

2015

Alcohol Uncovered:

A Peel Profile of Use, Health Outcomes and Harm

Please use the following citation when referencing this document:
Peel Public Health. Alcohol Uncovered: A Peel Profile of Use, Health Outcomes and Harm. 2015.

TABLE OF CONTENTS

1	Purpose of this Report
5	About the Region of Peel
6	History of Alcohol Use
9	Chapter 1 - Alcohol Use
41	Chapter 2 - The Health Risks and Benefits of Alcohol Use
66	Chapter 3 - Personal and Community Consequences of Alcohol Use
84	Chapter 4 - Alcohol Use and Risks Among Youth
92	Chapter 5 - Alcohol-Related Health Care Use and Costs
96	Chapter 6 - The Alcohol Regulatory System
109	Chapter 7 - The Alcohol Industry
124	Chapter 8 - Alcohol-Related Public Opinion and Public Policy
135	Chapter 9 - Acknowledgements
136	Chapter 10 - Data Sources and Limitations
143	Chapter 11 - Data Methods
161	Text References
165	Data References and Appendices



purpose of this report

The purpose of this report is to summarize the health status data related to alcohol consumption patterns and the alcohol-related health effects to inform program and policy development. The report will provide an overview of:

- alcohol use patterns;
- health risks and benefits of alcohol use;
- behavioural consequences of alcohol use;
- alcohol-related health care use and costs;
- the alcohol regulatory system;
- the alcohol industry; and
- alcohol-related public opinion and policy.

The intended audiences for this report are Peel Public Health staff, Region of Peel Councillors, community partners and the broader public health system.

How to Read this Report

Throughout this report we have focussed on local Peel data. Sometimes, however, data for Peel are unavailable or the numbers are too small and unreliable to be reported. In these instances, we provide data for Ontario or Canada. Additionally, we occasionally make use of provincial, federal or international data for the purposes of comparison.

Interpreting Confidence Intervals

In some tables, 95% confidence intervals (presented as '95% CI' in the report) are provided for many of the estimates (e.g., percentages). The confidence interval presents a lower and upper range of values, which we are confident contains the true value of the estimate for the whole population 95% of the time, or 19 times out of 20.

- When the 95% confidence interval of one estimate does not overlap with that of another estimate, the difference between the estimates is considered statistically significant (i.e., very unlikely to be due to chance).
- If the confidence intervals of two estimates do overlap, the estimates may still be significantly different.
- An appropriate statistical test would be required to assess the statistical difference of the two estimates. We did not conduct additional tests to determine significance in this report.
- Throughout the document the terms “significantly higher” or “significantly lower” are used to describe data that are significantly higher or lower based on the 95% confidence intervals that do not overlap with one another.

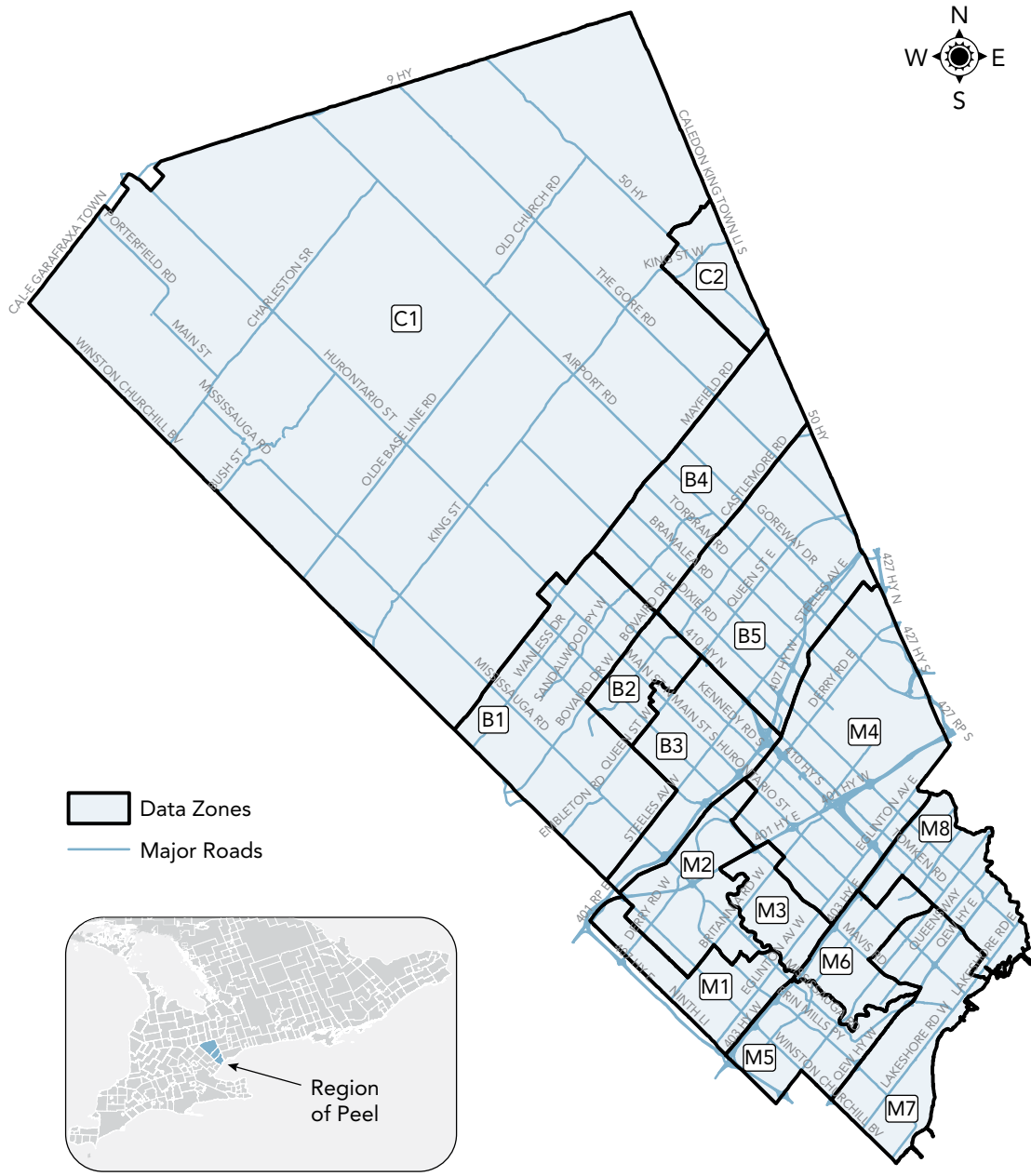
References



There are two types of references used in this report: text references and data references.

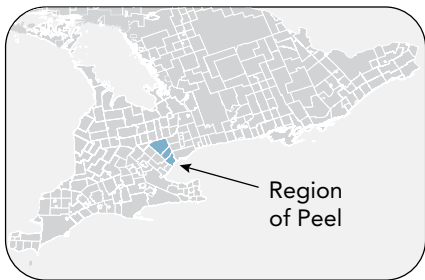
- Text references refer to references from articles, books or other documents and are defined by a superscript number. Example: A higher risk of binge drinking was observed.¹
- Data references refer to the source of the data for the statistic being presented in the text and are defined by a superscript letter. Example: Over 25% of the population reported binge drinking.^A In this example, the “A” would refer to the source of the data.

Some data included in this report are described spatially using a customized level of geography called “data zones”. These data zones were developed for Peel Public Health using Census data for the purposes of mapping health status data at a smaller geographic level, and are an aggregation of neighbouring census tracts. Data zones do not cross municipal boundaries. Map 1.1 is a reference map of the data zones with major roadways highlighted.

Map 1.1
Peel Health Data Zones



 Data Zones
 Major Roads

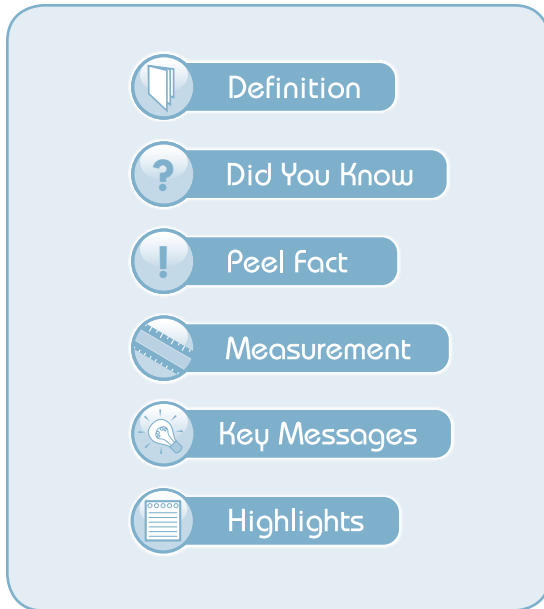


Data zones are denoted by the first letter of the municipality, followed by a number (e.g., C1 denotes Caledon data zone 1).

0 2 4 8 12 Kilometers

Source: Developed for Peel Public Health by McMaster University, School of Geography and Earth Sciences, 2009.

Key messages and facts are presented throughout this report and are indicated by various icons. The following box describes these icons and their meaning.



Sources of data, data limitations and methods of analysis used in this report are described in the **Data Sources and Limitations** and **Data Methods** sections. For additional details or information, please contact *HealthStatusData@peelregion.ca*.

Additional health status data are also available on the Health Status Data website: *peelregion.ca/health/statusdata/index.asp*

This report has been produced in two formats: a detailed report and a summary version. Both are available in hard copy and electronically. The web version of these reports can be found at *peelregion.ca/health/resources*.

Much of the data used in this report was provided to us by external organizations, and we extend our thanks to the following:

- Statistics Canada
- Cancer Care Ontario
- Canadian Institute for Health Information
- Ontario Ministry of Health and Long-Term Care



about the region of Peel

The region of Peel, located directly west of Toronto and York Region, includes the cities of Mississauga and Brampton, and the town of Caledon. At the time of the 2011 Census, 1.3 million people lived in Peel, making it one of the largest municipalities in Canada and second largest in Ontario.

Peel has experienced rapid growth with the population increasing by 12% between 2006 and 2011.^A By 2031, Peel's population is expected to exceed 1.6 million people.^B

! Peel Fact

Facts about Peel's Population

- Peel has a high proportion of children, as well as adults of reproductive age.^A
- Fifty-six per cent of residents aged 15 years and older have some post-secondary education.^C
- Thirty-eight per cent of residents aged 25 to 64 years received their post-secondary qualifications outside of Canada.^C
- The median after-tax income among individuals aged 15 years and older was \$27,241 (similar to the median of \$28,118 in Ontario as a whole).^C
- Half (51%) of Peel residents are immigrants, and 16% of Peel's population are recent immigrants (arrived in Canada in the past five years).^C
- One out of every five residents (21%) report "East Indian" as their ethnic origin (the most commonly reported ethnic origin in Peel).^C
- Seventeen per cent of residents are engaged in shift work.^{D1}
- Twenty-three per cent of Peel's industry is composed of the sales and service trade. This excludes public service.^C



history of alcohol use

Humans have been fermenting alcoholic drinks for at least 10,000 years and the use of alcohol is widely accepted across cultures. Alcohol (ethanol) is produced through the natural fermentation of fruit, vegetables or grains, or can be human-made through the process of distillation.¹ Humans use alcohol for a variety of reasons such as:

- in religion and worship;
- for medicinal, antiseptic and analgesic properties;
- as a safe beverage to drink when water is not safe;
- as a drink that is part of a meal;
- as a means to socialize (e.g., toasting at celebratory events); and
- as an intoxicant.^{2,3}

Early Uses of Alcohol

8000 BCE: The discovery of late stone-age beer containers made at this time show that humans have been fermenting alcoholic beverages for at least 10,000 years.⁴

4000 BCE: Wine first appeared in Egyptian pictographs.⁴



2000 BCE: Winemaking reached the Hellenic peninsula.⁴

1000 BCE: The Mayan civilization of Mexico was known to be a mead-drinking society. The Mayans also fermented a drink from corn.⁴

700 BCE: Wine became central to Greek culture and identity. In some Greek states such as Athens, wine consumption was a civic duty and everyone at public feasts received an equal share of wine.⁴

Did You Know

The ancient Egyptians worshipped Osiris, the god of wine and lord of the dead. The ancient Greeks annually honoured Dionysus (the god of wine), with a four-day feast consisting of intoxication, sobering up and atonement, followed by the celebration of Dionysus' return.⁵

Greeks generally endorsed drinking in moderation and frowned on drunkenness. Greek philosophers such as Xenophon (431-351 BCE), Plato (429-347 BCE), and Cato the Elder (234-149 BCE) all promoted drinking in moderation. However, the cult of Dionysus believed that intoxication could bring people closer to their god. A symposium, a gathering of men for an evening of conversation, entertainment and drinking, typically ended in drunkenness.⁴

160 BCE: Wine was considered to be of such high importance to Roman society that the Senate ordered the translation of a Carthaginian book on viticulture to promote its making.⁴

1 – 500 CE: Paul the Apostle (67 CE) considered wine to be God’s creation and therefore inherently good (1 Timothy 4:4). He recommended its use for medicinal purposes (1 Timothy 5:23), but condemned intoxication (1 Corinthians 3:16-17, 5:11, 6:10; Galatians 5:19-21; Romans 13:3) and recommended abstinence for those who could not control their drinking.⁴

501 – 1000 CE: Monasteries became the primary institution that maintained and advanced knowledge of brewing and winemaking techniques following the fall of the Roman Empire in 476 CE.⁴

By the end of the Middle Ages, spirits became popular alcoholic drinks.⁴

1620 – 1775 CE: Alcohol was widely and heavily used in the North American Colonies that became the United States. The Catholic Church generally viewed alcohol as a gift of God to be used in moderation for pleasure, enjoyment, and health but drunkenness was considered a sin.⁴

1690 – 1751 CE: In England, gin production was so high, and the cost so low, that the consumption of gin was rampant, resulting in the so-called ‘Gin Epidemic’.⁴

1916-1933 CE: Temperance movements resulted in alcohol prohibition in many countries such as Russia (1916-1917), Hungary (March-August 1919), Norway (1919-1927), Finland (1919-1932), Iceland (1919-1932), the United States (1920-1933) and Canada (provinces entered into and abolished prohibition independently over time).



Did You Know

1849: Swedish physician Magnus Huss invented the term alcoholism; however, the preferred term of this era was inebriety.⁵





chapter 1

ALCOHOL USE



Key Messages

- Two-thirds (64%) of Peel residents are current drinkers.
- While the rate of risky drinking behaviours among Peel residents is lower than among Ontario residents, some Peel residents, particularly males and non-immigrants, continue to engage in risky drinking behaviours.

**Did You Know**

The word “alcohol” is derived from an Arabic word meaning “finely divided spirit” and originally it referred to that part of the wine collected through distillation.⁶

This section of the report will describe:

- trends in alcohol use;
- abstainers and non-drinkers;
- current drinkers;
- frequency of alcohol use;
- low-risk drinking;
- risky drinking behaviours such as binge drinking, alcohol use and smoking, and alcohol use during pregnancy.

Trends in Alcohol Use

There are many factors that influence whether we drink alcohol at all, when and where we consume alcohol, and which type of alcohol we consume.

Alcoholic beverages are used throughout the world. The highest alcohol consumption levels are found in the developed world, including North America and Europe. The trends in alcohol use between 2006 and 2010 have remained steady.⁷

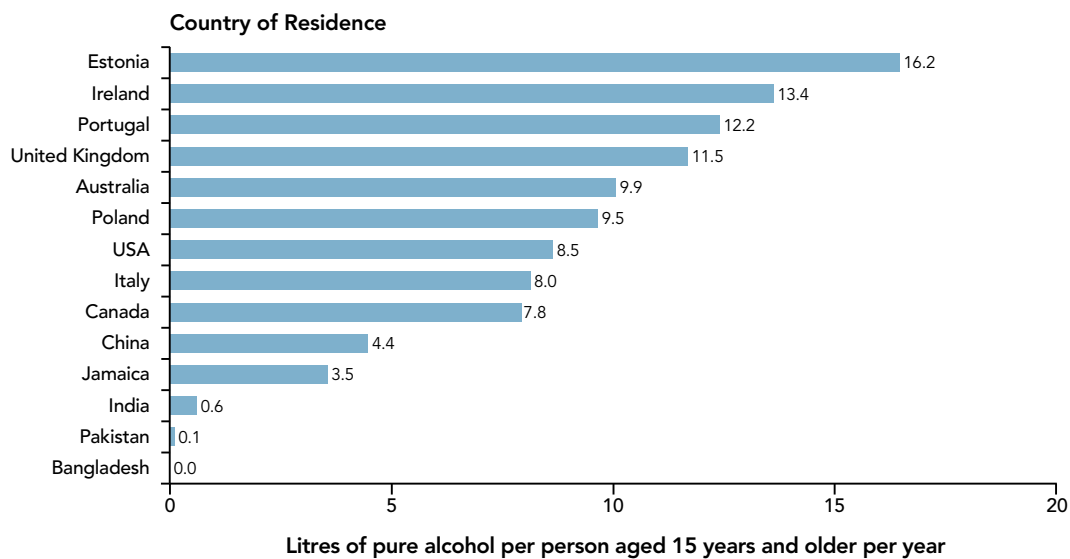
The per capita alcohol consumption among persons aged 15 years and older for selected countries is shown in Figure 1.1. The countries reflected in the figure are:

- those with the highest and lowest per capita consumption (Estonia and Bangladesh)
- Canada; and
- countries of origin for most of Peel’s immigrants.

Within Canada in 2011, the proportion of those who reported they had a drink in the past 30 days ranges by province between 55% and 69%. The province with the highest proportion of reported alcohol use in the past 30 days is Quebec (69%) (Figure 1.2).

Figure 1.1

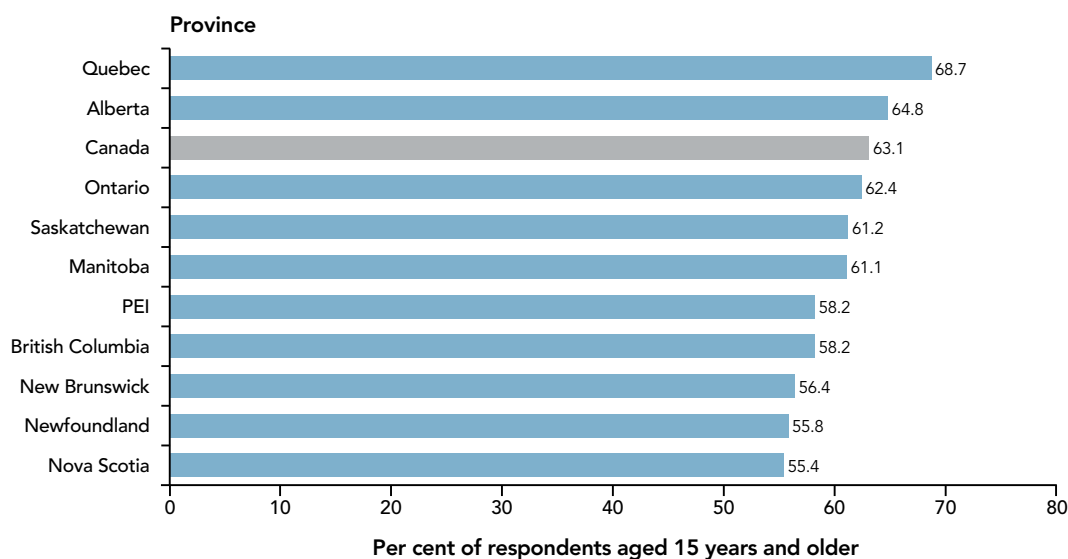
Worldwide Alcohol Consumption[†] among Adults by Country of Residence, 2005



[†] Defined as the recorded amount of alcohol consumed over a calendar year in a country, in litres of pure alcohol.

Source: World Health Organization. Global Health Observatory Data Repository. <http://apps/who/int/gho/data>. Accessed March 23, 2013.

Figure 1.2
Alcohol Use in the Past 30 Days,
Canada, and by Province, 2011



Source: Canadian Alcohol and Drug Use Monitoring Survey 2011 [Internet]: Health Canada; [updated February 4, 2014; cited March 26, 2014]. Available from: http://www.hc-sc.gc.ca/hc-ps/drugs-drogues/stat/_2011/summary-sommaire-eng.php#a2.

Abstainers and Non-Drinkers



Highlights

- One-third (36%) of Peel residents are non-drinkers.
- Females are more likely to be non-drinkers (43%) compared to males (29%).



Definition

There are many different definitions of abstainers depending on the source of data and the question used to collect the data. For the purposes of this report:

A **lifetime abstainer** is defined as a person who has never had an alcoholic drink in their lifetime.

Non-drinkers, also known as **long-term abstainers**, are defined as a person

who did not have a drink of beer, wine, liquor or any other alcoholic beverage in the past 12 months.

Because of the questions used to collect data about drinking status in the Canadian Community Health Survey, we are unable to provide Peel data that reflect those who are lifetime abstainers, that is, have never had a drink in their lifetime. Instead we present data for **non-drinkers**.

Worldwide, almost half of all men and two-thirds of women are long-term abstainers. People may abstain from drinking alcohol for many reasons such as:

- religious or cultural beliefs;
- personal preference;
- family history of alcoholism;
- health reasons or contraindications; and
- pregnancy or breastfeeding.

Abstention rates tend to be low in high-income, high consumption countries like Canada.⁷

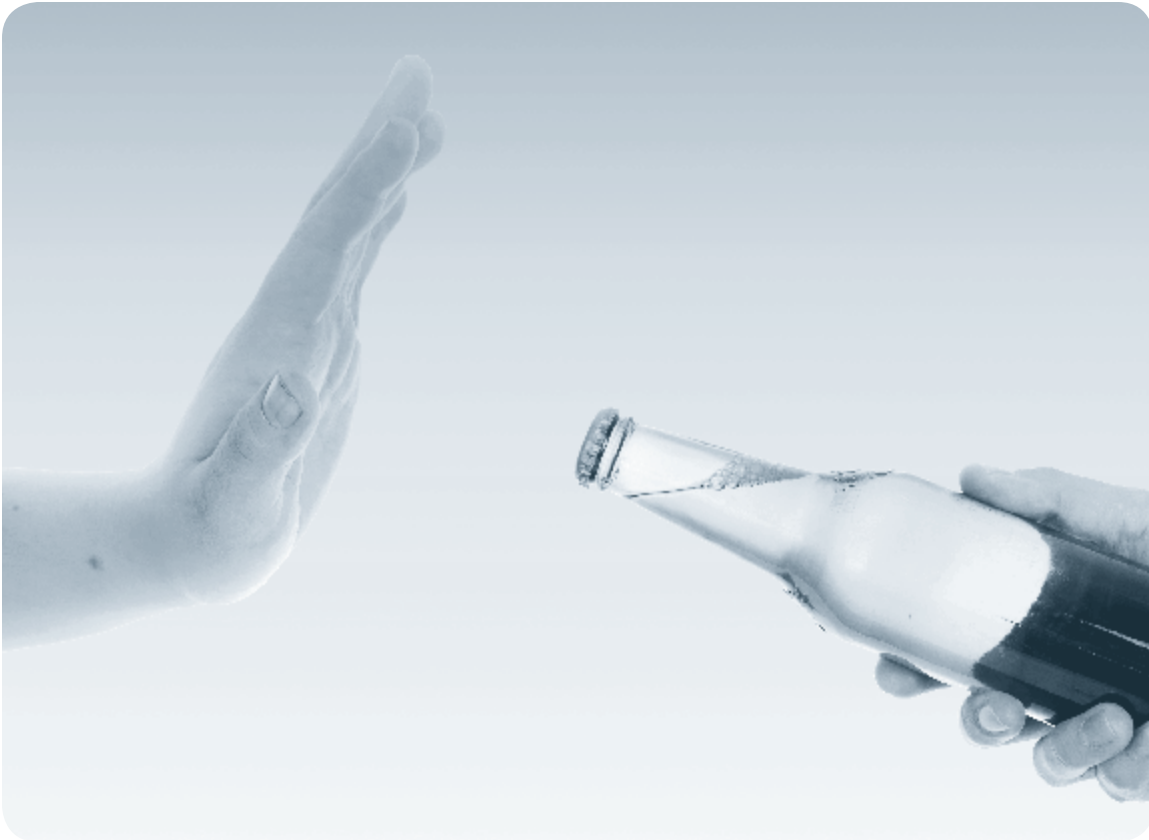


Definition

A **current drinker** is defined as a person who has consumed a drink of beer, wine, liquor or any other alcoholic beverage in the past 12 months.

Current drinkers can be further described as regular drinkers and occasional drinkers.

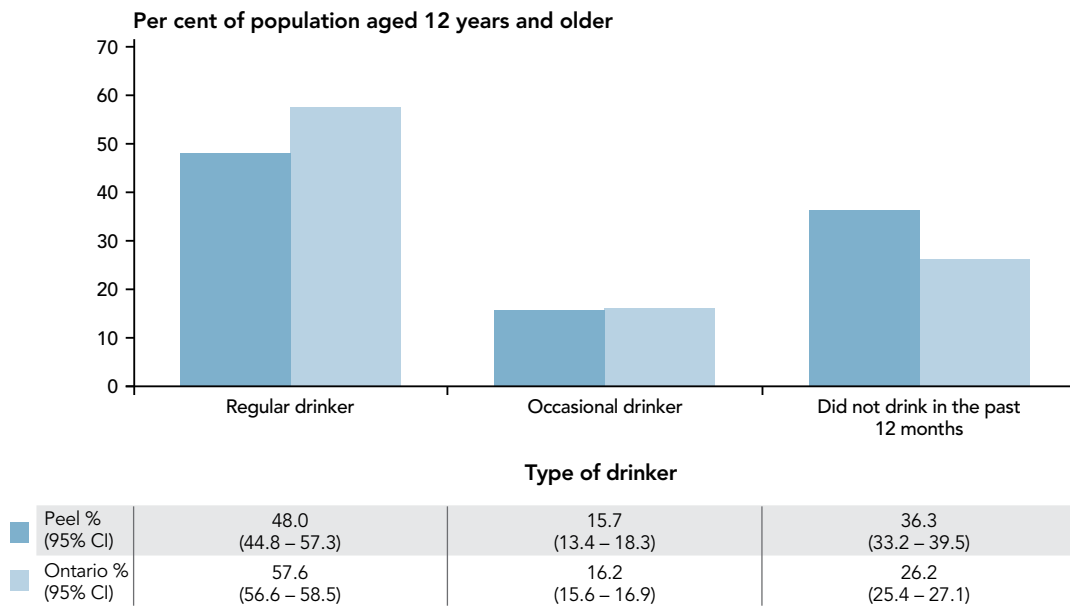
- A **regular drinker** is defined as a person who has had a drink at least once per month or more in the past 12 months.
- An **occasional drinker** is defined as a person who has had a drink less than once per month in the past 12 months.



One-third (36%) of Peel residents reported they have not consumed alcohol in the past year. This is a significantly higher proportion than Ontario (26%)

(Figure 1.3). There have been no changes in the type of drinker in Peel and Ontario between 2000/2001 and 2011/2012 (data not shown).

Figure 1.3
Type of Drinker,
Peel and Ontario, 2011/2012

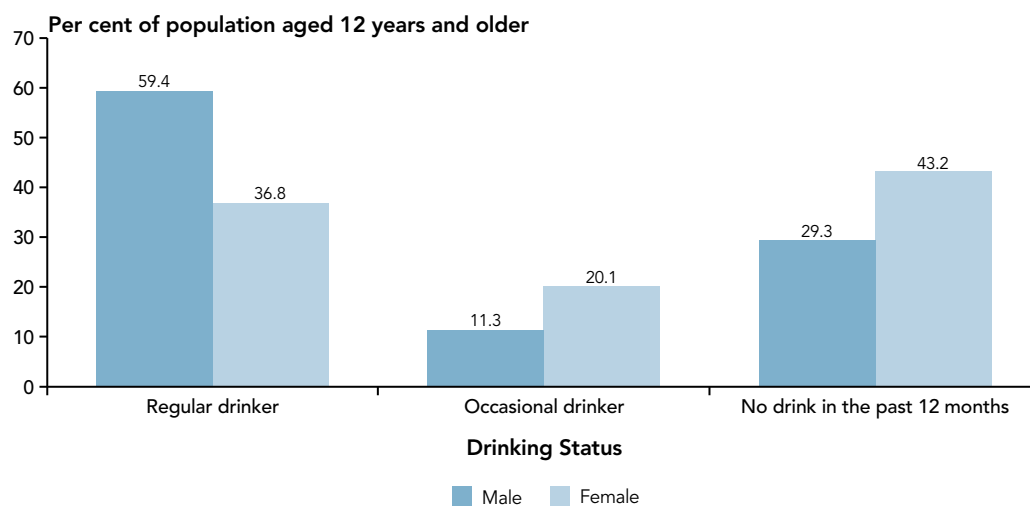


Note: 95% CI reflects the 95% confidence interval of the estimate.
Source: Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.



A significantly higher proportion of Peel females (43%) have not consumed alcohol in the past year compared to Peel males (29%) (Figure 1.4 and Table 1.1).

Figure 1.4
Drinking Status by Sex,
Peel, 2011/2012



Source: Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Table 1.1
Drinking Status[†] by Sex,
Peel, 2011/2012

		Current drinker		No drink in the past 12 months
		Regular drinker	Occasional drinker	
Male	Per cent (95% CI)	59.4 (54.6-64.1)	11.3 (8.7-14.4)	29.3 (25.0-34.0)
	Number of people	333,100	63,100	64,300
Female	Per cent (95% CI)	36.8 (32.9-40.8)	20.1 (16.6-24.1)	43.2 (38.9-47.5)
	Number of people	208,800	114,000	245,100
Total	Per cent (95% CI)	48.0 (CI: 44.8-57.3)	15.7 (13.4-18.3)	36.3 (33.2-39.5)
	Number of people	541,900	177,200	409,400

[†] Reflects population aged 12 years and older.

Note: 95% CI reflects the 95% confidence interval of the estimate.

Source: Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Current Drinkers

There are many factors that influence whether we drink alcohol at all, when and where we consume alcohol, and which type of alcohol we consume.



Highlights

- Two-thirds of Peel residents (64%) are current drinkers.
- Peel males (71%) are more likely to be current drinkers compared to females (57%).
- A significantly higher proportion of non-immigrants (74%) are current drinkers compared to long-term immigrants (65%) and recent immigrants (40%).



Measurement

A Canadian standard drink is any drink containing 13.6g of alcohol and equal to a:

- 341ml (12oz) bottle of 5% strength beer, cider or cooler;
- 142ml (5oz) glass of 12% strength wine; or
- 43ml (1.5oz) shot of 40% strength spirits.

Each country has its own definition of a standard drink. For example, a standard drink in Australia is 10g (12.5ml) of alcohol, while in the United States it is 14.5g (18ml).⁸

Just under two-thirds (64%) of Peel residents are current drinkers (drink regularly and occasionally) compared to three-quarters in Ontario (74%). Among Peel residents, 48% are regular drinkers and 16% are occasional drinkers (Figure 1.3).

Current Drinkers by Age Group and Sex

A significantly higher proportion of Peel males are current drinkers (71%) compared to females (57%) (Table 1.2). The proportion of males in Peel who are current drinkers is significantly lower compared to Ontario (71% vs 78%).^{E1} This finding is also the same for females (57% vs 70%).^{E1} There has been no change in the proportion of current drinkers in Peel between 2000/2001 and 2011/2012 (data not shown).^{E1}

A similar proportion of males and females between the ages of 12 and 29 years are current drinkers. While more males aged 30 years and older are current drinkers compared to females, the only significant difference is between males and females aged 30 to 44 years, where males are significantly more likely to be current drinkers (78%) compared to females (55%) (Figure 1.5 and Table 1.2).

Table 1.2
Current Drinker by Age Group and Sex,
Peel, 2011/2012

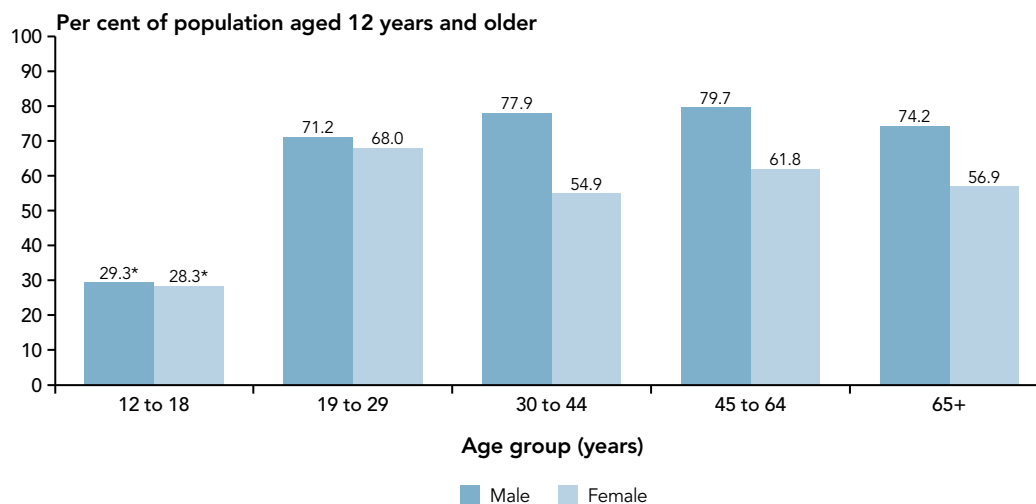
		Age group (years)					Total
		12–18	19–29	30–44	45–64	65+	
Male	Per cent (95% CI)	29.3* (20.2-40.4)	71.2 (60.2-80.1)	77.9 (69.1-84.8)	79.7 (69.0-87.3)	74.2 (63.3-82.8)	70.8 (66.1-75.1)
	Number of people	20,300*	76,400	112,700	142,100	46,500	398,000
Female	Per cent (95% CI)	28.3* (19.8-38.8)	68.0 (59.3-75.5)	54.9 (46.3-63.2)	61.8 (52.8-70.1)	56.9 (47.0-66.3)	56.8 (52.5-61.1)
	Number of people	17,400*	71,500	83,400	108,800	41,800	322,800
Total	Per cent (95% CI)	28.8 (22.3-36.4)	69.9 (62.0-75.6)	66.1 (59.7-72.0)	70.8 (64.1-76.7)	64.9 (57.6-71.5)	63.8 (60.6-66.9)
	Number of people	37,700	147,900	196,100	250,900	88,300	720,800

* Use estimate with caution.

Note: 95% CI reflects the 95% confidence interval of the estimate.

Source: Canadian Community Health Survey 2011/2012, Share File, Ontario Ministry of Health and Long-Term Care.

Figure 1.5
Current Drinker by Age Group and Sex,
Peel, 2011/2012



* Use estimate with caution.

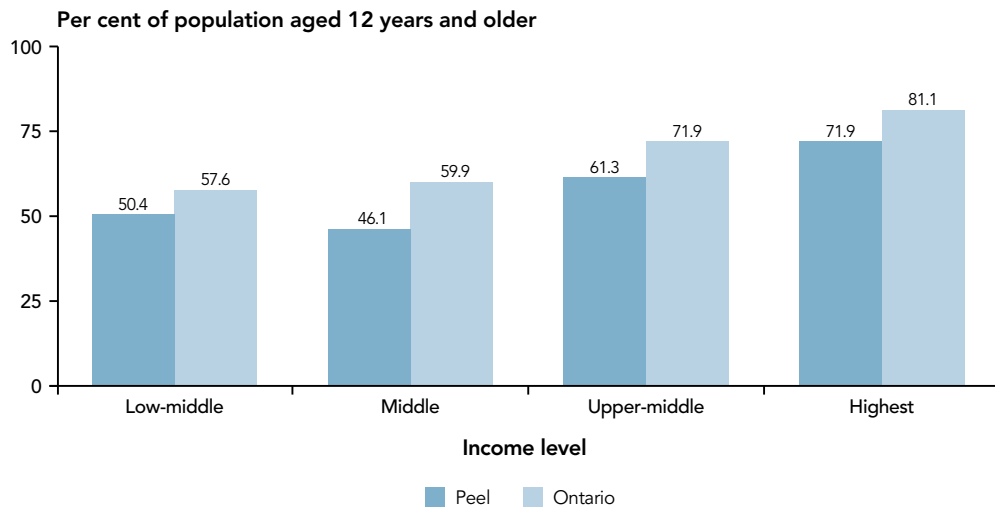
Source: Canadian Community Health Survey 2011/2012, Share File, Statistics Canada, Ontario Ministry of Health and Long-Term Care.

Current Drinkers by Income Level

The proportion of the population who are current drinkers increases with income level in Peel and Ontario. In Peel, a significantly higher proportion of those

in the highest income level are current drinkers compared to all other income levels (Figure 1.6). A definition of income can be found in Table 11.1.

Figure 1.6
Current Drinker by Income Level,
Peel and Ontario, 2011/2012



*Use estimate with caution.
95% CI reflects the 95% confidence interval of the estimate.
Source: Canadian Community Health Survey 2011/2012, Share File, Statistics Canada, Ontario Ministry of Health and Long-Term Care.

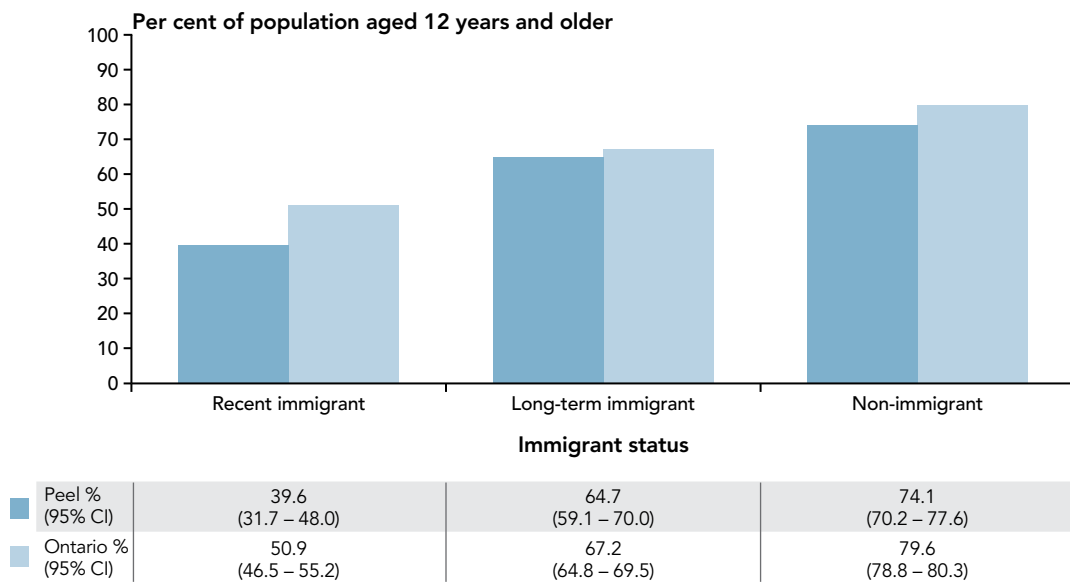


Current Drinkers and Immigrant Status

Over half (51%) of Peel’s residents are immigrants.^c A significantly higher proportion of non-immigrants (74%) are current drinkers compared to long-term immigrants (65%) and recent immigrants (65%) and recent immigrants

(40%) (Figure 1.7). The current proportion of drinkers by immigrant status has remained stable between 2000/2001 and 2011/2012 (data not shown).^{E1}

Figure 1.7
Current Drinker by Immigrant Status,
Peel, 2011/2012



Note: 95% CI reflects the 95% confidence interval of the estimate.
Source: Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.



Current Drinkers and Ethnicity

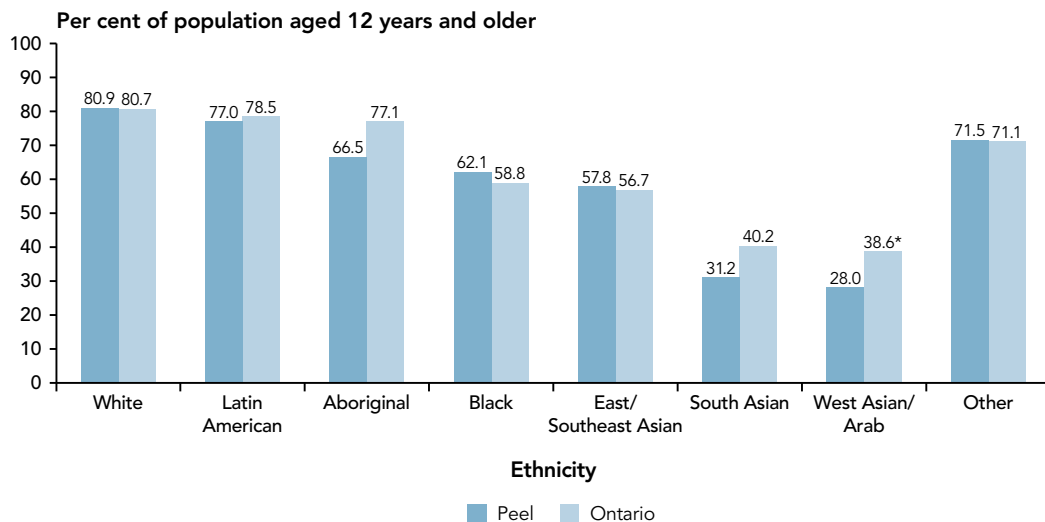
In Canada, those of Chinese (64%) and South Asian ethnicity (41%) were reported to be less likely to drink alcohol than Caucasian adults (81%) over the age of 15 years. These ethnic groups were also less likely to report binge drinking (five or more drinks at one time).⁹

In both Peel and Ontario, the highest proportion of current drinkers is reported by those who self-identify as White, Latin American or Aboriginal (Figure 1.8).

Did You Know

In South Asian cultures, abstinence is high among both men and women, particularly among those from Pakistani and Bangladeshi backgrounds.¹⁰

Figure 1.8
Current Drinker by Ethnicity,
Peel, 2011/2012



* Use estimate with caution.
Source: Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Frequency of Alcohol Use



Highlights

- In Peel just over half of current drinkers (56%) drink at least once per week.
- Males tend to consume alcohol more frequently than females.
- In Peel, significantly more men (30%) drink five or more drinks per week compared to women (17%).
- In Peel, 8% of current drinkers drink on a daily basis.
- A higher proportion of males drink daily (10%) compared to females (5%*).

*use estimate with caution.

In Peel, 64% of Peel’s population drank within the past 12 months (Figure 1.9).

Among this group:

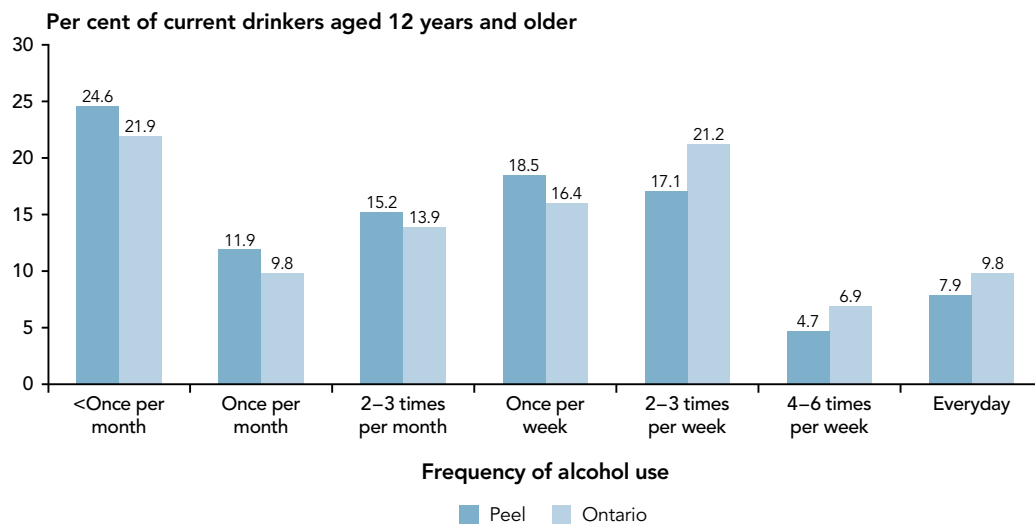
- 24% drink less than once per month;
- 27% drink between one and three times per month;

- 40% drink between one and six times per week; and
- 8% drink daily.

