

Infant Health— The First Year of Life



Introduction

Health in the first year of life is a vital precursor to health in later childhood and adulthood. This chapter includes information on several aspects of infant health, including birth weight, stillbirths, congenital anomalies, infant and perinatal deaths, and breastfeeding practices. Peel data are compared with Ontario data in each instance.

Injury-related mortality and hospitalizations during the first year of life are addressed in the injuries section of the chapter titled *Early Childhood Health* (see page 41).

Low Birth Weight

Birth weight is an important predictor of maternal and infant health. Infants born with low birth weight (weight less than 2,500 grams or five pounds, eight ounces) tend to have an increased risk of dying and experience more developmental and physical health problems compared to babies born with normal birth weight.^{16,17} This finding is even more dramatic among pre-term low birth weight children.¹⁶

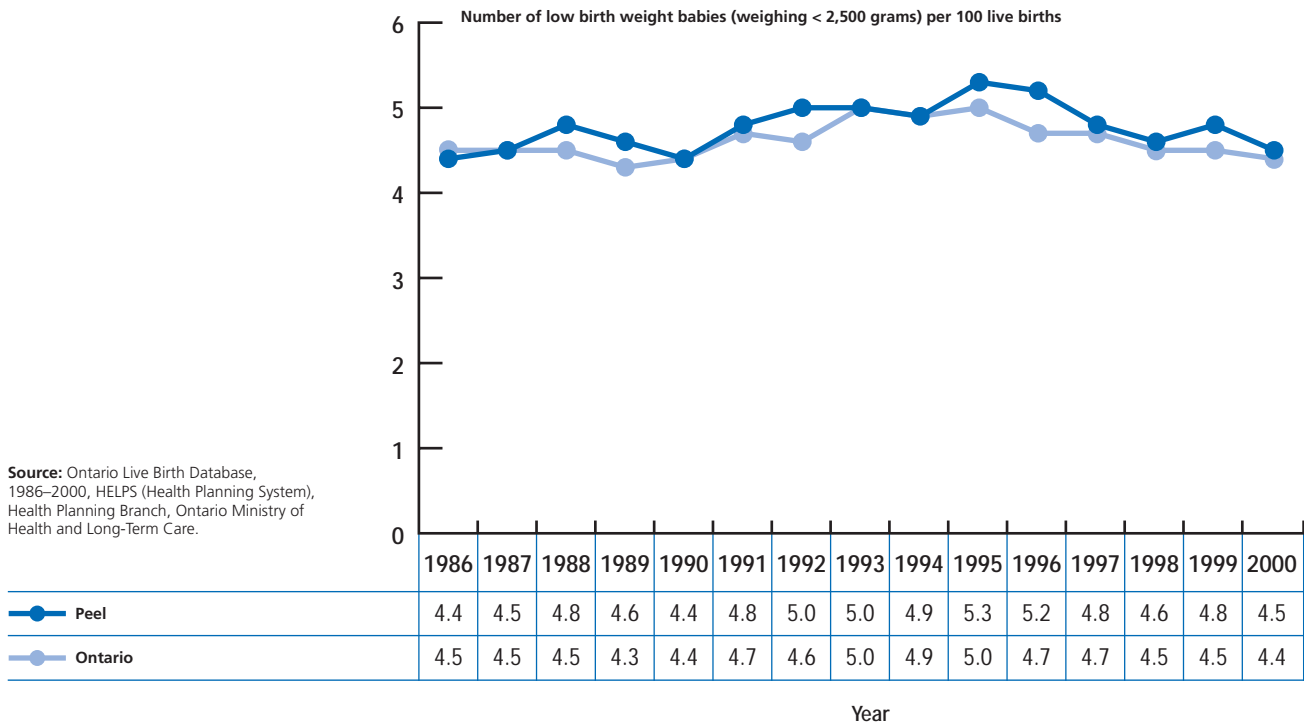
Maternal factors that may contribute to the risk of low birth weight babies include: having a lower socio-economic status,^{18,19} being of non-European origin,²⁰ being a teenage mother and being single or in a common-law relationship.^{19,21} Behaviours such as smoking and alcohol use during pregnancy have also been found to result in lower birth weight babies.²²

Results of several Canadian studies have shown that the increasing proportion of low birth weight babies is a function of an increase in the proportion of pre-term births.^{23,24,25} In these studies, potential reasons for the increases seen in low birth weight and pre-term births were given. These included: increased registration of extremely early births (20 to 27 weeks); increased use of ultra-sound-based estimates of gestational age;²⁵ increased obstetrical intervention;²⁴ increased multiple birth rates;²⁴ and increased use of reproductive technologies such as in-vitro fertilization and hormone induction of pregnancy.²⁶ These increases in low birth weight and pre-term births could also be explained by decreased availability of obstetrical care providers, the effects of negative economic changes, or lack of access to comprehensive prenatal programs.²³

Currently in Ontario, problems with recording the duration of pregnancies have been identified²⁷ and until such time as they are resolved, analyses of gestational age cannot be conducted. Babies born in multiple births (twins, triplets, etc.) have lower birth weights than singleton[†] births. In Peel, the number of multiple births varies from year to year, influencing rates of low birth weight. For this reason, low birth weight rates in this report are reported separately for singleton and total births.

