The Chief Public Health Officer's Report on the State of Public Health in Canada 2015

ALCOHOL CONSUMPTION IN CANADA

Canada

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A MESSAGE FROM CANADA'S CHIEF PUBLIC HEALTH OFFICER

Alcohol is a socially accepted part of everyday life for most Canadians. Almost 80 percent of us drink.

Many Canadians associate drinking with pleasurable social events such as music festivals, watching sports, parties, and relaxing. Celebrations and milestones like weddings, anniversaries, and awards are often "toasted" with alcohol.

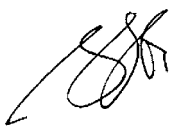
Our society condones, supports, and in some cases promotes drinking such as through "drink of the day" specials, sale prices on certain brands, and associating alcohol with fun and sophistication.

Although handled more like a food in Canada, alcohol is a mind-altering drug and there are health risks associated with drinking. Our low risk drinking guidelines do not mean that alcohol is harmless.

At least three million drinking Canadians risk acute illness, such as injury, and at least four and half million risk chronic conditions such as liver disease and cancer.

Our children grow up seeing alcohol in many aspects of their environment and around 3000 are born with fetal alcohol spectrum disorder each year.

I hope this report will raise awareness and stimulate frank conversations between Canadians, especially with their loved ones, and helps us reflect on how our society deals with this mind-altering drug.



Dr. Gregory Taylor
Canada's Chief Public Health Officer

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I would also like to sincerely thank the many individuals and groups within the Public Health Agency of Canada for all of their efforts and dedication, notably my report unit team, my support staff and members of the 2015 Core Advisory Group.

KEY MESSAGES

This report aims to increase Canadians' awareness about the health impacts of alcohol consumption.

- Humans have a long history with mind altering drugs, such as alcohol. Consuming alcohol is ingrained in Canadian culture. In 2013, an estimated 22 million Canadians, almost 80 percent of the population, drank alcohol in the previous year. **At least 3.1 million of those Canadians drank enough to be at risk for immediate injury and harm with at least 4.4 million at risk for chronic health effects, such as liver cirrhosis and various forms of cancer.**
- **Drinking patterns matter — how much and how often a person drinks alcohol are key factors that increase or decrease health impacts.** *Canada's Low-Risk Alcohol Drinking Guidelines* provide guidance on risky drinking patterns, including avoidance of alcohol in pregnancy. Low risk does not equal no risk.
- **Social situations, family contexts and messaging influence drinking patterns.** Exposure to alcohol through families and friends as well as through entertainment and advertising can strongly influence people's motives for drinking alcohol and their drinking patterns. For many Canadians, drinking is associated with many positive situations including important celebrations, forming friendships, positive mood and relaxation. However, risky drinking can increase the risk for family conflict, violence, crime including rape and traffic accidents through impaired driving.
- **Our understanding of the dose-dependent health effects of alcohol continues to evolve.** Recent research questions the health benefits of low to moderate alcohol consumption. Studies suggest that women are at increased risk for breast cancer even at a low level of one drink per day. The International Agency for Research on Cancer's *World Cancer Report 2014* and the Canadian Cancer Society state that **there is no "safe limit" of alcohol consumption when it comes to cancer prevention**.
- Youth are particularly at risk for negative impacts from drinking alcohol. Teenage brains are more vulnerable to the effects of alcohol. **Families, friends and all Canadians who care for or work with youth can play a positive role if they recognize their influence on youth's drinking patterns and support their healthy physical, mental and emotional development.**
- How we deal with alcohol in part defines our society. **Approaches such as a regulated alcohol industry, policies on pricing and taxation, controls on sales and availability and minimum age laws help reduce the impact on Canadians, especially youth.** These approaches vary across the country and may not be realizing their full potential. No single approach can address the large variations in the needs and drinking patterns of Canadians.
- The story of alcohol is complicated. Despite the large of amount of information available, **there are significant gaps in our understanding** of drinking patterns, risk factors, alcohol's impacts on health and the effectiveness of approaches to reduce these impacts.

