Report on

Maternal and Infant Health

Peterborough County-City Health Unit

2014

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INTRODUCTION

Healthy children are the foundation of healthy and prosperous communities. Despite good maternal and child health overall, there are women and children who do not share these good outcomes and who face health risks and considerable challenges.

Reproductive health begins before a baby is conceived and is dependent on the health of both parents prior to pregnancy. Research in the area of male health and reproduction is limited, although there is increasing evidence to suggest that a father's behaviour and health status before and during conception does play a role. The goal is good reproductive health for all, and although men can help in different ways to make this a reality, the focus of this report is on women's reproductive health.

The Ontario Public Health Standards (2008) establish requirements for public health programs and services. The goals of Reproductive Health are to "enable individuals and families to achieve optimal preconception health; experience a healthy pregnancy; have the healthiest newborn(s) possible; and be prepared for parenthood" (Ontario Ministry of Health and Long-Term Care, 2008). Health units are also required to conduct epidemiological analysis of surveillance data, including monitoring of trends and priority populations, in the areas of preconception health, healthy pregnancies, reproductive outcomes, and preparation for parenting.

Peterborough County-City Health Unit (PCCHU) recognizes that the responsibility for maternal and newborn health is shared among various agencies and organizations within the community. This report highlights PCCHU's role in reproductive health, provides a snapshot of trends related to the health of newborns in Peterborough County and City, and presents comparisons to Ontario and the rest of Canada where possible. We hope to provide snapshots of where we have been, where we are at present, and where we would like to be in the future.

METHODS

Data Sources

Data for this report was obtained from a variety of sources:

The data related to population size and population change were obtained from the 2006 and 2011 Census, administered by Statistics Canada. The census is conducted every five years in Canada and collects information on demographic, social, and economic characteristics. Censuses are considered free of sampling error as it involved the entire Canadian population.

Population estimates used to calculate rates during non-census years were obtained from Statistics Canada via the IntelliHEALTH database. Data are derived from the census and administrative sources on births, deaths, and migration. Post-censal estimates are based on the latest census results adjusted for net census under coverage and for the estimated population growth that occurred since that census.

Birth data originate from Vital Statistics of the Office of Registrar General (ORG). These data are distributed by the Ontario Ministry of Health and Long-Term Care's (MOHLTC) IntelliHEALTH ONTARIO (IntelliHEALTH) system. All live births in Ontario must be registered at the ORG. Available information includes birth weight category, parity, multiple births, and some demographic information. Prior to 2008, county, municipality, and public health unit geographic locations in IntelliHEALTH for place of occurrence and place of residence of mother were derived from a municipality code supplied by ORG to Statistics Canada. From 2008 onward, the place of occurrence municipality coding was discontinued by Statistics Canada and only postal code for residence was maintained. Statistics Canada now derives the municipality of residence from the postal code using the Postal Code Conversion File Plus (PCCF+) programs where there is a valid postal code. If no valid postal code is available, manual coding of residence municipality is done from any available address information on the record. Statistics Canada still uses special codes to indicate Indian Reserves within a county when a specific reserve is not identified on the registration.

Mortality/death data are also made available by the ORG and are retrieved using the MOHLTC IntelliHEALTH database. Data were extracted using International Classification of Diseases (ICD) codes for the primary cause of death.

The Canadian Institute for Health Information's (CIHI) Discharge Abstract Database (DAD) contains hospital inpatient records and it also distributed by the IntelliHEALTH system. DAD records are queried to obtain hospital birth counts which allows for the calculation of small and large for gestational age. Hospitalization data do not include home births and other non-hospital births, which together may account for approximately 2% of total births.

The majority of health behaviour data was obtained from the 2009-2010 cycle of the Canadian Community Health Survey (CCHS) conducted by Statistics Canada. The CCHS collects health determinants, health status and health system utilization data from people aged 12 years or older living in households across Canada. Data collected from the CCHS include: fruit and vegetable consumption; body mass index; folic acid prior to pregnancy; physical activity levels; smoking status; smoking during pregnancy; exposure to second-hand smoke; illicit substance use; alcohol use; and some breastfeeding data.

The Better Outcomes Registry Network (BORN) Ontario is a provincial program established in 2009 and integrates the data of five historical data systems into one accurate and timely maternal-child registry to form the authoritative information system. Data systems integrated into BORN include: Fetal Alert Network; Prenatal Screening Ontario; Niday Perinatal & NICU/SCN Database; Ontario Midwifery Program; and Newborn Screening Ontario. A historic aggregate data request was submitted to BORN in June 2012 to obtain data on smoking during pregnancy, intention to breastfeed, and small/large for gestational age for the years 2005 and 2010. Currently PCCHU does not have direct access to BORN data.

DEFINITIONS

95%CI: the 95% confidence interval is a range of values with a known probability (19 times out of 20) of include the true population estimate.

Body mass index (BMI): a metric to assess overweight and obesity status according to self-reported height and weight – one's mass in kilograms is divided by their height in meters squared; weight categories for persons 18 years of age are as follows: underweight (BMI <18.5), normal weight (BMI 18.5-24.9), overweight (BMI 25.0-29.9), or obese (BMI ≥ 30.0).

Crude birth rate: the total number of live births per 1,000 population.

Exclusive breastfeeding: no food or liquid other than breast milk, not even water is given to the infant from birth by the mother, health care provider, or family member/supporter.

Food insecure: reporting being food insecure is an indication of compromise in quality and/or quantity of food consumed or an indication of reduced food intake and disrupted eating patterns. People who are food insecure are: worried about not having enough to eat; compromise the quality of food they eat; or do not have a variety of food choices.

Heavy drinking: consumption of five or more alcoholic drinks on at least one occasion per month in the past 12 months.

Infant mortality: includes all deaths that occur to live-born infants and children under one year of age; the rate is expressed per 1,000 live births.

Illicit drugs: includes marijuana, cannabis, hashish; cocaine, crack; speed (amphetamines), ecstasy (MDMA), hallucinogens, PCP, LSD; glue, gasoline or other solvents; heroin; steroids.

Large for gestational age (LGA): the birth weight of an infant that falls above the 90th percentile of appropriate for gestational age infants, specific to the length of gestation.

Live birth: the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life such as heartbeat, umbilical cord pulsation, or definite movement of voluntary muscles, whether the umbilical cord has been cut or the placenta is attached. A live birth is not necessarily a viable birth.

Low birth weight: babies less than 2,500 grams at birth or 5 pounds 8 ounces.

Low risk drinking guideline 1: to reduce long-term health risks, women are recommended to not consumer more than two standard drinks per day, and no more than 10 standard drinks per week.

Low risk drinking guideline 2: the maximum special occasion alcohol consumption to reduce short-term risks among women is three standard drinks in one day.

Macrosomia: is a condition in which a baby is abnormally large before birth.

Multiple live birth rate: is the total number of multiple live births as a proportion of all live births.

Neural tube defects (NTDs): are congenital malformations of the central nervous system that are among the most common and serious of all congenital anomalies and result from the failure of the neural tube to close during early development at approximately 25 to 27 days following conception.

Peterborough: refers to the City of Peterborough and Peterborough County combined – the catchment area of the Peterborough County-City Health Unit (PCCHU); note that PCCHU is often used in the report.

Preterm birth: a live birth that occurs at less than 37 completed weeks (i.e., <259 days) of gestation.

Rate: the number of events (e.g., births) divided by the number of people in a given time frame; often this number is small and is therefore expressed per 1,000s population.

Regular drinker: consumed at least one standard drink of alcohol once per month or more over the past 12 months.

Reproductive age: women between the ages of 15 through 49, inclusive.

Small for gestational age (SGA): the birth weight of an infant that falls below the tenth percentile of appropriate for gestational age infants, specific to the length of gestation.

Standard drink: quantities of different alcoholic beverages that contain roughly the same amount of alcohol. The Canadian Centre on Substance Abuse (CCSA) defines one standard drink as 17.05 ml or 13.45 g of pure alcohol. This is roughly equivalent to:

- 341 mL (12 oz.) bottle of 5% beer, cider or cooler
- 142 mL (5 oz.) glass of 12% wine
- 43 mL (1.5 oz.) shot of 49% spirits

Stillbirth: a product of conception of 20 or more weeks gestation or fetal weight of 500 grams or more, which did not breathe or show other signs of life at delivery; death may occur before or during delivery.

EXECUTIVE SUMMARY

This report describes indicators of female reproductive health and reproductive outcomes. Male biological and psychosocial factors were not included in this report but the importance of men in reproductive health is recognized. The content in this report was determined by the access and availability of data. Some data was dated.

The cancellation of the Long Form Census by the Federal Government meant the loss of reliable data on important information.

The majority of babies in Peterborough County and City are born in good health. While this reflects well on the health of women in their reproductive years, there are trends and modifiable risk factors that merit continued attention.

Key Findings

Women in Peterborough

Reproductive Age

- The proportion of women of reproductive age (15 to 49) is lower than the provincial (41.5% compared to 47.5%)
- The number of women of reproductive age is decreasing
- 61.3% of women giving birth are between the ages of 25 and 34
- 5.4% of women giving birth are between the ages of 15 and 19 compared to 3.4% in Ontario
- Pregnancy rates in Peterborough among women ages 15 to 19 have been declining since 2007

Nutrition and Physical Activity

- 52.0% of women of reproductive age report eating five or more servings of fruits and vegetables per day which is similar to Ontario at 51.6%
- 64.0% of women of reproductive age report moderate to high levels of physical activity, a significantly greater proportion than the 48.9% in Ontario
- 56.4% of women of reproductive age report being a normal healthy weight, however about one third were either overweight or obese
- 55.0% of women who had given birth in the past five years had taken folic acid before their pregnancy compared to Ontario at 61.6%

Breastfeeding

- Intention to breastfeed at discharge from hospital has increased from 85.2% to 89.2%
- Peterborough rates are slightly lower than Ontario however they are following the same upward trend
- 93.3% of women between the ages of 35 and 44 reported the intention to breastfeed
- 87.1% of women under the age of 20 reported the intention to breastfeed
- The proportion of women breastfeeding declines over time: 87.7% of women are breastfeeding at discharge, compared to 88.3% at 48 hours, 83.4% at two weeks, and 64.7% at six months

Smoking

- 19.3% of women of reproductive age are daily or occasional smokers which is similar to Ontario at 17.2%
- 18.3% of pregnant women smoked throughout pregnancy compared to 8.6% in Ontario
- 90.9% of women age 35 to 44 did not smoke throughout pregnancy compared to 81.0% of women under the age of 20

Alcohol and Illicit Drug Use

- 62.6% of women between the ages of 19 to 49 are regular drinkers compared to 54.0% in Ontario
- 19.9% of women between the ages of 19 to 49 report heavy drinking compared to 12.8% in Ontario
- 17.0% of women of reproductive age have used an illicit substance in the past year

Babies in Peterborough

Births

- 1,138 babies are born each year, on average
- 73.4% of babies are delivered vaginally compared to 71.4% in Ontario

Low Birth Weight and Small for Gestational Age

- 4.2% of babies are low birth weight compared to 4.6% in Ontario
- 6.4% of babies born to mothers under the age of 20 are low birth weight compared to 6.1% in Ontario
- 6.5% of babies are small for gestational age

High Birth Weight and Large for Gestational Age

- 15.7% of babies are high birth weight
- Women in their 30s deliver the greatest proportion of high birth weight babies which is similar to Ontario
- Women between the ages of 15 to 19 deliver the lowest proportion of high birth weight babies
- 13.2% of babies are large for gestational age
- Large for gestational age babies are more common among older mothers
- The proportion of high birth weight and large for gestational age is decreasing although it remains consistently higher than Ontario

Preterm Births

- There are approximately 82 preterm births per year
- 7.2% of live births are preterm compared to 7.6% in Ontario
- Preterm births have remained relatively consistent, when compared to Ontario which has increased slightly
- Women age 15 to 19 and 40 to 44 have the largest proportion of preterm births at 9.1% and 11.2% of live births

Multiple Births

- Multiple live births increased from 1.9% in 2001 to 3.0% in 2011 compared to Ontario at 2.9% to 3.6%
- Twins are the most common type of multiple live births which is the same as Ontario

Congenital Anomalies

- 529 babies were identified as having a congenital anomaly between 2000 and 2010
- Babies can have more than one anomaly, 764 anomalies were identified during this time frame
- Congenital heart defects are the most common (33%)
- Congenital anomalies (32.7%) are the second leading cause of death to infants in Peterborough
- In Ontario, congenital anomalies account for 22.9% of infant deaths
- The rate of babies born with congenital anomalies in Peterborough is significantly higher than Ontario
- Congenital malformations of the circulatory system are the most common (41.2%) compared to Ontario at 30.4%

Infant Mortality

- 52 deaths were reported in infants less than one year of age between 2000 and 2009
- The most frequent cause of infant deaths in Peterborough (50.0%) and Ontario (58.3%) is conditions originating in the perinatal period

- The second leading cause of infant deaths in Peterborough is congenital anomalies (32.7%) and the third is ill-defined conditions (15.5%)
- This was generally similar to the province, where congenital anomalies accounted for 22.9% of infant deaths and 7.8% were due to ill-defined conditions.

Stillbirths

- 85 stillbirths were reported in Peterborough between 2001 and 2011
- Peterborough averages eight stillbirths per year compared to Ontario at 994 per year

It is recognized that data availability will expand as the BORN data collection system evolves and PCCHU gains full access. There is currently a paucity of data and research in the following areas:

- Rates of depression and postpartum mood disorders for mothers and fathers, and screening
- Number of pregnant women who drink alcohol, use tobacco products, use illicit and licit drugs, as this data tends to be under reported
- Time in pregnancy when prenatal care is accessed and who provides the care
- Screening for intimate partner abuse
- Women and men who require the use of assisted human reproductive technology
- Connections between environmental exposures and birth outcomes
- Male health and reproduction

Lifestyle factors including smoking, nutrition, physical activity, and alcohol and substance use prior to and during pregnancy influence the outcome of an infant's health in the neonatal period as well as later in life. Pregnancy is a time when many women make changes to adopt a healthier lifestyle and are receptive to new information. Strategizing with provincial and community partners to enhance primary prevention programs and address modifiable risk factors can improve reproductive health outcomes.

Prevention and intervention services should continue to focus on high risk mothers, families living in poverty and/or the working poor, women at risk of chronic diseases, women dealing with poor mental health, domestic violence, lack of social support, and lack of education. Identifying barriers and developing evidence-informed strategies to remove or reduce barriers will increase accessibility of programs and services, and ultimately improve birth outcomes.

Reproductive health for women and men needs to take an upstream approach. The health and well-being of women and men before pregnancy contribute to a healthy pregnancy which positively influences a healthy birth outcome. A healthy birth outcome along with preparation for parenthood will contribute to healthy children and families. Negative outcomes have lifelong impacts for families, communities, and society (Ministry of Health Promotion, May 2010).

PCCHU will continue to monitor reproductive health and outcome indicators in Peterborough County and City. Improved data access and quality will allow for a fuller understanding of reproductive health in our community. Monitoring the health and well-being of mothers, infants, and their families, will help to identify areas of success, areas where improvement is needed, and priority populations for which focused efforts are required.

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DEMOGRAPHICS

Between 2006 and 2011, the population of Peterborough grew by 1.4% from 133,080 to 134,933, less than the 5.7% increase in Ontario. In 2011 there were 29,025 women of reproductive age – between the ages of 15 and 49 – in Peterborough, representing 41.5% of the female population. This is a smaller fraction of the population of all women than in 2006 (44.1%). Since 2006, the number of women of reproductive age in Peterborough declined by 4.6% whereas Ontario saw a 1.0% increase. There was a 19.1% reduction of the number of women between the ages of 40 and 44 and a 12.0% reduction in the size of the 35 to 39 year old cohort (Table 1). By comparison, the number of women between the ages of 20 and 24 and those aged 30 to 34 increased by 15.7% and 4.3%, respectively.

Table 1. Number of women of reproductive age in 2011 by age group and percent change from 2006 Census, Peterborough

	Age Group n (% change)							
	15 – 19	20 – 24	25 – 29	30 – 34	35 – 39	40 – 44	45 – 49	Total
PTBO	2,560 (1.9)	3,305 (0.0)	2,780 (21.9)	2,265 (15.3)	2,090 (8.5)	2,375 (12.8)	2,835 (4.5)	18,210 (0.4)
PCCHU	4,345 (5.5)	4,705 (0.5)	3,875 (15.7)	3,405 (4.3)	3,445 (12.0)	4,055 (19.1)	5,195 (6.6)	29,025 (4.6)

Note: red text indicates a reduction from 2006
PTBO: City of Peterborough; PCCHU: Peterborough County-City Health Unit catchment area

SOCIODEMOGRAPHIC SNAPSHOT

Pregnancy and birth are the first of several life events that shape health outcomes within the course of a person's lifetime. Early childhood experiences have lasting biological, psychological, and social effects on health (Mikkonen & Raphael). The relationship between poverty and health is widely recognized. Poverty is a public health issue that affects the entire family. Children live in poverty because their families do. Poverty can lead to an increased risk for preterm birth, intrauterine growth restriction, neonatal or infant death (Larson, October 2007), delayed cognitive development, poor school performance, behavioural problems, and childhood asthma and injuries (Mikkonen & Raphael).