As shown in Figure 4.1, low birth weight rates* among singleton births increased gradually between 1986 and 1995 in both Peel and Ontario after which a gradual decline was observed. Peel's singleton low birth weight rates were either the same or slightly higher than rates in Ontario. This finding was similar for total births (data not shown).

Figure 4.1: Singleton Low Birth Weight Rates, Region of Peel and Ontario, 1986–2000



Source: Ontario Live Birth Database, 1986–2000, HELPS (Health Planning System), Health Planning Branch, Ontario Ministry of Health and Long-Term Care.

An examination of low birth weight births by the kind of birth in Peel (single, twin, triplet, etc.) between 1986 and 2000 revealed that less than 5% of single births were born with a weight of less than 2,500 grams. About half of all twins were born with a weight of less than 2,500 grams. Approximately 90% of all triplets and 100% of all quadruplets were born with a weight less than 2,500 grams.

[†] A singleton is a baby that is not a twin or other multiple birth.

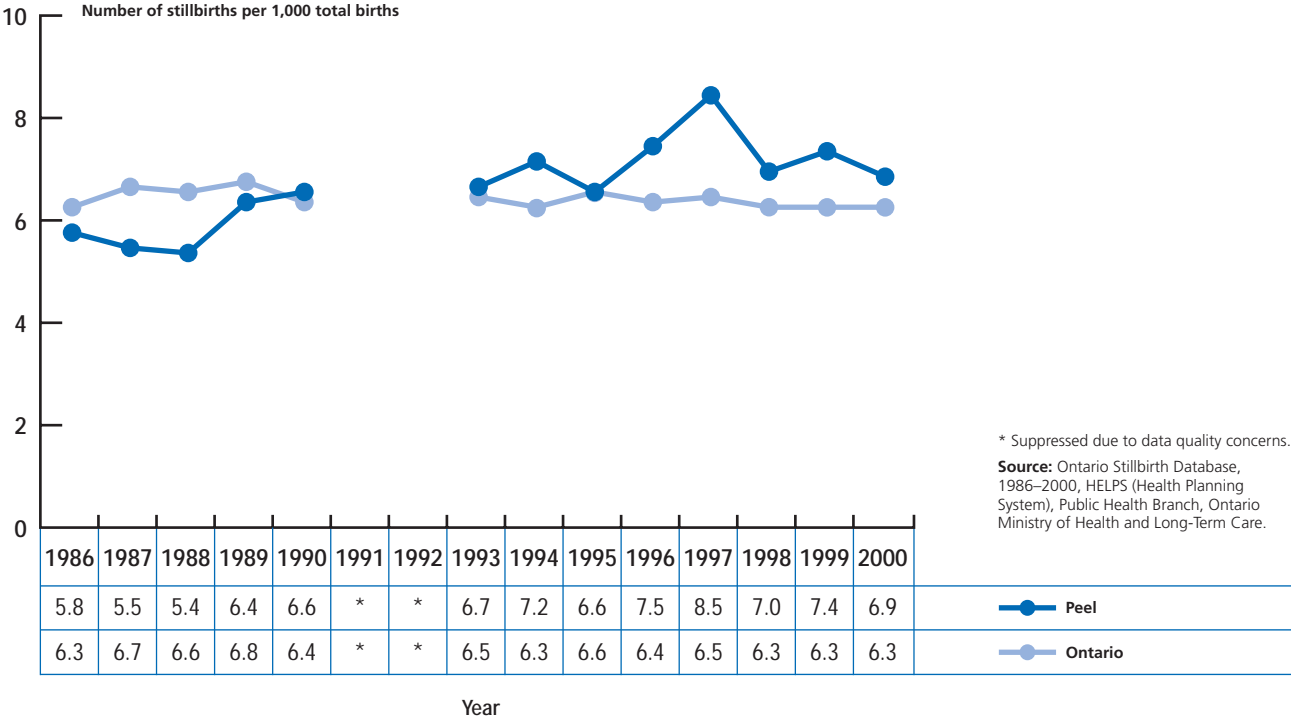
* The low birth weight rate is defined as the number of live births weighing less than 2,500 grams per 100 live births.

In Peel during 2000, most low birth weight infants were born to mothers aged 25 to 34 years; however, the highest rates of low birth weight were to mothers aged 15 to 19 years and 40 years and older, who had fewer births overall. This was true for both total live births and singleton live births.

Stillbirths

With the exception of 1991 and 1992 data, which were excluded from this analysis due to data quality concerns, stillbirth rates[†] in the Region of Peel gradually increased between 1986 and 1997 after which a decline was observed (see Figure 4.2).

Figure 4.2: Stillbirths, Region of Peel and Ontario, 1986–2000



Although Peel’s rate of stillbirths declined from a 15-year high of 8.5 per 1,000 total births in 1997 to 6.9 per 1,000 total births in 2000, these rates are expected to fluctuate more than rates in Ontario due to smaller numbers. In Ontario, stillbirth rates remained relatively stable over the 15-year period with 6.3 stillbirths per 1,000 total births per year in 2000.

[†] Stillbirth rates are defined as the number of stillbirths per 1,000 total births (stillbirths plus live births).

