



# Reproductive Health in Halton

The Regional Municipality of Halton

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# Executive summary

The Reproductive Health in Halton Report provides a snapshot of the health and wellbeing of mothers and infants in Halton Region.

## Preconception demographics

Halton's population is aging, and the proportion of females of reproductive age in the population is decreasing. However, because Halton's population overall is also growing, the number of females of reproductive age is increasing.

## Fertility & pregnancy

From approximately 2008-2015, fertility rates and pregnancy rates decreased in both Halton and Ontario. In Milton, however, pregnancy rates and fertility rates are approximately double those in Burlington, Oakville, and Halton Hills.

Teen pregnancy rates in Halton are also on the decline. In 2015, Halton's teen pregnancy rate was less than half the provincial rate.

While overall therapeutic abortion rates in Halton have remained relatively steady, trends over time differ by age. Among younger age groups, therapeutic abortion rates have been decreasing, while rates have been increasing among older age groups.

## Healthy pregnancies

Compared to Ontario mothers, Halton mothers are less likely to smoke, misuse drugs, or report experiencing one or more mental health concerns during pregnancy. Halton mothers were also more likely to attend prenatal classes, consume folic acid supplementation during pregnancy, or have a healthy pre-pregnancy body mass index compared to Ontario mothers. Alcohol exposure during pregnancy was similar in Halton and Ontario. However, nearly half of Halton mothers gained more weight than recommended during pregnancy.

Halton parents are waiting until older ages to have children. The average age of mothers and fathers is increasing in Halton, and Halton had a greater proportion of mother's aged 35 and over who gave birth compared to Ontario.

## Birth outcomes

Each year in Halton there are approximately 5,600 live births. Halton experienced an increase in the number of infants born between 2003 and 2009, after which point the number of infants born began to decrease.

Stillbirth rates in Halton are lower than Ontario, while multiple birth rates are higher compared to Ontario. Large for gestational age rates in Halton have been decreasing, while small for gestational age rates have been increasing.

## Infant health outcomes

Infant mortality rates are lower in Halton than Ontario. Congenital anomaly and infection rates are also lower in Halton compared to Ontario. In Halton, there has been an increase in the number of mothers initiating breastfeeding with their infants, as well as an increase in breastfeeding duration and exclusive breastfeeding.

## Social determinants of health

The social determinants of health, which include the social, political, economic, and environmental conditions where Halton residents live, learn, work, and play, can have an important role in reproductive health and health outcomes. It is important to keep the social determinants of health in mind when interpreting data throughout this report and when planning reproductive health programs and services.

# Introduction

The Reproductive Health in Halton Report provides a snapshot of the health and wellbeing of mothers and infants in Halton Region. The United Nations defines reproductive health as:

*“a state of complete physical, mental and social well-being, and not merely the absence of reproductive disease or infirmity. Reproductive health deals with the reproductive processes, functions and system at all stages of life”.<sup>1</sup>*

Each year in Halton there are approximately 5,600 births. Through [HaltonParents](#)<sup>2</sup>, the Halton Region Health Department offers a variety of programs and services to support family planning and promote healthy pregnancies, births, and infants, including:

- online and classroom prenatal programs;
- breastfeeding and car seat workshops;
- the Halton Prenatal Nutrition Program;
- Healthy Babies Healthy Children, a free program offering screening to identify high risk families; information and referral services, home visiting and service coordination;
- staff availability over the phone through the Family Health Information Line to provide information about health concerns, child growth and development, or available resources;
- an active social media presence to provide reliable information and support to Halton residents along their parenting journey.

The purpose of this report is to provide data on trends, emerging issues, and priority populations to inform public health programs, services, and policies that help all women have safe and healthy pregnancies and births. This report also serves to fulfil the surveillance and health status reporting requirement of the Health Department under the Ontario Public Health Standards related to preconception health, healthy pregnancies, reproductive health outcomes, and preparation for parenting.





# Presentation of the results

## Report structure

This report is divided into five major sections. Each section of the report begins with definitions of the indicators and types of rates presented, and an explanation of the data sources used in that section of the report. Many of the indicators in the report are based on the reproductive health core indicators developed by the Association of Public Health Epidemiologists in Ontario (APHEO). These core indicators are a set of definitions used by public health professionals across Ontario.<sup>3</sup> The five sections of this report include:



### Population demographics and health

Overview of Halton's population structure and sociodemographic characteristics, including a discussion of the relationship between social determinants of health and reproductive health outcomes.



### Fertility and pregnancy

Fertility, pregnancy, and therapeutic abortion rates.



### Healthy pregnancies

Data on folic acid supplementation, maternal body mass index and weight gain, maternal mental health, substance use during pregnancy, and prenatal class attendance.



### Birth outcomes

Live and multiple birth rates, as well as data on parent age, gestational age at birth, and birth weight.



### Infant health outcomes

Infant mortality rates, congenital infection and anomaly rates, and breastfeeding rates.

## Data sources

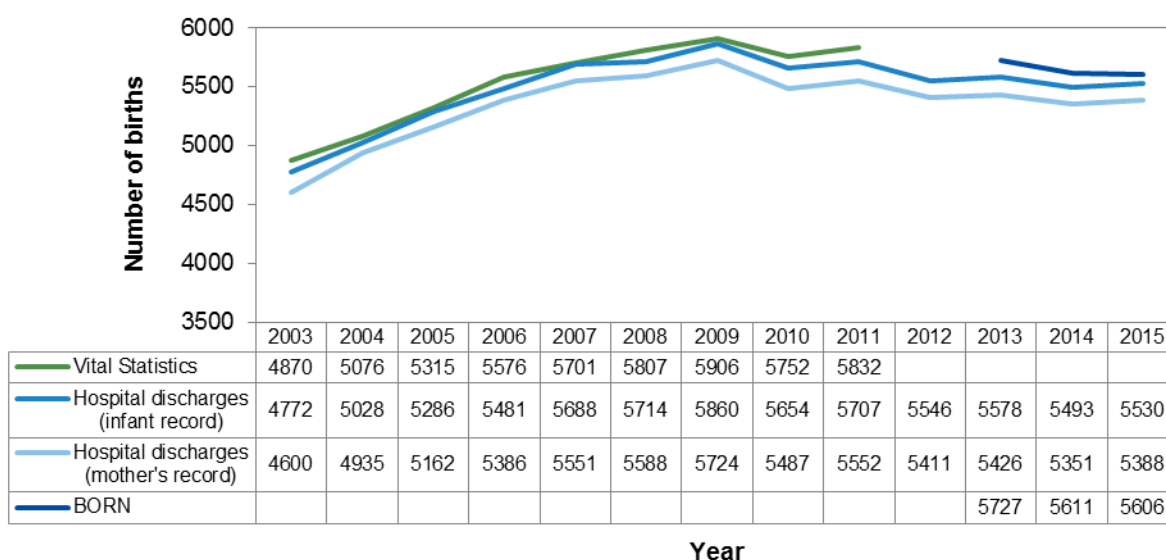
Three major reproductive health data sources were used for this report: Vital Statistics, Hospital Discharges, and the Better Outcomes Registry and Network. Each of these data sources has various strengths, weaknesses, and limitations. An important limitation to note is that little or no information on fathers is available through these data sources.

**Table 1** provides an overview of the three main data sources presented in this report. For a more detailed description, please see [Appendix – Data sources and limitations](#).

**Table 1: Summary of reproductive health data sources**

Data Source	Description
Vital Statistics	Vital Statistics birth data comes from the registration of births with the Ontario Registrar General by the attending physician or midwife, and the parent. It includes both hospital and home births. Births outside of Ontario are excluded, even if the mother is a resident of Ontario. While the Vital Statistics Birth Data provides the most complete record of the number of births, it is several years out of date.
Hospital Discharges	Hospital discharge data includes data from Ontario hospital births, but not from home births. Infant records include only live births. The mother's record captures the number of pregnancies, as they include stillbirths and count multiple births as one delivery or pregnancy. Mother's age is only available through the mother's record, therefore the mother's record is used most often in this report.
Better Outcomes Registry and Network (BORN)	BORN includes data on pregnancy, birth (including home births), and childhood in Ontario from hospitals, labs, midwifery practice groups, and clinical programs. The first full year of BORN data available is 2013.

**Figure 1** shows a comparison of the number of births in Halton by data source. It is important to note that the BORN and Vital Statistics data include both live births and stillbirths. The mother's hospital record includes live births and stillbirths, but counts multiple births as one delivery. The infant record includes only live born infants.



**Figure 1: Number of births by data source, Halton Region, 2003-2015.**

**Data sources:** Ontario Vital Statistics Birth Data [2003-2011], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Inpatient Discharges (mother's record & infant record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. BORN Information System [2013-2015], extracted October 26, 2016.

## Data notes

The years of data presented throughout this report vary, as the years of data available differ depending on the data source. In cases where counts were small, multiple years of data were combined to account for unstable rates in the population which can occur when examining a single year of data. Throughout the report, data were suppressed if there were fewer than six cases and marked with a double asterisk (\*\*), to ensure that individuals cannot be identified.

## Statistical significance

Differences between groups were tested for statistical significance by calculating 95% confidence intervals for rates. If the confidence intervals between groups did not overlap, the differences were considered statistically significant. All trends over time were tested for significance using linear regression and adjusting for autocorrelation. Please note that if a trend is referred to as “increasing” or “decreasing” throughout the report, the trend being described is always statistically significant. Differences between groups that are described throughout the report are also statistically significant, unless otherwise stated.

The first page of each subsection of the report provides a high level summary of the key findings for that section of the report under the heading “What does it tell us?”. For more detail on these findings including statistical significance, please refer to the graphs and accompanying text throughout the report.

# Population demographics & the social determinants of health



# Population demographics

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## What is it?

The term **demographics** refers to the statistical data of a population, including the number and characteristics of the people living in that population. This section of the report looks at Halton's population structure, including the number and percentage of females of **reproductive age** (15-49) in the population over time.

## Why is it important?

Understanding the age structure of a population can provide insight into the population's health needs. For instance, populations with a larger proportion of young adults and young families may require more reproductive health resources compared to older populations. Knowing whether Halton's population is increasing can also help the Health Department anticipate whether changes in resources and services will be required to meet the reproductive health needs of a growing population.

In particular, it is helpful to look at the population of females of reproductive age in Halton. This is because the first step to a healthy pregnancy is a healthy lifestyle prior to conception, often referred to as **preconception health**. The health choices that people make before pregnancy are important as they can impact chances of becoming pregnant, and affect health during pregnancy as well as the future health of their baby.<sup>4</sup> Knowing where in Halton the greatest number and proportion of females of reproductive age live is therefore important for informing the planning of programs and services

related to preconception health, as well as healthy pregnancies and births.

## What does it tell us?

As Halton Region's population ages, the *proportion* of women of reproductive age in Halton is decreasing. However, the *number* of women of reproductive age in Halton is increasing as Halton's overall population is growing. The number of women of reproductive age in Halton is projected to continue to increase over the next ten years.

The greatest number of females of reproductive age live in Burlington and Oakville. Milton, however, has an overall younger population than other municipalities in Halton, and therefore has a greater proportion of females who are of reproductive age.

## Data sources

Population Estimates [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016. Population Projections [2016-2025], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

## Limitations

Population projections originate from the Ontario Ministry of Finance, and are based on assumptions about births, deaths and migration, and involve a degree of uncertainty. The Ministry of Finance produces various scenarios from low to high growth. The projections from IntelliHEALTH used in this report are based on medium growth projections.



## Population distribution

Population pyramids show the age and sex distribution of a population. The shape of a population pyramid can provide information on the profile of the current population and can project how the population may increase or decrease in the future. Populations that have a typical pyramid shape are young, growing, and have high birth rates, while population pyramids that taper at the bottom represent older populations with low birth rates and declining growth. More rectangular shaped population pyramids represent populations that are stable. This information is important for informing pre-conception and reproductive health program and service planning and delivery in Halton Region.

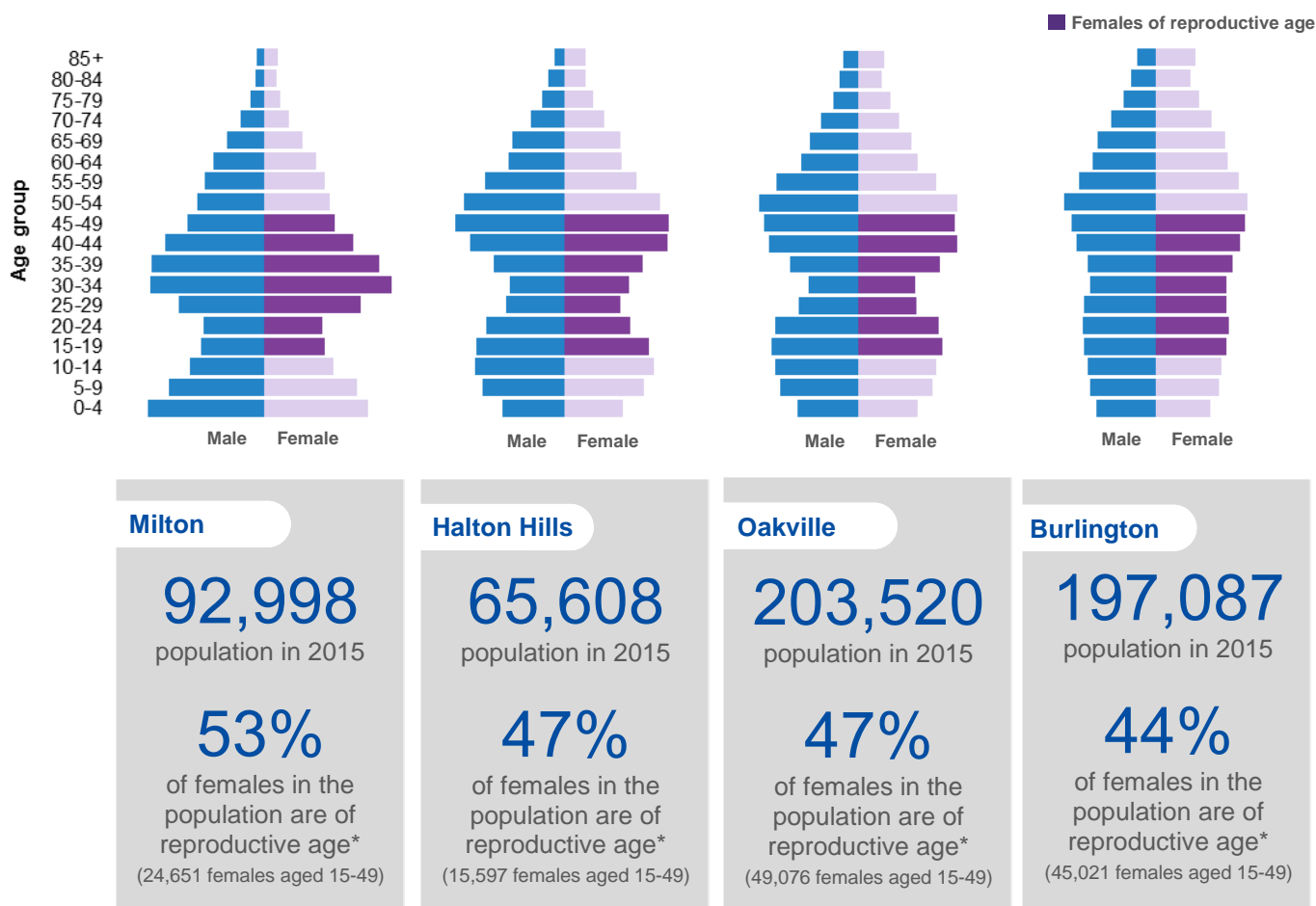
It is important to look at the population pyramids for each of the four municipalities in Halton separately, as the demographic profiles of each municipality are very different, as are the sizes of the populations of the four municipalities.

As seen in **Figure 2**, **Milton** has a very young population, as shown by the wide base of the pyramid and a high proportion of females of reproductive age (shown in dark purple).

**Halton Hills** and **Oakville** have similar population structures, with bases that taper slightly indicating a smaller proportion of young children in the population. In addition, Halton Hills and Oakville have a smaller proportion of young adults in their late twenties and thirties, and greater proportion of adults in their forties and fifties compared to Milton.

**Burlington** has a more rectangular shaped pyramid, and has the smallest proportion of females in the population who are of reproductive age.

While Milton has the highest proportion of females of reproductive age, the actual number of women in this age group is smaller than Burlington and Oakville.



**Figure 2: Population pyramids, by age and sex, Milton, Halton Hills, Oakville, and Burlington, 2015.**

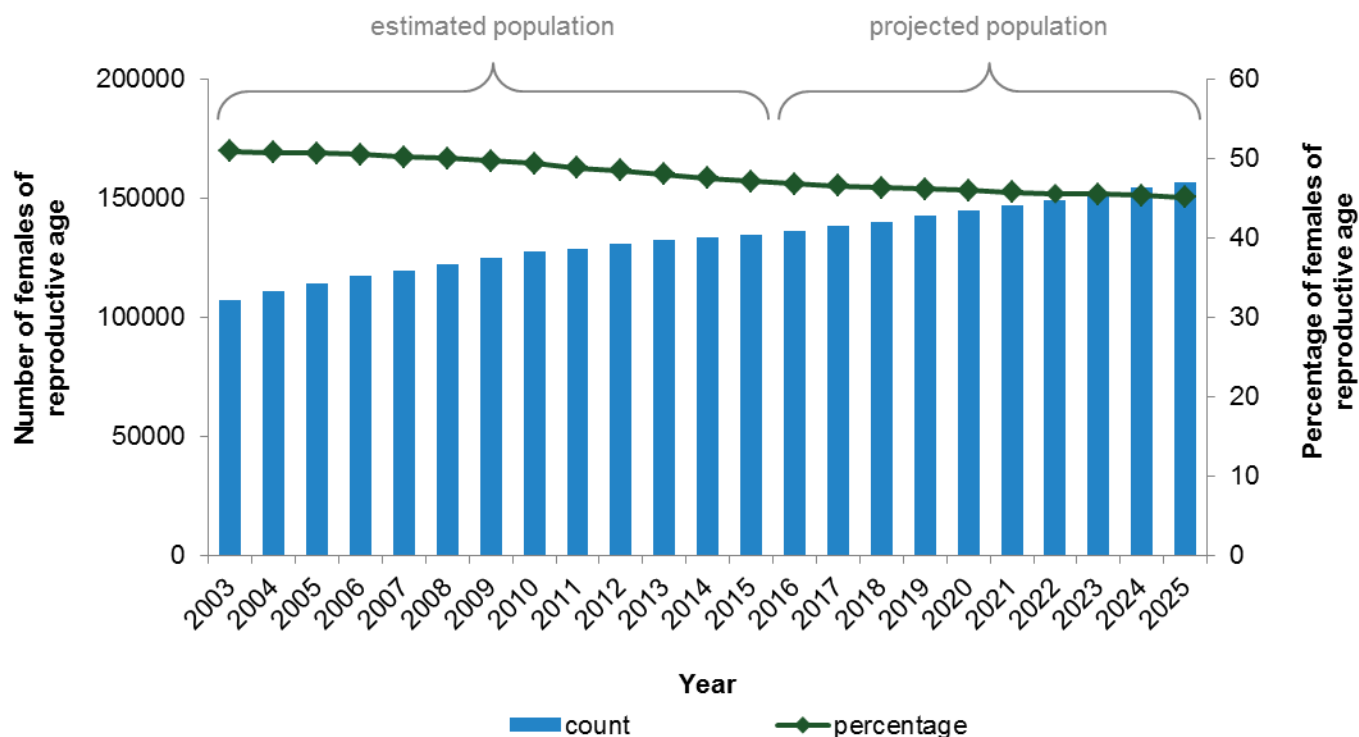
Data sources: Population Estimates [2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.  
\*Reproductive age is 15-49



## Population trends

As seen in **Figure 3**, the proportion of females in Halton who are of reproductive age (15-49) has decreased between 2003 and 2013, and is projected to continue to decline between 2015 and 2025 (shown by the green line). This trend is the result of an increase in the proportion of older adults in Halton as the baby boomer population increases. This is a trend seen not only in Halton, but throughout Canada.<sup>5</sup>

However, while the proportion of females aged 15-49 in Halton is decreasing, the actual number of females of reproductive age has been increasing since 2003 and is projected to continue increasing through to 2025 (shown by the blue bars).



**Figure 3: Estimated (2003-2015) and projected (2016-2025) number and percentage of females in the population, Halton Region.**

**Data sources:** Population Estimates [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016. Population Projections [2016-2025], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

# Social determinants of health

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## What is it?

Health is shaped by the social, political, economic, and environmental conditions where we live, learn, work, and play. These factors, such as income, education, immigrant status, social support networks and housing conditions are referred to as *social determinants of health*.<sup>6,7</sup>

## Why is it important?

Income, education, immigrant status, and access to health care are just a few examples of social determinants shown to be related to disparities in maternal and infant health.<sup>8,9</sup> For example, a woman in a low-income household with a limited social support network may not have access to a healthy diet or [folic acid supplements](#) important for a healthy pregnancy, and may experience greater stress. These factors could increase the risk of negative health outcomes for her baby. Certain health issues that can complicate a pregnancy also tend to be more prevalent in populations negatively impacted by the social determinants of health, including sexually-transmitted infections and diabetes.<sup>10,11,12</sup>

Having an understanding of the prevalence of some of these social determinants of health in Halton's population is important for a number of reasons. It can help provide a better understanding of the context behind the facts and figures presented throughout this report. It can provide insight into the extent to which Halton mothers may be vulnerable due to disparities in the social determinants of health, and highlight priority populations for health department programs and services.

Unfortunately, local data on the social determinants of health for pregnant women are limited. For many reproductive health indicators, it is not possible to assess the extent of socioeconomic inequalities in Halton. This section of the report instead provides an overview of the prevalence of a few select socio-demographic indicators for females of reproductive

age. A review of the literature has shown to be related to disparities in reproductive health outcomes. Because the data presented are for all females of reproductive age, it is important to keep in mind that the data presented may not reflect the prevalence of these risk factors among pregnant women.

## What does it tell us?

Females of reproductive age in Halton are less likely to live in a low income household compared to Ontario, and more likely to have a post-secondary education and a primary care physician. However, it is important to keep in mind that there are still groups within Halton's population who are negatively affected by the social determinants of health.

## Data sources

National Household Survey [2011], Statistics Canada. Canadian Community Health Survey [2013/14], Statistics Canada, Sharefile, Ontario Ministry of Health and Long-Term Care.

## Limitations

Data from the National Household Survey on females of reproductive age include ages 15-44, as it is based on the age groups included in the National Household Survey data tables. Throughout the rest of the report ages 15-49 are considered to be "reproductive age" for females.

The National Household Survey (NHS) is a voluntary survey that replaced the mandatory long form census in 2011. Because voluntary surveys are more prone to non-response bias than mandatory surveys, the NHS data may not be a representative sample of Halton's population. Statistics Canada has warned that people with low incomes and very high incomes, Aboriginals, and recent immigrants were less likely to respond to the NHS.

For more information on the Canadian Community Household Survey, including limitations, see [Data Notes: Canadian Community Health Survey](#).



## Education

### What does the research say?

Low maternal education has consistently been linked to poor perinatal health outcomes, including low birth weight, small for gestational age, pre-term births, and neonatal mortality.<sup>13,14,15</sup>

One possible explanation for these associations is that the prevalence of smoking before and during pregnancy tends to be higher among women with lower levels of education, and smoking while pregnant increase the risk of these negative health outcomes.<sup>13,14</sup>

Low maternal education is also likely intertwined with various other factors affecting reproductive health outcomes including prenatal nutrition, access to pre- and post-natal care, knowledge of risk factors (such as alcohol and substance use during pregnancy), and avoidance of these risk behaviours.<sup>13</sup>

### Halton data

- According to data from the 2011 NHS, 82% of Halton females and 74% of Ontario females aged 25-44 had a post-secondary certificate, diploma, or degree.
- Halton females were also more likely than Ontario females aged 25-44 to have a bachelor's level or higher university degree (47% compared to 38%).



## Income

### What does the research say?

Research has shown that even in countries with universal health care like Canada, income-related disparities in reproductive health and birth outcomes exist.<sup>14,15,16,17</sup> Low income has been associated with higher rates of pregnancy complications such as gestational diabetes and intrauterine growth restriction, as well as higher rates of poor infant health outcomes such as preterm births, small for gestational age, stillbirths, neonatal death, and delayed cognitive development.<sup>15,16,17</sup>

Several risk factors for these conditions may be more common among women living in low income, including stress in life, nutrient deficiencies, inadequate prenatal care, and high risk behaviours such as smoking or alcohol consumption during pregnancy.<sup>14,16,17</sup>

### Halton data

- According to data from the 2011 NHS, in 2011, 8.4% of Halton females aged 15-44 were living in a low income household based on the After-Tax Low-Income Measure, compared to 15.9% of Ontario females aged 15-44.
- The **After-Tax Low-Income Measure (LIM-AT)** is a relative measure of low income, based on adjusted median family income after tax. "Adjusted" means that the family size is accounted for, as family needs increase with size.



## Immigrant status

### What does the research say?

The relationships between immigrant status and maternal and infant health outcomes are complex.<sup>9,18,19,20</sup> Studies have found that disparities in reproductive health outcomes such as low birth weight and pre-term births tend to vary depending on factors such as country of origin and length of time spent in Canada.<sup>9,18,19,20</sup>

Post-partum depression is one example of a maternal health outcome that tends to be higher among immigrant populations in Canada.<sup>9,19,21,22</sup> Possible reasons for these disparities include lower levels of social support, being unaware of available supportive services, and difficulty or hesitancy accessing services due to language, cultural, or other barriers among immigrants.<sup>21</sup>

### Halton data

- According to data from the 2011 NHS, in 2011, one in four Halton females aged 15-44 was an immigrant. This was slightly less than Ontario (28%).
- In 2011, there were approximately 4,500 females aged 15-44 in Halton who were recent immigrants (i.e. immigrated within the past five years)



## Access to a primary care physician

### What does the research say?

Preconception health refers to the health of women and men in their reproductive years, and focuses on the steps that individuals can take to live healthy lifestyles, and increase their readiness for pregnancy, regardless of whether or not they plan to have children one day.<sup>23</sup>

Family physicians can play a role in preconception counseling and care, including supporting family planning and healthy body weights, screening and treatment for diseases including sexually-transmitted infections, and ensuring immunizations are up-to-date.<sup>24</sup> Therefore, having access to a primary care provider is an important determinant of reproductive health.

