2000	0	0	0	0	0.0	0.0	0.0
2001	2	1	3	1	0.5	0.3	0.8
2002	1	0	1	5	0.3	0.0	0.3
2003	2	1	3	6	0.5	0.2	0.7
2004	0	1	1	1	0.0	0.2	0.2

Source: Statistics reported to the Alberta Perinatal Health Program by Medical Records Departments of the hospitals.
Vital Statistics, Government Services, June 12, 2006 extraction.

Notes: Data include non-Alberta residents who died in Alberta.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

4. Births

4.1 Fertility Rates

4.2 Live Births

4.3 Birth Weight

4.4 Preterm Births

4.5 Multiple Births

4.6 Infant morbidity

4.7 Mortality

4.8 Maternal factors

4.8.1 Maternal postnatal morbidity

4.8.2 Breastfeeding

4.8.1 Maternal Postnatal Morbidity

Background

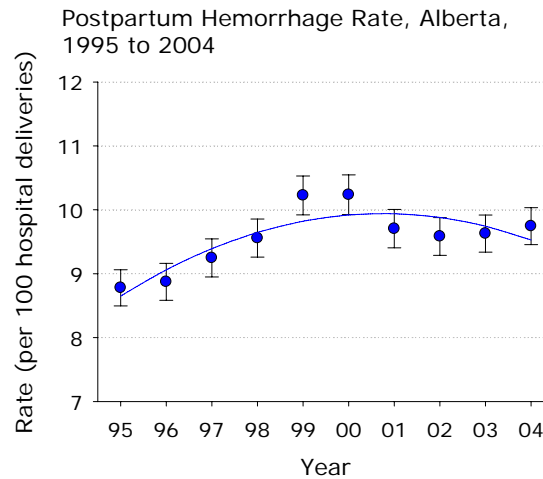
Postpartum hemorrhage: *Excessive blood loss after childbirth. May occur immediately after delivery or may be delayed by days or weeks* (Morgan, 1990). For the data presented below, postpartum hemorrhage was defined as loss of more than 500 ml of blood during the first 24 hours after vaginal delivery or loss of more than 1000 ml of blood after cesarean section.

Depression: *A mental state of depressed mood characterized by feelings of sadness, despair, and discouragement. Depression ranges from normal feelings of “the blues” through dysthymic disorder to major depressive disorder* (Dorland, 2000).

Postpartum depression: *In the analyses below, we looked at diagnoses of depressive disorders occurring within 1 month, 6 months, 1 year and 2 years after birth, compared with levels in the 40 weeks prior to delivery (prenatal depression).* About 70% of depressive disorders were classified as depressive disorders not otherwise specified, followed by dysthymia (22%), depressive reaction (5%), major depression (2%), and remaining diagnostic categories (1%).

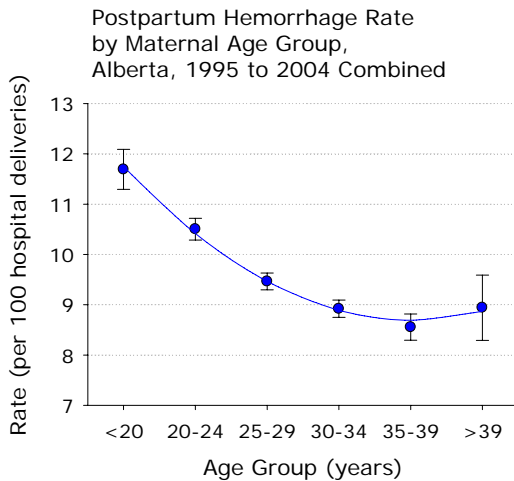
Rates for the postpartum hemorrhage and postpartum depression are per 100 hospital deliveries.

Time Trends (see Tables 4.8.1.1, 4.8.1.3)

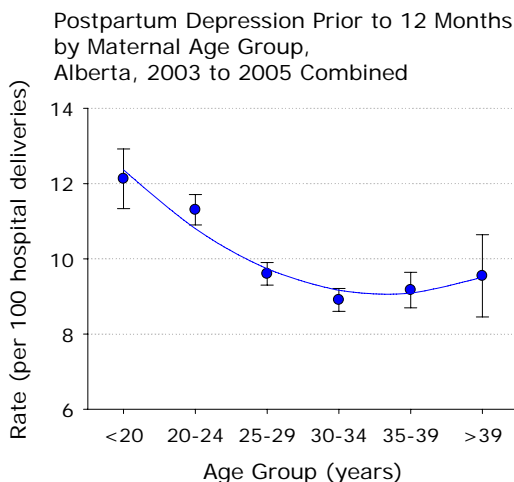


- For the period 1995 to 2004, the postpartum hemorrhage rate in Alberta varied between 8.8 and 9.7 (per 100 hospital deliveries), except for 1999 and 2000, when it was 10.2.
- In 2004, the postpartum hemorrhage rate was 9.7.
- There were no time trends in the rates of prenatal or postpartum depression between 2002 and 2004.
- In 2004, the rate of prenatal depression was 2.4 (per 100 hospital deliveries). The rate of depression one month following delivery was 2.0 (per 100 hospital deliveries) in 2004. This rate was not different from the prenatal rate.
- The postpartum depression rate up to 6 months after delivery was 6.7; this rate increased to 9.8 and 12.1 at 12 and 24 months after delivery, respectively.
- In summary, in the 12 months following delivery, 9.8% of women were diagnosed with depression, compared with 2.0% in the prenatal period.