WHAT THIS REPORT IS ABOUT

This report explores how consuming alcohol, a common mind-altering drug, is an important public health issue for Canadians. In 2013, an estimated 22 million Canadians, almost 80% of the population, reported that they drank alcohol in the previous year, a decrease from 2004.[1, 2]

Many Canadians who consume alcohol do so responsibly. However, alcohol consumption is linked to over 200 different diseases, conditions and types of injuries.[4] Of those who choose to drink, a significant number of Canadians (at least 3.1 million) drink enough to risk immediate injury and harm, including alcohol poisoning in some cases. At least 4.4 million are at risk for longer term negative health effects.[1]

Canadians are subjected to mixed messages about alcohol's benefits and harms. Alcohol consumption is a complex public health issue that can have a wide range of health impacts. Various factors contribute to the effects of alcohol, including how much people drink, how often they drink, what they are doing while they are drinking, as well as their underlying state of health.

Mind-altering drugs or substances contain psychoactive chemicals that act on the brain to change thinking, mood, consciousness, and behaviour and whose use can sometimes lead to dependence and abuse.[3]

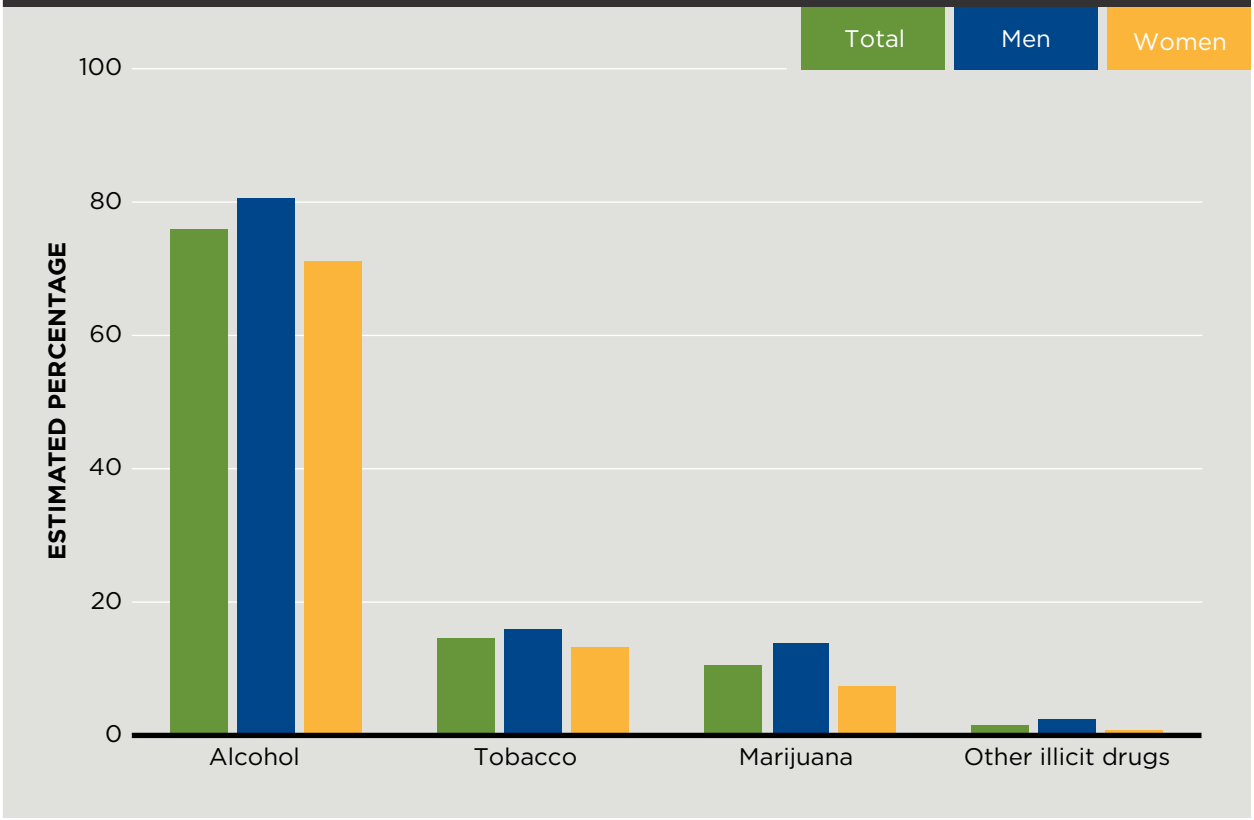
Under the *Food and Drugs Act*, alcohol is identified as a food. However, alcohol contains psychoactive chemicals making it a psychoactive drug or substance in terms of impacts on health.[3]

Why focus on alcohol?