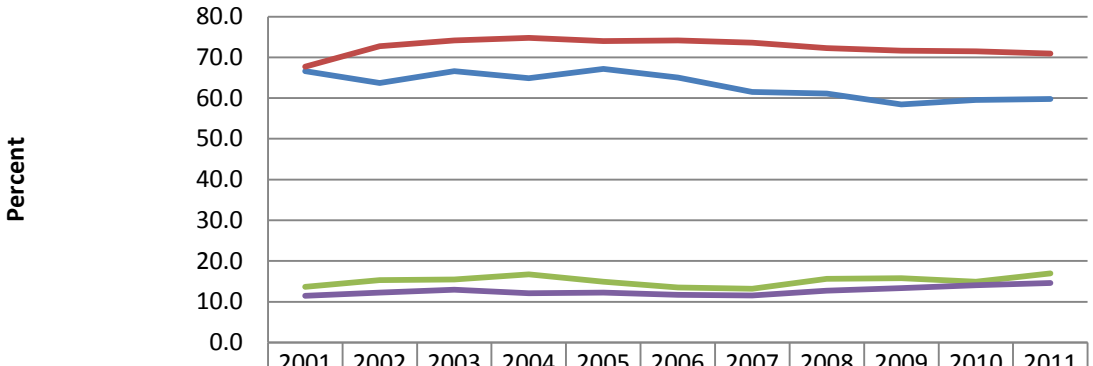
In 2010, there were 383,000 children living in poverty with their families in Ontario. This represents one child out of every seven. As of September 2013, there were 3,814 Ontario Works cases in Peterborough. The total number of individuals involved was 6,530 with children accounting for 34.1% (n=2,228). There were 1,224 children under the age of seven, 612 children aged seven to 12, and 392 children between the ages of 13 and 17. Single parents made up the majority of cases (n=1,084) while 281 cases were couples with children (John Coreno). The impact of child poverty is compounded among the historically disadvantaged: immigrants; racial minorities; indigenous people; the disabled; and female-led, single parent families. Poverty compromises children's health, education and overall well-being. Ontario's economic potential is also affected as the skills and talents of low-income people are under-utilized (Campaign Ontario 2000, February 2013).

Low income predisposes people to material and social deprivation. The greater the deprivation, the less likely individuals and families are able to afford the basics for health such as food, clothing, and housing. Deprivation also contributes to social exclusion by making it harder for people to participate in cultural, educational, and recreational activities. Social exclusion affects one's health and ability to live a fulfilling day-to-day life (Mikkonen & Raphael).

Where we live shapes our physical and mental health. Housing is the most expensive cost for most moderate and low-income households. Subsidized housing is important to poverty reduction. In 2012, 1,525 households in the Peterborough area were on the wait list for social housing (Housing is Fundamental City & County of Peterborough, 2013).

PCCHU has continued its commitment to address issues related to poverty. In 2011, PCCHU received funding for two full time equivalent Public Health Nurses (PHNs) to focus on the social determinants of health (SDOH). The SDOH PHN positions are assigned to Family Health and the Chronic Disease Injury Prevention teams, with a cross appointment to Poverty and Health within the Foundational Standards team.

In 2010, in Ontario, 35.6 % of children in female-led lone-parent families lived in poverty (Campaign Ontario 2000, February 2013). Between 2001 and 2011, the proportion of Peterborough mothers who were married at the time of the birth of their baby decreased from two thirds (66.6%) to 59.8% (Figure 1). In Ontario, however, the proportion of mothers who were married has been consistently higher than in Peterborough, though decreased slightly from a high of 74.8% in 2004 to 70.9% in 2011. The proportion of single (never-married) mothers was similar in Peterborough and Ontario, though both of these proportions have increased by approximately 3% each since 2001.



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Married (PCCHU)	66.6	63.7	66.6	64.9	67.2	65.0	61.5	61.1	58.4	59.5	59.8
Married (ON)	67.7	72.7	74.1	74.8	74.0	74.1	73.6	72.2	71.7	71.4	70.9
Single (PCCHU)	13.6	15.3	15.5	16.8	14.9	13.5	13.2	15.6	15.8	14.9	17.0
Single (ON)	11.5	12.2	12.9	12.1	12.2	11.7	11.5	12.7	13.3	14.1	14.6

Figure 1. Proportion of married and single mothers, Peterborough and Ontario; 2001-2011

ON: Ontario; PCCHU: Peterborough County-City Health Unit catchment area

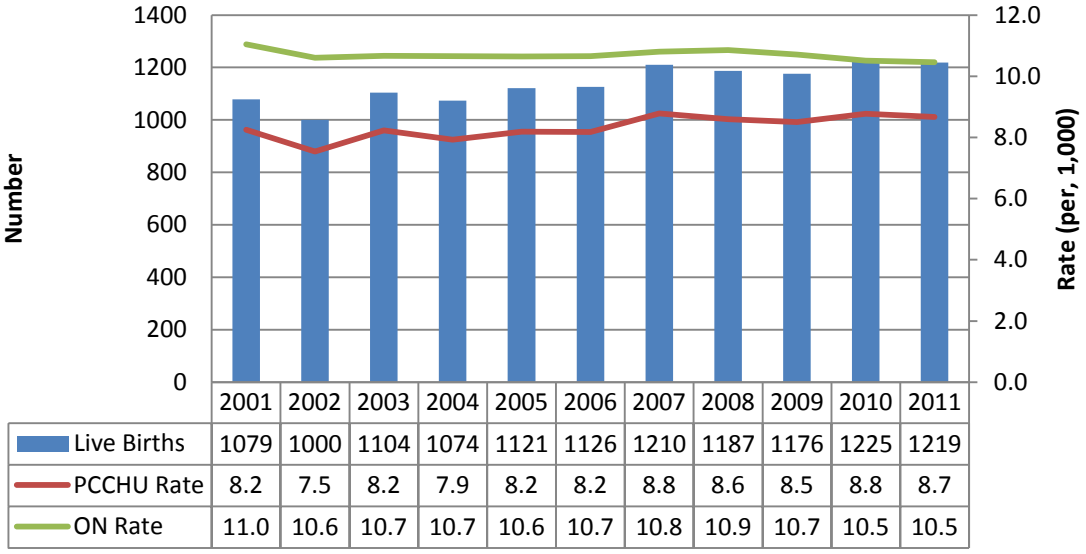
Between 2001 and 2011, the largest proportion of Peterborough women who were married when they gave birth were between the ages of 30 and 34 (81.1%) as well as the smallest proportion of women who were single at the time of birth at 5.4% (Table 2). The proportion of married women tends to get larger with increased age until 30 to 34 years and then decreases slightly. Ontario has comparable trends to Peterborough, though a larger proportion of 20 to 24 year old women were married (41.6% and 27.5%, respectively). Data do not add to 100% due to missing data.

Table 2. Proportion of married and single mothers by age group, Peterborough and Ontario; 2001-2011

	Peterborough		Ontario	
Age Group	**Married**	**Single**	**Married**	**Single**
15-19	3.5	55.9	8.7	61.0
20-24	27.5	33.0	41.6	31.1
25-29	69.0	11.6	74.3	11.2
30-34	81.1	5.4	84.0	5.7
35-39	78.1	5.9	82.1	6.0
40-44	67.7	9.8	76.5	8.2

BIRTH AND FERTILITY

Between 2001 and 2011, there were 12,521 live births to Peterborough women of reproductive age (average: 1,138; range 1,000 to 1,219) and in general the number of births per year increased during this time frame (Figure 2). Correspondingly, the crude birth rate increased from 8.2 live births per 1,000 population in 2001 to 8.7 per 1,000; by comparison, while higher than Peterborough, the crude birth rate in Ontario decreased slightly from 11.0 in 2001 to 10.5 in 2011.

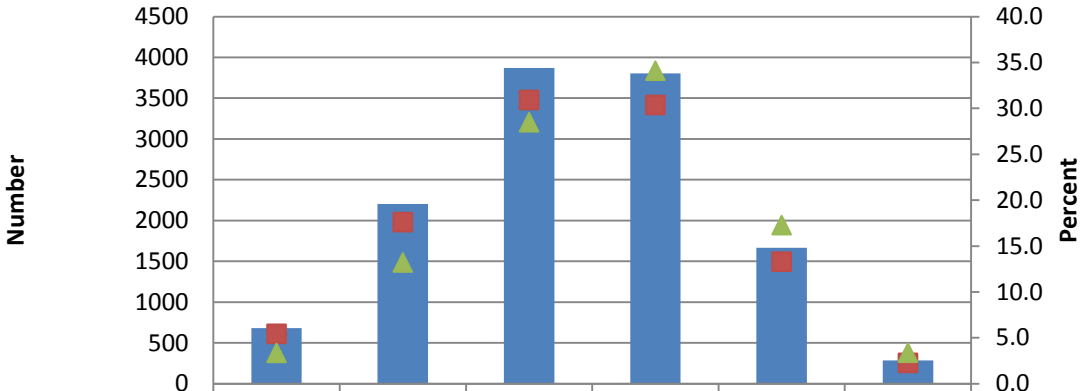


	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Live Births	1079	1000	1104	1074	1121	1126	1210	1187	1176	1225	1219
PCCHU Rate	8.2	7.5	8.2	7.9	8.2	8.2	8.8	8.6	8.5	8.8	8.7
ON Rate	11.0	10.6	10.7	10.7	10.6	10.7	10.8	10.9	10.7	10.5	10.5

Figure 2. Live births to Peterborough women and crude birth rates in Peterborough and Ontario, 2001-2011

ON: Ontario; PCCHU: Peterborough County-City Health Unit catchment area

The majority of women giving birth between 2001 and 2011 were between the ages of 25 and 29 (30.9%) and 30 to 34 (30.4%; Figure 3). In Ontario, women aged 30 to 34 and those 35 to 39 years of age accounted for a greater proportion of live births than in Peterborough. Likewise, the proportion of births to women under the age of 30 was smaller in Ontario compared to Peterborough. Due to the small and sporadic numbers of births among women 45 and older in Peterborough – 11 between 2001 and 2011 – data are not considered in this report.



	15-19	20-24	25-29	30-34	35-39	40-44
LB	681	2205	3871	3803	1665	285
PCCHU Percent	5.4	17.6	30.9	30.4	13.3	2.3
ON Percent	3.4	13.2	28.5	34.1	17.3	3.4

Figure 3. Number and proportion of live births by age group, Peterborough and Ontario; 2001-2011

ON: Ontario; PCCHU: Peterborough County-City Health Unit catchment area

Between 2001 and 2011 in Peterborough, the proportion of live births to women aged 25 to 29 decreased slightly from 33.6% in 2001 to 31.8% in 2011 while the proportion among women between the ages of 30 and 34 increased from 29.9% to 31.4% (Figure 4). In addition, the proportion of live births to women aged 20 to 24 also increased slightly from 15.9% in 2001 to 17.6% in 2011. By comparison, in Ontario, the proportion of live births to women aged 20 to 24 and those 25 to 29 decreased between 2001 and 2011 while the proportion of live births to women aged 30 to 34 and 35 to 39 increased (not shown).

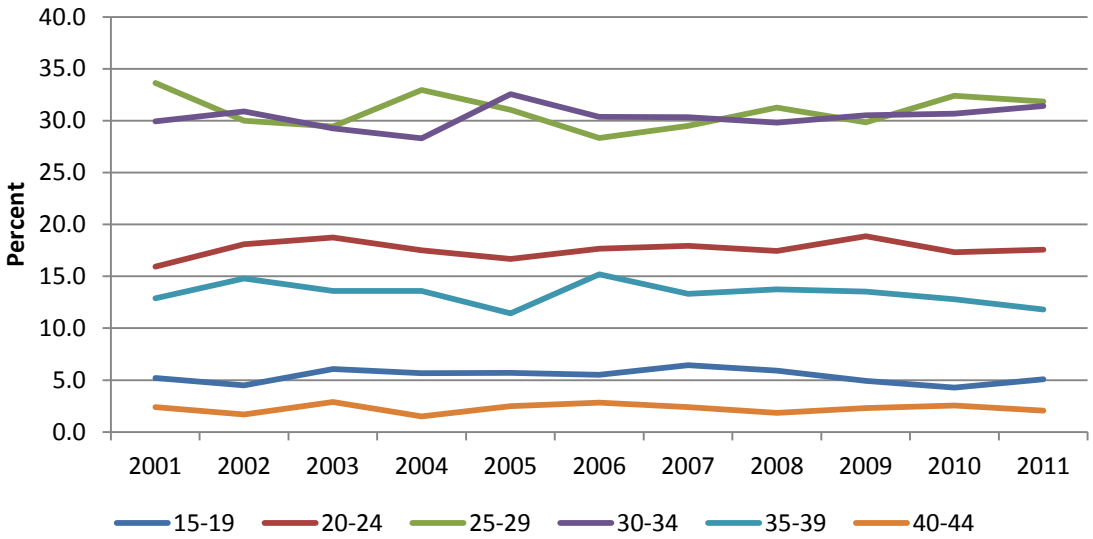
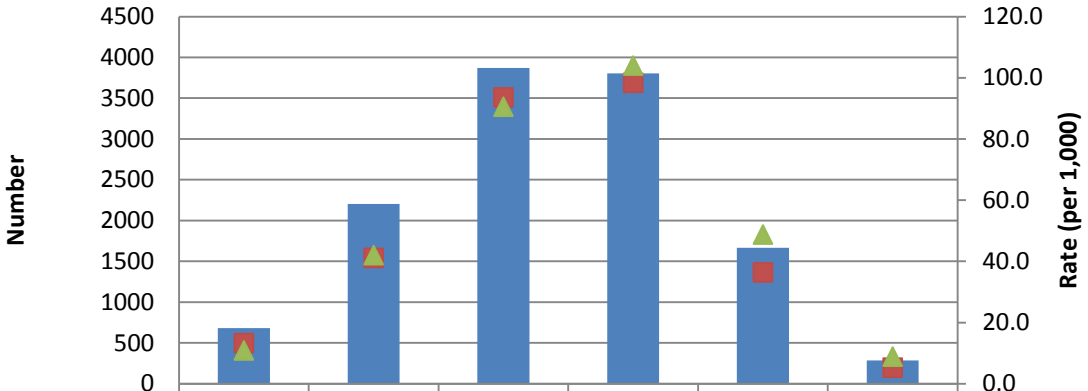


Figure 4. Proportion of live births by age group, Peterborough; 2001-2011

The live birth *rate* in Peterborough also varied by age group, with women aged 30 to 34 experiencing the highest rate between 2001 and 2011 at 98.4 per 1,000 women, followed by women aged 25 to 29 at 93.6 per 1,000 (Figure 5). Birth rates in Ontario were generally similar to Peterborough; the largest differences were found among women aged 35 to 39 and those aged 40 to 44.



	15-19	20-24	25-29	30-34	35-39	40-44
LB	681	2205	3871	3803	1665	285
PCCHU Rate	13.3	41.1	93.6	98.4	36.4	5.3
ON Rate	10.9	42.0	90.6	104.0	48.8	8.9

Figure 5. Number and live birth rate by age group, Peterborough and Ontario; 2001-2011

ON: Ontario; PCCHU: Peterborough County-City Health Unit catchment area

Between 2001 and 2011, there were noticeable trends in live birth rates to women of different age groups in Peterborough: the rate among women 15 to 19 increased from 12.5 per 1,000 to 14.3 per 1,000; and the rate of live births among women aged 40 to 44 also increased from 3.0 to 6.0 per 1,000 (Figure 6). In addition, the rate among women aged 30 to 34 saw an increase from 86.2 to 113.9 per 1,000 during this time frame. The rate among women aged 20 to 24 remained fairly stable while the rate among women between the ages of 25 and 29 dropped from 111.3 per 1,000 women in 2001 to 82.3 per 1,000 women in 2011. After a small increase between 2001 and 2006, live birth rates have been stable among 35 to 39 year old women. In general, similar trends exist in Ontario: rates increased between 2001 and 2011 among women aged 30 and older, while rates declined among women under the age of 30 (not shown).