### Halton data

- According to data from the Canadian Community Health Survey, in 2013/14, 95% of Halton females aged 15-49 and 92% of Ontario females reported having a regular medical doctor.

The relationship between the social determinants of health and various maternal and infant health outcomes are often complex and interrelated. While local data are not readily available to illustrate the reproductive health inequities that exist in Halton, literature suggests that women with low incomes, low education, and other women negatively affected by social determinants of health are at a greater risk of poorer reproductive health outcomes. Policies that create improvements in the social determinants of health are likely to decrease these health inequities and result in better reproductive health outcomes.

# Fertility & pregnancy



# Fertility rates

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## What is it?

Fertility rates measure the number of infants born per woman of reproductive age within a population.

**General fertility rates** are the number of births during a given period per 1,000 females in the population aged 15-49.

**Age-specific fertility rates** are the number of births per 1,000 females in an age group in a given period relative to the female population in that age group.

**Total fertility rates** are the average number of children that would be born per female if all females lived to the end of their childbearing years and bore children according to the age-specific fertility rates for that area and period.

## Why is it important?

Fertility rates provide insight into Halton's changing demographics. When total fertility rates are less than 2.1 children per woman, a population does not naturally replace itself.<sup>25</sup> If a fertility rate is below this rate, the population will naturally decrease over time unless there is sufficient immigration into the population to offset this trend.

It is also important to examine fertility rates by age, as high fertility among certain age groups (such as mothers over 35) is associated with negative infant health outcomes, such as low birth weight, preterm birth, and infant mortality.<sup>25,26</sup>

## What does it tell us?

While the number of females of reproductive age in Halton is increasing, the number of births in the region has decreased slightly between 2008 and 2015, resulting in an overall decline in fertility rates. Ontario has similarly seen a decline in fertility rates. This trend is common in industrialized countries, and is associated with many factors, including increased urbanization, a greater participation of women in the workforce, the rising cost of children, later age at

marriage, and greater access to birth control and abortion.<sup>25,27</sup>

Fertility rates in Milton were higher than the other three municipalities. Compared to Ontario, fertility rates tended to be lower in Halton among younger age groups and higher among older age groups.

Total fertility rates in Halton and Ontario were well below the 2.1 children per woman needed to sustain the current population size (without immigration). This is reflective of a general trend towards smaller family sizes seen in Canada since the baby boom in the 1950s.<sup>27</sup> The last time Canada's total fertility rate reached the replacement level of 2.1 children per woman was in 1971.<sup>27</sup>

## Data sources

Inpatient Discharges (mother's record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

## Limitations

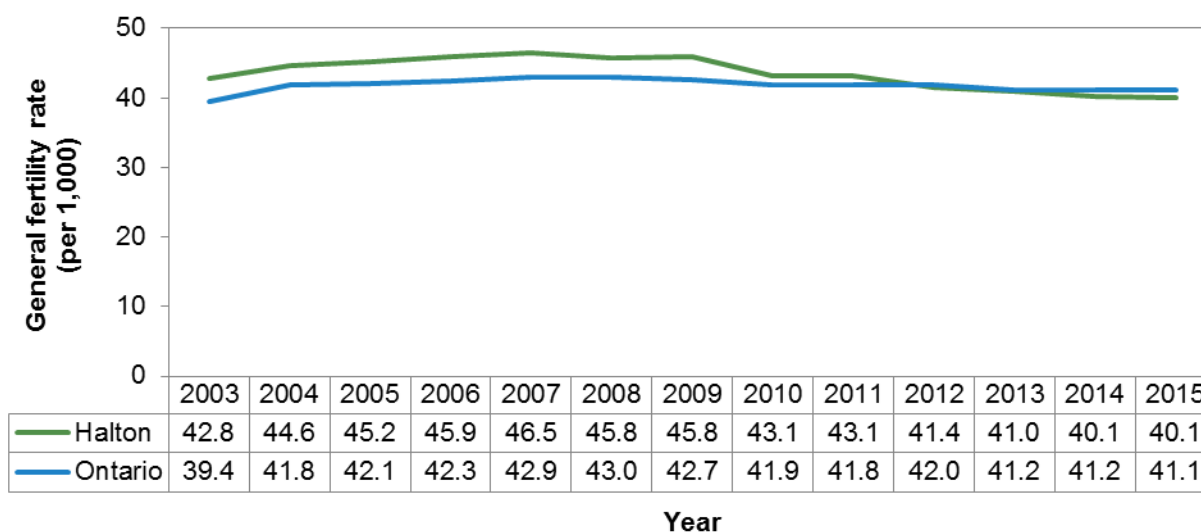
Hospital deliveries include live births and stillbirths, and count multiples as one delivery. Because the number of multiple births and stillbirths is relatively small, the number of deliveries approximates the number of newborns. Births to mothers that occurred out-of-province and births that occurred outside of a hospital (e.g. infants born at home) are not included. Missing/unknown data were excluded.

General fertility rates ignore differences in the age structures of populations. Total fertility rates are not affected by the age distribution of the population, but are affected by the timing of births (i.e. the average age of the mother at first birth).<sup>26,28</sup>



## General fertility rates

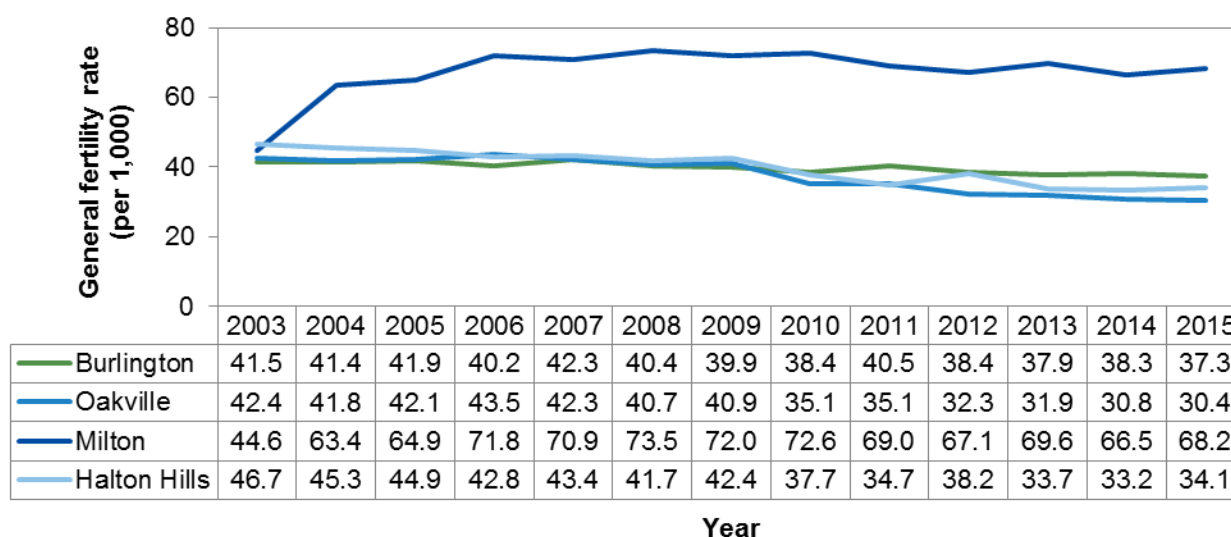
In both Halton and Ontario, general fertility rates increased from approximately 2003 to 2008, at which point the rates began to decrease. In 2015, the general fertility rate in Halton was similar to Ontario (**Figure 4**). For a summary of the number of hospital deliveries in Halton in 2015, see (**Table 2**).



**Figure 4: General fertility rate (per 1,000 females aged 15-49), Halton and Ontario, 2003-2015.**

**Data sources:** Inpatient Discharges (mother's record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

Since 2004, Milton has had a significantly higher general fertility rate than all other Halton municipalities. From 2003 to 2015, general fertility rates decreased in Burlington, Oakville, and Halton Hills. However in Milton, general fertility rates increased between approximately 2003 and 2008, and then began to decrease slightly in more recent years (**Figure 5**).

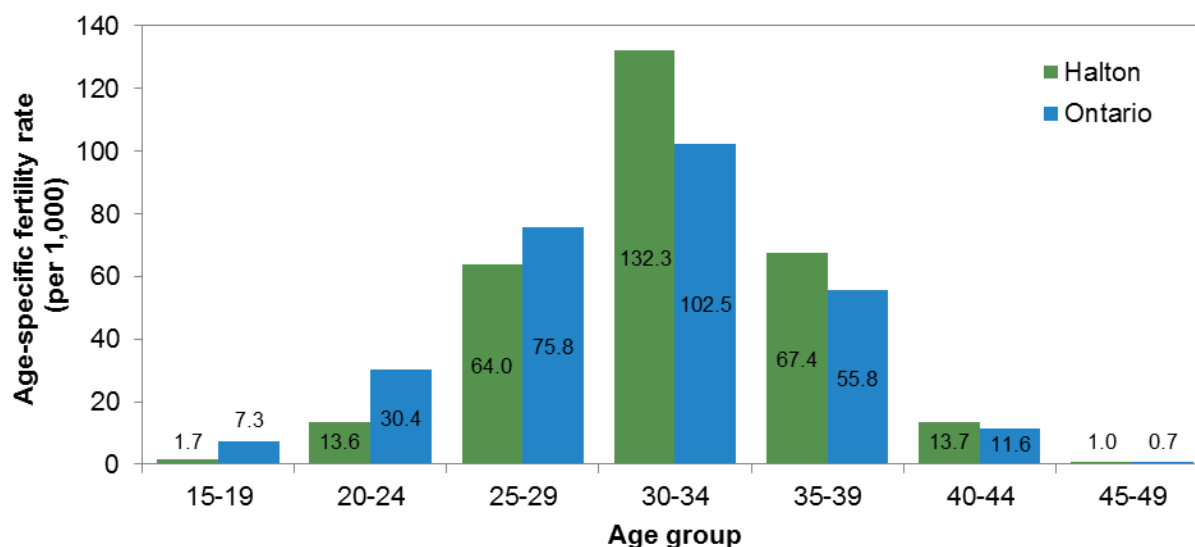


**Figure 5: General fertility rates (per 1,000 females aged 15-49), Halton and Ontario, 2003-2015.**

**Data sources:** Inpatient Discharges (mother's record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

## Age-specific fertility rates

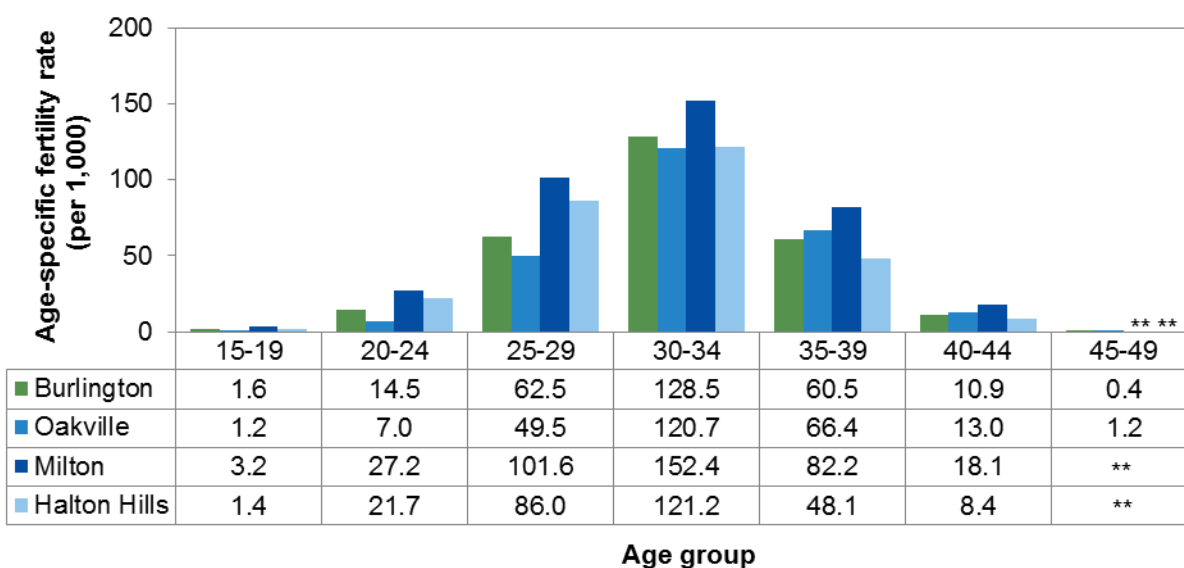
In Halton and Ontario, age-specific fertility rates tend to increase as age increases until ages 30-34, after which the rates begin to decrease. In 2015, age-specific fertility rates in Halton were significantly lower than Ontario among younger age groups (under 30), but significantly higher among the 30-34 and 35-39 age groups. This suggests that it is more common for mothers to give birth at older ages in Halton compared to Ontario (**Figure 6**).



**Figure 6: Age-specific fertility rate (per 1,000 females by age group), Halton and Ontario, 2015.**

Data sources: Inpatient Discharges (mother's record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

When looking at age-specific fertility rates by municipality for 2013-2015 combined, Milton had the highest fertility rates for all age groups up to and including 40-44. These differences were statistically significant when comparing Milton to all other municipalities for ages 25-29, 30-34, 35-39 and 40-44. Oakville's fertility rates among females aged 20-24 and 25-29 were significantly lower than all three other municipalities, reflecting fewer births among younger mothers in Oakville (**Figure 7**).

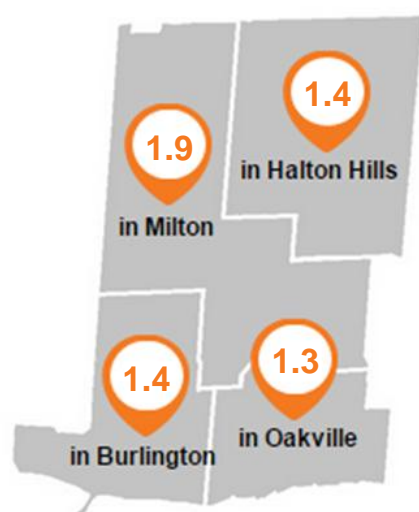


**Figure 7: Age-specific fertility rate (per 1,000 females by age group), by municipality, Halton Region, 2013-2015 combined.**

Data sources: Inpatient Discharges (mother's record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

\*\*not reportable (count <6)

## Total fertility rates



**Figure 8: Total fertility rate, by municipality, Halton Region, 2013-2015 combined**

**Data sources:** Inpatient Discharges (mother's record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016

In 2015, the total fertility rate was 1.4 children per woman in Halton, and 1.5 children per woman in Ontario. This is well below the total fertility rate of 2.1 children per woman which is needed to sustain current population levels if there is no immigration into the population.

When looking at total fertility rates by municipality for 2013-2015 combined, Milton had the highest total fertility rate at 1.9 children per woman (**Figure 8**).

## Number of hospital deliveries

**Table 2** provides a summary of the number of hospital deliveries for Halton residents for 2003-2015. Also shown is the number of deliveries in Halton by municipality and mother's age group. In recent years, there have been a similar number of hospital deliveries in Burlington, Oakville, and Milton, despite Milton's population being approximately half the size of the other two municipalities. The number of teen pregnancies in Halton has decreased compared to 2003, while the number of births to older mothers (over aged 35) has increased.

**Table 2: Number of hospital deliveries, Halton Region, by municipality and mother's age group, 2003-2015**

Year	Halton	Municipality				Age group						
		Burlington	Oakville	Milton	Halton Hills	15-19	20-24	25-29	30-34	35-39	40-44	45-49
2003	4598	1680	1773	505	640	62	290	1152	1985	948	156	**
2004	4935	1701	1792	805	637	55	285	1206	2177	1040	165	7
2005	5161	1750	1852	912	647	74	287	1244	2241	1109	199	7
2006	5386	1697	1948	1111	630	56	296	1287	2370	1184	184	9
2007	5551	1789	1912	1209	641	60	320	1254	2415	1265	230	7
2008	5586	1725	1864	1377	620	67	299	1290	2408	1302	214	6
2009	5723	1712	1900	1476	635	54	292	1282	2486	1350	247	12
2010	5487	1660	1644	1617	566	61	256	1172	2441	1289	252	16
2011	5552	1743	1651	1638	520	49	255	1207	2412	1374	235	20
2012	5411	1680	1541	1610	580	51	264	1113	2347	1364	261	11
2013	5426	1679	1540	1689	518	28	244	1155	2395	1345	250	9
2014	5350	1709	1500	1627	514	30	231	1119	2309	1363	280	18
2015	5385	1680	1493	1680	532	30	236	1054	2361	1378	305	21

**Data sources:** Inpatient Discharges (mother's record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

\*\*not reportable (count <6)

# Pregnancy rates

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## What is it?

Pregnancy rates measure the number of pregnancies per woman of reproductive age within a population.

**Pregnancies** include both deliveries (live births and stillbirths) as well as therapeutic abortions.

**Total pregnancy rates** are the number of pregnancies per 1,000 females aged 15-49 in a given time period.

**Age-specific pregnancy rates** are the number of pregnancies among females in an age group in a given time period relative to the female population in that age group.

This section of the report also highlights the **teen pregnancy rate**, which is the number of pregnancies per 1,000 females aged 15-19 in a given time period.

## Why is it important?

Unlike fertility rates, which only provide information on births, pregnancy rates provide information on all pregnancies, including live births, stillbirths, and therapeutic abortions.

It is important to examine pregnancy rates by age group, as pregnancies among older women (over aged 35) are associated with adverse health risks for both mothers and infants.<sup>25</sup>

Teen pregnancy is also associated with adverse health and social outcomes. Pregnant teenagers are at a greater risk of developing health problems such as depression, anaemia and hypertension, and infants are at a greater risk of low birth weights, preterm births, and other health issues.<sup>29</sup> Social determinants of health play an important role in teen pregnancy, with higher pregnancy rates among teenagers who are socioeconomically disadvantaged.<sup>29</sup> Teen pregnancy is also associated with educational, social and employment barriers later in life.<sup>29</sup>

## What does it tell us?

Halton's total pregnancy rate was slightly lower than Ontario. The total pregnancy rate in Milton was higher than Burlington, Oakville, and Halton Hills.

Like fertility rates, total pregnancy rates in both Halton and Ontario have been decreasing in recent years. Teen pregnancy rates in Halton have also been decreasing, which likely reflects increased access to and use of contraceptives, improved sexual health education, and greater access to reproductive health services.<sup>30</sup>

## Data sources

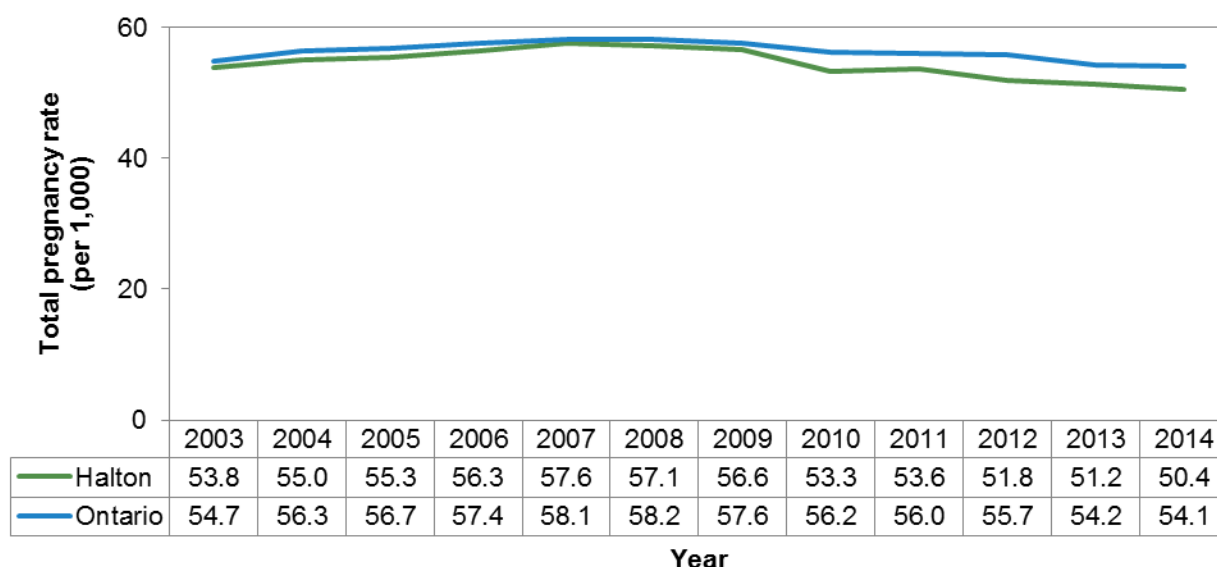
Inpatient Discharges (mother's record) [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.  
Hospital and Medical Services Data [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.  
Population Estimates [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

## Limitations

Miscarriages are not captured in this indicator. Hospital deliveries include live births and stillbirths, and count multiples as one delivery. Therapeutic surgical abortions that occurred in private physician's offices, hospitals, and abortion clinics are included, however pharmacologically induced abortions are not captured. Therapeutic abortions that occurred within 40 days of a previous therapeutic abortion are excluded, as these repeat procedures were likely related to complications from the previous procedure. Deliveries and therapeutic abortions that occurred out-of-province are not included. Age at the time of delivery is reported, therefore a woman who was pregnant at age 19 but gave birth at age 20 would not be captured as a teen pregnancy. Missing/unknown data were excluded.

## Total pregnancy rates

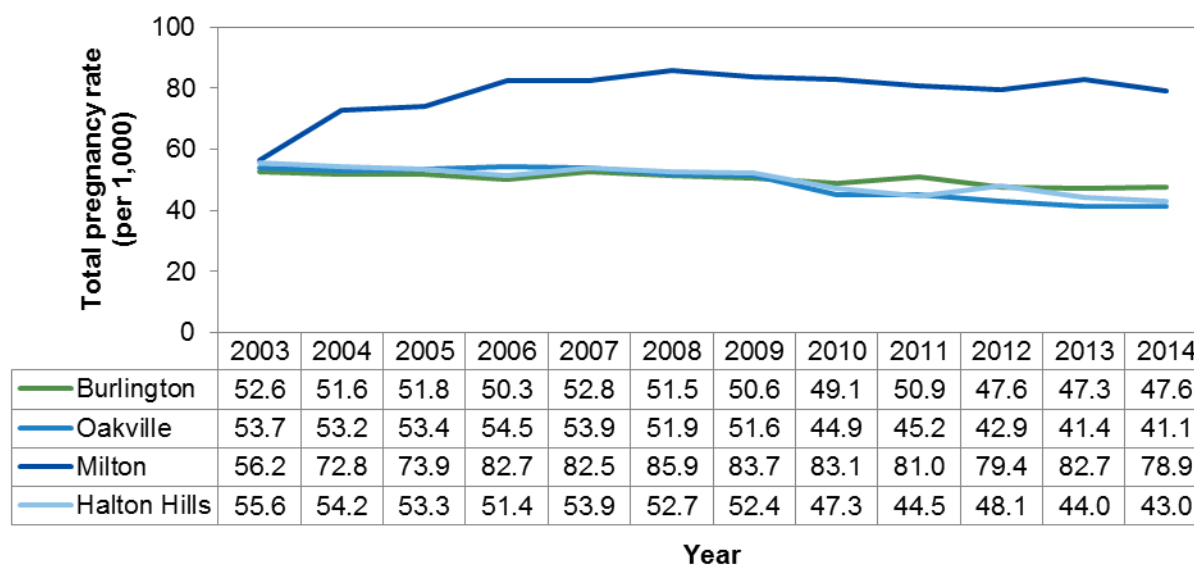
Total pregnancy rates in both Halton and Ontario increased slightly until approximately 2007, and both have since been decreasing. In 2014, the total pregnancy rate in Halton was significantly lower than Ontario (**Figure 9**).



**Figure 9: Total pregnancy rate (per 1,000 females aged 15-49), Halton and Ontario, 2003-2014.**

**Data sources:** Inpatient Discharges (mother's record) [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Hospital and Medical Services Data [2003-2014], Ontario Ministry of Health and Long-Term Care: INTELLIHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

Since 2004, Milton has had significantly higher total pregnancy rates compared to Burlington, Oakville, and Halton Hills. Milton experienced an increase in total pregnancy rates from 2003 until approximately 2008. In Burlington and Halton Hills, total pregnancy rate declined slightly between 2003 and 2014. In Oakville, total pregnancy rates were fairly steady until 2007, after which they also began to decrease (**Figure 10**).