Canadians have a long history with alcohol that has shaped drinking patterns over time. Alcohol is widely available and promoted in Canada.[5] Canadians are exposed to messages and images about alcohol through advertising and marketing of alcoholic beverages and in TV shows, movies and literature, as well as through alcohol retail outlets within their neighbourhood. With the majority of Canadians choosing to drink, people are exposed to alcohol through their friends and family, in their neighbourhoods, at social gatherings and through social media. Generally speaking, increased exposure and access to alcohol are linked to increased drinking.[10–36]

This report focuses on alcohol consumption at the population level in Canada, in order to raise awareness of the evidence regarding health risks. Canadians take health risks every day. Behaviours like how physically active people are, how many servings of fruit and vegetables or how much salt and fat is in the food people eat and how much alcohol people consume can all carry some degree of health risk. Many people who drink underestimate how much they drink.[37–39] Knowing the shorter- and longer-term risks to health may help some Canadians pay closer attention to their drinking and prevent negative impacts on their health and the health of others.

Figure 1:
WHAT PSYCHOACTIVE DRUGS ARE CANADIANS USING?



Estimated percentage of Canadians 15 years of age and older in 2013 who consumed alcohol, marijuana and other illicit drugs in the previous year and/or regularly smoke tobacco.[1]

What are Canadians using? Alcohol, tobacco, caffeine, marijuana, cocaine, heroin, hallucinogens, and various prescription drugs are all examples of psychoactive drugs. In Canada, alcohol is the most widely consumed psychoactive drug (see Figure 1)[1] except for caffeine. After water, coffee (which contains caffeine) is the second most consumed beverage in Canada.[40]

How can **alcohol be harmful**? Drinking alcohol was the third highest risk factor for global disease burden in 2010, moving up from being ranked sixth in 1990. It was also the top risk factor for poor health in people ages 15 to 49 years.[41]

Risky drinking can result in a wide range of negative impacts on society, including increased rates of premature death, disability and disease, impaired driving, reduced productivity, a burdened health care system, and high financial burden to both the individual and society.[e.g.,6, 8, 9, 42–48]

A SNAPSHOT OF ALCOHOL'S IMPACTS ON CANADIANS:

- In 2002, **4,258 deaths** in Canada were related to alcohol abuse, representing 1.9% of all deaths.[6]
- Costs related to alcohol in Canada equalled approximately **$14.6 billion** in 2002.[6]
- From April 2013 to March 2014, **$20.5 billion** worth of alcohol was sold in Canada.[7]
- In 2008, impaired driving was the **leading cause of criminal death** in Canada.[8]
- Among psychoactive drugs, alcohol-related disorders were the **top cause of hospitalizations** in Canada in 2011.[9]

DOSE-DEPENDENT HEALTH EFFECTS

Table 1: AN OVERVIEW OF THE DOSE-DEPENDENT HEALTH AND BEHAVIOURAL IMPACTS OF ALCOHOL CONSUMPTION

DIRECT EFFECTS	DISEASE AND CONDITIONS	FUNCTIONS AND SYSTEMS	BEHAVIOUR
Risky drinking can cause: • Alcohol use disorders • Amnesia (e.g., Korsakoff's syndrome) • Memory loss and blackouts • Delirium due to a severe form of withdrawal • Fetal Alcohol Spectrum Disorder (FASD)	Drinking alcohol is linked to: • Other drug use disorders • Brain damage • Liver disease • Various cancers • Pancreatitis • Mental health disorders • Suicide • Stomach ulcers • Hypertension • Stroke • Cardiovascular disease • Diabetes • Sexually transmitted infections	Drinking alcohol affects the following systems: • Immune • Stress • Memory, cognition • Digestion • Heart, blood, lungs • Brain • Hormones • Muscles • Fertility • Skin • Development	Risky drinking can lead to: • Risky behaviour • Impulsivity • Violence • Injury • Poor memory • Impaired decision-making • Lack of coordination • Poor academic performance • Impaired social and occupational functioning

References: 4, 42, 49, 51–127

At the individual level, alcohol affects a wide variety of biological systems in a dose-dependent manner, leading to impacts on health, well-being, and behaviour over both the short and long term (see Table 1).