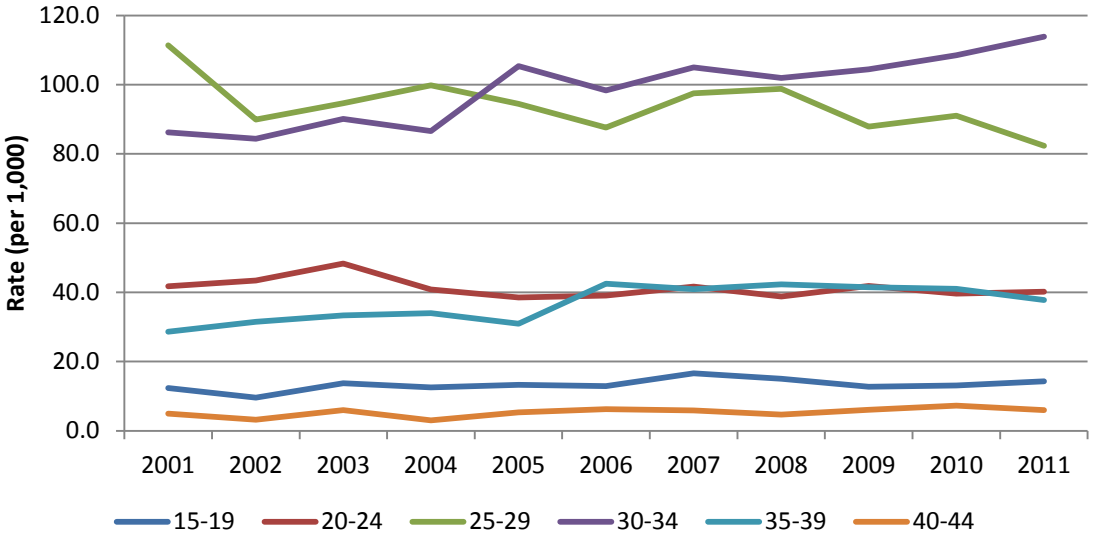


Figure 6. Live birth rates by selected age groups, Peterborough; 2001-2011

When discussing birth and fertility, it is also important to discuss pregnancies, which includes not only live births but therapeutic abortions (TAs), as well. Often stillbirths are included in calculating the number of pregnancies; however, due to small, unstable counts in the number of stillbirths in Peterborough they have not been included in the following analysis. Between 2001 and 2011, there were 4,278 TAs (average: 389; range: 324 to 424) among women of

reproductive age in Peterborough. Women under the age of 25 accounted for over half of the TAs during this time frame: 22.4% among 15 to 19 year olds and 36.9% among 20 to 24 year olds (Table 3). When taking into account TAs, the distribution of pregnancies across different age groups varies appreciably from the distribution of live births. Women aged 15 to 19 and 20 to 24 make up larger proportions of pregnancies at 9.8% and 22.5%. In contrast, women aged 25 to 29, and those 30 to 34 accounted for smaller proportions of all pregnancies compared to live births only.

Table 3. Number and proportion of live births (LB), TA and pregnancies by age group, PCCHU; 2001-2011

Birth Type	Age Group n (%)						
	15-19	20-24	25-29	30-34	35-39	40-44	Total
LB	681 (5.4)	2,205 (17.6)	3,871 (30.9)	3,803 (30.4)	1,665 (13.3)	285 (2.3)	**12,521**
TA	959 (22.4)	1,577 (36.9)	903 (21.1)	631 (10.1)	286 (6.7)	115 (2.7)	**4,278**
Pregnancies	1,640 (9.8)	3,782 (22.5)	4,774 (28.4)	4,234 (25.2)	1,951 (11.6)	400 (2.4)	**16,799**

The pregnancy *rate* by age group between 2001 and 2011 followed a similar pattern to live birth rate (Figure 7). In Peterborough, pregnancy rates among women aged 15 to 19 were slightly higher than the province during this time frame (31.9 pregnancies per 1,000 compared to 28.4 per 1,000). Rates were lower among Peterborough women aged 20 to 24 compared to the province (70.5 pregnancies per 1,000 and 74.3 per 1,000, respectively). Similar to live birth rates, pregnancy rates among Ontario women aged 30 to 34, 35 to 39, and 40 to 44 years of age were higher than in Peterborough.

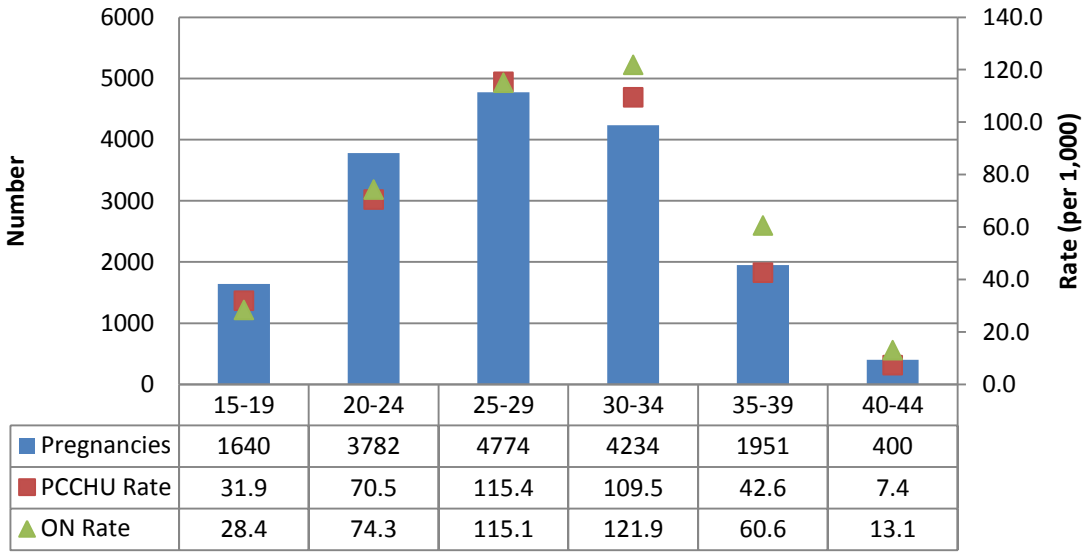


Figure 7. Number and rate of pregnancies by age group, Peterborough and Ontario; 2001-2011

ON: Ontario; PCCHU: Peterborough County-City Health Unit catchment area

Between 2001 and 2011, the pregnancy rate among women aged 30 to 34 increased from 95.0 pregnancies per 1,000 to 126.4 per 1,000 (Figure 8). No other age cohort saw this magnitude of increase. The pregnancy rate among women between the ages of 35 and 39 increased from 32.3 pregnancies per 1,000 in 2001 to 45.6 per 1,000. Among women aged 25 to 29, the pregnancy rate decreased from 131.6 pregnancies per 1,000 to 105.0 per 1,000. In general, similar trends exist in Ontario: pregnancy rates increased between 2001 and 2011 among women aged 30 and older while rates declined among women under the age of 30 (not shown).

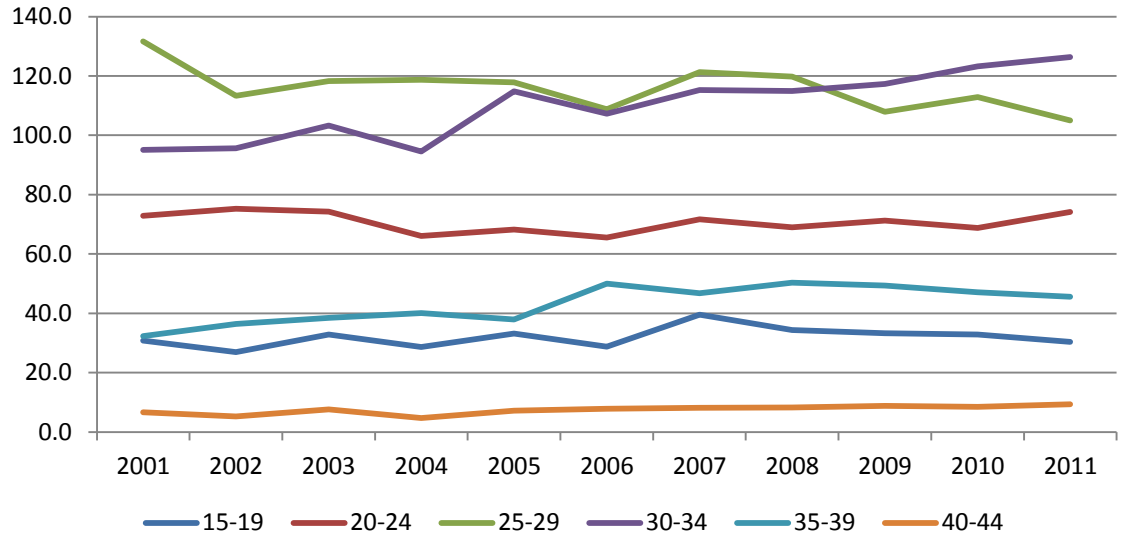
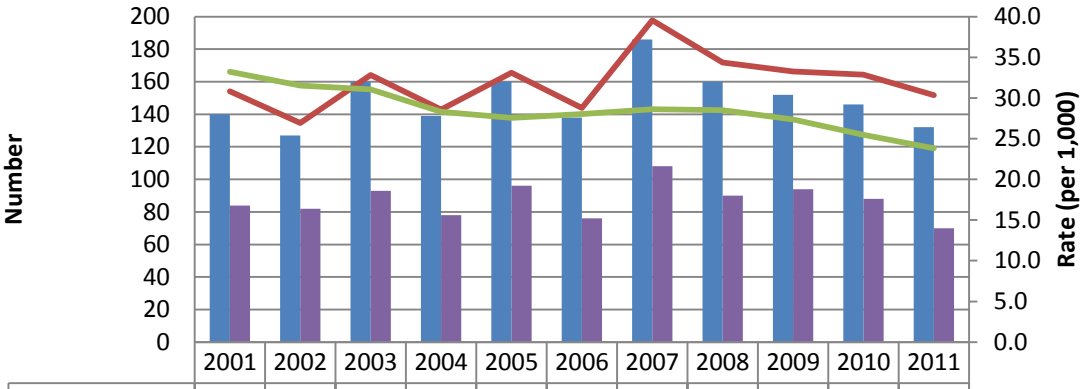


Figure 8. Pregnancy rate by age group, Peterborough; 2001-2011

Pregnancy rates among women between the ages of 15 to 19 have been declining in Canada and in most developed countries since the mid 1990's (Best Start, 2007). There are large regional differences in rates. Pregnancy is more common among vulnerable women and is a significant predictor of other social, educational, and employment barriers in later life (Ministry of Health and Long-Term Care, August 2009). Countries that have a more equitable distribution of wealth have a lower pregnancy rate (Best Start, 2007). Other factors that influence pregnancies among young women are: those who do not have the motivation to delay pregnancy; limited knowledge about sexuality and reproduction; lack of access and skills to use birth control; lack of confidence and communication skills to negotiate condom use; feeling pressured into having sex; and feeling that having a baby at a young age is normal and desirable (Best Start).

Pregnancies among young women are associated with an increased risk of poor outcomes for both the mother and baby. These poor outcomes can be inadequate maternal weight gain, anemia, a low birth weight baby, a preterm baby, and increased baby and maternal mortality rates (Klein) . Other pregnancy risks include hypertension, eclampsia, and depressive disorders (Ministry of Health and Long-Term Care, August 2009). Young pregnant mothers tend to experience inadequate prenatal care, physical and sexual abuse, drug use, and smoking (Department of Child and Adolescent Health and Development, 2004) (Huizinga, Loeber, & Thornberry, 1993). Psychosocial issues related to a lack of support systems, readiness for parenting, and loss of educational and/or employment opportunities have both short and long-term implications for the health and well-being of children born to young mothers.

In Peterborough, the number of therapeutic abortions (TAs) among women between the ages of 15 to 19, ranged from 70 to 108 between 2001 and 2011, while the number of pregnancies ranged from 127 to 186 (Figure 9). Pregnancy rates in this age group increased between 2001 and 2007 from 30.8 pregnancies per 1,000 to 39.6 per 1,000. Since 2007, the number of TAs and pregnancies decreased from 108 and 186, respectively, to 70 and 132. As a result, the pregnancy rate also decreased. By comparison, the pregnancy rate in Ontario has been declining since 2001 and was 23.8 pregnancies per 1,000 in 2011 compared to 30.4 per 1,000 in Peterborough.



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Preg.	140	127	160	139	160	138	186	160	152	146	132
TA	84	82	93	78	96	76	108	90	94	88	70
PTBO Rate	30.8	26.9	32.8	28.6	33.1	28.8	39.6	34.3	33.3	32.8	30.4
ON Rate	33.2	31.5	31.0	28.3	27.6	28.0	28.6	28.5	27.3	25.5	23.8

Figure 9. Number of pregnancies and TAs among young women and teenage pregnancy rate, Peterborough and Ontario; 2001-2011

ON: Ontario; PTBO: Peterborough County-City Health Unit catchment area

REPRODUCTIVE HEALTH

Reproductive health includes preconception health, preparation for pregnancy, prenatal health, healthy births and newborns, and parenthood. Good health before pregnancy will contribute to a healthy pregnancy; a healthy pregnancy will contribute to a healthy birth outcome; and a healthy birth outcome, along with preparation for parenthood, will contribute to healthy children and families.

Public Health Services

Prenatal Education

PCCHU is committed to raising awareness of the importance of creating safe and supportive environments that promote healthy pregnancies and healthy birth outcomes. The Health Unit offers: Prenatal Health Fairs, "Your First Prenatal Visit" packages, Teen and Adult Prenatal Classes, one-to-one education and support offered through telephone consultation and home visits by the Healthy Babies Healthy Children (HBHC) program, and Choose to be Smoke Free smoking cessation groups.

Educational activities are provided for people who are pregnant. The Reproductive Health program coordinates the Prenatal Health Fair. Health Unit staff and local businesses and organizations with an interest in maternal and family health provide interactive displays and demonstrations on specific topics related to pregnancy and early parenting. The Fair is held two times each year.

Many first time expectant parents in Peterborough participate in Prenatal Classes that prepare families for labour and delivery, the role of the support person, breastfeeding, caring for their newborn, and coping with the challenges of the postpartum period. Parents also learn about accessing support from local community agencies and services. A survey to assess six month breastfeeding practices conducted by PCCHU in 2012 on a random sample of over 200 new mothers indicated that 68.0% of those mothers had attended prenatal classes.

The PCCHU "Family HEALTH*line"* is staffed by Public Health Nurses who respond to requests for information and counselling on child health, parenting, and resources available in the community. The service is available Monday to Friday, 8:30 a.m. to 4:30 p.m.

Healthy Babies Healthy Children

The Healthy Babies Healthy Children (HBHC) program is committed to giving children the best possible start. It provides screening for pregnant women, every new baby and mother, and families with children to the age of school entry. HBHC is a preventative early identification and intervention program that provides support to families and children from the prenatal period up to age of school entry. During the prenatal period, Public Health Nurses provide one-to-one consultation for families needing extra prenatal education and support. Families can refer themselves, or can be referred by their healthcare provider or social service agency with the family's consent.

Up until March 2013, the Larsen Screen was completed by pregnant women to assess prenatal risk. Three indicators screened were: level of completion of formal education; attendance at prenatal classes; and smoking cigarettes, and if yes, the amount. Scores were assigned based on risk factors with greater than 13 deemed as high risk, and therefore requiring assessment by a HBHC, Public Health Nurse. In 2012, 606 Larsen prenatal screens were received by PCCHU, of which 16.0% (n=97) were high risk. There were 115 women (19.0%) who completed a Larsen screen that had achieved an education level of high school or less. Roughly two thirds (63.2%) of those screened had attended prenatal education classes and most (85.0%) did not smoke. Since March 2013, the Larsen has been replaced with the comprehensive HBHC Screen which covers prenatal, postpartum, and early childhood indicators.

Prenatal Care

Prenatal care is a critical component of a pregnant woman's health and her child's healthy development. Prenatal care is provided by a variety of health care professionals, including obstetricians, family physicians, midwives, nurse practitioners, and nurses. Women who receive prenatal care early and regularly have decreased risks of preterm delivery, low birth weight, and stillbirth (Public Health Agency of Canada, 2008 Edition). The availability of obstetrical services influences early access to prenatal care. All women in Peterborough County and City have access to prenatal and postnatal care. Women without a family physician can register with Health Care Connect, self- refer to the Partners in Pregnancy Clinic or to a midwife. For families without a family physician, newborns are followed by a pediatrician while in hospital. Once discharged from hospital, families with newborns can return to the Newborn Follow-up Clinic located in the Paediatric Outpatient (POP) Clinic at the Peterborough Regional Health Centre (PRHC), to see a pediatric Nurse Practitioner and Lactation Consultant.