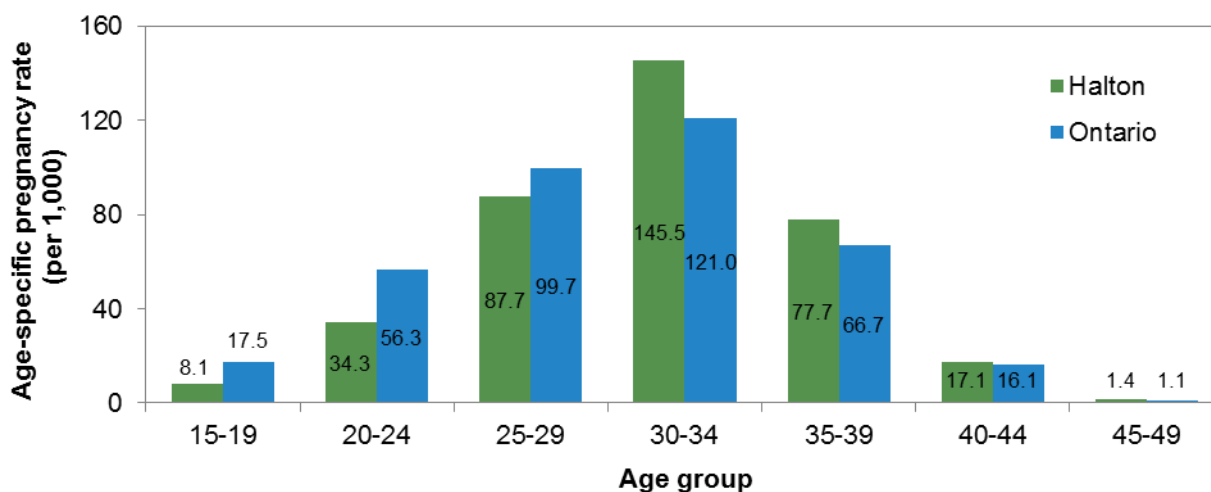


**Figure 10: Total pregnancy rate (per 1,000 females aged 15-49), by municipality, Halton Region, 2003-2014.**

**Data sources:** Inpatient Discharges (mother's record) [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Hospital and Medical Services Data [2003-2014], Ontario Ministry of Health and Long-Term Care: INTELLIHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

## Age-specific pregnancy rates

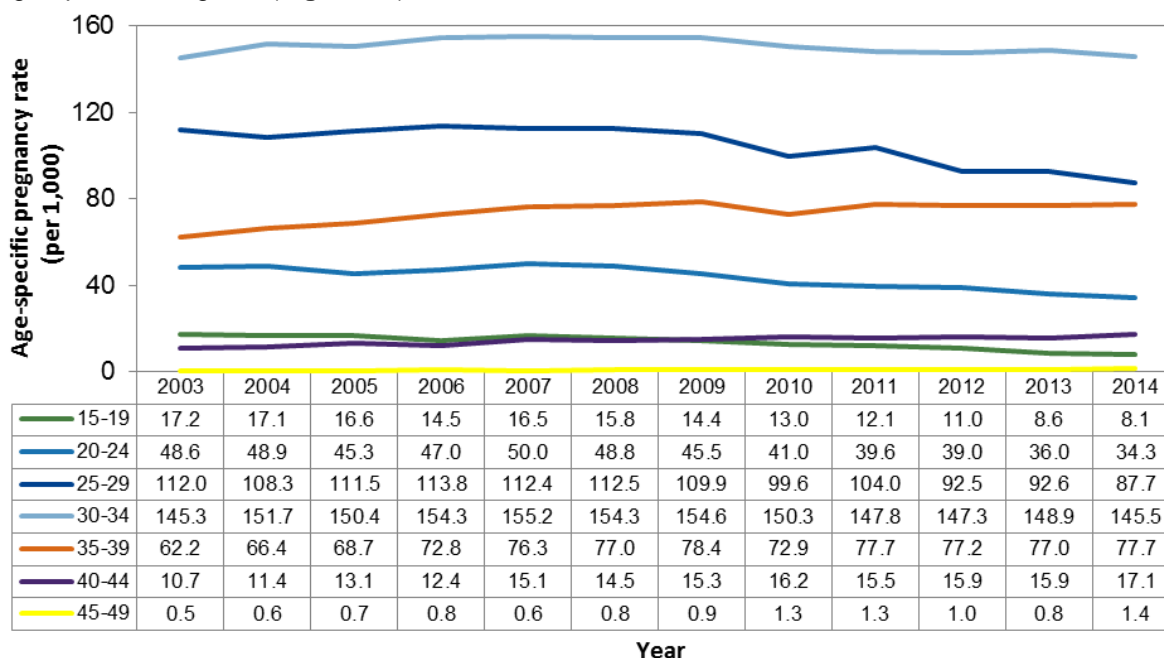
In both Halton and Ontario, age-specific pregnancy rates increase until ages 30-34, after which the rates begin to decrease with age. In 2014, the age-specific pregnancy rates were significantly lower in Halton than Ontario for all age groups under 30 years old. However, for ages 30-34 and 35-39, age-specific pregnancy rates were significantly higher in Halton than Ontario. The teen pregnancy rate (ages 15-19) for all of Ontario in 2014 was more than double the teen pregnancy rate in Halton (**Figure 11**). Based on analyses completed by Public Health Ontario, in 2014, Halton Region had the second lowest teen pregnancy rate out of all 36 health units in Ontario.<sup>31</sup>



**Figure 11: Age-specific pregnancy rate (per 1,000 females by age group), Halton and Ontario, 2014.**

Data sources: Inpatient Discharges (mother's record) [2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Hospital and Medical Services Data [2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

Trends in pregnancy rates over time in Halton vary by age group, with pregnancy rates generally decreasing among younger age groups (including teen pregnancy rates), and increasing pregnancy rates among mothers in the age groups above age 35 (**Figure 12**).



**Figure 12: Age-specific pregnancy rate (per 1,000 females by age group), Halton Region, 2003-2014.**

Data sources: Inpatient Discharges (mother's record) [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Hospital and Medical Services Data [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.



# Therapeutic abortion rates

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## What is it?

For this report, *therapeutic abortion (TA)* refers to the deliberate termination of a pregnancy, performed at hospitals, clinics, and private physician's offices.

*Total therapeutic abortion rates* are the number of therapeutic abortions per 1,000 females aged 15-49 in a given time period.

*Age-specific therapeutic abortion rates* are the number of pregnancies among females in an age group in a given period relative to the female population in that age group.

Also presented is the percentage of pregnancies for each age group that resulted in TAs compared to deliveries.

## Why is it important?

The majority of therapeutic abortions occur as the result of an unintended pregnancy.<sup>32</sup> TAs can be an indicator of unwanted and unplanned pregnancies in the population. TA rates may be affected by factors such as access to medical care, birth control, and education.<sup>32</sup>

In addition, TAs may also be performed to end a pregnancy when either the mother's life is in danger, or if the baby has a severe birth defect (congenital anomaly) such as a neural tube defect.

## What does it tell us?

The total rate of therapeutic abortions in Halton was lower than Ontario. In recent years, the TA rate in Milton has been slightly higher than Burlington, Oakville and Halton Hills.

The age-specific rate of TAs was highest in Halton among females aged 20-24. The highest proportion of pregnancies resulting in TAs was among Halton females aged 15-19 and 20-24.

Since 2003, age-specific TA rates have been decreasing among the younger age groups (15-19 and 20-24), but have been increasing among the older age groups (30-34, 35-39 and 40-44).

## Data sources

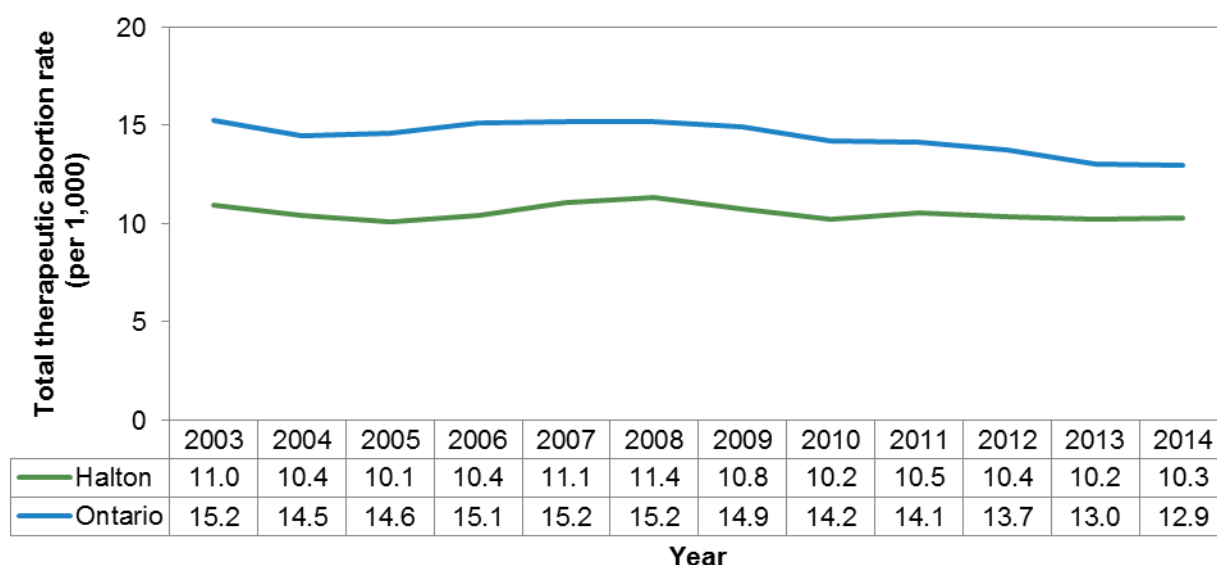
Hospital and Medical Services Data [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

## Limitations

Therapeutic surgical abortions that occurred in private physician's offices, hospitals, and abortion clinics are included, however pharmacologically induced abortions are not captured. TAs that occurred out-of-province are not included. TAs that occurred within 40 days of a previous therapeutic abortion are excluded, as these repeat procedures were likely related to complications from the previous procedure. Missing/unknown data were excluded.

## Total therapeutic abortion rates

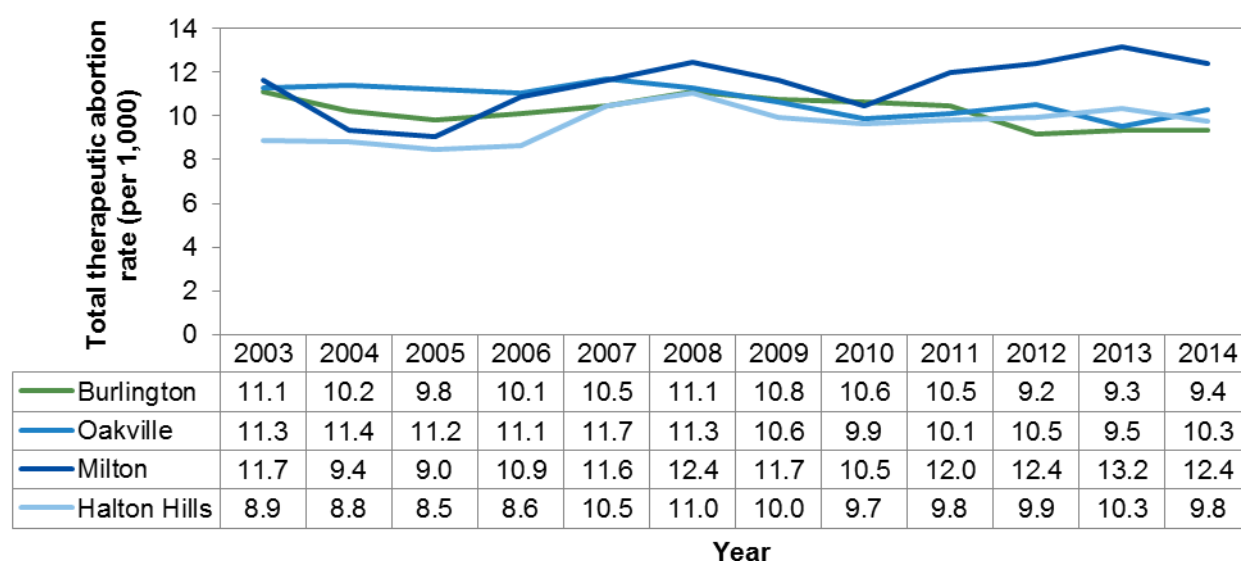
From 2003-2014, total TA rates decreased in Ontario and remained relatively steady in Halton. Halton has consistently had significantly lower TA rates than Ontario (**Figure 13**).



**Figure 13: Total therapeutic abortion rate (per 1,000 females aged 15-49), Halton and Ontario, 2003-2014.**

Data sources: Hospital and Medical Services Data [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

Due to the fairly small number of TAs in Halton each year, TA rates by municipality have been fairly variable. In general, however, TA rates decreased in Oakville from 2003-2014 and from 2008-2014 in Burlington. In Milton there has been a slight overall increase in total TA rates from 2004-2014 (**Figure 14**).

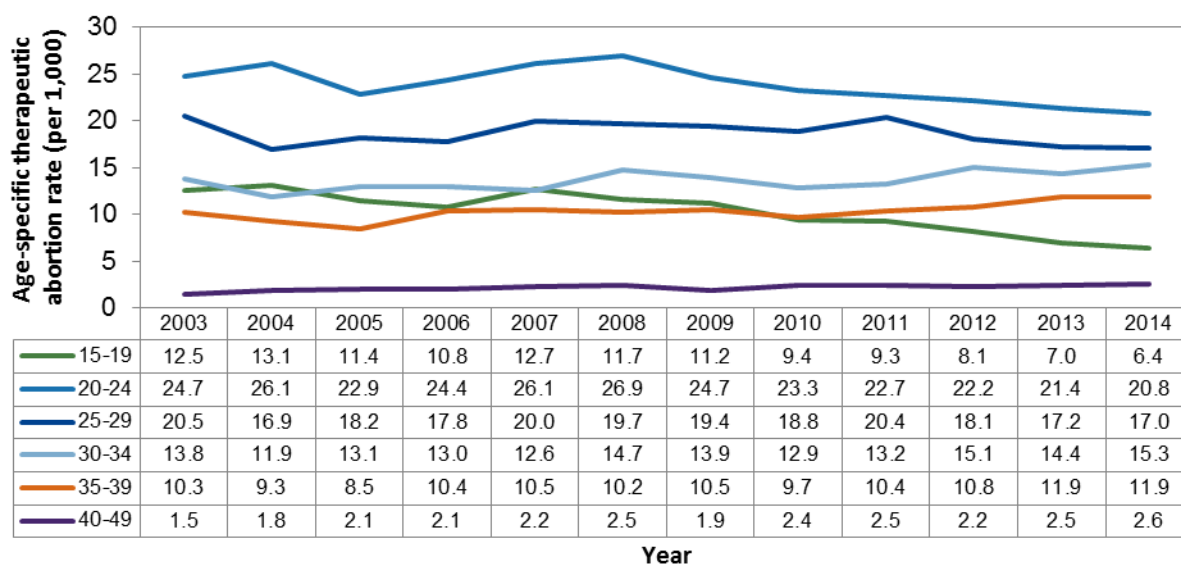


**Figure 14: Total therapeutic abortion rate (per 1,000 females aged 15-49), Halton Region, by municipality, 2003-2014.**

Data sources: Hospital and Medical Services Data [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

## Age-specific therapeutic abortion rates

Trends in TA rates from 2003-2014 in Halton varied by age group. From 2003-2014, age-specific TA rates decreased for the 15-19 and 20-24 age groups, and remained relatively steady for ages 25-29. However during this same time period, age-specific TA rates increased among females aged 30-34, 35-39, and 40-49 (**Figure 15**).

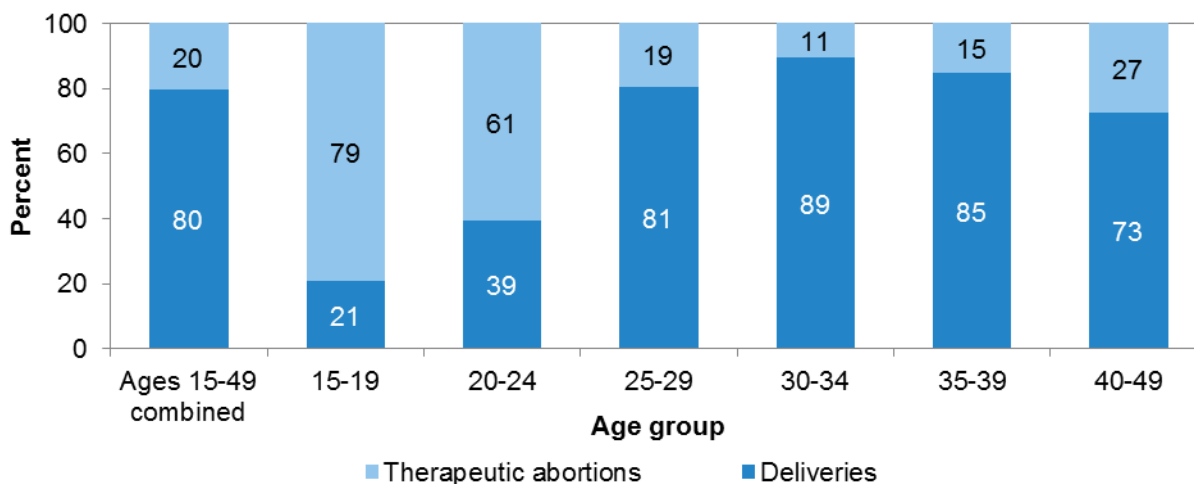


**Figure 15: Age-specific therapeutic abortion rate (per 1,000 females by age group), Halton Region, 2003-2014.**

**Data sources:** Hospital and Medical Services Data [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

## Proportion of pregnancies involving therapeutic abortions

Pregnancies in Halton teens aged 15-19 and females aged 20-24 were more likely to result in a therapeutic abortion than a delivery, whereas pregnancies among females aged 25-49 were more likely to result in a delivery compared to a therapeutic abortion.



**Figure 16: Percentage of pregnancies involving therapeutic abortions and deliveries, by age group, Halton Region, 2014.**

**Data sources:** Inpatient Discharges [2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Hospital and Medical Services Data [2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

## Number of therapeutic abortions

**Table 3** shows the number of therapeutic abortions among Halton residents between 2003 and 2014. Also shown are the number of TAs in Halton by municipality and mother's age group. It is important to note that while the number of TAs among teenagers (15-19) has decreased slightly in more recent years, the number of TAs has increased among older women, particularly those in the 40-49 age group.

**Table 3: Number of therapeutic abortions, Halton Region, by municipality and mother's age group, 2003-2014**

Year	Halton	Municipality				Age group					
		Burlington	Oakville	Milton	Halton Hills	15-19	20-24	25-29	30-34	35-39	40-49
2003	1176	451	471	132	122	167	301	258	208	188	54
2004	1154	421	490	119	124	181	326	223	186	170	68
2005	1152	410	493	127	122	165	294	243	213	157	80
2006	1219	428	496	168	127	163	320	238	218	197	83
2007	1325	444	528	198	155	198	350	272	213	201	91
2008	1386	473	516	233	164	189	367	274	254	199	103
2009	1344	463	493	239	149	189	345	275	246	208	81
2010	1300	460	462	233	145	162	336	273	229	197	103
2011	1356	451	474	284	147	162	344	294	237	212	107
2012	1353	402	503	297	151	144	351	271	268	221	98
2013	1352	414	459	320	159	125	355	263	256	245	108
2014	1374	418	501	304	151	115	357	270	272	247	113

Data source: Hospital and Medical Services Data [2014], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

# Healthy pregnancies



# Folic acid supplementation

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## What is it?

**Folic acid** is a naturally occurring B vitamin important for the healthy growth of an unborn baby.<sup>33</sup>

Presented are the *percentages of women who gave birth that reported taking folic acid* prior to pregnancy, during pregnancy, and both prior to and during pregnancy, during a given time period.

## Why is it important?

Folic acid is important for the development of an unborn baby's spine, brain, and skull, particularly during the first few weeks of a pregnancy.<sup>34</sup> Folic acid supplementation can help reduce the risk of **neural tube defects**, which are birth defects that occur when the neural tube fails to close during the early weeks of a pregnancy, and can result in lifelong disability or death.<sup>34</sup>

Health Canada recommends that women who could become pregnant take 0.4mg of folic acid every day, in addition to eating a healthy, balanced diet.<sup>33</sup> In order to reduce the risk of neural tube defects, it is important to begin folic acid supplementation at least three months prior to pregnancy, and continuing with folic acid supplementation throughout pregnancy.<sup>33</sup>

Women who are not taking folic acid supplements, are on restricted diet, or are experiencing food insecurity may be at a higher risk of insufficient folic acid intake and resulting complications.<sup>33</sup> To reduce disparities in access to and use of folic acid supplements, the needs of these priority populations should be considered when planning public health interventions to increase folic acid use.<sup>33</sup>

## What does it tell us?

Pregnant women in Halton were more likely than those in Ontario to consume folic acid in alignment with Health Canada guidelines both prior to and during pregnancy, and less likely to have not had any folic acid supplementation. However, there is still room for improvement as less than half of pregnant women in Halton met this guideline. Folic acid supplementation was lowest among young mothers, with less than one in five women under age 25 having taken folic acid supplementation both prior to and during pregnancy.

## Data sources

BORN Information System [2013-2015], extracted October 26, 2016 and January 5, 2017.

## Limitations

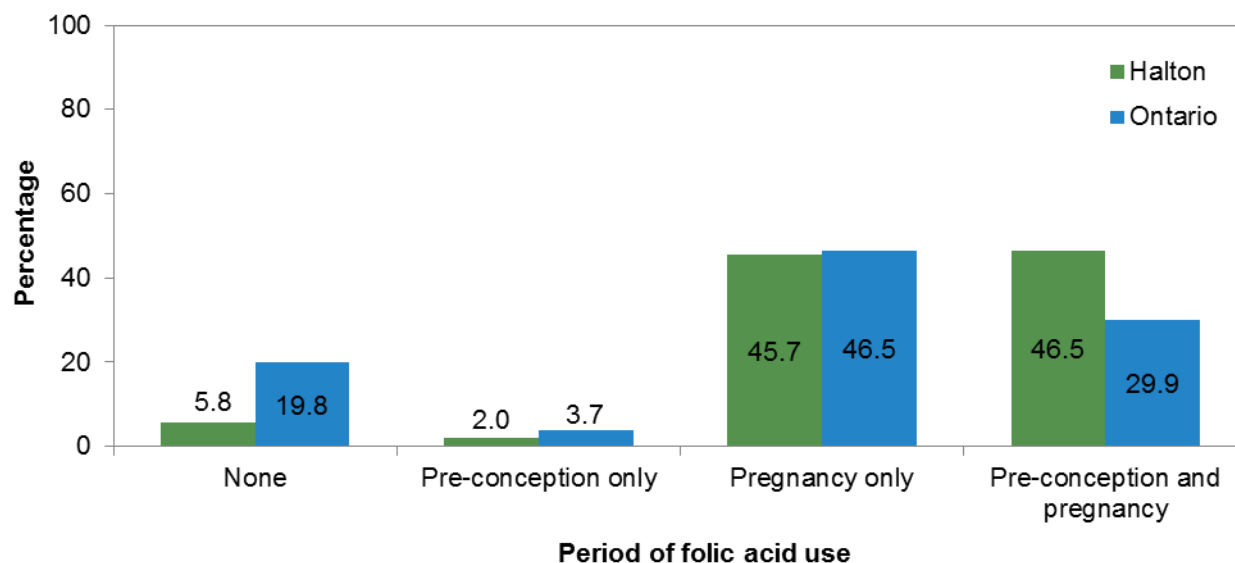
Data on folic acid use should be interpreted with caution due to high levels of missing information (ranging 5-10% in Halton and 8-11% in Ontario). Data from 2013-2015 were combined rather than reported on for each year individually due to the high percentage of missing data in 2013. Records with missing data were excluded. Folic acid supplementation use may not be an accurate measure of adequate folic acid intake. It is not known whether supplementation was at the recommended level, and those reporting no supplementation may have had adequate folate intake through a healthy diet.<sup>35</sup>





## Folic acid supplementation in Halton

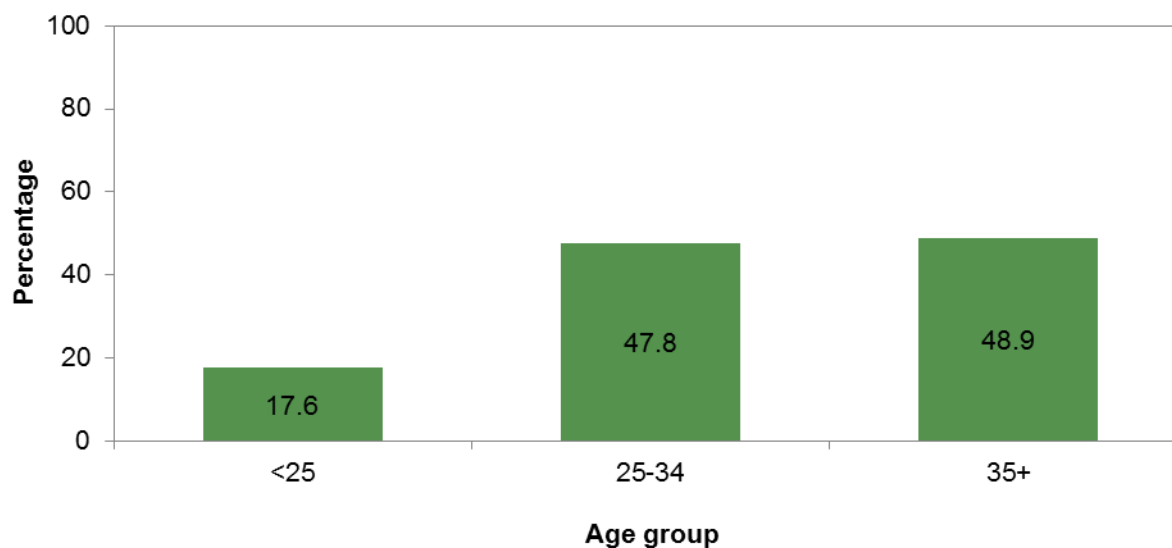
For 2013-15 (combined), the majority (92.2%) of pregnant women in Halton took folic acid supplementation during their pregnancy. Less than half took folic acid supplementation both prior to and during pregnancy as recommended by Health Canada, however, the percentage of pregnant women in Halton who consumed folic acid supplementation both prior to and during pregnancy was statistically significantly higher than Ontario. Pregnant women in Ontario were also significantly more likely than Halton women to not have taken any folic acid supplementation during pregnancy (**Figure 17**).



**Figure 17: Reported folic acid supplementation, females who gave birth (live or still), Halton Region, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted January 5, 2017.

For 2013-15 (combined) Halton females under age 25 were significantly less likely than all other age groups to have taken folic acid supplementation both prior to and during pregnancy (**Figure 18**).