For example, the International Agency for Research on Cancer (IARC) of the World Health Organization (WHO) has classified alcoholic beverages, ethanol in alcoholic beverages and acetaldehyde associated with the consumption of alcoholic beverages as carcinogenic to humans. This means that alcohol consumption is capable of increasing the incidence of cancer in a population. It can also reduce the length of time cancer is present but inactive in the body, increase cancer's severity, and increase the number of tumours or types of cancer present.[51]

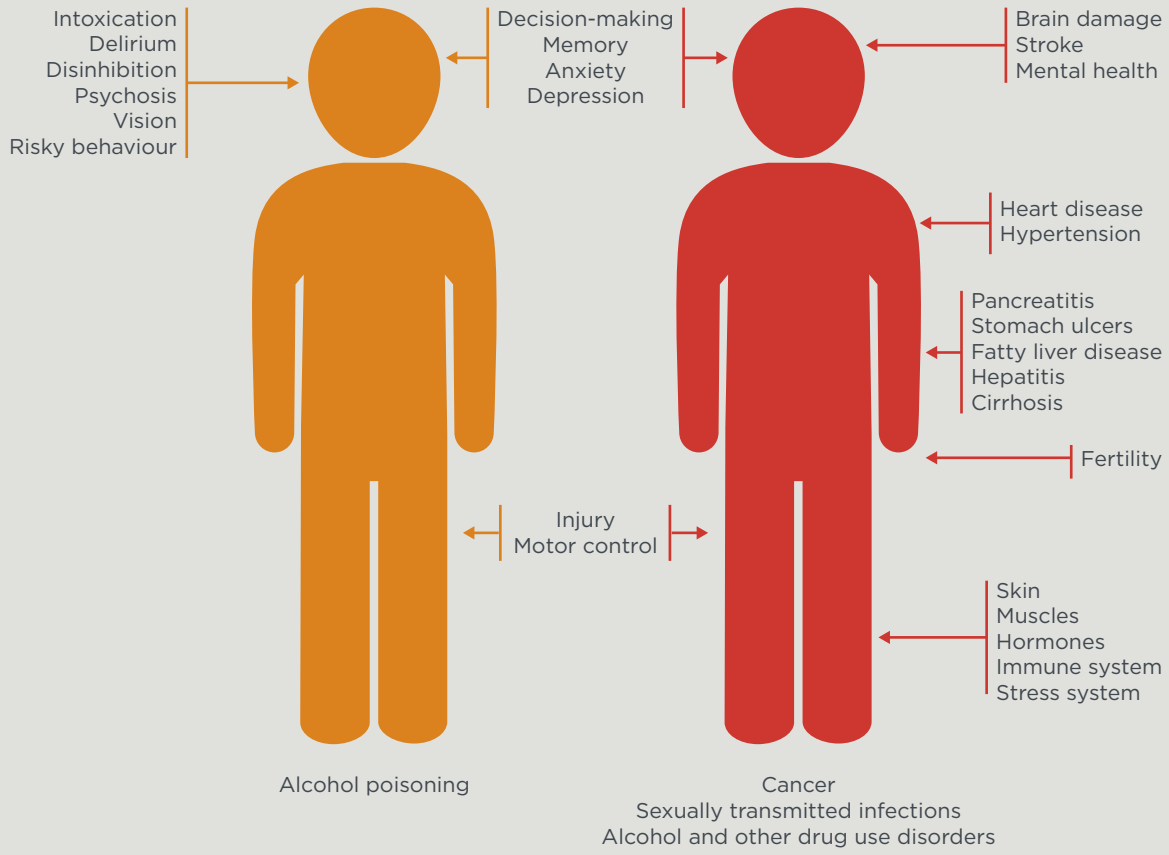
The IARC's *World Cancer Report 2014* and the Canadian Cancer Society state that **there is no "safe limit" of alcohol consumption** when it comes to cancer prevention.

Globally, alcohol was linked to over 3 million deaths per year in 2012, slightly more than lung cancer and HIV/AIDS combined.[48–50]

Many factors influence how alcohol affects a person's health, including how much and how often a person drinks, that person's specific risk factors, and what they are doing while they are drinking. Although controversial, studies have shown that alcohol may also have beneficial effects. However, benefits are dose-dependent and apply to a select set of diseases, conditions, situations, and segment of the population.[53, 54, 56, 57, 59, 61, 63–65, 69, 73, 76–80, 84, 87, 89, 90–92] Given that many people who drink underestimate how much they drink,[38, 39, 128–130], their perceived potential for harm or benefit may also be inaccurate.