Maternal Age Effects (see Tables 4.8.1.2, 4.8.1.4)



- Between 1995 and 2004, postpartum hemorrhage was most likely in mothers under 20, and declined with age group for women under 40.



- Postpartum depression was more common for mothers under 25, but only after 1 month postpartum. Prenatal depression and postpartum depression rates prior to the 6 month cutoff did not vary with maternal age for 2002 to 2004 combined. The figure above shows rates for postpartum depression prior to 12 months.

Limitations and Methodology Notes

See the Methodology and Limitations section in the Introduction (page 14) for a caution regarding comparison of 2002 maternal morbidity data to data from prior years due to changes in data coding systems.

4.8.1 Maternal Postnatal Morbidity

Background continued

Postpartum hemorrhage is the leading cause of maternal death worldwide. In Canada, no mortalities due to postpartum hemorrhage were reported between 1997 and 2000, but severe postpartum hemorrhage requiring hysterectomy and transfusion occurred in 1.22 out of every 1,000 deliveries (Health Canada, 2004a). Risk factors for postpartum hemorrhage include prolonged third stage of labour, preeclampsia, episiotomy, previous postpartum hemorrhage, and multiple pregnancy (Maughan, Heim, and Galazka, 2006). Outcomes range from complete recovery, to anemia, hysterectomy, or death. Common causes are uterine atony, retained placenta, obstetric trauma, and infection (Shane, 2001).

Postpartum depressive disorders are complicated phenomena, with severity ranging from mild “blues” to non-psychotic major depression to psychosis. In one meta-analysis, the strongest predictors of postpartum depression were prenatal depression, low self-esteem, childcare stress, and prenatal anxiety (Beck, 2001). Limited social support and teenage pregnancy have also been implicated (O’Hara & Swain, 1996). Hormonal and other biologic factors are thought to play an important role (Miller, 2002).

4.8.1 Maternal Postnatal Morbidity

Limitations and Methodology Notes continued

Postpartum hemorrhage and postpartum depression data did not include out-of-hospital births.

Table 4.8.1.1 Postpartum Bleeding Cases and Rate by Year, Alberta, 1995 to 2004

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Postpartum bleeding cases	3,371	3,307	3,357	3,576	3,869	3,751	3,608	3,655	3,820	3,920
Hospital deliveries	38,398	37,274	36,304	37,419	37,841	36,647	37,180	38,146	39,675	40,233
Rate (per 100 hospital deliveries)	8.8	8.9	9.2	9.6	10.2	10.2	9.7	9.6	9.6	9.7
Standard Error (SE)	0.14	0.15	0.15	0.15	0.16	0.16	0.15	0.15	0.15	0.15

Table 4.8.1.2 Postpartum Bleeding Cases and Rate by Maternal Age Group, Alberta, 1995 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Postpartum bleeding cases	2,938	8,173	11,244	9,427	3,787	665	36,234
Hospital deliveries	25,131	77,816	118,802	105,667	44,260	7,438	379,117
Rate (per 100 hospital deliveries)	11.7	10.5	9.5	8.9	8.6	8.9	9.6
Standard Error (SE)	0.20	0.11	0.08	0.09	0.13	0.33	0.05

Source: Fee-For-Service Claims Files, Alberta Health and Wellness, extracted May 2006.

Ambulatory Care Classification System (ACCS), Alberta Health and Wellness, extracted May 2006.

Hospital Inpatient Files, Alberta Health and Wellness, extracted May 2006.

Notes: Diagnostic codes: ICD-9=666, ICD-10=O72.

Data include Alberta residents only.

Totals for age groups include unknown ages.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.8.1.3 Prenatal and Postpartum Depression Cases and Rates, Alberta, 2002 to 2004

	2002	2003	2004
Hospital deliveries	38,146	39,652	40,208
Prenatal depression			
Cases	960	1,028	971
Rate (per 100 hospital deliveries)	2.5	2.6	2.4
Postpartum depression			
Up to 1 month			
Cases	725	780	806
Rate (per 100 hospital deliveries)	1.9	2.0	2.0
Up to 6 months			
Cases	2,403	2,713	2,705
Rate (per 100 hospital deliveries)	6.3	6.8	6.7
Up to 12 months			
Cases	3,650	4,010	3,940
Rate (per 100 hospital deliveries)	9.6	10.1	9.8
Up to 24 months			
Cases	4,632	4,976	4,867
Rate (per 100 hospital deliveries)	12.1	12.5	12.1

Table 4.8.1.4 Prenatal and Postpartum Depression Cases and Rate by Maternal Age Group, Alberta, 2002 to 2004 Combined