**Figure 18: Percentage of females who gave birth (live or still) who took folic acid supplementation both prior to and during pregnancy, Halton Region, by age group, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted October 26, 2016.

# Pre-pregnancy body mass index and gestational weight gain

## What is it?

**Body mass index (BMI)** is a simple, surrogate measure of body fatness. BMI measures a person's excess body weight using a weight-to-height ratio ( $BMI = \text{weight (kg)} / \text{height}^2 \text{ (m)}$ ).<sup>36</sup>

**Pre-pregnancy BMI** is based on self-reported height and weight closest to conception (no later than 12 weeks gestation), and is expressed as a percentage of women in each BMI category out of the total number of women who had a live birth or stillbirth.

**Table 4** summarizes BMI ranges for each category.

**Table 4: Body mass index categories and ranges**

Category	BMI range (kg/m <sup>2</sup> )
Underweight	<18.5
Normal weight	18.5-24.9
Overweight	25-29.9
Obese class I	30-34.9
Obese class II	35-39.9
Obese class III	≥40

**Gestational weight gain** is the percentage of women with weight gain during pregnancy within, greater than, or less than the ranges recommended by Health Canada (**Table 5**).<sup>37</sup>

**Table 5: Health Canada<sup>37</sup> gestational weight gain recommendations for singleton and twin pregnancies**

Pre-pregnancy BMI category	Recommended total weight gain (KG)
Singleton pregnancy	
Underweight	12.5-18.0
Normal weight	11.5-16.0
Overweight	7.0-11.5
Obese*	5.0-9.0
Twin pregnancy	
Underweight	NA
Normal weight	17.0-25.0
Overweight	14.0-23.0
Obese*	11.0-19.0

\*Obese category includes BMI range 30-34.9. There is no evidence to suggest an appropriate weight gain for a BMI >35.0.

NA – There is insufficient evidence to provide guidelines for underweight women carrying twins

## Why is it important?

A healthy weight prior to pregnancy is important for a healthy pregnancy. Women who enter pregnancy with a high BMI are more likely to have poorer health and pregnancy outcomes, such as an increased risk of diabetes and having to have a caesarean section.<sup>37</sup> Women with a low pre-pregnancy BMI can be at a greater risk for preterm births and having a low birth weight baby.<sup>37</sup> Gaining the recommended weight during pregnancy can reduce some of these risks and improve pregnancy outcomes.<sup>37</sup> Various factors may influence weight gain during pregnancy, including pre-pregnancy weight, age, parity, education, and income.<sup>38</sup>

## What does it tell us?

Women in Halton were more likely to have a pre-pregnancy weight in the normal range compared to Ontario. Nearly half of Halton women gained more weight than recommended during their pregnancy. Women who were overweight or obese prior to pregnancy were most likely to exceed the weight gain guidelines.

## Data sources

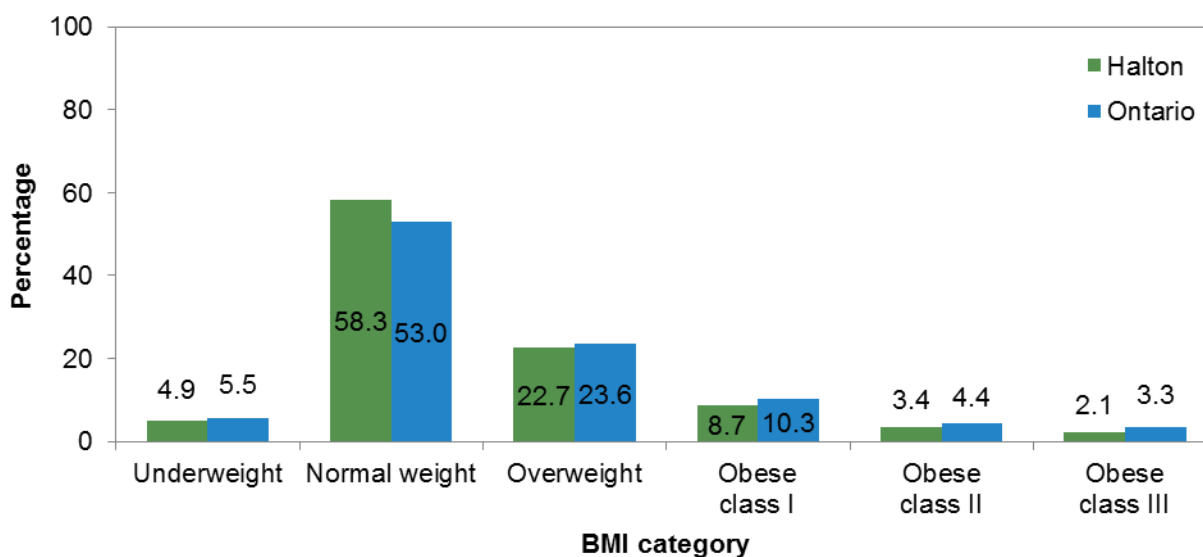
BORN Information System [2013-2015], extracted October 26, 2016.

## Limitations

Data on pre-pregnancy BMI and gestational weight gain had a high amount of missing information and should be interpreted with caution. Data were combined for 2013-2015 due to small numbers. Women with a pre-pregnancy BMI >34.9 or pregnant with three or more fetuses were excluded from the gestational weight gain calculations as there is insufficient evidence to develop weight gain guidelines for these groups.<sup>39</sup> Recommended maternal weight gain is not calculated for multiple birth pregnancies for women with a pre-pregnancy BMI <18.5, and are coded in BORN as missing.

## Pre-pregnancy body mass index

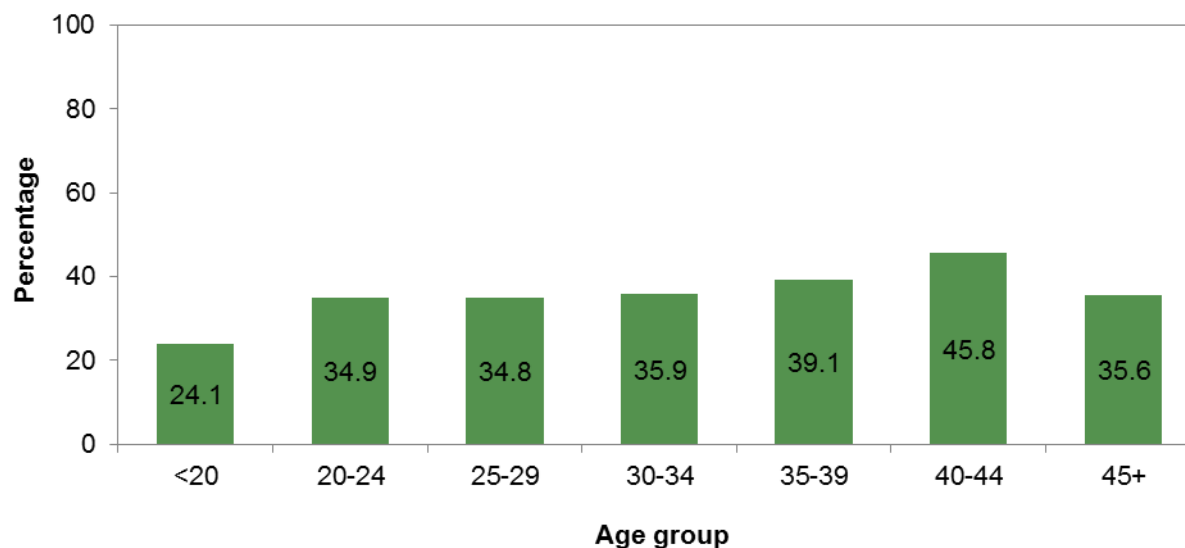
**Figure 19** shows the proportion of women in Halton and Ontario in each BMI category prior to pregnancy in 2013-15 (combined). Over half of women in Halton who gave birth had a normal weight prior to pregnancy. Women in Halton were significantly more likely to be in the normal weight range prior to pregnancy compared to Ontario. These estimates should be interpreted with caution due to a high amount of missing data in both Halton and Ontario (17%). Records with missing information for BMI were excluded in the data presented below.



**Figure 19: Pre-pregnancy body mass index category, females who gave birth (live or still), Halton and Ontario, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted October 26, 2016.

For 2013-15 (combined), Halton females under 20 years of age who gave birth were least likely to be overweight or obese, and these differences were statistically significant when compared to all other age groups except for ages 20-24 and 45+ (**Figure 20**).

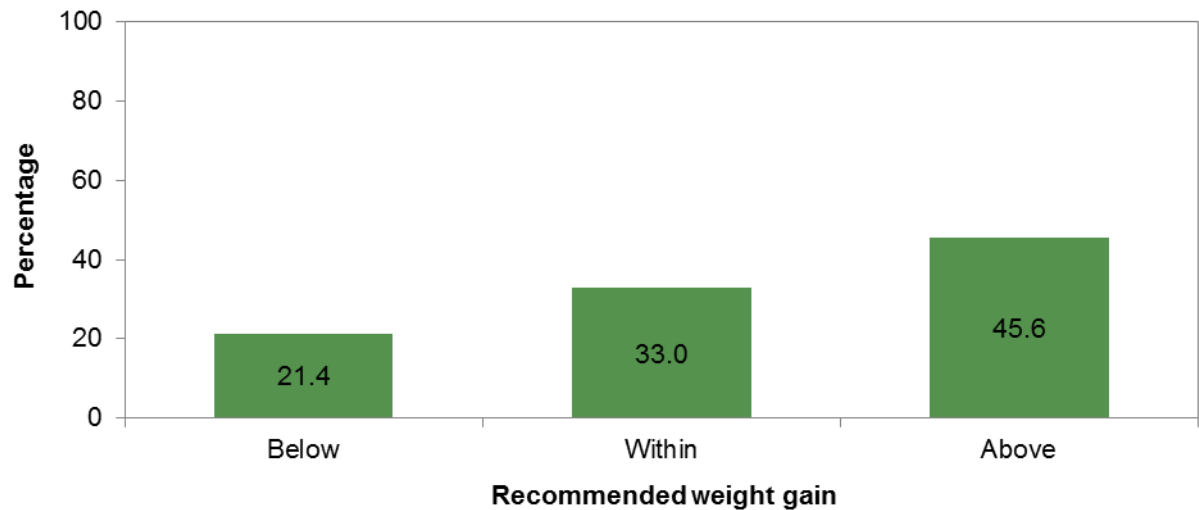


**Figure 20: Percentage of females who gave birth (live or still) who were overweight or obese prior to pregnancy, Halton Region, by age group, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted October 26, 2016.

# Gestational weight gain

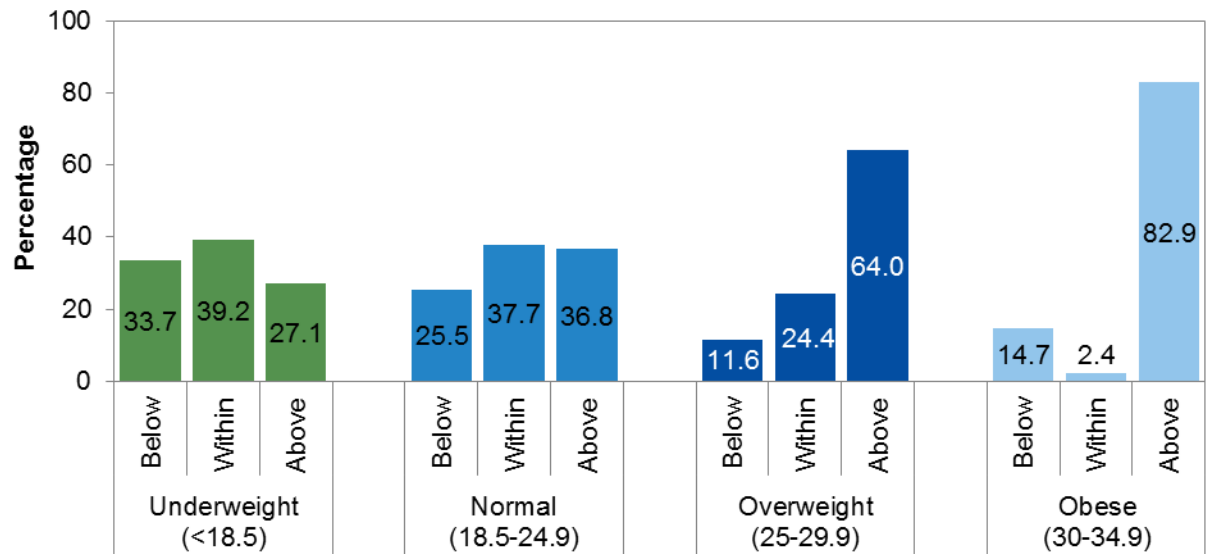
For 2013-15 (combined), more women in Halton who gave birth gained weight in excess of the recommended guidelines than within the recommended guidelines (**Figure 21**). This difference was statistically significant. Note that these estimates should be interpreted with caution due to the high amount of missing data on gestational weight gain for Halton (23%). Records with missing information for BMI were excluded in the data presented below.



**Figure 21: Percentage of females who gave birth (live or still), within, or above the recommended amount of weight during pregnancy, Halton Region, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted October 26, 2016.

For 2013-15 (combined), Halton mothers who were overweight or obese prior to pregnancy, were most likely to gain wait more weight than recommended by Health Canada during their pregnancy. Women who were underweight prior to pregnancy were most likely to gain less weight than recommended by Health Canada (**Figure 22**).



**Figure 22: Percentage of females who gave birth (live or still) who gained below, within, or above the recommended amount of weight during pregnancy, by pre-pregnancy BMI category, Halton Region, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted October 26, 2016.

# Maternal mental health

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## What is it?

This section of the report looks at the prevalence of mental health concerns during pregnancy. Indicators presented include:

- the percentage of women who gave birth (live or still) who *experienced depression during pregnancy*;
- the percentage of women who gave birth (live or still) who *experienced anxiety during pregnancy*;
- the percentage of women who gave birth (live or still) and who had given birth at least once before with a *history of postpartum depression*; and
- the percentage of women who gave birth (live or still) who *experienced any mental health concern during pregnancy* (including anxiety, depression, history of postpartum depression, addiction, bipolar, schizophrenia or other mental health concerns), during a given period of time.

## Why is it important?

Maternal mental health problems are common, with as many as one in five women developing a mental health issue while pregnant or during the first year after childbirth.<sup>40</sup> Maternal mental health is an important public health issue, as it can have effects on both the health of a mother and her baby.<sup>40</sup>

Women with mental health concerns during or after pregnancy may be at an increased risk of poor physical health, pregnancy complications, preterm labour, substance use, and difficulties caring for herself and her baby.<sup>40,41</sup> Maternal mental health problems can also have lasting impacts on her

child's cognitive and emotional health and wellbeing.<sup>40,42</sup>

While anyone may experience mental health problems during and after pregnancy, certain groups of women may be more vulnerable, including younger women, women living in low income households, immigrants, single women, women with lower education, and women with low social support.<sup>19,43,44</sup>

## What does it tell us?

For 2013-15 (combined), 14.9% of women who gave birth in Halton experienced one or more mental health concerns during pregnancy, which was slightly lower than Ontario. Young mothers (under 20 years old) were most likely to have experienced one or more mental health concerns during pregnancy.

## Data sources

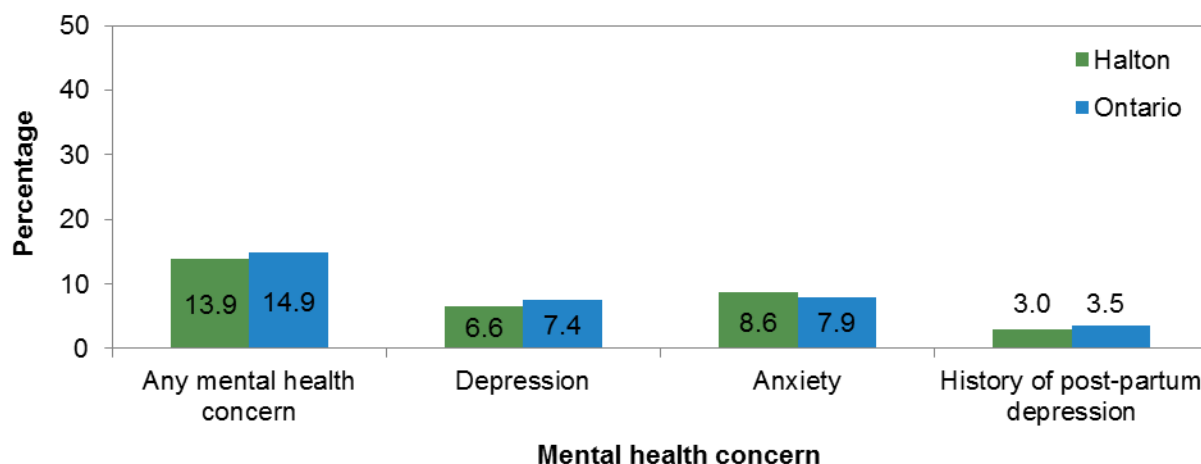
BORN Information System [2013-2015], extracted October 26, 2016 and January 5, 2017.

## Limitations

Due to small numbers, data from 2013-2015 were combined for analysis. Records with missing data were excluded. Maternal mental health variables are self-reported and thus subject to under-reporting and social desirability bias. Although a history of postpartum depression does not necessarily indicate a mental health concern during the current pregnancy, this element is included as a maternal mental health concern for this indicator because a previous experience with a perinatal mood or anxiety disorder such as postpartum depression increases one's risk of experiencing it again.<sup>45</sup>

## Overview of maternal mental health concerns

From 2013-15, an average of 778 women per year in Halton reported experiencing one or more mental health concerns during pregnancy. The most common reported mental health concern was anxiety, followed by depression. For 2013-15 (combined), Halton women were slightly less likely than women in Ontario to report experiencing one or more mental health concerns during pregnancy. Similarly, Halton women were slightly less likely than those in Ontario to report experiencing depression during pregnancy or having a history of post-partum depression. However, Halton women were slightly more likely than those in Ontario to report experiencing anxiety during pregnancy (**Figure 23**). These differences were all statistically significant.

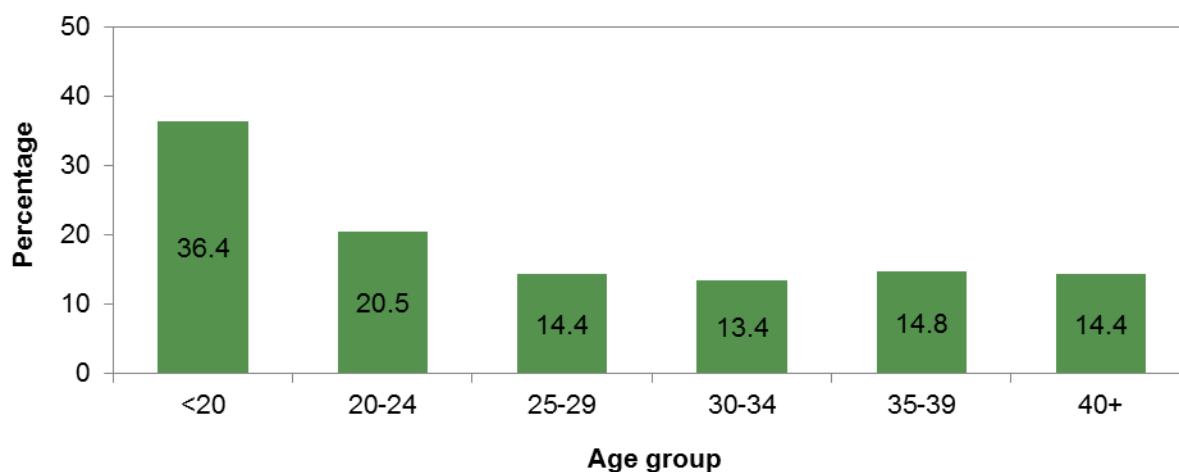


**Figure 23: Percentage of females who gave birth (live or still) who experienced any mental health concern, depression, anxiety during pregnancy, or who had a history of postpartum depression, Halton and Ontario, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted January 5, 2017 (history of post-partum depression data only) and October 26, 2016 (all other maternal mental health data).

## Maternal mental health concerns by age

For 2013-15 (combined), Halton females under 20 years old who gave birth were significantly more likely than all other age groups to report experiencing one or more mental health concerns during pregnancy (**Figure 24**).



**Figure 24: Percentage of females who gave birth (live or still) who experienced any mental health concern during pregnancy, by age group, Halton Region, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted October 26, 2016

# Substance use

## during pregnancy

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### What is it?

This section of the report examines the prevalence of smoking, alcohol, and drug use during pregnancy. Indicators presented include:

- the percentage of women who gave birth (live or still) who *reported smoking at the time of the newborn's birth*;
- the percentage of women who gave birth (live or still) who *resided with a smoker at the time of the newborn's birth*;
- the percentage of women who gave birth (live or still) who *reported any alcohol exposure during pregnancy*; and;
- the percentage of women who gave birth (live or still) who *reported any drug exposures during pregnancy* (including cocaine, gas/glue, hallucinogens, marijuana, methadone, narcotics, opioids and other drugs).

### Why is it important?

Smoking, alcohol and drug use during pregnancy can cause serious health problems for the mother and her developing baby. Some of the main effects (preterm birth, low birth weights, and congenital anomalies) of these prenatal exposures are the leading causes of infant mortality.<sup>23</sup>

Smoking during pregnancy can increase the risk of having a miscarriage, premature birth, having a baby with a low birth weight, and having a baby with certain congenital anomalies.<sup>46,47</sup> Exposure to second hand smoke similarly can increase the risk of having a premature birth or having a baby with a low birth weight. Infants whose mothers smoked during pregnancy or who are exposed to second hand smoke after birth are also at a greater risk for Sudden Infant Death Syndrome (SIDS).<sup>46,47</sup>

Alcohol is the most widely used drug known to cause adverse fetal effects. As well as the above

health effects, when consumed during pregnancy, alcohol increases the risk of giving birth to a baby with a range of physical, social, mental and emotional problems referred to as Fetal Alcohol Spectrum Disorder.<sup>48</sup> There is no safe level or time to drink alcohol while pregnant.<sup>48</sup>

Similar to tobacco and alcohol use, illicit drug use during pregnancy can also result in severe health consequences for the developing baby, as well as pregnancy complications and loss.<sup>49,50</sup> Although substance misuse is complex, pregnancy is considered a time when many women are motivated to change unhealthy or harmful behaviours.<sup>51</sup>

### What does it tell us?

Pregnant women in Halton were less likely than those in Ontario to report smoking or drug use at the time of their baby's birth. Young pregnant women (under age 25) were the most likely to report smoking while pregnant. There were no differences between Halton and Ontario in reported alcohol exposure while pregnant.

### Data sources

BORN Information System [2013-2015], extracted October 26, 2016 and January 5, 2017.

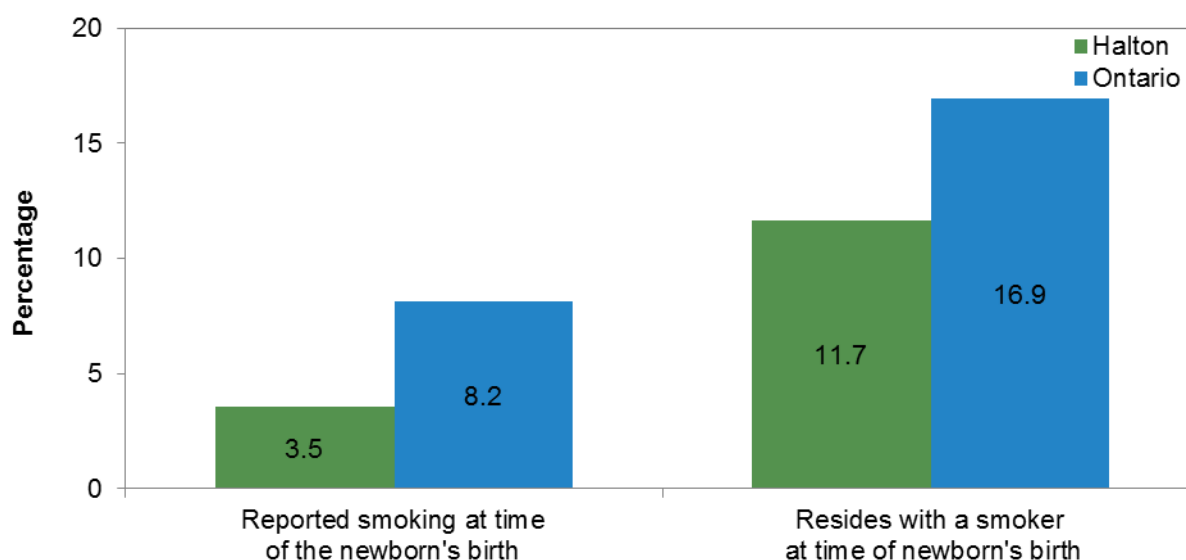
### Limitations

Due to small numbers, data from 2013-2015 were combined for analysis. Records with missing/unknown data were excluded. Data on residing with a smoker at the time of the newborn's birth should be interpreted with caution due to the high amount of missing data, particularly for Ontario (5% missing for Halton, 14% for Ontario). Maternal smoking, alcohol, and drug use variables are either self-reported or disclosed by a secondary source, and thus subject to under-reporting and social desirability bias.