Is alcohol consumption the same as alcohol abuse? No. Paying attention to drinking patterns, knowing what factors contribute to health risks, and recognizing signs can help reduce or prevent health risks, risky drinking, alcohol abuse, alcohol dependence, and alcohol use disorders and their associated harms.

EXAMPLES OF POTENTIAL HEALTH IMPACTS



References: [4, 42, 46–49, 51–127].

WHAT THIS REPORT COVERS

This report focuses on the health impacts of alcohol consumption, including how they develop and are modified by drinking patterns and risk factors. Included in this report are the following sections:

1. **Impacts on Canadians** explores how much Canadians are drinking and what are the resulting major impacts on health and society, including potential benefits.
2. **Pathways to Impacts : From Brain to Behaviour** outlines examples of how drinking patterns can lead to impacts on the brain and through behaviour.
3. **Influencing Factors** describes how different risk and protective factors can influence the risks for impacts from alcohol consumption.
4. **Population Health Perspective** provides three examples of specific populations in Canada: youth, women, and Aboriginal populations.
5. **Reducing Health Impacts** provides highlights on how public health can address the issue of alcohol consumption in Canada, with a focus on primary prevention.

IMPACTS ON CANADIANS

Identifying how much and how often people drink is a first step in understanding consequences, benefits, and harms of alcohol consumption on a particular population. Currently, data on alcohol consumption and related costs and harms, particularly for trends, are limited in Canada. This makes it difficult to capture a true picture of the impact on Canadians.

Drinking in Canada

In 2013, an estimated 22 million Canadians 15 years of age and older, almost 80% of the population, drank alcohol in the previous year, with the highest percentage of past year drinkers found in 30 to 34 year olds (see Figure 2a). The highest percentage of risky drinkers, based on drinking over the previous week, was found in young adults (ages 20 to 29) (see Figure 2b).[1] These data only capture risky drinking in the week previous to the survey, meaning it is a limited snapshot.[1]

From April 2013 to March 2014, Canadians bought almost 76 litres of beer, 16 litres of wine, 5 litres of spirits, and 4 litres of other alcoholic beverages per person.[7] Proportionally, Canadians drink more beer (51%) than spirits (27%) or wine (22%) (see Figure 3).[48]

Drinking is more common in men than women, as is risky drinking. For every year between 2003 and 2010, approximately one in three men and one in five women aged 15 years and older who drink reported that they drank risky amounts of alcohol at least once a month. In the same period, approximately 50% of young men and women (ages 18 to 24) who drank reported undertaking risky drinking on a monthly basis.[131]

Risky drinking is currently on the rise among women, especially those 35 years of age and older. In 2013, 56% of women aged 15 years and older reported binge drinking (four drinks or more in one sitting) at least once in the previous year compared to 44% in 2004.[1, 2, 132]

Risky Drinking: The impacts of alcohol are dose-dependent. In 2011, the Canadian Centre on Substance Abuse released *Canada's Low-Risk Alcohol Drinking Guidelines*. These guidelines identify how much is too much: [42]