	<20	20-24	25-29	30-34	35-39	>39	All
Hospital deliveries	6,490	23,729	36,915	33,742	14,354	2,776	118,006
Prenatal depression							
Cases	184	592	873	827	398	85	2,959
Rate (per 100 hospital deliveries)	2.8	2.5	2.4	2.5	2.8	3.1	2.5
Postpartum depression							
Up to 1 month							
Cases	135	487	707	635	286	61	2,311
Rate (per 100 hospital deliveries)	2.1	2.1	1.9	1.9	2.0	2.2	2.0
Up to 6 months							
Cases	501	1,790	2,420	2,047	881	182	7,821
Rate (per 100 hospital deliveries)	7.7	7.5	6.6	6.1	6.1	6.6	6.6
Up to 12 months							
Cases	787	2,682	3,544	3,006	1,316	265	11,600
Rate (per 100 hospital deliveries)	12.1	11.3	9.6	8.9	9.2	9.5	9.8
Up to 24 months							
Cases	966	3,417	4,385	3,734	1,661	312	14,475
Rate (per 100 hospital deliveries)	14.9	14.4	11.9	11.1	11.6	11.2	12.3

Sources: Fee for Service Claims File, Alberta Health and Wellness, June 2006 extraction.

Ambulatory Care Classification System, Alberta Health and Wellness, June 2006 extraction.

Hospital Inpatient Files, Alberta Health and Wellness, June 2006 extraction.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness, March 2006 extraction.

Notes: The number of women with depression is defined by the first three diagnoses recorded in any of the three data sources (Fee For Service Claims, Ambulatory Care Classification System, Inpatient Hospital Files)

4.8.2 Breastfeeding

Background

Breastfeeding newborns included those *documented as breastfeeding on discharge from hospital after birth*. This includes newborns exclusively breastfeeding as well as those receiving other sources of nutrition.

Rate of breastfeeding at hospital discharge: *Number of newborns per 100 newborns delivered in hospital who were breastfeeding when discharged.*

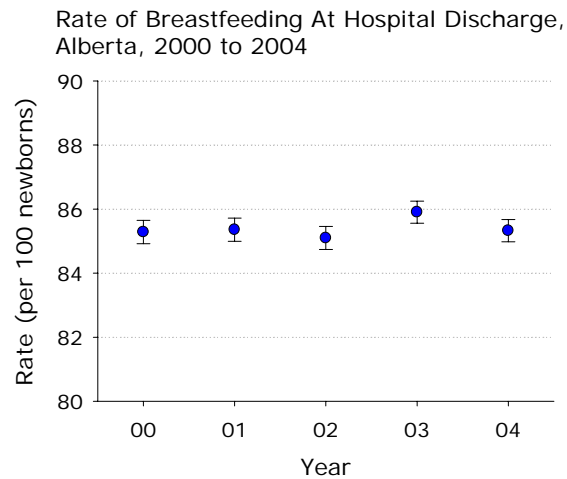
The World Health Organization recommends exclusive breastfeeding up to six months of age, and continuation of supplemented breastfeeding up to two years of age and beyond (World Health Organization, 2001; World Health Organization/UNICEF, 1990).

Breastfeeding is associated with protection from gastrointestinal and respiratory infections, otitis media, allergies, respiratory infections, Type 2 diabetes, and post-neonatal death, as well as enhanced cognitive development (Health Canada, 2003; Millar & Maclean, 2005). For mothers, benefits include reduced postpartum bleeding, earlier postpartum weight loss, delayed resumption of ovulation, increased postpartum bone remineralization, and reduced risk of ovarian and breast cancer (Health Canada, 2003).

The World Health Organization and the Public Health Agency of Canada recommend exclusive breastfeeding for the first six months of life. Only 17% of Canadian mothers were doing so in 2003. Exclusive breastfeeding for at least six months is more likely with mothers who are older, married, have higher levels of education, have higher household income, are immigrants, and are urban (Millar & Maclean, 2005).

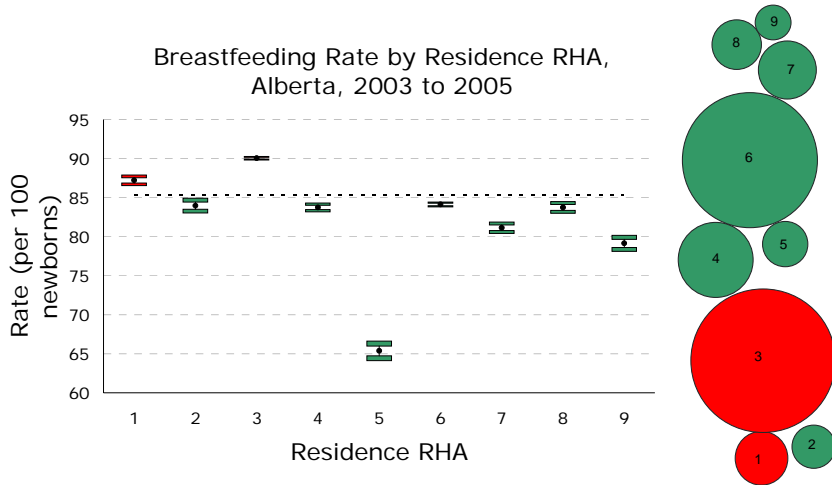


Time Trends (see Table 4.8.2.1)



- Breastfeeding at hospital discharge is common in Alberta. In 2004, 85.3% of newborns discharged from hospital after birth were breastfeeding.
- There was no time trend in the rate of breastfeeding at discharge from 2000 to 2004.