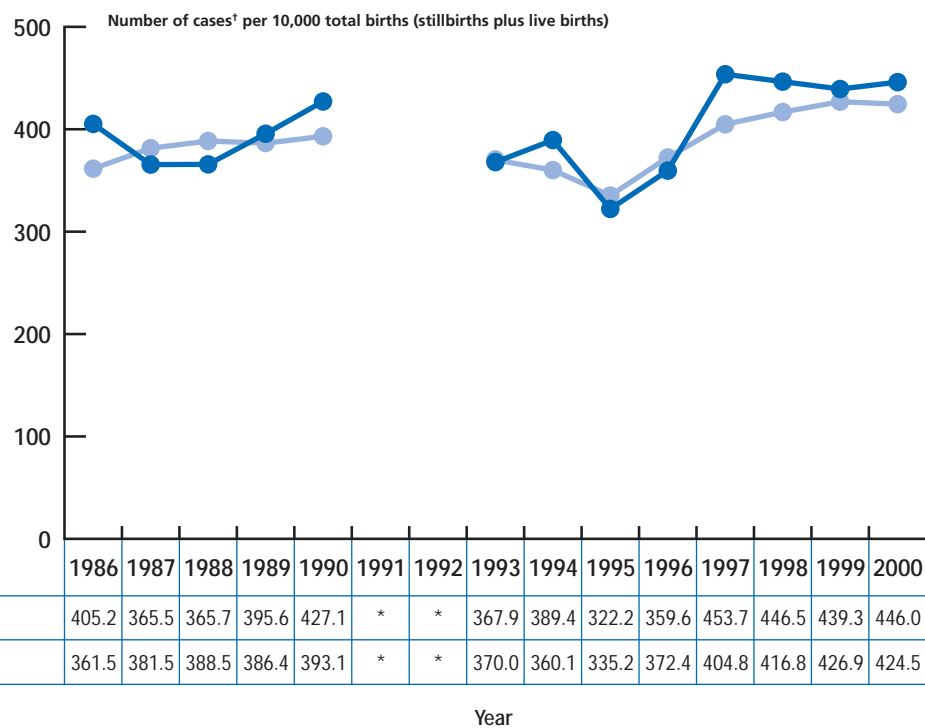
Congenital Anomalies

Congenital Anomalies

Data about congenital anomalies were collected from the Canadian Congenital Anomalies Surveillance System (CCASS). The CCASS obtains information on congenital anomalies detected at birth and up to one year of age from hospital records and through other provincial systems.^{28, 29} Limitations of the system include: lack of reporting from some hospitals; lack of outpatient data; exclusion of data on affected infants admitted to hospital for other reasons; and exclusion of fetuses with anomalies that result in termination of the pregnancy.^{28, 29}

Rates of congenital anomalies in Peel tended to be slightly higher than rates for the province between 1997 and 2000 (see Figure 4.3). Congenital anomaly rates in Peel increased from 1995 through 1997 after which rates remained relatively stable. Ontario rates generally increased from 1995 through 1999.

Figure 4.3: Congenital Anomalies, Region of Peel and Ontario, 1986–2000



* Suppressed due to quality concerns regarding stillbirth data.
 † Cases might include more than one defect.
Sources: Canadian Congenital Anomaly Surveillance System (CCASS), 1986–2000, Health Canada.
 Ontario Live Birth and Stillbirth Databases 1986–2000, HELPS (Health Planning System), Public Health Branch, Ontario Ministry of Health and Long-Term Care.

Neural Tube Defects

Neural tube defects (NTD) are birth defects associated with malformation of the embryonic spinal cord and certain parts of the brain and are among the most common and serious of all congenital anomalies.^{29,30} These defects include anencephalus, spina bifida and encephalocele. Spina bifida results when the lower portion of the neural tube fails to close properly, and may

lead to paralysis and hydrocephalus.²⁹ Anencephaly is a condition in which most of the infant’s brain is missing because it doesn’t develop. Encephalocele is a condition in which brain tissue bulges through a defect in the skull.³¹