## Smoking during pregnancy

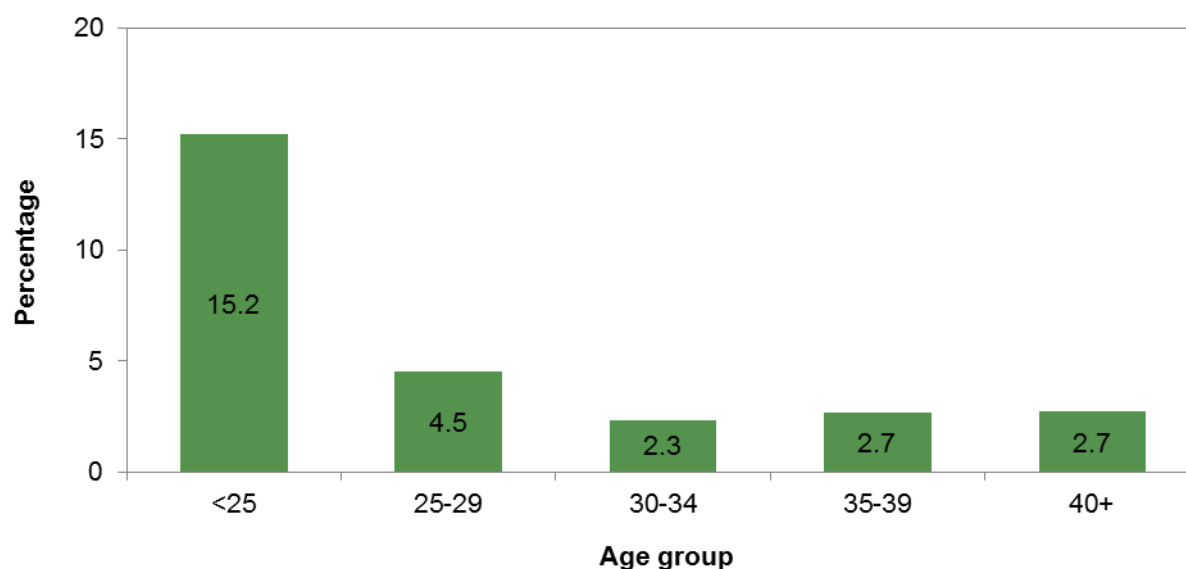
For 2013-15 (combined), Halton mothers were less likely than Ontario mothers to report smoking at the time of the newborn's birth, as well as living with a smoker at the time of the newborn's birth. These differences were both statistically significant (**Figure 25**).



**Figure 25: Percentage of females who gave birth (live or still) who reported any smoking or who reported residing with a smoker at the time of the newborn's birth, Halton Region and Ontario, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted January 5, 2017 (data on residing with a smoker) and October 26, 2016 (data on reported smoking)

For 2013-15 (combined), Halton women under age 25 were significantly more likely than all other age groups to report smoking at the time of their newborn's birth (**Figure 26**).



**Figure 26: Percentage of females who gave birth (live or still) who reported any smoking at the time of the newborn's birth, by age group, Halton Region, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted October 26, 2016.

# Alcohol and drug use during pregnancy

For 2013-15 (combined) women in Halton were less likely than those in Ontario to report any drug\* exposure during pregnancy, and this difference was statistically significant. There were no significant differences in alcohol exposure during pregnancy for women in Halton and Ontario. (Figure 27).

Alcohol consumption during pregnancy is known to incur risk to an unborn baby, and is considered socially undesirable.<sup>52</sup> For this reason, it is difficult to obtain accurate estimates of the prevalence of alcohol consumption among pregnant women, as some women may be unwilling to disclose alcohol use during pregnancy.<sup>53</sup> Other data sources, such as the 2005-2008 Canadian Maternal Experiences Survey (CMES),<sup>52</sup> and the 2007-2008 Canadian Community Health Survey (CCHS)<sup>54</sup> estimated the prevalence of alcohol consumption during pregnancy in Ontario at 12% and 5.4%, respectively. There are likely many different reasons for the different estimates for these various data sources, including changes in alcohol consumption during pregnancy in the population over time, as well as differences in data collection methodology. For example, a possible contributing factor for the lower estimates with BORN data could also be that women may be more hesitant to report alcohol consumption to healthcare providers compared to an anonymous survey such as the CCHS or CMES, in order to avoid perceived negative consequences or feelings of being judged by their healthcare provider. Drug exposure and smoking during pregnancy may also be underreported for similar reasons. Therefore, it is important that these estimates be interpreted with caution.

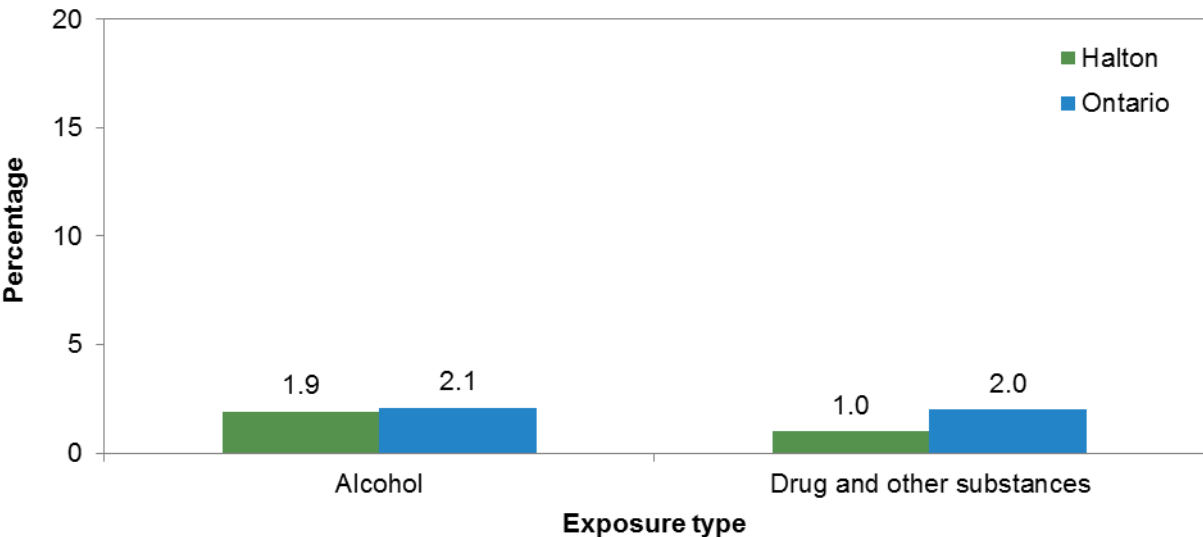


Figure 27: Percentage of females who gave birth (live or still) who reported any alcohol or drug\* exposure during pregnancy, Halton Region and Ontario, 2013-2015 combined.

Data source: BORN Information System [2013-2015], extracted October 26, 2016.

\*Drugs include: cocaine, gas/glue, hallucinogens, marijuana, methadone, narcotics, opioids and other drugs

# Prenatal class attendance

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## What is it?

This section of the report looks at the *percentage of women who gave birth (live and still) who participated in prenatal education classes* (online and in person) during their pregnancy, during a given time period.

## Why is it important?

Prenatal classes provide pregnant women and their partners with information on a range of topics about pregnancy, birth, and parenting. Prenatal education programs can be delivered online and in-person.

Monitoring the use of prenatal programs and services is important for identifying trends in uptake of prenatal education, identifying priority populations, and informing plans for the delivery of prenatal education programs in Halton.

## What does it tell us?

For 2013-15 (combined), 28.0% of pregnant women in Halton reported attending prenatal classes, which was higher than Ontario (24.9%). There were no differences in prenatal class attendance between mothers having single births compared to multiples.

Among Halton first time mothers specifically, 58.3% reported attending prenatal classes, which was also higher than Ontario (45.4%) First time mothers under age 20 and aged 20-24 were less likely than first time mothers in all other age groups to report having attended prenatal classes. First time mothers in Milton were more likely than those in Burlington to report attending prenatal classes.

## Data sources

BORN Information System [2013-2015], extracted October 26, 2016 and January 5, 2017.

## Limitations

Data on prenatal class attendance had a high amount of missing information and should be interpreted with caution (6.9% for all mothers and 7.4% for first time mothers in Halton, and 10.2% for all mothers and 11.4% for first time mothers in Ontario). Missing data were excluded. Due to small numbers, data from 2013-2015 were combined for analysis. Data on prenatal class attendance were self-reported. BORN does not collect data on where prenatal classes took place or whether they were online or in-person.

The **Halton Region Health Department** offers a number of different prenatal programs, including:

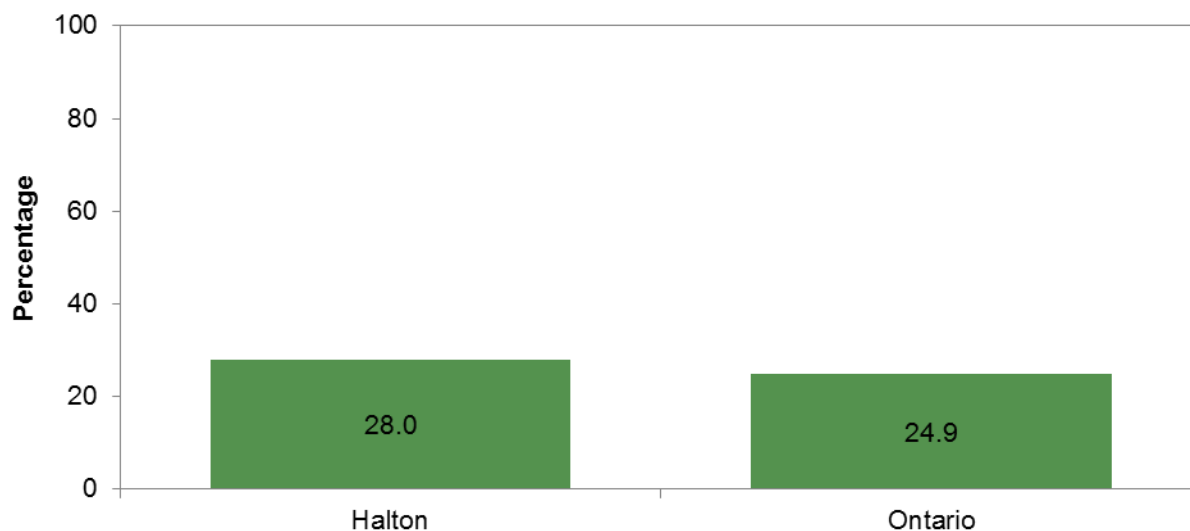
- Healthiest Babies Possible group prenatal classes
- Healthiest Babies Possible for parents expecting multiples
- Halton Online Prenatal Program
- Prenatal Car Seat Class
- Prenatal Breastfeeding Class
- Halton Prenatal Nutrition Program

For more information on prenatal and other parenting programs offered by the Halton Region Health Department, visit [haltonparents.ca](http://haltonparents.ca).



## Overview of prenatal class attendance

For 2013-15 combined, mothers in Halton were more likely to report having attended prenatal classes compared to those in Ontario, and this difference was statistically significant (**Figure 28**).



**Figure 28: Percentage of females who gave birth (live or still) who reported attending prenatal classes, Halton and Ontario, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted October 26, 2016.



For 2013-15 combined:

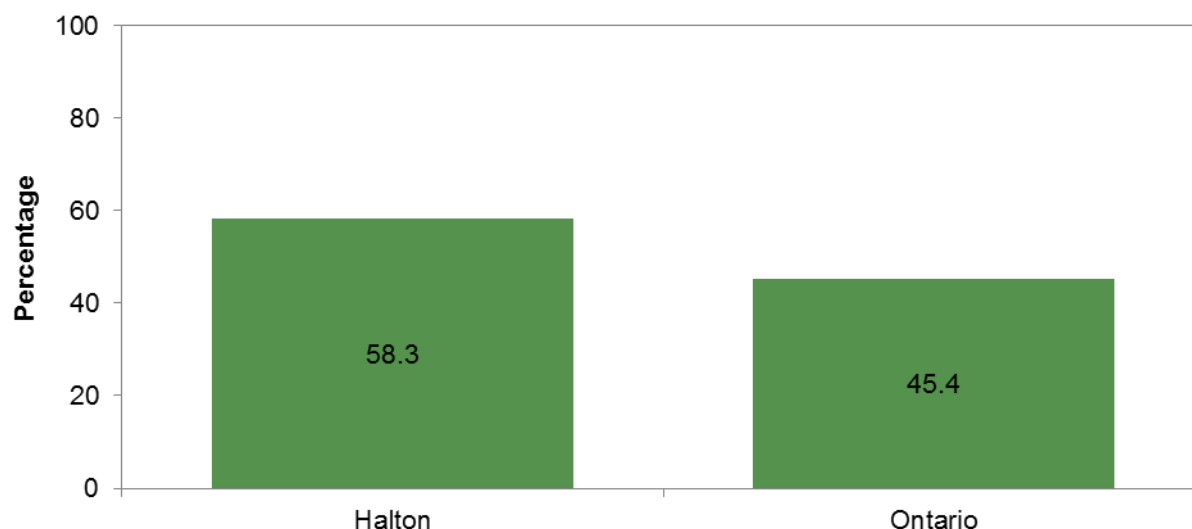
- **27.9%** of women with a singleton pregnancy attended prenatal classes
- **30.4%** of women pregnant with multiples attended prenatal classes.

This difference was not statistically significant.

Data source: BORN Information System [2013-2015], extracted October 26, 2016.

## First time mothers

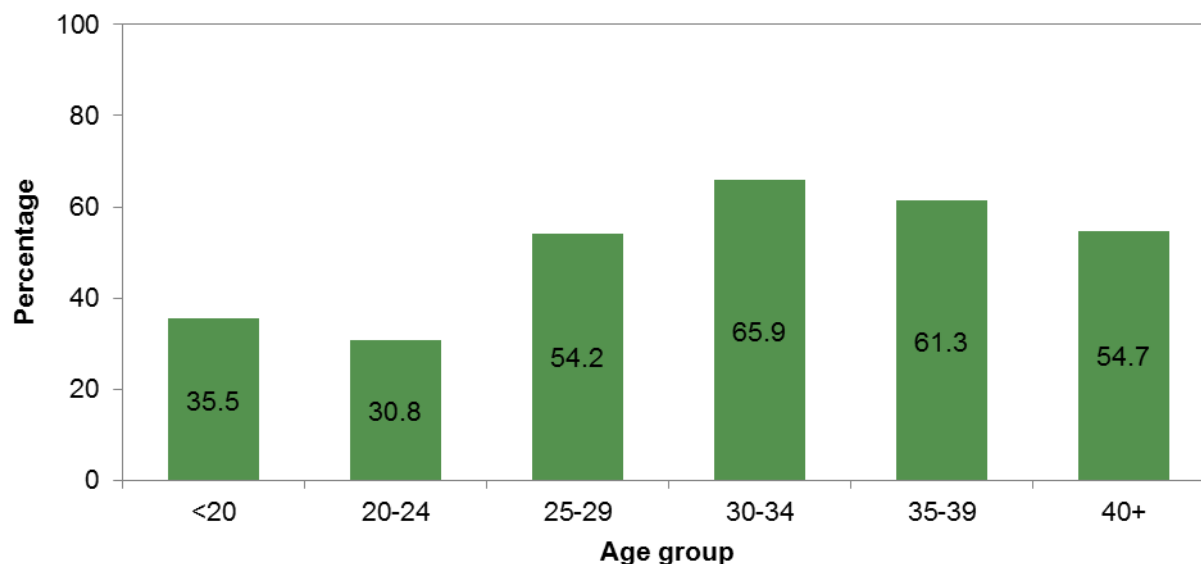
More than half of first time mothers in Halton reported attending prenatal classes, which was significantly higher than Ontario first time mothers (**Figure 29**).



**Figure 29: Percentage of first time mothers who gave birth (live or still) who reported attending prenatal classes, Halton and Ontario, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted January 5, 2017.

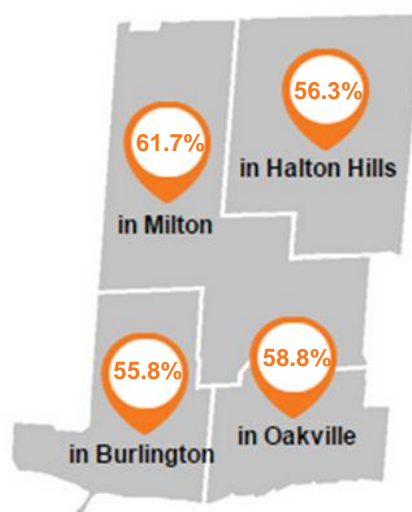
For 2013-15 combined, first time mothers under age 20 and ages 20-24 were less likely than all other age groups to report having attended prenatal classes (**Figure 30**). These differences were statistically significant when comparing mothers under age 20 and ages 20-24 to all other age groups except 45+.



**Figure 30: Percentage of first time mothers who gave birth (live or still) who reported attending prenatal classes, by age group, Halton Region, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted October 26, 2016.

For 2013-15 combined, first time mothers in Milton were most likely to report having attended prenatal classes. These differences were statistically significant when comparing first time mothers in Milton to first time mothers in Burlington (**Figure 30**).



**Figure 31: Percentage of females who gave birth (live or still) who reported attending prenatal classes, by municipality, Halton Region, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted October 26, 2016.

# Parents'

## age

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### What is it?

Indicators presented in this section of the report include:

- **Average age of mother** at the birth of their infant
- **Average age of father** at the birth of their infant
- **Percentage of women who gave birth who were aged 35 or over** at the birth of their infant
- **Percentage of first time mothers who were aged 35 or over** at the birth of their infant.

### Why is it important?

Canadian parents are having children at older ages.<sup>55,56</sup> From approximately the 1950s into the 1970s, the average age at first birth for a woman in Canada was about 24 years old.<sup>27</sup> Since the 1970s, average age of first-time mothers in Canada rose to 28.5 years old.<sup>27</sup> Some reasons for the rise in average age of mothers at childbirth include more women pursuing higher education, older ages at marriage, greater participation of women in the work force, as well as improvements in contraception allowing for more control over the timing of pregnancies.<sup>57</sup>

Delaying pregnancy until older ages can present health concerns for both a mother and her baby.<sup>58</sup> Compared to women under age 35, women who give birth at age 35 or over have a greater risk of developing hypertension (high blood pressure), preeclampsia, diabetes, and have an increased risk of needing to have a caesarean delivery.<sup>58</sup> Infants whose mothers are over 35 are more likely to be

preterm, have a low birth weight, or be small for their gestational age, and may also be at a greater risk for certain chromosomal and congenital anomalies.<sup>58</sup>

Research also suggests that infants born to older fathers might also have an increased risk of certain health issues, including schizophrenia and autism.<sup>59,60,61</sup>

### What does it tell us?

Over the past 25 years, the average ages of mothers and fathers have been increasing in both Halton and Ontario

In 2015, 20.0% of first time mothers and 31.6% of all mothers who gave birth were over age 35. The proportion of women who gave birth who were over aged 35 was higher in Halton compared to Ontario. Oakville had a higher proportion mothers who were aged 35 and over when they gave birth compared to the other three municipalities.

### Data sources

Vital Statistics [1987-2011]. Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Inpatient Discharges (mother's record) [2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

### Limitations

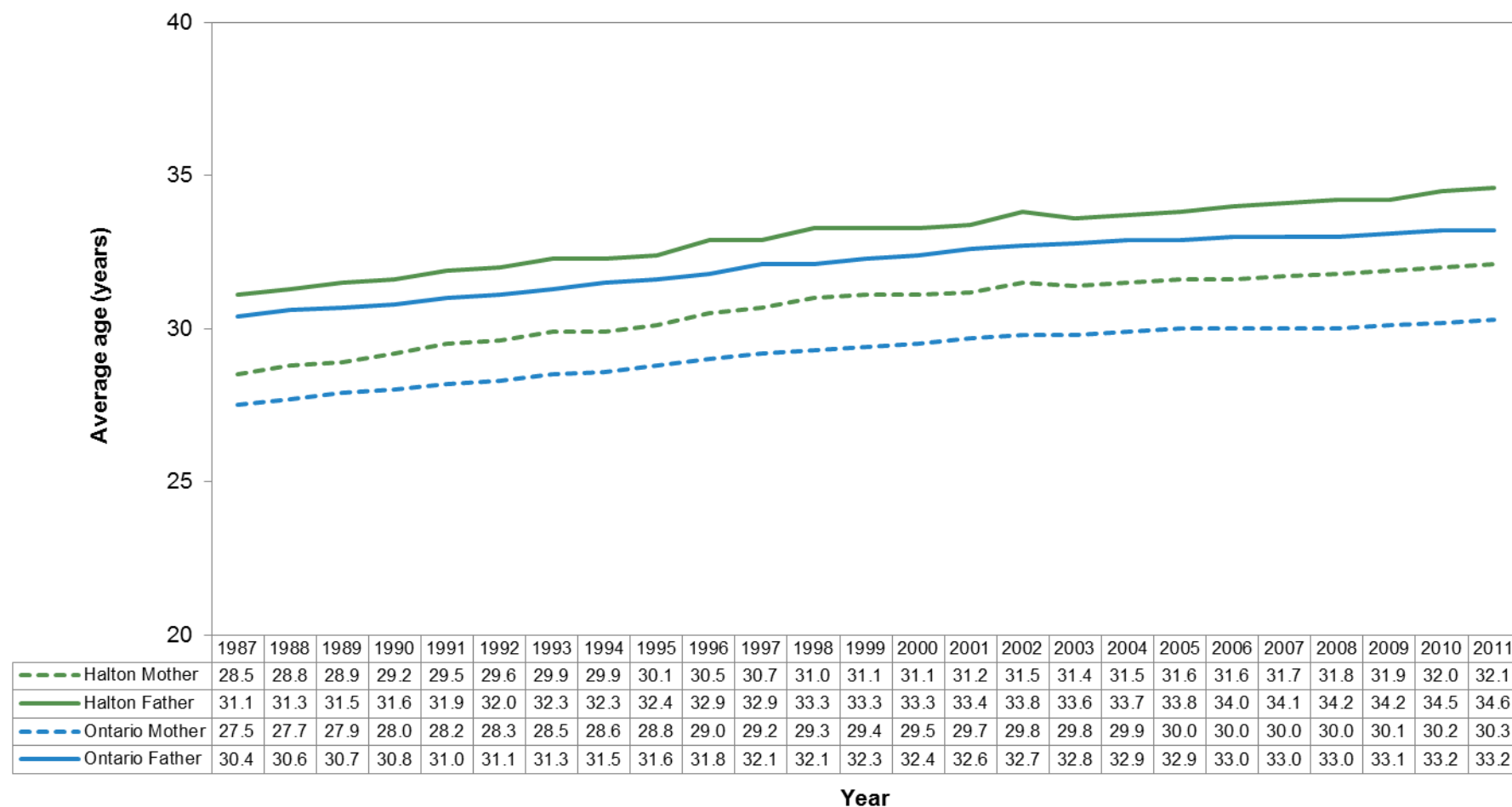
Out-of-province births and births that occurred outside of a hospital (e.g. infants born at home) are not included. Missing/unknown data were excluded. No variables exist in the Vital Statistics Data for father's residence; therefore indicators of father's age at infant's birth were analyzed by mother's residence. This assumes that the father resides in the same geographic area as the mother, which may not always be the case.





## Average age of mothers and fathers

From 1987 to 2011, the average ages of both mothers and fathers at the time of the baby's birth increased in Halton and Ontario (**Figure 32**). According to data presented in Public Health Ontario's Reproductive Health Snapshots, in 2014 Halton had the highest average age of a mother at birth out of all 36 health units in Ontario at 32.4 years of age. In comparison, the average age of mothers who gave birth in Ontario in 2014 was 30.6 years.<sup>62</sup>

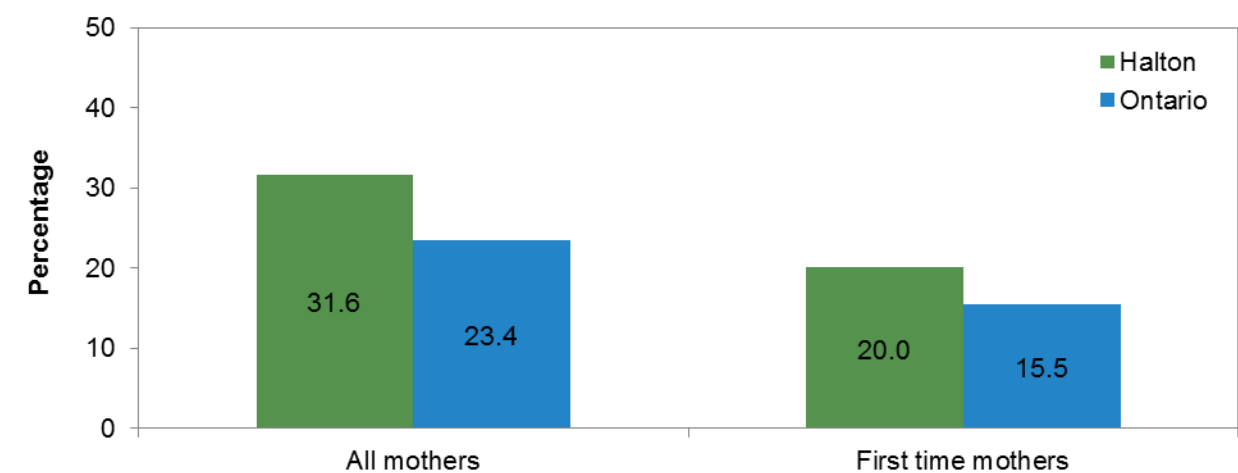


**Figure 32: Mean age of mother and mean age of father at infant's birth, Halton and Ontario, 1987-2011.**

Data source: Ontario Vital Statistics Birth Data [2003-2011], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

### Proportion of mothers aged 35 and over

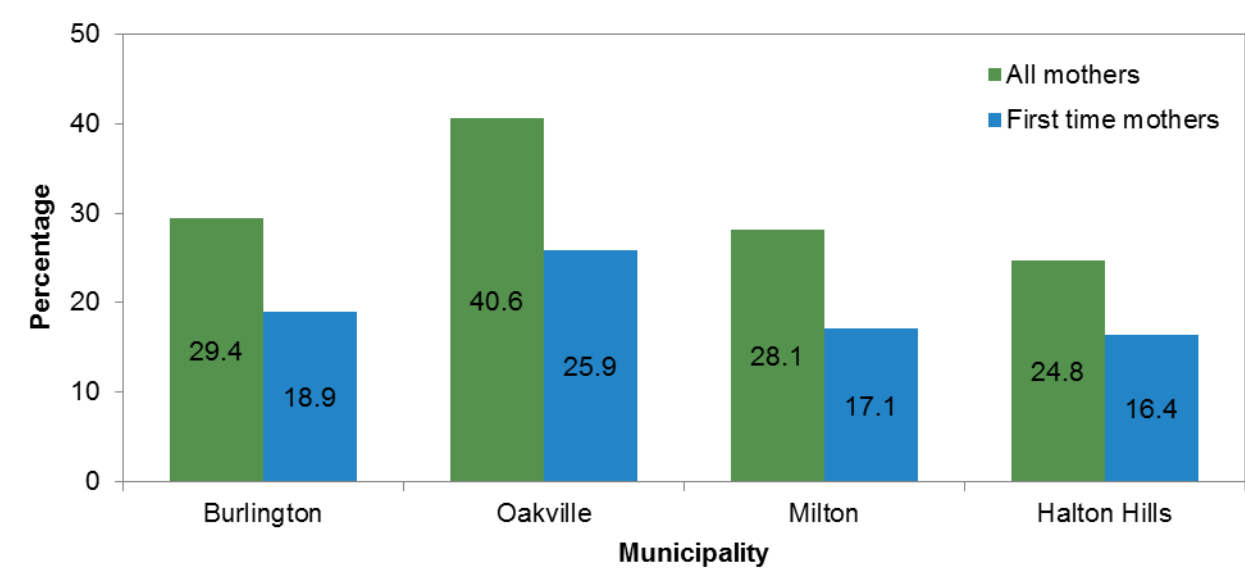
In 2015, 31.6% of mothers in Halton who gave birth were aged 35 and over, compared to 23.4% in Ontario. This difference was statistically significant. Among first time mothers, 20.0% in Halton and 15.5% in Ontario were aged 35 and over when they gave birth in 2015. This difference was also statistically significant (**Figure 33**).