Infections in Pregnancy

Women who are planning a pregnancy should ensure that they are healthy, free of infection and that their immunizations are up to date before becoming pregnant. Pregnant women need to be aware of some infections that could cause serious health risks to their unborn babies. Prevention, exposure, screening, and treatment of infections during pregnancy should be discussed with a health care provider. Reportable congenital infections are: congenital rubella syndrome, congenital cytomegalovirus (CMV) infection, neonatal herpes, neonatal Group B Streptococcal disease, conjunctivitis caused by gonorrhea and/or chlamydia, congenital gonorrhea and chlamydia (other than conjunctivitis), congenital syphilis, congenital Human Immunodeficiency Virus (HIV) infection, congenital Acquired Immunodeficiency Syndrome (AIDS), and congenital Hepatitis B.

All pregnant women in Ontario and Canada are offered HIV testing as part of their prenatal care. Many babies infected with HIV will die within three years, unless they are treated. Pregnant women with HIV can receive treatment to reduce the risk of passing HIV to their baby. The proportion of pregnant mothers who tested for HIV in 2010, in Ontario was 96.2%, with teen mothers being tested most frequently (97.1%). The proportion of pregnant mothers who tested for HIV in the Central East Local Health Integration Network (which encompasses Peterborough County) was 96.4% in 2010 (Ministry of Health and Long-Term Care) (Remis, Merid, & Palmer).

Nutrition during Pregnancy

A woman's nutritional and overall health, before and during pregnancy can affect the health of her baby. Healthy eating helps ensure that adequate nutrients are available to support a healthy pregnancy. According to Canada's Food Guide, pregnant women should eat two to three extra Food Guide servings each day (Health Canada).

Only 52.0% (95%CI: 43.7 – 60.2) of women between the ages of 15 and 49 in Peterborough were eating five or more servings of fruits and vegetables per day in 2009/2010. In Ontario, the proportion of women eating five or more fruits and vegetables per day was similar at 51.6% (95%CI: 50.0 – 53.1). Women of child bearing age are not eating enough fruits and vegetables each day.

Some women may choose not to follow Canada's Food Guide, however for some women, food insecurity is the reason. When money is limited, people are forced to adapt by cutting into their food budget. In Peterborough, one in ten households reported food insecurity, with 2.5% reporting severe food insecurity. Due to lack of money, they worried about running out of food, not having the quality or variety of foods they wanted, or not having enough to eat.

Parents living on low incomes feed their children first, and as a result, parents' nutrition and health suffers. As a last resort, people are forced to use food banks. In March 2013, 7,724 Peterborough residents were helped by food banks; of those, 50.2% were women and 40.8% were children under the age of 18.

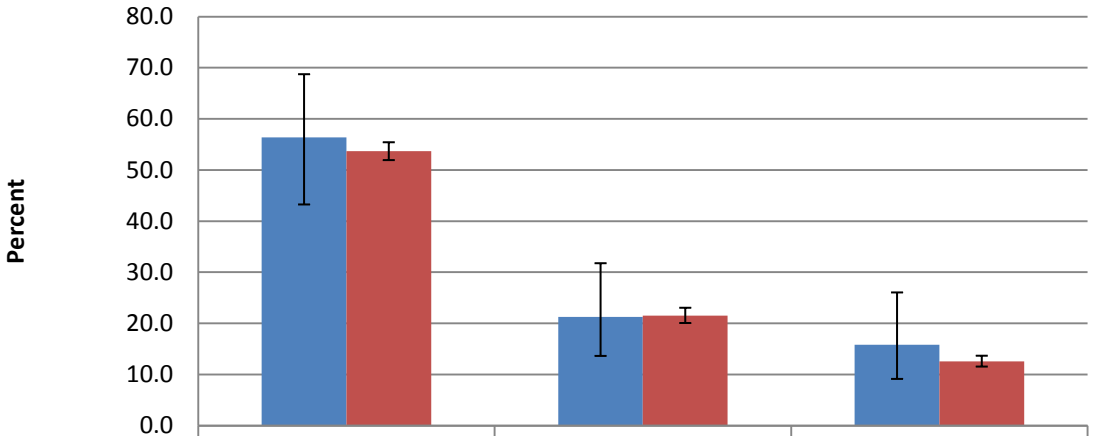
Public Health Nutritionists and Community Workers work with community members and other agencies to improve food security through community gardens, collective kitchens, and food box and prenatal nutrition programs.

The Health Unit provides staffing supports to Babies First, a Canadian Prenatal Nutrition Program that is offered in our community by the Peterborough Family Resource Centre. The program is available to women prior to 30 weeks gestation and for women who are breastfeeding. Women receive information and support from a Registered Dietitian, Nurse, Lactation Consultant, and an Addictions Counsellor.

Healthy Body Weight

Women who are overweight or obese before pregnancy are at risk of gestational diabetes, gestational hypertension, caesarean section, increased risk of excess blood loss, early labour and birth, miscarriage (The Society of Obstetricians and Gynaecologists of Canada), and large for gestational age and macrosomia (abnormally large before birth) babies. The birth of babies with macrosomia can result in prolonged labour and birth, trauma, asphyxia, caesarian delivery, and an increased risk of perinatal mortality (Goldenberg & Culhane). Larger babies also tend to grow to be heavier children (Parket, Rifas-Shiman, Oken, Belfort, & Jaddon, 2012). Forty to fifty percent of pregnant women gain more weight during pregnancy than what is recommended by the Institute of Medicine and the Society of Obstetricians and Gynecologists of Canada (Schieve, Bennett, Campbell, Johnston, & Les, 2007). Pregnant women who gain too much weight during pregnancy are at an increase risk of being overweight and consequently at increased risk of developing chronic diseases (Institute of Medicine (IOM), 2009) (Brown, Sinclair, Liddle, Hill, Madden, & Stockdale, 2012).

In 2009/2010, just over half (56.4%) of Peterborough women aged 18 to 49 reported being a normal healthy weight (Figure 10). However, roughly one third of women were either overweight or obese (21.3% and 15.8%, respectively).



	Normal	Overweight	Obese
Peterborough	56.4	21.3 *	15.8 *
Ontario	53.7	21.5	12.5

Figure 10. Proportion of women 18 to 49 by body mass index, Peterborough and Ontario; 2009/10

* estimates should be interpreted with caution due to a high sampling variability

Pregnant women who gain insufficient weight are at increased risk of having babies born prematurely and small for gestational age or low birth weight infants. Low birth weight can be associated with neonatal morbidity and mortality, physical and cognitive disabilities, and chronic health problems later in life (Goldenberg & Culhane).

Folic Acid

Folic acid is important for the normal development of the spine, brain, and skull of the fetus, especially during the first four weeks of pregnancy (Health Canada, 2002). Folic acid decreases the risk of neural tube defects (NTDs) (Health Canada, 2002) which are birth defects that occur when the neural tube fails to close early in pregnancy, often before a woman knows she is pregnant. These abnormalities of the spine, brain or skull can result in stillbirth or lifelong disabilities. Spina bifida is the most common NTD (Health Canada, 2002). All women who could become pregnant and those who are pregnant should take a daily multi-vitamin containing 0.4 mg of folic acid and eat a healthy, well-balanced diet according to Canada's Food Guide (Health Canada, 2002). There has been a decrease in the rates of NTDs in Canada since the folic acid fortification of white flour, enriched pasta and cornmeal sold in Canada. The decline in rates by up to 42% in Canada is a tremendous public health success story (Public Health Agency of Canada). According to the Public Health Agency of Canada, What Mothers Say (2009), lower levels of education and income were associated with not taking folic acid before pregnancy (Public Health Agency of Canada, 2009).

In 2009/2010, among Peterborough women of reproductive age who had given birth in the past five years, an estimated 55.0% (95%CI: 35.4 – 73.2) had taken folic acid before their pregnancy. In Ontario, 61.6% (95%CI: 58.5 – 64.6) of women who had given birth in the last five years had taken folic acid before their pregnancy.

Physical Activity and Pregnancy

In Canada, many pregnant women do not exercise enough and can gain too much weight during pregnancy (Mottola, 2011). Pregnant women were less likely to be meeting physical activity guidelines if they were single, divorced, separated or widowed, a visible minority, or had not completed high school (Gaston & Vamos). Women who are more active during pregnancy have reduced risks of gestational diabetes and hypertension. Regular physical activity during pregnancy can improve mood, help with appropriate weight gain, build stamina for labour and delivery, and increase energy levels (Mottola, 2011). Physical activity is safe for pregnant women who have a low-risk pregnancy (Mottola, 2011). Pregnant women should talk to their healthcare provider if they are interested in starting or continuing an exercise program. The PARmed-X for Pregnancy is a medical tool for screening pregnant women who are interested in starting or continuing an exercise program (Mottola, 2011).

At the YMCA Peterborough, the program "Young Mom's Working Out" is offered in partnership with PCCHU. The weekly program is for young pregnant women and mothers on limited incomes. Each session runs for ten weeks and offers exercise time, snack/social time, and health information followed by a mother and child swim.

In 2009/2010, 64.0% (95%CI: 51.6 – 74.8) of women of reproductive age in Peterborough reported moderate to high levels of physical activity, a significantly greater proportion than in Ontario (48.9%; 95%CI: 47.3 – 50.5).

Smoking during Pregnancy

Smoking tobacco during pregnancy remains a public health problem and increases the risk for a variety of negative health outcomes on the fetus and child. These include intrauterine growth restriction (IUGR), preterm birth, spontaneous abortion, placental complications, stillbirth, sudden infant death syndrome (SIDS) (Cnattingius, 2004) (Hofhuis, de Jonste, & Merkus, 2003) (Office of the Surgeon General, 2001) and low birth weights (Gibson, Waters, & Catalano, 2012) (Health Concerns). The long term health impacts to a child are the risk of ear and respiratory infections; asthma; learning difficulties (Cnattingius, 2004) (Hofhuis, de Jonste, & Merkus, 2003) (Office of the Surgeon General, 2001); behavioural problems such as attention-deficit / hyperactivity disorders; childhood cancers such as leukemia and lymphomas; and childhood overweight and obesity (Behl, 2013) (Health Concerns).

The relationship between maternal smoking and adverse pregnancy outcomes is influenced by the amount and duration of smoking. Women who stop smoking before becoming pregnant or during their pregnancy are at a reduced risk of

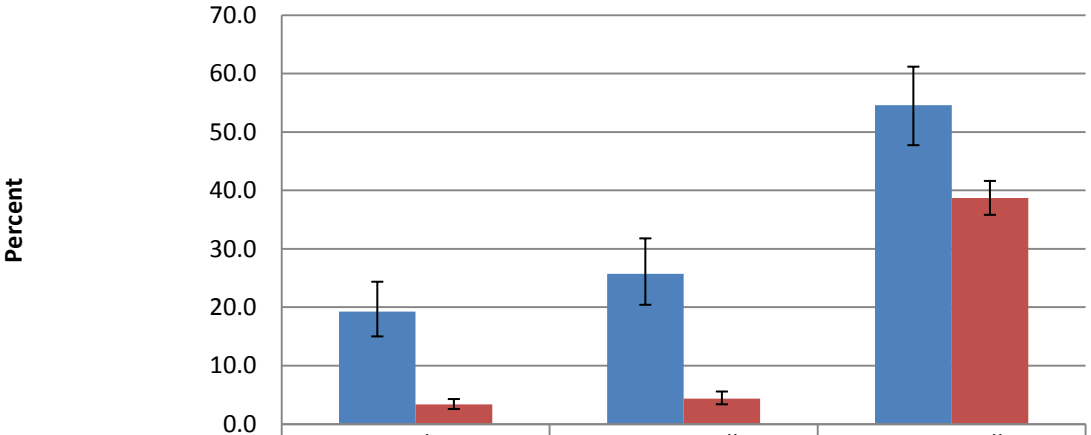
negative outcomes. Pregnant women are more likely to quit smoking and smoke fewer cigarettes than women who are not pregnant (Public Health Agency of Canada, 2009). Smoking rates during pregnancy are higher among women with low socioeconomic status and within vulnerable populations (Public Health Agency of Canada, 2009) (Joseph, Liston, Dodds, Dahlgren, & Allen, 2007).

Smoking remains one of the few potential preventable factors associated with low birth weight, preterm birth, and perinatal death. These factors alone demonstrate why perinatal tobacco cessation strategies must be included in public health programming.

The PCCHU Tobacco Use Prevention program works to meet the evolving needs in our community. In 2013, a "Community Conversation" was held with representatives from community agencies and organizations in Peterborough, who work with women of childbearing age and women who have participated in community programs. The purpose of this discussion was to gather ideas to improve local support for women in achieving optimal health, including staying or becoming smoke free. Participants acknowledged that opportunities exist for shared program delivery among community partners. In 2014, PCCHU will run a tobacco cessation group at the School for Young Moms. The School for Young Moms is a program that enables pregnant teens and mothers under the age of 21 to continue their high school education; develop their parenting skills; address their emotional, social and physical needs; and receive onsite care for their infants.

Since the spring of 2011, eight tobacco cessation groups have been completed. These groups are for pregnant and postpartum women. Each group ran for eight weeks followed by one booster session about one month after the last session.

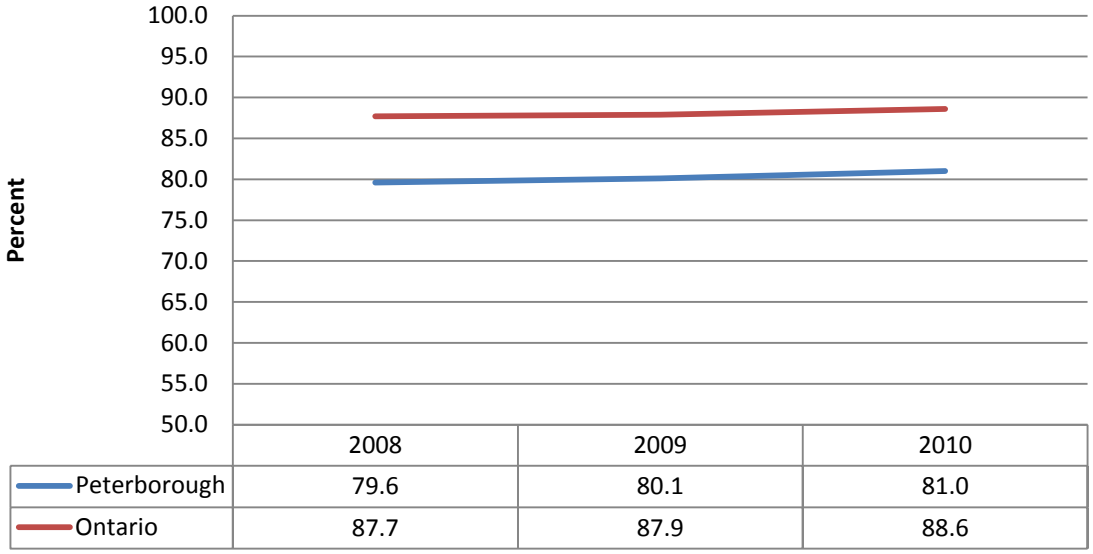
In Peterborough in 2009/2010, nearly one in five women (19.3%; 95%CI: 11.1 – 31.4) of reproductive age was a daily or occasional smoker; this was not significantly different than the 17.2% (95%CI: 16.1 – 18.3) of Ontario women of reproductive age who were smokers. Among smokers in Ontario, 19.3% were daily smokers during their last pregnancy, 25.7% smoked occasionally and just over half (54.6%) did not smoke at all (Figure 11). Among former smokers and non-smokers: only 3.3% of women smoked daily during their last pregnancy, 4.4% smoked occasionally and 38.7% did not smoke at all. Data for Peterborough are too variable to analyze with any degree of confidence.