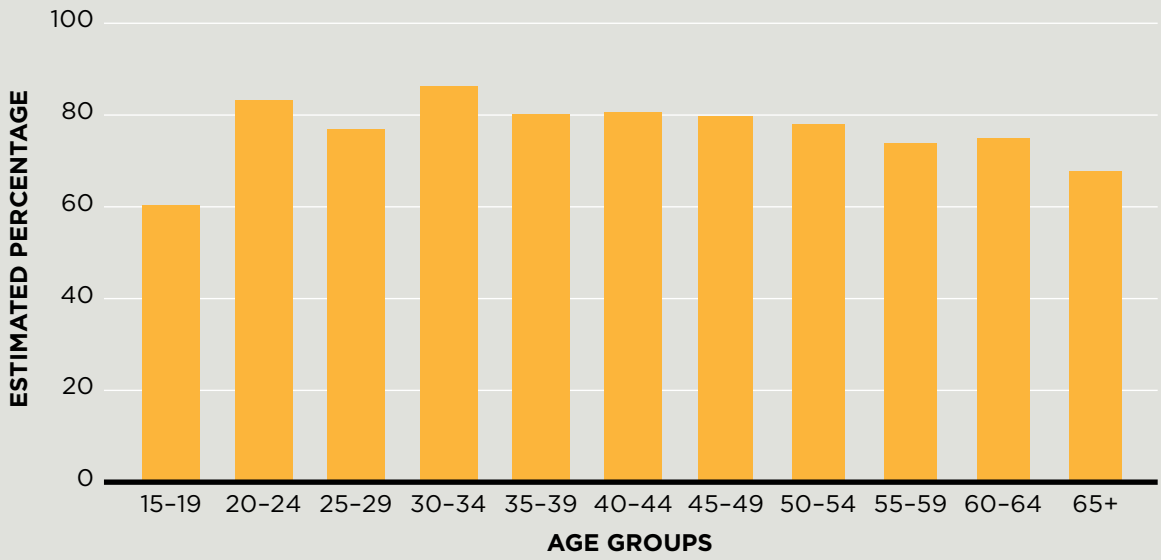
- Drinking more than 15 standard drinks a week for men or 10 a week for women with more than 3 drinks a day for men or 2 for women on most days increases the risk for long-term negative impacts on health.
- Drinking more than 4 standard drinks for men or 3 for women in an occasion increases the risks for short-term injury and harm.

There are no health benefits to alcohol consumption for youth. The potential health benefits from alcohol do not begin until middle age.

The evidence used to develop these guidelines can be found at this link.

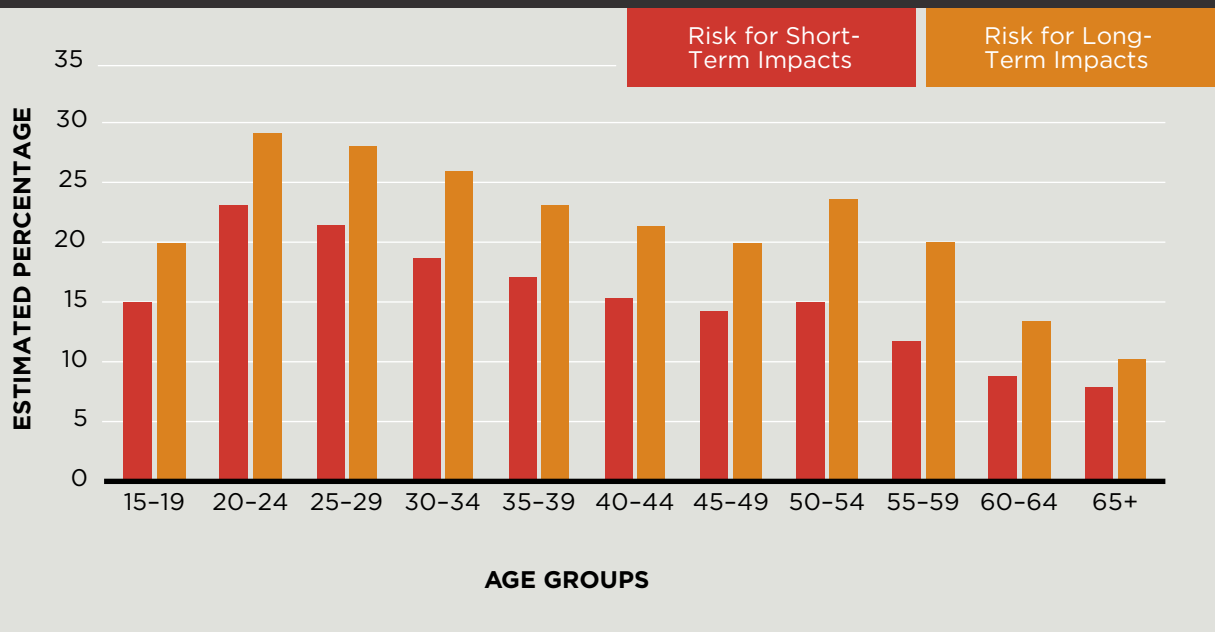
Rates of past-year drinking among Canadians aged 15 years and older have been decreasing from 79% in 2004 to 76% in 2013. For Canadians aged 15 to 24, rates of past year drinking dropped from 78% in 2004 to 73% in 2013.[1, 2, 132] An estimated 24% of Canadians — almost 7 million — aged 15 years and older reported that they did not drink in 2013.[1, 2]