Regional Data (see Tables 4.8.2.2, 4.8.2.3)



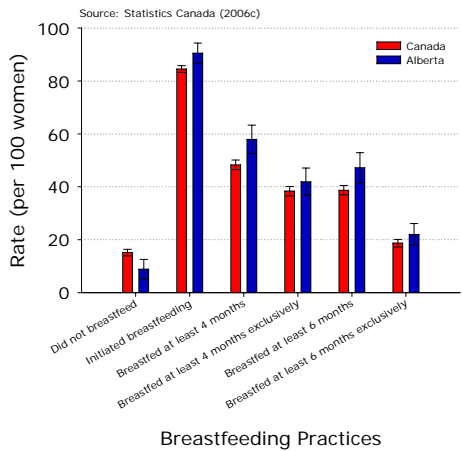
- The rate of breastfeeding at discharge was significantly higher than the provincial rate in RHAs 1 and 3, and lower in the remaining RHAs. The rates varied from 65.4% (RHA 5) of newborns to 90.0% (RHA 3).
- See Appendix 6.3.1 for methodology and interpretation of maps, graphs, and cartograms.

4.8.2 Breastfeeding

Background (continued)

In 2003, the Canadian breastfeeding initiation rate was 84.5 (per 100 women aged 15 to 55 who had a baby in the previous five years) and the rate for duration of exclusive breastfeeding for six months or more was 18.7. The rates in Alberta were 90.5 and 22.0, respectively (Statistics Canada, 2006c).

Breastfeeding Practices, Alberta and Canada, 2003



Rate of Breastfeeding at Discharge
2002-04



Table 4.8.2.1 Newborns Breastfeeding and Rate by Year, Alberta, 2000 to 2004

	2000	2001	2002	2003	2004
Newborns breastfeeding	30,954	31,450	32,238	33,921	34,193
Live newborns	36,296	36,846	37,884	39,488	40,074
Breastfeeding Rate (per 100 live births)	85.3	85.4	85.1	85.9	85.3
Standard Error (SE)	0.19	0.18	0.18	0.18	0.18

Table 4.8.2.2 Newborns Breastfeeding and Rate by Residence RHA, Alberta, 2000 to 2004 Combined

	Chinook	Palliser	Calgary	David Thompson	East Central	Capital	Aspen	Peace Country	Northern Lights	Alberta
Newborns breastfeeding	8,606	5,153	60,770	14,958	3,832	47,051	9,465	8,019	4,901	162,756
Live newborns	9,868	6,137	67,487	17,864	5,862	55,933	11,666	9,577	6,193	190,588
Breastfeeding Rate (per 100 live births)	87.2	84.0	90.0	83.7	65.4	84.1	81.1	83.7	79.1	85.4
Standard Error (SE)	0.34	0.47	0.12	0.28	0.62	0.15	0.36	0.38	0.52	0.08

Source: Hospital Inpatient Files, June 2006 extraction.

Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness, March 2006 release.

Notes: Data include Alberta residents only.

Totals for age groups and RHAs include unknown ages or RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

Table 4.8.2.3 Newborns Breastfeeding and Rate by Year and Residence RHA, Alberta, 2000 to 2004

Newborns breastfeeding	2000	2001	2002	2003	2004
Chinook	1,680	1,679	1,698	1,790	1,759
Palliser	989	1,020	1,031	1,023	1,090
Calgary	11,492	11,529	11,910	12,874	12,965
David Thompson	2,955	2,943	3,079	3,121	2,860
East Central	760	743	773	749	807
Capital	8,867	9,072	9,213	9,793	10,106
Aspen	1,783	1,930	1,913	1,899	1,940
Peace Country	1,535	1,585	1,603	1,668	1,628
Northern Lights	893	949	1,018	1,003	1,038
Alberta	30,954	31,450	32,238	33,921	34,193

Rate (per 100 live newborns)	2000	2001	2002	2003	2004
Chinook	87.1	86.6	87.8	87.7	86.9
Palliser	83.1	84.0	84.1	82.3	86.3
Calgary	89.5	89.9	89.6	90.8	90.3
David Thompson	86.3	85.9	86.2	84.1	76.6
East Central	68.3	67.5	66.1	62.6	62.9
Capital	83.2	83.2	82.9	85.2	85.9
Aspen	80.0	82.0	80.8	81.4	81.5
Peace Country	84.6	83.4	83.5	83.1	84.1
Northern Lights	80.5	79.7	79.0	78.4	78.2
Alberta	85.3	85.4	85.1	85.9	85.3

Source: Hospital Inpatient Files, Alberta Health and Wellness, May 2006 release.

Notes: Data include out-of-province residents.

Totals for RHAs include unknown RHAs.

Data may differ from previously published data due to differences in definitions and dates of data extraction.

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6. Appendices

6.1 Codes used for data extraction

6.2 Mortality definitions

6.3 Epidemiologic measures for maps

6.4 Populations

6.1.1 Codes Used for Data Extraction

From: International Classification of Disease – 9th Revision – Clinical Modification (ICD-9-CM) Codes, and International Statistical Classification of Diseases and Related Health Problems Tenth Revision, Canada (ICD-10-CA), and Canadian Classification of Health Interventions (CCI).