	Daily	Occasionally	Not At All
Smokers	19.3	25.7	54.6
Former/Non-Smokers	3.3	4.4	38.7

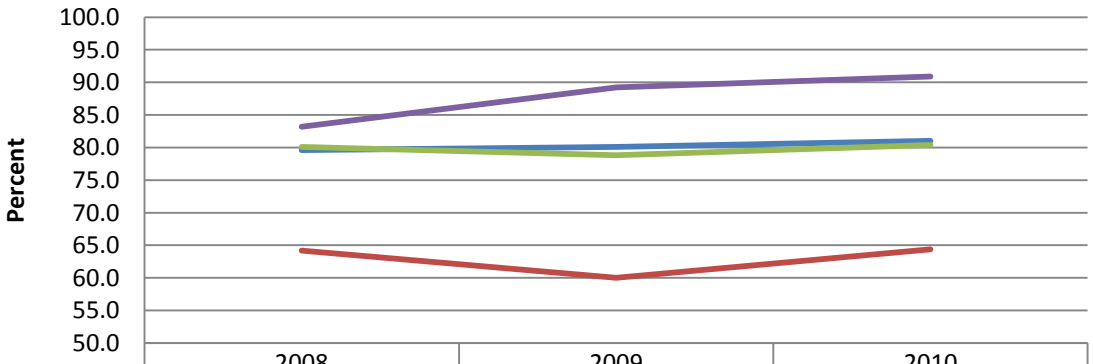
Figure 11. Smoking status during pregnancy among smokers and former/non-smokers, Ontario; 2009/10

Data from the Better Outcomes Registry Network (BORN) suggest that the majority of Peterborough and Ontario mothers did *not* smoke at any point during their pregnancy in 2010 (81.0% and 88.6%, respectively; Figure 12). Data prior to 2008 have a high volume of missing records and are not included. Since 2008, the proportion of mothers *not* smoking at any point during their pregnancy has increased slightly in both Peterborough and Ontario. In Peterborough, this proportion varied by age: only 64.6% of women under the age of 20 did *not* smoke at any point during their pregnancy compared to 90.9% of those between the ages of 35 and 44 (Figure 13). Conversely, 18.3% of Peterborough mothers smoked *throughout* pregnancy compared to 8.6% of Ontario mothers in 2010. Smoking *throughout* pregnancy also varies by age group: in 2010, a third (33.9%) of women under the age of 20 smoked throughout pregnancy compared to only 8.5% of those aged 35 to 44 (not shown).



	2008	2009	2010
Peterborough	79.6	80.1	81.0
Ontario	87.7	87.9	88.6

Figure 12. Proportion of women who did not smoke at any point during pregnancy, Peterborough and Ontario; 2008-2010



	2008	2009	2010
Total	79.6	80.1	81.0
<20	64.2	60.0	64.4
20-34	80.1	78.8	80.4
35-44	83.2	89.2	90.9

Figure 13. Proportion of women who did not smoke at any point during pregnancy by age group, Peterborough; 2008-2010

Second-Hand Smoke

Second-hand smoke is another term for environmental tobacco smoke (ETS) or passive smoke. Second-hand smoke is made up of sidestream smoke and mainstream smoke. Sidestream smoke goes directly into the air from the end of a burning cigarette, cigar or pipe. Mainstream smoke is inhaled by the smoker first and then exhaled into the air (Health Concerns). The chemical exposure from second-hand smoke is similar to the exposure of the smoker, but the pattern and amounts of exposure vary and are different from that of the smoker (Public Health Agency of Canada, 2008 Edition). There is no safe level of breathing other people's smoke and second-hand smoke is harmful to unborn babies (Center for Disease Control). The adverse health outcomes to babies are low birth weight, more frequent breathing problems, ear infections, more asthma attacks, and increased risk of Sudden Infant Death Syndrome (SIDS) (Center for Disease Control) (Burke, 2012).

In 2009/2010, approximately one in ten women of reproductive age in Peterborough reported that someone smoked in their home every day or almost every day (Figure 14). However, 81.0% (95%CI: 71.2 – 88.0) indicated that there were smoking restrictions in their home. In the same year, 8.2% of Peterborough women reported exposure to second hand smoke in a private vehicle every day or almost every day, while 11.1% reported being exposed to second-hand smoke in public spaces. The proportion of Ontario women reporting exposure to second-hand smoke was similar across locations and a similar proportion of women (79.1%; 95%CI: 77.8 – 80.4) reported having smoking restrictions in their home.

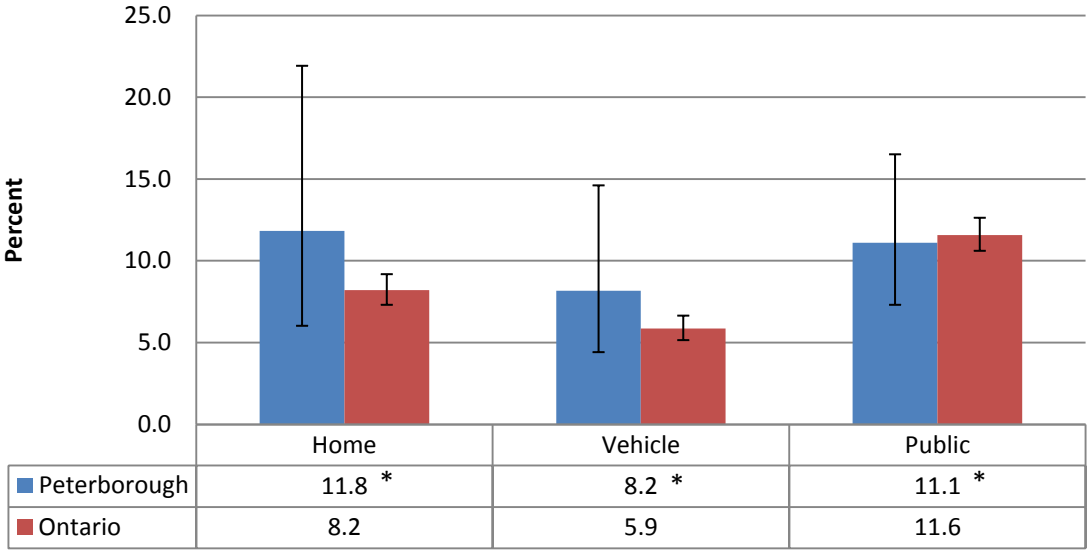


Figure 14. Proportion of women 15 to 49 who report being exposed to second-hand smoke in the home, in a private vehicle, or in a public space, Peterborough and Ontario; 2009/10

* estimates should be interpreted with caution due to a high sampling variability

Among female smokers of reproductive age in Ontario in 2009/2010, 41.5% (95%CI: 34.6 – 48.7) were exposed to second-hand smoking during their pregnancy or during the first six months after pregnancy, while nearly one in ten (8.5%; 95%CI: 7.1 – 10.2) of former smokers and non-smokers were exposed to second-hand smoke. Data for Peterborough are too variable to analyze with any degree of confidence.

Alcohol and Drug Use during Pregnancy

Alcohol and substance misuse can have direct negative outcomes to the fetus and baby, but can also compromise parenting which has a negative effect on the development of the child's brain and biological pathways (McCain, Mustard, & Shanker, 2007). Alcohol is one of the top health risks in the country and it is a known teratogen (Public Health Agency of Canada, 2009). No alcohol is best when planning a pregnancy and during pregnancy. There is no safe

type, amount, or time to drink alcohol during pregnancy or if planning a pregnancy (Public Health Agency of Canada, 2011). Health Canada and the Public Health Agency of Canada recommend that women who are or who may become pregnant should not consume any alcohol (Public Health Agency of Canada, 2008 Edition) (Public Health Agency of Canada, 2011). Drinking alcohol during pregnancy is associated with a multitude of adverse birth and long-term outcomes. Even drinking a small amount of alcohol during pregnancy can have a negative impact on the developing fetal brain (Public Health Agency of Canada, 2009). Alcohol consumption during pregnancy can cause fetal alcohol spectrum disorder (FASD), an umbrella term that describes the full range of disabilities associated with prenatal exposure to alcohol. These disabilities can be physical, social, and mental/emotional (Public Health Agency of Canada, 2011) (Ministry of Health and Long-Term Care, 2011) (Public Health Agency of Canada, 2009). FASD is identified as the leading cause of developmental and cognitive disabilities (Stade, Ali, Bennett, Campbell, Johnston, & Lens, 2009). The effects of alcohol on the fetus are thought to depend on several factors, including the amount of alcohol consumed, the pattern and timing of drinking, the mother's age, the mother's ability to metabolize alcohol, and the genetic susceptibility of the fetus (Godel, 2002) (Roberts & Nanson, 2000). Maternal alcohol consumption during pregnancy may also partially explain early adult alcohol abuse and alcohol dependence in offspring (Alati, Al Manun, & Williams, 2006). According to the Canadian Perinatal Health Report (2008), 10.5% of Canadian mothers reported drinking alcohol during pregnancy. This number may be higher due to under reporting.

In 2009/2010, 62.6% of Peterborough women between the ages of 19 and 49 identified themselves as a regular drinker compared to 54.0% in Ontario, though the difference was not statistically significant (Table 4). An estimated 19.9% of Peterborough women in this age cohort reported heavy drinking; by comparison, a significantly smaller proportion of women 19 to 49 in Ontario (12.8%) reported heavy drinking.

Another measure of alcohol consumption is reporting the proportion of people who comply with Canada's low-risk drinking guidelines (LRDG). Low-risk drinking helps to promote a culture of moderation. Guideline 1 seeks to reduce long-term health risks by limiting the number of alcoholic drinks consumed per week, while Guideline 2 suggests maximum alcohol consumption per occasion to reduce short-term risks (e.g., injury). In 2009/2010, approximately two thirds (67.5%) of Peterborough women aged 19 to 49 drank fewer than ten drinks per week and were compliant with Guideline 1; in the same year, only 43.2% of women were compliant with Guideline 2 by drinking three or fewer alcoholic beverages on one occasion (Table 4). Only 46.6% of Peterborough women were compliant with both Guidelines in 2009/2010. By comparison, 73.7%, 37.5%, and 54.6% of Ontario women aged 19 to 49 years of age were compliant with Guideline 1, 2, or both Guidelines, respectively.

Table 4. Patterns of alcohol consumption among women 19 to 49 years of age, Peterborough and Ontario; 2009/10

	Peterborough % (95%CI)	Ontario % (95%CI)
Regular drinker	62.6 (52.4 – 71.7)	54.0 (52.2 – 55.9)
Heavy drinking	19.9 (16.3 – 35.4)*	12.8 (11.8 – 13.9)
Complies with LRDG 1	67.5 (56.6 – 76.8)	73.7 (72.2 – 75.1)
Complies with LRDG 2	43.2 (32.2 – 54.9)	37.5 (35.9 – 39.3)
Complies with both LRDG	46.6 (35.4 – 58.2)	54.6 (53.0 – 56.3)

* estimates should be interpreted with caution due to a high sampling variability

Drug abuse can be caused by prescribed or illicit drugs. Peterborough has five methadone treatment centres which is considered high in number relative to its population. The Peterborough Regional Health Centre offers a Neonatal Abstinence Syndrome program. Education and support is provided to pregnant and mothers who are taking or took methadone or other drugs. After birth, support is provided to mothers and their babies while baby is hospitalized and prepares for the transition home and follow-up care.

Marijuana is the most widely used illicit drug by pregnant women. Prenatal exposure can result in attention deficit hyperactivity disorder (ADHD), learning disabilities, and memory impairment in babies (Psychoyos & Vinod, 2013) (Brown & Graves, 2013).

A significantly greater proportion of Peterborough women of reproductive age have used illicit drugs at least once in their lives – including one-time use cannabis or hashish (THC) – compared to Ontario women (64.7% and 41.2%, respectively; Table 5). Similarly, *excluding* one-time THC use, a greater proportion of Peterborough women used illicit drugs at least once in their lifetime compared to Ontario. The proportion of women using illicit substances in the past 12 months is significantly smaller than lifetime use; however, approximately one out of six Peterborough women of reproductive age report using an illicit substance in the past year (including *and* excluding one-time THC use).

Table 5. Patterns of illicit drug use among women 15 to 49 years of age, Peterborough and Ontario; 2009/10

	Peterborough % (95%CI)	Ontario % (95%CI)
Lifetime use (incl. one-time THC)	64.7 (56.4 – 72.2)	41.2 (39.6 – 42.8)
Lifetime use (excl. one-time THC)	56.3 (47.2 – 65.1)	33.0 (31.5 – 34.6)
Past year use (incl. one-time THC)	16.0 (8.3 – 28.5)	12.4 (11.5 – 13.3)
Past year use (excl. one-time THC)	15.4 (8.0 – 27.8)	11.6 (10.7 – 12.6)

For the *fiscal* years 2008 to 2012, there were 64 hospitalizations of infants (zero to 28 days old) affected by maternal drug use (average: 13). Due to small counts of hospitalizations, the rate varies considerably during this time between approximately 7.5 hospitalizations per 1,000 live births in 2009 and 14.7 hospitalizations per 1,000 in 2011. However, during this time frame, the rates for hospitalizations for infants affected by maternal drug use were an average of 1.9 times greater than Ontario.

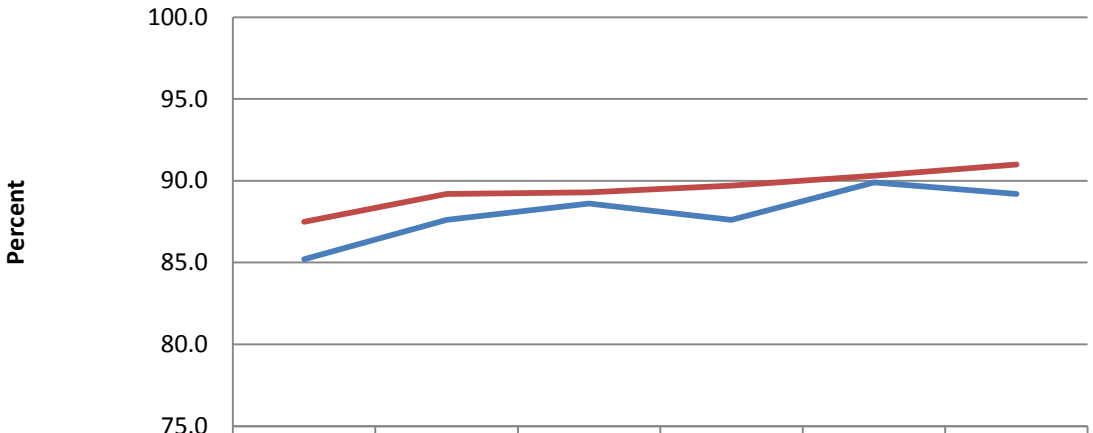
Intention to Breastfeed

Breastfeeding is best for babies and mothers. For babies, breastfeeding promotes optimal health, growth and cognitive development, and immunity (Public Health Agency of Canada, 2008 Edition) (Best Start: Ontario's Maternal Newborn and Early Child Development Resource Centre, no date). It also offers a protective role in childhood and youth overweight and obesity (Public Health Ontario, September 2013). The benefits for mothers are the promotion of bonding; reduction of the chance of postpartum bleeding; delay in ovulation; protection against osteoporosis; and lowering the risk of developing breast, uterine, and ovarian cancers (Public Health Agency of Canada, 2008 Edition) (Best Start: Ontario's Maternal Newborn and Early Child Development Resource Centre, no date).

The Public Health Agency of Canada, Health Canada, the Canadian Paediatric Society and the Dietitians of Canada recommend exclusive breastfeeding for the first six months after birth for healthy term infants, with the introduction of complementary foods and continued breastfeeding for up to two years of age and beyond. This is consistent with practices endorsed by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF). Exclusive breastfeeding is defined as breastfeeding with no other liquid or solids given to the infant.

Almost half of women make their infant feeding decision before pregnancy and half make their decision during pregnancy (Breastfeeding Committee for Canada, 2002). Prenatal breastfeeding education positively impacts initiation and duration rates, especially for women who have no previous breastfeeding experience. PCCHU's adult and teen prenatal education series offer a class on the topic of breastfeeding, to ensure families have the information they need to make an informed decision about infant feeding. Families are supported in whatever choice they make.

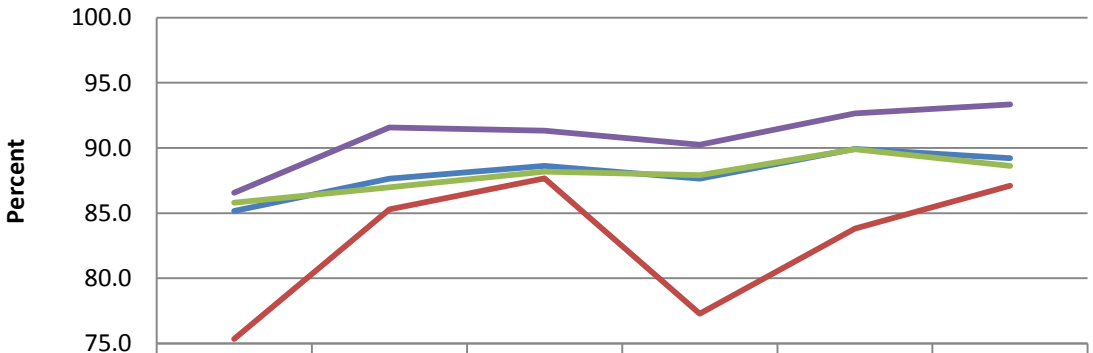
Data from BORN suggest that since 2005, the proportion of Peterborough women reporting the intention to breastfeed at discharge from hospital has increased from 85.2% to 89.2% in 2010 (Figure 15). While local rates are slightly lower than the province, they are following the same upward trend. Women between the ages of 35 to 44 reported the highest rates of intention to breastfeed and in 2010 nearly all women in this age group reported their intent to breastfeed at 93.3% (Figure 16). Women under the age of 20 were the least likely to report the intention to breastfeed though recent data suggests nearly one in ten (87.1%) had the intention to breastfeed in 2010.