The trends in the frequency of alcohol consumption have remained stable between 2000/2001 and 2011/2012 (data not shown).^{E1}

Figure 1.9

Frequency of Alcohol Consumption among Current Drinkers, Peel and Ontario, 2011/2012



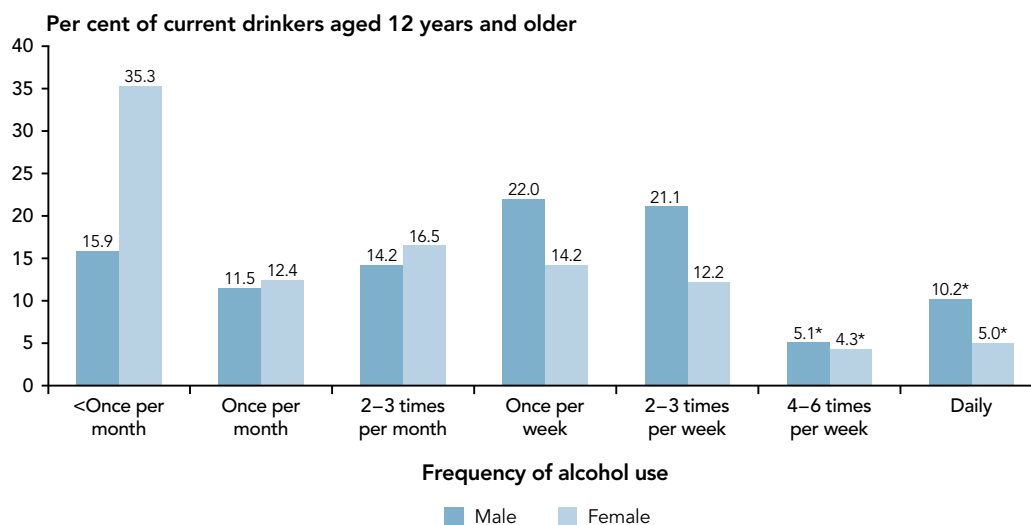
Source: Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Males tend to drink more frequently than females. For example, 58% of males drink at least once per week compared with 36% of females. While a higher proportion of

males drink daily compared to females, the difference is not statistically significant (Figure 1.10 and Table 1.3).

Figure 1.10

Frequency of Alcohol Consumption among Current Drinkers by Sex, Peel, 2011/2012



* Use estimate with caution.

Source: Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long Term Care.

Table 1.3

Frequency of Alcohol Consumption among Current Drinkers[†] by Sex, Peel, 2011/2012

		< Once per month	Once per month	2-3 times per month	Once per week	2-3 times per week	4-6 times per week	Daily
Male	Per cent (95% CI)	15.9 (12.4-20.3)	11.5 (8.5-15.3)	14.2 (10.8-18.5)	22.0 (17.1-27.9)	21.1 (17.1-25.6)	5.1* (3.4-7.6)	10.2* (7.0-14.7)
	Number of people	63,100	45,400	56,300	87,400	83,400	20,100*	40,500*
Female	Per cent (95% CI)	35.3 (29.9-41.2)	12.4 (9.5-16.0)	16.5 (13.0-20.7)	14.2 (10.8-18.3)	12.2 (9.5-15.6)	4.3* (2.6-7.1)	5.0* (3.4-7.5)
	Number of people	114,000	40,100	53,200	45,700	39,500	14,000*	16,300*
Total	Per cent (95% CI)	24.6 (21.3-28.4)	11.9 (9.7-14.4)	15.2 (12.7-18.2)	18.5 (15.3-22.2)	17.1 (14.5-20.0)	4.7 (3.5-6.5)	7.9 (5.9-10.5)
	Number of people	177,200	85,500	109,500	133,100	122,900	44,900	56,800

[†] Reflects population aged 12 years and older.

* Use estimate with caution.

Note: 95% CI reflects the 95% confidence interval of the estimate.

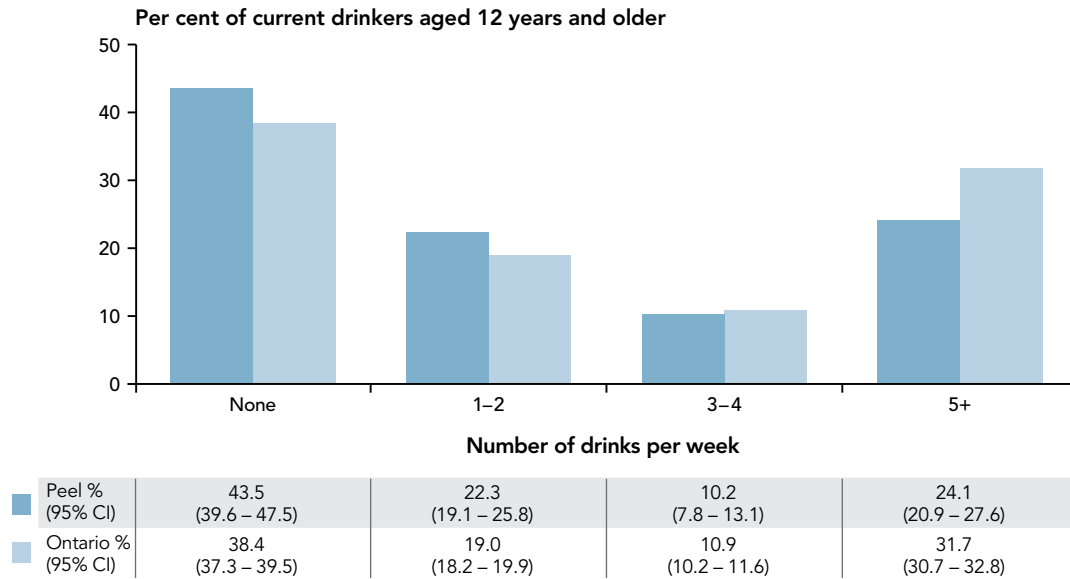
Source: Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Weekly Drinking

Just over half of Peel drinkers (56%) consume at least one or more drinks on a weekly basis. A significantly lower

proportion of Peel residents drink five or more drinks per week than Ontario residents (Figure 1.11).

Figure 1.11
Distribution of Weekly Drinking,
Peel and Ontario, 2011/2012



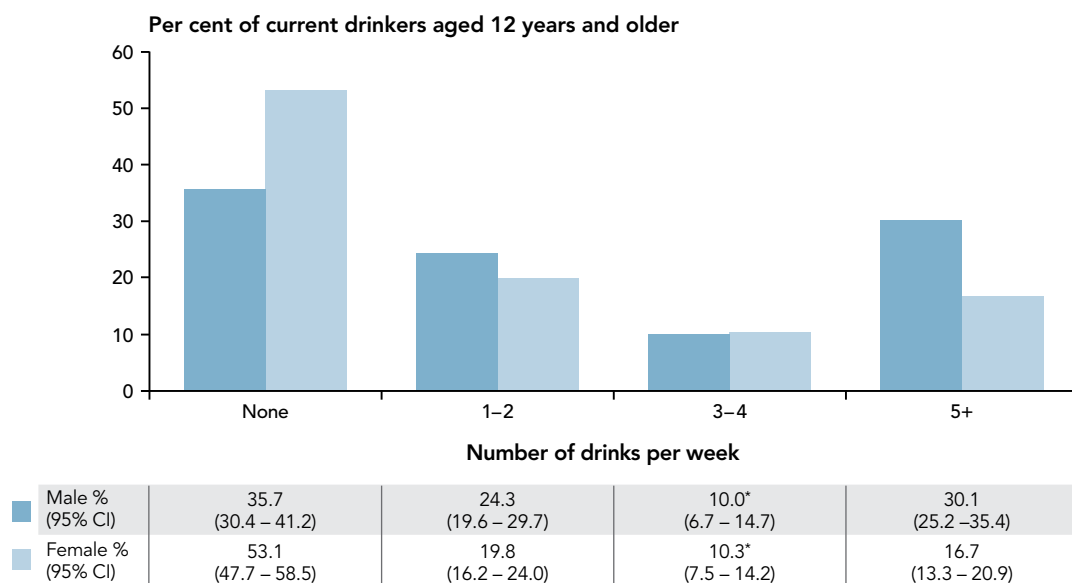
Note: 95% CI reflects the 95% confidence interval of the estimate.

Source: Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long Term Care.



In Peel, significantly more women have no drinks on a weekly basis (53%) compared to men (36%). By contrast, significantly more men than women drink five or more drinks per week (30% compared to 17%) (Figure 1.12).

Figure 1.12
Distribution of Weekly Drinking by Sex,
Peel, 2011/2012



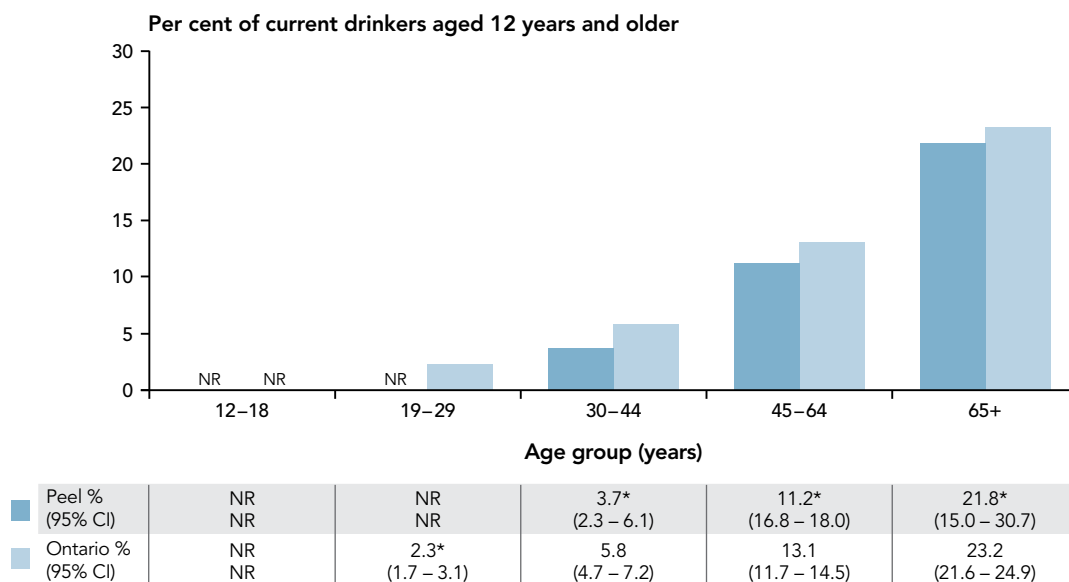
* Use estimate with caution.
Note: 95% CI reflects the 95% confidence interval of the estimate.
Source: Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long Term Care.

Daily Drinking

Among current drinkers in Peel, 8% (56,700 people) drink on a daily basis.^{E1}

A higher proportion of males (10%) drink daily compared to females (5%*) (Table 1.4). (*use estimate with caution).

The highest rate of daily drinking is among seniors aged 65 years and older (Figure 1.13 and Table 1.4). This is true for both Peel and Ontario. The proportion of seniors who are daily drinkers has not changed between 2000/2001 and 2009/2010 (data not shown).^{E1}

Figure 1.13**Daily Alcohol Consumption among Current Drinkers by Age Group, Peel and Ontario, 2011/2012**

* Use estimate with caution.

NR - Not releasable due to small numbers.

Note: 95% CI reflects the 95% confidence interval of the estimate.

Source: Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Table 1.4**Daily Alcohol Consumption among Current Drinkers by Sex and Age Group, Peel, 2011/2012**

		Per cent	(95% CI)	Number of people
Sex	Male	10.2*	(7.0-14.7)	40,500
	Female	5.0*	(3.4-7.5)	16,300
Age group (years)	12-18	NR	NR	NR
	19-29	NR	NR	NR
	30-44	3.7*	(2.3-6.1)	7,300
	45-64	11.2*	(6.8-18.0)	28,000
	65+	21.8*	(15.0-30.7)	19,200
Total		7.9*	(5.9-10.5)	56,700

* Use estimate with caution.

NR - Not releasable due to small numbers.

Note: 95% CI reflects 95% confidence interval of the estimate.

Source: Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Low-Risk Drinkers



Highlights

- In Peel, a significantly higher proportion of the population (85%) adhere to the 2003 Ontario low-risk drinking guidelines compared to Ontario (79%).
- Peel females are more likely to adhere to the 2003 Ontario Low-Risk Drinking Guidelines (91%) compared to males (79%).
- Significantly more Peel residents aged 30 years and older adhere to the low-risk drinking guidelines compared with those aged 19 to 29 years.
- Peel seniors have the highest rates of adherence to low-risk drinking at 91%.
- In Peel, poor adherence to low-risk drinking is associated with the following factors: being male, being in the highest income level, “white” ethnicity, being Canadian born, single marital status and being a smoker.

Low-risk drinking guidelines (LRDG) have emerged in a number of countries as an approach to reduce the risk of alcohol-related harm within the population. More recently, these guidelines have included daily limits (which are intended to reduce immediate harm, such as injuries) and weekly limits (which are intended

to reduce long-term negative health outcomes, such as cancer).

Internationally, there is no consensus about what constitutes ‘low-risk’ drinking, the definition of a standard drink, or whether there should be sex differences in the daily/weekly limits.¹¹





Definition

Low-risk drinkers are defined as those who follow the low-risk drinking guidelines.

Prior to 2011, the revised *2003 Ontario Low-Risk Drinking Guidelines* defined low-risk drinking as no more than:

- nine drinks a week for women, with no more than two drinks a day most days; or
- fourteen drinks a week for men, with no more than two drinks a day most days.

These guidelines applied to those of legal drinking age, which at the time was 19 years of age.¹²

In 2011, new Canadian guidelines were released. The *2011 Canadian Low-Risk Alcohol Drinking Guidelines*⁸ defined low-risk drinking under a series of guidelines:

Guideline 1 – Do not drink if:

- driving a vehicle or using machinery and tools;
- taking medication or other drugs that interact with alcohol;
- doing any kind of dangerous physical activity;
- living with mental or physical health problems;
- living with alcohol dependence;
- pregnant or planning to be pregnant;
- responsible for the safety of others; and
- making important decisions.

Guideline 2 – For adults aged 25 to 64 years of age who do drink, reduce long-term health risks by capping the number of drinks at:

- ten drinks a week for women, with no more than two drinks a day most days; or
- fifteen drinks a week for men, with no more than three drinks a day most days.

Guideline 3 – For adults aged 25 to 64 years of age who do drink, reduce short-term risks by restricting alcohol intake as follows:

- Women should drink no more than three drinks on any single occasion.
- Men should drink no more than four drinks on any single occasion.

Guideline 4 – When pregnant or planning to become pregnant do not drink any alcohol at all.

Guideline 5 – For young people:

- Delay drinking until the late teen years if you are a child or youth.

There are no specific guidelines for seniors.⁸

Both the new Canadian Guidelines and the pre-2011 Ontario low-risk drinking guidelines aim to provide a balance between acute and long-term effects of alcohol consumption. However, the new guidelines are less restrictive about the quantity of alcohol consumed on a weekly basis. As a result, in this report, we have intentionally analyzed data using the *2003 Ontario Low-Risk Drinking Guidelines* drinking guideline definition referred to henceforth as the former low-risk drinking guidelines.

In Peel, a significantly higher proportion of Peel residents aged 19 years and older adhere to the former low-risk drinking guidelines (85%) compared to Ontario (79%).^{E1} The proportion of Peel residents who are low-risk drinkers has remained stable between 2000/2001 and 2011/2012

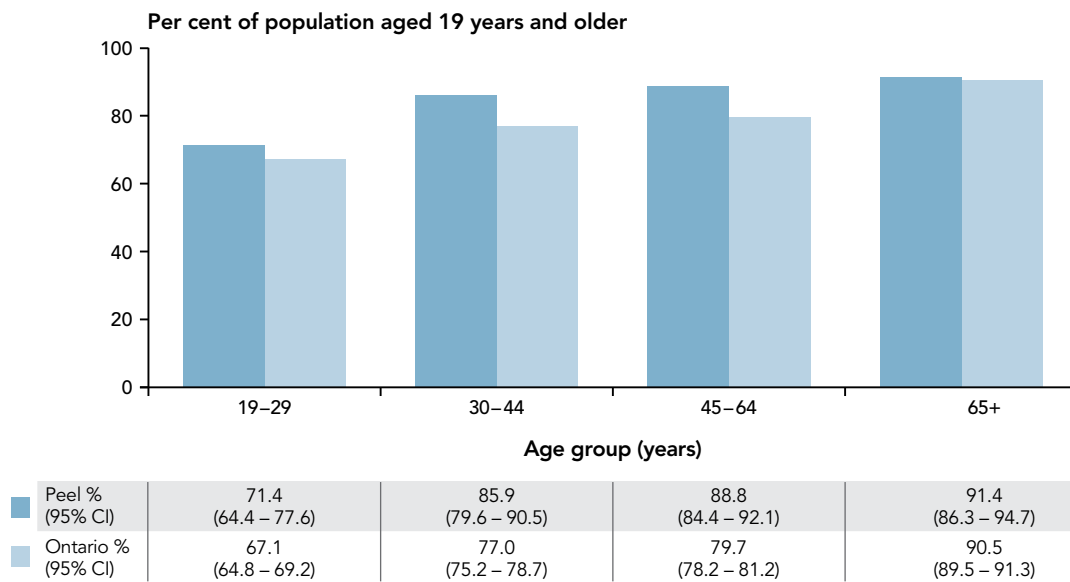
(data not shown). Peel females are more likely to adhere to the former low-risk drinking guidelines (91%) compared to males (79%), a finding that is similar to that for Ontario.^{E1}

Did You Know

The **2011 Canadian Low-Risk Alcohol Drinking Guidelines** allows adults aged 19 years and older to drink more per week compared to the old low-risk drinking guidelines.

In Peel, when **2011 Canadian Low-Risk Alcohol Drinking Guidelines** were applied to using 2009/2010 Canadian Community Health Survey data, 87% of Peel residents were considered low-risk drinkers compared to 83% when using the former low-risk drinking guidelines.

Figure 1.14
Adherence to Former Low-Risk Drinking Guidelines by Age Group, Peel and Ontario, 2011/2012



Notes: 95% CI reflects the 95% confidence interval of the estimate.
Low-risk drinking is based on the 2003 Ontario low-risk drinking definition.
Source: Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

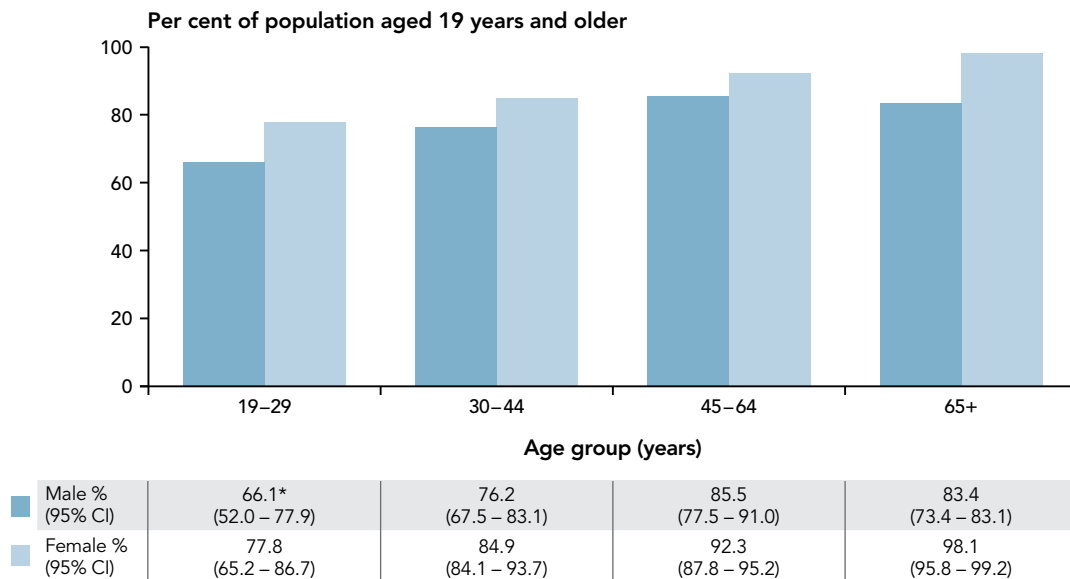
Significantly more Peel residents aged 30 years and older adhere to the former low-risk drinking guidelines compared with those aged 19 to 29 years. Seniors have the highest rates of adherence to low-risk drinking at 91% (Figure 1.14).

Compared to Ontario, a significantly higher proportion of Peel residents aged 30 to 64 years adhere to the former low-risk drinking guidelines (Figure 1.14).

In Peel, a similar proportion of males and females across all age groups adhere to the low-risk drinking guidelines with the exception of those aged 30 to 44 years where a significantly higher proportion of females adhere to the guidelines compared to males (Figure 1.15). Low-risk drinking trends have remained stable across all age groups between 2000/2001 and 2011/2012 (data not shown).

Figure 1.15

Adherence to Former Low-Risk Drinking Guidelines by Age Group and Sex, Peel, 2011/2012



* Use estimate with caution.

Notes: 95% CI reflects the 95% confidence interval of the estimate.

Low-risk drinking is based on the pre-2011 Ontario low-risk drinking definition.

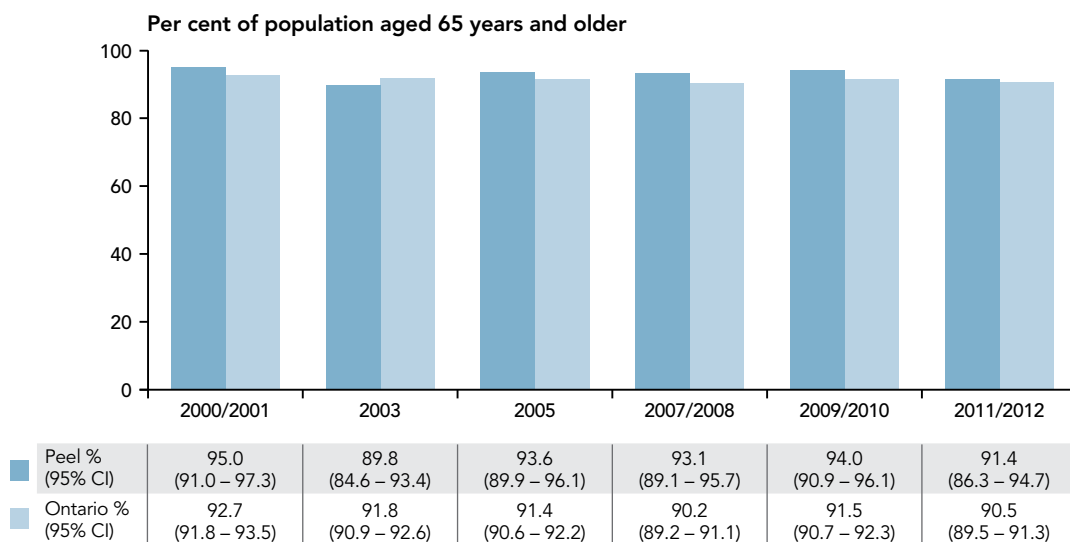
Source: Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Low-Risk Drinking among Seniors

In Peel, most seniors aged 65 years and older adhere to the low-risk drinking guidelines and this has remained stable over time (Figure 1.16). This is because a high proportion of seniors do not drink daily (68%), or have only one drink per day (23%), which would classify their drinking as low-risk.^{E1}



Figure 1.16
Adherence to Former Low-Risk Drinking among Seniors by Year,
Peel and Ontario, 2000/2001 – 2011/2012



Notes: 95% CI reflects the 95% confidence interval of the estimate.
Low-risk drinking is based on the pre-2011 Ontario low-risk drinking definition.
Source: Canadian Community Health Survey 200/2001, 2003, 2005, 2007/2008, 2009/2010, 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Determinants of Health and Behavioural Risk Factors Associated with Poor Adherence to Low-Risk Drinking

There are many factors associated with poor adherence to low-risk drinking (e.g., age, sex, income). To account for the fact that some of these factors themselves

might be related to one another, a logistic regression modelling analysis, which incorporates multiple variables into the analysis, was conducted. The results of the logistic regression modelling approach provide a more accurate assessment of an outcome (such as low-risk drinking) by considering variables that are associated with one another.

The adjusted results of the regression analysis for the association between poor adherence to low-risk drinking and other factors are presented and described in Tables 1.5 and 1.6.

After controlling for all other factors in the model, poor adherence to the former low-risk drinking guidelines is independently associated with the following factors:

- male
- highest level income
- “white” ethnicity
- Canadian born
- single marital status
- smoker

Table 1.5

Adherence to the Former Low-Risk Drinking Regression Analysis Summary, Peel, 2000/2001, 2003, 2005, 2007/2008, 2009/2010 Combined

Variable	Discussion
Age	After 19 years of age, as age increases, so to does the likelihood of adhering to low-risk guidelines.
Sex	Males are less likely to adhere to the low-risk drinking guidelines than females.
Income level	Those in the highest income group are less likely to adhere to the low-risk drinking guidelines than those in the upper-middle income category.
Education level	There was no statistically significant difference between educational achievement levels and adherence to low risk drinking guidelines in Peel.
Ethnicity	Ethnicity was found to have an effect on the outcome of adherence to low-risk drinking guidelines. Respondents who identified as Black, East/South East Asian, South Asian, and all other ethnic origins were significantly more likely to follow guidelines when compared to those of White ethnicity.
Immigrant status	Adherence to the low-risk drinking guideline amongst recent immigrants was almost 2.5 times greater than for non-immigrants. Long-term immigrants were also significantly more likely to follow the guidelines when compared with non-immigrants.
Marital status	Never married individuals were significantly less likely to adhere to low-risk drinking guidelines than those who are now married/in common-law relationships.
Employment status	There was no difference detected in the odds of adherence to low-risk drinking guidelines between employed and unemployed status.
Sense of community	There was no association between low-risk drinking and sense of community belonging.
Self-perceived life stress	There was no association between self-perceived life stress and adherence to low-risk drinking.
Self-perceived health	There was no relationship between adherence to low-risk drinking guidelines and self-perceived health status.
Smoking status	Current smokers were almost 60% less likely to adhere to low-risk drinking guidelines than were those who don't smoke or who no longer smoke.

Source: Canadian Community Health Survey, 2000/2001, 2003, 2005, 2007/2008, 2009/2010. Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.



Definition

An **odds ratio (OR)** estimates the rate of an event occurring in one population in relation to its rate of occurrence in another population.

- If the $OR=1$, the rate of an event occurring in one population is equal to the rate of an event occurring in another population.
- If the $OR >1$, the rate of an event occurring in one population is greater than the rate of an event occurring in another population. For example, if the odds ratio equals 2, the odds of the event occurring is twice as high in the one population compared to the other population.
- If the $OR <1$, the rate of an event occurring in one population is less than the rate of an event occurring

in another population. For example, if the odds ratio was 0.50, the odds of the event occurring in one population is 50% lower compared to the other population. This is determined by the following calculation: $(1-0.50)*100 = 50\%$.

The adjusted odds ratio describes the increased risk of poor adherence to low-risk drinking for each determinant or risk factor, taking into account other factors that may also be associated with poor adherence to low-risk drinking. When an adjusted odds ratio is used to explain the excess risk of poor adherence to low-risk drinking with each factor, it can be assumed that this magnitude of excess risk is attributable to the particular factor alone, and not due to the influence of other factors being explored.

Table 1.6 shows the magnitude of the relationship between each factor explored, and the likelihood of poor adherence to low-risk drinking by using the adjusted odds ratio as the measure of risk.

One can interpret the results in Table 1.6 using the sex variable and immigrant status variable as examples:

- The odds ratio for adherence to the low-risk drinking guidelines for males was 0.37. This means that males are 63% less likely to adhere to the low-risk drinking guidelines compared to females as the comparison group.
- The odds ratio for adherence to the low-risk drinking guidelines for recent immigrants was 2.49. This means that immigrants are 2.5 times more likely to adhere to the low-risk drinking guidelines when using non-immigrants as the comparison group.

Table 1.6

Association between Adherence to Low-Risk Drinking Guidelines[†] and Social or Behavioural Determinants, Peel, 2000/2001, 2003, 2005, 2007/2008, 2009/2010 Combined

Variable	Adjusted odds ratio (95% CI)
Age	1.02* (1.02-1.03)
Sex	
Male	0.37* (0.31-0.44)
Female	1.0
Household income level	
Lowest-to-middle	0.98 (0.61-1.58)
Upper-middle	1.0
Highest	*0.68 (0.56-0.82)
Education level	
Lowest-to-middle	0.98 (0.61-1.58)
Upper-middle	1.0
Highest	*0.68 (0.56-0.82)
Education level	
Less than secondary	1.00 (0.75-1.33)
Secondary graduate	0.96 (0.78-1.17)
Other post-secondary	0.84 (0.61-1.16)
Post-secondary graduate	1.0
Ethnicity	
White	1.0
Black	*2.02 (1.31-3.12)
East/Southeast Asian	*2.47 (1.56-3.92)
South Asian	*2.61 (1.81-3.74)
Other	*1.73(1.20-2.49)
Immigrant status	
Recent immigrant	*2.49 (1.68-3.69)
Long-term immigrant	*1.26 (1.02-1.56)
Non-immigrant	1.0
Marital status	
Now married/common law	1.0
Divorced/separated/widowed	0.88 (0.66-1.17)
Single	*0.74 (0.60-0.92)
Employment status in past week	
At work last week/absent last week [‡]	1.0
No job last week	1.25 (1.00-1.57)

Table 1.6 continues ...

Table 1.6 continued

Variable	Adjusted odds ratio (95% CI)
Sense of community belonging	
Very strong/somewhat strong	1.0
Somewhat weak/very weak	1.04 (0.88-1.23)
Self-perceived life stress	
Quite a bit/extremely	1.19 (0.99-1.44)
Not at all/not very/a bit	1.0
Self-perceived health	
Excellent/very good/good	1.0
Fair/ poor	1.12 (0.83-1.53)
Smoking status	
Current smoker	*0.42 (0.35-0.50)
Non-smoker	1.0

† Reflects the 2003 Ontario low risk drinking guidelines and is defined as males aged 19 years and older who drank more than 14 drinks per week, females aged 19 years and older who drank more than nine drinks per week or people who drank more than two drinks on any day of the previous week for the years included in the analysis.

* indicates statistically significant findings (p<0.05).

‡ Employed in last week.

Source: Canadian Community Health Survey, 2000/2001, 2003, 2005, 2007/2008, 2009/2010. Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Risky Alcohol Behaviours

Binge Drinking



Highlights

- In Peel, a significantly lower proportion of the population (12%) engaged in binge drinking in the past year compared to Ontario (17%).
- Binge drinking is more likely among those:
 - who are male;
 - aged 19 to 44 years;
 - in the highest income level;
 - with some post-secondary education;
 - who are Canadian born with "White" ethnicity;
 - with single marital status;
 - who are employed;
 - who smoke; and
 - who are physically active.

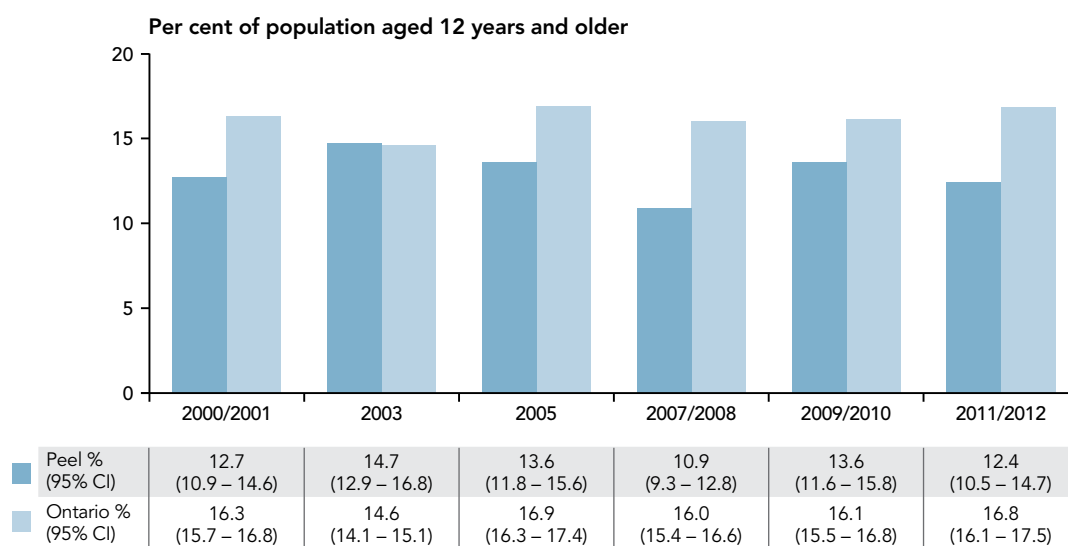


Definition

Binge drinking is defined as having five or more drinks on at least one occasion in the past 12 months.

In Peel in 2011/2012, a significantly lower proportion of the population (12%) engaged in binge drinking in the past year compared to Ontario (17%). In both Peel and Ontario, the prevalence of binge drinking has remained stable between 2000/2001 and 2011/2012. In each year, the percentage of Peel's population that binge drinks is lower than Ontario (Figure 1.17).

Figure 1.17
Binge Drinking by Year,
Peel and Ontario, 2000/2001 – 2011/2012



Note: 95% CI reflects the 95% confidence interval of the estimate.

Source: Canadian Community Health Survey 200/2001, 2003, 2005, 2007/2008, 2009/2010, 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Determinants of Health and Behavioural Risk Factors Associated with Binge Drinking

To assess factors that are associated with binge drinking, a regression analysis was conducted. After controlling for all other factors in the model, the following factors are independently associated with a higher risk of binge drinking:

- male
- age of 19 to 44 years
- highest level income

- attained some post-secondary education
- Canadian born
- “White” ethnicity
- single marital status
- employed
- smoker
- physically active

The adjusted results of the regression analysis for the association between poor adherence to low-risk drinking and other factors are described and presented in Tables 1.7 and 1.8.

Table 1.7
Binge Drinking Regression Analysis Summary
 Peel, 2003, 2005, 2007/2008, 2009/2010, 2011 Combined

Variable	Discussion
Age	The odds of binge drinking decrease as age increases.
Sex	Males were almost four times more likely to binge drink than females.
Income level	Those with the highest income were 1.3 times more likely to binge drink compared to those in lower income levels.
Education level	Respondents who reported having some post-secondary education were significantly more likely to binge drink compared to those who were post-secondary graduates.
Immigrant status	Recent immigrants and long-term immigrants were less likely to binge drink compared to non-immigrants.
Ethnicity	Respondents who identified as Southeast or East Asian, and South Asian were less likely to binge drink in comparison to those who identified as White.
Marital status	Those who are single are significantly more likely to binge drink in comparison to those who are married or in common law relationships. No significant difference was found between individuals who were divorced, separated or widowed and those who were married or in a common law relationship.
Employment	Respondents who reported not having a job in the past week were significantly less likely to binge drink compared to those who were employed.
Sense of community	No association between sense of belonging and binge drinking.
Self-perceived life stress	No association between self-perceived life stress and binge drinking.
Self-perceived health	No association between self-perceived health and binge drinking.
Smoking status	Current smokers are significantly more likely to binge drink compared to those who have never or formerly smoked.
Physical activity level	Those who reported being physically inactive were less likely to binge drink compared to highly active respondents.

Source: Canadian Community Health Survey, 2003, 2005, 2007/2008, 2009, 2010, 2011, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

One can interpret the results in Table 1.8 using the sex variable and immigrant status variable as examples:

- The odds ratio for binge drinking for males was 3.96. This means that males are almost four times more likely to binge drink compared to females as the comparison group.
- The odds ratio for binge drinking for recent immigrants was 0.34. This means that immigrants are 66% less likely to binge drink when using non-immigrants as the comparison group.

Table 1.8

Association between Binge Drinking and Social or Behavioural Determinants,
Peel, 2003, 2005, 2007/2008, 2009/2010, 2011 Combined

Variable	Adjusted odds ratio (95% CI)
Age group (years)	
12-18	0.65 (0.33-1.25)
19-24	2.35 (1.50-3.67)*
25-34	1.85 (1.32-2.59)*
35-44	1.44 (1.02-2.04)*
45-54	1.0
55-64	0.65 (0.39-1.08)
65+	0.82 (0.41-1.63)
Sex	
Female	1.0
Male	3.96 (3.16-4.98)*
Household income level	
Lowest-to-middle	1.12 (0.55-2.28)
Upper-middle	1.0
Highest	1.39 (1.09-1.76)*
Education level	
Less than secondary	1.01 (0.69-1.48)
Secondary graduate	1.03 (0.76-1.39)
Other post-secondary	1.43 (1.02-1.99)*
Post-secondary graduate	1.0
Ethnicity	
White	1.0
Black	0.42 (0.22-0.81)*
East/Southeast Asian	0.41 (0.23-0.73)*
West Asian or Arabic	0.39 (0.04-3.89)
South Asian	0.41 (0.26-0.66)*
Latin	1.08 (0.49-2.38)
Aboriginal/Other	0.85 (0.48-1.50)
Immigrant status	
Recent immigrant	0.34 (0.21-0.54)*
Long-term immigrant	0.72 (0.54-0.96)*
Non-immigrant	1.0

Table 1.8 continues ...

Table 1.8 continued

Variable	Adjusted odds ratio (95% CI)
Marital status	
Married/common law	1.0
Divorced/separated/widowed	1.19 (0.76-1.86)
Single	1.95 (1.45-2.61)*
Employment status in past week **	
At work last week/absent last week [†]	1.0
No job last week	0.70 (0.52-0.95)*
Sense of community belonging	
Very strong/somewhat strong	1.0
Somewhat weak/very weak	1.18 (0.95-1.45)
Self-perceived life stress	
Quite a bit/extremely	1.0
Not at all/not very/a bit	0.98 (0.77-1.26)
Self-perceived health	
Excellent/very good/good	1.0
Fair/poor	1.35 (0.91-2.02)
Smoking status	
Current smoker	3.22 (2.54-4.09)*
Non smoker	1.0
Physical activity level	
Active	1.0
Moderate	1.09 (0.82-1.46)
Inactive	0.59 (0.47-0.74)*

Note: Reflects respondents aged 12 years and older.

* indicates statistically significant findings p<0.05.

** Also contains not applicable category (not shown).

[†] Employed in last week

Source: Canadian Community Health Survey, 2003, 2005, 2007/2008, 2009, 2010, 2011, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Alcohol Use and Smoking



Highlights

- In Peel, current drinkers are three times more likely to smoke (19%) compared to non-drinkers (6%).
- The combined use of alcohol and tobacco increases a person's risk of alcohol or tobacco-related diseases.

In Peel, current drinkers are three times more likely to smoke (19%) compared to non-drinkers (6%). This is similar to Ontario (Table 1.9). While the proportion

of current drinkers who smoke is higher among males compared to females, the difference is not statistically significant (data not shown).

The combined use of alcohol and tobacco increases a person's risk of alcohol or tobacco-related diseases because they have a synergistic effect on health-related outcomes.¹³

Table 1.9
Drinking Status by per cent of Smokers,
Peel and Ontario, 2011/2012

	Current smokers	Current drinker	
		Yes	No
Peel	Per cent (95% CI)	18.7 (15.9-21.9)	6.3 (4.0-9.7)
	Number of people	134,600	25,700
Ontario	Per cent (95% CI)	23.3 (21.9-24.7)	11.1 (9.4-12.9)
	Number of people	987,800	136,600

Note: 95% CI reflects the 95% confidence interval of the estimate.

Source: Canadian Community Health Survey, 2011/2012, Statistics Canada, Share File, Statistics Canada, Ontario Ministry of Health and Long-Term Care.

Alcohol and Pregnancy



Highlights

- Data about alcohol use in the pre-conception period are not available for Peel. In Canada, 62% of women reported that they drank alcohol three months prior to pregnancy or before realizing they were pregnant.¹⁴
- In Peel, 1% of women reported using alcohol during pregnancy.^F
- Fetal alcohol spectrum disorder data for Peel are not available. The estimate for Canada is approximately 1% of the population.
- In Peel, 79% of Peel adults reported that “no amount of alcohol (0 drinks)” is safe to drink during pregnancy.
- In 2007, 59% of Peel women reported that their doctor told them not to drink any alcohol at all when pregnant.

Alcohol use during pregnancy can affect the health of both the mother and fetus. The effects of prenatal exposure to alcohol on the baby are unpredictable and are difficult to diagnose. It is recommended in the Canadian low-risk drinking guidelines that women who are pregnant or planning to become pregnant not drink any alcohol at all.

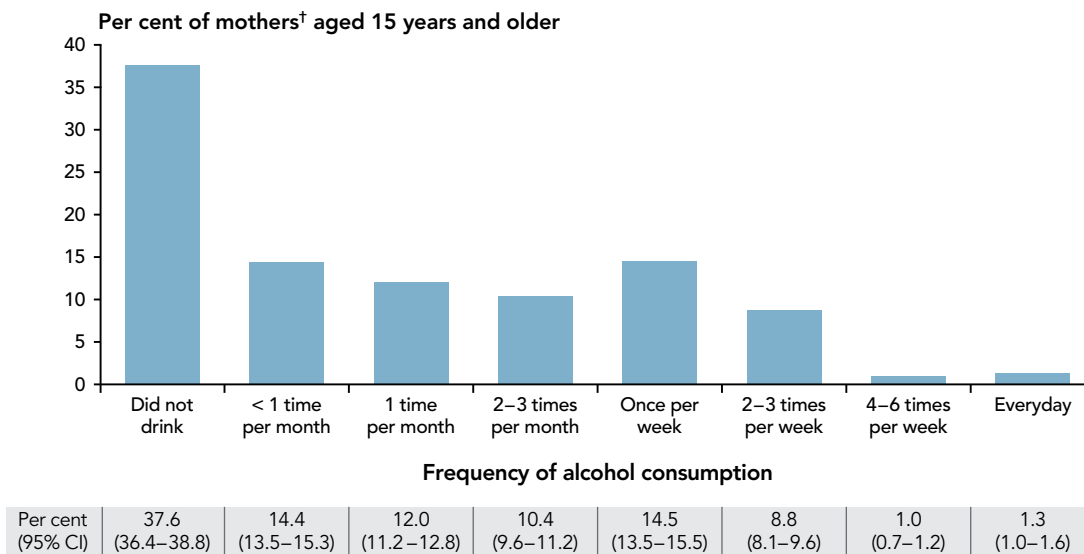
Alcohol Use and the Pre-conception Period

Almost two-thirds (62%) of Canadian women reported that they drank alcohol three months prior to pregnancy or before realizing they were pregnant.¹⁴

The frequency of alcohol consumption is shown in Figure 1.17. Data are not available for Peel.