Induced Abortion

1995 to 2005

Fee-For-Service Claims Diagnostic Code: ICD-9-CM = 635-636

For gestational age, facility type, and facility region analyses only:

1995 to March 2002

Fee-For-Service Claims health service codes: 86.41, 87.0, 87.0A, 87.1, 87.21

April 2002 to 2004

Diagnostic Code

ICD-10-CA: O04^^ Medical abortion

Intervention Codes

CCI: 5CA88.^^ Medical termination

CCI: 5CA89GA Surgical aspiration and curettage

CCI: 5CA89GC Surgical dilatation and curettage

Spontaneous abortion

1995 to 2005

Fee-For-Service Claims Diagnostic Code: ICD-9-CM = 634

Hospital Delivery

1995 to 2005

Inpatient Hospital Separations, the Program Area as Main Patient Service code = 51

or

January 1, 1995 to March 2002

Diagnostic Codes

ICD-9-CM: 640-648 Complications mainly related to pregnancy
Fifth digit: 1: Delivered, with or without mention of antepartum condition
2: Delivered, with mention of postpartum complication

ICD-9-CM: 650 Delivery in a completely normal case

ICD-9-CM: 651-659 Other indications for care in pregnancy, labour and delivery
Fifth digit: 1: Delivered, with or without mention of antepartum condition
2: Delivered, with mention of postpartum complication

V Code

ICD-9-CM: V27 Outcome of delivery

April 2002 to March 2005

Diagnostic Codes

ICD-10-CA: O10^^ to O99^^ with a last digit of 1 or 2
Pregnancy, childbirth and the puerperium, (excluding pregnancy with abortive outcome)

or Z37^^ Outcome of delivery

Intervention Codes

CCI: 5MD50^^ to 5MD60^^

Manually assisted vaginal delivery (vertex), Unassisted spontaneous vaginal delivery, Water birth, Forceps traction and rotation delivery, Vacuum traction delivery, Combination of vacuum and forceps delivery, Breech delivery, Cesarean section delivery.

Induction of labour**1995 to 2001**

Procedure Codes

ICD-9-CM: 73.4

Medical induction of labour

ICD-9-CM: 73.01

Induction of labour by artificial rupture of membranes

ICD-9-CM: 73.1

Other surgical induction of labour

2002 to 2004

Intervention Codes

CCI: 5AC30AL, 5AC30AZ, 5AC30CA, 5AC30GU, 5AC30HA, 5AC30YA, 5AC30YB, 5AC30ZZ

Medical Induction

CCI: 5AC30AN, 5AC30AP, 5AC30CK

Surgical Induction

CCI: One of 5AC30AL, 5AC30AZ, 5AC30CA, 5AC30GU, 5AC30HA, 5AC30YA, 5AC30YB, 5AC30ZZ, and one of 5AC30AN, 5AC30AP, 5AC30CK

Combined Induction

If a delivery was counted in “Combined Induction”, it was not counted in “Medical Induction” or “Surgical Induction” (i.e., these three categories are mutually exclusive).

Operative/assisted Delivery**1995 to March 2002**

Procedure Codes

ICD-9-CM: 74

Cesarean section and removal of fetus
(74.91 (hysterotomy to terminate pregnancy) was excluded).

ICD-9-CM: 72.0

Low forceps operation

ICD-9-CM: 72.1

Low forceps operation with episiotomy

ICD-9-CM: 72.2

Mid forceps operation

ICD-9-CM: 72.21

Mid forceps with episiotomy

ICD-9-CM: 72.29

Other mid forceps operation

ICD-9-CM: 72.3

High forceps operation

ICD-9-CM: 72.31

High forceps operation with episiotomy

ICD-9-CM: 72.39

Other high forceps operation

ICD-9-CM: 72.7

Vacuum extraction

ICD-9-CM: 72.71

Vacuum extraction with episiotomy

April 2002 to 2004

Intervention Codes

CCI: 5MD53^^, 5MD55^^, 5MD.60.RG, 5MD.60.JZ, 5MD.60.KC, 5MD.60.RA, 5MD.60.RE,
5MD.60.JW, 5MD.60.RG, 5MD.60.CB, 5MD.60.CC, 5MD.60.CD, 5MD.60.CE, 5MD.60.CF,
5MD.60.CG

Forceps traction and rotation delivery

CCI: 5MD54^^, 5MD55^^, 5MD.60.RD, 5MD.60.KA, 5MD.60.KD, 5MD.60.RB, 5MD.60.RF,
5MD.60.JX, 5MD.60.RH, 5MD.60.CB, 5MD.60.CC, 5MD.60.CD, 5MD.60.CE, 5MD.60.CF,
5MD.60.CG

Vacuum traction delivery

CCI: 5MD55^^

Combination of vacuum and forceps delivery

CCI: 5MD60^^

Cesarean section delivery

Shoulder dystocia

1995 to 2004: Fee-For-Service Claims, Diagnostic Code: ICD-9-CM = 660.4

January 1995-March 2002: Inpatient Hospital Separations, Diagnostic Code: ICD-9-CM = 660.4

April 2002-March 2005: Inpatient Hospital Separations, Diagnostic Code: ICD-10-CA = O66.0

Respiratory distress syndrome

1995 to March 2002

Diagnostic code

ICD-9- CM: 769 Respiratory distress syndrome

April 2002 to 2004

Diagnostic code

ICD-10-CA: P22.0 Respiratory distress syndrome of newborn (RDS)