	2005	2006	2007	2008	2009	2010
Peterborough	85.2 *	87.6	88.6	87.6	89.9	89.2
Ontario	87.5	89.2	89.3	89.7	90.3	91.0

Figure 15. Proportion of women who intended to breastfeed, Ontario and Peterborough; 2005-2010

* estimates should be interpreted with caution due to a high proportion of missing data (ten percent or more)



	2005	2006	2007	2008	2009	2010
Total	85.2	87.6	88.6	87.6	89.9	89.2
< 20	75.3	85.3	87.7	77.3	83.8	87.1
20 - 34	85.8*	87.0	88.2	87.9	89.9	88.6
35 - 44	86.6	91.6	91.3	90.2	92.6	93.3

Figure 16. Proportion of women who intended to breastfeed by age group, Peterborough; 2005-2010

* estimates should be interpreted with caution due to a high proportion of missing data (ten percent or more)

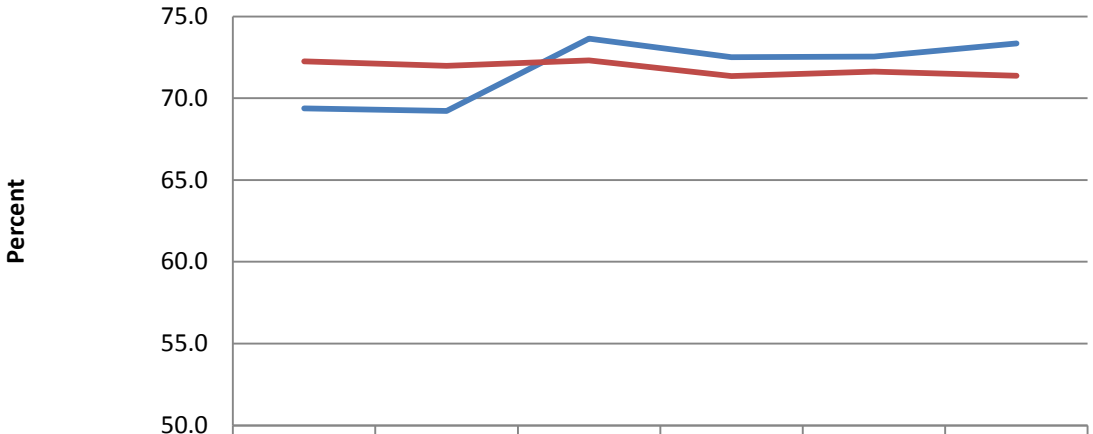
REPRODUCTIVE OUTCOMES

The majority of babies born to Peterborough women are healthy; however, there are various birth and infant outcomes that can have negative consequences.

Delivery

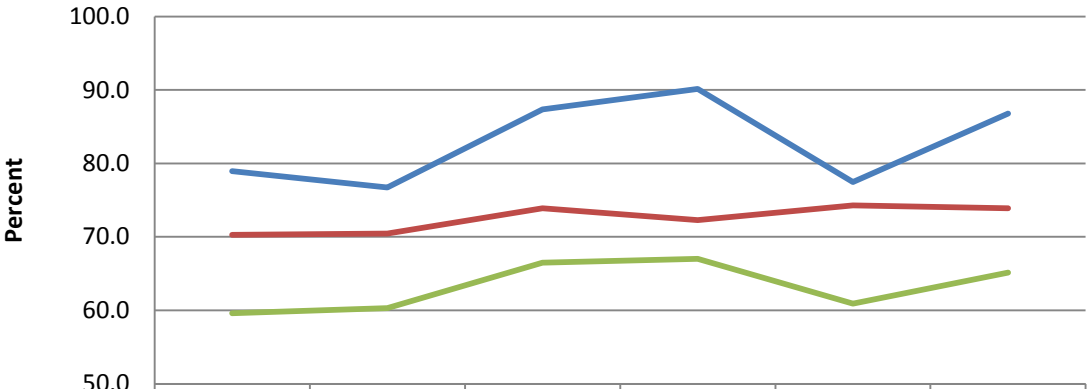
During natural and normal childbirth, the baby is born head-first through the birth canal (vagina). Medical interventions are not used during natural childbirth but are used during normal childbirth. There are many benefits of a natural birth for women and their babies. These are: no surgery and therefore no risks of associated complications, reduced risk of injury and infections, faster recovery and a shorter hospital stay, increased confidence, and reduced stress (The Society of Obstetricians and Gynaecologists of Canada)

The majority (73.4%) of babies born in Peterborough in 2010 were delivered vaginally (Figure 17). This proportion of vaginal births has increased slightly since 2005 in Peterborough and between 2007 and 2010 was relatively consistent. By contrast, in Ontario, the proportion of babies delivered vaginally decreased slightly from 72.3% in 2005 to 71.4% in 2010. A larger proportion of younger mothers under the age of 20 gave birth vaginally compared to other age groups in Peterborough (Figure 18). In 2010, 86.8% of babies born to mothers under the age of 20 were delivered vaginally, compared to 73.9% among women aged 20 to 34 and 65.1% among women age 35 to 44 years of age. There have generally been increases in the proportion of vaginal births across age groups in Peterborough whereas in Ontario, the proportion of vaginal births among women aged 35 to 44 has decreased since 2005 (Figure 19).



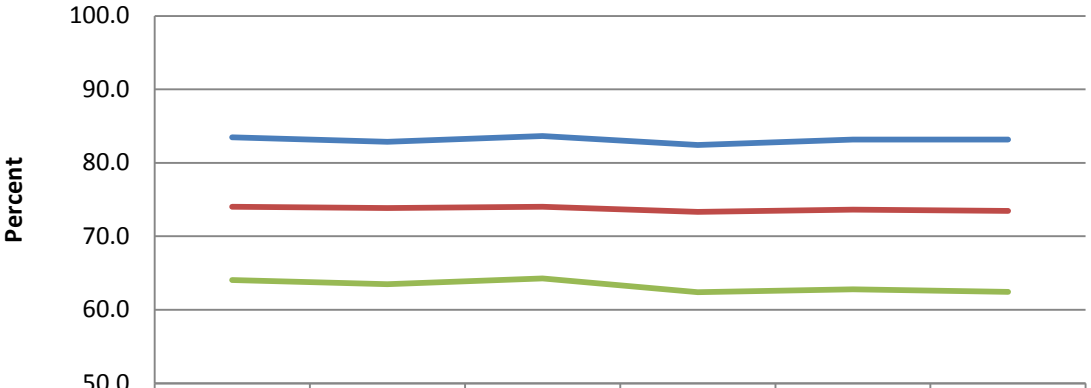
	2005	2006	2007	2008	2009	2010
Peterborough	69.4	69.2	73.6	72.5	72.5	73.4
Ontario	72.3	72.0	72.3	71.3	71.6	71.4

Figure 17. Proportion of vaginal births, Peterborough and Ontario; 2005-2010



	2005	2006	2007	2008	2009	2010
< 20	78.9	76.7	87.3	90.1	77.5	86.8
20 - 34	70.3	70.5	73.9	72.3	74.3	73.9
35 - 44	59.6	60.3	66.5	67.0	60.9	65.1

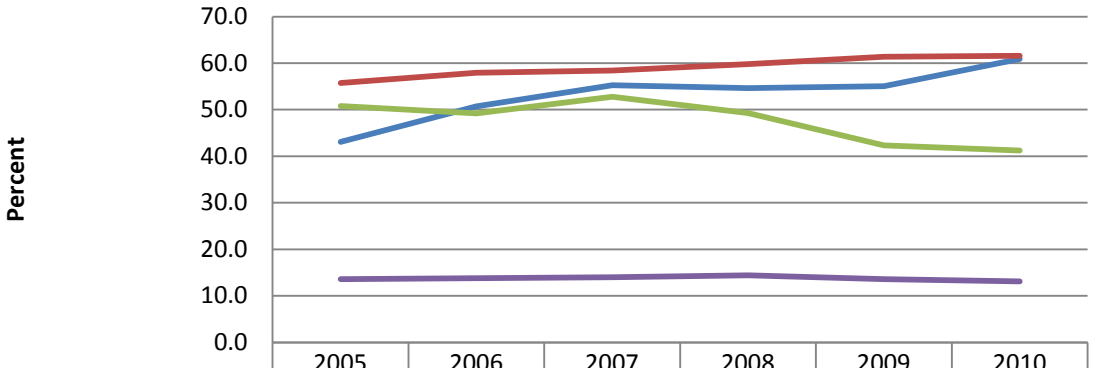
Figure 18. Proportion of vaginal births by age group, Peterborough; 2005-2010



	2005	2006	2007	2008	2009	2010
< 20	83.5	82.9	83.6	82.4	83.2	83.2
20 - 34	74.0	73.9	74.0	73.3	73.6	73.5
35 - 44	64.0	63.5	64.3	62.4	62.8	62.5

Figure 19. Proportion of vaginal births by age group, Ontario; 2005-2010

In 2010, among Peterborough women who delivered their babies vaginally, nearly two thirds (60.9%) received epidural or spinal (E/S) anesthesia for pain management during labour, an increase from 43.1% in 2005 (Figure 20). Similarly, the proportion of Ontario women who received E/S for pain management increased during this time frame, though not at the same rate as Peterborough. While the use of E/S has increased, the proportion of Peterborough women using narcotics for pain management during vaginal labour has decreased: in 2005, 50.8% of women received narcotics compared to 41.3% in 2010. By comparison, only 13.9% of Ontario women received narcotics in 2005 compared to 13.1% in 2010.

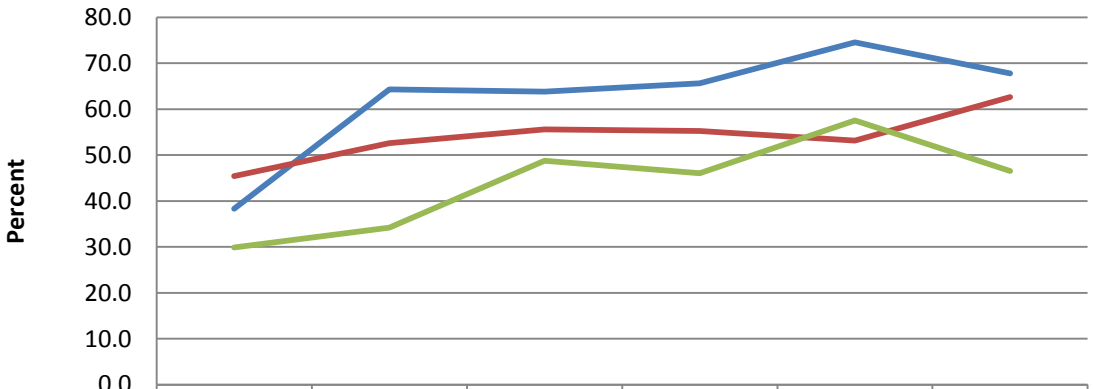


	2005	2006	2007	2008	2009	2010
PCCHU E/S	43.1	50.7	55.3	54.7	55.0	60.9
Ontario E/S	55.7	57.9	58.4	59.8	61.4	61.6
PCCHU Narcotics	50.8	49.2	52.8	49.3	42.3	41.3
Ontario Narcotics	13.6	13.8	14.0	14.4	13.6	13.1

Figure 20. Proportion of women receiving E/S or narcotics for pain management during vaginal labour, Peterborough and Ontario; 2005-2010

ON: Ontario; PCCHU: Peterborough County-City Health Unit catchment area

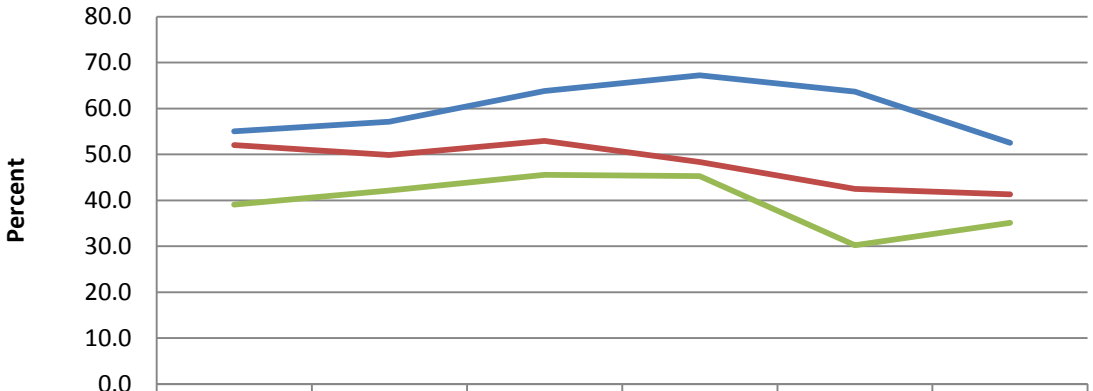
A greater proportion of mothers under the age of 20 received an E/S for pain management compared to other age groups: in 2010, 67.8% of women under the age of 20 received E/S for pain management compared to 62.6% of women aged 20 to 34, and 46.5% of women between the ages of 35 and 44 (Figure 21). In addition, between 2005 and 2010, the largest increase in E/S use occurred among mothers under the age of 20: there was a 29.5% increase in E/S use among young mothers compared to 17.2% and 16.6% increase in women aged 20 to 34 and 25 to 44, respectively. In Ontario, the trends are similar, though the rates of increase are much smaller (not shown).



	2005	2006	2007	2008	2009	2010
< 20	38.3	64.3	63.8	65.6	74.5	67.8
20 - 34	45.4	52.6	55.6	55.2	53.2	62.6
35 - 44	29.9	34.2	48.8	46.0	57.5	46.5

Figure 21. Proportion of women receiving E/S for pain management during vaginal labour by age group, Peterborough; 2005-2010

Narcotics used for pain management during vaginal labour increased among young mothers (under 20) between 2005 and 2008 before declining to 52.5% in 2010 (Figure 22). Also, a larger proportion of young mothers under the age 20 received narcotics for pain compared to other age groups.



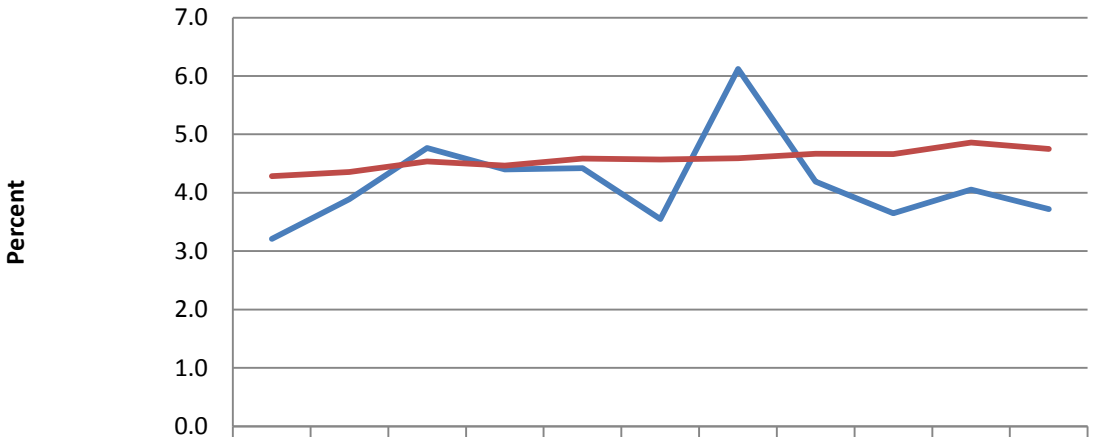
	2005	2006	2007	2008	2009	2010
< 20	55.0	57.1	63.8	67.2	63.6	52.5
20 - 34	52.0	49.8	52.9	48.4	42.5	41.3
35 - 44	39.1	42.1	45.5	45.2	30.2	35.1

Figure 22. Proportion of women receiving narcotics for pain management during vaginal labour by age group, Peterborough; 2005-2010

Low Birth Weight

A low birth weight (LBW) baby is defined as a baby that is less than 2,500 grams at birth or five pounds eight ounces. A baby's weight at birth is the most important determinant of perinatal, neonatal, and post-neonatal outcomes (Ohlsson & Shah, 2008). A baby born prematurely and/or small for gestational age could be LBW. LBW babies have a greater risk for poor neurological and developmental outcomes. These babies can have learning disabilities, poor cognitive development, delayed motor and social development, childhood illnesses, and be re-admitted to hospital for health problems (Heidiger, Overpeck, Ruan, & Troendle, 2002). The modifiable risk factors to prevent LBW babies include: smoking while pregnant, poor health and nutrition, substance abuse, social factors, maternal infection, maternal hypertension, and poor access to prenatal care (Canadian Institute for Health Information, 2009).