Figure 1.18

Frequency of Alcohol Consumption Three Months Prior to Pregnancy or Prior to Realizing They Were Pregnant, Canada, 2006/2007



† Who had a singleton live birth in Canada during a three-month period preceding the 2006 Census and who lived with their infant at the time of data collection.
 Note: 95% CI reflects the 95% confidence interval of the estimate.
 Source: Public Health Agency of Canada. The Canadian Maternity Experiences Survey, Ottawa, 2009.

Prevalence of Alcohol Use during Pregnancy

In 2006/2007, approximately 11% of Canadian women and 9% of Ontario women reported some amount of alcohol consumption during pregnancy.¹⁴ Reported alcohol consumption during pregnancy varied by age, with older women more likely to report drinking alcohol than younger women.¹⁴

In Peel in 2013, only 1% of women reported using alcohol during pregnancy.^F

Fetal Alcohol Spectrum Disorder

The impact of alcohol during pregnancy depends on various factors such as the amount, frequency and timing of alcohol consumed.¹⁵ Alcohol consumption during pregnancy can have adverse effects on the fetus resulting in developmental abnormalities such as fetal alcohol

spectrum disorder (FASD).¹⁶ FASD may manifest in cognitive, behavioural, neurodevelopmental, physiological or physical damage that affects the individual over his or her lifetime. In Canada, FASD is estimated to affect approximately 1% of the population (approximately 300,000 people).¹⁶

Definition

Fetal alcohol spectrum disorder (FASD) is an umbrella term used to describe a range of disabilities and diagnoses associated with prenatal exposure to alcohol which include:

- fetal alcohol syndrome;
- partial fetal alcohol syndrome;
- alcohol-related neurodevelopmental disorder; and
- alcohol-related birth defects.¹⁷

Perceptions of Alcohol Use

In Peel, 79% of Peel adults reported that “no amount of alcohol (zero drinks)” is safe to drink during pregnancy. An additional 15% reported one to two drinks over a month is safe, and 2.5%* (use estimate with caution) reported one drink per day is safe.^{D3}

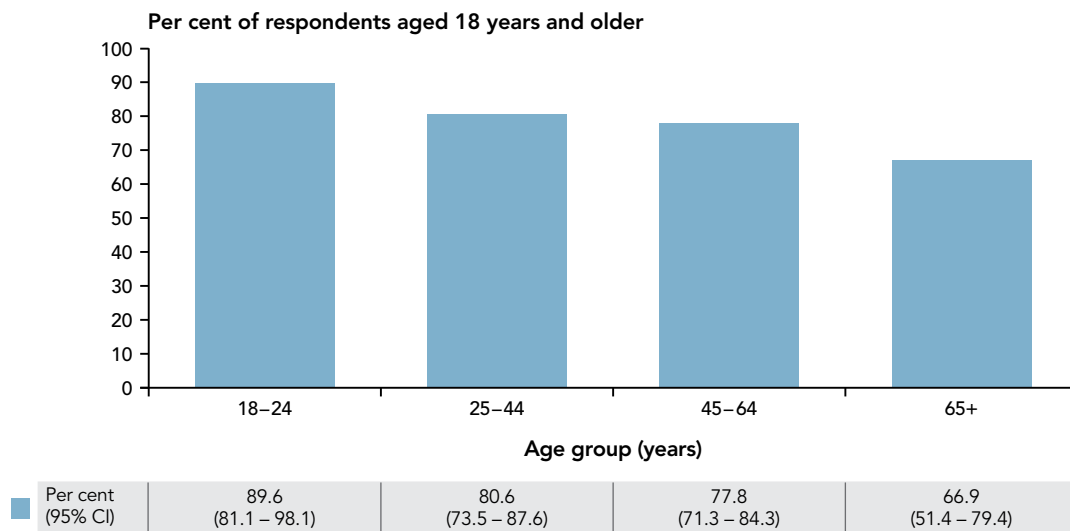
A significantly higher proportion of females (85%) reported that “no amount of alcohol (zero drinks)” is safe to drink during pregnancy compared to males (72%).^{D3} This proportion declines with increasing age group (Figure 1.19). In the reproductive age group of 25 to 44 years, 81% of respondents reported that “no amount of alcohol (zero drinks)” is safe to drink during pregnancy.

Alcohol-related Advice from Physicians

In Peel in 2007, 59% of women reported that their doctor told them not to drink any alcohol at all when pregnant; 24% were either told that between one and two drinks over the course of a month is okay or that she should reduce the amount she drinks while pregnant. The remaining 17% of women were told by their doctor that if she does not drink alcohol, she should continue to not drink alcohol.^{D2}

Figure 1.19

Belief that No Amount of Alcohol is Safe During Pregnancy by Age Group, Peel, 2011



Note: 95% CI reflects the 95% confidence interval of the estimate.
Graph portrays respondents who answered “0 number of drinks” to the question: “Which of the following do you think is a safe level of alcohol to drink during pregnancy?”
Source: Rapid Risk Factor Surveillance System, 2011, Peel Public Health.



chapter 2

THE HEALTH RISKS AND BENEFITS OF ALCOHOL USE



Key Messages

- Alcohol use has health benefits such as reducing the risk of some diseases.
- The health burden of alcohol-related diseases and injuries is high, and outweighs the benefits. Annually within Peel there are:
 - 3,476 emergency room visits that are 100% attributable to alcohol;
 - 1,155 hospitalizations attributable to alcohol;
 - 28 new cases of cancer attributable to alcohol;
 - 127 deaths attributable to alcohol; and
 - 1,493 ambulance calls attributable to alcohol.

Alcohol use can result in both positive and negative health outcomes. For example, consumption of one drink per day may provide a person with protective health benefits (e.g., reduced risk of ischemic stroke), but could increase one's risk of other types of disease (e.g., liver cirrhosis).

This section of the report will describe both the benefits and risks of disease and injuries caused by alcohol as it relates to the number of incident cases of cancer, emergency department visits, hospitalizations and deaths in Peel.



Did You Know

History of Health Effects of Alcohol

1001 – 1500 CE: A physician practising in Constantinople reported that drinking wine in excess caused inflammation of the liver.⁴

1785: A study by Benjamin Rush (originally published in a newspaper in 1784) hypothesized the health consequences of the chronic heavy alcohol use which still hold true today including: gastrointestinal problems, liver disease, infectious diseases (i.e., tuberculosis and pneumonia), diabetes, epilepsy, gout and mental health problems.

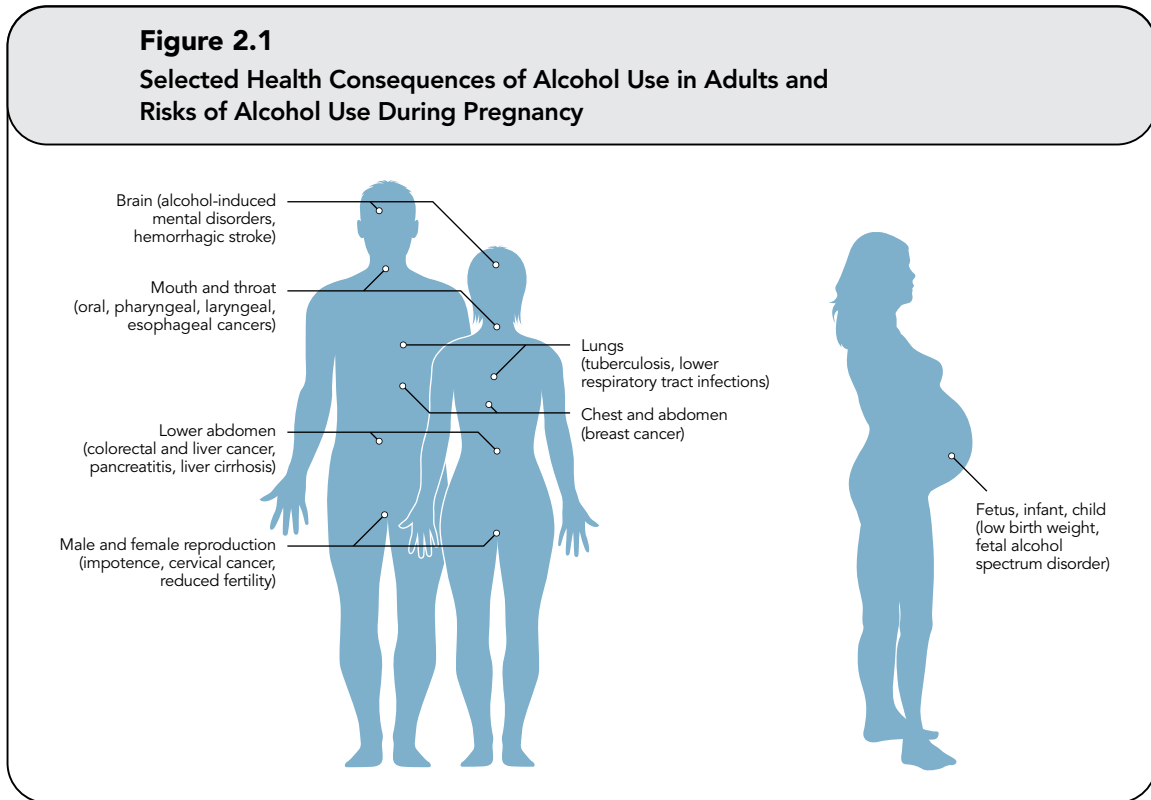
1905: Sir William Osler's *Principles and Practice of Medicine* highlighted the causal relations between drinking and different diseases, describing alcoholism as a disease, and differentiating between acute intoxication and chronic alcoholism.⁴

1926: Raymond Pearl's highly influential text, *Alcohol and Longevity*, described the J-shaped curve relationship between the average volume of alcohol consumption and all-cause mortality, as well as highlighted the importance of drinking patterns within the same average volume of drinking.⁴

1973: Fetal alcohol syndrome was identified.⁴



Figure 2.1 depicts selected alcohol-attributable health risks.



Health Conditions that are 100% Attributable to Alcohol

Table 2.1 describes the number of emergency department visits, hospitalizations and deaths that are 100% attributable to alcohol.

Definition

Health conditions that are 100% attributable to alcohol are those that are solely caused by alcohol consumption and not any other cause.

Measurement

Up to 10 diagnostic codes can be captured about a person’s visit to the emergency department or hospital or about their cause of death. Data presented in this chapter only reflects the “main problem or diagnosis” code for emergency department visits, and the “most responsible diagnosis” code for hospitalizations. For deaths, only

the “underlying cause of death” code is used. Since only the main code is used to identify alcohol-related conditions, the data may underestimate the number of emergency room visits, hospitalizations or deaths that are alcohol-related. Details about disease-specific codes can be found in Table 11.4.

In Peel, alcohol-induced mental disorders are the leading cause of alcohol-attributable emergency department visits (75% of all visits) and alcohol-attributable

hospitalizations (34%). Alcoholic liver disease is responsible for 69% of all alcohol-attributable deaths (Table 2.1).

Table 2.1

Alcohol-related Emergency Department Visits, Hospitalizations and Deaths that are 100 Per Cent Alcohol Attributable

Health outcome	Emergency department visits (average annual number 2007–2011)			Hospitalization (average annual number 2007–2011)			Mortality (average annual number 2007–2011)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
CHRONIC CONDITIONS									
Alcohol induced mental disorders	1,844	747	2,591	166	50	216	3	1	4
Alcohol dependence syndrome	312	97	409	64	24	88	3	0	3
Alcohol gastritis	47	10	57	8	1	9	0	0	0
Alcohol liver disease	196	41	237	108	37	145	24	7	31
Degeneration of nervous system due to alcohol	4	0	4	3	1	4	0	0	0
Alcoholic polyneuropathy	0	0	0	0	0	0	0	0	0
Alcoholic cardiomyopathy	2	0	2	2	0	2	1	0	1
Alcoholic myopathy	0	0	0	0	0	0	0	0	0
Alcohol-induced chronic pancreatitis	10	2	12	12	2	14	1	0	1
Alcohol-induced acute pancreatitis	38	6	44	83	16	99	1	0	1
Fetal alcohol syndrome	0	0	0	0	0	0	0	0	0
Fetus and newborn affected by maternal users of alcohol	0	0	0	0	0	0	0	0	0

Table 2.1 continues ...

Table 2.1 continued

Health outcome	Emergency department visits (average annual number 2007–2011)			Hospitalization (average annual number 2007–2011)			Mortality (average annual number 2007–2011)		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
ACUTE CONDITIONS									
Excessive blood level of alcohol	1	0	1	0	0	0	0	0	0
Unintentional poisoning by alcoholic beverages	40	31	71	13	7	20	4	0	4
Alcohol poisoning by undetermined intent	9	6	15	3	1	4	0	0	0
Attempted suicide or suicide by alcohol	12	17	29	9	9	18	0	0	0
Evidence of alcohol involvement determined by blood alcohol level	2	2	4	2	0	2	0	0	0
TOTAL	2,517	959	3,476	473	148	621	37	8	45

Notes: Codes reflect alcohol-related conditions that are 100% attributable to alcohol.
 Sources: National Ambulatory Care Reporting System 2007-2011, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.
 Hospital In-Patient Discharges Data 2007-2011, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.
 Ontario Mental Health Reporting System, 2007-2011, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.
 Ontario Mortality Database 2005-2009, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.
 Alcohol and Public Health: Alcohol-Related Disease Impact (ARDI) [Internet].:Centres for Disease Control and Prevention; [cited June 16, 2014].
 Available from https://apps.nccd.cdc.gov/DACH_ARDI/Info/ICDCodes.aspx

Alcohol Use and Mental Health

As shown in Table 2.1, alcohol-induced mental disorders account for the majority of emergency department visits and

hospitalizations for conditions that are 100% attributable to alcohol.

It is hard to disentangle from the data whether alcohol use results in mental health problems or whether mental health problems result in alcohol use. About 20% of Canadians with a mental disorder have a co-occurring substance abuse problem.¹⁸

Emergency department (ED) visits have increased since 2003 as shown in Figure 2.2 and Table 2.2. The rates of ED visits for alcohol-induced mental disorders are twice as high among males compared to females. Since there have been no International Classification of Disease (ICD-10) changes over this period, the increase is likely real.



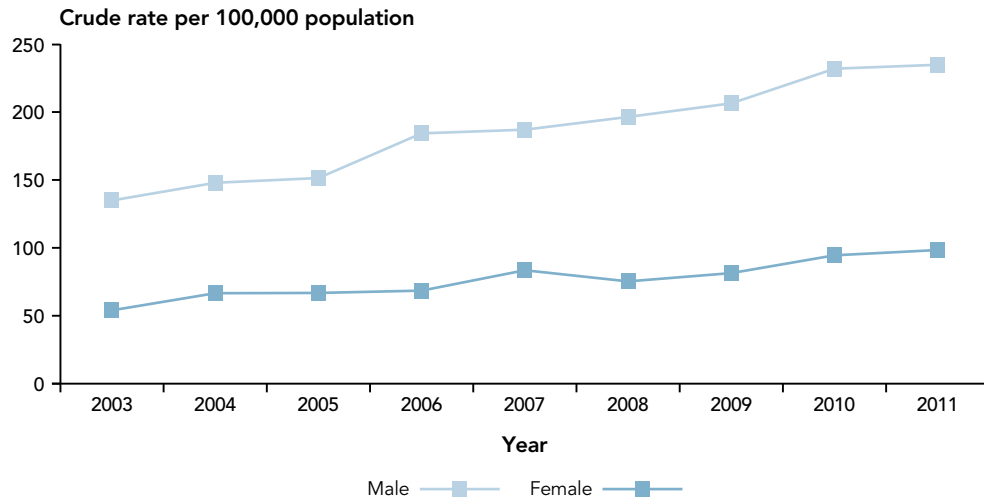
Definition

Alcohol-induced mental disorders are defined as mental and behavioural disorders due to the use of alcohol and include: alcohol intoxication, harmful alcohol use, alcohol withdrawal state with and without delirium, psychotic disorder, amnesic syndrome, residual and late-onset psychotic disorder, and other unspecified mental and behavioural disorders.

The rate of Peel hospitalizations for alcohol-induced mental disorders has remained stable over time (data not shown).

Figure 2.2

Emergency Department Visits for Alcohol-Induced Mental Disorders by Sex and Year, Peel, 2003–2012



Sources: National Ambulatory Care Reporting System 2003-2011, Intellihealth Ontario, Ministry of Health and Long-Term Care. Population Estimates 2003-2011, Intellihealth Ontario, Ministry of Health and Long-Term Care.

Table 2.2

Emergency Department Visits for Alcohol-Induced Mental Disorders by Sex, Peel, 2003 – 2011

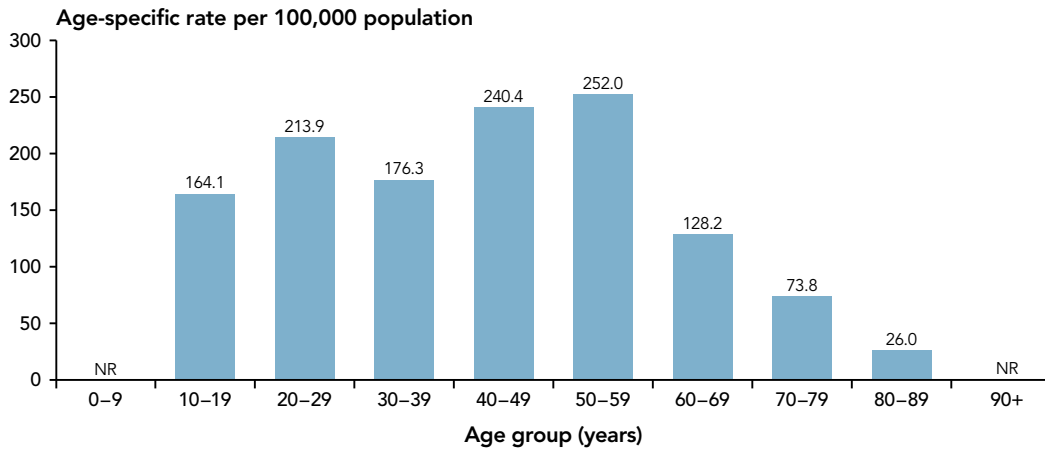
Year	Male		Female		Total	
	Number	Crude rate per 100,000	Number	Crude rate per 100,000	Number	Crude rate per 100,000
2003	747	134.9	300	54.0	1,047	94.4
2004	844	147.9	382	66.6	1,226	107.1
2005	890	151.4	395	66.8	1,285	108.9
2006	1,114	184.3	417	68.5	1,531	126.2
2007	1,163	187.0	524	83.5	1,687	135.0
2008	1,252	196.4	485	75.3	1,737	135.5
2009	1,342	206.4	536	81.4	1,878	143.5
2010	1,541	231.9	637	94.5	2,178	162.7
2011	1,591	234.8	677	98.4	2,268	166.1

Sources: National Ambulatory Care Reporting System 2003-2011, Intellihealth Ontario, Ministry of Health and Long-Term Care. Population Estimates 2003-2011, Intellihealth Ontario, Ministry of Health and Long-Term Care.

The highest rates of emergency department visits from alcohol-induced mental disorders are seen in those between the ages of 40 and 59 years (Figure 2.3).

Figure 2.3

Emergency Department Visits for Alcohol-Induced Mental Disorders by Age Group, Peel, 2011



NR - Not releasable due to small numbers.

Sources: National Ambulatory Care Reporting System 2011, Intellihealth Ontario, Ministry of Health and Long-Term Care. Population Estimates 2011, Intellihealth Ontario, Ministry of Health and Long-Term Care.



Alcohol-related Diseases, Injuries and Deaths that are Averted and Partially Attributable to Alcohol

To determine the number of diseases, injuries and deaths that are attributable to alcohol, we have used the following:

- Relative risks for diseases that are partially attributable to alcohol use (Table 2.3) and alcohol-attributable fractions for injuries partially attributable to alcohol (Table 2.4). It should be noted that while there are other diseases that have been attributed to alcohol use (e.g., esophageal varices, cholelithiasis, spontaneous abortion, prematurity, intra-uterine growth restriction, and psoriasis), the relative risks for these conditions were not available by number of drinks per day and are therefore not presented in the results.
- The Peel percentage of daily alcohol consumption by males and females (Table 2.5).
- The number of incident cases of cancer, hospitalizations and deaths for the diseases and injuries described in Tables 2.3 and 2.4.



Definition

Relative risk (RR) is defined as the proportional difference in disease rates between exposed and non-exposed persons. The relative risk tells us how much more likely people with a specific exposure (e.g., excessive alcohol use) are of developing a disease (e.g., cirrhosis of the liver) compared to people without the exposure (e.g., non-drinkers).

- If $RR=1$, the risk in exposed persons equals the risk in non-exposed persons.
- If $RR>1$, the risk in exposed persons is greater than the risk in non-exposed persons.
- If $RR<1$, the risk in exposed persons is less than the risk in non-exposed persons.

Some of the relative risks in Table 2.3 fall below one, which means there is a protective effect of using alcohol. It should be noted however, that most protective effects are at low levels of alcohol consumption.

Table 2.3

Relative Risk for Diseases by Alcohol Consumption Level and Sex

Disease	Relative risk by number of drinks per day									
	1		2		3–4		5–6		>6	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
CHRONIC CONDITIONS										
Tuberculosis*	1.00	1.00	1.00	1.00	2.94	2.94	2.94	2.94	2.94	2.94
Lower respiratory infections‡	1.07	1.07	1.14	1.14	1.25	1.25	1.43	1.43	1.79	1.79
CARDIOVASCULAR DISEASES										
Ischemic heart disease*	0.81	0.81	0.81	0.81	0.86	0.86	0.98	0.98	1.31	1.31
Conduction disorders and other dysrhythmias‡	1.08	1.08	1.17	1.17	1.32	1.32	1.54	1.54	2.02	2.02
Hemorrhagic stroke (morbidity)	1.11	0.71	1.23	0.86	1.44	1.18	1.78	1.78	2.56	3.49
Hemorrhagic stroke (mortality)	1.10	1.22	1.21	1.49	1.39	2.01	1.68	2.99	2.33	6.02
Ischemic stroke (morbidity)	0.87	0.82	0.94	0.87	1.07	1.01	1.25	1.31	1.63	2.21
Ischemic stroke (mortality)	0.87	0.66	0.95	0.75	1.08	1.05	1.29	1.86	1.70	5.97
Hypertension†	1.13	0.99	1.28	1.47	1.54	2.61	1.97	5.17	3.03	15.14
GASTROINTESTINAL DISEASES										
Pancreatitis*	1.03	1.03	1.12	1.12	1.41	1.41	2.33	2.33	9.51	9.51
Liver cirrhosis (morbidity)	1.26	2.39	1.59	3.42	2.22	5.05	3.54	7.66	7.91	13.51
Liver cirrhosis (mortality)	1.47	3.34	2.15	5.48	3.76	9.38	8.12	16.71	30.69	36.61

Table 2.3 continues ...

Table 2.3 continued

Disease	Relative risk by number of drinks per day									
	1		2		3–4		5–6		>6	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
DIGESTIVE SYSTEM DISEASES										
Lip and oropharyngeal cancer*	1.42	1.42	1.96	1.96	2.97	2.97	4.68	4.68	7.97	7.97
Esophageal cancer*	1.20	1.20	1.43	1.43	1.87	1.87	2.64	2.64	4.67	4.67
Colon cancer*	1.03	1.03	1.05	1.05	1.09	1.09	1.15	1.15	1.26	1.26
Rectum cancer*	1.05	1.05	1.10	1.10	1.18	1.18	1.30	1.30	1.53	1.53
Liver cancer*	1.10	1.10	1.21	1.21	1.38	1.38	1.60	1.60	1.99	1.99
Laryngeal cancer*	1.21	1.21	1.47	1.47	1.95	1.95	2.81	2.81	4.99	4.99
OTHER										
Breast cancer*	1.13	1.13	1.27	1.27	1.52	1.52	1.93	1.93	2.93	2.93
Epilepsy*	1.19	1.19	1.41	1.41	1.81	1.81	2.52	2.52	4.53	4.53
Diabetes mellitus†	0.88	0.64	0.88	0.60	0.94	0.96	1.11	8.39	1.72	16.60
Low birth weight‡	1.05	1.05	1.29	1.29	1.84	1.84	3.07	3.07	7.85	7.85

* RR associated with the outcome of mortality.

‡ Unknown if RR outcome associated with morbidity or mortality.

† RR associated with the outcome of morbidity.

RR outcomes that are specific to mortality or morbidity have been used interchangeably.

Note: The relative risks described reflect those that were assessed for the creation of the new Canadian low-risk drinking guidelines. It should be noted that while there are other diseases that have been attributed to alcohol use (e.g., esophageal varices, cholelithiasis, spontaneous abortion, prematurity, intra-uterine growth restriction, and psoriasis), the relative risks for these conditions were not available by number of drinks per day and are therefore not presented in the results.

Source: Rehm, J; Kekoe, T; Taylor, B; Patra J. Evidence Base for the Development of Canadian Drinking Guidelines. Toronto, Ontario: Centre for Addiction and Mental Health; September 2009.

We can interpret the meaning of the relative risk in Table 2.3 using liver cirrhosis as an example. The relative risk for liver cirrhosis is 36.61 for females who drink more than six drinks per day. This means that females who drink more than six drinks per day are about 36 times more likely to die from liver cirrhosis than those who have never been drinkers.

The relative risk data in Table 2.3 are used along with the per cent of daily alcohol consumption to calculate the number of incident cases of cancer, hospitalizations or deaths that are attributable to alcohol. The result of this calculation is called the population-attributable fraction.



Definition

The **population-attributable fraction (PAF)** describes the proportion of all cases of disease or death that are attributable to a particular exposure (e.g., excessive alcohol use). It is a way of describing the proportion of the disease or death that could be prevented if the exposure (e.g., excessive alcohol use) was removed. Since this report is about alcohol, we use the term **alcohol-attributable fraction (AAF)** to describe the proportion of disease or death that could be prevented by removing exposure to alcohol.

Some of the relative risk numbers used to calculate the PAFs are specific to mortality only and some to morbidity only. In these instances, the relative risk has been used interchangeably, meaning we have used a mortality relative risk to estimate morbidity.

Table 2.4 describes the alcohol-attributable fractions (AAFs) for injuries related to alcohol. A caveat to using these AAFs for Peel calculations is that they have been derived from other Canadian or Australian studies using the drinking patterns from those contexts. As a result, the calculations that use the Canadian or Australian AAFs may not be the most accurate representation of alcohol-related injury outcomes for Peel.

We can interpret the meaning of the AAF in Table 2.4 using pedestrian injuries as an example. The AAF for pedestrian injuries for males is 40%. This means that 40% of all pedestrian injuries among males are caused by alcohol.

Some of the AAF percentages presented in Table 2.4 are for mortality and some are for hospitalization. The AAF percentages used to calculate the number of alcohol-associated hospitalizations or deaths related to injuries have been used interchangeably, meaning that in some instances we have used a morbidity AAF to calculate mortality.



Table 2.4
Alcohol-Attributable Fractions Related to Injury by Sex

Diseases	Male alcohol-attributable fraction per cent	Female alcohol-attributable fraction per cent
Motor vehicle traffic accidents (hospital)	24	11
Motor vehicle traffic accidents (death)	33	11
Pedestrian injuries† (death)	40	17
Bicycle accident injuries	20	20
Water transport accident injuries	20	20
Accidental fall injuries (<65 years old)	22	14
Accidental fall injuries (65+ years old)	12	4
Arson injuries	44	44
Accidental excessive cold	25	25
Accidental drowning	34	34
Accidental aspiration	25	25
Striking against/struck by objects/caught in/between objects	7	7
Occupational and machine injuries	7	7
Accidental firearm injuries	25	25
Suicide, self-inflicted injuries	32	29
Victim fight, brawl, rape; victim assault with firearms; victim assault with cutting instrument; victim assault other	47	47

Rehm J, Room R, Monteiro M, Gmel G, Graham K, Rehn N, et al. Alcohol use. In: Ezzati M, Lopez A, Rodgers A, Murray C, editors. Comparative Quantification of Health Risks. Global and Regional Burden of Disease Attributable to Selected Major Risk Factors. Volume 1. Geneva: World Health Organization; 2004. p. 959-1108.

? Did You Know

Women are typically smaller than men and have higher amounts of body fat, smaller body water volumes and lower rates of first-pass alcohol metabolism.¹⁹ These sex differences may contribute to the increased vulnerability women have to the adverse health effects from alcohol.¹⁹ For example, women are more likely than men to develop liver cirrhosis at similar levels of alcohol consumption.²⁰



In Peel, the daily amount of alcohol consumed by males and females is shown in Table 2.5.

Table 2.5

Per cent and Average Number of Drinks Consumed Daily† by Number of Daily Drinks and Sex, Peel, 2003, 2005, 2007/2008, 2009/2010, 2011/2012 Combined

Number of drinks	Male		Female		Total	
	Per cent	Average annual number	Per cent	Average annual number	Per cent	Average annual number
0	71.4	361,300	86.9	456,100	79.3	817,500
1	17.9	90,800	10.4	54,500	14.1	145,300
2	6.6	33,600	2.0	10,300	4.3	43,900
3–4	3.2	16,300	0.7*	3,500*	1.9	19,800
5–6	0.5*	2,800*	NR	NR	0.3*	3,000*
>6	0.3*	1,400*	NR	NR	0.1*	1,400*

† Reflects population aged 12 years and older.

* Use estimate with caution.

NR – Not releasable due to small numbers.

Source: Canadian Community Health Survey 2003, 2005, 2007/2008, 2009/2010, 2011/2012, Share File, Statistics Canada, Ontario Ministry of Health and Long-Term Care.



Definition

Number of Drinks by Alcohol Content

The number of daily drinks is defined as:

- One drink per day (13.6g of alcohol)
- Two drinks per day (27.2g of alcohol)
- Three to four drinks per day (average of 3.5 drinks; average of 47.6 g of alcohol)
- Five to six drinks per day (average of 5.5 drinks; average of 74.8 g of alcohol)
- More than six drinks per day (average of nine drinks; average of 122.4 g of alcohol).

For comparison a 750 litre bottle of wine contains about 70g of pure alcohol.

The number of incident cases of cancer, and hospitalizations and deaths for alcohol-related disease or injury, in the following tables are an estimate of the contribution of alcohol use to these conditions. These estimates are based on several years of data. The years used to calculate the average annual number vary depending on the data source. The information about what years were included in the calculation can be found in the footnotes underneath each table.

Additional details about the methods used to calculate the incident cases of cancer, hospitalizations and deaths for alcohol-related disease and injury can be found in Chapter 11 – Data Methods.

Incident Cases of Cancer Attributable to Alcohol

Table 2.6 shows the number of incident cases of cancer attributable to alcohol use at the current level of drinking (Table 2.5) in Peel on an annual basis.

In reviewing these tables, be aware of the following caveats:

- It is possible that one person could have had multiple cases of cancer at one time. The data in these tables have not been adjusted to reflect this.
- The calculations do not account for the synergistic effects of other exposures such as smoking and alcohol use.



Definition

An **incident case** is a newly diagnosed case of a disease within a specified time period. For example, an incident case of cancer would represent a case of cancer that has been diagnosed in a particular calendar year.

What does this mean?

There are approximately 28 new cases of cancer diagnosed every year (an average of two per month) that are attributable to alcohol use in Peel (Table 2.6).

Table 2.6

Average Annual Incident Cases of Cancer Attributable to Alcohol by Sex, Peel, 2005–2009

Diseases	Male			Female			Total		
	AAF per cent	Number of incident cases	Number of incident cases attributable to alcohol	AAF per cent	Number of incident cases	Number of incident cases attributable to alcohol	AAF per cent	Number of incident cases	Number of incident cases attributable to alcohol
CANCER									
Lip and oropharyngeal	19.3	9	2	7.1	3	0	16.2	12	2
Esophageal	9.9	25	2	3.4	9	0	8.2	34	2
Liver	4.7	46	2	1.7	13	0	4.0	59	2
Laryngeal	10.6	21	2	3.7	< 5	0	9.7	24	2
Breast	NA	NA	NA	2.2	632	14	2.2	632	14
Colon	1.2	180	2	0.5	167	1	0.8	347	3
Rectum	2.3	93	2	0.8	60	1	1.7	153	3
TOTAL		374	12		887	16		1,261	28

AAF=Alcohol-attributable fraction.

NA = Not applicable.

Notes: Data about other incident cases of disease are not available.

Number of incident cases reflects the average annual number of cases for the years 2005-2009 for those aged 15 years and older.

Sources:

Cancer Incidence: Cancer Care Ontario - SEER*Stat - OCRIS (May 12) Oct 2012 release 2005-2009.

Prevalence of daily drinking: Canadian Community Health Survey 2003, 2005, 2007/2008, 2009/2010, 2011/2012 combined, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Relative risk for diseases attributable to alcohol: Source: Rehm, J; Kekoe, T; Taylor, B; Patra J. Evidence Base for the Development of Canadian Drinking Guidelines. Toronto, Ontario: Centre for Addiction and Mental Health; September 2009.

Chronic Disease Hospitalizations Averted due to Alcohol



Definition

A **hospitalization** is defined as a discharge from hospital due to death, discharge home or transfer to another facility.

Table 2.7 shows the number of hospitalizations due to disease that are averted due to alcohol at the current level of drinking in Peel on an annual basis (as shown in Table 2.5). Tables that describe the number of hospitalizations

averted mean that alcohol use would have had a beneficial effect and would have potentially prevented the person from being hospitalized for that condition.

In reviewing these tables be aware of the following caveats:

- The calculations do not account for the synergistic effects of other exposures such as smoking and alcohol use.
- It is possible that one person could have had several admissions for the same alcohol-related disease. The data have not been adjusted to account for this and must be interpreted as admissions rather than people.

Table 2.7

Average Annual Number of Disease-Related Hospitalizations Averted due to Alcohol Use by Sex, Peel, 2007–2011

Diseases	Male			Female			Total		
	AAF per cent	Number of hospitalizations	Number of hospitalizations averted	AAF per cent	Number of hospitalizations	Number of hospitalizations averted	AAF per cent	Number of hospitalizations	Number of hospitalizations averted
CARDIOVASCULAR DISEASES									
Ischemic heart disease	-5.4	2,311	125	-2.5	959	24	-4.6	3,270	149
Ischemic stroke	-2.3	491	12	-2.2	427	9	-2.3	918	21
OTHER									
Diabetes mellitus	-3.1	380	12	-4.8	291	14	-3.8	671	26
TOTAL		3,182	149		1,677	47		4,859	196

AAF=Alcohol attributable fraction.

Notes:

Number of hospitalizations reflects the average annual number of cases for the years 2007-2011 for those aged 15 years and older.

Sources: Hospital In-Patient Discharge Data 2007-2011, Intellihealth Ontario, Ministry of Health and Long-Term Care.

Prevalence of daily drinking: Canadian Community Health Survey 2003, 2005, 2007/2008, 2009/2010, 2011/2012 combined, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Relative risk for diseases attributable to alcohol: Source: Rehm, J; Kekoe, T; Taylor, B; Patra J. Evidence Base for the Development of Canadian Drinking Guidelines. Toronto, Ontario: Centre for Addiction and Mental Health; September 2009.

What does this mean?

For some health conditions (e.g., ischemic heart disease, ischemic stroke, diabetes), there is a protective effect of low levels of alcohol consumption. The alcohol-attributable fraction calculated in this scenario describes the number of hospitalizations averted at the current level of drinking.

We can interpret Table 2.7 to mean that approximately 196 hospitalizations are averted each year related to ischemic heart disease, ischemic stroke and diabetes at the current level of drinking in Peel. The majority of averted hospitalizations (76%) are related to ischemic heart disease.

Chronic Disease Hospitalizations Attributable to Alcohol

By contrast, Tables 2.8 and 2.9 show the number of hospitalizations due to disease or injury that are attributable to alcohol at the current level of drinking in Peel on an annual basis (Table 2.5).

In reviewing these tables, be aware of the following caveats:

- The calculations do not account for the synergistic effects of other exposures such as smoking and alcohol use.
- It is possible that one person could have had several admissions for the same alcohol-related disease. The data have not been adjusted to account for this and must be interpreted as admissions rather than people.

Table 2.8

Average Annual Number of Disease-Related Hospitalizations Attributable to Alcohol Use by Sex, Peel, 2007–2011

Diseases	Male			Female			Total		
	AAF per cent	Number of hospitalizations	Number of hospitalizations attributable to alcohol	AAF per cent	Number of hospitalizations	Number of hospitalizations attributable to alcohol	AAF per cent	Number of hospitalizations	Number of hospitalizations attributable to alcohol
RESPIRATORY DISEASES									
Tuberculosis	7.1	19	1	1.3	22	0	4.0	41	1
Lower respiratory infections	3.2	597	19	1.2	635	7	2.2	1,232	26
Respiratory total		616	20		657	7		1,273	27
CARDIOVASCULAR DISEASES									
Conduction disorders and other dysrhythmias	3.9	441	17	1.6	429	7	2.8	870	24
Hemorrhagic stroke	5.4	178	10	-3.3	136	-5	1.6	314	5
Hypertension	6.5	93	6	1.9	95	2	4.2	188	8
Cardiovascular total		712	33		660	4		1,372	37

Table 2.8 continues ...

Table 2.8 continued

Diseases	Male			Female			Total		
	AAF per cent	Number of hospitalizations	Number of hospitalizations attributable to alcohol	AAF per cent	Number of hospitalizations	Number of hospitalizations attributable to alcohol	AAF per cent	Number of hospitalizations	Number of hospitalizations attributable to alcohol
GASTROINTESTINAL DISEASES									
Pancreatitis	5.5	209	11	0.8	231	2	3.0	440	13
Liver cirrhosis	13.6	30	4	18.1	27	5	13.6	57	9
Gastro-intestinal total		239	15		258	7		497	22
DIGESTIVE SYSTEM DISEASES									
Lip and oropharyngeal cancer	19.4	53	10	7.1	30	2	14.9	83	12
Esophageal cancer	9.9	32	3	3.4	12	0	8.2	44	3
Colon cancer	1.2	177	2	0.5	159	1	0.9	336	3
Rectum cancer	2.3	122	3	0.8	66	1	1.8	188	4
Liver cancer	4.7	51	2	1.7	20	0	3.8	71	2
Laryngeal cancer	10.4	21	2	3.7	5	0	9.3	26	2
Digestive total		456	22		292	3		748	26
OTHER									
Breast cancer	NA	NA	NA	2.2	194	4	2.2	194	4
Epilepsy	9.4	86	8	3.3	76	3	6.5	162	11
Low birth weight	NA	NA	NA	1.7	1,744	29	1.7	1,744	29
Other total		86	8		2,014	36		2,100	44
TOTAL		2,109	98		3,881	58		5,990	156

AAF=Alcohol attributable fraction.

Notes:

Number of hospitalizations reflects the average annual number of cases for the years 2007-2011 for those aged 15 years and older with the exception of low birth weight, which reflects all ages.

Sources: Hospital In-Patient Discharge Data 2007-2011, Intellihealth Ontario, Ministry of Health and Long-Term Care.

Prevalence of daily drinking: Canadian Community Health Survey 2003, 2005, 2007/2008, 2009/2010, 2011/2012 combined, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Relative risk for diseases attributable to alcohol: Source: Rehm, J; Kekoe, T; Taylor, B; Patra J. Evidence Base for the Development of Canadian Drinking Guidelines. Toronto, Ontario: Centre for Addiction and Mental Health; September 2009.

Table 2.9**Average Annual Injury-Related Hospitalizations due to Alcohol Use by Sex, Peel, 2007–2011**

	Male			Female			Total		
	AAF per cent	Number of hospitalizations	Number of hospitalizations attributable to alcohol	AAF per cent	Number of hospitalizations	Number of hospitalizations attributable to alcohol	AAF per cent	Number of hospitalizations	Number of hospitalizations attributable to alcohol
Motor vehicle traffic accidents	24	167	40	11	110	12	19	277	52
Bicycle accident	20	51	10	20	16	3	20	67	13
Water transport accident	20	3	1	20	2	0	20	5	1
Accidental fall (<65 years)	22	509	112	14	374	52	20	883	164
Accidental fall (65+ years)	12	417	50	4	836	33	7	1,253	83
Arson	44	0	0	44	0	0	44	0	0
Accidental excessive cold	25	3	1	25	1	0	25	4	1
Accidental drowning	34	5	2	34	1	0	34	6	2
Accidental aspiration	25	15	4	25	10	3	25	25	7
Striking against/struck by objects/caught in/between objects	7	158	11	7	47	3	7	205	14
Occupational and machine injuries	7	46	3	7	7	1	7	53	4
Accidental firearm	25	5	1	25	0	0	25	5	1
Attempted suicide, self-inflicted	32	132	42	25	213	62	30	345	104
Assault §	47	106	50	47	12	6	47	118	56
TOTAL		1,617	327		1,629	175		3,246	502

AAF=Alcohol attributable fraction.

§ Defined as: victim of a fight, brawl, rape, victim of assault with firearms; victim of assault with cutting instrument; victim of assault other.

Notes: Number of hospitalizations reflects the average annual number of cases for the years 2007-2011 for all ages.

Sources: Hospital In-Patient Discharge Data 2007-2011, Intellihealth Ontario, Ministry of Health and Long-Term Care.

Prevalence of daily drinking: Canadian Community Health Survey 2003, 2005, 2007/2008, 2009/2010, 2011/2012 combined, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Rehm J, Room R, Monteiro M, Gmel G, Graham K, Rehn N, et al. Alcohol use. In: Ezzati M, Lopez A, Rodgers A, Murray C, editors. Comparative Quantification of Health Risks. Global and Regional Burden of Disease Attributable to Selected Major Risk Factors. Volume 1. Geneva: World Health Organization; 2004. p. 959-1108.

What does this mean?

Tables 2.8 and 2.9 show that there are 156 disease-related and 502 injury-related hospitalizations that are attributed to the current levels of drinking in Peel. Among the 502 alcohol-attributable injury-related hospitalizations, 30% are a result of accidental falls and 21% to suicide attempts.



Chronic Disease and Injury Deaths Averted due to Alcohol

Table 2.10 shows the number of disease-related deaths averted at the current levels of alcohol consumption in Peel (Table 2.5).

Table 2.10
Average Annual Number of Disease-Related Deaths Averted due to Alcohol Use by Sex, Peel, 2005–2009

Diseases	Male			Female			Total		
	AAF per cent	Number of deaths	Number of deaths averted	AAF per cent	Number of deaths	Number of deaths averted	AAF per cent	Number of deaths	Number of deaths averted
Ischemic heart disease	-5.4	402	22	-2.5	284	7	-4.2	686	29
Ischemic stroke	-2.2	69	2	-4.6	95	4	-3.6	165	6
Diabetes mellitus	-3.1	22	1	-4.8	22	1	-3.9	44	2
TOTAL		493	25		401	12		894	37

AAF=Alcohol attributable fraction.

Notes:

Number of deaths reflects the average annual number of cases for the years 2005-2009 for those 15 years and older.

Sources:

Ontario Mortality Database 2005-2009, Intellihealth Ontario, Ministry of Health and Long-Term Care.

Prevalence of daily drinking: Canadian Community Health Survey 2003, 2005, 2007/2008, 2009/2010, 2011/2012 combined, Statistics Canada,

Share File, Ontario Ministry of Health and Long-Term Care.

Relative risk for diseases attributable to alcohol: Rehm, J; Kekoe, T; Taylor, B; Patra J. Evidence Base for the Development of Canadian Drinking Guidelines. Toronto, Ontario: Centre for Addiction and Mental Health; September 2009.

What does this mean?

For some health conditions (e.g., ischemic heart disease, ischemic stroke, diabetes), there is a protective effect of low levels of alcohol consumption. The population-attributable fraction calculated in this scenario describes the number of deaths averted due to the current level of alcohol use in Peel.