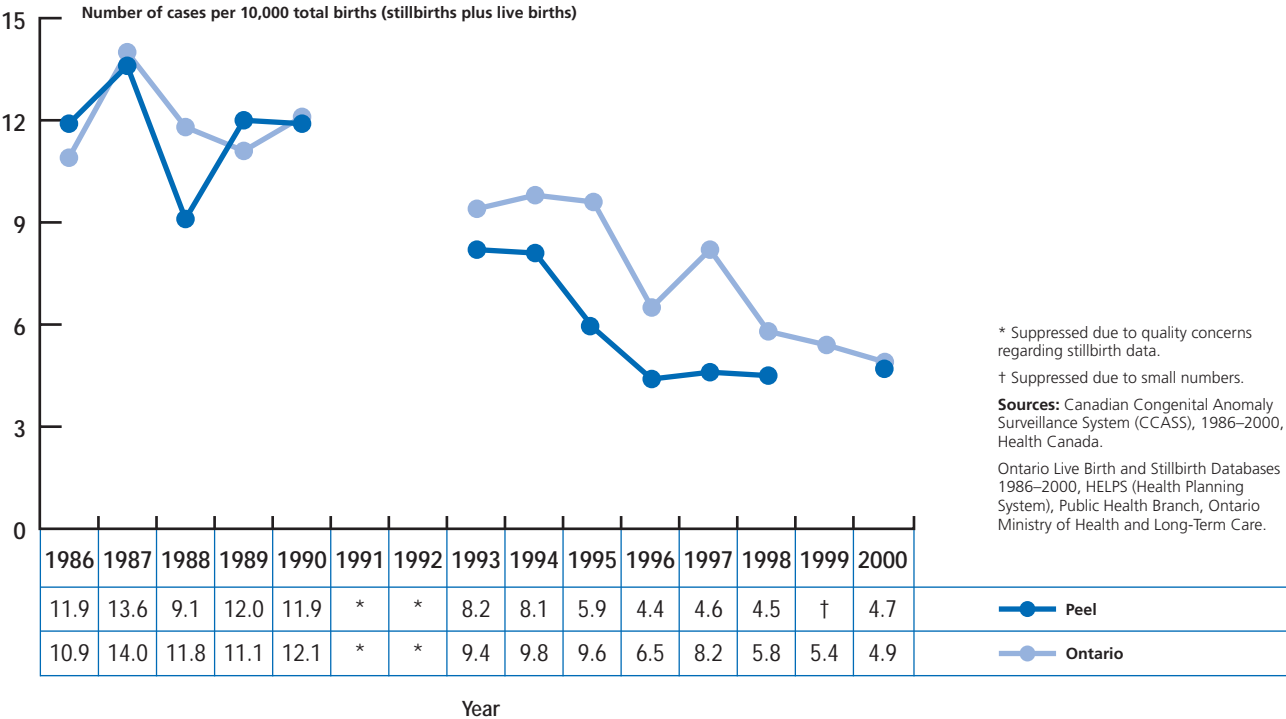
Approximately 260 babies are born each year in Canada with a NTD.³² Unfortunately, there are no data on the number of pregnancies terminated after a screening test detected a NTD or after the fetus spontaneously aborted as a result of a NTD.²⁹

Closure of the neural tube is complete approximately 25 to 27 days after conception, when many women do not even know they are pregnant.²⁹ Current recommendations therefore suggest that all women of child-bearing age consume a minimum of 0.4 mg of folic acid per day, from diet and vitamin supplements, to reduce the risk of having a baby with a NTD.³³

In Canada, an analysis of birth defects found that in 1999, the birth prevalence of NTDs was 5.8 per 10,000 total births. The 1999 rate for Canada (excluding Nova Scotia) was 5.6 per 10,000 total births, a significant decline from the rate of 11.1 per 10,000 reported in 1989.²⁹

As shown in Figure 4.4, rates of neural tube defects in both Peel and Ontario decreased between 1986 and 2000; however the rate for Peel remained relatively stable between 1996 and 2000.

Figure 4.4: Neural Tube Defects, Region of Peel and Ontario, 1986–2000



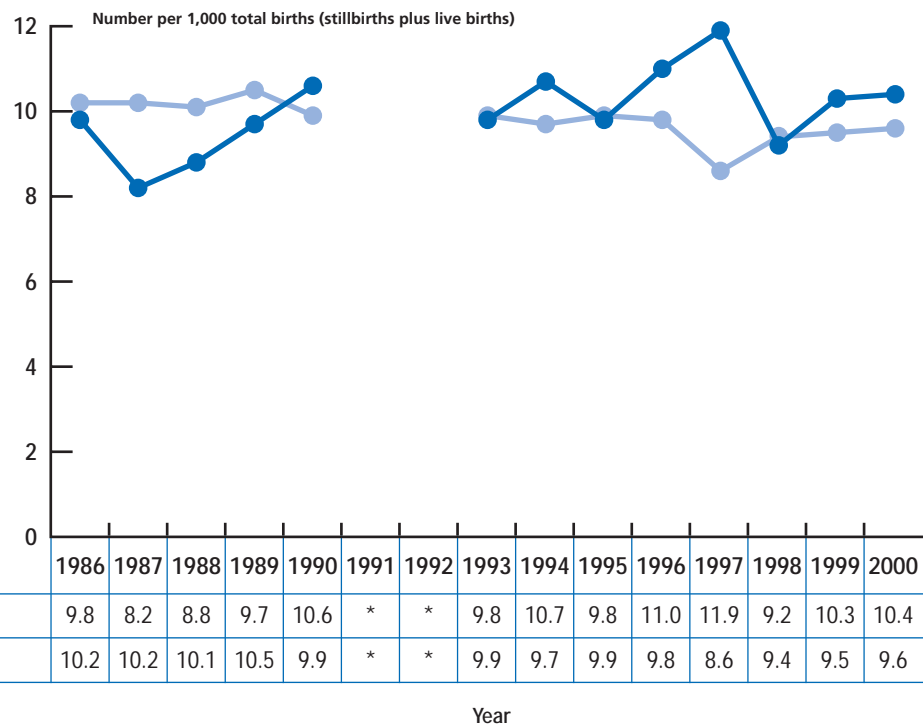
Perinatal and Infant Mortality

Perinatal Mortality

The perinatal period is defined as the time period between 20 weeks gestation or 500 grams in weight, and seven days after delivery. Rates of perinatal mortality include stillbirths and infant deaths up to seven days of age, expressed per 1,000 total births (live births plus stillbirths).

Between 1986 and 1989, Peel's perinatal mortality rates were below those of the province. Peel's rate started to rise in 1988. This upward trend continued, with slight fluctuations, right up to 1997 when the rate for Peel reached a 15-year high of 11.9 deaths per 1,000 total births, over the same period. In 1998, Peel's rate decreased to 9.2 deaths per 1,000 total births and 10.4 deaths per 1,000 total births by 2000 (see Figure 4.5).