In Peterborough, 4.2% of singleton babies born between 2001 and 2011 were LBW (Figure 23). The proportion of LBW babies was relatively consistent over this time frame except for a peak in 2007 of 6.1%, but has since decreased to 3.7% in 2011. By comparison, the proportion of LBW babies in Ontario was 4.6% during this time frame and increased slightly by 0.4% between 2001 and 2011.



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Peterborough	3.2	3.9	4.8	4.4	4.4	3.6	6.1	4.2	3.6	4.1	3.7
Ontario	4.3	4.4	4.5	4.5	4.6	4.6	4.6	4.7	4.7	4.9	4.7

Figure 23. Proportion of LBW singletons, Peterborough and Ontario; 2001-2011

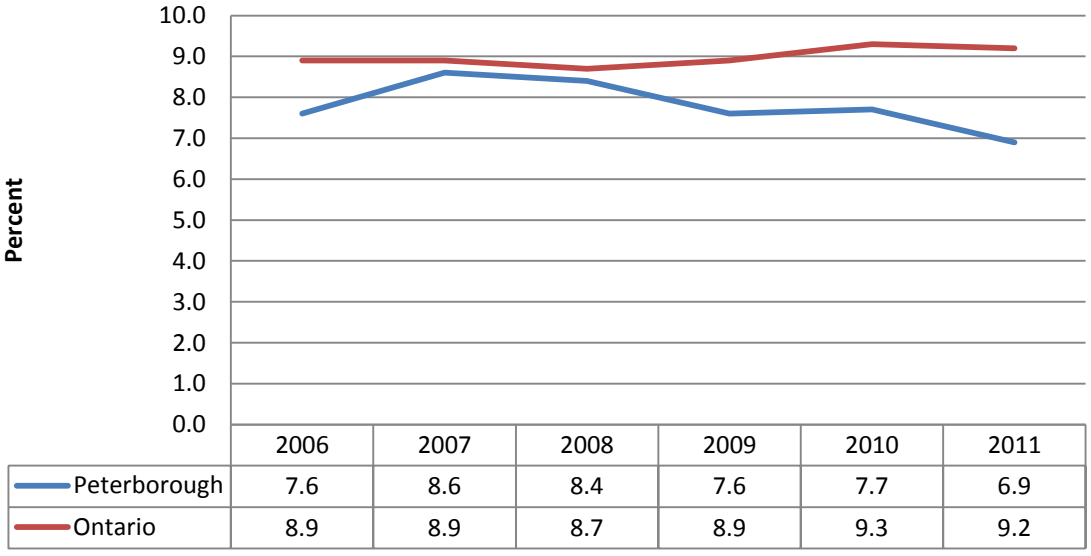
Babies born to women under the age of 20 are at greater risk of being LBW at birth: between 2001 and 2011, 6.4% of babies born to mothers under the age of 20 were LBW (
Table 6). Additionally, 5.5% of babies born to women between the ages of 20 and 24 were LBW. By comparison, only 3.1% and 3.7% of babies born to women between the ages of 30 and 34 and those 35 to 39 were LBW. In Ontario, 6.1% of babies born to mothers under the age of 20 and 5.1% of babies born to women between the ages of 20 to 24 were LBW.

Table 6. Proportion of LBW babies by maternal age group, Peterborough; 2001-2011

Maternal Age	15-19	20-24	25-29	30-34	35-39	40-44
Peterborough	6.4	5.5	4.3	3.1	3.7	4.1
Ontario	6.1	5.1	4.3	4.1	4.8	6.5

Small for Gestational Age

Another means to determine if babies are being born underweight is to determine if they are small for their gestational age (SGA). At any point during pregnancy, a fetus will be within a predictable weight range and the smallest ten percent of live birth singletons are considered SGA. Risk factors for SGA are low pre-pregnancy body mass index, low weight gain during pregnancy, reporting life as "very stressful" (Heaman, Kingston, & Chalmers, 2013), smoking during pregnancy, using cocaine while pregnant, pre-eclampsia and gestational hypertension (McCowan & Horgan, 2009). In Peterborough an average of 7.8% of babies were SGA for the years 2006 through 2011 (Figure 24). Similar to LBW, the proportion of SGA babies in Peterborough has been decreasing since a peak in 2007 when 8.6% of babies were SGA compared to 6.9% in 2011. By comparison, the proportion of SGA babies in Ontario has increased slightly from a low of 8.7% in 2008 to 9.2% in 2011. Data from BORN (not shown) indicate that SGA babies were more common among younger mothers, with 11.8% SGA babies born to women under the age of 20 in 2010.



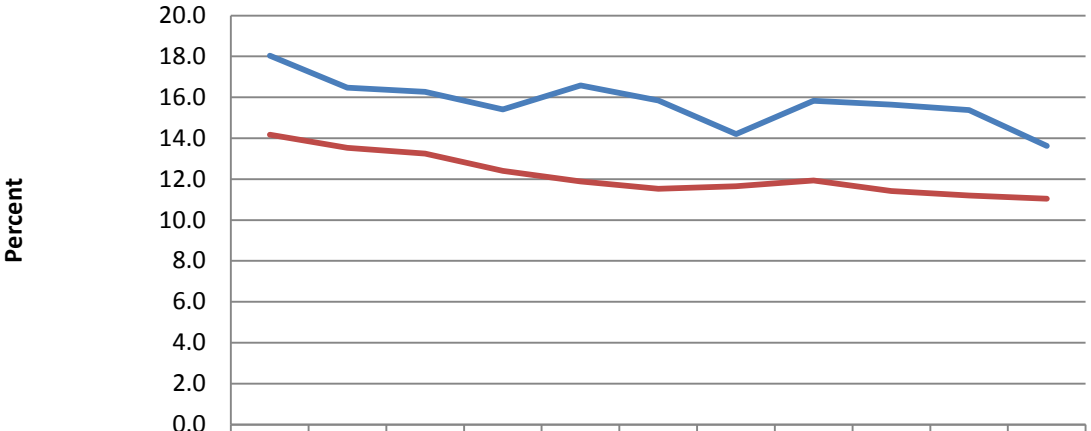
	2006	2007	2008	2009	2010	2011
Peterborough	7.6	8.6	8.4	7.6	7.7	6.9
Ontario	8.9	8.9	8.7	8.9	9.3	9.2

Figure 24. Proportion of SGA babies, Peterborough and Ontario; 2006-2011

High Birth Weight

A high birth weight (HBW) baby is considered more than 4,000 grams or greater than 8 pounds which can have adverse consequences for both mother and baby, such as birth trauma or fetal asphyxia. A baby born at a gestational age of 42 or more weeks or large for gestational age could be HBW. Infants born with a HBW may be at an increased risk of childhood obesity, increased blood pressure, high blood sugar, and diabetes later in life (Mayo Clinic). Risk factors for having a baby of HBW include maternal diabetes, maternal obesity, maternal age greater than 35, excessive weight gain during pregnancy, previous pregnancies, and an overdue pregnancy (Mayo Clinic)

Between 2001 and 2011 in Peterborough, 15.7% of the singleton babies were born with a HBW. While the proportion of babies born with a HBW has been decreasing since 2001 in Peterborough, it has been consistently higher than the province (Figure 25).



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Peterborough	18.0	16.5	16.3	15.4	16.6	15.8	14.2	15.8	15.6	15.4	13.6
Ontario	14.2	13.5	13.2	12.4	11.9	11.5	11.7	11.9	11.4	11.2	11.0

Figure 25. Proportion of singleton HBW babies, Peterborough and Ontario; 2001-2011

Women in their 30's delivered the highest proportion of singleton babies over 4,000 grams: 17.5% of births to women between the ages of 30 and 34 and 18.4% of births to women aged 35 to 39 were HBW (Table 7). However, only 9.0% of singleton births among mothers under the age of 20 were HBW. Patterns were similar in the province; however across all age groups the proportion of HBW babies was smaller.

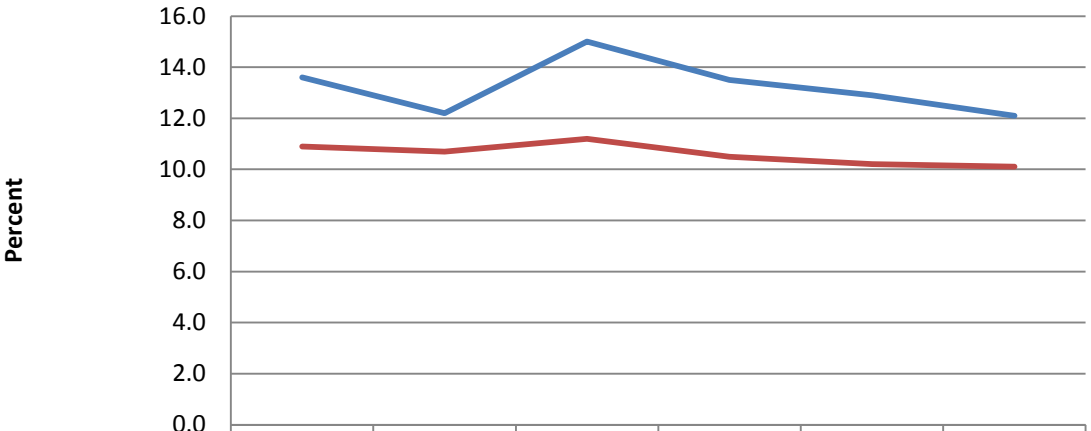
Table 7. Proportion of HBW babies by maternal age group, Peterborough; 2001-2011

Maternal Age	15-19	20-24	25-29	30-34	35-39	40-44
Peterborough	9.0	12.8	15.6	17.5	18.4	16.4
Ontario	10.0	10.6	11.9	12.9	13.0	12.3

Large for Gestational Age

Similar to SGA, the largest ten percent of live birth singletons are considered large for gestational age (LGA). In Peterborough, 13.2% of babies were LGA for the years 2006 through 2011. Like HBW, the proportion of LGA babies in Peterborough has been decreasing since a peak during 2008, when 15.0% of babies were LGA compared to 12.1% in 2011 (Figure 26). The proportion of LGA babies in Ontario has decreased slightly between 2006 and 2011 and has been

consistently lower than Peterborough. Data from BORN indicate LGA babies were more common among older mothers, with 14.9% LGA babies born to women 35 years of age and older in 2010 (not shown).



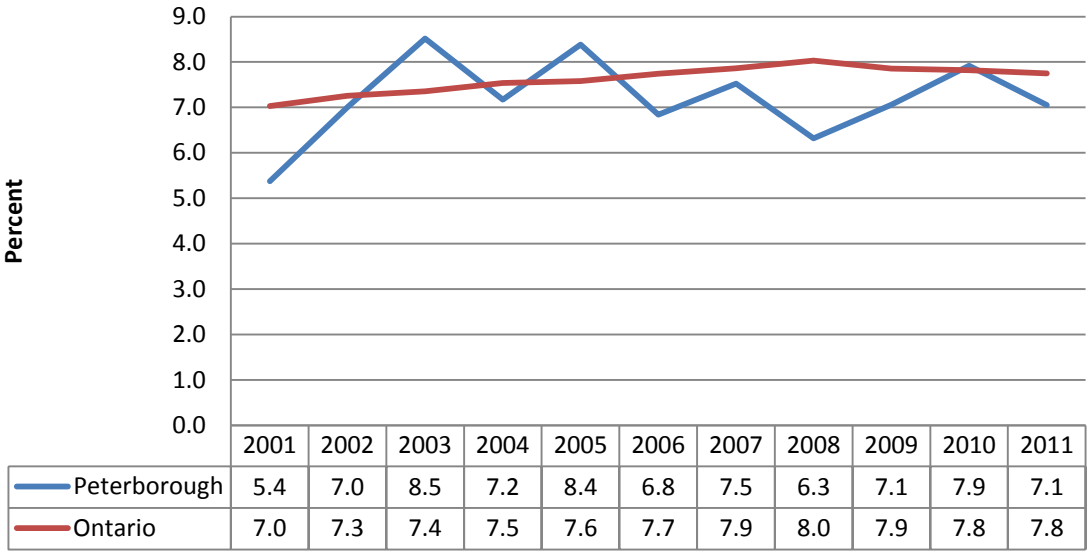
	2006	2007	2008	2009	2010	2011
Peterborough	13.6	12.2	15.0	13.5	12.9	12.1
Ontario	10.9	10.7	11.2	10.5	10.2	10.1

Figure 26. Proportion of LGA babies, Peterborough and Ontario; 2006-2011

Preterm Births

A preterm birth is the birth of an infant prior to 37 weeks of pregnancy. Preterm labour is one of the most common problems in pregnancy. It is the cause of 75% of all newborn deaths in babies born without birth defects (The Society of Obstetricians and Gynaecologists of Canada). Generally, the earlier a baby is born the greater the chances of problems. Infants born early are more likely to experience short and long-term neurological, health, behavioural, and psychosocial problems. The causes of preterm births are numerous and are not clearly understood. There are many factors that are associated with preterm births: tobacco and alcohol use; substance abuse; late prenatal care; stress; poor nutrition; physical or emotional abuse; previous premature birth; pregnancy with twins, triplets or other multiples; an interval of less than six months between pregnancies; conception through in vitro fertilization; problems with the uterus, cervix or placenta; some infections (particularly of the amniotic fluid and lower genital tract); some chronic conditions, such as high blood pressure and diabetes; being underweight or overweight before pregnancy; having a younger or older maternal age; iatrogenic causes, i.e., induction of labour; and low maternal income or socioeconomic status (Mayo Clinic) (Centers for Disease Control). Some of these are modifiable risk factors. The risks can be reduced by not smoking, drinking or using drugs if pregnant; eating properly; reducing stress; knowing the signs of premature labour; and accessing prenatal health care.

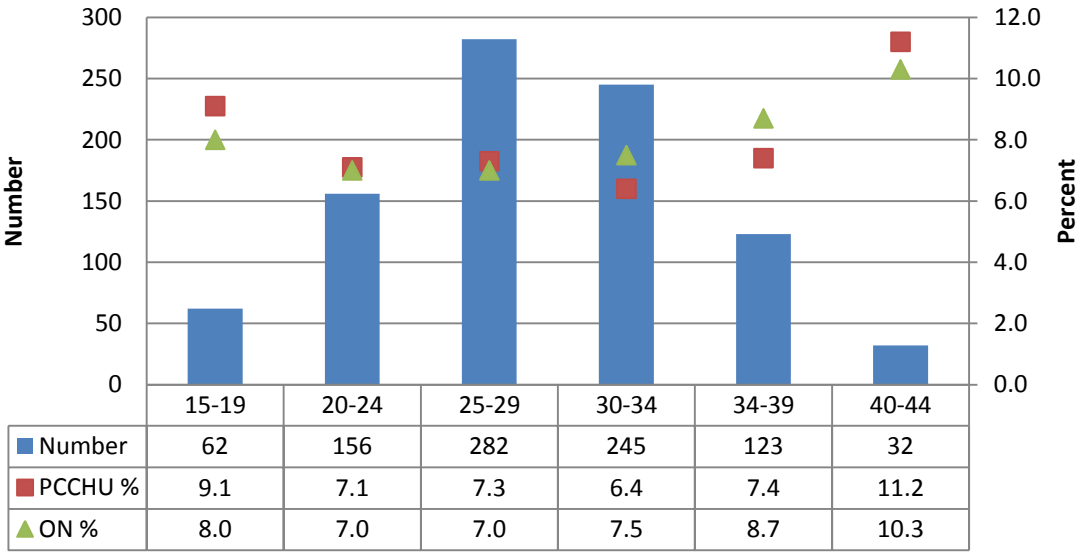
Between 2001 and 2011, there were 902 preterm births in Peterborough with an average of 82 per year. Preterm babies accounted for 7.2% of live births in Peterborough compared to 7.6% in Ontario during this time frame. While the proportion of preterm births in Peterborough has been relatively consistent since 2002, the proportion of preterm babies in the province increased slightly from 7.0% in 2001 to 7.8% in 2011 (Figure 27).