We can interpret this to mean that approximately 37 deaths are averted each year due to these disease outcomes by the current level of drinking in Peel. Most averted deaths are associated with ischemic heart disease.

Chronic Disease and Injury Deaths Attributable to Alcohol

Tables 2.11 and 2.12 show the number of disease-related deaths attributable

to alcohol at the current levels of alcohol consumption in Peel (Table 2.5).

Table 2.11

Average Annual Number of Disease-Related Deaths Attributable to Alcohol Use by Sex, Peel, 2005–2009

Diseases	Male			Female			Total		
	AAF per cent	Number deaths	Number of deaths attributable to alcohol	AAF per cent	Number deaths	Number of deaths attributable to alcohol	AAF per cent	Number deaths	Number of deaths attributable to alcohol
RESPIRATORY DISEASES									
Tuberculosis	7.1	3	0	1.3	2	0	4.7	5	0
Lower respiratory infections	3.2	56	2	1.2	68	1	2.1	124	3
Respiratory total		59	2		70	1		129	3
CARDIOVASCULAR DISEASES									
Conduction disorders and other dysrhythmias	3.9	14	1	1.6	21	0	2.5	35	1
Hemorrhagic stroke	4.8	41	2	3.8	45	2	4.3	86	4
Hypertension	6.5	19	1	1.9	25	1	3.9	44	2
Cardio-vascular total		74	4		91	3		165	7
GASTROINTESTINAL DISEASES									
Pancreatitis	5.5	3	0	0.8	4	0	3.2	7	0
Liver cirrhosis	27.1	18	5	28.1	12	3	27.1	30	8
Gastro-intestinal total		21	5		16	3		37	8
DIGESTIVE SYSTEM DISEASES									
Lip and oropharyngeal cancer	19.4	2	1	7.1	0	0	19.3	2	1
Esophageal cancer	9.9	23	2	3.4	9	0	8.2	32	2
Colon cancer	1.2	64	1	0.5	64	0	1.1	128	1
Rectum cancer	2.3	20	1	0.8	14	0	1.7	34	1
Liver cancer	4.7	32	2	1.7	9	0	4.0	41	2
Laryngeal cancer	10.6	9	1	3.7	1	0	9.8	10	1
Digestive total		150	8		97	0		247	8

Table 2.11 continues ...

Table 2.11 continued

Diseases	Male			Female			Total		
	AAF per cent	Number deaths	Number of deaths attributable to alcohol	AAF per cent	Number deaths	Number of deaths attributable to alcohol	AAF per cent	Number deaths	Number of deaths attributable to alcohol
OTHER									
Breast Cancer	NA	NA	NA	2.2	120	3	2.2	120	3
Epilepsy	9.4	2	0	3.3	2	0	5.4	4	0
Low Birth weight*	4.8	41	2	3.8	45	2	4.3	86	4
Other total		2	0		140	3		142	3
Total		306	19		414	10		720	29

AAF=Alcohol attributable fraction.

NA = Not applicable.

* Low birth weight reflects number of females delivering a low birth weight baby.

Notes:

Number of deaths reflects the average annual number of cases for the years 2005-2009.

Number of deaths reflects those aged 15 years and older with the exception of low birth weight, which reflects all ages.

Sources:

Ontario Mortality Database 2005-2009, Intellihealth Ontario, Ministry of Health and Long-Term Care.

Prevalence of daily drinking: Canadian Community Health Survey 203, 2005, 2007/2008, 2009/2010, 2011/2012 combined, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Relative risk for diseases attributable to alcohol: Rehm, J; Kekoe, T; Taylor, B; Patra J. Evidence Base for the Development of Canadian Drinking Guidelines. Toronto, Ontario: Centre for Addiction and Mental Health; September 2009.



Table 2.12
Average Annual Number of Injury-Related Deaths Attributable to Alcohol Use,
Peel, 2005–2009

	Male			Female			Total		
	AAF per cent	Number deaths	Number of deaths attributable to alcohol	AAF per cent	Number deaths	Number of deaths attributable to alcohol	AAF per cent	Number deaths	Number of deaths attributable to alcohol
Motor vehicle traffic accidents	33	28	9	11	11	1	28	39	10
Bicycle accident	20	0	0	20	0	0	20	0	0
Water transport accident	20	1	0	20	0	0	20	1	0
Accidental fall (<65 years)	22	10	2	14	3	0	20	13	2
Accidental fall (65+ years)	12	33	4	4	43	2	7	76	6
Arson	44	0	0	44	0	0	44	0	0
Accidental excessive cold	25	0	0	25	0	0	25	0	0
Accidental drowning	34	6	2	34	2	1	34	8	3
Accidental aspiration	25	3	1	25	3	1	25	6	2
Striking against/struck by objects/caught in/between objects	7	2	0	7	0	0	7	2	0
Occupational and machine injuries	7	1	0	7	0	0	7	1	0
Accidental firearm	25	0	0	25	0	0	25	0	0
Suicide, self-inflicted	32	51	16	29	22	6	30	73	22
Assault §	47	15	7	47	3	1	47	18	8
TOTAL		150	41		87	12		237	53

AAF=Alcohol-attributable fraction

§ Defined as: victim of a fight, brawl, rape; victim of assault with firearms; victim of assault with a cutting instrument; victim of assault other.

Notes:

Number of deaths reflects the average annual number of deaths for the years 2005-2009 for all ages.

Sources:

Ontario Mortality Database 2005-2009, Intellihealth Ontario, Ministry of Health and Long-Term Care.

Rehm J, Room R, Monteiro M, Gmel G, Graham K, Rehn N, et al. Alcohol use. In: Ezzati M, Lopez A, Rodgers A, Murray C, editors. Comparative Quantification of Health Risks. Global and Regional Burden of Disease Attributable to Selected Major Risk Factors. Volume 1. Geneva: World Health Organization; 2004. p. 959-1108.

What does this mean?

Tables 2.11 and 2.12 show that there are 29 disease-related deaths and 53 injury-related deaths that are attributable to alcohol at the current levels of drinking in Peel each year. Among the 29 alcohol-attributable disease-related deaths, 28% are associated with liver cirrhosis. Among the 53 alcohol-attributable injury-related deaths, 42% are due to suicide.

Overall Health Burden of Alcohol Use in Peel

Table 2.13 summarizes the total number of alcohol-related diseases or injuries in Peel for incident cases of cancer, emergency department visits, hospitalizations and deaths at the current level of drinking (as shown in Table 2.5).

- **Cancer incidence:** There are approximately 28 cases of cancer newly diagnosed each year that can be attributed to alcohol (which is less than 1% of all newly diagnosed cases of cancer).
- **Emergency department (ED) visits:** Alcohol can be attributed to 3,476 emergency department visits (which is approximately 1% of all ED visits).
- **Hospitalization:** While 196 hospitalizations have been averted due to the current level of alcohol use, 1,279 hospitalizations are attributable to alcohol use (which is approximately 2% of all hospitalizations).
- **Mortality:** While 37 deaths have been averted due to the current level of alcohol use, 127 deaths are attributable to alcohol use (which is almost 3% of all deaths).

Table 2.13

Total Number of Incident Cases of Cancer, Emergency Department Visits, Hospitalizations and Deaths due to Disease and Injury Prevented and Attributed to Alcohol Use, Peel

	Cancer Incidence	Emergency Department Visits	Hospitalization	Mortality
Chronic disease or injury averted	0	Data not available	196	37
Chronic diseases and injuries attributable to alcohol	28	3,476	1,279	127
Difference between averted and attributable*	28	3,476	1,083	90

* Difference between averted and attributable calculated as total number of attributable minus total number of averted.

Sources:

Cancer Incidence: Cancer Care Ontario - SEER*Stat - OCRIS (May 12) Oct 2012 release, 2005-2009.

National Ambulatory Care Reporting System 2007-2011, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Hospital In-Patient Discharges Data 2007-2011, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Ontario Mental Health Reporting System 2007-2011, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Ontario Mortality Database 2005-2009, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Ambulance Calls due to Alcohol Intoxication



Measurement

All details about ambulance calls are documented on the Ambulance Call Report.

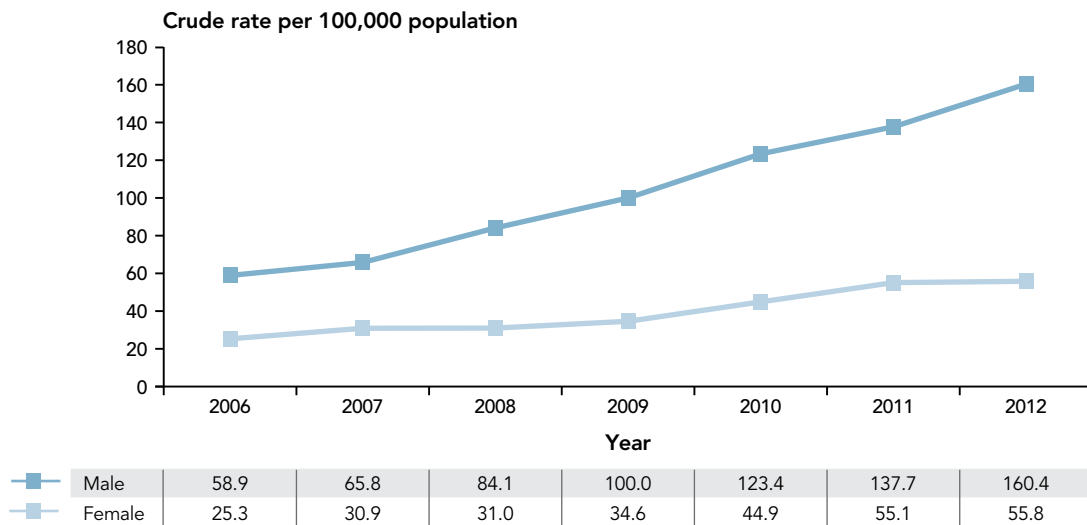
While there is a dedicated code for capturing alcohol intoxication, it is possible that some alcohol intoxication calls may be missed if the primary reason for the call is something other than alcohol intoxication.

The rate of ambulance calls related to alcohol intoxication doubled in Peel between 2006 and 2012. Males are three times more likely to be treated by paramedics for alcohol intoxication than females. In 2012, there were 1,103 calls for males and 390 for females. This accounts for 1.6% of all ambulance calls for 2012 (Figure 2.4).

The average cost per ambulance call is \$700. In 2012 there were a total of 1,493 alcohol-related ambulance calls for an estimated cost of \$1,045,100.

Figure 2.4

Rate of Ambulance Calls due to Alcohol Intoxication by Sex and Year, Peel, 2006–2012



Sources: Peel Regional Paramedic Services, 2006-2012, Peel Ambulance Call Report data.
Population estimates 2006-2011, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.
Population projections 2012, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

The ambulance call rates for alcohol intoxication increased significantly between 2006 and 2012 for every age group and are highest among those aged 50 to 59 and 19 to 29 years of age (Table 2.14 and Figure 2.5).

Table 2.14

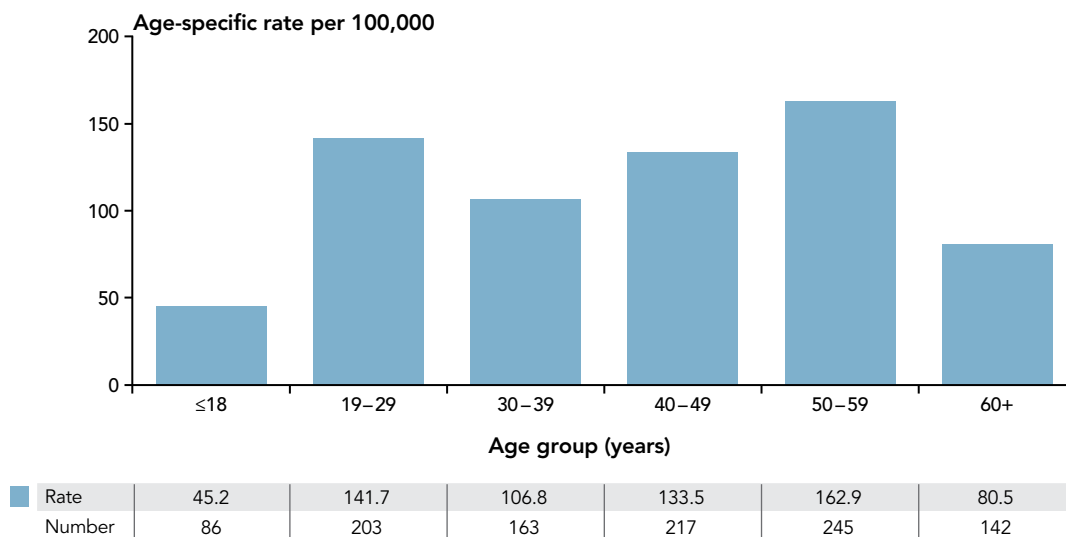
Rate of Alcohol Intoxication* Ambulance Calls by Sex, Age Group and Year, Peel, 2006–2012

		2006 rate per 100,000 population	2007 rate per 100,000 population	2008 rate per 100,000 population	2009 rate per 100,000 population	2010 rate per 100,000 population	2011 rate per 100,000 population	2012 rate per 100,000 population
Sex	Male	58.9	65.8	84.1	100.0	123.4	137.7	160.4
	Female	25.3	30.9	31.0	34.6	44.9	55.1	55.8
Age group (years)	≤18	34.8	36.0	39.1	43.7	40.9	44.5	45.2
	19–29	57.8	63.2	65.3	92.7	102.8	123.8	141.7
	30–39	35.8	45.7	47.1	52.2	67.9	84.6	106.8
	40–49	52.1	63.0	88.0	89.1	111.0	117.7	133.5
	50–59	44.1	56.2	76.7	90.4	129.5	144.5	162.9
	60+	16.9	24.9	34.2	45.1	64.9	70.2	80.5
Total		42.4	49.0	58.1	68.2	84.8	96.4	109.4

*As defined by the paramedic identified Primary Problem Code, describing the underlying problem or most probable cause of the patient's presentation.
Sources: Peel Regional Paramedic Services, 2006-2012 Peel Ambulance Call Report data.
Population estimates 2006-2011 and Population projections 2012, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Figure 2.5

Rate of Ambulance Calls due to Alcohol Intoxication by Age Group, Peel, 2012



Sources: Peel Regional Paramedic Services, 2012 Peel Ambulance Call Report data.
Population projections 2012, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.



chapter 3

PERSONAL AND COMMUNITY CONSEQUENCES OF ALCOHOL USE



Key Messages

Personal Impacts of Alcohol Use

- About one in 10 Ontarians (14%) engage in hazardous or harmful drinking or have symptoms of alcohol dependence and about 6% of Canadians experience harms due to their own drinking.

Alcohol Impact on Family, Friends and at Work

- One-third of Canadians (33%) report harm from someone else's drinking.
- In Mississauga and Brampton the rate of police calls for family or domestic disputes that include liquor offences has declined over time.

Alcohol Impact on the Community

- Peel Regional Police respond to many calls for alcohol-related assaults and for liquor offences. The

number and rate of these types of calls has increased over time.

Drinking and Driving

- About 5% of residents in Peel drink and drive.
- The number of charges in Mississauga and Brampton related to blood alcohol concentration suspensions and impaired driving have increased over time.
- The rate of motor vehicle collisions due to alcohol is almost five times higher among males compared to females.

In Peel, there are many data gaps related to the personal impacts of alcohol use; the impact of alcohol on family, friends and at work; and the impact of alcohol in the community.

Excessive consumption of alcohol can negatively affect a person's physical and psychological health, impair a person's judgement resulting in risky behaviours, affect the lives of those who live and work with the drinker, and have an impact on the community.

This chapter will describe the personal consequences of drinking, the impact of alcohol on family relationships, friendships, and work, and the impact at a community level.



Personal Impacts of Alcohol Use



Highlights

- In Ontario in 2011, 14% of the population scored 8+ on the AUDIT tool, meaning they engage in hazardous or harmful drinking or have symptoms of alcohol dependence. This is higher among males compared to females. Data are not available for Peel.
- In Canada in 2010, 6% of the total population reported experiencing harms due to alcohol in the past year. Males are more likely to report

experiencing alcohol-related harm (7.6%) compared to females (3.9%).²²

Alcohol Impact on Work

- Seven per cent of Canadians report that over their lifetime, alcohol has had an impact on their work (defined as work, studies or employment opportunities).²¹

There are no available data about the personal or work-related impacts of alcohol use in Peel.

Individual alcohol-related harms can manifest itself in several areas of a drinker's life including effects on:

- physical health;
- friendships and social life;
- financial position;
- home life or marriage;
- work or school studies (e.g., employment opportunities, difficulty learning);
- legal problems; and
- housing problems.

This section will describe several measures of individual alcohol-related harm:

- alcohol dependence
- AUDIT Score
- self-reported harm due to alcohol use

The Alcohol Use Disorders Identification Test

The Alcohol Use Disorders Identification Test (AUDIT) is typically used in primary care settings to identify hazardous or harmful patterns about alcohol use and symptoms of alcohol dependence.²³ In this report, we use the term alcohol use disorder to reflect a score of 8+ on the AUDIT tool.



Measurement

The AUDIT has 10 questions that are used to determine hazardous or harmful alcohol use, or alcohol dependence symptoms. Details about the scoring of each question can be found in Appendix A.

Domain: Hazardous Alcohol Use

- How often do you have a drink containing alcohol?
- How many drinks containing alcohol do you have on a typical day when you are drinking?
- How often do you have six or more drinks on one occasion?

Domain: Dependence Symptoms

- How often during the last year have you found that you were not able to stop drinking once you had started?
- How often during the last year have you failed to do what was normally expected from you because of drinking?
- How often during the last year have you needed a drink in the morning

to get yourself going after a heavy drinking session?

Domain: Harmful Alcohol Use

- How often during the last year have you had a feeling of guilt or remorse after drinking?
- How often during the last year have you been unable to remember what happened the night before because you had been drinking?
- Have you or someone else been injured as a result of your drinking?
- Has a relative, friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?

Each question can score from zero to four. The total AUDIT score is then calculated by adding up the score from each question. An AUDIT score of 8+ is an indication of hazardous or harmful alcohol use or possibly dependence.²³

In Ontario, 18% of past year drinkers aged 18 years and older scored 8+ on the AUDIT scale indicating the potential for an alcohol use disorder. A significantly

higher proportion of males (26%) scored 8+ compared to females (10%) (Table 3.1).²⁴ There are no data available for Peel adults.

Table 3.1
Per cent of Population with an Alcohol Use Disorders Identification Text Score of 8+ by Sex*, Ontario, 2011

	Male		Female		Total	
	Per cent	(95% CI)	Per cent	(95% CI)	Per cent	(95% CI)
Total population	21.5	(18.6–24.7)	7.9	(6.3–9.8)	14.4	(12.7–16.2)
Past year drinkers [§]	25.8	(22.4–29.6)	10.0	(8.0–12.5)	17.8	(15.8–20.1)

* Reflects per cent of respondents aged 18 years and older with an AUDIT score of 8+ in the past 12 months.

§ Past year drinker is defined as drinking alcohol at least once during the 12 months before the survey.

Note: 95% CI reflects the 95% confidence interval of the estimate.

Source: Ialomiteanu, AR; Adlaf, EM; Hamilton, H; Mann, RE. CAMH Monitor eReport: Addiction and Mental Health Indicators Among Ontario Adults, 1977-2011 (CAMH Research Document Series No. 35). Toronto: Centre for Addiction and Mental Health.

The proportion of the population with an AUDIT score of 8+ is highest amongst the drinking population aged 18 to 29 years (Figure 3.1).

Figure 3.1
Per cent of Drinkers with an Alcohol Use Disorders Identification Test of 8+† by Age Group, Ontario, 2011



† Defined as one or more alcohol dependence symptoms in the past 12 months.

‡ Drank alcohol at least once during the 12 months before the survey.

* Use estimate with caution.

Note: 95% CI reflects the 95% confidence interval of the estimate.

Source: Ialomiteanu, AR; Adlaf, EM; Hamilton, H; Mann, RE. CAMH Monitor eReport: Addiction and Mental Health Indicators Among Ontario Adults, 1977-2011 (CAMH Research Document Series No. 35). Toronto: Centre for Addiction and Mental Health.

Self-Reported Harm

In Canada in 2010, 6% of the total population reported experiencing harms due to alcohol in the past year. Males are more likely to report experiencing alcohol-related harm (7.6%) compared to females (3.9%).²²

Figure 3.2 displays the proportion of Canadian male and female drinkers in 2004 reporting different types of adverse consequences as a result of their own drinking during their lifetime. Compared to females, males in Canada consistently reported a higher proportion of harms across all types of consequences. Data are not available for Peel.

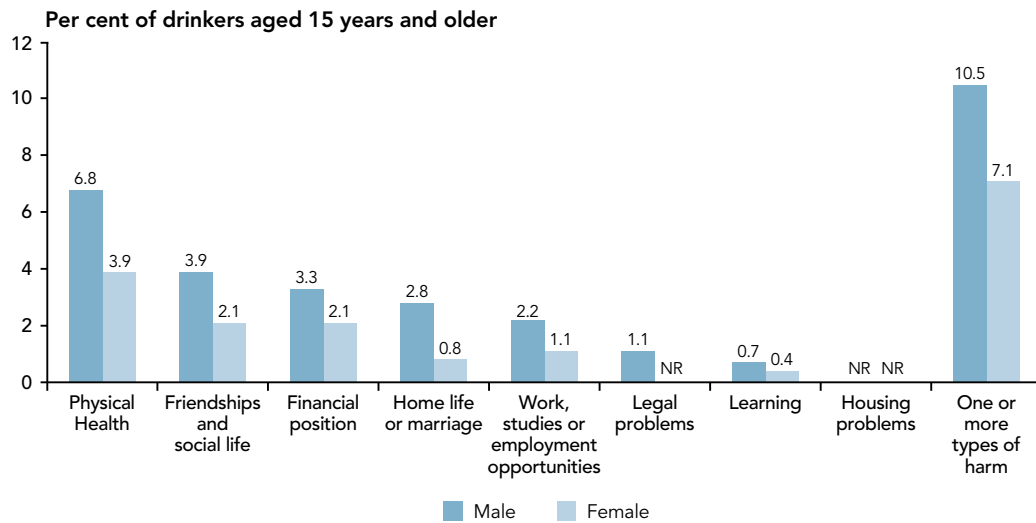
Alcohol and Work

A person who consumes too much alcohol can have lower productivity at work (e.g., absences, work-delays). Other negative social consequences of excessive drinking include work-related injuries and job loss.⁷

Seven per cent of Canadians report that over their lifetime, alcohol has had an impact on their work (defined as work, studies or employment opportunities). This is reported by a higher proportion of males (9.3%) than females (4.4%).²¹

Figure 3.2

Lifetime Harms from One’s Own Alcohol Use by Sex, Canada, 2004



NR = Not releasable due to small numbers.

Source: Health Canada and Canadian Executive Council on Addictions. Canadian Addiction Survey (CAS): Focus on Gender. 2008. Ottawa: Minister of Health Canada.

Alcohol and its Impact on Family and Friends



Highlights

- One-third of Canadians (33%) reported they have experienced one or more types of harm in the past year because of someone else's drinking. The most common type of harm reported was being insulted or humiliated (Figure 3.3). Data are not available for Peel.
- The rate of police calls related to liquor offences as a result of family or domestic dispute has declined over time in Mississauga and Brampton. The rates of police calls are higher among males and those aged 19 to 49 years (Table 3.2).

There are no other data available for Peel that describe the impact of alcohol on family, friends or work.

Social harm as a result of drinking is closely linked to the roles and responsibilities of everyday life: work, family, friendship and public image.⁷ This section will describe the impact of alcohol on:

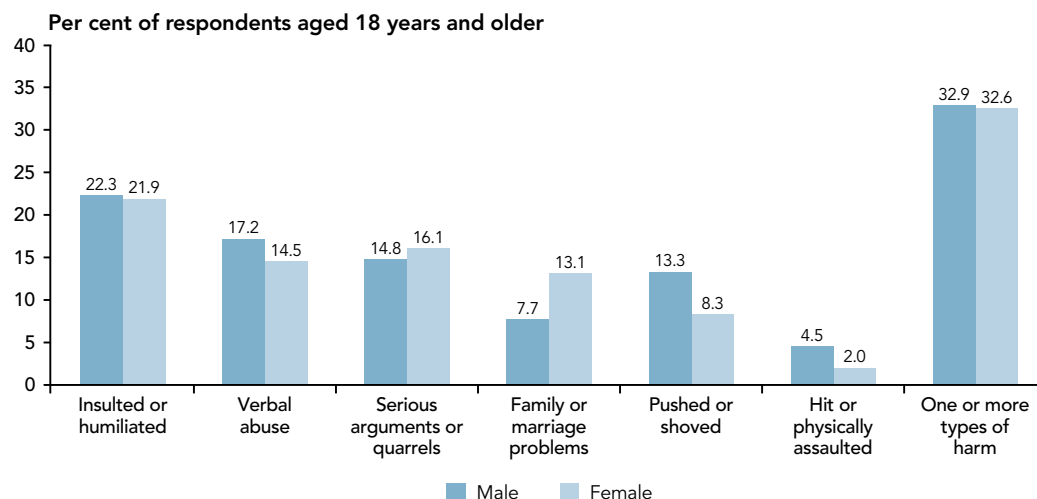
- harm resulting from the drinking of others; and
- family relationships.

Harm Resulting from the Drinking of Others

In Canada, one-third (33%) of respondents reported they have been harmed by one or more types of harm in the past year because of someone else's drinking. Being insulted or humiliated was the most common type of harm reported (Figure 3.3). Data are not available for Peel.

Figure 3.3

Past-Year Harms Resulting from the Drinking of Others by Sex, Canada, 2004



Source: Health Canada and Canadian Executive Council on Addictions. Canadian Addiction Survey (CAS): Focus on Gender. 2008. Ottawa: Minister of Health Canada.

Family and Intimate Partner Violence

Alcohol consumption, especially in excessive amounts, significantly contributes to the occurrence of intimate partner violence.²⁵



Definition

Intimate partner violence refers to any act of physical, psychological or sexual violence, or controlling behaviour within an intimate relationship.²⁵

Excessive drinking by one partner can intensify family stressors (e.g., finances, childcare) that may increase the risk of violence between partners. Children experiencing violence or threats of violence at home are more likely to have problematic drinking habits later in life.²⁵

Risk factors for alcohol-related intimate partner violence include:

- poor or fair mental health coupled with problematic alcohol use;
- heavy drinking in individuals with antisocial personality disorder; and
- relationship dissatisfaction.

The health effects of victims of alcohol-related violence include fatal and non-fatal physical injuries, emotional problems leading to depression and suicide, and the use of alcohol and other drugs to cope with the experience of violence.²⁵ Victims often have difficult relationships with family, friends and future partners. In addition, alcohol-associated violence can affect the victim's ability to work or attend school.²⁵

Liquor Offences Associated with a Family or Domestic Dispute Disturbance



Definition

Liquor offences associated with a family or domestic dispute disturbance are defined as all disputes involving a child, parent, sibling, cousin, aunt, uncle, or extended family. The officer making the arrest must document alcohol within the police report for this type of arrest to be classified as a liquor-related offence.

The rate of police calls related to liquor offences as a result of family or domestic dispute has declined over time in Mississauga and Brampton. The rates of police calls are higher among males and those aged 19 to 49 years (Table 3.2).

Table 3.2

Number of Peel Regional Police Calls for Liquor Offences associated with a Family or Domestic Dispute Disturbance by Sex, Age Group and Year, Brampton and Mississauga, 2009–2012

		2009 number and rate of liquor offences per 100,000 population		2010 number and rate of liquor offences per 100,000 population		2011 number and rate of liquor offences per 100,000 population		2012 number and rate of liquor offences per 100,000 population	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
Sex	Male	70	10.8	34	5.1	32	4.7	25	3.6
	Female	14	2.1	14	2.1	9	1.3	6	0.9
Age group (years)	≤18	NR	NR	NR	NR	NR	1.2	NR	NR
	19–29	20	9.6	15	7.0	11	5.0	8	3.6
	30–39	21	10.7	9	4.6	10	5.0	8	4.0
	40–49	28	12.7	14	6.3	8	3.6	10	4.5
	50–59	12	7.3	8	4.7	7	3.9	NR	NR
	60+	NR	NR	NR	NR	NR	0.5	NR	NR
Total		84	6.4	48	3.6	41	3.0	31	2.2

NR = Not releasable due to small numbers.
 Sources: RMS-NICHE 2009-2012, Peel Regional Police.
 Population Estimates 2009-2011, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.
 Population Projections 2012, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Alcohol and its Effects on the Community



Highlights

- Data about alcohol and its effects on the community are available from police-related calls for alcohol-related assault and for liquor offences in Mississauga and Brampton.
- In Mississauga and Brampton, 11% of police calls for assault were alcohol-related. The overall rate of alcohol-related assault calls has increased over time.
- In Mississauga and Brampton, the majority of police calls for liquor offences are for being intoxicated in public (99%). The rate of police calls related to liquor offences has increased over time.
- Police calls for alcohol-related assaults and for liquor offences are higher among males and among the 19 to 59 year age group.

Alcohol abuse and intoxication can affect the community through alcohol-related violence (e.g., physical or sexual

assault; robbery and property crimes); and alcohol-related injuries (e.g., from drinking and driving).⁷

The information in this section describes alcohol-related charges or offences for assault, liquor offence, and drinking and driving. Other issues such as vandalism, fights etc., are not captured here.

Alcohol-Related Assaults



Definition

A person commits an **assault** when they:

- intentionally apply force to another person (directly or indirectly) without their consent;
- attempt or threaten to apply force to another person; or
- accost or impede another person or beg, while openly wearing or carrying a weapon or an imitation thereof.²⁶

In Mississauga and Brampton, 11% of police calls for assault were alcohol-related. The overall rate of alcohol-related assault calls has increased over time. Alcohol-related assaults are six times higher among males compared to females, and are highest amongst those between the ages of 19 to 49 years (Table 3.3). There have been no changes in police policies or legislation that might explain this increase.



Table 3.3
Number of Peel Regional Police Calls of Alcohol-Related Assault by Sex, Age Group and Year, Brampton and Mississauga, 2009–2012

		2009 number and rate of assault per 100,000 population		2010 number and rate of assault per 100,000 population		2011 number and rate of assault per 100,000 population		2012 number and rate of assault per 100,000 population	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
Sex	Male	326	50.1	310	46.7	333	49.1	414	60.2
	Female	42	6.4	60	8.9	65	9.4	70	10.0
Age group (years)	≤18	23	6.9	7	2.1	24	7.1	20	5.9
	19–29	113	54.3	122	57.0	114	52.3	145	65.5
	30–39	93	47.6	98	49.6	99	49.6	135	67.0
	40–49	106	48.2	100	45.1	121	54.4	111	50.2
	50–59	29	17.6	33	19.2	28	15.7	53	28.8
	60+	NR	NR	10	5.1	12	5.8	20	9.4
Total		368	28.1	370	27.6	398	29.1	481	34.9

NR = Not releasable due to small numbers.
 Source: RMS-NICHE 2009-2012, Peel Regional Police.
 Population Estimates 2009-2011, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.
 Population Projections 2012, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Liquor Offences



Definition

Liquor offences are defined as all offences committed under the Liquor Licence Act. Some examples include: selling alcohol to a person who is intoxicated or less than 19 years of age, fermenting alcohol without a license, or being intoxicated in public.

In Mississauga and Brampton, the majority of police calls for liquor offences are for being intoxicated in public (99%). The rate of police calls related to liquor offences has increased over time and is highest among males, and those between the ages of 19 to 59 years (Table 3.4). There have been no changes in police policies or legislation that might explain this increase.



Table 3.4

Number of Peel Regional Police Calls for Liquor Offences by Sex, Age Group and Year, Brampton and Mississauga, 2009–2012

		2009 number and rate of liquor offences per 100,000 population		2010 number and rate of liquor offences per 100,000 population		2011 number and rate of liquor offences per 100,000 population		2012 number and rate of liquor offences per 100,000 population	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
Sex	Male	1,003	154.2	1,125	169.3	1,173	173.1	1,310	190.4
	Female	160	24.3	180	26.7	153	22.2	209	29.9
Age group (years)	≤18	50	15.0	72	21.4	54	15.9	55	16.1
	19–29	380	182.6	402	187.8	421	193.0	426	192.3
	30–39	234	119.7	237	120.1	253	126.7	339	168.3
	40–49	278	126.4	332	149.9	303	136.2	341	154.3
	50–59	171	103.7	186	108.5	227	127.7	292	158.5
	60+	48	25.7	75	38.0	68	32.7	66	31.1
Total		1,163	88.8	1,305	97.5	1,327	97.2	1,519	109.5

Sources: RMS-NICHE 2009-2012, Peel Regional Police.
Population Estimates 2009-2011, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.
Population Projections 2012, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care.

Drinking and Driving



Highlights

- In Peel:
 - 5% of residents reported driving after having two or more drinks the hour before they drove.
 - 6% of residents have been a passenger in a car with a driver who had consumed two or more drinks in the hour before driving.
 - Ontario has the lowest rate of impaired driving incidents.
- In 2012 in Brampton and Mississauga there were:
 - 148 blood alcohol concentration suspensions issued
 - 1,596 impaired driving charges
 - 237 motor vehicle collisions involving alcohol
- In Ontario, the rate of fatalities from drinking and driving has declined by 68% between 1990 and 2010.²⁷

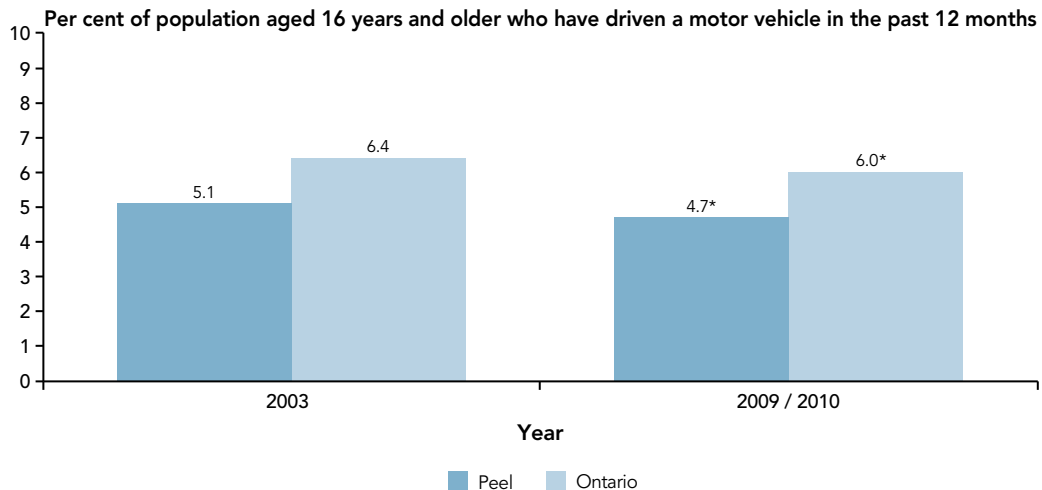
Alcohol is a major risk factor for traffic fatalities and injuries and has been determined to increase both the risk and severity of traffic accidents.^{7, 28} The use of alcohol slows down reaction time which has a causal role in traffic accidents.²⁸

Drinking and Driving

In 2009/2010, 5%* of Peel residents reported driving after having two or more drinks in the hour before they drove. This is equivalent to approximately 28,600* people in Peel. The per cent of residents reporting drinking and driving in Peel is similar to Ontario (6%).^{E2} (*use estimate with caution)

In Ontario, drinking and driving is reported more frequently by males (10%) compared to females (2%) (data not shown).^{E2} Peel data are not reportable.

Figure 3.4
Prevalence of Drinking and Driving[†],
Peel and Ontario, 2003 and 2009/2010



[†] Defined as driving a motor vehicle after having two or more drinks in the hour before driving within the past 12 months.

* Use estimate with caution.

Source: Canadian Community Health Survey 2003, 2009/2010, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Passenger of a Drinking Driver

In 2009/2010, 6% of Peel residents reported that they had been a passenger in a vehicle driven by a person who had two or more drinks in the hour before driving. It is not known whether the driver was drunk. This is significantly lower than

Ontario's 2009/2010 rate of 9%.^{E2} Peel males (8%) are more likely to have been a passenger in a vehicle driven by a person who had two or more drinks in the hour before driving compared to females (4% - use estimate with caution).^{E2}



Approximately one in ten children and young adults reported being a passenger with a potentially drunk driver in Peel in 2009/2010 (Figure 3.5).

Figure 3.5

Prevalence of Being a Passenger with a Driver who had Two or More Drinks in the Past Hour before Driving by Age Group, Peel, 2009/2010



* Use estimate with caution.

95% CI reflects the 95% confidence interval of the estimate.

NR = Not releasable due to small numbers.

Source: Statistics Canada, Canadian Community Health Survey, 2009/2010, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Impaired Driving Incidents



Definition

An impaired driver is defined as a person who commits an offence and:

- operates a motor vehicle or vessel; or
- operates or assists in the operation of an aircraft or of railway equipment; or
- has the care or control of a motor vehicle, vessel, aircraft or railway

equipment whether it is in motion or not:

- while the person's ability to operate the vehicle, vessel, aircraft or railway equipment is impaired by alcohol or a drug; or
- having consumed alcohol in such a quantity that the concentration in the person's blood exceeds 80mg of alcohol in 100ml of blood".²⁶

In Canada, the rate of impaired driving incidents has declined from 577 to 262 per 100,000 between 1986 and 2011. Adults between the ages of 20 and 34 years have the highest rates of impaired driving charges compared to all other age groups.²⁹

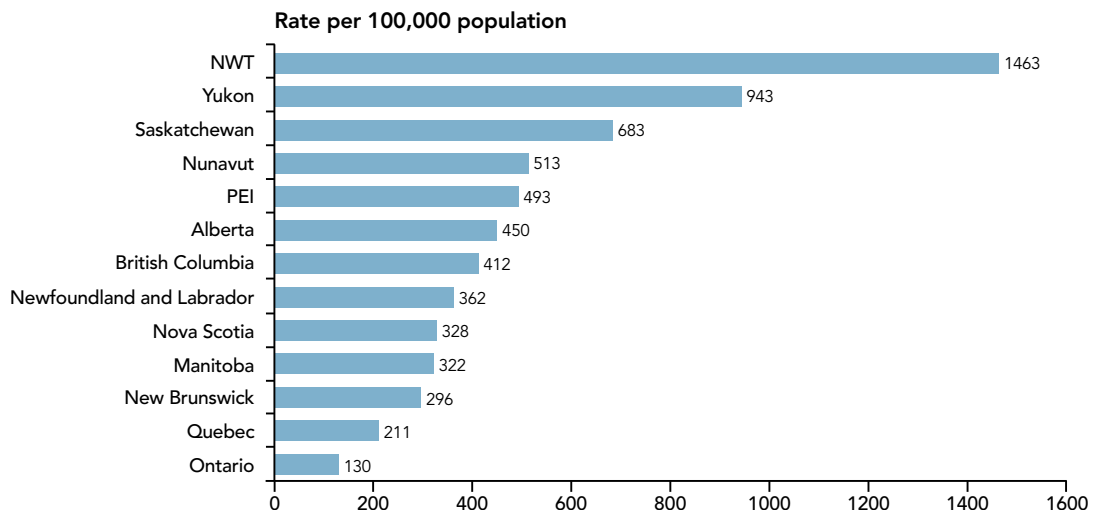
Ontario has the lowest rate of police-reported impaired driving incidents in the country (Figure 3.6). Although not shown, the rates of police-reported impaired driving incidents in Ontario have declined between 2001 and 2011.²⁹

There were 1,596 impaired driving charges in Mississauga and Brampton in 2012. The rate of impaired driving charges has increased over time as a result of deploying increased police resources to problem areas. Impaired driving arrests are highest amongst males and those aged 19 to 29 years (Table 3.6).

Did You Know

Impaired driving incidents reported by police tend to occur most frequently between 11 p.m. and 4 a.m.²⁹

Figure 3.6
Police-reported Impaired Driving Incidents by Province and Territory, Canada, 2011



Note: Counts are based upon the most serious violation in an incident. One incident may involve multiple violations.
Source: Statistics Canada, Canadian Centre for Justice Statistics, Uniform Crime Reporting Survey 2011.

Table 3.6
Profile of Impaired Drivers by Sex, Age Group and Year,
Brampton and Mississauga, 2009–2012

		2009 number and rate of impaired driving per 100,000 drivers*		2010 number and rate of impaired driving per 100,000 drivers*		2011 number and rate of impaired driving per 100,000 drivers*		2012 number and rate of impaired driving per 100,000 drivers*	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
Sex	Male	1,061	502.7	1,146	517.8	1,320	596.4	1,373	620.4
	Female	125	71.7	125	68.2	176	96.0	223	121.6
Age group (years)	16–18	0	0	0	0	NR	NR	5	30.5
	19–29	260	341.9	347	421.8	464	564.1	549	667.4
	30–39	335	454.4	364	513.6	387	546.1	402	567.2
	40–49	272	283.9	267	279.4	325	340.1	316	330.7
	50–59	205	323.0	205	260.8	241	306.6	214	272.2
	60+	114	182.6	88	144.2	76	124.5	110	180.3
Total		1,168	303.0	1,271	314.0	1,496	369.6	1,596	394.4

*The numerator reflects number of drivers stopped by police. The denominator reflects the number of drivers of Peel.

NR = Not releasable due to small numbers.

Source: RMS-NICHE 2009-2012, Peel Regional Police.

2009 population of drivers: Canadian Community Health Survey 2009, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

2010-2012 population of drivers: Canadian Community Health Survey 2010, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

Blood Alcohol Content (BAC) Suspensions

It is a criminal offence under the Criminal Code of Canada to drive with more than 80 milligrams (mg) of alcohol in 100 millilitres (ml) of blood (0.08). Some drivers can still be charged with impaired driving if their blood alcohol concentration is less than 0.08.

In Ontario, drivers can face an immediate roadside license suspension for refusing to take a breath test, or having a blood alcohol concentration of 0.05 or more (or 50mg of alcohol in every 100ml of blood).³⁰

Did You Know

In Ontario, a blood alcohol content (BAC) suspension is defined as a licence suspension of three, seven or 30 days, issued when the driver is suspected of being impaired (BAC range of 0.05 to 0.08). However, the driver can be released unconditionally based on the results of roadside or breathalyzer tests not warranting a charge of impaired.³⁰

If the driver's BAC is more than 0.08, they will immediately receive a 90-day

driver's license suspension and have their vehicle impounded for seven days.^{26, 30}

On August 1, 2010, Ontario introduced Bill 126 stating that any individual aged 21 years and under who has a full class drivers' license is not permitted to drive if they have been drinking alcohol. If caught, the driver receives an immediate driver's license suspension for 24 hours.³⁰

In Mississauga and Brampton, the rate of BAC suspensions among drivers has increased since 2009 as a result of deploying additional police resources to

problem areas. Rates of BAC suspensions are six times higher among males compared to females and are highest among those aged 19 to 29 years (Table 3.5).