Figure 4.5: Perinatal Mortality, Region of Peel and Ontario, 1986–2000



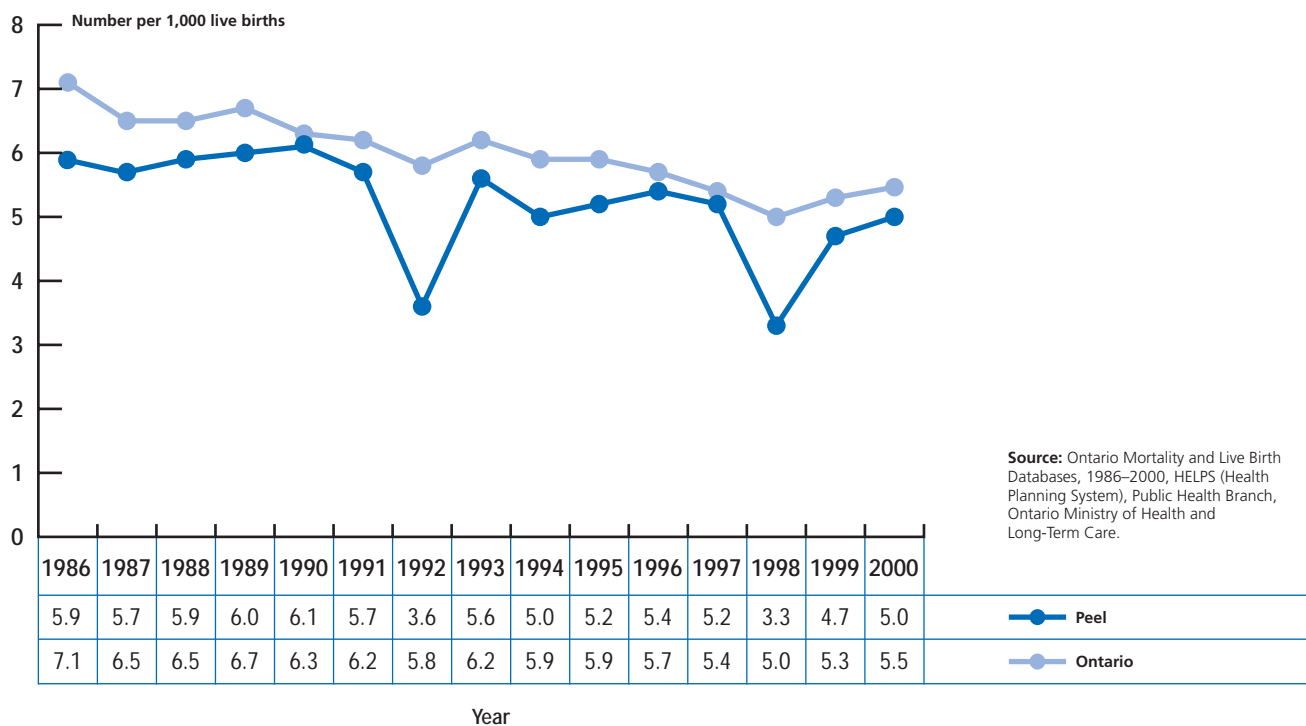
* Suppressed due to quality concerns regarding stillbirth data.

Source: Ontario Mortality Database, Ontario Live Birth Database and Stillbirth Databases, 1986–2000, HELPS (Health Planning System), Public Health Branch, Ontario Ministry of Health and Long-Term Care.

Infant Mortality

Infant mortality includes all deaths that occur to live-born infants and children under one year of age, and is expressed per 1,000 live births. Infant mortality rates gradually decreased in Ontario over the 13-year period between 1986 and 1998, from 7.1 to 5 deaths per 1,000 live births, after which it increased slightly to 5.5 deaths per 1,000 in 2000. In Peel, rates started at a lower point in 1986, at 5.9 deaths per 1,000 live births, and declined to their lowest point in 1998 (3.3 deaths per 1,000 live births). Rates have increased to 5 deaths per 1,000 live births in 2000 (see Figure 4.6).

Figure 4.6: Infant Mortality, Region of Peel and Ontario, 1986–2000



In Canada in 2001, the infant mortality rate was 5.2 deaths per 1,000 live births.³⁴ While the decline in these rates over time has been substantial, international experience indicates there is still room for improvement. For example, Japan, Finland and Sweden have rates as low as 3.8, 4 and 4 deaths per 1,000 live births respectively, although these rates might not be directly comparable due to differences in definitions.¹⁷

The decline in infant mortality and increase in perinatal mortality might be linked to the increased registration of very premature infants. Extremely premature infants—births that previously may have been registered as spontaneous abortions, if at all, are now surviving and being registered as births due to advances in obstetric and neonatal care.³⁵

Selected causes of infant death are shown in Table 4.1. Peel data for the years 1989 to 1999 were combined to provide adequate numbers for analysis. The most frequent cause of infant death in both Peel and Ontario was related to conditions occurring in the perinatal period. These included maternal conditions that affect the fetus, complications of pregnancy and birth, and conditions related to birth trauma, birth weight, length of gestation and infection.