Congenital Anomalies

1995 to 2002

Diagnostic Codes

ICD-9- CM: 740.0-742.0	Neural Tube Defects
ICD-9- CM: 745.0-745.9	Heart Septal Defect
ICD-9- CM: 758.0	Down Syndrome
ICD-9- CM: 753.2	Urinary obstructive anomalies

For “All congenital anomalies combined” analyses, the following diagnostic codes were included:

Congenital Anomalies within ICD-9 740.0-759.9:

ICD-9- CM: 740.0-742.9	Nervous System Anomalies
ICD-9- CM: 743.0-743.9	Eye Anomalies
ICD-9- CM: 744.0-744.9	Ear, Face and Neck
ICD-9- CM: 745.0-747.9	Cardiovascular System Defect
ICD-9- CM: 748.0-748.9	Respiratory System Anomalies
ICD-9- CM: 749.0-751.9	Digestive System Anomalies
ICD-9- CM: 752.0-752.9	Genital Organ Anomalies
ICD-9- CM: 753.0-753.9	Urinary System Anomalies
ICD-9- CM: 754.0-756.9	Musculoskeletal Anomalies
ICD-9- CM: 757.0-757.9	Integument Anomalies
ICD-9- CM: 758.0-758.9	Chromosomal Anomalies
ICD-9- CM: 759.0-759.9	Other and Unspecified Anomalies

Congenital Anomalies/Disorders Outside ICD-9 740.0-759.9:

ICD-9- CM: 140-239	Neoplasm
ICD-9- CM: 243.9	Congenital Hypothyroidism
ICD-9- CM: 255.2	Adrenogenital Disorders
ICD-9- CM: 270	Amino Acid and Organic Acid Disorders
ICD-9- CM: 271	Disorders of CHO Transport and

Metabolism

ICD-9- CM: 275	Disorders of Mineral Metabolism
ICD-9- CM: 277.00	Cystic Fibrosis
ICD-9- CM: 282	Hereditary Hemolytic Anemias
ICD-9- CM: 343 (including 342, 344)	Cerebral Palsy
ICD-9- CM: 348.0	Cerebral Cysts
ICD-9- CM: 760.76	Fetal Alcohol Syndrome

2002 to 2005

Diagnostic codes

ICD-10: Q00, Q01, Q05	Neural tube defects
ICD-10: Q20-Q21	Heart septal defects
ICD-10: Q90	Down syndrome
ICD-10: Q62	Urinary obstructive anomalies

For “All congenital anomalies combined” analyses, the following diagnostic codes were included:

Congenital Anomalies inside ICD-10 XVII

ICD-10-CA:Q00-Q07	Congenital malformations of the nervous system
ICD-10-CA: Q10-Q18	Congenital malformations of eye, ear, face and neck
ICD-10-CA: Q20-Q28	Congenital malformations of the circulatory system
ICD-10-CA: Q30-Q34	Congenital malformations of the respiratory system
ICD-10-CA: Q35-Q37	Cleft lip and cleft palate
ICD-10-CA: Q38-Q45	Other congenital malformations of the digestive system
ICD-10-CA: Q50-Q56	Congenital malformations of genital organs
ICD-10-CA: Q60-Q64	Congenital malformations of the urinary system
ICD-10-CA: Q65-Q79	Congenital malformations and deformations of the musculoskeletal system
ICD-10-CA: Q80-Q89	Other congenital malformations
ICD-10-CA: Q90-Q99	Chromosomal abnormalities, not elsewhere classified

Congenital Anomalies outside ICD-10 XVII

Same category as those prior 2002 involving too many codes to list.

Postpartum Hemorrhage**1995 to 2004**

Fee-For-Service Claim:s Diagnostic Code: ICD-9-CM = 666

1995-March 2002

Inpatient Hospital Separations & Ambulatory Care Visits: Diagnostic Code: ICD-9-CM = 666

April 2002- 2004

Inpatient Hospital Separations & Ambulatory Care Visits: Diagnostic Code: ICD-10-CA = O72

Postpartum Depression**1999 to 2004**

Fee-For-Service Claims Diagnostic Code: ICD-9-CM = 296.2-296.3, 311

1999-March 2002

Inpatient Hospital Separations& Ambulatory Care Visits: Diagnostic Code: ICD-9-CM = 296.2-296.3, 311

April 2002- 2004

Inpatient Hospital Separations & Ambulatory Care Visits: Diagnostic Code: ICD-10-CA = F32-F33, F53