**Figure 33: Proportion of mothers who were aged 35 and over at the time of birth, all mothers and first time mothers, Halton and Ontario, 2015.**

Data source: Inpatient Discharges (mother’s record) [2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

Oakville had a significantly higher proportion of mothers who were aged 35 and over when they gave birth compared to the other three municipalities. This was true both for all mothers who gave birth, as well as first time mothers, specifically (**Figure 34**).



**Figure 34: Proportion of mothers who were aged 35 or over at the time of birth, all mothers and first time mothers, by municipality, Halton Region, 2015.**

Data source: Inpatient Discharges (mother’s record) [2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

# Birth outcomes



# Live birth rates

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## What is it?

**Live births** include births where immediately upon birth the infant breathes or shows other signs of life (e.g. heartbeat), regardless of pregnancy duration. A live birth is not necessarily a viable birth.

**Counts of live births** are compared over time for three different data sources: Hospital discharges (includes only live hospital births), the BORN Information System (includes live hospital births and births attended by midwives), and Vital Statistics (includes all live births).

Counts of live births are also presented by mother's age group, and by **parity**, which is the number of previous times that a woman has given birth (both live and still) using BORN data. BORN is used because it is more current than Vital Statistics, and information on mother's age and parity are not available in the newborn's hospital discharge record.

Also presented are **crude live birth rates**, which are the total number of live births per 1,000 population in a given time period. Crude birth rates are presented using hospital discharge data for newborns, as hospital data is more recent than Vital Statistics, and has more years of data available compared to BORN.

## Why is it important?

Like pregnancy and fertility rates, live birth rates are another indicator of population growth and the reproductive capacity of a population. The number of live births in Halton can be used to inform program planning and service delivery.

## What does it tell us?

The number of live births in Halton increased between 2003 and 2009, at which point the number of births began to decrease slightly. The mother's age group with the highest number of births was ages 30-34, and the lowest numbers of births were

to mothers under 20 and over 45. Approximately 42% of live births in Halton were to first time mothers.

Crude live birth rates have been decreasing in recent years in both Halton and Ontario, and were similar to one another in 2015. When looking at crude birth rates by municipality, Burlington, Oakville and Halton Hills experienced a decline between 2003 and 2015. Milton, however, experienced an increase in crude birth rate until approximately 2010, followed by a slight decline in recent years. Since 2004, Milton has had a significantly higher birth rate compared to all other municipalities. Part of this difference may be explained by a greater proportion of females of reproductive age in Milton.

## Data sources

BORN Information System [2013-2015], extracted October 26, 2016. Inpatient Discharges (infant's record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Ontario Vital Statistics Birth Data [2003-2011], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

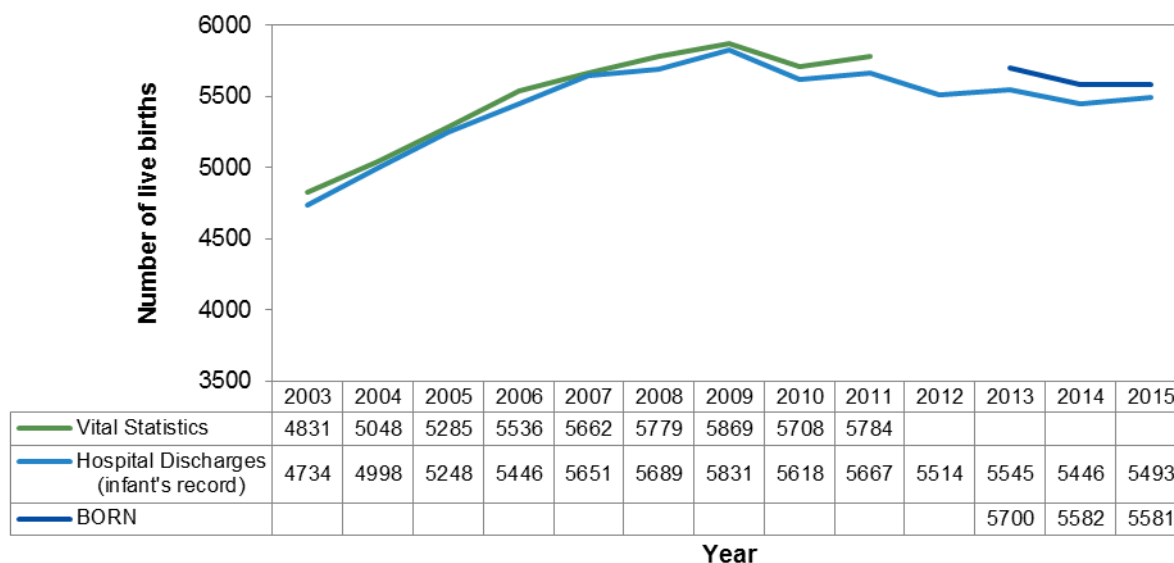
## Limitations

See [Appendix – Data sources and limitations](#) for more information on the strengths and limitations of each data source presented. Due to small numbers, data from 2013-2015 were combined for analysis. Records with missing/unknown data were excluded.

Crude birth rates are influenced by the age structure of the population, and will be higher in populations with more women of childbearing age. The underlying age structure of a population should be considered when interpreting crude birth rates. Crude birth rates may also be affected by the pattern of migration in and out of the population.

## Number of live births

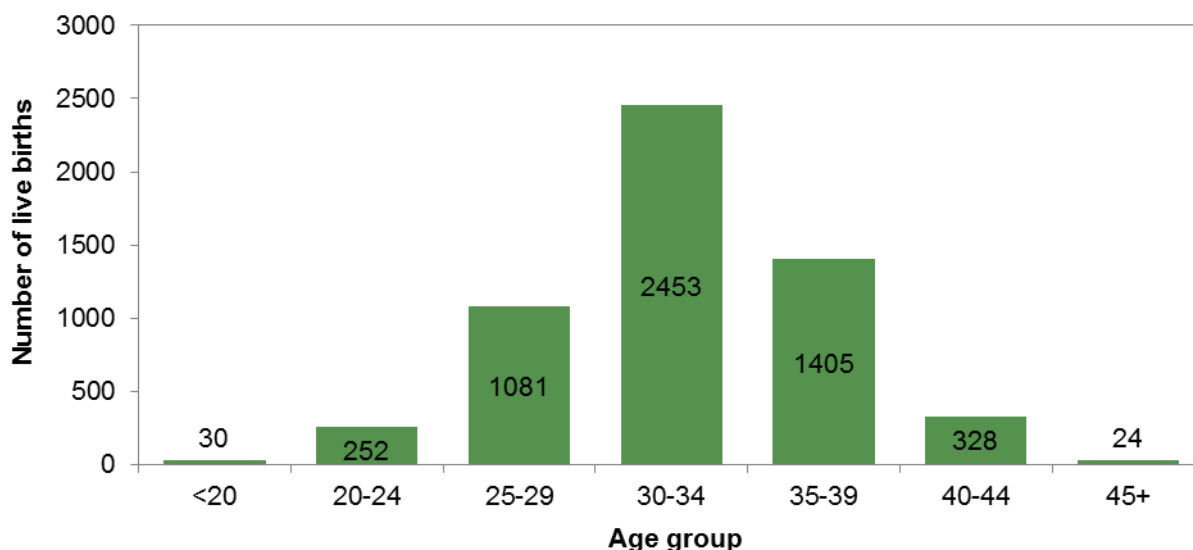
**Figure 35** shows the number of live births in Halton by data sources and years of data available. Hospital discharge data only includes data on infants born in a hospital in Ontario. BORN data includes both hospital births and births attended by midwives in Ontario. Vital Statistics data includes all registered live births, as required under the Vital Statistics Act.<sup>63</sup>



**Figure 35: Number of live births, by data source, Halton Region, 2003-2015.**

**Data sources:** Ontario Vital Statistics Birth Data [2003-2011], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Inpatient Discharges (infant record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. BORN Information System [2013-2015], extracted October 26, 2016.

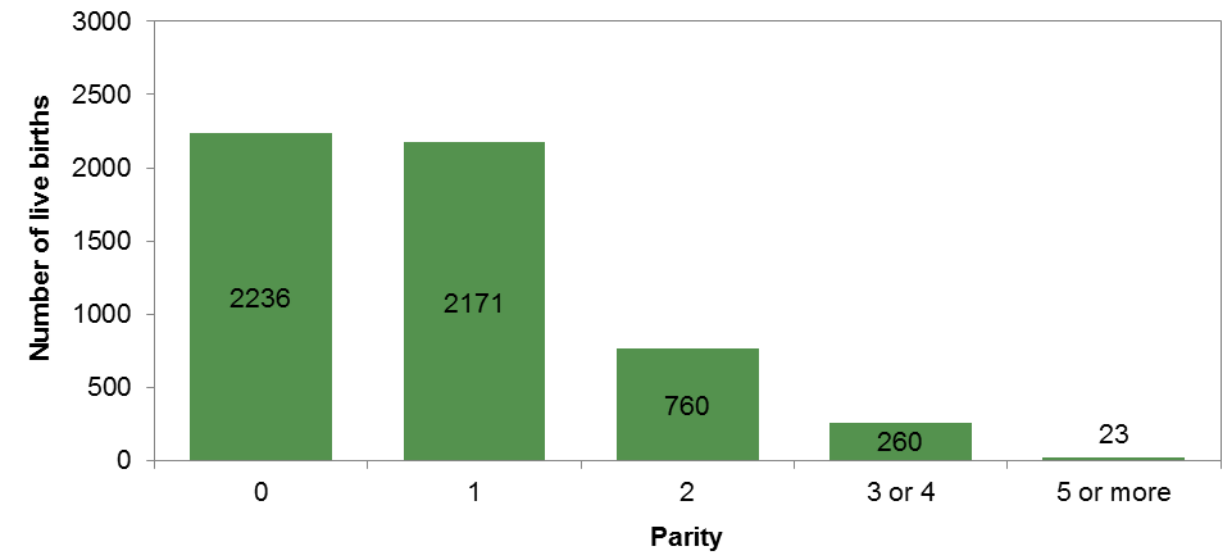
**Figure 36** shows the number of live births in Halton by mother's age group in 2015 based on data from BORN. Mother's aged 30-34 had the highest number of live births, while the lowest number of live births were to teen mothers and mothers aged 45 and over.



**Figure 36: Number of live births, by mother's age group, Halton Region, 2015.**

**Data source:** BORN Information System [2013-2015], extracted October 26, 2016.

**Figure 37** shows the number of live births by parity (the number of previous times a mother has had a live birth or stillbirth) in 2015 based on data from BORN. In 2015, approximately 41% of live births in Halton were to first time mothers.

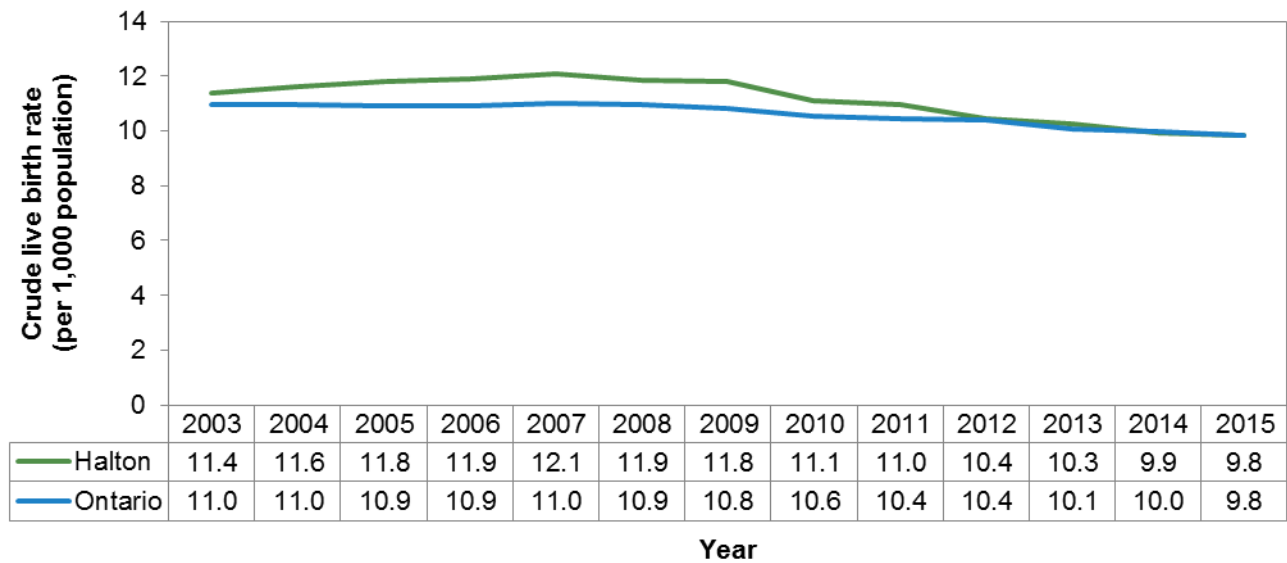


**Figure 37: Number of live births, by parity, Halton Region, 2015.**

Data source: BORN Information System [2013-2015], extracted October 26, 2016.

### Crude live birth rates

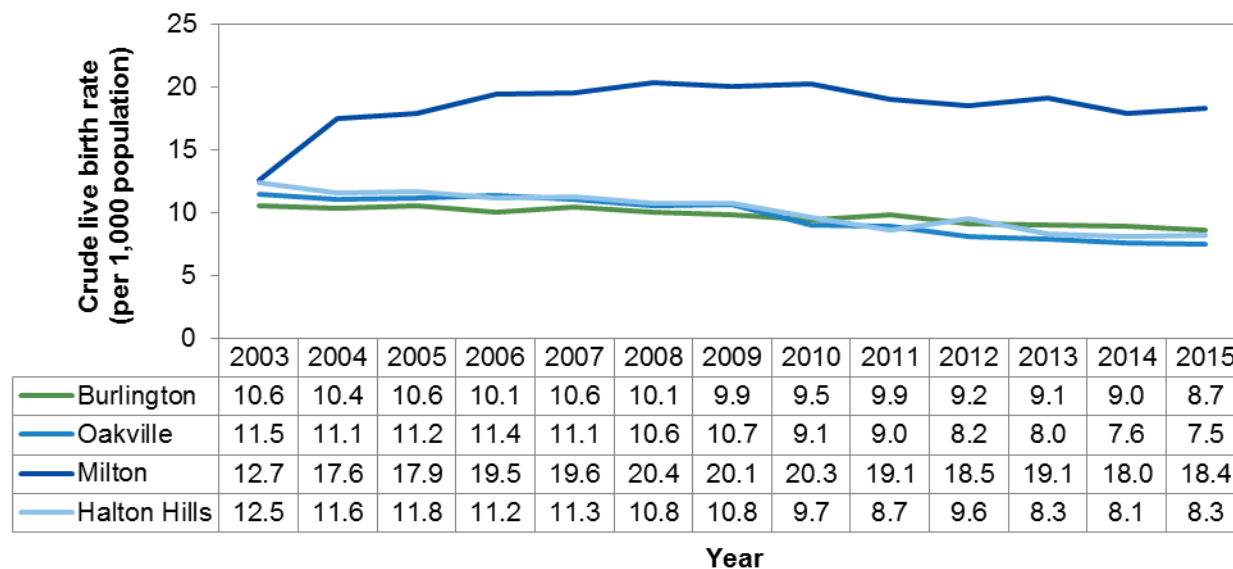
**Figure 38** shows the crude live birth rates in Halton and Ontario from 2003 to 2015, based on hospital discharge data. In Halton, crude live birth rates increased until approximately 2007, at which point they began to decrease. In Ontario, crude live birth rates also have been decreasing since approximately 2007. In 2015, the crude birth rate in Halton was similar to Ontario.



**Figure 38: Crude live birth rate (per 1,000 population), Halton and Ontario, 2003-2015.**

Data source: Inpatient Discharges (infant's record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.

**Figure 39** shows the crude live birth rates for each municipality in Halton from 2003 to 2015, based on hospital discharge data. Burlington, Oakville and Halton Hills experienced a decline in crude live birth rates between 2003 and 2015. Milton, however, experienced an increase in crude live birth rates until approximately 2010, followed by a slight decline in recent years. Since 2004, Milton has had a significantly higher crude live birth rate compared to all other municipalities. Part of this difference may be explained by a greater proportion of females of reproductive age in Milton.



**Figure 39: Crude live birth rate (per 1,000 population), by municipality, Halton Region, 2003-2015.**

**Data source:** Inpatient Discharges (infant's record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. Population Estimates [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted August 26, 2016.



# Stillbirth rates

---

## What is it?

**Stillbirths** occur when a baby is born without any signs of life, after 20 weeks of pregnancy.

**Crude stillbirth rate** is the total number of stillbirths per 1,000 total births over a given period of time.

Crude stillbirth rates are presented as three-year moving averages to account for some of the instability in rates due to small numbers.

## Why is it important?

Causes of stillbirths are often unknown. However, some possible reasons for stillbirths may include congenital anomalies (birth defects) in the baby, problems with the placenta or umbilical cord, or health issues with the mother such as diabetes or an infection.<sup>64</sup>

While anyone can have a stillbirth, research has found certain groups may be at a higher risk, including mothers who are overweight/obese, smoking or using other substances during pregnancy, advanced maternal age (over aged 35), or a multiple pregnancy.<sup>64,65</sup>

As many of the risk factors for stillbirths are modifiable, such as overweight/obesity and smoking

during pregnancy, public health interventions that promote healthy pregnancies are important for reducing stillbirth rates in the population.<sup>65</sup>

## What does it tell us?

Crude stillbirth rates from 2004 to 2014 have been relatively steady in Ontario, and somewhat more variable in Halton due to small numbers. Stillbirth rates in Halton have consistently been lower than Ontario.

## Data sources

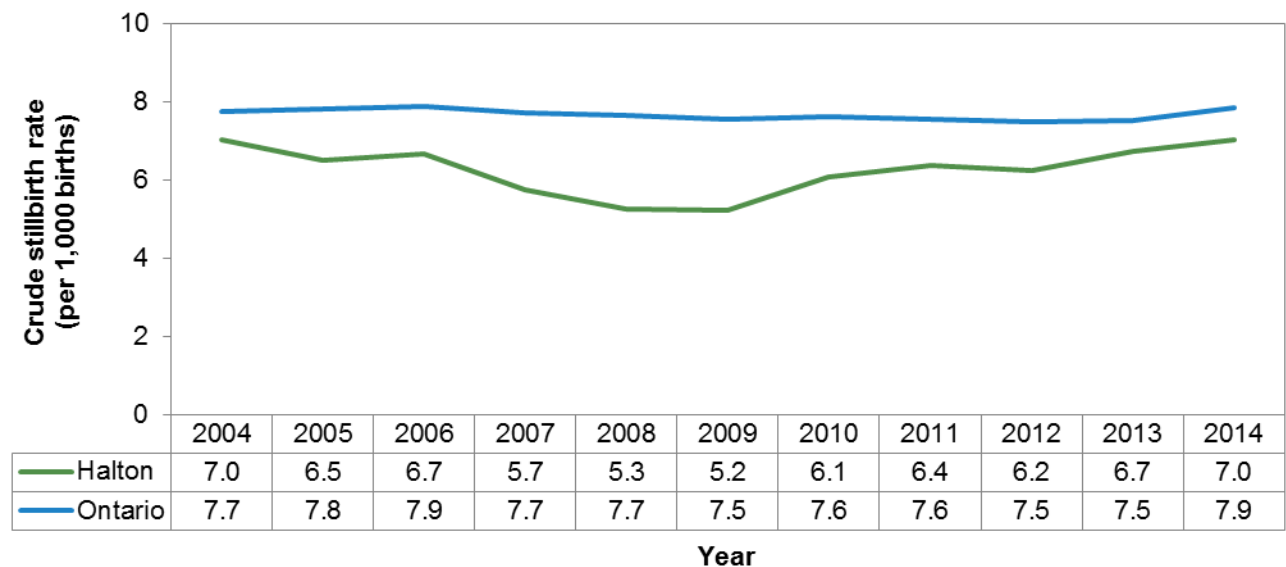
Inpatient Discharges (infant's record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

## Limitations

In Canada, a stillbirth is defined as  $\geq 20$  weeks gestation or  $\geq 500$  g.<sup>66</sup> However, birth weight is not available in hospitalization data for stillbirths, therefore stillbirths of all weights are included in the crude rates. Stillbirths to mothers that occur out-of-province and stillbirths that occurred outside of a hospital (e.g. infants born at home) are not included.

### Crude stillbirth rates

From 2011-2015, there were an average of 38 stillbirths in hospitals per year in Halton and over 1,000 stillbirths in hospitals per year in all of Ontario. **Figure 40** shows crude stillbirth rates for Halton and Ontario using three-year moving averages to account for unstable rates in the population due to small numbers. Stillbirth rates in Ontario have remained relatively stable, and rates have varied somewhat more in Halton due to small numbers. Halton has consistently had statistically significantly lower stillbirth rates compared to Ontario.



**Figure 40: Crude stillbirth rate (per 1,000 total births), based on moving 3-year averages, Halton and Ontario, 2004-2014.**

Data source: Inpatient Discharges (infant's record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

# Multiple birth rates

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## What is it?

The **multiple birth rate** refers to the number of deliveries involving multiple births, per 100 deliveries during a given period of time. **Multiple births** can include twins, triplets, quadruplets, or higher order multiple births.

## Why is it important?

Multiple gestation pregnancies can put both mothers and infants at a greater risk of serious health issues. Women pregnant with multiples are at a greater risk of gestational diabetes, hypertension, miscarriage, pre-eclampsia, as well as complications during delivery.<sup>67</sup> Infants have a greater risk of low birth weight, preterm birth, a higher risk of death within the first week of birth, as well as many other health issues.<sup>67</sup>

Fertility treatments put a woman at risk for a multiple pregnancy. Over the last couple of decades, the multiple birth rate in Canada has increased along with a rise in assisted reproductive technology (ART).<sup>68</sup> In addition, many women are delaying pregnancy until later in life, and older women have a greater risk of having multiples, particularly with fertility treatment.<sup>69</sup> However, in more recent years this growth has slowed somewhat, due to improvements in ART leading to fewer multiple births.

Parenting multiples can also present challenges. The Halton Region Health Department offers

“Healthiest Babies Possible for Parents Expecting Multiples” group prenatal classes specific to parents expecting more than one baby.

## What does it tell us?

The multiple birth rate in Ontario increased between 2003 and 2013. In Halton, due to small numbers the multiple birth rate has been much more variable, however in general it has also risen slightly in the same time period. For 2011-15 combined, the multiple birth rate in Halton was higher than Ontario. In both Halton and Ontario for 2011-15 combined, the multiple birth rate increased as mother’s age increased.

For 2010-15 combined, 4.2% of all hospital deliveries had involved ART, however 37.5% of all multiple deliveries occurring in hospital had involved ART.

## Data sources

Inpatient Discharges (mother’s record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

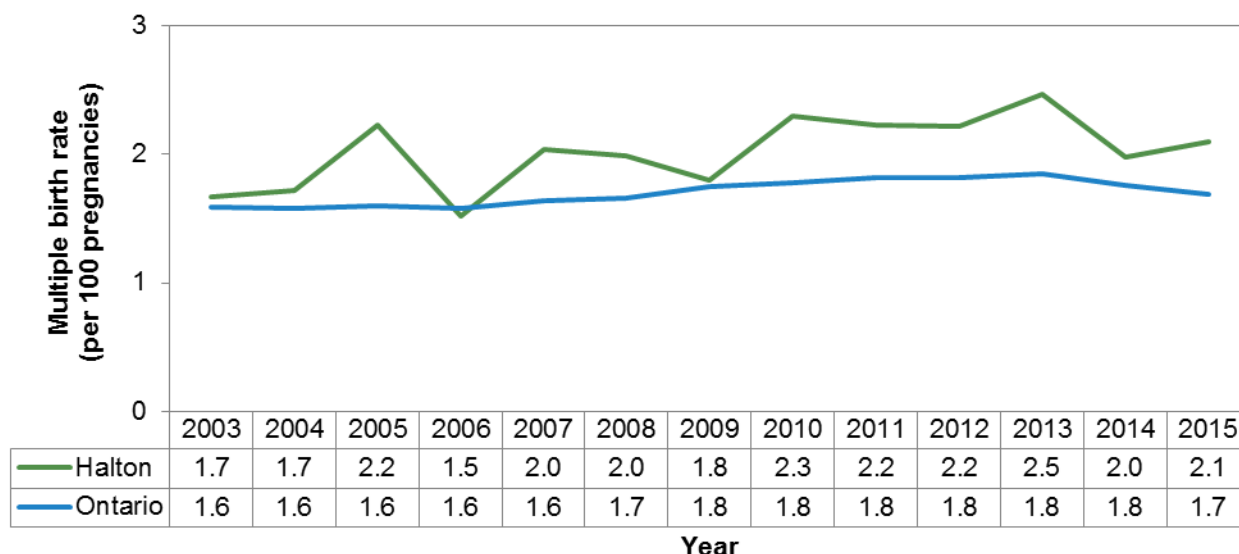
## Limitations

Hospital deliveries include live births and stillbirths, and count multiples as one delivery. Births to mothers that occurred out-of-province and births that occurred outside of a hospital (e.g. infants born at home) are not included. Missing/unknown data were excluded.