Table 4.1: Selected Causes of Death in Infants (Children Less than 1 Year), Region of Peel and Ontario, 1989–1999 Combined

Cause of Death	Peel			Ontario		
	Number	Per Cent	Rate*	Number	Per Cent	Rate*
Perinatal conditions	371	51.4	259.1	4,174	45.0	263.0
Congenital anomalies	204	28.3	142.5	2,724	29.4	171.7
Ill-defined conditions	78	10.8	54.5	1,282	13.8	80.8
Nervous system and sense organ disorders	17	2.5	11.9	194	2.1	12.2
Injuries and poisonings	16	2.2	11.2	206	2.2	13.0
Respiratory diseases	7	1.0	4.9	162	1.7	10.2
Infectious diseases	6	0.8	4.2	121	1.3	7.6
All others	23	3.2	16.1	408	4.5	25.7
Total	722	100.0	504.3	9,271	100.0	584.3

* Average Annual Rate per 100,000.

Sources: Ontario Mortality Database, 1989 to 1999, HELPS (Health Planning System), Public Health Branch, Ontario Ministry of Health and Long-Term Care.

Population Estimates 1989–1999, Provincial Health Planning Database (PHPDB), Release date: July 2003, Health Planning Branch, Ontario Ministry of Health and Long-Term Care.

In Peel, slightly more than half (51%) of all infant deaths were caused by perinatal conditions, while another 28% were caused by birth defects. Similar proportions were found for Ontario. The next largest category of cause of death among infants was ill-defined conditions, which includes Sudden Infant Death Syndrome (SIDS). This ill-defined conditions category accounted for 11% and 14% of infant deaths in Peel and Ontario, respectively.

As with infant mortality rates, Peel's average annual rates of infant death by selected causes were generally lower than the corresponding rates in Ontario.

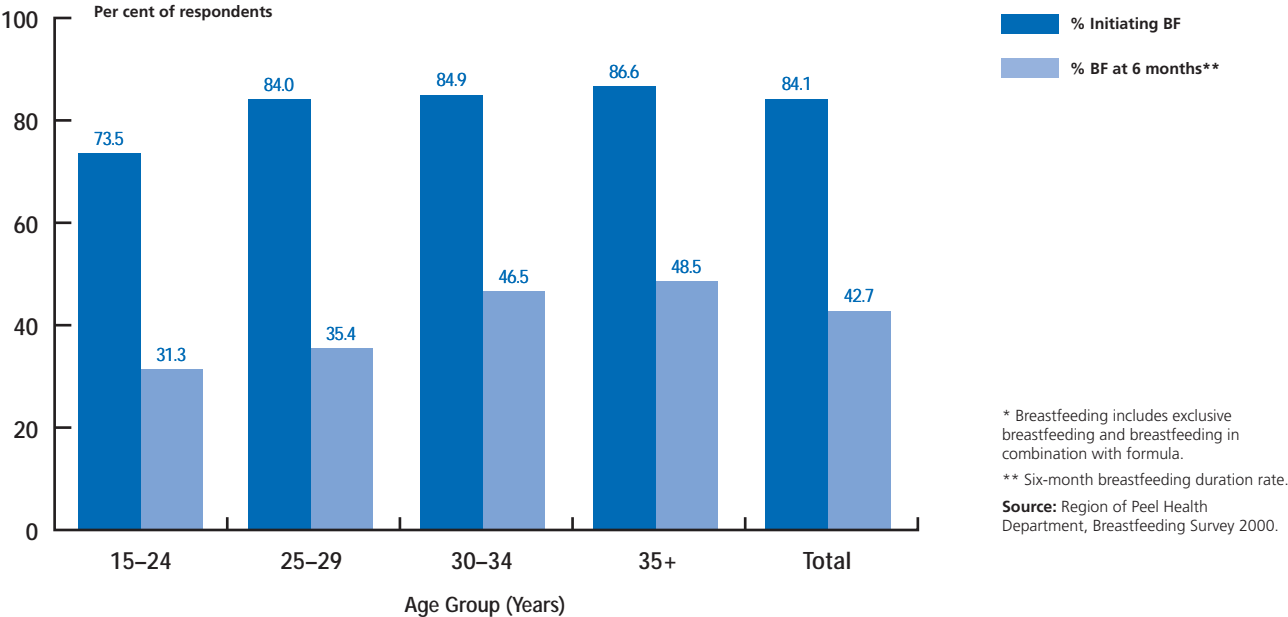
Breastfeeding Practices

Breastfeeding infants during the first six months of life is widely recognized to be the optimal method of feeding and provides benefits to both the mother and infant.³⁶ Breastfeeding reduces maternal anxiety, develops maternal self-esteem, promotes contraction of the uterus, improves bone remineralization and possibly reduces the risk of ovarian cancer.³⁷ It also benefits the mother by helping her to lose weight and return to her pre-pregnancy weight more quickly.³⁸ Benefits to the infant include protection against gastrointestinal and respiratory infections, middle ear infections and the possible enhancement of cognitive function.³⁹

In 2000, the Region of Peel Health Department completed a telephone survey with 541 Peel mothers who had a live-born infant in April, May or June of 1999. The primary purpose of the study was to determine the breastfeeding initiation and duration rates in Peel. Other factors, such as awareness of breastfeeding and other infant feeding supports and services in the community and reasons for cessation, were also examined. Details about the study methodology have been previously published.³⁶

Eighty-four per cent of mothers who participated in the survey initially fed their babies breast milk at birth. Of these mothers, 79.5% breastfed exclusively and 4.6% fed their babies a combination of breast milk and formula. The six month breastfeeding duration rate from this study was 42.7% (using all women in the study as the denominator). Breastfeeding initiation rates and duration rates varied by the age of the mother as shown in Figure 4.7.