6. Appendices

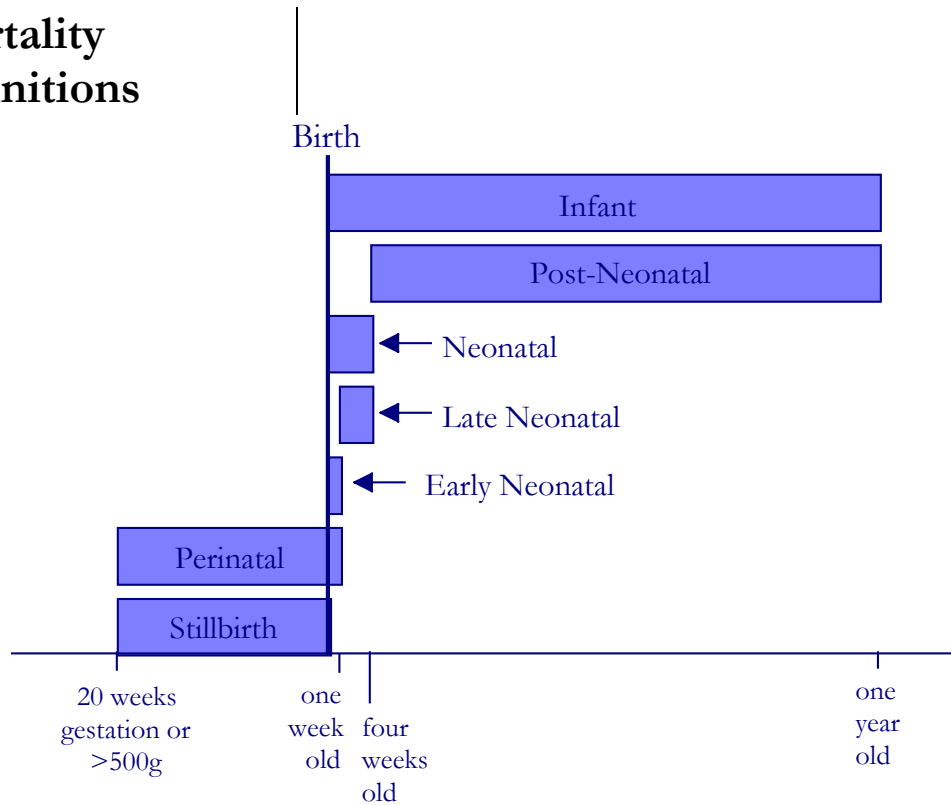
6.1 Codes used for data extraction

6.2 Mortality definitions

6.3 Epidemiologic measures for maps

6.4 Populations

6.2.1 Mortality Definitions



Type of Death

Infant
 Post-Neonatal
 Neonatal
 Late Neonatal
 Early Neonatal
 Perinatal
 Stillbirth

Definition

Death prior to one year of age
 Death at four weeks of age or later, prior to one year of age
 Death prior to four full weeks of age
 Death at one week of age or later, prior to four weeks of age
 Death prior to one full week of age
 Stillbirth or early neonatal death
 Death prior to birth, at 20 weeks gestation or later, or weighing 500 grams or more

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6.3.1 Epidemiologic Measures for Maps

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All health events reported in this document are mapped according to the method described below. This method was developed to address the issue of how population sizes of health regions can affect rate stability. Specifically, rates will be less stable for RHAs with smaller populations than those for RHAs with larger populations. The mapping method used in this report is designed to address this issue and allow statistically consistent interpretations. (As an example the numbers shown in the calculations in Steps 1, 2 and 3 below are for low birth weight babies born in the Chinook, Palliser and Northern Lights health regions and compared against provincial rates from 2000 to 2002.)

The mapping method consists of the following seven steps:

1. Calculate the rates for each region. For crude rates, an example of this calculation is shown below. *Note: where sex-age standardized rates are used a more detailed calculation would be required.*

Health Region #	Low Birth Weight (LBW)	Total Live Births	Proportion LBW
1	331	5,874	0.056
2	213	3,677	0.058
.	.	.	.
.	.	.	.
.	.	.	.
9	175	3,602	0.049

2. Calculate the rate for the province. For crude rates, an example of this calculation is shown below. *Note: where sex-age standardized rates are used a more detailed calculation would be required.*

Number of low birth weight newborns: 6,999

Total number of live births: 112,133

Proportion low birth weight: $6,999 / 112,133 = 0.062$

3. Calculate standard error of a probability of a health event for each regional rate. For crude rates the formula which follows can be used. *Note: where sex-age standardized rates are used a more detailed calculation would be required.*

$$\sqrt{\frac{p(1-p)}{n}}$$

Where:

p is the proportion (estimate of probability) for the region
n is the number of births.

Health #	Region	Low Weight	Birth	Total Births	Proportion LBW	Calculation	Standard Error
1		331		5,874	0.056	$\sqrt{\frac{0.056(1-0.056)}{5,874}}$	0.0030
2		213		3,677	0.058	$\sqrt{\frac{0.058(1-0.058)}{3,677}}$	0.0038
.	
.	
9		175		3,602	0.049	$\sqrt{\frac{0.049(1-0.049)}{3,602}}$	0.0036

4. Calculate the regional-specific standard scores.

Subtract the regional proportion from the provincial proportion and divide these by the standard error derived for each region in step 3. Repeat for each region.

$$\text{Score} = \frac{\text{regional proportion} - \text{provincial proportion}}{\text{regional standard error}}$$

5. Graph the regional-specific standard scores calculated in Step 4.

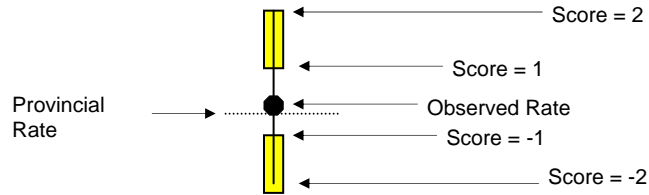
The following colour scheme is used to differentiate the rates that may differ from the provincial average.