Table 3.5

Profile of Blood Alcohol Content (BAC) Suspensions by Sex, Age Group and Year, Brampton and Mississauga, 2009–2012

		2009 number and rate of BAC suspensions per 100,000 population		2010 number and rate of BAC suspensions per 100,000 population		2011 number and rate of BAC suspensions per 100,000 population		2012 number and rate of BAC suspensions per 100,000 population	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
Sex	Male	484	22.7	71	32.1	129	58.3	128	57.8
	Female	7	4.0	11	6.0	18	9.8	20	10.9
Age group (years)	16–28	NR	NR	NR	NR	NR	NR	NR	NR
	19–29	23	30.2	35	42.5	66	80.2	65	79.0
	30–39	11	14.9	13	18.3	30	42.3	35	49.4
	40–49	8	8.3	20	20.9	23	24.1	23	24.1
	50–59	7	11.0	10	12.7	13	16.5	11	14.0
	60+	5	8.0	NR	NR	11	18.0	13	21.3
Total		55	14.3	82	20.3	147	36.3	148	36.6

*The numerator reflects number of drivers stopped by police. The denominator reflects the number of drivers in Peel.
NR = Not releasable due to small numbers.

Source: RMS-NICHE 2009-2012, Peel Regional Police.

2009 population of drivers: Canadian Community Health Survey 2009, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

2010-2012 population of drivers: Canadian Community Health Survey 2010, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.



Motor Vehicle Collisions involving Alcohol



Definition

A **motor vehicle collision (MVC)** is defined as a collision of a motor vehicle (e.g., car, motorcycle) with another motor vehicle, a stationary object, a bicycle or a person or animal.

A **motor vehicle collision involving alcohol** is one in which the person driving the motor vehicle was under the influence of alcohol (blood alcohol concentration of 0.05 or greater).

Of the 1,596 impaired driver arrests in Mississauga and Brampton in 2012, 15% were motor vehicle collisions involving alcohol. The rate of motor vehicle collisions due to alcohol has remained stable over time and is five times higher among males compared to females. By age, the highest rate of motor vehicle collisions with alcohol is among those between 19 to 29 years (Table 3.7).

Table 3.7

Motor Vehicle Collision (MVC) involving Alcohol by Sex, Age Group and Year, Brampton and Mississauga, 2009–2012

		2009 number and rate of MVCs involving alcohol per 100,000 drivers*		2010 number and rate of MVCs involving alcohol per 100,000 drivers*		2011 number and rate of MVCs involving alcohol per 100,000 drivers*		2012 number and rate of MVCs involving alcohol per 100,000 drivers*	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
Sex	Male	174	82.4	194	87.7	164	74.1	201	90.8
	Female	29	16.6	32	17.4	32	17.4	36	19.6
Age group (years)	16–18	8	57.3	NR	NR	9	54.9	6	36.6
	19–29	80	105.2	86	104.5	72	87.5	99	120.4
	30–39	44	59.7	52	73.4	38	53.6	48	67.7
	40–49	40	41.7	39	40.8	45	47.1	43	45.0
	50–59	23	36.2	30	38.2	25	31.8	25	31.8
	60+	8	12.8	15	24.6	7	11.5	16	26.2
Total		203	52.7	226	55.8	196	48.4	237	58.6

Note: MVCs involving alcohol are a subset of impaired drivers defined in Table 3.6.

*The numerator reflects number of drivers investigated by police. The denominator reflects the driver population in Peel.

NR = Not releasable due to small numbers.

Source: RMS-NICHE 2009-2012, Peel Regional Police.

2009 population of drivers: Canadian Community Health Survey 2009, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.

2010-2012 population of drivers: Canadian Community Health Survey 2010, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care.



Did You Know

- Lowering the legal blood alcohol content for drivers combined with enforcement can reduce motor vehicle crashes by approximately 20%.^{7, 28}
- In high income countries about 20% of fatally injured drivers have blood alcohol content above legal limits.^{7, 28}

Mortality from Drinking and Driving

In Ontario, the rate of fatalities from drinking and driving has declined by 68% between 1990 and 2010.²⁷ Compared to other Canadian provinces and territories, Ontario had the second lowest per capita rate of impairment-related crash deaths. Nunavut had the lowest.³¹ Data for Peel are not available.



chapter 4

ALCOHOL USE AND RISKS AMONG YOUTH



Key Messages

- About 40% of students in Peel try alcohol before they get to high school, although the quantity consumed is not as high among Peel students as for Ontario students.
- The proportion of students who have been drunk in the past month, who binge drink or who are at risk for an alcohol use disorder in Peel is significantly lower than among students in Ontario.
- Peel students are engaging in other risky alcohol behaviours such as using energy drinks with alcohol, using alcohol and cannabis on the same occasion, playing drinking games, having sexual intercourse while high or drunk, drinking and driving, or being a passenger with a driver who had been drinking alcohol.
- Some students have consumed other forms of alcohol such as mouthwash, rubbing alcohol and hand sanitizer.
- Students feel that alcohol is easy to access and about half report that they had been given alcohol by someone else.

Early adolescent experimentation with alcohol often occurs in the home and at family functions. Parental alcohol use, beliefs and attitudes directly affect children’s alcohol use, but family cohesiveness and parental monitoring can protect against adolescent alcohol misuse.³²

Alcohol Initiation and Use



Highlights

- About 40% of students in Peel and Ontario tried alcohol before they got to high school.
- Peel students do not drink as heavily compared to Ontario youth.
- In Peel, 9% of students report being drunk at least once in the past four weeks. This is significantly lower than in Ontario students (18%).^G
- About 4% of Peel and Ontario students have consumed other forms of alcohol such as mouthwash, rubbing alcohol and hand sanitizer.^G

Alcohol Initiation

Approximately 40% of Peel and Ontario students who ever drank alcohol reported trying it before entering high school. About one-quarter of students (23%) who have tried more than a sip of alcohol had

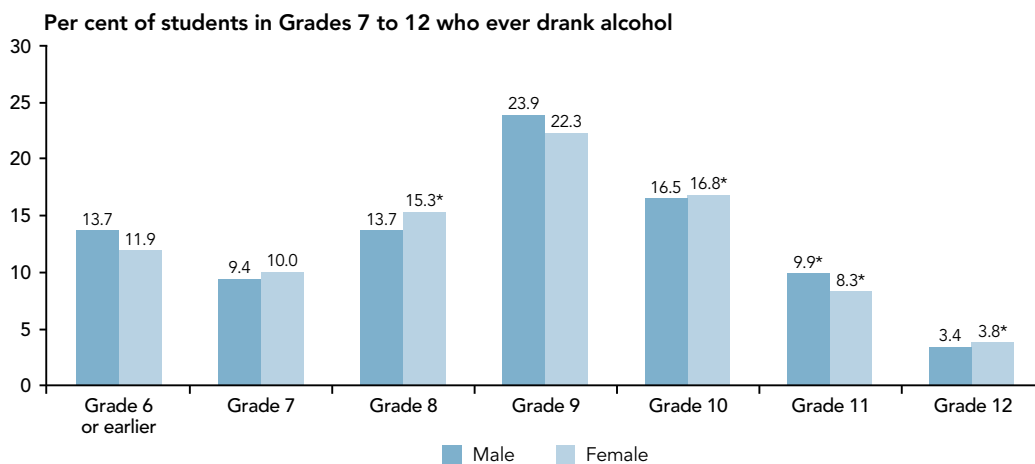
their first drink in Grade 9. There are no differences by sex (Figure 4.1).



Definition

A student is defined as a person attending school in grades 7 to 12.

Figure 4.1
Grade of Alcohol Initiation[†] by Sex,
Peel and Ontario, 2013



[†] Defined as ever having more than a sip of alcohol in their lifetime.

* Use estimate with caution.

Source: Ontario Student Drug Use and Health Survey, 2013, Centre for Addiction and Mental Health, Peel Public Health.

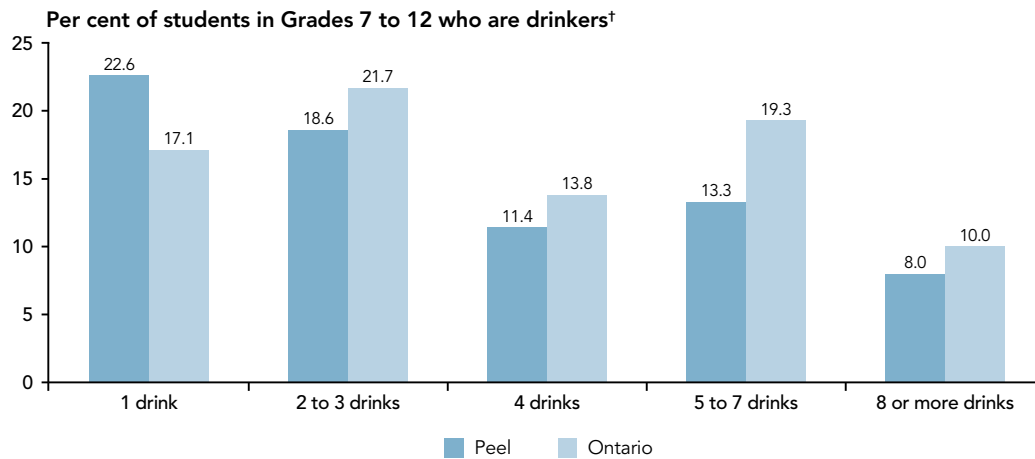
! Peel Fact

The top three reasons that students tried alcohol in Peel are:

- curiosity (42%)
- given a drink by a relative (39%)
- friends encouraged it (15%)^H

Figure 4.2

Number of Drinks Consumed by Students on a Typical Day when Drinking, Peel and Ontario, 2013



[†] Defined as someone who has consumed alcohol in the past 12 months.

Source: Ontario Student Drug Use and Health Survey, 2013, Centre for Addiction and Mental Health, Peel Public Health.

Number of Drinks Consumed

The number of drinks consumed by students on a typical day when drinking is shown in Figure 4.2. Peel students do not drink as heavily on days when they drink, compared to Ontario youth.

Being Drunk

In Peel, 9% of Grade 7 to 12 students report being drunk at least once in the past four weeks. This is significantly lower than Ontario students (18%).

In Peel, 9% of Grade 7 to 12 students reported that they had been intoxicated (drunk or high) on school property in the past 12 months. This is similar to Ontario (12%). A similar proportion of males and females report this behaviour and there is no difference by grade.^G

Alcohol Use Disorders and Risky Alcohol Behaviors



Highlights

Alcohol Use Disorders

- About one in 10 Peel students (8%), representing about 9,300 students, are at risk for an alcohol use disorder. This is lower than Ontario students (16%).^G
- Among past year drinkers, the proportion of youth who scored 8+ on the AUDIT was 21% in Peel. This is significantly lower than Ontario youth (29%).^G

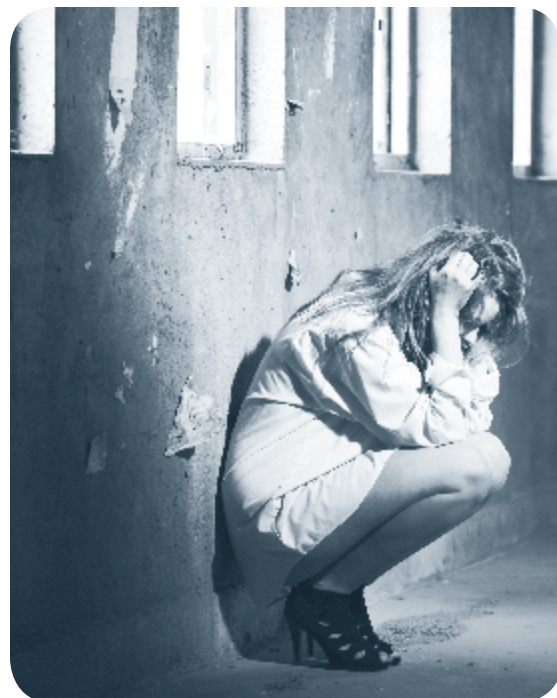
Risky Alcohol Behaviours

Peel students reported partaking in the following risky behaviours associated with alcohol:

- binge drinking (11%)^G
- combining energy drinks with alcohol (27%)^G
- consuming alcohol and cannabis on the same occasion (11%)^G
- playing drinking games at least once in the past four weeks (12% - use estimate with caution)^G
- having sexual intercourse at least once while high or drunk (48%)^H
- having sexual intercourse in the past 12 months when they didn't really want to because they were drinking or doing drugs (5%)^H
- driving within an hour of drinking two or more alcoholic drinks (3% - use estimate with caution)^G
- being a passenger with a driver who had been drinking alcohol (18%)^H

Alcohol Use Disorders

The Alcohol Use Disorders Identification Test (AUDIT) is typically used in primary care settings to identify hazardous or harmful patterns due to alcohol use or symptoms of alcohol dependence.²³ In this report, we will use the term alcohol use disorder to reflect a score of 8+ on the AUDIT tool.



 Measurement

The AUDIT has 10 questions that are used to determine harmful alcohol use. Details about the scoring of each question can be found in Appendix A.

Domain: Hazardous Alcohol Use

- How often do you have a drink containing alcohol?
- How many drinks containing alcohol do you have on a typical day when you are drinking?
- How often do you have six or more drinks on one occasion?

Domain: Dependence Symptoms

- How often during the last year have you found that you were not able to stop drinking once you had started?
- How often during the last year have you failed to do what was normally expected from you because of drinking?
- How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

Domain: Harmful Alcohol Use

- How often during the last year have you had a feeling of guilt or remorse after drinking?
- How often during the last year have you been unable to remember what happened the night before because you had been drinking?
- Have you or someone else been injured as a result of your drinking?
- Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?

Each question can score from zero to four. The total AUDIT score is then calculated by adding up the score from each question. An AUDIT score of eight or more (8+) is an indication of harmful alcohol use or possibly dependence.²³

A significantly lower proportion of Peel youth (8%) representing about 9,300 students are classified as being at risk for an alcohol use disorder according to the AUDIT compared to Ontario youth (16%). There are no differences between males and females.^G

Among past year drinkers the proportion of Peel youth who scored 8+ on the AUDIT was 21% in Peel. This is significantly lower than Ontario youth (29%).^G

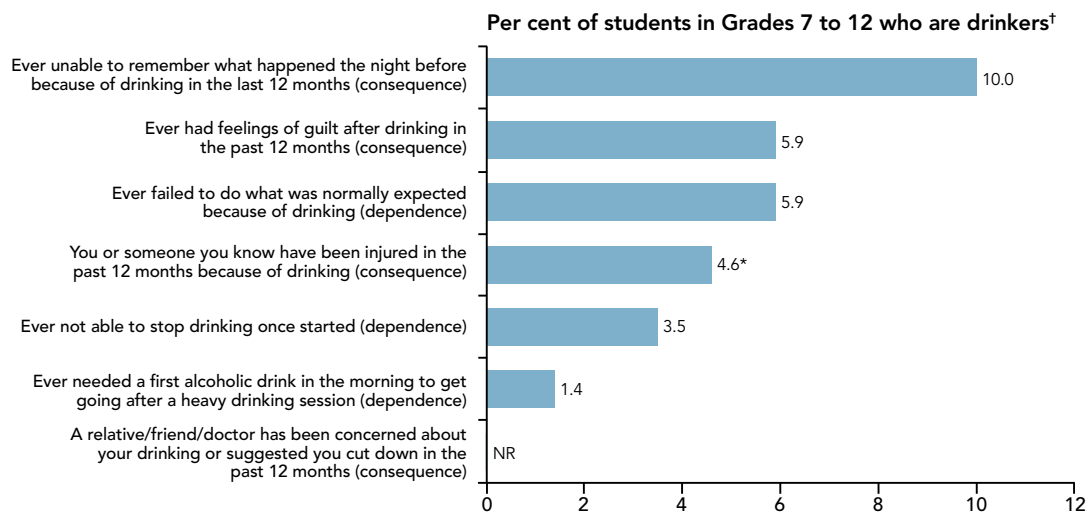
**Did You Know**

While the difference is not statistically different, the proportion of students who report that they don't know where to turn to talk about emotional or mental health needs is 37%* among Grade 7 to 12 students with an AUDIT score of 8+ compared to 26% of students without an AUDIT score of 8+.

*use estimate with caution

Figure 4.3 describes measures of alcohol dependence and adverse consequences of alcohol use among Peel youth. There are no differences between males and females for any of these measures.

Figure 4.3
Measures of Alcohol Dependence and Adverse Consequences,
Peel, 2013



[†] Defined as someone who has consumed alcohol in the past 12 months.

NR = Not releasable due to small numbers.

* Use estimate with caution.

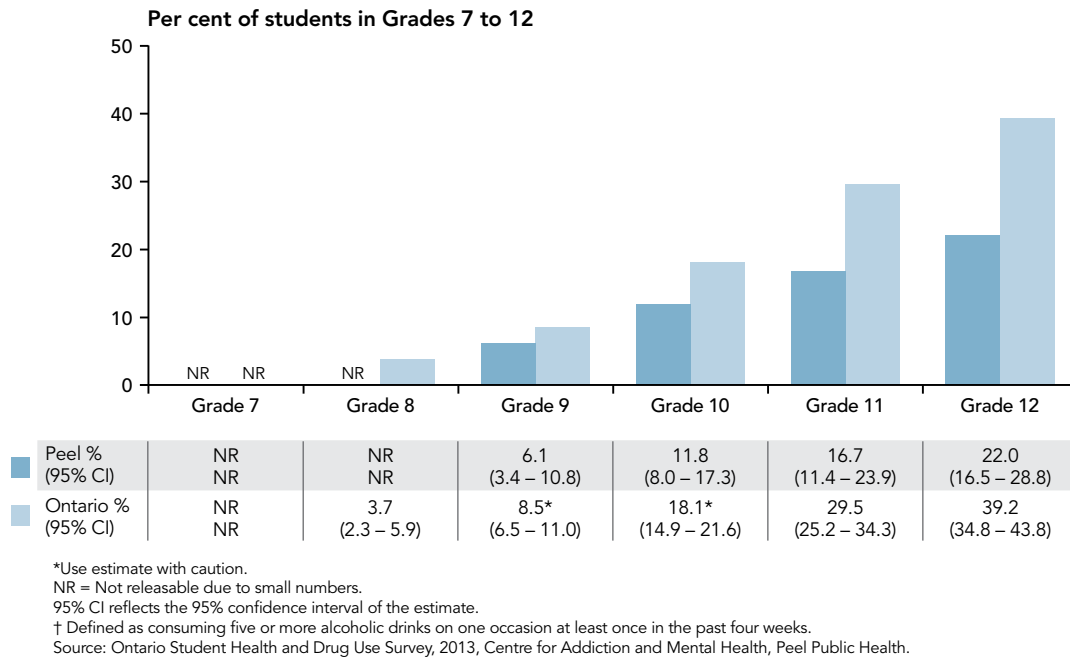
Source: Ontario Student Health and Drug Use and Health Survey, 2013, Centre for Addiction and Mental Health, Peel Public Health.



Binge Drinking

In Peel, 11% of students in Grades 7 to 12 report binge drinking, which is significantly lower than that reported for Ontario (20%).⁶ There is no difference by sex. By the time a Peel student is in Grade 12, almost one-quarter (22%) report having engaged in binge drinking at least once in the past four weeks (Figure 4.4).

Figure 4.4
Binge Drinking[†] among Students by Grade,
Peel and Ontario, 2013



Alcohol, Energy Drinks, Cannabis and Drinking Games

A similar per cent of students in Peel (27%) and Ontario (29%) who had ever consumed alcohol in the past year reported combining energy drinks with alcohol.^G

Eleven per cent of Peel students have consumed alcohol and cannabis on the same occasion in the past 12 months. This is similar to Ontario.^G

Twelve per cent (use estimate with caution) of Peel students report playing drinking games at least once in the past four weeks. This is significantly lower than for Ontario (20%).^G

Alcohol Use and Sex

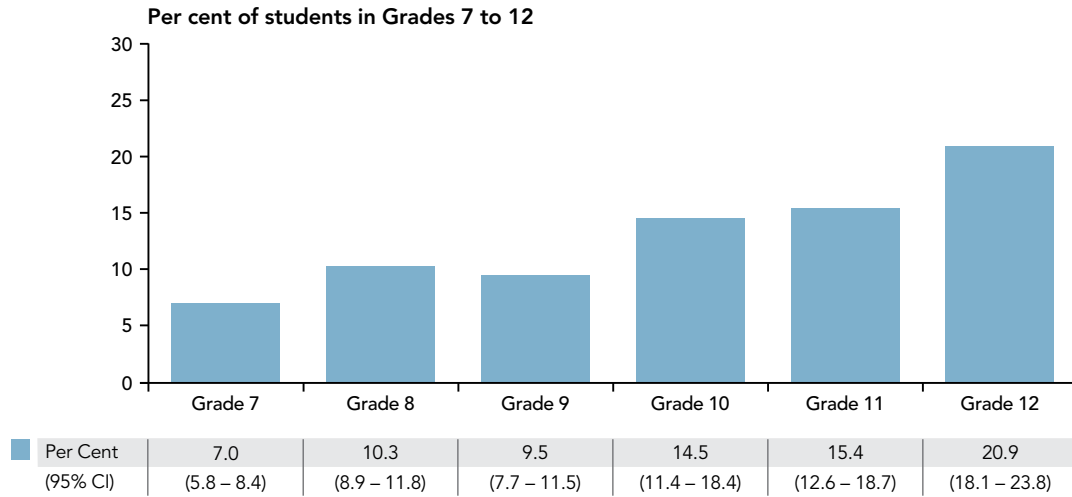
In Peel in 2011, 48% of sexually active students reported having sexual intercourse at least once while high or drunk.^H Additionally, 5% of Peel students also reported having had sexual intercourse in the past 12 months when they didn't really want to because they were drinking or doing drugs.^H

Drinking and Driving

In Peel, 3% (use estimate with caution) of students in Grades 10 to 12 with a driver's license reported driving within an hour of drinking two or more alcoholic drinks.^G

Additionally, 18% of Peel students in Grades 7 to 12 reported being a passenger with a driver who had been drinking alcohol (Figure 4.5).

Figure 4.5
Proportion of Students who were Passengers with Someone who had been Drinking Alcohol, Peel, 2011



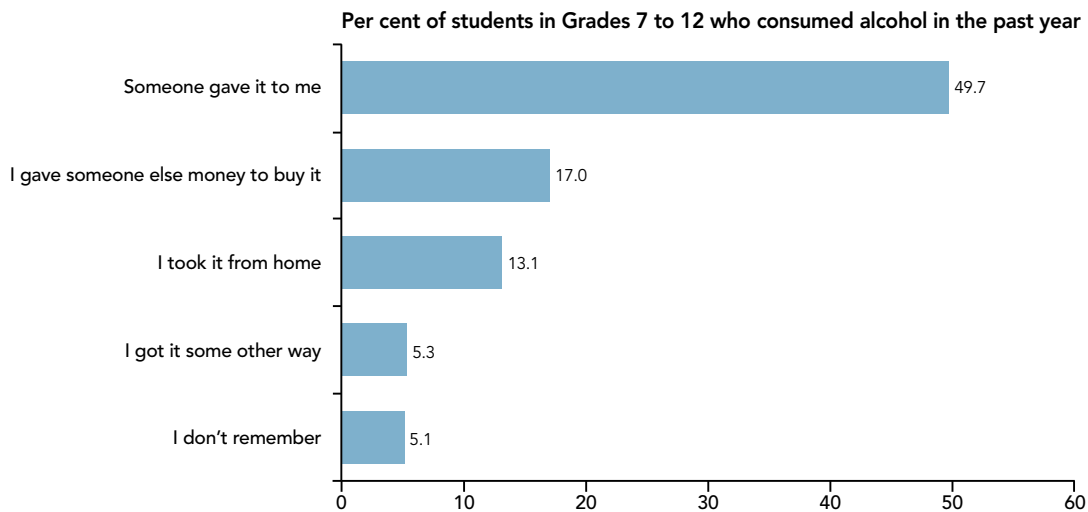
95% CI reflects the 95% confidence interval of the estimate.
 Source: Student Health Survey 2011, Peel Public Health.

Accessing Alcohol

Fifty-eight per cent of Peel students feel that it would be very or fairly easy to get alcohol if they wanted some.⁶ While half

(50%) received alcohol from someone else, 17% had another person buy it for them and 13% took it from home (Figure 4.6).

Figure 4.6
Methods of Obtaining Alcohol, Peel, 2013



Source: Ontario Student Drug Use and Health Survey 2013, Centre for Addiction and Mental Health, Peel Public Health.



chapter 5

ALCOHOL-RELATED HEALTH CARE USE AND COSTS



Key Messages

- The total health care and societal cost of alcohol use in Ontario is \$5.3 billion which is approximately \$441 per capita.³³
- In Peel, it is estimated that the hospitalization costs of treating alcohol-attributable diseases and injuries is just over \$11.5 million per year in Peel. However, this is an underestimate as there are some diseases and injuries attributable to alcohol for which we were unable to calculate hospitalization costs.

Alcohol-Related Costs in Canada and Ontario

The direct and indirect social cost of alcohol use in Canada is estimated to be \$14.6 billion³³, approximately \$463 per capita. This estimate includes the direct costs of health care, law enforcement, prevention, research and other direct costs (e.g., fire damage, traffic damage) as well as indirect productivity costs (Table 5.1).

In Canada, 49% of all costs attributable to alcohol use are for indirect costs related to productivity. Direct health care costs are second at 23% and direct law enforcement is third at 21%.

In Ontario, the cost of alcohol use is estimated at \$5.3 billion, which works out to approximately \$441 per capita. Details about the type of cost breakdown for Ontario are not available (Table 5.1).

Alcohol-Related Hospital Costs in Peel

To estimate the hospital costs associated with treating alcohol-attributable diseases and injuries in Peel, we multiplied the average annual number of hospitalizations attributable to alcohol for each disease or injury by the unit cost for treating each alcohol-attributable disease or

Table 5.1
Costs Attributable to Alcohol Use
Canada and Ontario, 2002

Type of cost	Canada	Ontario
Direct health care costs	\$3,306,200,000	NA
• Morbidity (hospitalization)	\$1,478,200,000	
• Prescription drugs	\$767,600,000	
• Inpatient specialized treatment	\$754,900,000	
• Family physician visit	\$172,800,000	
• Ambulatory care (physician fees)	\$80,200,000	
• Outpatient specialized treatment	\$52,400,000	
Direct law enforcement costs	\$3,072,200,000	NA
• Police	\$1,898,800,000	
• Corrections	\$660,400,000	
• Courts	\$513,100,000	
Direct costs for prevention and research	\$53,000,000	NA
Other direct costs	\$996,100,000	NA
• Traffic accident damage	\$756,900,000	
• Fire damage	\$156,500,000	
• Administrative costs for transfer payments (e.g., social welfare, worker's compensation)	\$65,800,000	
• Losses associated with the workplace (e.g., health promotion programs, drug testing at work)	\$17,000,000	
Indirect costs: productivity losses	\$7,126,400,000	NA
• Long-term disability	\$6,163,900,000	
• Premature mortality	\$923,000,000	
• Short-term disability (days with reduced activity)	\$23,600,000	
• Short-term disability (days in bed)	\$15,900,000	
TOTAL	\$14,554,000,000	\$5,318,400,000

Note: excluded from these costs are private costs associated with alcohol use (e.g., cost to purchase alcohol); welfare benefits paid to individuals disabled by alcohol abuse; and other intangible costs (e.g., pain and suffering associated with alcohol abuse).

Source: Rehm, J.; Baliunas, D.; Brochu, S.; Fischer, B.; Gnam, W.; Patra, J et al. The costs of substance abuse in Canada 2002. Ottawa: Canadian Centre on Substance Abuse; March 2006.

injury hospitalization.³⁴ Note that there are some conditions listed in Table 5.2 that do not have cost estimates available. As a result, our hospitalization costs are underestimated.

Using currently available data, it is estimated that the hospitalization costs of treating alcohol-attributable diseases and injuries is just over \$11.5 million per year in Peel.

Table 5.2
Average Number of Alcohol-Attributable Hospitalizations and Costs
Peel, 2007–2011 (average annual number)

	Number of hospitalizations attributable to alcohol abuse	Cost per hospital stay	Cost of hospitalizations attributable to alcohol abuse
RESPIRATORY DISEASES			
Tuberculosis	1	\$16,131	\$16,131
Lower respiratory infections	26	\$4,763	\$123,838
CARDIOVASCULAR DISEASES			
Conduction disorders and other dysrhythmias	24	\$5,966	\$143,184
Hemorrhagic stroke	5	\$14,261	\$71,305
Hypertension	8	\$11,351	\$90,808
Alcoholic cardiomyopathy	2	\$21,287	\$42,574
GASTROINTESTINAL DISEASES			
Pancreatitis	13	\$8,896	\$115,648
Alcohol-induced chronic pancreatitis	14	\$8,896	\$124,544
Alcohol-induced acute pancreatitis	99	\$8,896	\$880,704
Liver cirrhosis	9	\$19,786	\$178,074
DIGESTIVE SYSTEM DISEASES			
Lip and oropharyngeal cancer	12	\$16,628	\$199,536
Esophageal cancer	3	\$12,713	\$38,139
Colon cancer	3	\$13,277	\$39,831
Rectum cancer	4	\$13,277	\$53,108
Liver cancer	2	\$12,713	\$25,426
Laryngeal cancer	2	\$12,713	\$25,426
Alcoholic gastritis	9	\$5,680	\$51,120
Alcoholic liver disease	145	\$14,239	\$2,064,655
NERVOUS SYSTEM DISORDERS			
Alcoholic myopathy	0	\$14,690	0
Alcoholic polyneuropathy	0	\$15,244	0
Degeneration of nervous system due to alcohol	4	\$9,287	\$37,148
MENTAL AND BEHAVIOURAL DISORDERS			
Alcohol-induced mental disorders	216	\$6,368	\$1,375,488
Alcohol dependence syndrome	88	\$6,368	\$560,384

Table 5.2 continues ...

Table 5.2 continued

	Number of hospitalizations attributable to alcohol abuse	Cost per hospital stay	Cost of hospitalizations attributable to alcohol abuse
OTHER DISEASES			
Breast cancer	4	\$4,755	\$19,020
Epilepsy	11	\$7,786	\$85,646
Low birth weight	29	\$16,379	\$474,991
Fetal alcohol syndrome (all ages)	0	\$7,078	0
Fetus and newborn affected by maternal use of alcohol (all ages)	0	Data not available	0
Excessive blood level of alcohol	0	\$5,918	0
INJURIES*			
Motor vehicle traffic accidents	52	\$9,045	\$470,340
Bicycle accident	13	\$9,045	\$117,585
Water transport accident	1	\$9,045	\$9,045
Accidental fall (<65 years)	164	\$9,045	\$1,483,380
Accidental fall (65+ years)	83	\$9,045	\$750,735
Arson	0	\$9,045	\$0
Accidental excessive cold	1	\$9,045	\$9,045
Accidental drowning	2	\$9,045	\$18,090
Accidental aspiration	7	\$9,045	\$63,315
Striking against/struck by objects/ caught in/between objects	14	\$9,045	\$126,630
Occupational and machine injuries	4	\$9,045	\$36,180
Accidental firearm injuries	1	\$9,045	\$9,045
Suicide, self-inflicted	104	\$9,045	\$940,680
Attempted suicide by alcohol	18	Data not available	
Assault [§]	56	\$9,045	\$506,520
Unintentional poisoning by alcoholic beverages	20	\$9,720	\$194,400
Alcohol poisoning undetermined intent	4	Data not available	
Evidence of alcohol involvement determined by blood alcohol level	2	Data not available	
TOTAL	1,279	---	\$11,571,718

*The cost of hospitalization for external causes of injury was not specifically available from the Canadian Institute for Health Information. As a result, the average cost for overall injury was used.

§ Defined as victim of a fight, brawl, rape; victim or assault with firearms; victim of assault with cutting instrument; victim of assault other.

Notes: Number of hospitalizations reflects the average annual number of cases for the years 2007-2011 for those aged 15 years and older with the exception of low birth weight, which reflects all ages.

Sources: Hospital In-Patient Discharge Data 2007-2011, Intellihealth Ontario, Ministry of Health and Long-Term Care.

Prevalence of daily drinking: Canadian Community Health Survey 2003, 2005, 2007/2008, 2009/2010, 2011/2012 combined, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care

Relative risk for diseases attributable to alcohol: Rehm, J; Kekoe, T; Taylor, B; Patra J. Evidence Base for the Development of Canadian Drinking Guidelines. Toronto, Ontario: Centre for Addiction and Mental Health; September 2009.

Attributable fractions for injury related to alcohol: Rehm J, Room R, Monteiro M, Gmel G, Graham K, Rehn N, et al. Alcohol use. In: Ezzati M, Lopez A, Rodgers A, Murray C, editors. Comparative Quantification of Health Risks. Global and Regional Burden of Disease Attributable to Selected Major Risk Factors. Volume 1. Geneva: World Health Organization; 2004. p. 959-1108.

Hospital costs: Canadian Institute for Health Information. The cost of acute hospital stays by medical condition in Canada, 2004-2005. Ottawa: Canadian Institute for Health Information; 2008.



chapter 6

THE ALCOHOL REGULATORY SYSTEM



Key Messages

- Canada's involvement in alcohol regulation began in the late 1800s.
- Ontario has many laws and regulations related to alcohol.
- Municipal Alcohol Policies (MAP) provide a means for municipalities to regulate alcohol consumption on municipally-owned properties in compliance with current liquor laws.

Canada has a long history of direct government involvement in alcohol management. This includes governing the process of producing, selling, importation, distribution and consumption of alcohol through a series of federal and provincial laws.

In addition to these federal and provincial laws, each municipality can influence the sale and consumption of alcohol through municipal alcohol policies and by-laws governing the sale and consumption of alcohol. The following section will provide an overview of the alcohol regulatory system in Canada and Ontario. The role of municipalities in local alcohol policy will also be described.



Did You Know

- The federal government in Canada has regulatory authority for alcohol trade, taxation, advertising and related Criminal Code offences.
- Provincial governments are largely responsible for controlling alcohol availability, enforcing liquor laws and providing education, health care and social services.
- At the municipal/local level, control can be exercised as to where and how alcohol is consumed in municipally owned recreation facilities and parks through municipal alcohol policies, by-laws and regulations.³⁵

Some History about Alcohol Legislation in Canada

- **1878:** The *Canada Temperance Act*, also known as the *Scott Act*, was created, allowing for local people to hold referendums as to whether or not to prohibit alcohol sales within their municipality.^{36, 37} The Canadian temperance movement began during roughly the same time as those in Britain and the US.³⁶
- **1915 - 1917:** Canada enacted prohibition in all provinces during the First World War.³⁸
- **1928:** The Canadian government passed the *Importation of Intoxicating Liquors Act* banning liquor importation unless consigned through the government or a public liquor monopoly.³⁹

Alcohol Regulation in Canada

The responsibility for enacting laws and regulations regarding the sale and distribution of alcoholic beverages in Canada is the sole responsibility of the provinces and territories. The federal laws related to alcohol include:

- *Federal Excise Act* (related to taxes)
- *Importation of Intoxicating Liquors Act* (related to international traffic in intoxicating liquors)
- *Food and Drugs Act*
- *Alcohol Advertising Regulations*
- *Agreement on Internal Trade* (relating to trade in beverage alcohol products)
- *Criminal Code of Canada* (relating to alcohol-impaired driving, violence and injury)

Federal Excise Act

Federal excise taxes represent one of four types of taxes that affect alcohol prices in Canada. *The Excise Act, 2001* modernized the legislation governing the taxation of spirits, wine and tobacco products and introduced an updated administrative and enforcement framework that reflects current industry practices. The other three types of taxes that affect alcohol prices are provincial mark-ups, environmental taxes and federal/provincial sales taxes.³⁵

Importation of Intoxicating Liquors Act

The *Importation of Intoxicating Liquors Act* regulates the interprovincial importation of intoxicating liquors for personal use. This 1928 law states that: “No person shall import, send, take or transport, or cause to be imported, sent, taken or transported, into any province from or out of any place within or outside Canada any intoxicating liquor.” The only way an individual can legally move a bottle of wine from one province to another – or from another country to Canada – is with the permission of the provincial liquor control board.

In June of 2012, Bill C-311 was introduced and passed to amend the *Importation of Intoxicating Liquors Act*, making it legal for Canadians to buy and transport Canadian wine for personal use across provincial/territorial borders within the limits and regulations set by each province or territory.⁴⁰

Food and Drugs Act

The *Food and Drugs Act* provides definitions of alcohol, what is allowed to be contained in different types of alcohol and how these need to be described on the product.

Alcohol Advertising Regulations

There are two pieces of legislation related to alcohol advertising: *The Guide to Food Labelling and Advertising and the Code and Interpretation Guidelines for Broadcast Alcohol Advertising in Canada*.

The Canadian Radio-television and Telecommunications Commission (CRTC) has broad regulation-making authority in the field of broadcasting, including the power to make regulations relating to the “character of advertising” and the amount of broadcast time. Regulations regarding alcohol advertising are contained within the *Code for Broadcast Advertising of Alcoholic Beverages*, enacted on August 1, 1996. The code stipulates the requirements around commercial messages for alcoholic beverages, with specific intent to ensure that nondrinkers not be positively influenced by the use of an alcoholic beverage.⁴¹

Before June 1995, the Canadian government, through the CRTC, held mandatory pre-clearance of all alcohol advertisements. Since 1997, efforts to control alcohol advertisements have been left to the provinces, broadcasters and the industry themselves on a voluntary basis. In its place, the Advertising Standards Canada (ASC), a non-governmental organization that screens ads for consumer products, has taken over the script pre-clearance function for the broadcasting industry and reviews ads as per request by the industry. In 2002, the ASC expanded its review services to include the Ontario guidelines set out by the Alcohol and Gaming Commission of Ontario (AGCO) to support Ontario-specific regulations regarding alcohol promotion.

The current regulation process in Canada makes it difficult to control advertising due to the following reasons:

- There are no limitations or regulations on alcohol advertising through:
 - traditional media;
 - sponsorship of youth functions;
 - point of purchase advertising;
 - product placement in movies and televisions;
 - school and campus marketing; and
 - the internet.
- Regulation of alcohol advertising is challenged by international trade agreements given the global expansion of the alcohol industry.
- The CRTC *Code for Broadcast Advertising of Alcoholic Beverages* makes no reference to controlling advertisements that contain content that influences young viewers such as “alco-pops,” alcoholic energy drinks and party scenes.
- There is a lack of consistent alcohol promotion guidelines to assure that the advertisements produced do not appeal to under age audiences, even if provincial laws are set to mandate review of all alcohol advertisements.

Agreement on Internal Trade

The purpose of the *Agreement on Internal Trade* regarding alcoholic beverages is to reduce or eliminate barriers to interprovincial trade in alcoholic beverages. Under this agreement, governments are required to:

- Reconcile differences among standards-related measures (i.e., labelling and packaging regulations and requirements), as well as oenological practices (wine-making).

- Ensure that wine and wine products are labelled in accordance with any national standards that may be developed by the Wine Standards Committee.
- Review and reconcile differences in the definition of wine and wine products in the Agreement with that developed by the Wine Standards Committee.⁴²

Criminal Code of Canada

The *Criminal Code of Canada* (s. 249 - 261) states it is a criminal offence to operate a motor vehicle (whether in motion or not) while impaired. This includes driving with a blood alcohol concentration (BAC) exceeding 80mg of alcohol in 100ml of blood (0.08 BAC), or impairment by a drug. If police have reasonable grounds to believe a person is committing, or at any time within the preceding three hours has committed this offence, they may request the person submit a blood and/or breath sample. It is also an offence to fail or refuse to comply with the request without a reasonable excuse.

The types of infractions under the *Criminal Code of Canada* related to alcohol-impaired driving include:

- impaired driving causing bodily harm or death;
- driving with a BAC above 0.08 and causing bodily harm or death;
- operating or having care or control of a motor vehicle:
 - while one’s ability to do so is impaired by alcohol or a drug; or
 - while having a BAC in excess of 0.08;
- failing or refusing to provide a sample without a reasonable excuse;
- failing or refusing to provide a sample knowing that one’s operation and assistance in the operation of the motor

vehicle, vessel, aircraft or railway equipment caused an accident resulting in bodily harm or death;

- continuing to drive even when suspended or prohibited from doing so.

For criminal offences to become criminal convictions under the *Criminal Code of Canada*, police need to lay charges and those charges need to be prosecuted through the court system. The consequences for convicted offenders are determined by judges and can include jail time, monetary penalties and driving prohibitions or restrictions.



Did You Know

While the federal government has authority over alcohol trade, taxation, advertising and related *Criminal Code of Canada* offences, it is provincial governments that are largely responsible for controlling alcohol availability, enforcing liquor laws and providing needed education, health care and social services.



Some History about Alcohol Legislation in Ontario

- **1864:** *The Dunkin Act* allowed municipalities to ban liquor sales within their jurisdiction if the majority of electors were in favour of prohibition.³⁹
- **1890:** The *Liquor Licence Act* was created to deal with licensing and possession of alcohol in Ontario.³⁷
- **1916:** Prohibition started in Ontario with the passing of the *Ontario Temperance Act*.^{36, 43}
- **1927:** Prohibition in Ontario ended with the establishment of the provincial control system: the Liquor Control Board of Ontario (LCBO).³⁶
- **1927:** The passing of the *Liquor Control Act* granted the LCBO authority to control the transportation, sale and delivery of beverage alcohol in Ontario. In other words, the LCBO is able to buy spirits, wines and beer from domestic and foreign suppliers for distribution and sale in Ontario, as well as operate retail stores, oversee private agency stores in small rural communities and regulate Brewers Retail stores, Ontario winery stores and privately operated duty-free stores.⁴⁴
- **1934:** The *Liquor Control Act* was amended to allow hotels and clubs in Ontario to sell beer and wine with meals.³⁹
- **1947:**
 - The Liquor Licence Board of Ontario (LLBO), a LCBO companion organization, was established under the *Liquor License Act* which was in charge of regulating the sale of alcohol in licensed establishments, as well as alcohol advertising and promotions.⁴⁴
 - The Liquor Licence Board of Ontario (now the Alcohol and Gaming Commission of Ontario) was established to grant establishments licenses to sell liquor by the glass.



Did You Know

Between 1927 and 1958 the LCBO also issued several liquor permit books:

- The *Temporary Liquor Permit* for visitors
- The *Duplicate Liquor Permit* for those who had lost previous permits;
- The *Special Permit* for physicians, druggists, dentists and veterinary surgeons, manufacturers, mechanics, scientifics, hospitals
- The *Resident Wine and Beer Permit* and the *Temporary Wine and Beer Permit* in an attempt to wean Ontario citizens off spirits
- The *Single Purchase or Special Single Purchase* permits for a one-time purchase of a small quantity of liquor at a cost of twenty-five cents

In 1962, the LCBO abolished the liquor permit entirely. After 1962 'Purchase Order' forms were the only means to review questionable purchases, consumption and sales.

- 1971: Legal drinking age was reduced in Ontario from 21 to 18 years of age.³⁹
- 1979: Minimum drinking age in Ontario was raised to 19 years of age.³⁹
- 1998: The Alcohol and Gaming Commission of Ontario (AGCO) was formed to assume the responsibilities of the Liquor Licence Board of Ontario and the Gaming Control Commission.⁴⁵
- January 24, 2005: Ontario introduced the "Bring Your Own Wine" (BYOW) program, which allows diners to bring their own unopened wine to dinner at participating restaurants. A corkage fee is applicable as determined by the licensed establishment.³⁹
- February 1, 2005: *Sandy's Law* (Bill 43) came into effect, requiring all licensed establishments to post signs cautioning women that consuming alcohol during pregnancy can cause fetal alcohol spectrum disorder.³⁹
- 2011 - 2012: Recent amendments made to the regulations of the *Liquor Licence Act* governing special occasion permits and licenses to sell liquor came into effect. Examples of some of these changes include changes to monetary penalties for violations of the *Liquor Licence Act*, and specific conditions for serving alcohol with a special occasion permit (e.g., such as offering food while alcohol is being served).⁴⁶
- 1962: *Ontario Liquor Licence Act* was amended to broaden certain aspects of licensing and sale of alcoholic beverages. Hours of sale for on-premise consumption extended to up to 12 hours per day.³⁹
- 1969: Self-service liquor stores were introduced in Ontario.³⁹

Alcohol Regulation in Ontario

Both the Alcohol and Gaming Commission of Ontario (AGCO) and the Liquor Control Board of Ontario (LCBO) have a significant role in the regulation of alcohol in Ontario.