Figure 4.7: Proportion of Mothers Initiating Breastfeeding* and Breastfeeding to Six Months by Maternal Age Group, Region of Peel, 2000



The most common reasons for discontinuation of breastfeeding were concerns that the baby was not getting enough to eat and concerns about the breast milk supply (41%). Just over one-third (35%) of women discontinued because they returned to work and an additional 15% mentioned social reasons.

According to the 2002 Rapid Risk Factor Surveillance System Survey (RRFSS)*, an estimated 86.2% of women aged 18 to 49 years who had a baby in the past

* The Rapid Risk Factor Surveillance System (RRFSS) is an on-going telephone survey occurring in various public health units across Ontario. On a monthly basis, a random sample of 100 adults aged 18 years and older is interviewed regarding risk behaviours, knowledge, attitudes and awareness about health related topics of importance to public health. The survey content varies from year to year.

five years, initiated breastfeeding or tried to breastfeed their child even if only for a short time. An estimated 58% of those who were no longer breastfeeding indicated that they had breastfed for six months or more. Although the sample of mothers who recently gave birth was much smaller than that for the 2000 survey, the results are comparable in terms of breastfeeding initiation rates.

In 2004/2005, Peel Health will be conducting another study which will examine breastfeeding duration rates at six and twelve months post-partum.

Attitudes towards Breastfeeding in Public

There are a number of factors that influence duration of breastfeeding such as supportive practices and written breastfeeding policies at health care institutions, as well as additional education and support for parents by health professionals and educators. Supportive environments for breastfeeding in the community and workplace are also an important measure aimed at improving breastfeeding duration.⁴⁰

In 2003, 56% of Peel residents thought that it was acceptable for a mother to breastfeed her baby while in a restaurant or shopping mall. Attitudes towards breastfeeding in these public settings varied by sex and age group. A larger proportion of males than females felt that breastfeeding was acceptable in restaurants or shopping malls (see Figure 4.8). Respondents aged 25 to 44 years were more likely to feel that breastfeeding in both settings is acceptable than were other age groups (see Figure 4.9 on following page).

Figure 4.8: Per Cent of Respondents who Feel that Breastfeeding in Public is Acceptable, by Sex, Region of Peel, 2003

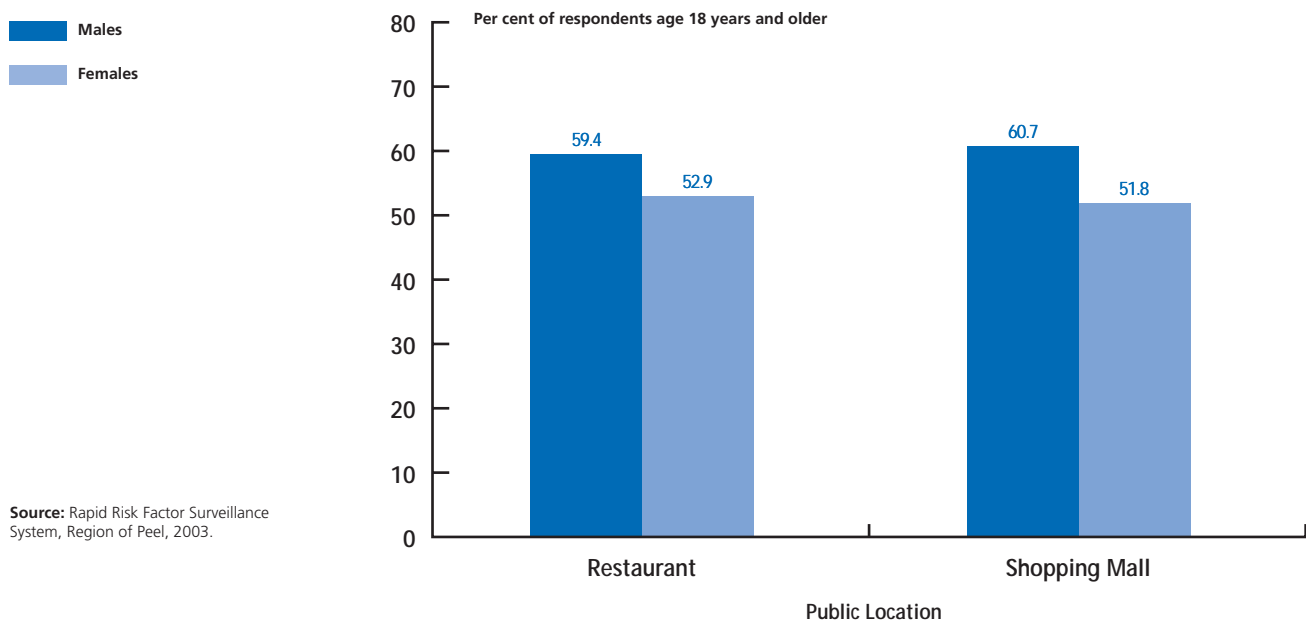
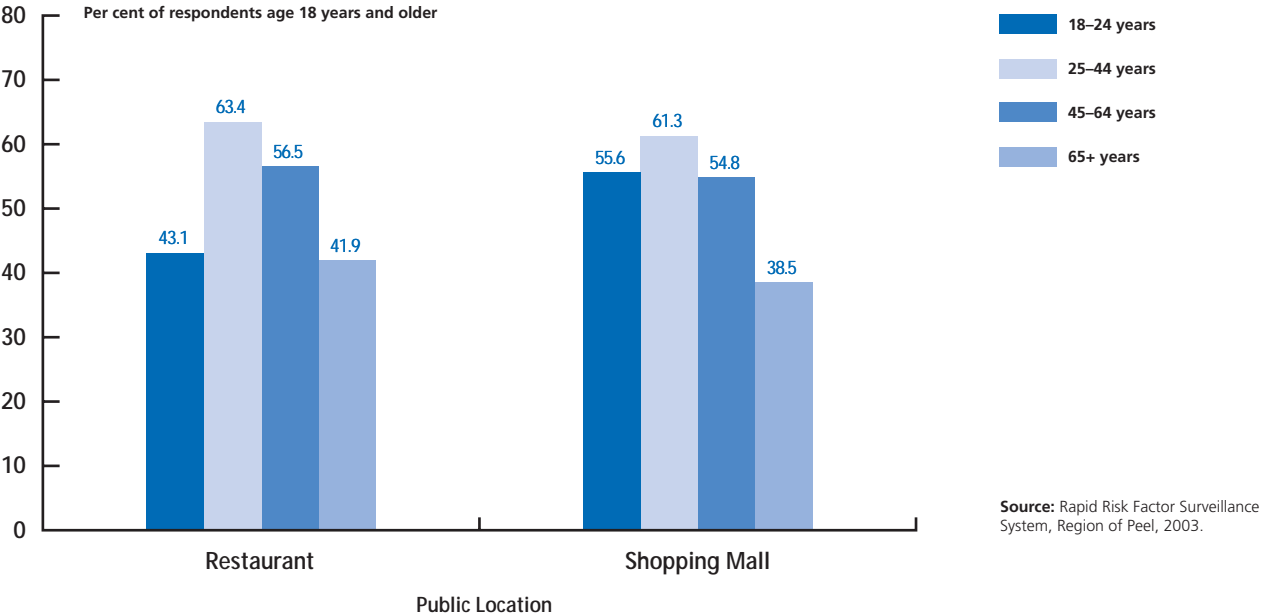