Score	Interpretation	Colour
≥ 2	Higher than provincial average (significant difference in a conventional statistical test ($p < 0.05$))	Red
≥ 1 and < 2	probably higher than provincial average ($p > 0.5$ but < 0.95 that difference is not due to random variation)	Orange
< 1 and > -1	Not likely to differ from provincial average ($p < 0.5$ that difference is not due to random variation)	Yellow
≤ -1 and > -2	Probably lower than provincial average ($p > 0.5$ but < 0.95 that difference is not due to random variation)	Light green
≤ -2	Lower than provincial average (significant difference in a conventional statistical test ($p < 0.05$))	Dark green

The figure below illustrates how to interpret the graphic for an individual region. The yellow bars are used to show

that the provincial rate crosses between the 1 and -1 score range. The table above lists other colour possibilities by score category.

The black dot represents the value of the rate for each region. The colour of the bars above and below the dot represents the score of the region. The portion of the bar closest to the black dot represents the value for a standard score of 1 or -1, while the part of the bars farthest from the dot represent the value for a score of 2 or -2.



6. Generate maps using the same categories for each region as listed in Step 5.

The graph and map are placed in the same page. The map allows the reader to obtain a quick overview while more detailed information is presented on the graph. The colour assigned to each region is based on the colour of the bars in the graph for the same region. This provides a spatial context to the distribution patterns and consistency among the two graphic elements.

7. Generate a cartogram.

A cartogram is similar to a map. However, each region is represented by a circle that is sized proportionately to the regional population. This graphic is useful for interpreting reported rates by providing an indication of the population size of each region. Each RHA in the cartogram is coloured the same as it is on the provincial map.

Map/graph/cartogram colour legend:



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6.4.1 Populations

Women 15 - 49 by Residence RHA, Alberta, 1995 to 2005

Residence RHA	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Chinook	36,153	36,337	36,526	36,667	37,116	37,409	37,453	37,469	37,538	37,637	37,620
Palliser	21,889	22,282	22,598	23,112	23,687	24,010	24,533	24,896	24,841	25,011	25,177
Calgary	257,762	262,672	270,007	280,183	289,318	294,761	301,784	309,686	314,359	318,119	322,633
David Thompson	64,942	65,549	66,295	68,165	69,694	70,704	71,763	72,962	73,520	74,125	74,553
East Central	25,153	25,250	25,328	25,663	25,721	25,838	26,088	26,345	26,308	26,207	26,172
Capital	243,000	242,239	243,425	246,101	250,900	253,364	256,989	261,592	264,438	265,829	267,430
Aspen	42,789	42,868	43,303	44,003	44,416	44,399	44,765	45,130	44,774	44,538	44,291
Peace Country	31,082	31,753	32,202	32,977	33,660	33,874	34,118	34,583	34,705	35,038	35,364
Northern Lights	15,476	15,632	16,424	17,081	17,419	17,784	18,304	19,263	20,028	20,611	21,073
Unknown	39	24	39	107	50	39	116	38	49	59	36
Total Women 15-49	738,285	744,606	756,147	774,059	791,981	802,182	815,913	831,964	840,560	847,174	854,349
Alberta Population	2,713,375	2,741,189	2,791,334	2,854,621	2,923,449	2,967,755	3,022,891	3,086,646	3,134,337	3,179,036	3,222,191

Source: Alberta Health Care Insurance Plan Registration File, Alberta Health and Wellness as of March 2006

Notes: Data may differ from previously published data due to differences in definitions and dates of data extraction.

Women 10 - 49 by Age Group, Alberta, 1995 to 2005

Age group	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
10-14	102,724	104,617	106,030	107,146	108,776	110,073	110,821	111,927	112,452	111,565	110,360
15-17	56,240	58,103	60,090	62,489	64,531	65,499	66,621	67,490	67,455	68,065	69,187
18-19	37,088	37,383	38,136	39,617	40,965	42,723	44,386	45,513	45,940	46,249	46,372
15-19	93,328	95,486	98,226	102,106	105,496	108,222	111,007	113,003	113,395	114,314	115,559
20-24	93,701	92,886	95,077	98,376	102,104	103,552	106,634	110,520	113,900	116,575	118,397
25-29	102,546	101,308	101,729	104,141	105,731	105,981	106,813	109,731	111,509	113,764	116,210
30-34	125,921	121,346	117,541	114,614	112,685	110,996	112,047	113,471	114,564	114,582	115,321
35-39	126,934	128,478	130,859	132,964	133,934	132,554	129,575	126,332	122,284	119,152	117,930
40-44	107,201	112,471	117,949	123,113	127,749	131,234	133,936	137,029	138,222	138,573	137,349
45-49	88,654	92,631	94,766	98,745	104,282	109,643	115,901	121,878	126,686	130,214	133,583
Women aged 15 - 49	738,285	744,606	756,147	774,059	791,981	802,182	815,913	831,964	840,560	847,174	854,349
Women aged 10 - 49	841,009	849,223	862,177	881,205	900,757	912,255	926,734	943,891	953,012	958,739	964,709
Alberta Population	2,713,375	2,741,189	2,791,334	2,854,621	2,923,449	2,967,755	3,022,891	3,086,646	3,134,337	3,179,036	3,222,191

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