## Multiple birth rates

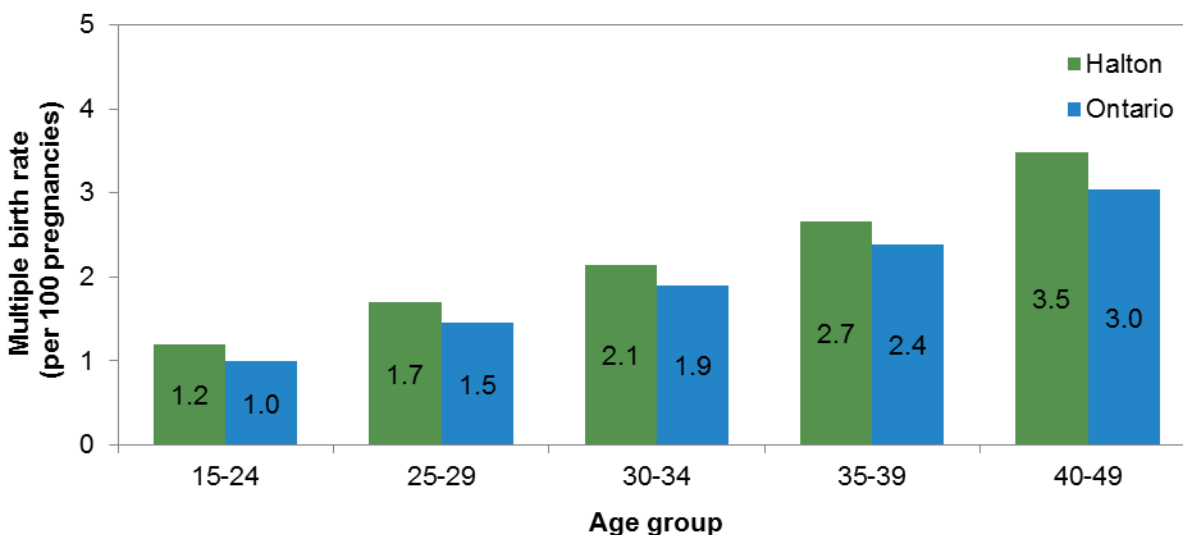
From 2011-2015, there were an average of 119 multiples pregnancies in Halton per year, and an average of 2417 multiples pregnancies in Ontario (delivered in hospital). Ontario's multiple birth rate increased between 2003 and 2013. Due to the small number of multiple pregnancies in Halton each year, Halton's multiple birth rate has fluctuated more from year to year. In general, however, the multiple birth rate in Halton increased during the same time period. For 2011-2015 (combined), the multiple birth rate in Halton was significantly higher than Ontario (Figure 41).



**Figure 41: Multiple birth rate (per 100 pregnancies), Halton and Ontario, 2003-2015.**

Data source: Inpatient Discharges (mother's record) [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

For 2011-15 combined, the multiple birth rate increased as mother's age increased in both Halton and Ontario (Figure 42). In Halton, these differences between age groups were statistically significant when comparing the youngest two age groups to the oldest two age groups. In Ontario, the differences between all age groups were statistically significant.

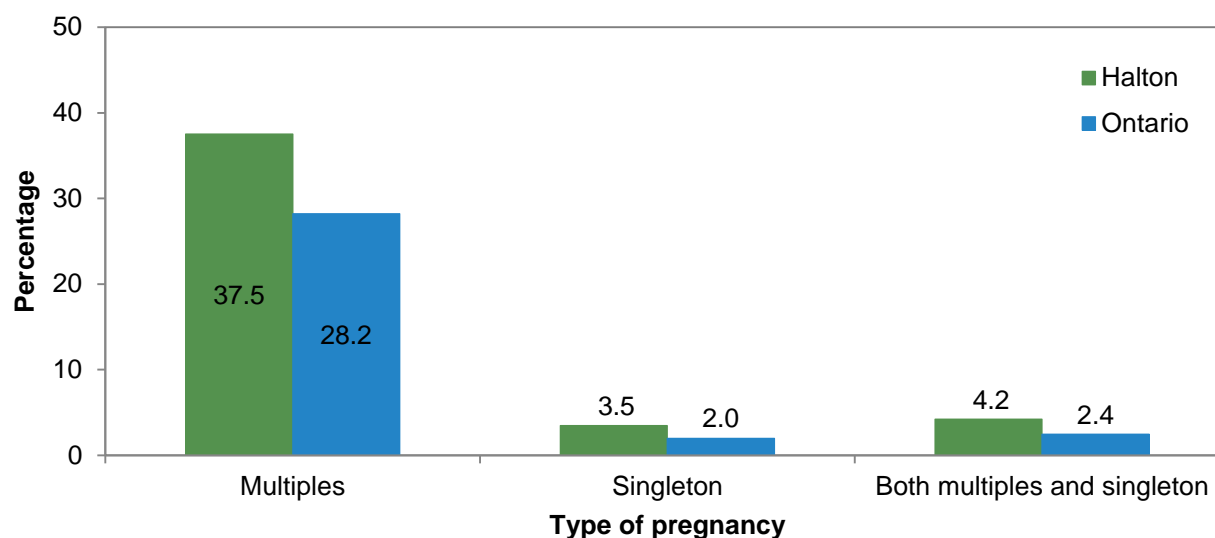


**Figure 42: Multiple birth rate (per 100 pregnancies), Halton and Ontario, 2011-2015 combined.**

Data source: Inpatient Discharges (mother's record) [2011-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

## Multiple births and assisted reproductive technology

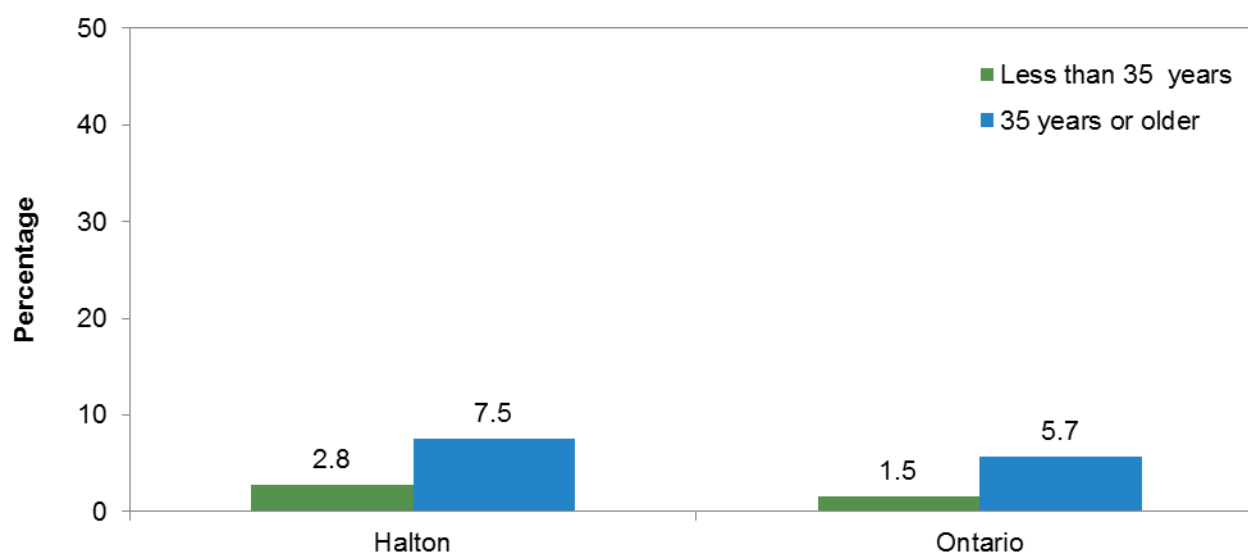
For 2011-15 combined, the proportion of pregnancies (both singleton and multiple) involving assisted reproductive technology (ART) was significantly higher in Halton compared to Ontario. During this time period, 37.5% of multiples pregnancies in Halton involved ART, compared to only 3.5% of singleton pregnancies (**Figure 43**).



**Figure 43: Percentage of pregnancies involving assisted reproductive technology, by type of pregnancy, Halton and Ontario, 2011-15 combined.**

**Data source:** Inpatient Discharges (mother's record) [2011-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

For 2011-15 combined, a significantly higher proportion of pregnancies among women aged 35 and over involved assisted reproductive technology compared to women under 35 in both Halton and Ontario.



**Figure 44: Percentage of pregnancies involving assisted reproductive technology, by mother's age group, Halton and Ontario, 2011-15 combined.**

**Data source:** Inpatient Discharges (mother's record) [2011-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

# Gestational age

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## What is it?

**Gestational age** refers to the age of the pregnancy in weeks.

**Preterm birth rate** refers to the number of live born infants who were born less than 37 weeks completed gestation, per 100 live births over a given period of time.

**Term birth rate** refers to the number of live born infants who were born 37-41 weeks completed gestation, per 100 live births over a given period of time.

**Postterm birth rate** refers to the number of live born infants who were born at 42 or more weeks completed gestation, per 100 live births over a given period of time.

## Why is it important?

The earlier an infant is born, the greater the risk of adverse health outcomes, including death. Examples of short and long-term health issues premature infants may face include breathing and feeding difficulties, cerebral palsy, developmental delay, and vision and hearing impairments.<sup>70</sup>

Causes of preterm births are numerous, complex, and in many cases not well understood.<sup>70</sup> However, several factors associated with preterm births include multiple birth status, maternal diabetes and hypertension, younger (teenage) or older (35+) maternal age, previous preterm deliveries, smoking and alcohol use during pregnancy, stress, and neighbourhood income.<sup>71,72</sup>

Postterm pregnancies also can present health risks for both a mother and her baby. Women with postterm pregnancies (particularly if the baby is large) have a greater risk of requiring forceps, vacuum-assisted birth or caesarian sections, as well

as other delivery complications.<sup>73</sup> Some of the risks of postterm birth for infants include complications involving the placenta, decreased amniotic fluid, birth injuries if they are particularly large, low blood sugar, stillbirth, and newborn death.

As with preterm births, causes of postterm births are not very well understood. Several known risk factors for postterm births include being a first time mother, being an older mother, obesity, and previously having a postterm pregnancy.<sup>74</sup>

## What does it tell us?

The majority of live born infants in Halton had a gestation period that was to term (92.8%). 6.8% of live births were preterm, and less than one percent were postterm.

After age 20, the preterm birth rate in Halton increased as mother's age increased.

## Data sources

BORN Information System [2013-2015], extracted October 26, 2016.

## Limitations

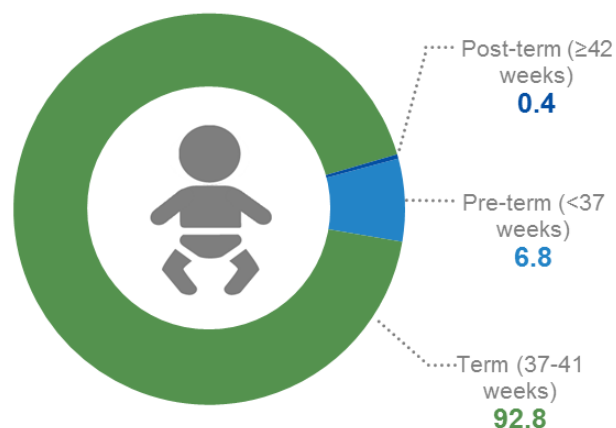
Missing data were excluded. Due to the small number of preterm and postterm births, data from 2013-2015 were combined for analysis. Gestational age data can be affected by recall errors, post-conception bleeding, irregular or long/short menstrual cycles, delayed ovulation, and pregnant women or partner's desire to indicate a later conception.<sup>75,76</sup> These types of errors have become less of an issue in the past decade with the use of ultrasound technology in Ontario to estimate length of gestation.<sup>75,76</sup>

### Gestational age rates

For 2013-15 combined, the majority of live born infants in Halton had a gestational age that was to term (37-41 weeks completed gestation).

6.8% of live born infants were preterm (less than 37 weeks completed gestation).

Less than one per cent of deliveries were postterm (greater than 42 weeks gestation).

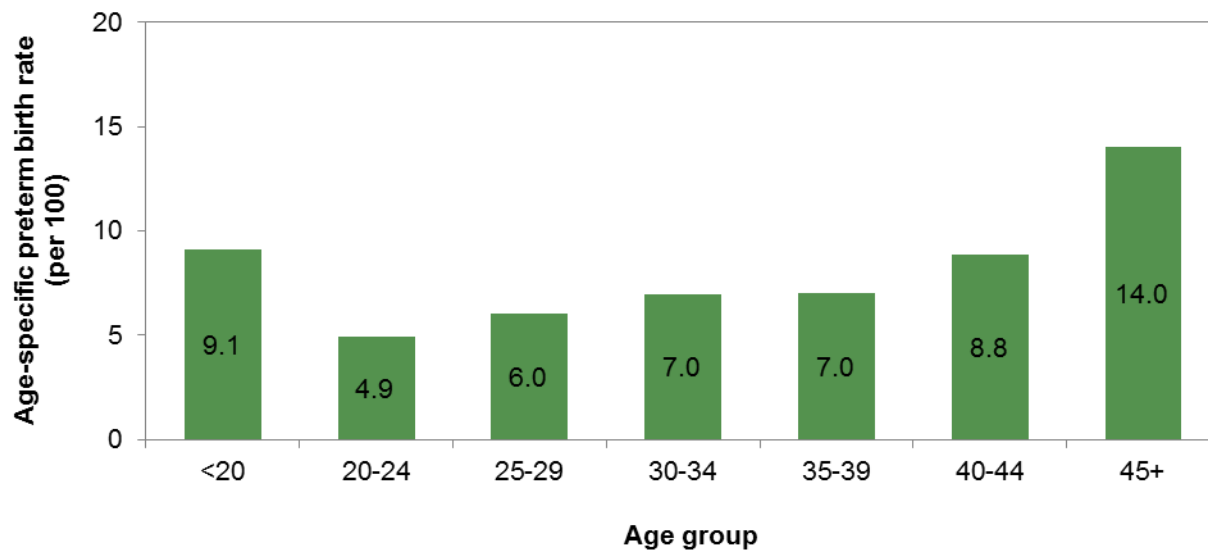


**Figure 45: Gestational age rates (per 100 live births), Halton Region, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted October 26, 2016.

### Age-specific preterm birth rates

For 2013-15 combined, teenage mothers and mothers aged 45 and over had the highest age-specific preterm birth rates, however these differences were not statistically significant.



**Figure 46: Preterm birth rate (<37 weeks completed gestation), by mother's age group, Halton Region, 2013-2015 combined.**

Data source: BORN Information System [2013-2015], extracted October 26, 2016.



# Birth weights

## What is it?

**Small for gestational age** refers to the total number of singleton live births with weights below the 10<sup>th</sup> percentile for their gestational age and sex, per 100 singleton live births over a given period of time.

**Large for gestational age** refers to the total number of singleton live births with weights above the 90<sup>th</sup> percentile for their gestational age and sex, per 100 singleton live births over a given period of time.

**Birth weight rates** by weight category (see **Table 6**) are the total number of live births in that weight category per 100 live births over a given period of time (includes both singleton and multiple births).

**Table 6: Birth weight categories**

Birth weight category	Weight range (grams)
Extremely low	500-999
Very low	1000-1499
Moderately low	1500-2499
Normal	2500-4499
High	4500+

## Why is it important?

Small for gestational age (SGA) infants may appear physically or neurologically mature, but are smaller than other babies of the same gestational age.<sup>77</sup> SGA babies may be small because their parents are small.<sup>77</sup> SGA may also be the result of fetal growth problems such as intrauterine growth restriction, where the unborn baby receives less oxygen and nutrients than it needs to grow.<sup>77</sup> SGA babies may face health problems before and after birth, including low oxygen levels, low blood sugar, and difficulty maintaining a normal body temperature.<sup>77</sup>

Low birth weight (less than 2500g) is a major risk factor for infant mortality, and is often associated with being born prematurely.<sup>78</sup> Infants with a low birth weight are also at an increased risk for many health and developmental issues, such as learning difficulties, hearing and visual impairments, as well as chronic respiratory problems.<sup>78</sup>

Low birth weight and SGA are important public health issues as they occur more frequently in certain disadvantaged populations, such as women with low socio-economic status.<sup>77,78</sup> Some risk factors for SGA and low birth weight include poor health and nutrition, as well as smoking, alcohol or drug use during pregnancy.<sup>77,78</sup>

Large for gestational age babies (LGA) weigh more than usual for babies of the same gestational age.<sup>79</sup> Some factors associated with LGA and high birth weight include larger parents, high weight gain during pregnancy, and diabetes in the mother.<sup>79,80</sup> High birth weight or LGA babies may face difficulties during birth due to their large size, and be at a greater risk for blood sugar and breathing problems.<sup>79,80</sup>

## What does it tell us?

LGA rates in Halton and Ontario are decreasing, while SGA rates are increasing. While the majority of Halton infants (92.7%) born between 2013 and 2015 had a normal birth weight (2500-4499g), on average each year over 300 babies were born with a low birth weight (<2500g) and over 90 babies were born with a high birth weight (≥4500g). Multiples and preterm babies were more likely to have a low birth weight.

## Data sources

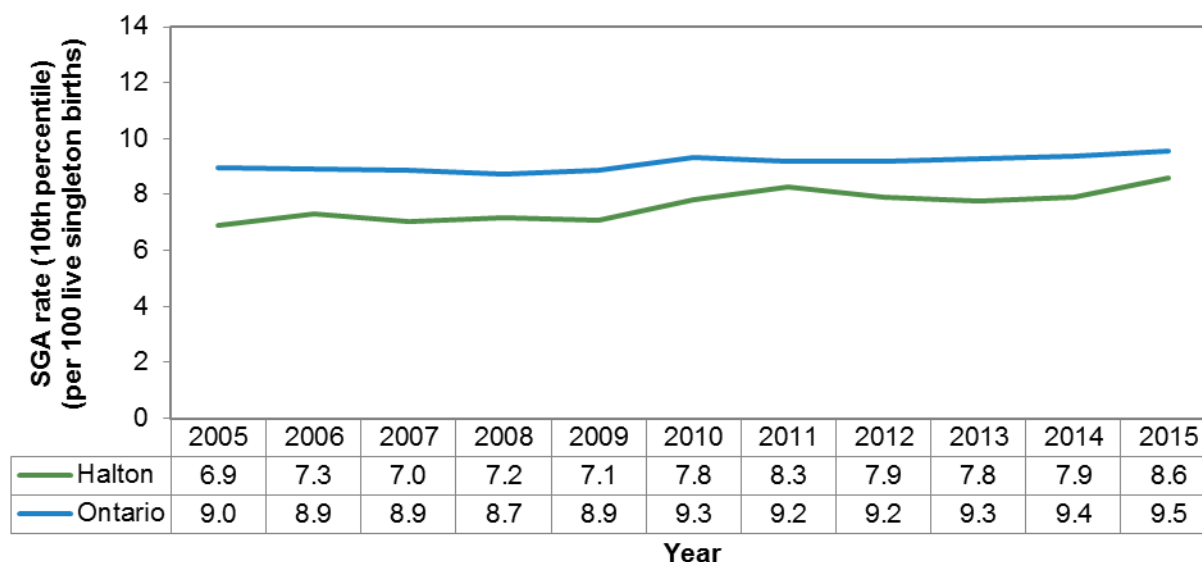
Inpatient Discharges [2003-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016. BORN Information System [2013-2015], extracted October 26, 2016.

## Limitations

Missing data and birth weights of zero grams were excluded. Gestational ages 22-43 weeks were included, and records missing sex were excluded from SGA and LGA calculations as the calculations are sex-specific. Due to the small number of infants with low and high birth weights, data from 2013-2015 were combined for analysis. Data do not include out-of-province births.

### Small for gestational age rates

From 2005-2015, small for gestational age rates increased in both Halton and Ontario. While SGA rates in Halton have consistently been lower than Ontario, in 2015 this difference was not statistically significant (**Figure 47**).

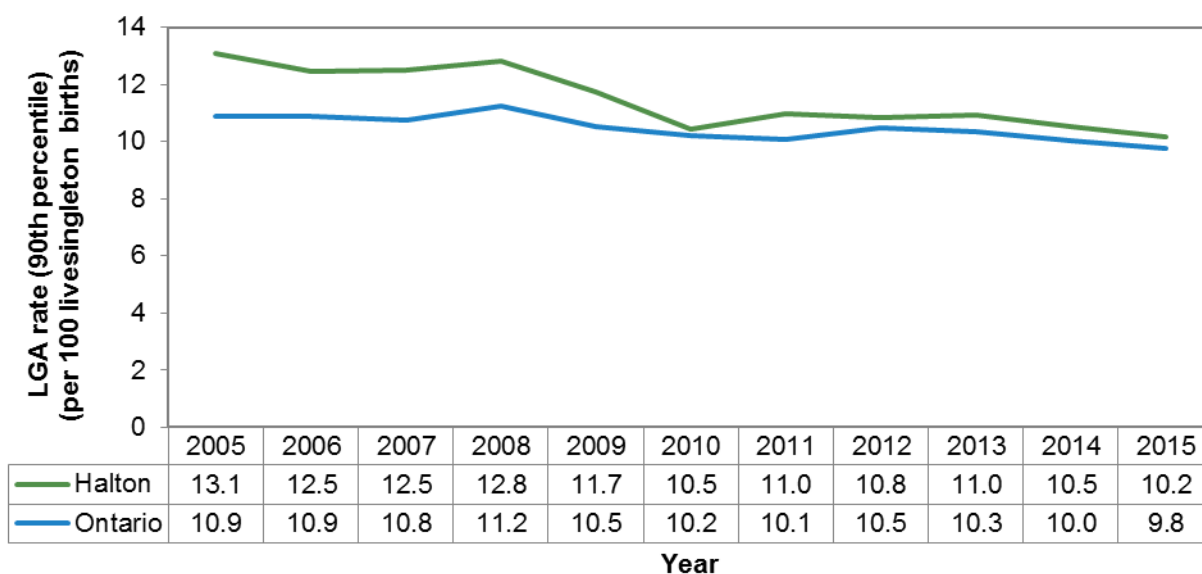


**Figure 47: Small for gestational age (below 10<sup>th</sup> percentile) rate (per 100 live singleton births), Halton and Ontario, 2005-2015.**

Data source: Inpatient Discharges (infant's record) [2005-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

### Large for gestational age rates

From 2005 to 2015, large for gestational age rates decreased in both Halton and Ontario. In 2015, the large for gestational age rate in Halton was similar to Ontario (**Figure 48**).



**Figure 48: Large for gestational age (above 90<sup>th</sup> percentile) rate (per 100 live singleton births), Halton and Ontario, 2005-2015.**

Data source: Inpatient Discharges (infant's record) [2005-2015], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

# Birth weight categories

**Table 7** shows the average number of births and percentage of births per year in Halton from 2013 to 2015. The majority of infants born in Halton had a normal birth weight (92.7%), while 5.6% had a low birth weight and 1.7% had a high birth weight.

**Table 7: Average number and percentage of births per year, by birth weight category, Halton Region, 2013-2015.**

Birth weight category	Average number of births per year (2013-15)	Percentage of births per year (2013-15)
Extremely low (500-999g)	14	0.3%
Very low (1000-1499g)	22	0.4%
Moderately low (1500-2499g)	276	4.9%
Normal (1500-2499g)	5178	92.7%
High (4500+g)	92	1.7%

Data source: BORN Information System [2013-2015], extracted October 26, 2016.  
Note: excludes infants with a birth weight <500g.

For 2013-15 combined, Halton infants who were multiples or who were born preterm were significantly more likely to be born with a low birth weight. There were no significant differences in low birth weight rates by mother’s age group in Halton.



**52.3%** of multiples had a low birth weight.  
**3.7%** of singletons had a low birth weight.



**57.1%** of preterm babies (<37 weeks gestation) had a low birth weight.  
**1.9%** of full-term babies (≥37 weeks gestation) had a low birth weight.

# Infant health outcomes



# Infant mortality rates

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## What is it?

**Infant mortality rate** refers to the total number of deaths for live born infants (364 days old or younger) per 1,000 live births over a given period of time.

Infant mortality rates are presented as three-year moving averages to account for some of the instability in rates due to small numbers.

## Why is it important?

Infant mortality is an important indicator of post-natal and infant care. On an international scale, infant mortality is often used as an indicator of the overall health and wellbeing of a nation, and generally well reflects education and health status of women, and the public health environment, and overall human development of that country.<sup>81</sup>

Infant mortality rates in Canada have decreased dramatically over the past century due to improved sanitation, medical advances, improved access to health care, better nutrition and improved education.<sup>82</sup> However, certain subgroups in Canada's population experience higher rates of infant mortality, including those living in low income, and Indigenous populations.<sup>81</sup>

Immaturity due to preterm birth is the leading cause of infant mortality in Canada.<sup>82</sup>

## What does it tell us?

There has been a slight decline in infant mortality rates in Ontario since about 2004. Infant mortality

rates in Halton have been more variable due to very small numbers of infant deaths each year. Infant mortality rates in Halton have generally been lower than Ontario. The majority (84%) of infant deaths in Halton occurred during the neonatal period (first 27 days of life).