The Alcohol and Gaming Commission of Ontario (AGCO)

The Alcohol and Gaming Commission of Ontario (AGCO) is a provincial regulatory agency that reports to the Ministry of the Attorney General and is responsible for regulating alcohol use by administering the following:

- *Alcohol and Gaming Regulation and Public Protection Act*, 1996 (Sections 3 and 4)
- *Liquor Licence Act*
- *Wine Content and Labelling Act*, 2000
- *Liquor Control Act* (Section 3(1) b, e, f, g and 3(2)a).

The Liquor Control Board of Ontario

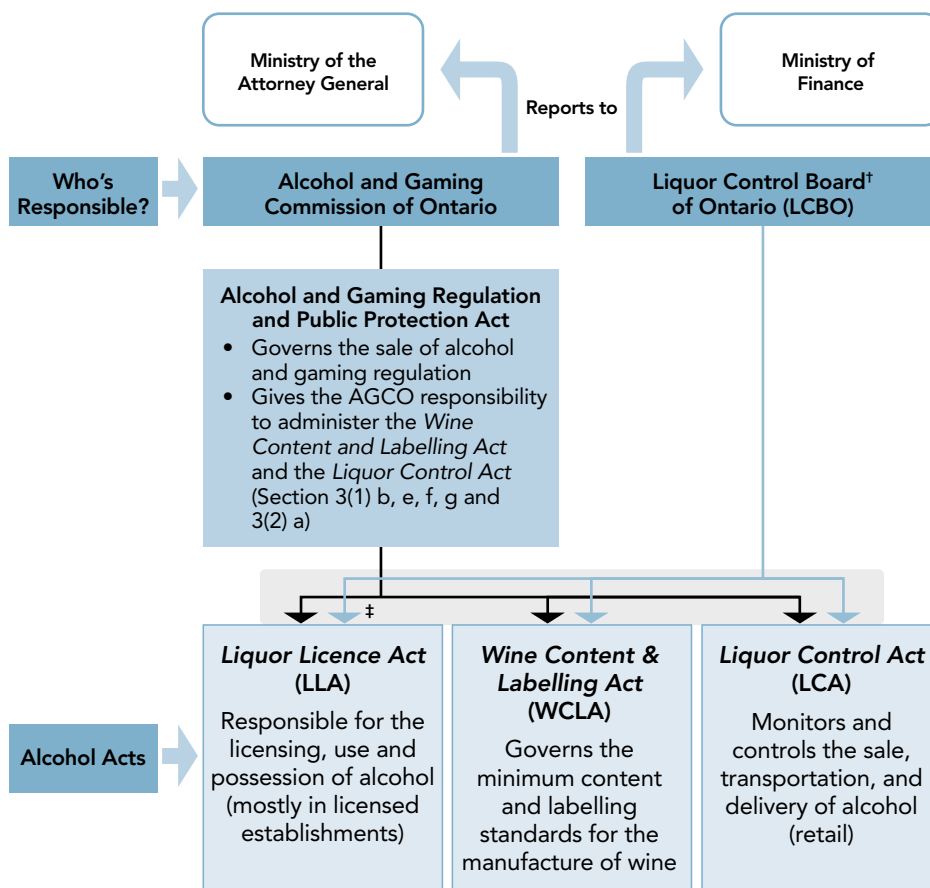
The Liquor Control Board of Ontario (LCBO) controls the sale and transportation of liquor for home consumption and liquor sales to licensed establishments through LCBO stores, Brewers Retail stores and brewery, winery and distillery retail stores throughout Ontario. The board buys wine and liquor products for resale to the public and tests them to maintain high standards of quality. The LCBO also establishes prices for beer, wine and spirits.



The Lieutenant Governor in Council of the LCBO appoints up to 11 members. The members of the board are appointed to hold office for a term of five years and may be reappointed for further succeeding terms not exceeding five years each.⁴⁷

Figure 6.1 illustrates the relationships between Ontario's alcohol regulatory agencies and alcohol acts.

Table 6.1
Ontario's Alcohol Regulatory Agencies and their Relationship with Current Alcohol Acts



† The Board of LCBO is comprised of up to 11 members who are appointed by the Lieutenant-Governor, through Orders-in-Council, on the recommendation of the Premier and the Minister of Finance. Members are appointed for a term of up to five years and terms can be renewed.
 Note: The area shaded in grey illustrates the overlapping responsibility among Ontario's alcohol regulatory agencies in the administration of the alcohol acts.
 ‡ Under the LCA (Section 3(1) g), the Board of LCBO has power, subject to the LLA, to determine the municipalities within which government stores shall be established or authorized and the location of such stores in such municipalities.

Ontario Laws and Regulations Pertaining to Alcohol

The following summarizes four laws and regulations within Ontario pertaining to alcohol:

- *Alcohol and Gaming Regulation and Public Protection Act* and Regulations
- *Liquor Control Act* and Regulations
- *Liquor Licence Act* and Regulations
- *Wine Content and Labelling Act* and Regulations

Alcohol and Gaming Regulation and Public Protection Act and Regulations

This Act governs the sale of alcohol and regulation of gaming in Ontario. Its regulations describe the structure of the Alcohol and Gaming Commission of Ontario.

Liquor Control Act and Regulations

The *Liquor Control Act* gives the Liquor Control Board of Ontario the right to import and sell liquor, establishing its role as first receiver of all alcohol imported into the province. This includes the ability to:

- buy, import, sell and have in its possession for sale, liquor and other products containing alcohol;
- control the sale, transportation and delivery of liquor; and
- do all things necessary for the management and operation of the board in the conduct of its business.

The AGCO is also responsible for administering parts of the LCA as follows:

- To control the sale, transportation and delivery of liquor.
- To authorize manufacturers of beer and spirits and wineries that manufacture Ontario wine to sell their beer, spirits or Ontario wine in stores owned and operated by the manufacturer or the winery and to authorize Brewers Retail Inc. to operate stores for the sale of beer to the public.
- To control and supervise the marketing methods and procedures of manufacturers and of wineries that manufacture Ontario wine.
- Subject to the *Liquor Licence Act*, to determine the municipalities within which

government stores shall be established or authorized and the location of such stores in such municipalities.

Liquor Licence Act and Regulations

The sale, service and consumption of alcohol in Ontario are controlled by the *Liquor Licence Act* (LLA), which is overseen by the AGCO. The LLA sets out the rules for the sale and service of beverage alcohol in this province as follows:

- alcohol licenses and permits
- the responsible use of alcohol (e.g., sale of alcohol to an intoxicated person, sale of alcohol to a person under the age of 19 years)
- compliance, as it relates to alcohol enforcement
- alcohol-related offences (e.g., penalties for not adhering to the Act)
- how municipal by-laws interact with the Act

The Government of Ontario has made amendments over the years to the LLA to eliminate unnecessary regulations and strengthen social responsibility requirements. Since 2011, a number of changes have been made to Regulations 389/91 (special occasion permit program) and 719 (licenses to sell liquor), which are currently in effect.



Wine Content and Labelling Act and Regulations

The *Wine Content and Labelling Act* (2000) establishes the minimum content and labelling standards for the manufacture of wine in Ontario. It requires all wine manufactured in Ontario to contain a minimum of 30% Ontario grape or grape product in each bottle.

Alcohol Manufacture, Distribution, and Sales in Ontario

Ontario's liquor system resembles other packaged goods systems in which products are manufactured and then distributed through wholesale operations to retail outlets. The main difference is that governments closely regulate the manufacture, distribution and sale of alcohol. Brewers, wineries and distillers in Ontario manufacture alcohol under a licence from the AGCO. Many

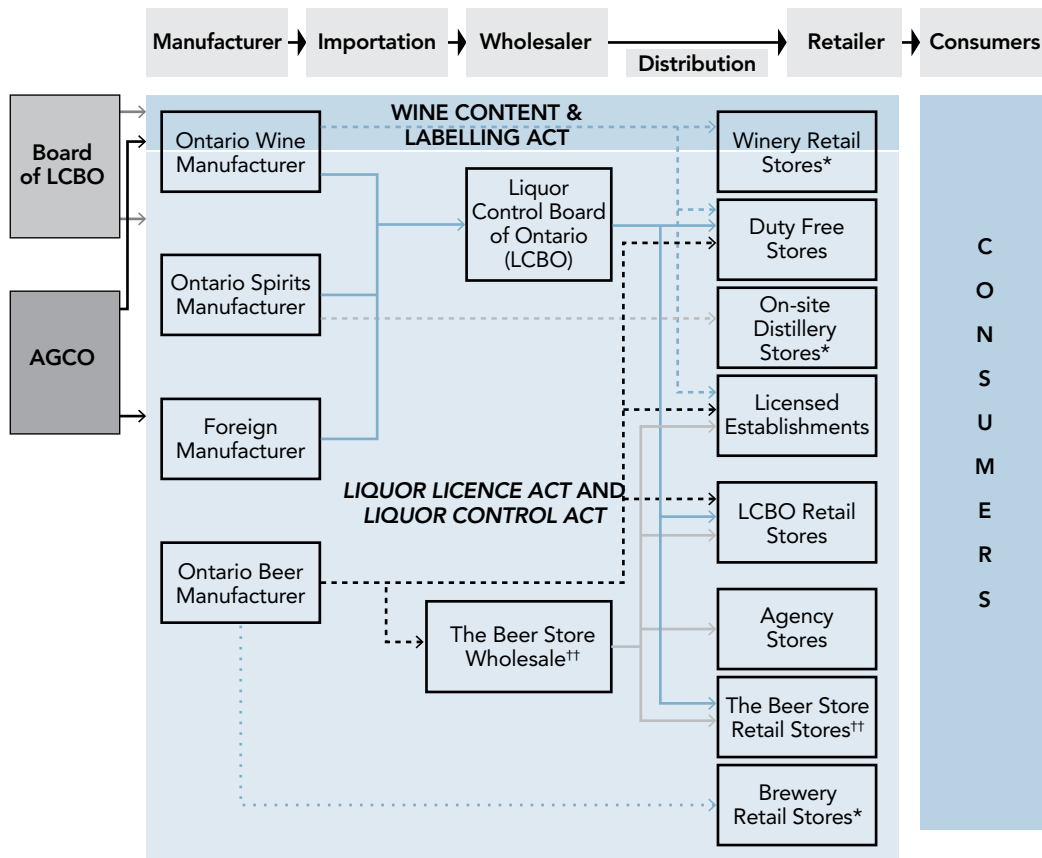
manufacturers are authorized to sell their beer, spirits or Ontario wine in stores owned and operated by the manufacturer or the winery. They can also sell and deliver their products to the LCBO or the Brewers Retail Inc (BRI) for sale to the public. Manufacturers outside of Ontario may sell their products only to the LCBO, as the designated first receiver of imported alcohol.

In Ontario, the wholesale, distribution and retail functions are highly integrated. Both LCBO and BRI function as a wholesaler, distributor and retailer within their own supply chain. They also act as wholesalers to each other and to agency stores, licensed establishments and duty-free stores, depending on the type of product.⁴⁸

Figure 6.2 describes the manufacturing, wholesale and retail relationships within Ontario's liquor system as of 2014.



Table 6.2
The Ontario Liquor System



Adapted from: Strategy for transforming Ontario's beverage alcohol system. A report of the beverage alcohol review panel. July 2005. [Internet].: Ontario Ministry of Finance [updated October 7, 2009; cited March 19, 2015]. Available from: <http://www.fin.gov.on.ca/en/consultations/basr/report.html>.
 ‡ The Beer Store (Brewers Retail) is a private retailer operated by three major foreign-based breweries: Labatt, Molson and Sleeman. In 2015, The Beer Store opened up ownership to Ontario craft brewers by issuing preferred shares in the company.
 * Ontario operated winery stores are owned and operated by the Ontario wine producers, with each store selling only the brands controlled by that company. On-site distillery stores are owned and operated by the respective distiller and sell only their products. On-site brewery stores are owned and operated by the respective brewer and sell only their products.

Other Ontario Laws and Regulations related to Alcohol

The following summarizes the laws and regulations Ontario related to alcohol:

- *Vintners Quality Alliance Act*
- Liquor Advertising Guidelines
- The *Ontario Highway Traffic Act (HTA)*

Vintners Quality Alliance Act

The *Vintners Quality Alliance Act* ensures the quality standards of a wine by establishing and maintaining an appellation of origin system for Vintners Quality Alliance wine. This allows consumers to identify such wines on the basis of the areas where the grapes are grown and the methods used in making the wine. Only wines being sold under the appellation description are required to confirm to this act.

Liquor Advertising Guidelines

These guidelines, produced by the Alcohol and Gaming Commission of Ontario, provide information about pricing and promotion of liquor by liquor sales licensees as well as guidelines for liquor sales licensees and manufacturers about alcohol promotions and alcohol inducements.

Ontario Highway Traffic Act and Regulations

The *Ontario Highway Traffic Act* regulates drivers and vehicles on Ontario roads. It defines rules related to the use of alcohol and driving of a motor vehicle.

Examples of infractions under the *Ontario Highway Traffic Act*:

- Driving a motor vehicle with a blood alcohol concentration of more than 0.05mg in 100ml of blood.
- As of May 1, 2009, drivers with a blood alcohol concentration between 0.05 and 0.08 (known as the “warn range”) can lose their licence at roadside up to three (for a first occurrence), seven (for second time) or 30 days (for subsequent occurrence).⁴⁹
- As of August 1, 2010, zero blood alcohol concentration for fully licensed drivers less than 21 years of age and novice drivers of all ages in the graduated license system.⁴⁹

Individuals convicted for impaired driving offences face penalties under Canada’s Criminal Code and *Ontario’s Highway Traffic Act*.

Municipal Alcohol Regulation

While most drinking in Ontario occurs at home and in licensed establishments, alcohol can also be consumed during special occasions and functions in some public venues. Local communities have control over where and how alcohol is consumed in municipally owned facilities and parks.

The Alcohol and Gaming Commission of Ontario (AGCO) grants Special Occasion Permits (SOPs) for private, public and industry promotional events (i.e., banquets, weddings, festivals and sporting events), and in municipally owned recreation facilities. They are issued through the LCBO SOP service stores throughout the province on behalf of the AGCO. According to *Ontario’s Liquor Licence Act*, Special Occasion Permit holders are responsible for the safety and sobriety of their event’s participants. In order to better manage the consumption of alcohol in municipally owned recreation facilities and areas, a growing number of local governments have made the decision to implement a municipal alcohol policy.³⁵

Municipal Alcohol Policy (MAP)

A municipal alcohol policy (MAP) is a policy document that describes alcohol use on municipally owned property, including recreation centres, halls, sports arenas, fields, parks and beaches. It clearly lays out where alcohol use is and is not allowed on municipally owned property, and specifies various stipulations and restriction on events involving alcohol, including: SOPs, liquor licenced events under a caterer's endorsement, and/or events in a municipally licenced facility.

A MAP is guided by, but cannot supersede, provincial liquor regulations.

Many municipalities in Ontario have implemented alcohol risk management policies in an attempt to reduce problems related to alcohol use. At present, all three municipalities in Peel are at varying degrees of developing and updating their MAPs.



chapter 7

THE ALCOHOL INDUSTRY



Key Messages

- The number of alcohol-related establishments and vendors in Peel account for 6% of all establishments in Ontario.
- In Peel, restaurants make up the majority (85%) of establishments that sell alcohol.
- The per capital sale of alcohol per person in Ontario is second lowest in the country.
- With the exception of LCBO data, information about alcohol sales, taxes and revenue are not available for Peel.
- Alcohol accessibility has increased with Ontario initiatives such as promoting the sale of local wines in farmers markets.

Some History about Alcohol Production in Canada and Ontario

- **1650:** Canada’s first commercial brewery was established in Montreal.
- **1769:** Canada’s first distillery was established in Quebec City.⁵¹
- **1927:** The Liquor Control Board of Ontario (LCBO) opened 86 stores.
- **1928:** Brewers Warehousing Ltd. (now The Beer Store retail system), began operating in Ontario.³⁹
- **1935:** Wineries were allowed to operate one wine store from their premises.
- **1965:** Changes were made to the *Liquor Licence Act* regulations concerning hours of operation of licensed premises. The closing hours, in effect since wartime beer shortage days, were lifted. Beverage rooms throughout Toronto remained open during the former compulsory closing time of 6:30 p.m. to 8:00 p.m.
- **1969:** The first self-serve LCBO store opened.
- **1985:** The first in-store merchandising program was introduced.
- **2007:** The “By the Glass” initiative allows Ontario wineries and breweries to make an application to the Alcohol and Gaming Commission of Ontario for a Manufacturer’s Limited Liquor Sales Licence to sell and serve their wine and beer to patrons for consumption in single servings at their manufacturing site.



Licensed Alcohol Establishments in Peel and Ontario



Highlights

- There are a total of 1,042 alcohol-related establishments and vendors in Peel accounting for 6% of all establishments in Ontario.
- In Peel, restaurants make up the majority of establishments that sell alcohol at 85%.

Ontario has a total of 18,948 establishments that sell or make alcohol. Only 6% of all Ontario alcohol-related establishments and vendors are located in Peel (Table 7.1). Given that Peel's population makes

up about 10% of Ontario's population, this percentage of licensed alcohol establishments is lower than what we would expect.



Table 7.1
Alcohol Producers and Vendors by Type,
Peel and Ontario

Type of Producer and vendor	Total number in Ontario	Total number in Peel	Per cent located within Peel
Distillery (2012)	18	2	11.1
Winery (2012)	205	7	3.4
Brewery (2012)	59	3	5.1
All bottle on premises (2012) AGCO*	583	23	3.9
Licensed establishments	16,789	957	5.7
Beer Stores (2014 website)	441	25	5.7
LCBO† stores (2014)	634	25	3.9
LCBO† agency stores (2014)	219	0	0
TOTAL NUMBER OF ALCOHOL ESTABLISHMENTS	18,948	1,042	5.5

*Alcohol and Gaming Commission of Ontario

† Liquor Control Board of Ontario

Note: LCBO agency stores are privately owned and operate under a licence from the liquor authorities, usually to provide services to residents of small or remote communities.

Sources:

Ontario and Peel distillery, winery and brewery for 2012: Peel Public Health.

Ontario all bottle on premises for 2012/2013: Alcohol and Gaming Commission of Ontario. Alcohol and Gaming Commission of Ontario 2012/2013 Annual Report. Ontario, 2013.

Peel all bottle on premises for 2012/2013: Peel Public Health.

Peel licensed establishments for 2012: Peel Public Health.

Ontario licensed establishments for 2012/2013: Alcohol and Gaming Commission of Ontario. Alcohol and Gaming Commission of Ontario 2012/2013 Annual Report. Ontario, 2013.

Beer Stores for 2014: Beer Store. Store locations. Cited June 18, 2014. Internet.

LCBO Stores and Agency Stores for 2013: Liquor Control Board of Ontario. Find a store. Cited June 14, 2014. Internet.

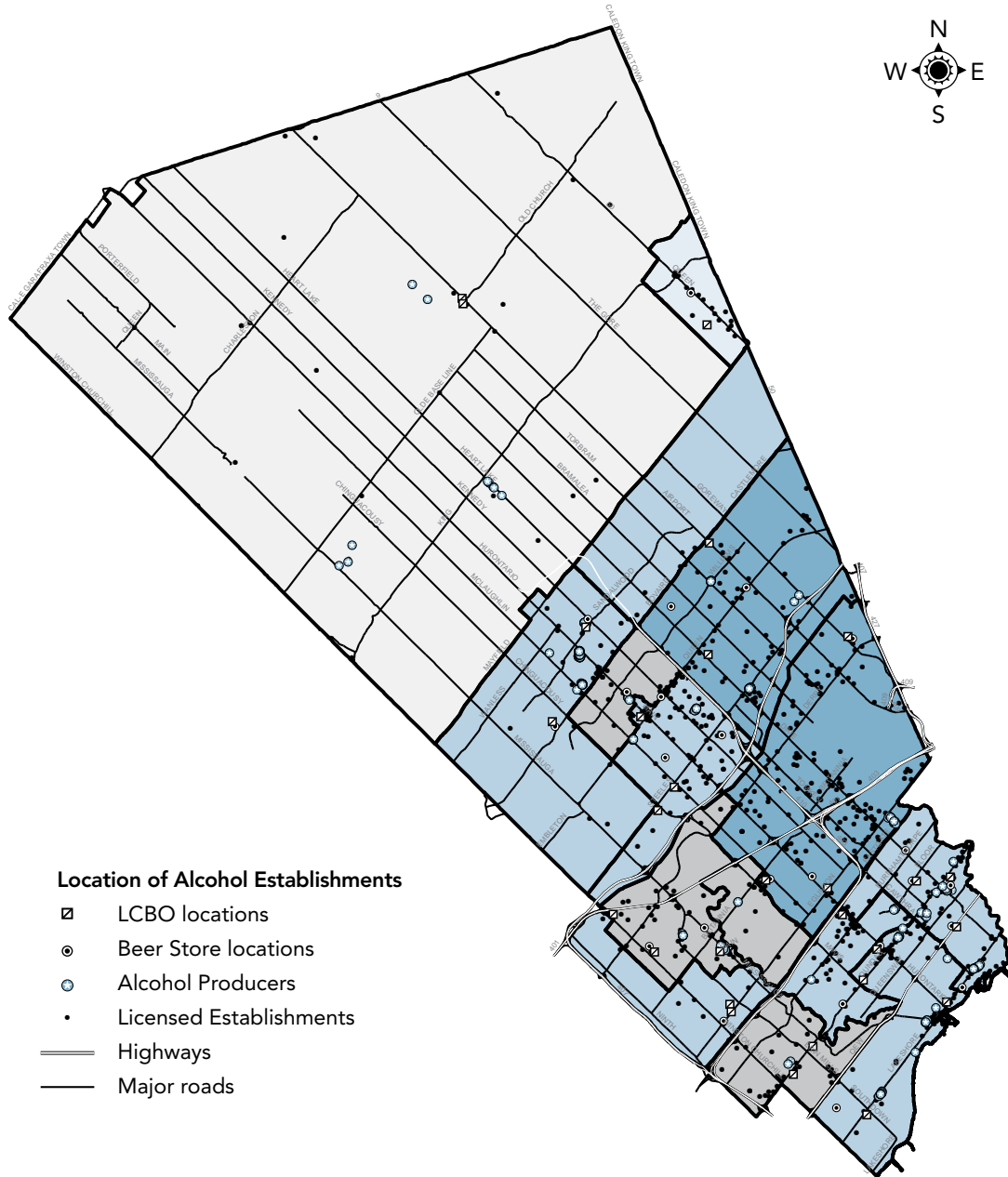


Did You Know

- Vintner's Quality Alliance wines are now permitted to be sold at farmers markets as part of Ontario's initiative to promote local wine.

Map 7.1 shows the distribution of establishments that either produce or sell liquor in Peel.

Map 7.1
Location of Alcohol Establishments,
Peel, 2012–2014



Location of Alcohol Establishments

- ▣ LCBO locations
- Beer Store locations
- Alcohol Producers
- Licensed Establishments
- Highways
- Major roads

† Alcohol producers include Bottle on premise, Brewery, Distillery and Winery

Sources:

LCBO addresses: www.lcbo.com. Accessed March 20, 2014.

Beer Store addresses: www.thebeerstore.ca. Accessed March 20, 2014.

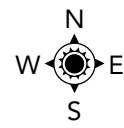
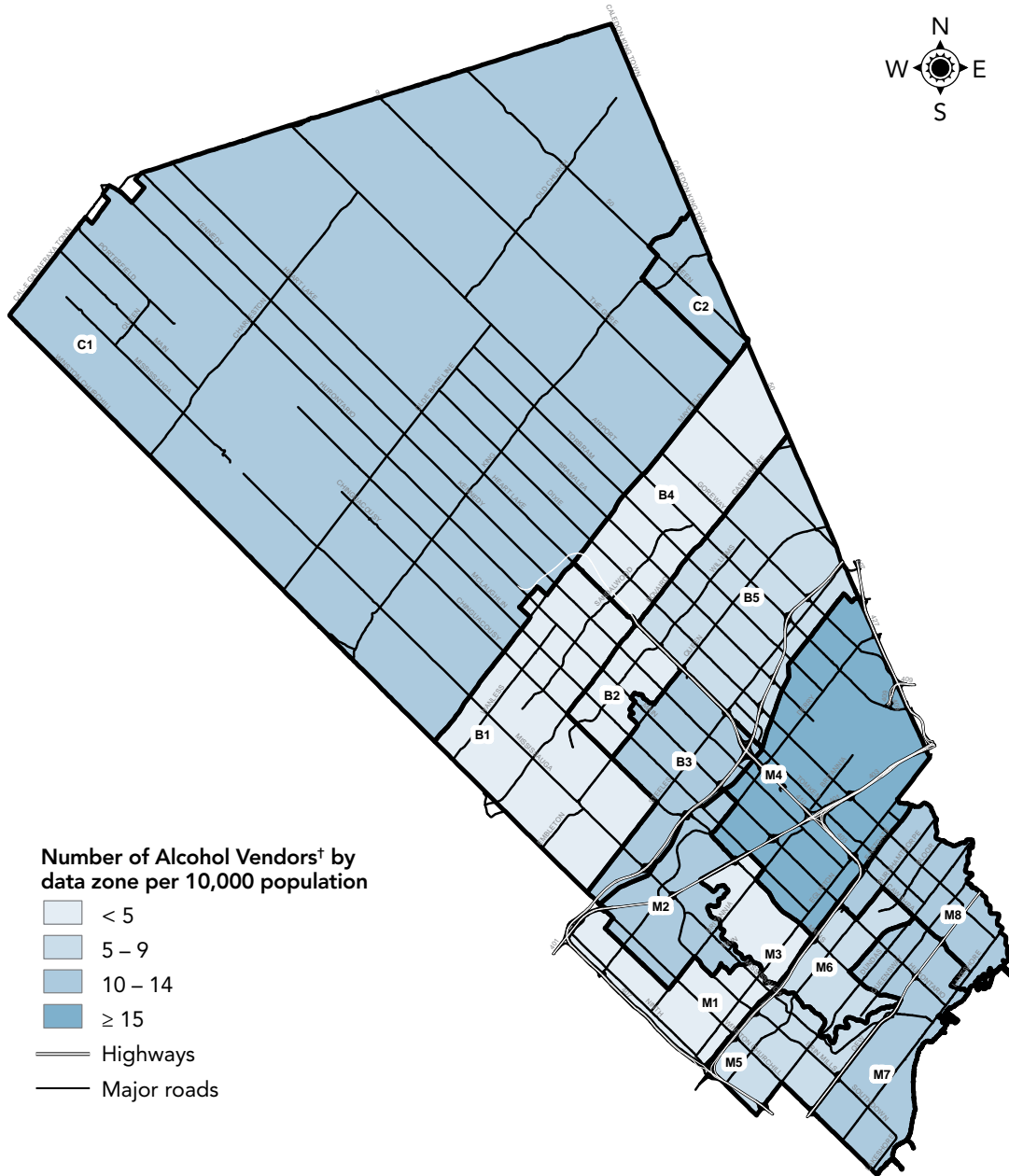
All other producers and establishment addresses: Alcohol and Gaming Commission of Ontario. Personal communication 2012.

Population: Tax File Data (T1 Family File) 2011, Statistics Canada.

0 4 8 Kilometers

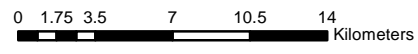
Map 7.2 shows the number of establishments that either produce or sell liquor within Peel per capita by data zone. The area with the highest rate of alcohol-related establishments is M4. This area contains Pearson International Airport and as a result the population count is much lower.

Map 7.2
Number of Alcohol Vendors[†] per 10,000 population by Data Zone, Peel, 2014



[†] Alcohol vendors include Bottle on premise, Brewery, Beer Store, Distillery LCBO and Winery

Sources:
 LCBO addresses: www.lcbo.com. Accessed March 20, 2014.
 Beer Store addresses: www.thebeerstore.ca. Accessed March 20, 2014.
 All other vendor addresses: Alcohol and Gaming Commission of Ontario. Personal communication 2012.
 Population: Tax File Data (T1 Family File) 2011, Statistics Canada.



In Peel, restaurants make up the majority of types of establishments that sell alcohol at 85%. This is followed by bars (3.6%) and hotels or motels (3.4%).

Table 7.2
Type of Licensed Liquor Establishments,
Peel, 2012

Type of establishment	Number of establishments	Per cent of all establishments
Restaurant	809	84.5
Bar/tavern/nightclub/sports bar	34	3.6
Hotel/motel	33	3.4
Banquet hall	26	2.7
Social club	21	2.2
Billiard or pool hall	10	1.0
Adult entertainment	6	0.6
Retirement residence	5	0.5
Bowling alley	4	0.4
Theatre	3	0.3
Golf course	2	0.2
Stadium	2	0.2
College/University	1	0.1
Lounge	1	0.1
TOTAL	957	100

Source: Peel licensed establishments for 2012. Peel Public Health.

Alcohol Sales, Pricing, Taxes and Revenue



Highlights

- Of the 13 provinces and territories, Ontario's per capita sale of alcohol per person is the second lowest, at 7.5 litres per person.
- In Ontario, total alcohol sales are \$7.5 billion. Almost half (42%) of all alcohol sold is beer.

? Did You Know

1927 – 1958: The Liquor Control Board of Ontario used three pieces of administrative technology to capture all purchases and sales of liquor in Ontario:

- The Liquor Permit book, a passport-like document carried by all permit holders in the province, which identified and included a complete record of their purchases.
- The purchase order form, which documented individual purchases.

- Endorsement stamps, which retail store employees used to stamp purchase records as having been reviewed, approved and filled.³⁶

1957: A permit card was used to replace the liquor permit book for individuals to purchase alcohol for off-premise consumption.³⁹

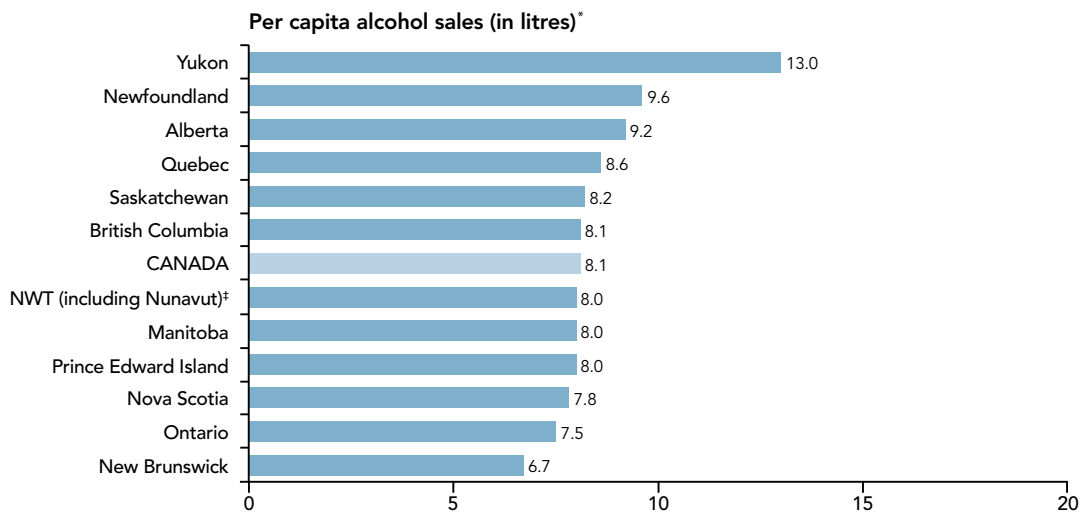
1961: Liquor permits required to purchase beverage alcohol were abolished.

Alcohol Sales

In Canada, the amount of alcohol sold is equivalent to about 8.1 litres per person per year. Of the 13 provinces and territories, Ontario’s per capita sale of alcohol per person is one of the lowest, at 7.5 litres per person (Figure 7.1). These data take into

account the amount of alcohol sold per person and do not reflect the varying price of alcoholic beverages across Canada.

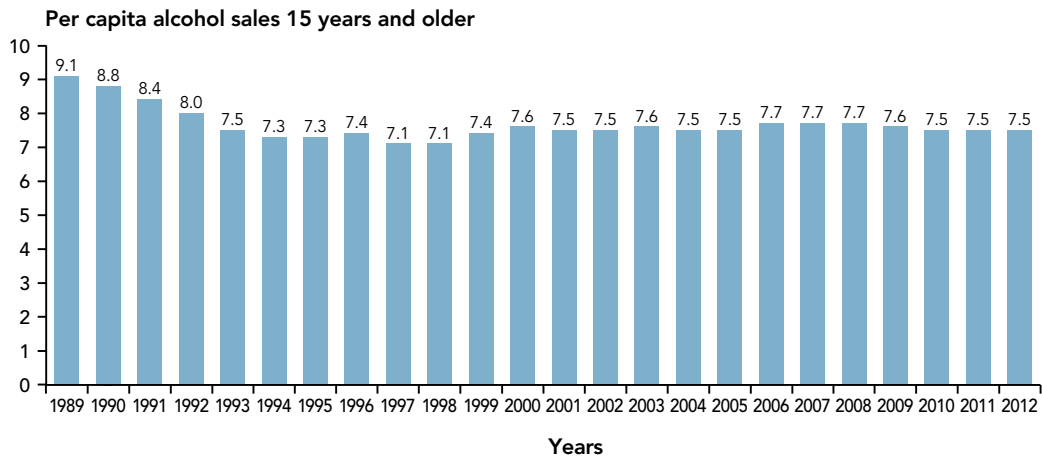
Figure 7.1
Per Capita† Volume of Sales (in Litres) of Alcoholic Beverages by Province, Canada, 2012



† Per capita values may not add due to rounding
 * Reflects population aged 15 years and older
 ‡ The per capita sales of the Northwest Territories and Nunavut are combined since the distribution centre in Nunavut is not representative of all sales of the territory.
 Source: Statistics Canada. Table 183-0019 – Volume of sales of alcoholic beverages per capita 15 years and older, fiscal years ending March 31, annual (litres), CANSIM (database). Accessed October 2, 2013.

The per capita sales of absolute alcohol in Ontario have been relatively stable over the past 20 years (Figure 7.2). In 2013, the sale of alcoholic beverages per capita for those aged 15 years and older in Ontario was \$669.⁵²

Figure 7.2
Per Capita† Volume of Sales in Litres of Absolute Alcohol,
Ontario, 1989–2012



† Per capita values may not add due to rounding

Source: Statistics Canada. Table 183-0019 – Volume of sales of alcoholic beverages per capita 15 years and older, fiscal years ending March 31, annual (litres), CANSIM (database). Accessed October 2, 2013

In Ontario, total alcohol sales are \$7.5 billion (Table 7.3). Almost half (42%) of all alcohol sold is beer.

Table 7.3
Alcohol Sales and Proportion of Sales,
Ontario, 2013

	Beer	Wine	Spirits	Total
Total sales of alcoholic beverages	\$3,172,601,000	\$2,263,607,000	\$2,069,506,000	\$7,505,714,000
Proportion of sales	42%	30%	28%	100%

Sources: Statistics Canada. Table 183-0015. Sales of alcoholic beverages of liquor authorities, wineries and breweries, by value and volume, fiscal years ended March 31. CANSIM (database). Accessed October June 16, 2014.

The Consumer Price Index and Alcohol Pricing

The consumer price index (CPI) is used to monitor changes in Canadian consumer prices. It is calculated by quantifying items in a fixed basket of goods. Figure 7.3 shows pricing for alcohol served in licensed establishments and for alcohol purchased from stores, compared to the overall consumer price index.

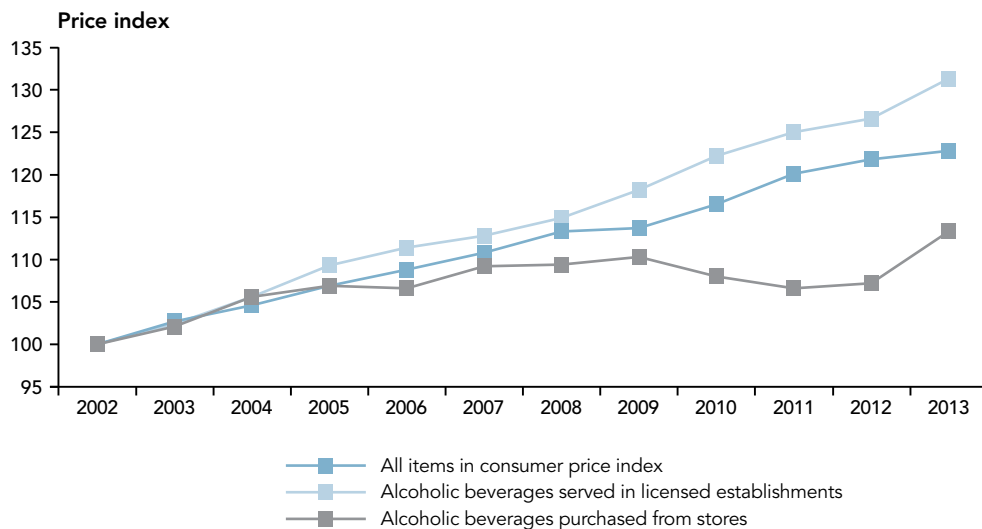
The middle line is the consumer price index. In 2013, the CPI was 122.8. We can interpret this to mean that in comparison with the base period of 2002, the price of a fixed basket of goods has increased by about 23%. The pricing of alcoholic beverages served in licensed

establishments has changed since the base period of 2002 and by 2013 had increased by approximately 31%. This is eight percentage points higher than the CPI.

Pricing of alcohol purchased from stores has also increased by 13% since 2002, which is lower than the rate of inflation. Hence, alcohol purchased from stores has remained less expensive relative to that purchased in licensed establishments.

Figure 7.3

Alcohol Pricing Compared to the Consumer Price Index for Alcohol Served in Licensed Establishments and Purchased in Stores, Ontario, 2002–2013



Note: 2002 is the base period.
 Source: Statistics Canada. Table 326-0021. Consumer Price Index, 2009 basket, annual, CANSIM (database).
 Accessed October 2, 2013.

In Ontario, the minimum price standards vary by the type of alcohol and quantity being sold (Table 7.4).

Table 7.4
Minimum Alcohol Price and Size Standards,
Ontario

	Size and minimum price			
Beer	284ml (10 oz)	455ml (16 oz)	568ml (20 oz)	1.7 l (60 oz)
	\$1.67	\$2.67	\$3.33	\$10
Wine	170ml (6 oz)	500ml (18 oz)	750ml (26 oz)	1 l (35 oz)
	\$2.40	\$7.20	\$10.40	\$14
Spirits	14ml (0.5 oz)	43ml (1.5 oz)	57ml (2 oz)	85ml (3 oz)
	\$1	\$3	\$4	\$6

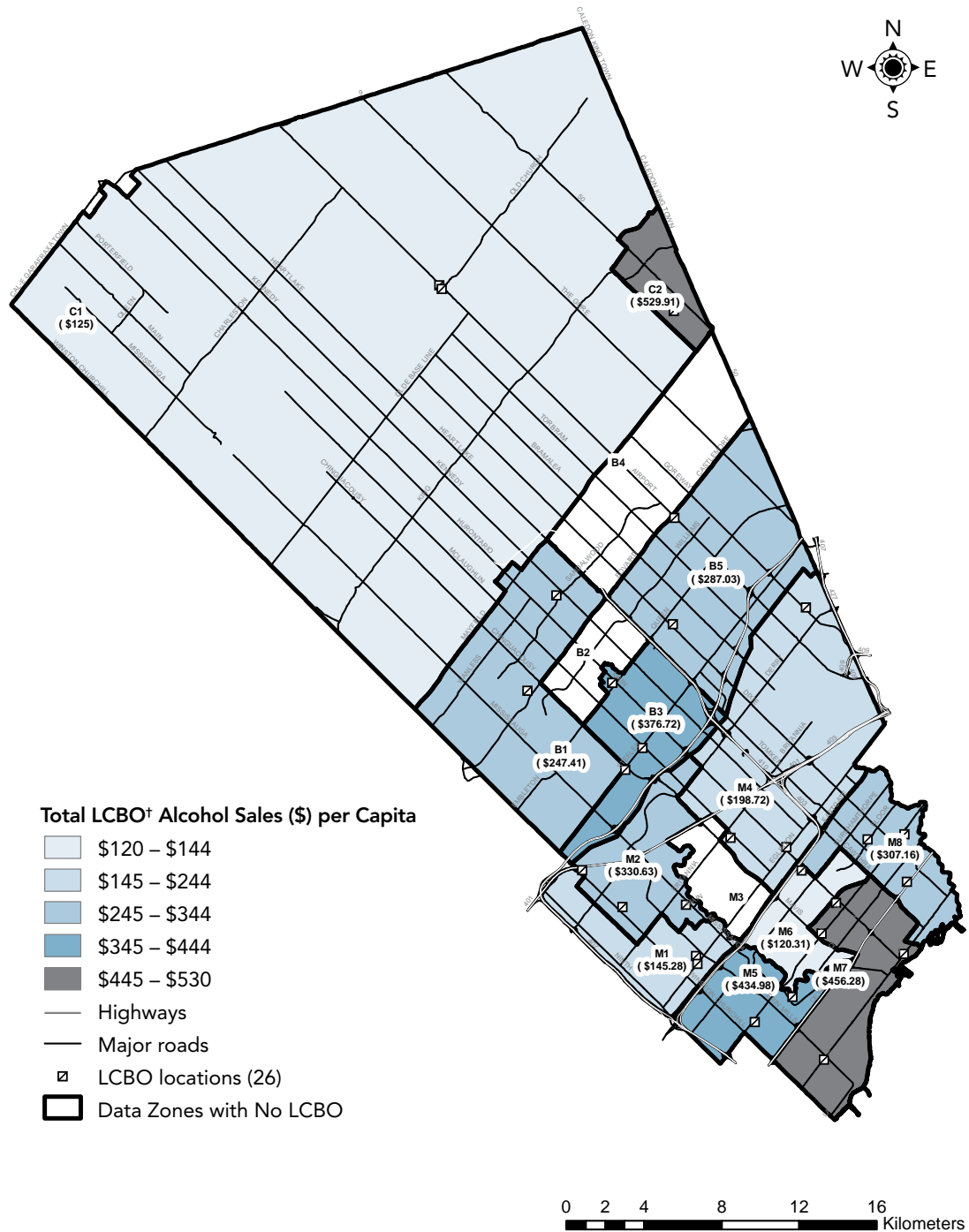
Source: Alcohol and Gaming Commission of Ontario. Liquor Advertising Guidelines: Liquor Sales Licensees and Manufacturers. August 2011.



Map 7.3 shows the LCBO sales per capita by data zone in Peel. Data are not available for other types of establishments. The LCBO store located in Data Zone C2 (Bolton) has the highest sales per capita in Peel.