Figure 4.9: Per Cent of Respondents who Feel that Breastfeeding in Public is Acceptable, by Age Group, Region of Peel, 2003



Summary

Low Birth Weight

Rising rates of low birth weight that were seen in Peel and Ontario throughout the late 1980's and early 1990's began to decline after 1995 to 4.5 per 1,000 live births in Peel and 4.4 in Ontario by 2000. In Peel, the highest rates of singleton low birth weight were seen in mothers aged 15 to 19 years and 40 years and older.

Stillbirths

Stillbirth rates in Peel increased gradually between 1986 and 1987, after which they declined to a rate of 6.9 stillbirths per 1,000 total births in 2000. In Ontario, stillbirth rates remained relatively stable over the 15-year period with 6.3 stillbirths per 1,000 total births per year in 2000.

Congenital Anomalies

Rates of congenital anomalies in Peel tended to be slightly higher than rates for the province between 1997 and 2000. Congenital anomaly rates in Peel increased from 1995 through 1997, after which rates remained relatively stable. Ontario rates generally increased from 1995 through 1999. In contrast, rates of neural tube defects in both Peel and Ontario decreased between 1986 and 1996. However, the rate for Ontario increased in 1997 and 1998, after which it fluctuated in 1999 and 2000.

Perinatal and Infant Mortality

After reaching a high of 11.9 deaths per 1,000 total births in 1997, the perinatal mortality rate began to stabilize at 10.4 deaths per 1,000 total births in 2000. Rates in Peel over the last few years (1994 to 2000) have generally been higher than in Ontario. In contrast, infant mortality has declined in Ontario, although a slight increase occurred between 1998 and 2000. This trend has been similar, but less dramatic, in Peel. By 2000, infant mortality rates in Peel were 5 per 1,000 live births compared to 5.7 per 1,000 live births in Ontario. In Peel, approximately half (51%) of infant deaths were due to perinatal conditions, 28% to congenital anomalies and an additional 11% to ill-defined conditions such as Sudden Infant Death Syndrome.

Breastfeeding Practices

Breastfeeding initiation rates of 84% were calculated using data from a Region of Peel survey conducted in 2000. The six-month duration rate from the same study was 43%.

Both breastfeeding initiation and duration varied by the age of the mother. Breastfeeding initiation rates increased with each increasing age group, as did the six-month duration rates.

The most common reasons for discontinuation of breastfeeding were concerns that the baby was not getting enough to eat and concerns about the breast milk supply (41%). Just over one-third (35%) of women discontinued because they returned to work and an additional 15% mentioned social reasons.

There are a number of factors that influence duration of breastfeeding; among these are supportive environments for breastfeeding in the community.⁴⁰ In 2003, 56% of Peel residents thought that it was acceptable for a mother to breastfeed her baby while in a restaurant or shopping mall. Attitudes towards breastfeeding in these public settings varied by sex and age group.