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Peterborough	5.4	7.0	8.5	7.2	8.4	6.8	7.5	6.3	7.1	7.9	7.1
Ontario	7.0	7.3	7.4	7.5	7.6	7.7	7.9	8.0	7.9	7.8	7.8

Figure 27. Proportion of preterm live births, Peterborough and Ontario; 2001-2011

Women between the ages of 25 and 29 and those aged 30 to 34 accounted for 31.3% and 27.2% of all preterm births in Peterborough between 2001 and 2011. In Ontario, these age groups make up 26.3% and 33.3% of all preterm births, respectively. However, despite accounting for the largest proportions of all preterm births in Peterborough, only 7.3% and 6.4% of all live births among women 25 to 29 and those 30 to 34 were preterm during this time frame (Figure 28). Similarly, 7.0% and 7.5% of births among women in these age cohorts in Ontario were preterm. Women under the age of 20 and those between the ages of 40 and 44 had the largest proportion of preterm births in Peterborough at 9.1% and 11.2%, respectively.



	15-19	20-24	25-29	30-34	34-39	40-44
Number	62	156	282	245	123	32
PCCHU %	9.1	7.1	7.3	6.4	7.4	11.2
ON %	8.0	7.0	7.0	7.5	8.7	10.3

Figure 28. Number and proportion of preterm births by age group, Peterborough and Ontario, 2001-2011

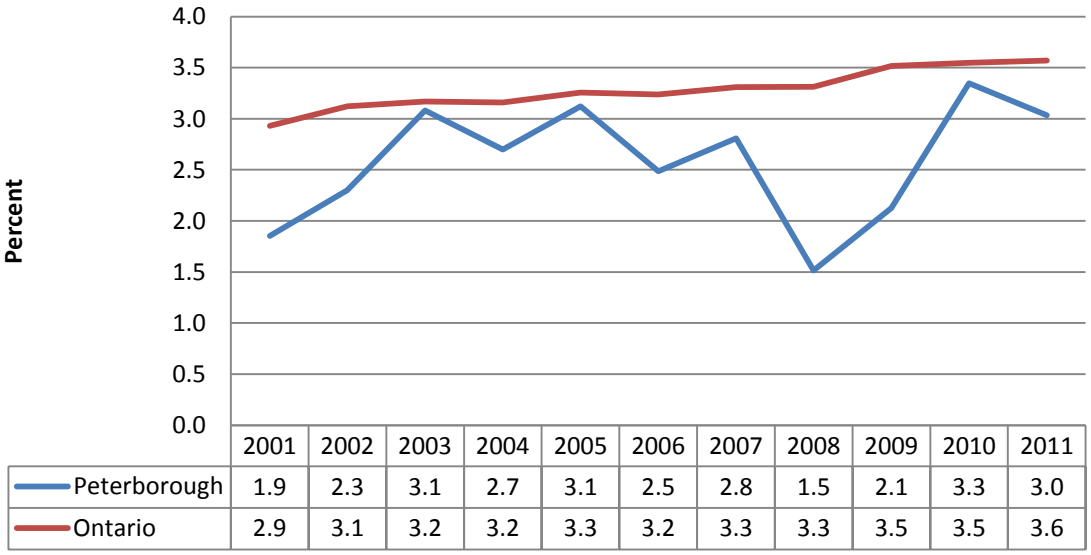
ON: Ontario; PCCHU: Peterborough County-City Health Unit catchment area

Multiple Births

While most multiple pregnancies result in healthy babies, there are more risks associated with multiple pregnancies. The risks to mothers are gestational diabetes, hypertension, pre-eclampsia, preterm labour, early and late miscarriages,

the need for a caesarean delivery, hemorrhage, and anemia (Government of Canada) (Enkin, Keirse, Neilson, Crowther, & Duley, 2000) (Lee, Cleary-Goldman, & D'Alton, 2006). Infants are more likely to be born prematurely and to have low birth weights. They are more at risk of neonatal mortality, developmental disabilities, and severe and lifelong special needs (Enkin, Keirse, Neilson, Crowther, & Duley, 2000) (Lee, Cleary-Goldman, & D'Alton, 2006). Families of multiple birth children face increased physical, financial, and psycho-social stresses (Government of Canada) (Enkin, Keirse, Neilson, Crowther, & Duley, 2000) (Lee, Cleary-Goldman, & D'Alton, 2006). Increases in the multiple birth rate reflects older mothers giving birth and the increased use of assisted reproductive technology (The Society of Obstetricians and Gynaecologists of Canada).

The proportion of multiple live births increased in Peterborough from 1.9% in 2001 to 3.0% in 2011 (Figure 29). Similarly, the proportion of multiple live births has also being increasing in Ontario over the same time frame from 2.9% to 3.6%. The most common type of multiple in Peterborough was twins, accounting for 92.6% (n=300) of all multiple live births between 2001 and 2011. In Ontario, twins also accounted for the largest proportion of all multiple live births (95.3%).



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Peterborough	1.9	2.3	3.1	2.7	3.1	2.5	2.8	1.5	2.1	3.3	3.0
Ontario	2.9	3.1	3.2	3.2	3.3	3.2	3.3	3.3	3.5	3.5	3.6

Figure 29. Proportion of multiple live births, Peterborough and Ontario; 2001-2011

Infant Mortality

Infant mortality rate is defined as the number of deaths of live born babies in the first year after birth (Public Health Agency of Canada, 2011). The leading causes are immaturity, congenital anomalies, and asphyxia (Public Health Agency of Canada, 2011).

In Peterborough, between 2000 and 2009, there were 52 deaths reported in infants less than one year of age. The most frequent cause of infant death in Peterborough was from conditions originating in the perinatal period, accounting for 50.0% of infant deaths. These are conditions that have their origin in the perinatal period even though death or morbidity can occur later, such as birth trauma, or the fetus and newborn affected by maternal factors and by complications of pregnancy, labour, and delivery. Similarly, perinatal conditions were the most frequent cause of death among infants under the age of one in Ontario at 58.3% – most of these were due to extremely LBW (13.8%) and extreme immaturity or premature birth (9.1%).

Congenital anomalies were the second leading cause of death to infants in Peterborough (32.7%) and the third being ill-defined conditions (15.5%). A smaller proportion of infant mortality in the province was due to these factors: congenital anomalies accounted for 22.9% of infant deaths and 7.8% were due to ill-defined conditions. Among congenital

conditions resulting in infant death in Peterborough, congenital malformations of the circulatory system were the most common (41.2%); in Ontario, malformations of the circulatory system accounted for 30.4% of all deaths due to congenital conditions.

Congenital Anomalies

Congenital anomalies (CAs), birth defects and congenital malformations are terms that describe an abnormality of structure, function or body metabolism that is present at birth (even if not diagnosed until later in life). CAs can result in physical or mental disability and/or death. In spite of the frequency of CAs, the underlying causes for most (40%-60%) remain unknown. It has been estimated that around 15%-25% are due to recognized genetic conditions, 8%-12% are due to environmental factors, and 20%-25% are due to multiple factors (Health Canada, 2002). The most commonly recognized CAs is Down Syndrome (DS), neural tube defects (NTDs), and orofacial clefts (Public Health Agency of Canada, 2008 Edition).

Between 2000 and 2010, 529 babies in Peterborough were identified as having a CA or 428.0 babies per 10,000 live births (Table 8). In total, because babies can have more than one anomaly, 764 anomalies were identified during this time frame (618.1 anomalies per 10,000 births). The most common anomalies identified were congenital heart defects which occurred in 175 babies or at a rate of 141.6 babies per 10,000 live births. Among congenital heart defects, atrial septal defects occurred most frequently (89 or 72.0 per 10,000). Musculoskeletal anomalies were also relatively common, occurring among 147 babies born between 2000 and 2010 (118.9 babies per 10,000). The most frequently identified musculoskeletal anomaly was club foot (35 or 24.3 per 10,000).

The rate of babies born with CAs in Ontario between 2000 and 2010 was significantly lower than Peterborough; similarly, the total anomaly rate was also statistically significantly lower. Musculoskeletal and congenital heart defects were also the most commonly identified congenital anomalies in Ontario (110.0 per 10,000 and 98.6 per 10,000, respectively). While rates of anomalies by site were lower in Ontario than Peterborough between 2000 and 2010, only the rate of congenital heart defects was statistically significantly smaller.

Table 8. Number of babies with a congenital anomaly by site, Peterborough and Ontario; 2000-2010

	Peterborough		Ontario	
Anomaly Site/System	Number	Rate (per 10,000)	Number	Rate (per 10,000)
Total cases	529	428.0	58,182	385.9*
Total anomalies	764	618.1	78,768	522.5*
Central nervous system	35	28.3	3,830	25.4
Eye	†	†	647	4.3
Ear, face and neck	13	10.5	2,009	13.3
Congenital heart defects	175	141.6	14,869	98.6*
Circulatory system	36	29.1	4,152	27.5
Respiratory system	12	9.7	1,374	9.1
Cleft lip/palate	18	14.6	2,148	14.2
Digestive system	47	38.0	4,595	30.5
Genital organ anomalies	62	50.2	5,790	38.4

Urinary system	57	46.1	8,296	55.0
Musculoskeletal system	147	118.9	16,590	110.0
Anomalies of integument	5	4.0	792	5.3
Down syndrome	21	17.0	2,128	14.1
Other chromosomal anomalies	9	7.3	1,148	7.6
Other and unspecified	28	22.7	3,042	20.2

* significantly different
† suppressed due to small counts
Note: counts by site/system will not add to the total number of cases because a baby can only appear once in a category (e.g., digestive system anomalies) but is included in every category in which it has an anomaly.

In Peterborough, 21 babies were born with DS between 2000 and 2010 (17.0 per 10,000). DS, also known as Trisomy 21, is characterized by an extra copy of chromosome 21. This chromosomal abnormality is typified by clinical distinctive features, including: developmental delay; characteristic facial features; and associated health problems such as heart defects, increased infection, and vision and hearing problems (Health Canada, 2002). The risk of having a baby with DS increases with a woman's age.

Between 2000 and 2010, six babies were born with spina bifida in Peterborough, resulting in a rate of 4.9 babies per 10,000 live births. Spina bifida is a NTD. There has been a decrease in the rates of NTDs in Canada since the fortification of flour and other cereal grain products with folic acid, which became mandatory in 1998 (Public Health Agency of Canada, 2008 Edition).

Stillbirths

Stillbirths refer to infants who do not breathe or show other signs of life at delivery, with death occurring before or during delivery. A stillbirth is defined as 20 or more weeks' gestation or a fetal weight of 500 grams. Between 2001 and 2011, there were a total of 85 stillbirths in Peterborough, with an average of eight per year. The risk factors for stillbirths are maternal obesity, smoking, pre-existing diabetes, history of mental health problems, and fetal growth restriction (Gardosi, Madurasinghe, Williams, Malik, & Francis, 2013). These are modifiable risk factors which are important from a public health perspective.

Acquired Congenital Infections

Congenital infections can happen when a pregnant woman is infected with a communicable disease and passes it to her baby during pregnancy or birth. Congenital infections monitored by public health include Human Immunodeficiency Virus, hepatitis B and C, neonatal herpes, chlamydia, gonorrhea, cytomegalovirus (CMV), syphilis, neonatal Group B streptococcus (GBS), and congenital rubella syndrome (CRS). Between 2005 and 2012, there were 11 cases of infections that occurred among infants under the age of one. Most (6 or 54.5%) of the infections were GBS which is a leading cause of neonatal sepsis and meningitis. Babies can be protected from GBS, by mothers being screened and given antibiotics prior to delivery. Other confirmed infections included neonatal herpes, hepatitis C, chicken pox, and chlamydia.

Vaccinations and screening tests where applicable, before and during pregnancy can prevent infections among women and their unborn babies.

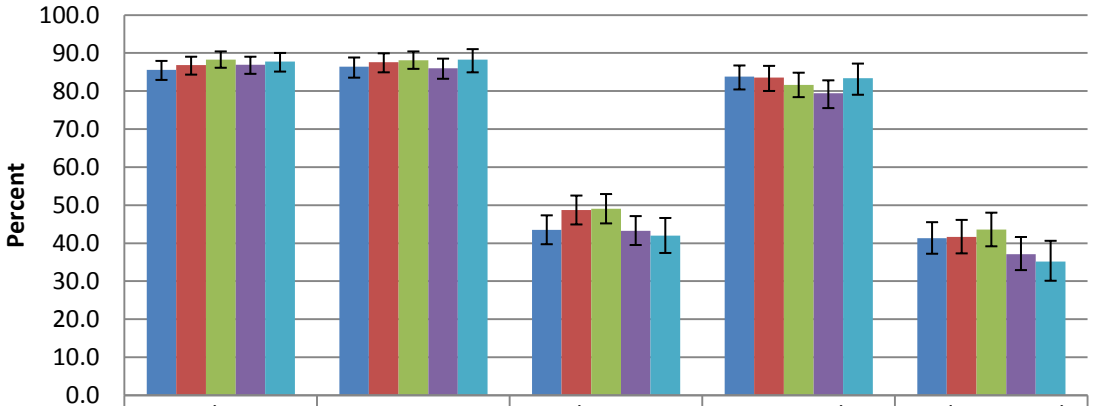
Breastfeeding

The World Health Organization (WHO), Health Canada, Public Health Agency of Canada and the Canadian Paediatric Society, all recommend exclusive breastfeeding to six months, with the introduction of complementary foods and continued breastfeeding to two years and beyond. The Ontario Public Health Standards (2008) call for an increased rate of exclusive breastfeeding until six months with continued breastfeeding until two years and beyond. The Ontario government will be establishing new initiatives to help babies get the best start in life. Starting in 2014, a 24 hour breastfeeding telephone service will provide support, advice, and referrals from Registered Nurses. Targeted support will be provided for mothers in population groups that have lower rates of breastfeeding, and hospitals will be supported in becoming Baby-Friendly Initiative® (BFI) compliant.

In 2007, PCCHU implemented a surveillance system to monitor breastfeeding up to two weeks after delivery by contacting new mothers and asking them about infant feeding habits. Data from 2008 onward was analyzed as information was not collected for the entire 2007 year. Between 2008 and 2012, the Health Unit collected data on 4,211 women. Of these women, 51.8% were between the ages of 20 and 29, and 40.8% of the women were aged 30 to 39.

The proportion of women reporting breastfeeding at hospital discharge and any breastfeeding 48 hours after hospital discharge increased between 2008 and 2012 by 2.1% and 1.8%, respectively (Figure 30). Exclusive breastfeeding at 48 hours approached 50% in 2009 and 2010, though for the remaining three years of data, the average exclusive breastfeeding rate was 42.9%. After three years of decreases in the proportion of women reporting any breastfeeding two weeks after giving birth, increases from 79.4% in 2011 to 83.4% in 2012 were seen. Finally, the proportion of women reporting exclusive breastfeeding at two weeks decreased slightly between 2011 and 2012 after a number of years of small increases. It is important to note that fluctuations from year to year across all indicators have not been statistically significantly different. These data are complemented by data from the 2009/2010 CCHS indicating that 85.1% of women aged 15 to 55 who gave birth in the past five years breastfed or tried to breastfeed their last child.

If women were not exclusively breastfeeding at the two week follow-up call they were asked to indicate reasons for feeding their infant something other than breast milk. Not having enough breast milk was the most frequently reported reason for supplementation at 34.8%



	Discharge	Any 48	Exclusive 48	Any 2 Wk	Exclusive 2 Wk
2008	85.6	86.4	43.5	83.8	41.3
2009	86.8	87.6	48.7	83.6	41.7
2010	88.3	88.1	49.0	81.6	43.6
2011	86.9	86.0	43.3	79.4	37.1
2012	87.7	88.3	42.0	83.4	35.2

Figure 30. Prevalence of breastfeeding at discharge, and any or exclusive breastfeeding at 48 hours and two weeks by year, Peterborough; 2008-2012

In addition to conducting regular surveillance, PCCHU also implemented a six month breastfeeding survey on a random sample of over 200 new mothers in 2012. At six months, two thirds (64.7%) of women indicated their baby currently received breast milk and among women who ever breastfed, 6.5% reported exclusive breastfeeding. Among those women who were *not* breastfeeding at six months, two thirds (67.7%) stopped at three months or earlier and the most common reason for stopping was not enough breast milk (58.5%).

The BFI is a best practice program for breastfeeding protection, promotion, and support, as outlined by the Breastfeeding Committee for Canada (BCC). BFI ensures that parents have accurate information allowing them to make informed decisions about infant feeding, and that adequate resources are in place to support informed decisions. All parents are supported in the decision they make, including parents who decide not to breastfeed and those who are unable to breastfeed for medical reasons. In 2008, the PCCHU achieved Baby-Friendly designation, which is valid for five years. PCCHU has completed the first phase of re-designation, and the final phase will occur in March 2014.

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