Map 7.3

LCBO[†] Total Alcohol Sales per Capita by Data Zone,
Peel, 2012



[†] Liquor Control Board of Ontario
 Data from LCBO Sales Data Fiscal year: April 1, 2012 – March 31, 2013. Personal communication August 15, 2013
 Population: Tax File Data (T1 Family File) 2011, Statistics Canada

Alcohol Taxes and Revenue

The social and economic benefits and costs of beverage alcohol present an interesting paradox to Canadians. On one hand, alcohol taxes provide an important source of revenue for provincial, territorial and federal governments and these funds are used to provide a wide range of goods and services to the population. On the other, risky alcohol consumption is associated with substantial health and social harm that cost those same

governments billions of dollars each year in health and enforcement.³³

Alcohol Taxes

Prince Edward Island has the highest alcohol tax within Canada. The Northwest Territories, Nunavut and Alberta have no alcohol tax (Table 7.5).

Table 7.5

Rates of Provincial Sales Taxes[†] in Canadian Jurisdictions for Alcoholic Beverages and Per Capita Volume of Alcoholic Beverage Sales in Litres, Canadian Provinces and Territories

Province		Type of sales tax			Per capita volume of alcoholic beverage sales in litres
		General Provincial sales tax (%)	Additional alcohol sales tax (%)	Total sales tax on alcohol	
Prince Edward Island		10	25	35	8.0
Newfoundland		0	15	15	9.6
Nova Scotia		0	15	15	7.8
New Brunswick		0	15	15	6.7
Ontario	Liquor stores	8	4	12	7.5
	On-premise	8	2	10	
Manitoba		7	5	12	8.0
British Columbia		7	3	10	8.1
Yukon Territories		0	10	10	13.0
Saskatchewan		6	4	10	8.2
Quebec		7.5	0	7.5	8.6
Northwest Territories		0	0	0	8.0
Nunavut		0	0	0	8.0
Alberta		0	0	0	9.2

[†] Taxes applied separately or as a component of a Harmonized Sales Tax.

Sources:

Per capita volume of alcoholic beverage sales in litres: Statistics Canada. Table 183-0019 – Volume of sales of alcoholic beverages per capita 15 years and older, fiscal years ending March 31, annual (litres), CANSIM (database). Accessed October 2, 2013.

Stockwell, T., Leng J., Sturge, J. Alcohol Pricing and Public Health in Canada: Issues and Opportunities. Centre for Addictions Research of BC, University of Victoria, British Columbia, Canada. February 2006.

Alcohol Revenue

The production and sale of alcohol generate a substantial amount of revenue for federal and provincial governments both from sales taxes and markups applied directly to alcohol products and from income and other taxes derived from alcohol-related economic activities. However, governments only report direct revenues from the control and sale of alcohol on an annual basis.⁵³

The Ontario government collected an estimated \$2.3 billion in alcohol revenues in fiscal 2013 excluding sales tax revenues related to alcohol sales. This revenue is a combination of Liquor Control Board of Ontario (LCBO) profit transfers and beer and wine taxes collected in relation to the Beer Store and winery retail store sales.

The LCBO collects markups and fees on all products that it sells (retail and wholesale). The transfer to the government represents the net profit of the agency once its operating expenses have been paid.

Beer and wine taxes in relation to the Beer Store and winery retail store sales are consumer taxes set under the *Alcohol and Gaming Regulation and Public Protection Act*, 1996. These taxes are pre-collected by manufacturers and remitted directly to the Ministry of Finance by breweries and wineries.

DON'T DRINK
AND DRIVE

chapter 8

ALCOHOL-RELATED PUBLIC OPINION AND PUBLIC POLICY



Key Messages

- There are a variety of federal, provincial and municipal policies and interventions aimed at reducing and controlling the consumption of alcohol.
- Public opinion data about alcohol policy can be used to change existing or introduce new policies.

Alcohol policies developed by governments and other leaders through laws, rules and regulations are aimed at addressing alcohol problems in order to promote the health of the population as a whole.³⁵

Alcohol policy can help minimize or prevent alcohol-related consequences by implementing specific strategies with regard to alcohol problems. For example:

- increasing alcohol taxes
- regulating the physical availability of alcohol
- restricting marketing
- controlling drinking and driving
- allocating resources toward prevention
- education or treatment services.²⁸

This chapter will examine existing alcohol interventions and policies and describe public opinion data for some of these interventions and policies.

Alcohol Policy Levers

There are several types of evidence-based policies and interventions aimed at reducing and controlling the consumption of alcohol. These policies and interventions can be categorized as either a tier one or a tier two approach.

Tier one policies aim to reduce population-level damage from alcohol and reduce high-risk drinking in the future (i.e., regulating alcohol pricing and taxation, regulating physical availability, restricting alcohol marketing).

Tier two policies are oriented to specific drinking situations, risky behaviours, contexts or sectors of the population (i.e., modifying drinking contexts, drinking and driving countermeasures, alcohol education and persuasion, and treatment and early interventions). Details of each are summarized in Table 8.1.

Table 8.1
Municipal Influence and Public Opinion on Alcohol Policy

Tier and type of policy	Ability to modify through municipal or local level	Public opinion data available
Tier 1 - Pricing and taxation		
• Alcohol taxes		✓
• Minimum pricing		
• Prices and tax based on volume of alcohol		
• Bans on price discounts and promotions		
• Special or additional taxation on alcopops and youth-oriented beverages		
Tier 1 - Regulating physical availability		
• Government monopoly of retail sales		✓
• Hours and days of sale restrictions	✓	✓
• Restrictions on density of outlets	✓	✓
• Bans on sales	✓	
• Bans on drinking in public places	✓	
• Minimum legal purchase age		✓
• Rationing		
• Different availability by alcohol strength		
Tier 1 - Restrictions on marketing		
• Legal restrictions on exposure	✓	✓
• Legal restrictions on content	✓	
• Alcohol industry's voluntary self-regulation	✓	
Tier 2 – Modifying the drinking environment		
• Staff training and house policies relating to responsible beverage service	✓	✓
• Staff and management training to better manage aggression	✓	
• Enhanced enforcement of on-premises laws and legal requirements	✓	
• Server liability	✓	
• Voluntary codes of bar practice	✓	
• Late-night lockouts of licensed premises	✓	

Table 8.1 continues ...

Table 8.1 continued

Tier and type of policy	Ability to modify through municipal or local level	Public opinion data available
Tier 2 – Drinking-driving countermeasures		
• Random breath testing	✓	✓
• Lowered blood alcohol concentration limits		
• Sobriety check points	✓	✓
• Administrative licence suspension		
• Low blood alcohol concentration for young drivers		
• Graduated licensing for novice drivers		
• Designated drivers and ride services	✓	✓
• Severity of punishment		
Tier 2 – Education and persuasion		
• Brief interventions with high-risk students	✓	
• College student normative education and multi-component programmes	✓	
• Warning labels and signs	✓	
• Classroom education	✓	
• Mass media campaigns, including drinking-driving campaigns	✓	
• Social marketing	✓	
Tier 2 - Treatment and early intervention		
• Brief interventions with at-risk drinkers	✓	✓
• Mutual help/self-help attendance	✓	✓
• Mandatory treatment of drunk-driving repeat offenders	✓	✓
• Medical and social detoxification	✓	✓
• Talk therapies	✓	✓
• Pharmaceutical therapies		

Source: Babor TF, Caetano R, Casswell S, Edwards G, Giesbrecht N, Graham K, et al. Alcohol: No ordinary commodity: Research and public policy. Oxford Scholarship Online; 2010.

In addition, the three key policies that would have the greatest impact on reducing alcohol related harms include:

- regulating the physical availability of alcohol:
 - limit alcohol density
 - restrict hours of service
 - retail provincial ownership and regulation of the alcohol distribution system through the Liquor Control Board of Ontario (LCBO)
 - limit alcohol permitted at public events
- controlling affordability (this increases government revenues while decreasing alcohol-related harms):
 - volumetric pricing (pricing related to the alcohol content of the beverage)
 - minimum pricing
 - indexation of pricing
- restrictions on marketing:
 - Strengthen local restrictions on alcohol advertising such as imposing constraints on the number, location, size and content of alcohol advertisements.

- Restrict alcohol sponsorship at civic events involving youth.
- Use clear criteria for appropriate marketing practices that also have clear enforcement practices for non-compliance.^{28, 50}

Alcohol-related Policies and Public Opinion

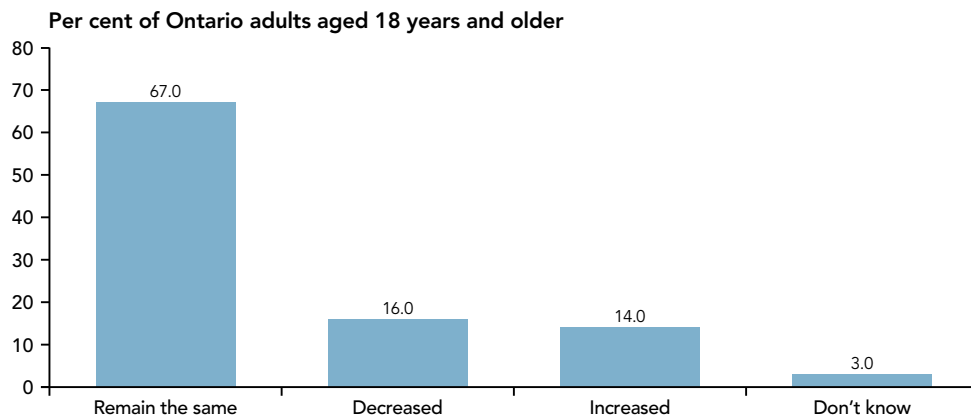
There are a number of provincial policies and programs across all Canadian provinces that have the potential to improve health and reduce social harms from alcohol. These are described throughout the remainder of this chapter along with Ontario public opinion data.

Alcohol Pricing and Taxation

There is much variation in alcohol pricing practices across the provinces and territories. All jurisdictions, except for Alberta, have minimum prices for at least one beverage type sold in off-premise outlets. In addition, all provinces, except for British Columbia and Quebec, have separate (and higher) minimum pricing for on-premise establishments.

While alcohol taxes have been shown to be effective at reducing harms by creating barriers to purchasing alcohol, only 14% of Ontarians state that alcohol taxes should be increased (Figure 8.1).

Figure 8.1
Public Opinion about Alcohol Taxes[†],
Ontario, 2010



[†] Based on the question: "Do you think taxes on alcoholic beverages should be increased, decreased or remain the same?"
Source: Centre for Addiction and Mental Health. Ontarians' Opinions About Alcohol Policy. CAMH Population Studies eBulletin. Sept 2011;12(3).



Regulating Physical Availability

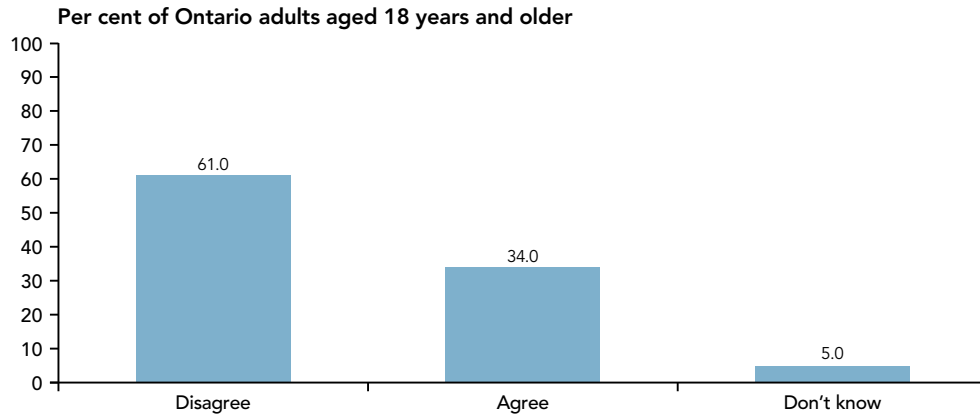
Privatization of Alcohol and Availability of Stores

The privatization of retail alcohol sales is associated with increases in per capita sales.²⁸ The topic of privatization of alcohol retail sales remains an ongoing debate in Ontario and other provinces.

In Ontario, 61% of the population aged 18 years and older state that the Liquor Control Board of Ontario stores should not be privatized (Figure 8.2).

Figure 8.2

Public Opinion about Closing all Liquor Control Board of Ontario (LCBO) Stores and Allowing Privately Run Stores[†], Ontario, 2011



[†] Based on the question: "The Ontario government should close all LCBO stores, and allow privately-run stores to sell alcohol. Do you agree, somewhat agree, somewhat disagree or strongly agree?"

Source: Centre for Addiction and Mental Health. Ontarians Prefer Current Controls on Access to Alcohol. CAMH Population Studies eBulletin. June 2013;14(2).

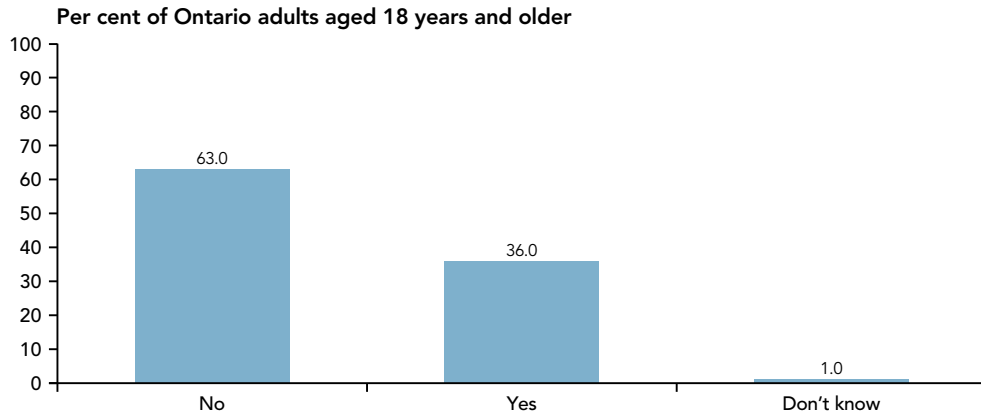
In addition, the majority of Ontario residents (63%) do not think that alcohol should be made available in corner stores (Figure 8.3).

No province has regulated population-based restrictions on overall outlet density. However, many provinces including Ontario allow municipalities to determine the location and number of outlets.



Figure 8.3

Public Opinion about Whether Alcohol should be Available in Corner Stores[†], Ontario, 2011



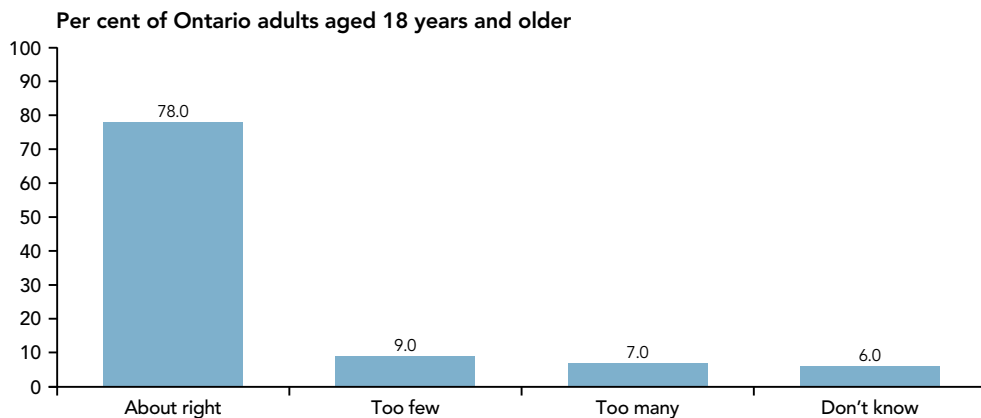
[†] Based on the question: "Do you think alcoholic beverages should be available in corner stores?"
 Source: Centre for Addiction and Mental Health. Ontarians Prefer Current Controls on Access to Alcohol. CAMH Population Studies eBulletin. June 2013;14(2).

Additionally, some jurisdictions provide the opportunity for citizen input on the establishment of new outlets or the issue of new licenses.

Most people (78%) in Ontario think that the current number of places to buy alcohol is about right (Figure 8.4).

Figure 8.4

Public Opinion about the Number of Places to Buy Alcohol[†], Ontario, 2011



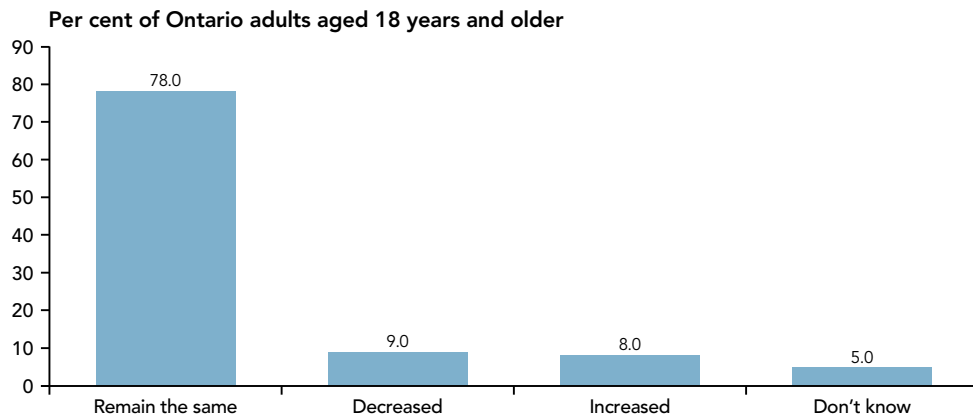
[†] Based on the question: "Including bars, do you think the number of places where you can buy alcohol in your community is too few, too many, or about right?"
 Source: Centre for Addiction and Mental Health. Ontarians Prefer Current Controls on Access to Alcohol. CAMH Population Studies eBulletin. June 2013;14(2).

Hours of Sale

In Ontario, extended hours of alcohol sales from on-premise establishments may be authorized during special events (e.g., World Cup soccer matches). In general, the majority of the population in Ontario (78%) state that current beer and liquor store hours should remain the same (Figure 8.5).



Figure 8.5
Public Opinion about Beer and Liquor Store Hours†, Ontario, 2010



† Based on the question: "Do you think beer and liquor store hours should be increased, decreased or remain the same?"
Source: Centre for Addiction and Mental Health. Ontarians' Opinions About Alcohol Policy. CAMH Population Studies eBulletin. Sept 2011;12(3).

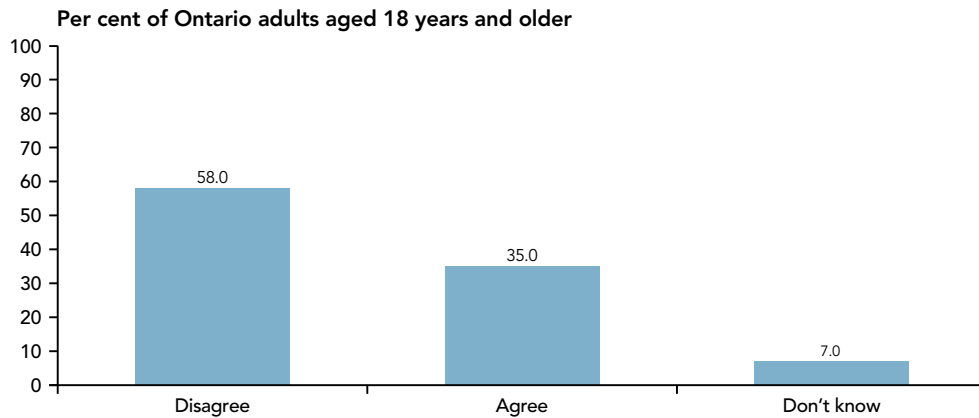
Local Community Control over Alcohol Sales and Consumption

Liquor control board systems are effective in controlling alcohol consumption.

One-third (35%) of Ontario residents believe that local communities should have control over alcohol sales and consumption, rather than the current provincial level of control (Figure 8.6).

Figure 8.6

Public Opinion about Local Community Control over Alcohol Sales and Consumption[†], Ontario, 2011



[†] Based on the question: “Local communities should be able to put their own controls on the sale and consumption of alcohol, even if these controls are stricter than the provincial controls. Do you strongly agree, somewhat agree, somewhat disagree or strongly disagree?”
Source: Centre for Addiction and Mental Health. Ontarians Prefer Current Controls on Access to Alcohol. CAMH Population Studies eBulletin. June 2013;14(2).

Legal drinking age

There is no federally defined legal drinking age in Canada. Each province and territory sets its own limits. In Ontario, the legal drinking age was reduced from 21 to 18 years in 1971 and then increased to 19 years in 1978 where it has remained.

All provinces and territories have supporting legislation that prohibits both the purchase of alcohol by a minor and the sale of alcohol to a minor.



Did You Know

In Ontario, almost half of the population (49%) would support increasing the legal drinking age.⁵⁴

Restrictions on Marketing and Advertising

Almost all provinces have alcohol advertisement content restrictions that go beyond those stipulated in the Canadian Radio-television Telecommunications Committee (CRTC) Code for Broadcast Advertising of Alcoholic Beverages. Many jurisdictions also impose restrictions on the placement of advertisements and the advertising of price.

Some examples of these include: restricting marketing of oversized alcoholic beverages, restricting drinking contests, and restricting public advertising of liquor or availability of liquor at an event.

Ontario forbids the advertisement of two for one specials and sponsorship that associates liquor with driving or any activities that involve care and skill, or elements of physical danger. In addition, ferment on premise locations in Ontario may not promote price per bottle or promote their prices as being inexpensive or “cheap.”

Municipalities can have influence over restrictions on marketing in the following aspects:

- Strengthen local restrictions on alcohol advertising (e.g., impose constraints on number, location, size, and content).
- Apply sponsorship restrictions to civic events.
- Discourage venues from advertising and conducting “happy hour” sales.
- Review existing advertising regulatory systems with view to updating the standards, especially as they pertain to youth, as well as the mechanisms of receiving and responding to consumer complaints about alcohol advertising.



Did You Know

Just over half of Ontarians (53%) would support an increase of prohibitions on wine and liquor in TV advertising.⁵⁴

Modifying the Drinking Environment

Server and management training and challenge and refusal programs

A number of provinces including Ontario have server training programs that are mandatory on a province-wide basis for staff at all public on-premise establishments. In Manitoba and Ontario, server training is also required for staff at special events where alcohol is being served.



Did You Know

Just over three-quarters of Ontarians (76%) support efforts to prevent drunken customers from being served.⁵⁴

Drinking and Driving Countermeasures

Low Blood Alcohol Concentration for Young Drivers

As of August 1, 2010, both novice drivers of any age and all drivers 21 and under, regardless of license class, must have a blood alcohol concentration of zero when operating a motor vehicle. A person caught with any amount of alcohol in his or her blood is subject to the following penalties:

- An immediate 24-hour roadside driver license suspension.
- A fine from between \$60 to \$500 and a suspension period as per the Novice Driver Escalating Sanction scheme, up to and including cancellation of the novice license upon conviction.
- For a fully licensed driver who is 21 and under, a 24-hour roadside driver license suspension if alcohol is found in the blood and a fine of between \$60 to \$500 and a 30-day license suspension if convicted.⁵⁵

Manitoba, Ontario and New Brunswick are the only provinces to adopt a zero BAC limit that extends beyond the length of the graduated license program.

There is no public opinion data available about low blood alcohol concentration for young drivers.

Graduated license system

A graduated licensing program is a cornerstone of any policy aimed at reducing crash risk among youth and novice drivers. These programs are designed to give young and novice drivers an opportunity to gain driving experience while limiting known risks. Such programs typically include a zero blood alcohol concentration requirement, night-time and highway driving restrictions and limits on

the number of passengers. The duration of the programs depend on the province or territory, but generally range from one and a half to three years.

All provinces with the exception of Manitoba have implemented a graduated licensing program of at least two years. Ontario's graduated licensing system was introduced on April 1, 1994 to all new drivers applying for their first car or motorcycle license. The two-step licensing process takes at least 20 months to complete.

There is no public opinion data available about graduated license system programs.

Sobriety check points

Almost all of Ontarians (97%) support random police checks.⁵⁴

Administrative License Suspension

Recognizing that the risk for impairment-related crashes begins below a blood alcohol concentration of 0.08, all provinces except Quebec have established administrative license suspension programs to intervene with drivers who have blood alcohol concentration of 0.05 or higher. The key elements of these programs include immediate roadside licence suspensions and fines or reinstatement fees. In Ontario, this was established as of May 1, 2009.

There is no public opinion data available about license suspensions.

Ignition Interlock Programs

Alcohol ignition interlocks are an effective tool for stopping impaired driving. Using the same technology as the roadside breathalyzers administered by police, an ignition interlock prevents a car from starting or remaining operational if the driver's breath indicates he or she is over a pre-set limit. This program was established in Ontario on August 3, 2010.

All provinces except for New Brunswick and Newfoundland and Labrador have mandatory interlock programs for federal impaired driving offenders, but the quality of the programs vary. All provinces, except for New Brunswick, Nova Scotia and Newfoundland and Labrador, have mandatory remedial programs for federal impaired driving offenders.

There is no public opinion data available about ignition interlock programs.

Education and Persuasion

Warning labels and signs

Ontario has legislated mandatory warning signs for both off-premise and on-premise outlets with a clear and direct health message pertaining to the risks of consuming alcohol while pregnant (i.e. Sandy's law).

There is no public opinion data available about warning labels and signs.



chapter 9

ACKNOWLEDGEMENTS

This report was written by Julie Stratton and Dr. Megan Ward.

Chapter authors and other major contributors included Linda Andrews, Troy MacLean Tom Martin, Simone Kaptein and Teresa Wan.

Additional input was provided by Pat Bromby, Cathy Granger, Michelle Hakvoort and Elizabeth Amorim.

We extend a special thanks to Dr. Lisa Simon, Associate Medical Officer of Health who reviewed our report and provided insightful comments and direction.

This report was designed and formatted by Communications Services.

DATA SOURCES AND LIMITATIONS

Numerous data sources were used in this report and are described in this section. For additional details about the methods of analysis used in each of the chapters of this report, please refer to Chapter 11 - Data Methods.

Census Data

The Census is conducted every five years and data are provided by Statistics Canada. The 2011 Census was conducted on May 10, 2011.

Limitations:

- The Census undercounts some groups, such as the homeless, young adults and Aboriginal people on reserves.
- Comparison between censuses is affected by changes in question wording and in the definition of the population concerned.

National Household Survey

The National Household Survey (NHS) was implemented for the first time between May and August 2011. The reference date for the survey is May 10, 2011 (the same day as Census Day). The target population for the NHS was all persons who usually live in Canada, in all provinces and territories, at the time of the survey. This includes those on Indian reserves or settlements, permanent and non-permanent residents (including refugees and work permit holders and their families).

The NHS was conducted using two methods: self-administered survey (online or paper version) or enumerator-administered (Indian reserves and remote areas) and is available in 31 languages other than English or French.

Limitations:

- Due to the voluntary nature of the NHS, there is a possibility of non-response bias if those who chose not to respond to the survey are systematically different than those who respond.
- There were differences in the questions used to capture some concepts between the 2006 long-form census and the 2011 NHS. Therefore, comparisons between the 2006 and 2011 variables should be made with caution.
- The NHS overestimated some population groups (e.g., population born in the Philippines, per cent of population with a university certificate or diploma below bachelor's level) and underestimated other population groups (e.g., population born in Pakistan, recent immigrants).
- Data from Statistics Canada are transformed using a random rounding process to maintain confidentiality. Values, including totals, are randomly rounded either up or down to a multiple

of five or 10. The result is that, when these data are summed or grouped, the total value may not match the sum of the individual values, since the total and subtotals are independently rounded. Similarly, percentages calculated on rounded data may not necessarily add up to 100%. Note also that the same value in the same table may be rounded up in one analysis and rounded down in the next.

Canadian Community Health Survey

The Canadian Community Health Survey (CCHS) is a Statistics Canada survey designed to provide health information at the provincial, regional and public health unit levels. The target population of the CCHS includes household residents in all provinces and territories. Excluded are populations living on Indian Reserves, Canadian Forces Bases and those living in institutions or more remote areas. There is one randomly selected respondent per household, with an over-sampling of youths resulting in a second member of certain households being interviewed. The CCHS sample is primarily a selection of dwellings drawn from the Labour Force Survey area sampling frame. For the regional-level survey, the sample is supplemented with a random digit-dialing sample in some health regions.

The interview for the health region-level survey includes common content asked of all sample units, optional content determined by each health region from a predefined list of questionnaire modules, and socioeconomic and demographic content.

A focused provincial-level survey consists of some general health content and one focus content topic per cycle. Focus content is intended to be an in-depth treatment of topical issues (e.g., mental health, nutrition).

Prior to 2007, data were collected every two years. Data presented for 2000/2001, 2003 and 2005 reflect this data collection method. Starting in 2007, major changes were made to the survey design in order to improve its effectiveness and flexibility for data collection on an ongoing basis. As a result, data collection now occurs every year, but for Peel a “cycle” is still considered to be a two-year period (e.g., 2007/2008, 2009/2010). Data collection for the CCHS is done by either computer assisted personal or telephone interviewing for the area sample or telephone interviewing for the random digit-dialling sample. Data are weighted to reflect the population of Peel.

All computations, use and interpretation of these data are entirely that of Peel Public Health.

Limitations:

- Depending upon the question, data may be subject to recall bias, social desirability bias and errors from proxy reporting.
- Individuals and/or households without a telephone would be excluded from the sampling frame.
- Some analyses are limited by sample size.



Peel Student Health Survey 2011

In March 2011, Peel Public Health conducted a health survey of students in Peel between Grades 7 and 12 in partnership with the Dufferin-Peel Catholic District School Board and the Peel District School Board. The survey consisted of a questionnaire completed by students within randomly selected schools and classes.

The survey captured information on a variety of topics, including eating habits, physical activity, substance use, mental health, bullying, injury and sun safety. Height and weight measurements were taken by a public health nurse for each participating student. In addition, a physical fitness assessment was conducted by trained assessors (for Grade 9 students only) and an oral health assessment was completed by public health dental hygienists (for Grades 10 and 12 only). The final sample included approximately 8,500 students from 37 elementary schools and 23 secondary schools in Peel.

Limitations

- Data are not weighted to reflect the student population in Peel.
- Survey results are not generalizable to all Grade 7 to 12 students in Peel as the survey was administered to a sample of students in only two participating school boards.
- Excluded by design are student dropouts and students enrolled in French schools and private schools.
- Results should be interpreted with caution as self-reported survey data have the potential for recall error and providing socially desirable answers.
- Due to the cross-sectional nature of the data, causal relationships cannot be inferred.

Ontario Student Drug Use and Health Survey

The Ontario Student Drug Use and Health Survey (OSDUHS), is the longest ongoing school survey of adolescents in Canada, and the second longest in North America. The study is based on 18 survey cycles (to date) conducted every two years since 1977.

All data are based on self-reports derived from anonymous questionnaires administered in classrooms to Ontario students between the Grades of 7 and 12 between November and June of the school year. The survey is restricted to adolescent students enrolled in publicly-funded schools (public and Catholic schools).

Limitations:

- The survey is based on self-reported information, and may therefore be subject to recall bias, social desirability bias and non-response bias.
- Those enrolled in private schools, institutionalized for correctional or health reasons, on First Nations reserves, military bases and in the far northern region of Ontario are excluded.
- The survey does not capture the extent of illicit drug use or trends in illicit drug use among adolescents who may be at higher risk, such as those that dropped out of school or street youth.
- The cross-sectional design provides a snapshot of drug use at a specific time point but does not monitor changes in an individual's drug use over time.

In 2013, Peel bought an enhanced sample in the OSDUHS. The OSDUHS data used in this publication came from the Ontario Student Drug Use and Health Survey conducted by the Centre for Addiction and Mental Health and administered by the Institute for Social Research, York University. Its contents and interpretation

are solely the responsibility of Peel Public Health and do not necessarily represent the official view of the Centre for Addiction and Mental Health.

Cancer Incidence

The Ontario Cancer Registry (OCR), housed at Cancer Care Ontario, is a computerized database of information about all Ontario residents who have been newly diagnosed with cancer (incidence) or who have died of cancer (mortality). All types of cancer are registered, except non-melanoma skin cancer. The system is passive and relies predominantly on administrative data. The Registry is compiled by linking administrative data, clinical and demographic data from four major data sources:

- Hospital discharge and ambulatory care records with cancer diagnoses in the Canadian Institute of Health Information (CIHI), Discharge Abstract Database (DAD) and National Ambulatory Care Reporting System (NACRS).
- Pathology reports with any mention of cancer from hospitals and private laboratories.
- Records from Regional Cancer Centres or Princess Margaret Hospital.
- Ontario death certificates with cancer as the underlying cause of death.

All cancer-related data on these records are reviewed by an electronic system of medical logic to produce consolidated information about the cancer diagnosis. Cancer diagnoses are classified according to the International Classification of Diseases for Oncology, 3rd edition (ICDO-3).

Limitations:

- Currently, this data source only provides information at the Census Division (CD) or Public Health Unit (PHU) level of geography.

Emergency Department Data

Hospital emergency departments were the first centres to report to the National Ambulatory Care Reporting System (NACRS) in fiscal year 2002/2003. Ambulatory visit data provide only a crude measure of the prevalence of a cause for the following reasons:

- A person may not visit the emergency department or may visit several times for the same disease or injury event.
- A person may visit more than one hospital for the same disease or injury event.
- A person may not seek care at a hospital emergency department.

Limitations:

- Ontario residents visiting hospitals outside of the province are excluded. Areas bordering other provinces may be more affected.

Hospital Discharge Data

All hospitals report into the Discharge Abstract Database (DAD). A hospital discharge is a release from hospital due to death, discharge home or transfer to another facility. Hospitalization data provide only a crude measure of the condition being quantified for the following reasons:

- A person may be hospitalized several times for the same disease or injury event.
- A person may be discharged from more than one hospital (when transferred) for the same injury event.
- A person may not seek care at a hospital.

Limitations:

- Co-morbidity contributes uncertainty to classifying the most responsible diagnosis.

- Data are influenced by factors that are unrelated to health status such as availability and accessibility of care, and administrative policies and procedures. This may influence comparisons between areas and over time.



Mortality Data

The Office of the Registrar General obtains information about mortality from death certificates, which are completed by physicians. All deaths within Ontario are registered in the office of the division registrar within which the death occurs. A Statement of Death must be filed with a division registrar before a Burial Permit can be issued.

Limitations:

- Co-morbidity contributes to uncertainty to classifying the underlying cause of death.
- Determining the true cause of death may require further investigation in some instances. For example, when the cause of death could have social or legal ramifications (e.g., suicide).

Ontario Mental Health Reporting System (OMHRS)

Data collection for the OMHRS began on April 1, 2006. Prior to this, information on hospitalizations due to mental illness were captured in the Discharge Abstract Database (DAD). Facilities reporting to the OMHRS include general hospitals and specialty psychiatric facilities within Ontario that have designated adult mental health beds (for patients aged 18 years and older). While the majority of children are admitted to general hospitals, a small proportion of children (2% of patients less than 18 years of age) occupy adult mental health beds; the majority of child and adolescent mental health patients are captured in the DAD.

There are five different types of assessments performed on mental health inpatients that are included in the OMHRS: a full admission, a short-stay, quarterly, discharge and a change in status assessment. Information on a patient's diagnosis, assessment and treatment is collected at several points throughout a patient's stay.

OMHRS uses the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) for mental health diagnoses and the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Canadian Enhancement (ICD-10-CA) for other diagnoses. DSM-IV is a multi-axial classification system published by the American Psychiatric Association, and was developed in conjunction with ICD-10 so that the two classification systems would be consistent and use similar terminology. Any comparison of codes between these systems was done using Appendix H: Classification with ICD-10 Codes of

the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition.

The mental health diagnoses recorded in OMHRS are the Axis I and Axis II diagnoses noted at the time of the inpatient assessment. Data presented in this report were selected using only the DSM-IV Axis I Primary Diagnosis variable, which reflects clinical disorders that represent acute symptoms needing treatment, usually the principle diagnosis or "most responsible diagnosis".

Limitations:

- Data from OMHRS do not represent the true incidence or prevalence of mental illnesses, as they exclude individuals not admitted to hospital as well as those with less severe or undiagnosed mental disorders.
- Co-morbidity contributes uncertainty to classifying the most responsible diagnosis.
- Data are influenced by factors that are unrelated to health status such as availability and accessibility of care, and administrative policies and procedures. These factors may influence comparisons between areas and over time.
- A patient's primary diagnosis may change during the course of their stay and their discharge diagnosis may not reflect what was initially captured upon admission.

Rapid Risk Factor Surveillance System

The Rapid Risk Factor Surveillance System (RRFSS) is an ongoing telephone survey occurring among various public health units across Ontario. Each month, a random sample of 100 adults aged 18 years and older is interviewed regarding awareness, knowledge, attitudes and risk behaviours of importance to public health:

for example, smoking, sun safety, bike helmet use and water testing in private wells. The Institute for Social Research (ISR) at York University conducts the survey on behalf of all RRFSS-participating health units.

Limitations:

- Depending upon the question, data may be subject to recall bias, social desirability bias and errors from proxy reporting.
- Individuals and/or households without a telephone (household or cell) would be excluded from the sampling frame.
- In Peel, the survey is administered in English only.

Ambulance Call Data

Land ambulances provide emergency pre-hospital care and transport of patients to health care facilities for further care. 911 calls for an ambulance are routed through the Central Ambulance Communications Centre.

In Peel, paramedics document patient care on an “Ambulance Call Report form,” which is then entered into an electronic database. There are several documentation points on the form about the reason for the patient call: dispatch problem, primary problem, secondary problem and final primary problem.

The data presented in this report reflect the “final primary problem,” which is the paramedic’s final assessment of the patient’s condition at the point of turning care over to the hospital or other health care provider. It reflects the condition that, in the opinion of the paramedic, is the priority at the time this transfer is made.

Limitations:

- Co-morbidity contributes uncertainty to classifying the “final primary problem.” For example, coding of gastrointestinal problems might actually be diagnosed later as kidney stones.
- Ambulance data reflect the number of calls, and could include a person who received ambulance care more than once.

Police Data

The Records Management System (RMS) database captures information about all calls that Peel Regional Police respond to. Peel Regional Police monitor all police related activity within the municipalities of Brampton and Mississauga. All police calls are documented and entered into the RMS.

Limitations:

- Police calls may involve residents who are not Peel residents.
- Data do not include the Town of Caledon, which is policed by the Ontario Provincial Police.
- Data within this system reflect calls that Peel Regional Police respond to and do not mean a person was convicted.
- Data reflect a snapshot in time and can change for various reasons (e.g., incidents being reclassified, later reporting of incidents). As a result there may be discrepancies with statistics reported in other publications.
- The statistics provided in this report may differ from those used by agencies such as Statistics Canada. Caution should be taken when making comparisons of data.



chapter 11

DATA METHODS

Rounding

Within the majority of tables and figures of this report, values are presented to one decimal of precision. Values in the text of the report are rounded to nearest whole number. Due to rounding, some values may sum to more or less than 100%.

Statistical Significance

The following terms have been used to imply statistical significance between groups: “significantly,” “more likely” and “less likely.” Ninety-five per cent confidence intervals were used to determine the significance of differences between groups.

Data Releasability

To ensure confidentiality and to meet reporting requirements, data are presented as follows:

- Canadian Community Health Survey (CCHS):
 - “NR – Not releasable due to small numbers” (when coefficient of variation greater than or equal to 0.334)
 - “* Use estimate with caution” (when coefficient of variation is between 16.6 and 33.3)
- Cell counts with less than five individuals were suppressed for mortality, hospitalization, emergency department visits, cancer incidence and ambulance and police data.
- Peel Student Health Survey:
 - “NR – not releasable due to small numbers” (when un-weighted numerators had less than 10 individuals and denominator counts had less than 30 individuals)
 - “* Use estimate with caution” (when coefficient of variation is between 16.6 and 33.3)
- Ontario Student Drug Use and Health Survey
 - “NR – Not releasable due to small numbers” (when coefficient of variation greater than or equal to 33.4)
 - “* Use estimate with caution” (when coefficient of variation is between 16.6 and 33.3)

International Classification of Diseases (ICD) Codes

Causes of death or illness are coded using a standard system called the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10). The Ninth Revision of the International Classification of Diseases (ICD-9) was used to code cause of death between 1979 and 1999 and hospital separations between 1986 and 2002. The ICD-10 system was used to code mortality data from 2000 forward. Hospitalization data from 2003 forward were coded using the Canadian version of the ICD-10 system (ICD-10-CA), with codes provided by the Canadian Institute for Health Information. As changes in the coding system may cause artificial changes in the number of cases of a particular cause of illness, trends in specific causes must be interpreted with caution. These were noted in the text when applicable.

Canadian Community Health Survey Data Analysis

For analyses using the Canadian Community Health Survey (CCHS), outcomes of interest where a “missing,” “do not know” or “refused” response was greater than 5% were included in the denominator.

Unless otherwise stated, the following CCHS variables were defined as follows:

Household Income is based on self-reported total household income and the number of individuals in the household (Table 11.1):

Table 11.1
Canadian Community Health Survey Household Income Categories

Income level name	Income level name	Number of people in the household	Total household income
Lowest – middle	Lowest – lower middle	1 – 2 people	<\$14,999
		3 – 4 people	<\$19,999
		5+ people	<\$29,999
Upper middle	Middle	1 – 2 people	\$15,000 to \$29,999
		3 – 4 people	\$20,000 to \$39,999
		5+ people	\$30,000 to \$59,999
Highest	Upper middle	1 – 2 people	\$30,000 to \$59,999
		3 – 4 people	\$40,000 to \$79,999
		5+ people	\$60,000 to \$79,999
Highest	Highest	1 – 2 people	More than \$60,000
		3+ people	More than \$80,000

Source: Canadian Community Health Survey, Statistics Canada.

Education is categorized as follows:

- less than secondary school graduation
- secondary school graduation, no post-secondary education
- other post-secondary education
- post-secondary degree/diploma

Immigrant Status is defined as follows:

- recent immigrant: arrived in Canada within the past 10 years
- long-term immigrant: resident of Canada for 11 or more years
- non-immigrant: Canadian-born population

Ethnicity is categorized into the following eight groups based on a question about cultural and racial background at the time of the interview:

- White
- Black
- East/Southeast Asian (e.g. Chinese, Filipino, Southeast Asian, Cambodian, Indonesian, Laotian, Vietnamese, Japanese, Korean)
- West Asian/Arab (e.g. Arab, West Asian, Afghan, Iranian)
- South Asian (e.g. East Indian, Pakistani, Sri Lankan)
- Latin American (e.g. Mexican, Caribbean, South American)
- Aboriginal people of North America (e.g. North American Indian, Metis, Inuit/ Eskimo)
- Other (multiple responses across categories defined here, and non-response/don't know/refusal)

Chapter Specific Methods

Chapter 1 – Alcohol Use

Low-risk Drinking and Binge Drinking Regression Modelling

A low-risk drinking regression model was developed using Canadian Community Health Survey data from the following years: 2000/2001, 2003, 2005, 2007/2008 and 2009/2010.

A binge drinking regression model was developed using Canadian Community Health Survey data from the following years: 2003, 2005, 2007/2008, 2009/2010 and 2011.

For the low-risk drinking model, low-risk drinking was defined as nine drinks a week for women, with no more than two drinks a day most days; and 14 drinks a week for men, with no more than two drinks a day most days.

For the binge drinking model, binge drinking was defined as the proportion of the population who had five or more drinks on at least one occasion in the past 12 months.

The following variables were included in each model:

Age:

For the low-risk drinking model, age (aged 19 years and older) was a continuous variable.

For the binge drinking model, age (aged 12 years and older) was categorized into the following age groups in years: 12-18, 19-24, 25-34, 35-44, 45-54, 55-64 and 65+.

Sex:

For both models, sex was categorized into males and females. Females were the referent category.

Household income level:

For both models, household income level was derived using the total household income and the number of people living in the household. The variable was categorized as lowest to middle, upper-middle and highest, with the referent group being respondents in the upper-middle category.