## Data sources

Ontario Mortality Database and Live Birth Database [2000-2011], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

## Limitations

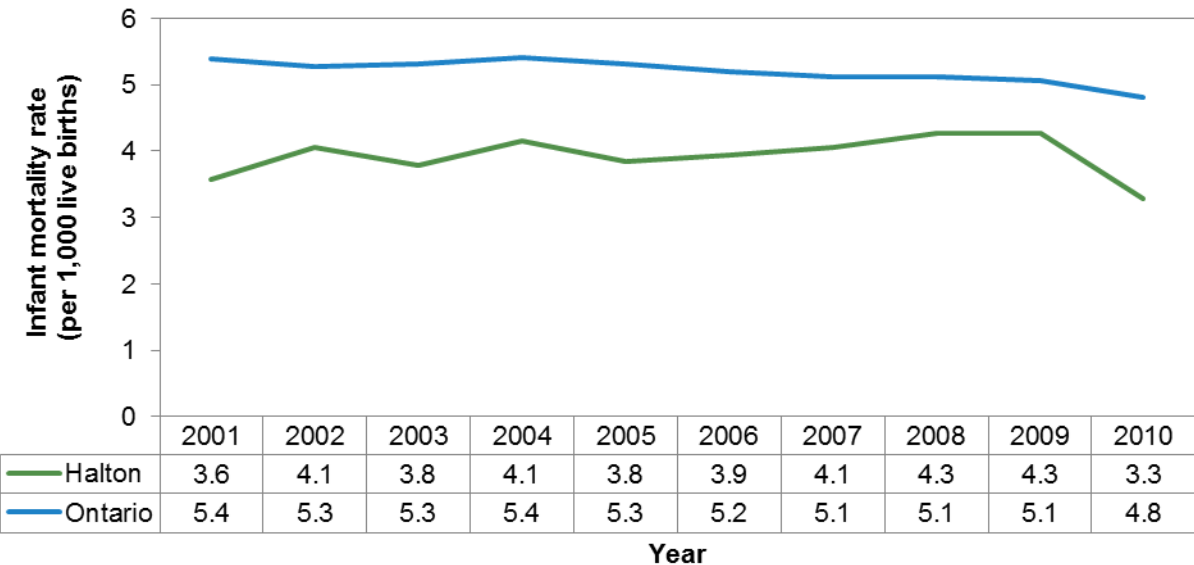
Deaths that occurred outside of Ontario are not included.

Note that infant mortality rate data in both Halton and Ontario should be interpreted with caution due to identified data quality issues with Ontario's Vital Statistics database. In 1996, some municipalities introduced fees for registering births which may resulted in a decrease in the registration of live births, particularly among certain vulnerable subgroups such as low income and teen parents.<sup>83,84</sup> These registration fees were eliminated in the mid-2000s with the introduction of an electronic registration system.<sup>84</sup> A large proportion of infant birth and death records in Ontario cannot be linked (42% in Ontario in 2003 compared to about 1% in all other provinces), as a result, it is not possible to examine infant mortality by certain characteristics such as gestational age and birth weight.<sup>83</sup>

# Infant mortality rates

In Halton, between 2007 and 2011 there was an average of 22 deaths per year among infants under one year of age. The majority of these deaths (84%) occurred during the neonatal period (27 days old or younger).

**Figure 49** shows infant mortality rates for Halton and Ontario from 2001 to 2010. Three year moving averages were used to account for unstable rates in the population due to small numbers. Infant mortality rates in Ontario declined slightly between about 2004 and 2010. Halton's rates have been more variable due to smaller numbers. In general, Halton has had slightly lower mortality rates compared to Ontario.



**Figure 49: Infant mortality rate (per 1,000 live births), based on moving 3-year averages, Halton and Ontario, 2001-2010.**

**Data source:** Ontario Mortality Database and Live Birth Database [2000-2011], Ontario Ministry of Health and Long-Term Care: IntelliHEALTH Ontario, extracted October 24, 2016.

# Congenital anomalies and infections

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## What is it?

**Congenital anomalies**, also referred to as congenital malformations or birth defects, are structural or functional anomalies that occur during the baby's development in utero (in the mother's womb).<sup>86</sup> Congenital anomalies may be identified prenatally, at birth, or later in life, and can be caused by genetic problems, chromosomal disorders, environmental factors or nutrient deficiencies.

**Congenital infections** are infections (e.g. syphilis, rubella, cytomegalovirus) that are transmitted from the mother to the fetus or infant during pregnancy or delivery.

The **congenital anomaly and infection rate** refers to the number of live births or stillbirths identified as having at least one confirmed congenital anomaly or infection, per 10,000 births (live and still) over a given period of time.

## Why is it important?

In Canada, approximately one in 25 babies is diagnosed with one or more congenital anomalies.<sup>86</sup> Congenital anomalies are the second leading cause of infant mortality, after immaturity.<sup>86</sup>

Congenital anomalies can place significant financial, emotional, and psychological burdens on families.<sup>86</sup> From a public health perspective, individuals with congenital anomalies may require more health resources and services for the management and treatment of their conditions.<sup>86</sup>

Over the past several decades, public health has played an important role in reducing the incidence of congenital anomalies in the population.<sup>86</sup> Fortification of food with folic acid and folic acid supplementation has helped to reduce neural tube defects such as spina bifida (failure of the spinal column to close

properly) and anencephaly (absence of a major portion of the brain), while vaccination against rubella has helped to eliminate congenital rubella syndrome in Canada.<sup>86</sup>

For many congenital anomalies, the causes are multifactorial, involving both genetic and environmental factors. It is important to note, however, that like many other diseases, the prevalence of certain congenital anomalies and infections vary by socioeconomic status.<sup>86</sup> Several risk factors for congenital anomalies may also be more prevalent in lower income groups, such as smoking and alcohol use during pregnancy, poor nutrition, and lack of multivitamin supplements.<sup>86</sup> Reducing socioeconomic disparities in the population may help to further reducing the incidence of some congenital anomalies.<sup>86</sup>

## What does it tell us?

Each year, there are about 50 infants born in Halton with congenital anomalies or infections. The rate of congenital anomalies and infections in Halton was lower than Ontario for 2013-15 combined.

## Data sources

BORN Information System [2013-2015], extracted October 26, 2016.

## Limitations

Data on congenital anomalies and congenital infections were grouped together as congenital infections are included under congenital anomalies in the data cube in BORN, and because of the small numbers of congenital anomalies and infections in Halton.

Records with missing data are excluded. Some congenital anomalies may be under-reported if they are not diagnosed at the time of birth.

### Congenital anomaly and infection rate

On average from 2013-2015 there were approximately 50 infants born per year in Halton with one or more confirmed congenital anomalies or congenital infections. Congenital anomalies are not mutually exclusive, and infants may be born with more than one congenital anomaly or infection. On average from 2013-2015 there were approximately 74 confirmed congenital anomalies or infections identified among infants born in Halton each year.

For 2013-15 combined, the rate of congenital anomalies and infections was significantly lower in Halton compared to Ontario (Figure 50). During this time period, some of most common congenital anomalies among Halton infants were atrial septal defects and ventricular septal defects (both conditions involving “holes” in the heart), as well as Down Syndrome.

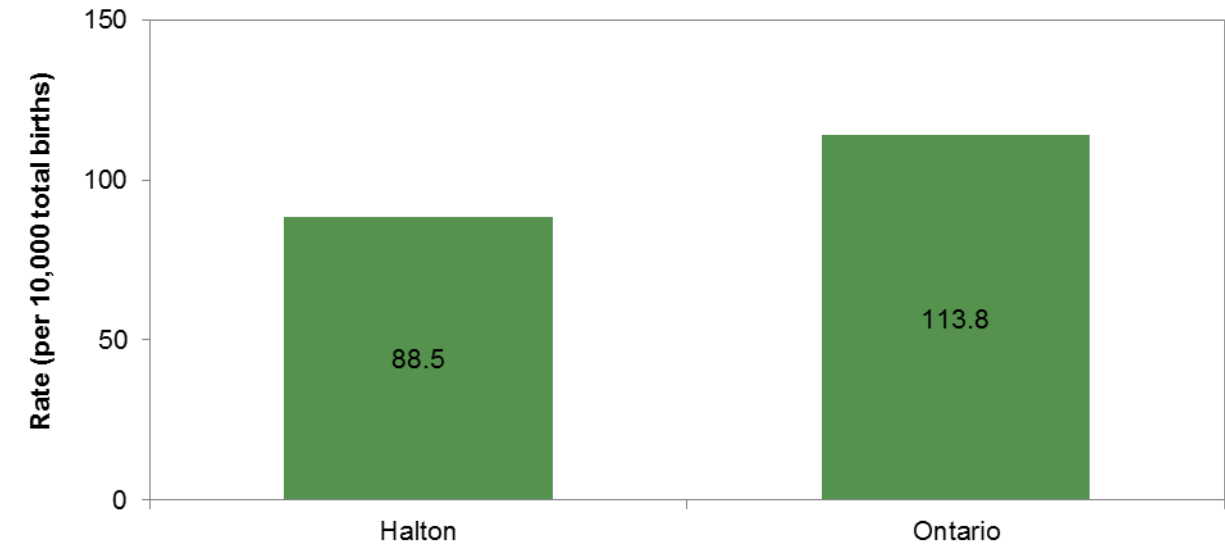


Figure 50: Rate of congenital anomalies and congenital infections (per 10,000 live births and stillbirths), Halton and Ontario, 2013-15 combined.

Data source: BORN Information System [2013-2015], extracted October 26, 2016.



# Breastfeeding rates

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## What is it?

This section of the report highlights rates of breastfeeding initiation and duration using data from Halton Region's Infant Feeding Study.

**Breastfeeding initiation** refers to the percentage of mothers who initiated breastfeeding while in hospital or after coming home from the hospital.

**Breastfeeding duration** refers to the percentage of mothers who were breastfeeding at the start of each time period. Time period is based on the age of the baby (e.g. the percentage of mothers who are breastfeeding when they baby turns one month old).

**Breastfeeding exclusivity** refers to the percentage of mothers who were breastfeeding exclusively (i.e. no other foods or liquids) at the start of each time period from age one week to six months.

## Why is it important?

Breastfeeding is important for both a mother and her baby. Breastfeeding provides infants with the nutrients that they need for healthy growth and development, as well as antibodies and immune factors that help protect them against infections.<sup>87</sup> Breastfeeding also has benefits for the mother, including more rapid weight loss after birth, facilitating mother-infant bonding, and may reduce the risk of reproductive cancers.<sup>87,</sup>

The World Health Organization and Health Canada recommend breastfeeding exclusively during the first six months, and sustained for up to two years or longer together with appropriate complementary feeding.<sup>87,88</sup>

The Halton Region Health Department provides a number of different programs and services that support breastfeeding including prenatal classes and Public Health Nurse support via phone, email or social media. For more information on Halton Region and community breastfeeding supports, visit [haltonparents.ca](http://haltonparents.ca).

## What does it tell us?

Breastfeeding initiation, duration, and exclusivity have been increasing in Halton. In 2014 the vast majority (97%) of Halton mothers initiated breastfeeding. 56% of Halton mothers were breastfeeding exclusively when their baby turned one week old, and 19% were breastfeeding exclusively when their baby turned six months old in 2014.

Results from Halton's Infant Feeding Study showed that Halton mothers with lower levels of education, who lived in Canada for less than 10 years, and who did not breastfeed their other children were more likely to breastfeed for a shorter duration. Halton mothers who lived in Canada for less than five years, and mothers who did not breastfeed their other children were also more likely to breastfeed exclusively for a shorter duration.

## Data sources

Infant Feeding Study [2000/01, 2007/08, 2014], Halton Region Health Department.

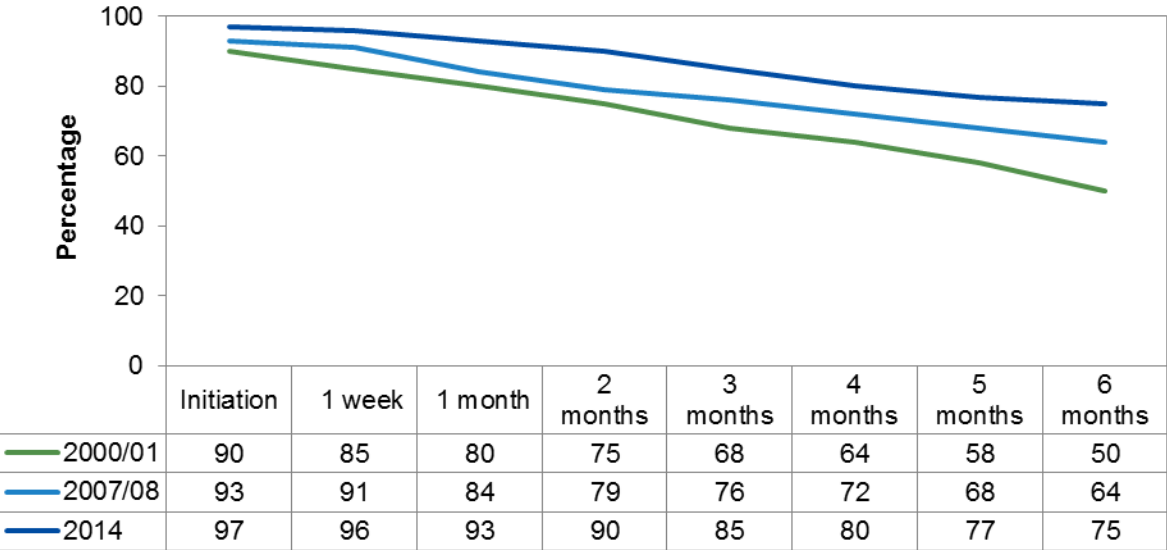
Data for the 2014 Infant Feeding Study were collected using a survey distributed to Halton mothers when their babies turned six months old. For more information on methods, results, and limitations of the Infant Feeding Study, see the [2014 Infant Feeding in Halton](http://halton.ca) report at [halton.ca](http://halton.ca).

## Limitations

The sample of mothers who completed the survey for the Infant Feeding Study may not be representative of all women who gave birth in Halton. Data are self-reported and may be subject to bias. For example, mothers may not have provided accurate responses but rather responses that they thought would appear positive or correct.

# Breastfeeding initiation and duration

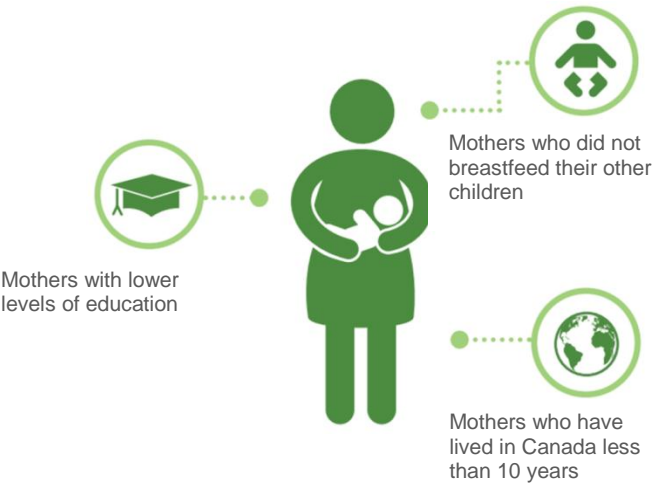
The percentage of mothers who are breastfeeding their infant decreases from initiation to six months of age. The percentage of mothers who initiated breastfeeding has increased in Halton, from 90% in 2000/01 to 97% in 2014. This increase was statistically significant. The percentage of Halton mothers breastfeeding at each time period from one week to six months also increased from 2000/01 to 2014 (Figure 51).



**Figure 51: Percentage of Halton mothers breastfeeding to age 6 months, 2000/01, 2007/08, 2014.**

Data source: Infant Feeding Study [2000/01, 2007/08, 2014], Halton Region Health Department.

Data from Halton’s Infant Feeding Study showed that there were several demographic characteristics that were statistically significantly associated with breastfeeding duration and exclusivity among Halton mothers. Halton mothers who breastfed for a shorter duration included:



### Breastfeeding exclusivity

In 2014, 56% of Halton mothers reported that their infant was breastfeeding exclusively when the baby turned one week old, and 19% were breastfeeding exclusively when the baby turned six months old. As shown in **Figure 52**, breastfeeding exclusivity has increased for all time periods from 2000/01 to 2014, and these increases were all statistically significant.

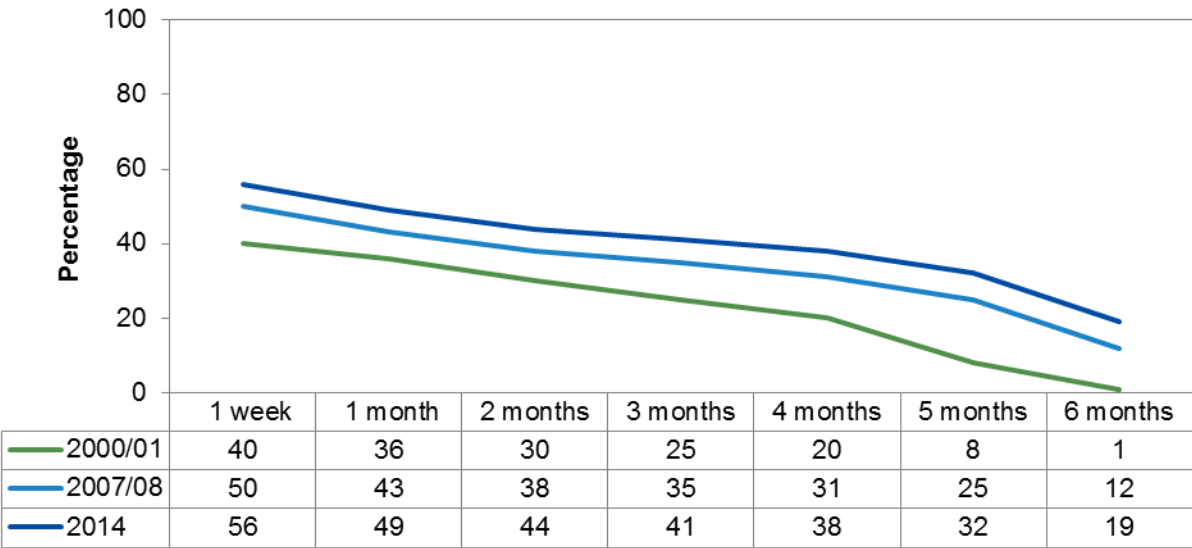


Figure 52: Percentage of Halton mothers breastfeeding exclusively to age six months, 2000/01, 2007/08, 2014.

Halton's Infant Feeding study also found that Halton mothers who lived in Canada for less than five years, and mothers who did not breastfeed their other children were significantly more likely to breastfeed exclusively for a shorter duration.



For more information on Halton's Infant Feeding Study including methodology, please see the [2014 Infant Feeding in Halton Report](#).

## Conclusion

This report provided a snapshot into the health and wellbeing of pregnant mothers and infants in Halton Region. While many indicators of healthy pregnancies and births suggest that on the whole Halton mothers and infants are doing well compared to Ontario, it is important to keep in mind that the social determinants of health play an important role in reproductive health and health outcomes. While local data on the social determinants of reproductive health are not readily available, the literature suggests that women with low incomes, low education, or those who are negatively affected by other social determinants of health are at a greater risk of poorer reproductive health outcomes. Given that it has been illustrated that population health inequities exist in Halton (see the [2012 Income and Health Inequalities Report](#)), it is likely that these inequities reported in the literature also exist in Halton Region.

Public health programs and services should aim to improve population health outcomes and decrease health inequities. Having an understanding of the myriad of ways in which the social determinants of health may affect reproductive health outcomes assists public health to achieve this goal. Using the literature together with available local data, it is possible to gain a better understanding of which populations are more likely to experience health inequities and why these inequities exist. With this information, staff can tailor programs and services to meet the unique needs of these populations. However, in order to see significant and sustained improvement in reproductive health outcomes, public health programs and services need to be supported by policies that lead to improvements in the social determinants of health. For example, policies and programs that provide adequate incomes and affordable housing can help to ensure that expectant mothers are able to afford a nutritious diet, which is an important factor for healthy pregnancies and births.

While fertility and pregnancy rates in Halton Region are generally decreasing, Halton's population as a whole is increasing, and programs and services that promote optimal preconception health, healthy pregnancies, healthy birth outcomes and preparation for parenting will continue to be needed.

For more data and reports on reproductive and infant health in Halton, including breastfeeding, visit [halton.ca](http://halton.ca). For more information on healthy pregnancies, healthy babies, parenting, as well as programs and services offered by the Halton Region Health Department, visit [halton.ca](http://halton.ca).

## Appendix – Data sources and limitations

Three major reproductive health data sources were used for this report: hospital discharge data from IntelliHEALTH Ontario, Vital Statistics data from IntelliHEALTH Ontario, and the Better Outcomes Registry Network (BORN).

The tables below describe each of the data sources used throughout this report, including relevant definitions, limitations, strengths, and years of data available. Information on the strengths and limitations of each data source are adapted from the [Reproductive Health Core Indicators Documentation Report](#) produced by the Association of Public Health Epidemiologists in Ontario.<sup>89</sup>

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### Vital Statistics Birth Data

#### General Description

- Information on live births and stillbirths are collected by ServiceOntario using the birth registration form completed by parents, and the Notice of Live Birth or Stillbirth form completed by the health care provider who attended the birth. Since 2010, both components of birth registration are predominately completed online.
- Live birth and stillbirth registration is required by law.
- Data are accessed through IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

#### Years Available

- 1986+ (at the time of this report, 2011 was the most recent year of data available)

#### Strengths

- Earliest reproductive health data available of the three data sources.
- Postal code is available for nearly all birth records.
- Very few birth records with missing birth weight or gestational age.
- Data cleaning is done at the provincial level to ensure standardized quality across Ontario.
- Provincial comparisons available.

#### Limitations

- Not all births are registered, and under-registration varies by geography and other characteristics. Under-registration also appears more common for teen mothers and infants that die soon after birth.
- In 1996, municipalities were allowed to charge a fee for live birth registration. As a result, there was an excess of unregistered live births in municipalities that charged for registration. Fees are no longer required, and documentation of births is now submitted directly to ServiceOntario rather than municipal offices.
- Data file linking live birth registrations and infant death registrations is not available. Therefore it is not possible to examine infant mortality by gestational age or birth weight.
- Data are typically several years out of date (currently 5 years out of date). This is particularly problematic in areas with lots of growth and shifting demographics, such as Milton.
- Does not collect information about maternal health behaviours or breastfeeding practices.
- Due to identified problems with Ontario Vital Statistics Data, some national reports have chosen to exclude Ontario data from analysis. For more information, see the Public Health Agency of Canada's Canadian [Perinatal Health Report](#).<sup>90</sup>

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## Hospitalization Data

### General Description

- Hospitalization data include in-patient discharges resulting from a hospital admission for delivery of a live birth or stillbirth. Each delivery admission generates a maternal record (for delivery of a live birth or stillbirth) and a newborn record (for live births and stillbirths).
- Day procedures and emergency department visits are available through the National Ambulatory Care Reporting System (NACRS); however, births not admitted overnight are still captured in the in-patient database.
- Data are accessed through IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

### Years Available

- 1997+ (at the time of this report, 2015 was the most recent year of data available)

### Strengths

- Data are available from 1997 onwards, which allows for examination of trends over time.
- Data are more current compared to Vital Statistics.
- Postal code is available for nearly all birth records.
- Very few newborn records are missing birth weight or gestational age.
- Effectively captures teen pregnancies, low birth weight, preterm and multiple births
- Captures deliveries as well as births. Deliveries more accurately count pregnancies because they include stillbirths and count multiple births as one pregnancy/delivery (based on mother's hospital discharge record).
- Data cleaning at the provincial and national level ensures standardized quality across Canada.
- Provincial comparisons are available.

### Limitations

- Excludes home births – approximately 1.7% of annual births to Ontario residents
  - Newborn and maternal records are separate, and not all variables are available on both. Linking maternal and newborn discharge records can be done, but the linking variable is incomplete, particularly for earlier years.
  - On the maternal record, gestational age at birth is not available prior to 2007; however, gestational age at admission for birth is available from 2003. On the newborn record, gestational age at birth is available from 2003.
  - Multiple births are not available prior to the 2003 calendar year. From 2003 forward, multiple births can be identified using the "Z37" code on the maternal record.
  - Does not collect information about maternal health behaviours.
  - Minimum one-year delay in release of data to public health.
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## BORN Data

### General Description

- The BORN Information System is an internet-based database that provides access to population-based perinatal data.
- Includes data from a number of sources including fertility clinics, prenatal screening laboratories, specialized antenatal clinics, hospitals, midwifery groups, newborn screening laboratories and prenatal screening and newborn screening follow-up clinics.
- Access to the BORN Information System is through BORN Ontario via Public Health Reports of the Public Health Data Cube.

### Years Available

- April 2012+

### Strengths

- Captures births occurring both inside and outside of hospitals.
- Very few births records are missing birth weight or gestational age.
- Provides extensive information about newborn characteristics, including information on maternal health history and behaviours, infant feeding, maternal and newborn outcomes, and health services utilization.
- Completed data generally available within six months of the infant's birth.

### Limitations

- Historic data prior to April 2012 not available, so it is not possible to examine long-term trends over time.
- Some variables have a high amount of missing data which could limit data accuracy, including (but not limited to) folic acid intake, smoking at prenatal visit, weight gain during pregnancy, and prenatal class attendance.
- Limited comparison to Ontario available. Ontario comparisons and comparisons to peer group only available in BORN pre-defined reports.
- Births which occur to mothers with a residential postal code where the majority of the population lives on an Aboriginal reserve or community are not included. This is unlikely to have an impact on Halton data, but may impact other health units with a large Aboriginal population.<sup>91</sup>
- Although data in the public health cube is refreshed daily, there is a lag time of six months before data are over 90% complete, and up to 15 months before data can be considered 99% in Ontario. Large variations in timeliness exist between public health units.<sup>91</sup>

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