Educational level of respondent:

The educational level was defined as the highest level of education reported by the respondent for both models. The variable was categorized as less than secondary school education, secondary graduate, other post-secondary education and post-secondary graduate. Respondents who were post-secondary graduates were defined as the referent group.

Immigrant status:

For both models, a variable for immigrant status was derived using reported time since immigration to Canada. Respondents were categorized as recent immigrants (immigrated 10 or less years ago), long-term immigrants (immigrated to Canada 11 years ago or longer) and non-immigrants (Canadian-born respondents). Respondents who were non-immigrants were defined as the referent group.

Ethnicity:

For the low-risk drinking model, the variable for ethnicity was categorized into respondents who identified as the following:

- White (referent category)
- Black
- East or Southeast Asian
- West Asian or Arab
- South Asian or other (Latin American or other racial origins (including multiple origins))

For the binge-drinking model, the variable ethnicity was categorized into respondents who identified as the following:

- White (referent category)
- Black
- East/Southeast Asian (e.g. Chinese, Filipino, Southeast Asian, Cambodian, Indonesian, Laotian, Vietnamese, Japanese, Korean)
- West Asian/Arab (e.g. Arab, West Asian, Afghan, Iranian)
- South Asian (e.g. East Indian, Pakistani, Sri Lankan)
- Latin American (e.g. Mexican, Caribbean, South American)
- Other (Aboriginal people of North America (e.g. North American Indian, Metis, Inuit/Eskimo, and multiple responses across categories defined here, and non-response/don't know/refusal)

Marital status:

The variable describing marital status consists of three categories in both models. Respondents were grouped as currently married or in a common-law relationship; divorced, separated or widowed; and single. The married/common-law category was defined as the referent group.

Employment status in past week:

In both models, the employment status of respondents was categorized as those who reported being at work in the last week or were absent from work last week (referent category), and those who reported having no job last week. Respondents who reported being permanently unable to work were excluded from the analysis due to the small sample size in Peel.

Sense of community belonging:

A self-reported variable was used to measure respondents' sense of belonging to the local community. In both models, the variable was grouped into two categories: very strong or somewhat strong (referent group), and somewhat weak or very weak.

Self-perceived life stress:

In both models, the variable for self-perceived life stress was similarly dichotomized into respondents who reported being extremely stressed or quite a bit stressed, and those reporting being not at all stressed, not very stressed or being a bit stressed. The latter was used as the referent category.

Self-perceived health:

The variable for self-perceived health was included in both models, and consisted of two categories: excellent, very good or good health, and fair or poor health. Respondents reporting excellent, very good or good health were used as the referent category.

Smoking status:

This variable consisted of two categories for both models: current smokers (daily and occasional), non-smokers (daily and occasional former smokers) and never-smokers. Respondents in the non-smoker category were used as the referent group.

Physical activity level:

Physical activity levels were defined using calculated energy expenditure values, and were categorized as active (referent group), moderate and inactive. This variable was included in the analyses for both models.

Statistical Analysis:

Analysis was performed using SPSS statistical software. Common variables were identified across each individual cycle and were combined to create a merged dataset. Changes in questionnaire content across each cycle were considered prior to merging to ensure the appropriateness of combining cycles. For the final logistic regression analyses, a bootstrap procedure developed by Statistics Canada to account for the complex sampling design of the survey was used to generate robust estimates and confidence intervals.

Exploratory modelling was conducted using a block approach. All determinants of health variables were selected for inclusion in the model. Additional explanatory variables identified in the literature were also considered for inclusion. Missing data were excluded from the analyses.

Collinearity diagnostics were conducted using the variance inflation factor (VIF) and tolerance (TOL). In all models, the variable of inflation was less than five for each variable, indicating no problems with collinearity among the covariates. Odds ratios and 95% confidence intervals were generated.



Chapter 2 – The Health Benefits and Risks of Alcohol Use

In this chapter, the alcohol-attributable fraction (AAF) was used to determine the annual number of preventable cases of disease or injury, hospitalizations, and deaths due to selected diseases and injuries that are attributable to alcohol use. The

diseases selected were those where there were strong relative risk data for alcohol use and the disease. The diseases chosen for this analysis, along with the relative risk of disease for the number of drinks consumed per day by sex, are listed in Table 11.2.

Table 11.2
Relative Risk for Diseases by Alcohol Consumption Level and Sex

Disease	Relative risk by number of drinks per day									
	1		2		3–4		5–6		>6	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
CHRONIC CONDITIONS										
Tuberculosis	1.00	1.00	1.00	1.00	2.94	2.94	2.94	2.94	2.94	2.94
Lower respiratory infections	1.07	1.07	1.14	1.14	1.25	1.25	1.43	1.43	1.79	1.79
CARDIOVASCULAR DISEASES										
Ischemic heart disease	0.81	0.81	0.81	0.81	0.86	0.86	0.98	0.98	1.31	1.31
Conduction disorders and other dysrhythmias‡	1.08	1.08	1.17	1.17	1.32	1.32	1.54	1.54	2.02	2.02
Hemorrhagic stroke (morbidity)	1.11	0.71	1.23	0.86	1.44	1.18	1.78	1.78	2.56	3.49
Hemorrhagic stroke (mortality)	1.10	1.22	1.21	1.49	1.39	2.01	1.68	2.99	2.33	6.02
Ischemic stroke (morbidity)	0.87	0.82	0.94	0.87	1.07	1.01	1.25	1.31	1.63	2.21
Ischemic stroke (mortality)	0.87	0.66	0.95	0.75	1.08	1.05	1.29	1.86	1.70	5.97
Hypertension	1.13	0.99	1.28	1.47	1.54	2.61	1.97	5.17	3.03	15.14
GASTROINTESTINAL DISEASES										
Pancreatitis	1.03	1.03	1.12	1.12	1.41	1.41	2.33	2.33	9.51	9.51
Liver cirrhosis (morbidity)	1.26	2.39	1.59	3.42	2.22	5.05	3.54	7.66	7.91	13.51
Liver cirrhosis (mortality)	1.47	3.34	2.15	5.48	3.76	9.38	8.12	16.71	30.69	36.61

Table 11.2 continues ...

Table 11.2 continued

Disease	Relative risk by number of drinks per day									
	1		2		3–4		5–6		>6	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
DIGESTIVE SYSTEM DISEASES										
Cancer of the lip, oral cavity and pharynx	1.42	1.42	1.96	1.96	2.97	2.97	4.68	4.68	7.97	7.97
Esophageal cancer	1.20	1.20	1.43	1.43	1.87	1.87	2.64	2.64	4.67	4.67
Colon cancer	1.03	1.03	1.05	1.05	1.09	1.09	1.15	1.15	1.26	1.26
Rectum cancer	1.05	1.05	1.10	1.10	1.18	1.18	1.30	1.30	1.53	1.53
Liver cancer	1.10	1.10	1.21	1.21	1.38	1.38	1.60	1.60	1.99	1.99
Laryngeal cancer	1.21	1.21	1.47	1.47	1.95	1.95	2.81	2.81	4.99	4.99
OTHER										
Breast	1.13	1.13	1.27	1.27	1.52	1.52	1.93	1.93	2.93	2.93
Epilepsy	1.19	1.19	1.41	1.41	1.81	1.81	2.52	2.52	4.53	4.53
Diabetes mellitus	0.88	0.64	0.88	0.60	0.94	0.96	1.11	8.39	1.72	16.60
Low birth weight	1.05	1.05	1.29	1.29	1.84	1.84	3.07	3.07	7.85	7.85

Note: The relative risks described reflect those that were assessed for the creation of the new Canadian low-risk drinking guidelines. It should be noted that while there are other diseases that have been attributed to alcohol use (e.g., esophageal varicities, cholelithiasis, spontaneous abortion, prematurity, intra-uterine growth restriction, and psoriasis), the relative risks for these conditions were not available by number of drinks per day and are therefore not presented in the results.

Source: Rehm, J; Kekoe, T; Taylor, B; Patra J. Evidence Base for the Development of Canadian Drinking Guidelines. Toronto, Ontario: Centre for Addiction and Mental Health; September 2009.



Table 11.3 describes existing alcohol-attributable fractions (AAFs) for injuries related to alcohol. A caveat to using these AAFs for Peel calculations is that they have been derived from other Canadian or Australian studies using the drinking patterns from those contexts. As a result, the calculations that use the Canadian or Australian AAFs may not be the most accurate representation of alcohol-related injury outcomes for Peel.

Alcohol-Attributable Cancer Incidence, Disease and Injury Hospitalization, and Death Coding

Alcohol-attributable cancer incidence, disease and injury codes for hospitalizations and mortality were captured using the International Classification of Diseases – Tenth revision described in Table 11.4 and the Diagnostic and Statistical Manual of Mental Disorders – Fourth edition (DSM-IV) coding in Table 11.5.

Table 11.3
Alcohol-Attributable Fractions Related to Injury, by Sex

Diseases	Male alcohol-attributable fraction per cent	Female alcohol-attributable fraction per cent
Motor vehicle traffic accidents (hospital)	24	11
Motor vehicle traffic accidents (death)	33	11
Pedestrian injuries† (death)	40	17
Bicycle accident injuries	20	20
Water transport accident injuries	20	20
Accidental fall injuries (<65 years old)	22	14
Accidental fall injuries (65+ years old)	12	4
Arson injuries	44	44
Accidental excessive cold	25	25
Accidental drowning	34	34
Accidental aspiration	25	25
Striking against/struck by objects/caught in/between objects	7	7
Occupational and machine injuries	7	7
Accidental firearm injuries	25	25
Suicide, self-inflicted injuries	32	29
Victim fight, brawl, rape; victim assault with firearms; victim assault with cutting instrument; victim assault other	47	47

Rehm J, Room R, Monteiro M, Gmel G, Graham K, Rehn N, et al. Alcohol use. In: Ezzati M, Lopez A, Rodgers A, Murray C, editors. Comparative Quantification of Health Risks. Global and Regional Burden of Disease Attributable to Selected Major Risk Factors. Volume 1. Geneva: World Health Organization; 2004. p. 959-1108.

When necessary, several years of data were averaged and used when calculating alcohol-attributable fractions to avoid concerns about small numbers and year-to-year variation.

Table 11.4

Data Sources and Criteria for Case Inclusion in Calculations of Alcohol-Attributable Incidence, Emergency Department Visits, Hospitalization and Mortality

Disease	Attribution to alcohol	Cancer incidence	Emergency department visits	Hospitalization	Mortality
RESPIRATORY DISEASES					
Tuberculosis	Partial	NA	NA	ICD-10 A15-A19, B90 Age=15 years and older Years=2007-2011	ICD-10 A15-A19, B90 Age=15 years and older Years=2005-2009
Lower respiratory infections	Partial	NA	NA	ICD-10 J00-J22; J85, P23 Age=15 years and older Years=2007-2011	ICD-10 J00-J22; J85, P23 Age=15 years and older Years=2005-2009
CARDIOVASCULAR DISEASES					
Ischemic heart disease	Partial	NA	NA	ICD-10 I20-I25 Age=15 years and older Years=2009-2011	ICD-10 I20-I25 Age=15 years and older Years=2005-2009
Conduction disorders and other dysrhythmias	Partial	NA	NA	ICD-10 I47-I48 Age=15 years and older Years=2007-2011	ICD-10 I47-I48 Age=15 years and older Years=2005-2009
Hemorrhagic stroke	Partial	NA	NA	ICD-10 I60-I62, I69.0, I69.1, I69.2 Age = 15 years and older Years=2007-2011	ICD-10 I60-I62, I69.0, I69.1, I69.2 Age = 15 years and older Years=2005-2009
Ischemic stroke	Partial	NA	NA	ICD-10 I63-I67, I69.3 Age=15 years and older Years=2007-2011	ICD-10 I63-I67, I69.3 Age=15 years and older Years=2005-2009
Hypertension	Partial	NA	NA	ICD-10 I63-I67, I69.3 Age=15 years and older Years=2007-2011	ICD-10 I63-I67, I69.3 Age=15 years and older Years=2005-2009
Alcoholic cardiomyopathy	100%	NA	ICD-10 I42.6 All ages Years=2007-2011	ICD-10 I42.6 All ages Years=2007-2011	ICD-10 I42.6 All ages Years=2005-2009

Table 11.4 continues ...

Table 11.4 continued

Disease	Attribution to alcohol	Cancer incidence	Emergency department visits	Hospitalization	Mortality
GASTROINTESTINAL DISEASES					
Pancreatitis	Partial	NA	ICD-10 K85-K86 (excluding K85.2 and K86.0) All ages Years=2007-2011	ICD-10 K85-K86 (excluding K85.2 and K86.0) Age=15 years and older Years=2007-2011	ICD-10 K85-K86 (excluding K85.2 and K86.0) Age=15 years and older Years=2005-2009
Alcohol-induced acute pancreatitis	100%	NA	ICD-10 K85.2 All ages Years=2007-2011	ICD-10 K85.2 All ages Years=2007-2011	ICD-10 K85.2 All ages Years=2005-2009
Alcohol-induced chronic pancreatitis	100%	NA	ICD-10 K86.0 All ages Years=2007-2011	ICD-10 K86.0 All ages Years=2007-2011	ICD-10 K86.0 All ages Years=2005-2009
Liver cirrhosis	Partial	NA	NA	ICD-10 K73-K74 Age=15 years and older Years=2007-2011	ICD-10 K73-K74 Age=15 years and older Years=2005-2009
DIGESTIVE SYSTEM DISEASES					
Lip and oropharyngeal cancer	Partial	ICD-10C00-C14 Age=15 years and older Years=2005-2009	NA	ICD-10 C00-C14 Age=15 years and older Years=2007-2011	ICD10 C00-C14 Age=15 years and older Years=2005-2009
Esophageal cancer	Partial	ICD-10 C15 Age=15 years and older	NA	ICD-10 C15 Age=15 years and older Years=2007-2011	ICD-10 C15; ICD-9 150.0-150.9 Age=15 years and older Years=2005-2009
Colon cancer	Partial	ICD-10C18 Age=15 years and older Years=2005-2009	NA	ICD-10 C18 Age=15 years and older Years=2007-2011	ICD-10 C18 Age=15 years and older Years=2005-2009
Rectum cancer	Partial	ICD-10 C19-C21 Age=15 years and older Years=2005-2009	NA	ICD-10 C18-C21, C26.0 Age=15 years and older Years=2007-2011	ICD-10 C18-C21, C26.0; ICD-9 153, 154.0-154.1, 159.0 Age=15 years and older Years=2005-2009
Liver cancer	Partial	ICD-10 C22 Age=15 years and older Years=2005-2009	NA	ICD-10 C22 Age=15 years and older Years=2007-2011	ICD-10 C22 Age=15 years and older Years=2005-2009
Laryngeal cancer	Partial	ICD-10 C32; Age=15 years and older Years=2005-2009	NA	ICD-10 C32 Age=15 years and older Years=2007-2011	CD-10 C32; I ICD-9 161.0-161.9 Age=15 years and older Years=2005-2009

Table 11.4 continues ...

Table 11.4 continued

Disease	Attribution to alcohol	Cancer incidence	Emergency department visits	Hospitalization	Mortality
DIGESTIVE SYSTEM DISEASES continued					
Alcoholic gastritis	100%	NA	ICD-10 K29.2 All ages Years=2007-2011	ICD-10 K29.2 All ages Years=2007-2011	ICD-10 K29.2 All ages Years=2005-2009
Alcoholic liver disease	100%	NA	ICD-10 K70 All ages Years=2007-2011	ICD-10 K70 All ages Years=2007-2011	ICD-10 K70 All ages Years=2005-2009
NERVOUS SYSTEM DISEASES					
Alcoholic myopathy	100%	NA	ICD-10 G72.1 All ages Years=2007-2011	ICD-10 G72.1 All ages Years=2007-2011	ICD-10 G72.1 All ages Years=2005-2009
Alcoholic polyneuropathy	100%	NA	ICD-10 G62.1 All ages Years=2007-2011	ICD-10 G62.1 All ages Years=2007-2011	ICD-10 G62.1 All ages Years=2005-2009
Degeneration of nervous system due to alcohol	100%	NA	ICD-10 G31.2 All ages Years=2007-2011	ICD-10 G31.2 All ages Years=2007-2011	ICD-10 G31.2 All ages Years=2005-2009
MENTAL AND BEHAVIOURAL DISORDERS					
Alcohol-induced mental disorders	100%	NA	ICD-10 F10.0-F10.1, F10.3-F10.9 All ages Years=2007-2011	ICD-10 F10.0-F10.1, F10.3-F10.9 All ages Years=2007-2011	ICD-10 F10.0-F10.1, F10.3-F10.9 All ages Years=2005-2009
Alcohol dependence syndrome	100%	NA	ICD-10 F10.2 All ages Years=2007-2011	ICD-10 F10.2 All ages Years=2007-2011	ICD-10 F10.2 All ages Years=2005-2009
OTHER DISEASES					
Breast cancer	Partial	ICD-10 C50 Age = 15 years and older Years=2005-2009	NA	ICD-10 C50 Age = 15 years and older Years=2007-2011	ICD-10 C50 Age = 15 years and older Years=2005-2009
Diabetes	Partial	NA	NA	ICD-10 E10-E14 Age=15 years and older Years=2007-2011	ICD-10 E10-E14 Age=15 years and older Years=2005-2009
Epilepsy	Partial	NA	NA	ICD-10 G40-G41 Age = 15 years and older Years=2007-2011	ICD-10 G40-G41 Age = 15 years and older Years=2005-2009
Low birth weight	Partial	NA	NA	ICD-10 P05-P07 Age = All ages Years=2007-2011	ICD-10 P05-P07 Age = All ages Years=2005-2009

Table 11.4 continues ...

Table 11.4 continued

Disease	Attribution to alcohol	Cancer incidence	Emergency department visits	Hospitalization	Mortality
OTHER DISEASES continued					
Fetal alcohol syndrome	100%	NA	ICD-10 Q86.0 All ages Years=2007-2011	ICD-10 Q86.0 All ages Years=2007-2011	ICD-10 Q86.0 All ages Years=2005-2009
Fetus and newborn affected by maternal use of alcohol	100%	NA	ICD-10 P04.3, O35.4 All ages Years=2007-2011	ICD-10 P04.3, O35.4 All ages Years=2007-2011	ICD-10 P04.3, O35.4 All ages Years=2005-2009
Excessive blood level of alcohol	100%	NA	ICD-10 R78.0 All ages Years=2007-2011	ICD-10 R78.0 All ages Years=2007-2011	ICD-10 R78.0 All ages Years=2005-2009
INJURIES					
Motor vehicle traffic accidents	Partial	NA	NA	ICD-10 V20-V28(.3-.9), V29-V79(.4-.9), V80(.3-.5), V81.1, V82.1, V83-V86(.0-.3), V87(.0-.8), V89.2 All ages Years=2007-2011	ICD-10 V20-V28(.3-.9), V29-V79(.4-.9), V80(.3-.5), V81.1, V82.1, V83-V86(.0-.3), V87(.0-.8), V89.2 All ages Years=2005-2009
Bicycle accident injuries	Partial	NA	NA	ICD-10 V10-V11, V15-V18, V19 (.0,.3, .8, .9) All ages Years=2007-2011	ICD-10 V10-V11, V15-V18, V19 (.0,.3, .8, .9) All ages Years=2005-2009
Water transport accident injuries	Partial	NA	NA	ICD-10 V90-V94 All ages Years=2007-2011	ICD-10 V90-V94 All ages Years=2005-2009
Accidental fall injuries	Partial	NA	NA	ICD-10 W00-W19, Y30 Age=< 65 and 65+ Years=2007-2011	ICD-10 W00-W19, Y30 Age=<65 and 65+ Years=2005-2009
Arson injuries	Partial	NA	NA	ICD-10 X97 All ages Years=2007-2011	ICD-10 X97 All ages Years=2005-2009
Accidental excessive cold	Partial	NA	ICD-10 X31 All ages Years=2007-2011	ICD-10 X31 All ages Years=2007-2011	ICD-10 X31 All ages Years=2005-2009
Accidental drowning	Partial	NA	ICD-10 W65-W74, V90, V92, Y21 All ages Years=2007-2011	ICD-10 W65-W74, V90, V92, Y21 All ages Years=2007-2011	ICD-10 W65-W74, V90, V92, Y21 All ages Years=2005-2009
Accidental aspiration	Partial	NA	NA	ICD-10 W78-W80 All ages Years=2007-2011	ICD-10 W78-W80 All ages Years=2005-2009

Table 11.4 continues ...

Table 11.4 continued

Disease	Attribution to alcohol	Cancer incidence	Emergency department visits	Hospitalization	Mortality
INJURIES continued					
Striking against/ by objects; caught in/between objects	Partial	NA	NA	ICD-10 W20-W23, W50-W52 All ages Years=2007-2011	ICD-10 W20-W23, W50-W52 All ages Years=2005-2009
Occupational and machine	Partial	NA	NA	ICD-10 W24, W27-31, V84, V85, X17 All ages Years=2007-2011	ICD-10 W24, W27-31, V84, V85, X17 All ages Years=2005-2009
Accidental firearm	Partial	NA	NA	ICD-10 W33-W34 All ages Years=2007-2011	ICD-10 W33-W34 All ages Years=2005-2009
Suicide, self-inflicted	Partial	NA	NA	ICD-10 X60-X64, X66-X84, Y87.0 All ages Years=2007-2011	ICD-10 X60-X64, X66-X84, Y87.0 All ages Years=2005-2009
Attempted suicide by alcohol	100%	NA	ICD-10 X65 Age=15 years and older	ICD-10 X65 Age=15+ Years=2007-2011	ICD-10 X65 Age=15+ Years=2005-2009
Assault [§]	Partial	NA	NA	ICD-10 X94-96, X97-99, Y00-Y06, Y08, Y09, Y87.1 All ages Years=2007-2011	ICD-10 X94-96, X97-99, Y00-Y06, Y08, Y09, Y87.1 All ages Years=2005-2009
Unintentional poisoning by alcoholic beverages	100%	NA	ICD-10 X45 (with T51.0 Ethyl alcohol or T51.1 Methyl alcohol diagnosis codes only All ages Years=2007-2011	ICD-10 X45 (with T51.0 Ethyl alcohol or T51.1 Methyl alcohol diagnosis codes only All ages Years=2007-2011	ICD-10 X45 (with T51.0 Ethyl alcohol or T51.1 Methyl alcohol diagnosis codes only All ages Years=2005-2009
Alcohol poisoning undetermined intent	100%	NA	ICD-10 Y15 Age=15 years and older Years=2007-2011	ICD-10 Y15 Age=15 years and older Years=2007-2011	ICD-10 Y15 Age=15 years and older
Evidence of alcohol involvement determined by alcohol level	100%	NA	ICD-10 Y90 All ages Years=2007-2011	ICD-10 Y90 All ages Years=2007-2011	ICD-10 Y90 All ages Years=2005-2009

§ Defined as victim of a fight, brawl, rape; victim or assault with firearms; victim of assault with cutting instrument; victim of assault other.

Data sources:

Cancer Incidence: Cancer Care Ontario - SEER*Stat Release 7.1.0 Cancer, 2005-2009.

Cancer Mortality: Cancer Care Ontario - SEER*Stat Release 7.1.0, 2005-2009.

Emergency department visit: National Ambulatory Care Reporting System 2007-2011, IntelliHEALTH Ontario, Ministry of Health and Long-Term Care

Hospitalization: Hospital In-Patient Discharge Data 2007-2011, IntelliHEALTH Ontario, Ministry of Health and Long Term Care.

Mortality: Ontario Mortality Database 2005-2009, IntelliHEALTH, Ontario Ministry of Health and Long-Term Care.

Table 11.5
Coding for Ontario Mental Health Reporting System Data

Category	Description	DSM-IV code	Related ICD-10 code
Alcohol-induced mental disorders	Alcohol intoxication	303.00	F10.00
	Alcohol intoxication delirium	291.0	F10.03
	Alcohol abuse	305.00	F10.1
	Alcohol withdrawal	291.8	F10.3
	Alcohol withdrawal delirium	291.0	F10.4
	Alcohol-induced psychotic disorder with delusions	291.5	F10.51
	Alcohol-induced psychotic disorder with hallucinations	291.3	F10.52
	Alcohol-induced persisting amnesic disorder	291.1	F10.6
	Alcohol-induced persisting dementia	291.2	F10.73
	Alcohol-induced mood disorder	291.8	F10.8
	Alcohol-induced anxiety disorder	291.8	F10.8
	Alcohol-induced sexual dysfunction	291.8	F10.8
	Alcohol-induced sleep disorder	291.8*	F10.8
	Alcohol-related disorder not otherwise specified	291.9	F10.9
Alcohol dependence	Alcohol dependence	303.90	F10.2

Shaded areas mean code was included in the filter

*Code may or may not have been included as 291.8

Source: American Psychiatric Association. Appendix H: DSM-IV classification with ICD-10 codes. In: Diagnostic and statistical manual of mental disorders. Fourth Edition. Washington: American Psychiatric Association; 1994

Calculating Alcohol-Attributable Disease and Injury Outcomes from Relative Risk Numbers, Alcohol-Attributable Fractions and Prevalence of Alcohol Use

For some alcohol-related diseases, the alcohol-attributable fractions (AAFs) for new or existing cases of disease, hospitalizations and deaths were calculated using relative risk estimates from Table 11.2 and Peel specific daily alcohol use prevalence using the following formula:

$$AAF = [(p_0 + p_1(RR_1) + p_2(RR_2)) + p_3(RR_3) + p_4(RR_4) + p_5(RR_5)) - 1] / [p_0 + p_1(RR_1) + p_2(RR_2) + p_3(RR_3) + p_4(RR_4) + p_5(RR_5)]$$

Formula measures are defined in Table 11.6.

Table 11.6
Description of Formula Parameters for Alcohol-Attributable Fraction Calculation

Measure	Definition
p0	Percentage of population aged 12 years and older who do not currently drink alcohol
p1	Percentage of population aged 12 years and older who consume one drink per day
p2	Percentage of population aged 12 years and older who consume two drinks per day
p3	Percentage of population aged 12 years and older who consume three to four drinks per day
p4	Percentage of population aged 12 years and older who consume five to six drinks per day
p5	Percentage of population aged 12 years and older who consume six or more drinks per day
RR1	Relative risk of death or disease for the population who consume one drink per day relative to non-drinkers
RR2	Relative risk of death or disease for the population who consume two drinks per day relative to non-drinkers
RR3	Relative risk of death or disease for the population who consume three to four drinks per day relative to non-drinkers
RR4	Relative risk of death or disease for the population who consume five to six drinks per day relative to non-drinkers
RR5	Relative risk of death or disease for the population who consume six or more drinks per day relative to non-drinkers

Chapter 5 – Alcohol Related Health Care Use and Costs

Alcohol-Attributable Health Expenditures

Direct hospitalization costs attributable to daily alcohol use were calculated for Peel using Canadian Institute for Health Information (CIHI) cost for hospitalization by disease estimates.³⁴

The number of hospitalizations attributable to daily alcohol use were calculated by applying the alcohol-attributable fraction (AAF) to the average number of annual hospitalizations for the years 2007 to 2011 for each disease category.

A disease-specific unit cost (Table 11.7) was applied to each hospitalization count to estimate the annual cost of hospitalizations for each disease:

$$\text{Annual Hospitalization Costs} = \text{Number of Alcohol-Attributable Hospitalizations} \times \text{Unit Cost}$$

Table 11.7
Unit Cost for Each Diagnosis of Selected Chronic Diseases, Canada 2004–2005

Disease	Cost attributed to the treatment of primary diagnosis and complexities, all sexes	Notes
Tuberculosis	\$16,131	
Lower respiratory infections	\$4,763	
Conduction disorders and other dysrhythmias	\$5,966	
Hemorrhagic stroke	\$14,261	
Hypertension	\$11,351	
Alcoholic cardiomyopathy	\$21,287	
Pancreatitis	\$8,896	
Alcohol-induced chronic pancreatitis	\$8,896	
Alcohol-induced acute pancreatitis	\$8,896	
Liver cirrhosis	\$19,786	
Lip and oropharyngeal cancer	\$16,628	
Esophageal cancer	\$12,713	
Colon cancer	\$13,277	Reflects costs of treating the colon, rectum and anus
Rectum cancer	\$13,277	Reflects costs of treating the colon, rectum and anus
Liver cancer	\$12,713	

Table 11.7 continues ...

Table 11.7 continued

Disease	Cost attributed to the treatment of primary diagnosis and complexities, all sexes	Notes
Laryngeal cancer	\$12,713	
Alcoholic gastritis	\$5,680	
Alcoholic liver disease	\$14,239	
Alcoholic myopathy	\$14,690	
Alcoholic polyneuropathy	\$15,244	
Degeneration of nervous system due to alcohol	\$9,287	
Alcohol induced mental disorders	\$6,368	
Alcohol dependence syndrome	\$6,368	
Breast cancer	\$4,755	
Epilepsy	\$7,786	
Low birth weight	\$16,379	
Fetal alcohol syndrome all ages	\$7,078	
Fetus and newborn affected by maternal use of alcohol (all ages)	–	Costing data not available
Excessive blood level of alcohol	\$5,918	
Motor vehicle traffic accidents	\$9,045	
Bicycle accident	\$9,045	
Water transport accident	\$9,045	
Accidental fall (<65 years)	\$9,045	
Accidental fall (65+ years)	\$9,045	
Arson	\$9,045	
Accidental excessive cold	\$9,045	
Accidental drowning	\$9,045	
Accidental aspiration	\$9,045	
Striking against/struck by objects/caught in/between objects	\$9,045	
Occupational and machine injuries	\$9,045	
Accidental firearm injuries	\$9,045	
Suicide, self-inflicted	\$9,045	
Attempted suicide by alcohol	–	Costing data not available
Assault ^s	\$9,045	
Unintentional poisoning by alcoholic beverages	\$9,720	
Alcohol poisoning undetermined intent	–	Costing data not available
Evidence of alcohol involvement determined by blood alcohol level	–	Costing data not available

Source: Canadian Institute for Health Information, 2008. The Cost of Acute Care Hospital Stays by Medical Condition in Canada, 2004/2005.



text references

1. Beyond the basics: Alcohol [Internet] Addictions Foundation of Manitoba. Available from: http://afm.mb.ca/wp-content/uploads/woocommerce_uploads/2013/03/AlcoholBTB.pdf.
2. Makela K. The uses of alcohol and their cultural regulation. *Acta Sociologica*. 1983;26(1):21-31.
3. Edwards G. Alcohol: The ambiguous molecule. London: Penguin Books; 2000.
4. Boyle P, Boffetta P, Lowenfels AB, Burns H, Brawley O, Zatonski W, et al. Alcohol science, policy and public health. United Kingdom: Oxford University Press; 2013.
5. Rose M, Cherpitel C. Alcohol: its history, pharmacology and treatment. Centre City, Minnesota: Hazelden Foundation; 2011.
6. Brands B, Sproule B, Marshman J, editors. Drugs & drug abuse. 3rd Ed. Toronto, Ontario: Centre for Addiction and Mental Health; 1998.
7. World Health Organization. Global status report on alcohol and health. Geneva, Switzerland: World Health Organization; 2011.
8. Butt P, Beirness D, Gliksman L, Paradis C, Stockwell T. Alcohol and health in Canada: A summary of evidence and guidelines for low risk drinking. Ottawa, Ontario: Canadian Centre on Substance Abuse; 2011.
9. Nakamura N, Ialomiteanu A, Rehm J, Fischer B. Prevalence and characteristics of substance use among Chinese and South Asians in Canada. *J Ethn Subst Abuse*. 2011;10(1):39-47.

10. Hurcombe R, Bayley M, Goodman A. Ethnicity and alcohol. A review of the UK literature. Middlesex University: Joseph Rowntree Foundation; 2010.
11. Furtwaengler NA, de Visser RO. Lack of international consensus in low-risk drinking guidelines. *Drug Alcohol Rev.* 2013 Jan;32(1):11-8.
12. Bondy SJ, Rehm J, Ashley MJ, Walsh G, Single E, Room R. Low-risk drinking guidelines: The scientific evidence. *Can J Public Health.* 1999 Jul-Aug;90(4):264-70.
13. International Agency for Research on Cancer Working Group on the Evaluation of Carcinogenic Risks to Humans. IARC monographs on the evaluation of carcinogenic risks to humans. Volume 96. Alcohol consumption and ethyl carbamate. Lyon, France: International Agency for Research on Cancer; 2010.
14. Public Health Agency of Canada. What mothers say: The Canadian Maternal Experiences Survey. Ottawa: 2009.
15. Public Health Agency of Canada. Fetal alcohol spectrum disorder (FASD). Public Health Agency of Canada; 2005.
16. Carson G, Cox LV, Crane J, Croteau P, Graves L, Kluka S, et al. Alcohol use and pregnancy consensus clinical guidelines. *J Obstet Gynaecol Can.* 2010 Aug;32(8 Suppl 3):S1-31.
17. Health Canada and the Public Health Agency of Canada. Fetal alcohol spectrum disorder. Canada: Health Canada; 2006.
18. Rush B, Urbanoski K, Bassani D, Castel S, Wild TC, Strike C, et al. Prevalence of co-occurring substance use and other mental disorders in the Canadian population. *Can J Psychiatry.* 2008 Dec;53(12):800-9.
19. Wilsnack RW, Wilsnack SC. Gender and alcohol: Consumption and consequences. In: Boyle P, Boffeta P, Lowenfels AB, Burns H, Brawley O, Zatonski W, et al, Eds. *Alcohol: Science, policy and public health.* First Ed. Oxford University Press; 2013. p. 153.
20. Rehm J, Taylor B, Mohapatra S, Irving H, Baluinas D, Patra J, et al. Alcohol as a risk factor for liver cirrhosis: A systematic review and meta-analysis. *Drug Alcohol Rev.* 2010;29(4):437-45.
21. Adlaf E, Begin P, Sawka E. Canadian addiction survey (CAS): A national survey of Canadians' use of alcohol and other drugs: Prevalence of use and related harms: Detailed report. Ottawa: Canadian Centre on Substance Abuse; 2005.
22. Canadian alcohol and drug use monitoring survey, 2010 [Internet]. Ottawa: Health Canada [updated July 3, 2012; cited May 21, 2014]. Available from: http://www.hc-sc.gc.ca/hc-ps/drugs-drogues/stat/_2010/summary-sommaire-eng.php.
23. Babor TF, Higgins-Biddle JC, Saunders JB, Monteiro MG. The alcohol use disorders identification test. Guidelines for use in primary care. Second Ed. Geneva, Switzerland: World Health Organization; 2001.
24. Ialomiteanu A, Adlaf E, Hamilton H, Mann R. CAMH monitor eReport. Addiction and mental health indicators among Ontario adults 1977-2011 (CAMH research document series no. 35). Toronto: Centre for Addiction and Mental Health; 2012.
25. World Health Organization. Intimate partner violence and alcohol. Geneva, Switzerland: World Health Organization; 2006.

26. Justice laws website: Criminal code [Internet]. Ottawa: Government of Canada [updated May 8, 2014; cited May 21, 2014]. Available from: <http://laws-lois.justice.gc.ca/eng/acts/C-46/>.
27. Road Safety Policy Office - Vehicles. Ontario road safety annual report 2010. Toronto: Ministry of Transportation; 2010.
28. Babor TF, Caetano R, Casswell S, Edwards G, Giesbrecht N, Graham K, et al. Alcohol: No ordinary commodity: Research and public policy. Oxford Scholarship Online; 2010.
29. Perreault S. Impaired driving in Canada, 2011. Minister of Industry, 2013; 2013 January 10, 2013.
30. Ontario Highway Traffic Act, R.S.O 1990, Chapter H.8, 44.1 (1) and (2)1990).
31. Solomon R, Cardy J, Noble I, Wulkan R. Mapping our progress to safer roads. The 2012 provincial and territorial legislative review. London, Ontario: Faculty of Law, The University of Western Ontario; 2013.
32. Frohlich K, Ross N, Richmond C. Health disparities in Canada today: Some evidence and a theoretical framework. *Health Policy*. 2006;79(2-3):132-43.
33. Rehm J, Baliunas D, Brochu S, Fischer B, Gnam W, Patra J, et al. The costs of substance abuse in Canada 2002. Ottawa: Canadian Centre on Substance Abuse; March 2006.
34. Canadian Institute for Health Information. The cost of acute care hospital stays by medical condition in Canada, 2004-2005. Ottawa: CIHI; 2008.
35. Alcohol Policy Network. Priorities 2006: Developments in alcohol policy since 1996. Toronto: Ontario Public Health Association; 2006.
36. Genosko G, Thompson S. Punched drunk: Alcohol surveillance and the LCBO 1927-1975. Canada: Fernwood Publishing; 2009.
37. Alcohol Policy Network, Ontario Public Health Association. Alcohol policy distance education series: Liquor licensing 101: Ontario's liquor license act. In press October 2003.
38. Addictions Foundation of Manitoba. Fast facts on alcohol. Manitoba: Corporate Resources, The Addictions Foundation of Manitoba; 2002.
39. Milestones in alcohol policy [Internet].: Alcohol Policy Network; 2010; cited February 12, 2014]. Available from: http://www.apolnet.ca/thelaw/policies/pol_milestones.html.
40. Bill C-311 [Internet]. Ottawa, Ontario: Parliament of Canada [updated June 28, 2012; cited October 24, 2014]. Available from: <http://www.parl.gc.ca/LegisInfo/BillDetails.aspx?Language=E&Mode=1&Bill=C311&Parl=41&Ses=1>.
41. Code for broadcast advertising of alcoholic beverages [Internet]. Gatineau, Quebec: Canadian Radio-television and Telecommunications Commission [updated August 1, 1996; cited October 24, 2014]. Available from: <http://www.crtc.gc.ca/ENG/GENERAL/CODES/ALCOHOL.HTM>.
42. Agreement on internal trade [Internet]. Ottawa, Canada: Industry Canada [updated September 27, 2011; cited February 29, 2015]. Available from: http://www.ic.gc.ca/eic/site/ait-aci.nsf/eng/h_il00064.html#chap_10.
43. Lefebvre A. Prohibition and the smuggling of intoxicating liquors between the two saults. *The Northern Mariner*. 2001;XI(3):33.

44. Jazairi NT. The impact of privatizing the liquor control board of Ontario. Interim Report. 1994.
45. Alcohol and Gaming Commission of Ontario. License Line. 2005;5(1):1-10.
46. Information bulletins - alcohol [Internet].: Alcohol and Gaming Commission of Ontario; cited February 12, 2014]. Available from: http://www.agco.on.ca/en/whatwedo/bulletins_alcohol.aspx.
47. Ontario - public appointments secretariat. liquor control board of Ontario [Internet].: Queen's Printer for Ontario [updated July 10, 2014; cited March 19, 2015].
48. Strategy for transforming Ontario's beverage alcohol system. A report of the beverage alcohol review panel. July 2005. [Internet].: Ontario Ministry of Finance [updated October 7, 2009; cited March 19, 2015]. Available from: <http://www.fin.gov.on.ca/en/consultations/basr/report.html>.
49. Fact sheet: New roadside license suspensions. [Internet]. Ontario: Ministry of Transportation Ontario [updated June 20, 2010; cited February 12, 2014]. Available from: <http://www.mto.gov.on.ca/english/safety/impaired/fact-sheet.shtml#adls>.
50. Simcoe Muskoka District Health Unit. Managing alcohol risk within municipalities. In press June 2013.
51. The Canadian distillery industry [Internet]. Ottawa, Ontario: Agriculture and Agri-Food Canada [updated March 19, 2013; cited March 28, 2013]. Available from: <http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1171995761751&lang=eng>.
52. Table 3 - Sales of alcoholic beverages per capita 15 years and over for the year ending March 31, 2013 [Internet]. Ottawa, Ontario: Statistics Canada [updated April 10, 2014; cited October 2, 2013]. Available from: <http://www.statcan.gc.ca/daily-quotidien/140410/t140410a003-eng.htm>.
53. Thomas G. Analysis of beverage alcohol sales in Canada. Alcohol price policy series, Report 2 of 3. Ottawa: Canadian Centre on Substance Abuse; November 2012.
54. Health Canada. Canadian Addiction Survey (CAS). Public opinion, attitudes and knowledge. Minister of Health; 2006.
55. Impaired driving [Internet]. Ontario: Ontario Ministry of Transportation [updated February 10, 2015; cited March 19, 2015]. Available from: <http://www.mto.gov.on.ca/english/safety/impaired-driving.shtml>.



data references and appendices

Data References

- A** Census 2011, Statistics Canada
- B** Hemson Consulting, Population Forecast, Region of Peel
- C** National Household Survey 2011, Statistics Canada
- D1** Rapid Risk Factor Surveillance System, 2005, Peel Public Health
- D2** Rapid Risk Factor Surveillance System, 2007, Peel Public Health
- D3** Rapid Risk Factor Surveillance System, 2011, Peel Public Health
- E1** Canadian Community Health Survey 2011/2012, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care
- E2** Canadian Community Health Survey 2009/2010, Statistics Canada, Share File, Ontario Ministry of Health and Long-Term Care
- F** Born Outcomes and Registry Network (BORN)-Niday, 2010, BORN Ontario
- G** Ontario Student Health and Drug Use Survey, 2013, Centre for Addiction and Mental Health, Peel Public Health
- H** Student Health Survey 2011, Peel Public Health

Appendices

APPENDIX A

The Alcohol Use Disorders Identification Test Questions and Response Options

APPENDIX A

The Alcohol Use Disorders Identification Test Questions and Response Options

1. How often do you have a drink containing alcohol?

- (0) Never (skip to Questions 9 and 10)
- (1) Monthly or less
- (2) 2 to 4 times a month
- (3) 2 to 3 times a week
- (4) 4 or more times a week

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

- (0) 1 or 2
- (1) 3 or 4
- (2) 5 or 6
- (3) 7, 8 or 9
- (4) 10 or more

3. How often do you have six or more drinks on one occasion?

- (0) Never
- (1) Less than monthly
- (2) Monthly
- (3) Weekly
- (4) Daily or almost daily

Skip to Questions 9 and 10 if Total Score for Questions 2 and 3 = 0

4. How often during the last year have you found that you were not able to stop drinking once you had started?

- (0) Never
- (1) Less than monthly
- (2) Monthly
- (3) Weekly
- (4) Daily or almost daily

5. How often during the last year have you failed to do what was normally expected from you because of drinking?

- (0) Never
- (1) Less than monthly
- (2) Monthly
- (3) Weekly
- (4) Daily or almost daily

APPENDIX A continues ...

APPENDIX A continued

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

- (0) Never
- (1) Less than monthly
- (2) Monthly
- (3) Weekly
- (4) Daily or almost daily

7. How often during the last year have you had a feeling of guilt or remorse after drinking?

- (0) Never
- (1) Less than monthly
- (2) Monthly
- (3) Weekly
- (4) Daily or almost daily

8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?

- (0) Never
- (1) Less than monthly
- (2) Monthly
- (3) Weekly
- (4) Daily or almost daily

9. Have you or someone else been injured as a result of your drinking?

- (0) No
- (2) Yes, but not in the last year
- (4) Yes, during the last year

10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?

- (0) No
- (2) Yes, but not in the last year
- (4) Yes, during the last year

Source: Babor TF; Higgins-Biddle JC.; Monteiro MG. The Alcohol Use Disorders Identification Test. Guidelines for Use in Primary Care. Second Edition. Geneva, Switzerland: World Health Organization; 2001.



7120 Hurontario St., P.O. Box 667 RPO Streetsville
Mississauga, ON L5M 2C2 • 905-799-7700

peelregion.ca/health/reports