Figure 2a:
DRINKING RATES IN CANADA IN 2013



Estimated percentage of Canadians 15 years of age and older who had consumed alcohol in the year previous to a 2013 survey.[1]

Figure 2b:
RISKY DRINKING RATES IN CANADA IN 2013



Estimated percentage of Canadians 15 years of age and older who had consumed alcohol **in the week prior to a 2013 survey** in amounts that exceeded the guidelines for risks for short- or long-term impacts.[1]

How much alcohol do Canadians really drink? Most people tend to underreport how much alcohol they drink. Not only do people tend to underestimate how much they and others drink, they also tend to underestimate how harmful alcohol is.[37–39, 129, 133–148] In some cases, drinking on special occasions, which is not well captured by many surveys, can partially explain this discrepancy.[149] Some surveys only capture a short period of consumption (e.g., one week), leading to a limited picture of consumption.[1]

Surveys tend to focus on drinking of regulated alcoholic beverages (e.g., beer, wine, liquor), meaning data on consumption of home brew and other sources of alcohol are not captured. Estimates on the proportion of home brew consumed as part of the total consumption of alcohol in Canada vary widely and depend on the source of data used and how data are analysed.[150–152]

Attempts have been made to account for under-reporting.[e.g., 37, 129, 153–155] In Canada, under-reporting occurred more often for spirits than for beer or wine. Canadians under the age of 45 were more likely to under-report their alcohol consumption as were low-risk drinkers of any age. Men and women were similar in terms of the extent to which they under-report their consumption of alcohol.[129]

How much does alcohol contribute to daily caloric intake? Unlike many other drugs, alcohol can count towards daily caloric intake (see Table 2).[45] The National Institutes of Health in the United States has an alcohol calorie calculator for a variety of different types of alcohol. For example:

- 1 drink of regular beer (12 ounces) is 153 calories.
- 1 drink of red wine (5 ounces) is 125 calories, while 1 glass of white wine (5 ounces) is 121 calories.
- 1 drink of gin, rum, vodka, whisky, or tequila (1.5 ounces) is 97 calories. This does not account for calories in added ingredients, such as carbonated beverages or juice.

Figure 3: TYPE OF DRINK CONSUMED BY CANADIANS IN 2010 (PERCENTAGE OF ALCOHOL CONSUMPTION PER CAPITA IN LITRES)[48]

Adjusted rates for risky drinking: To adjust Canadian drinking data from 2008 to 2010 for under-reporting, data on drinking over the previous year and sales data were incorporated. These adjusted data suggest that:[155]

- Estimates of the average rates of past-year risky drinking among Canadians ages 15 years and older who drink rose from **16.7% to 38.6%** for short-term harm and from **6.8% to 27.3%** for long-term harm.
- Most underage drinking and drinking by young adults occurs in bouts of heavy drinking (i.e., exceeding the short-term guidelines) rather than in a low level of drinking spread out over several days.

Table 2: EXAMPLES OF HOW DAILY CONSUMPTION OF ALCOHOL CAN CONTRIBUTE TO DAILY CALORIC INTAKE

	CALORIES	APPROXIMATE % OF RECOMMENDED DAILY CALORIC INTAKE
For men between the ages of 19 to 50 years who are somewhat active (recommend daily calories: 2600–2700)		
4 drinks of regular beer	612	23%
4 drinks of red wine	500	19%
4 drinks of white wine	484	18%
4 drinks of gin, rum, vodka, whisky, or tequila	388	14.5%
For women between the ages of 19 to 50 years who are somewhat active (recommended daily calories: 2000–2100)		
3 drinks of regular beer	459	22.5%
3 drinks of red wine	375	18.5%
3 glasses of white wine	363	17.5%
3 glasses of gin, rum, vodka, whisky, or tequila	291	14%

Note: These calculations are based on recommendations from *Canada's Low-Risk Alcohol Drinking Guidelines* and *Canada's Food Guide*

Costs of Alcohol in Canada

Costs related to alcohol consumption can be explored through sales and the overall cost to society. Sales can provide an indirect measure of consumption and cost to the individual, while overall cost shows the high financial burden of alcohol in Canada.

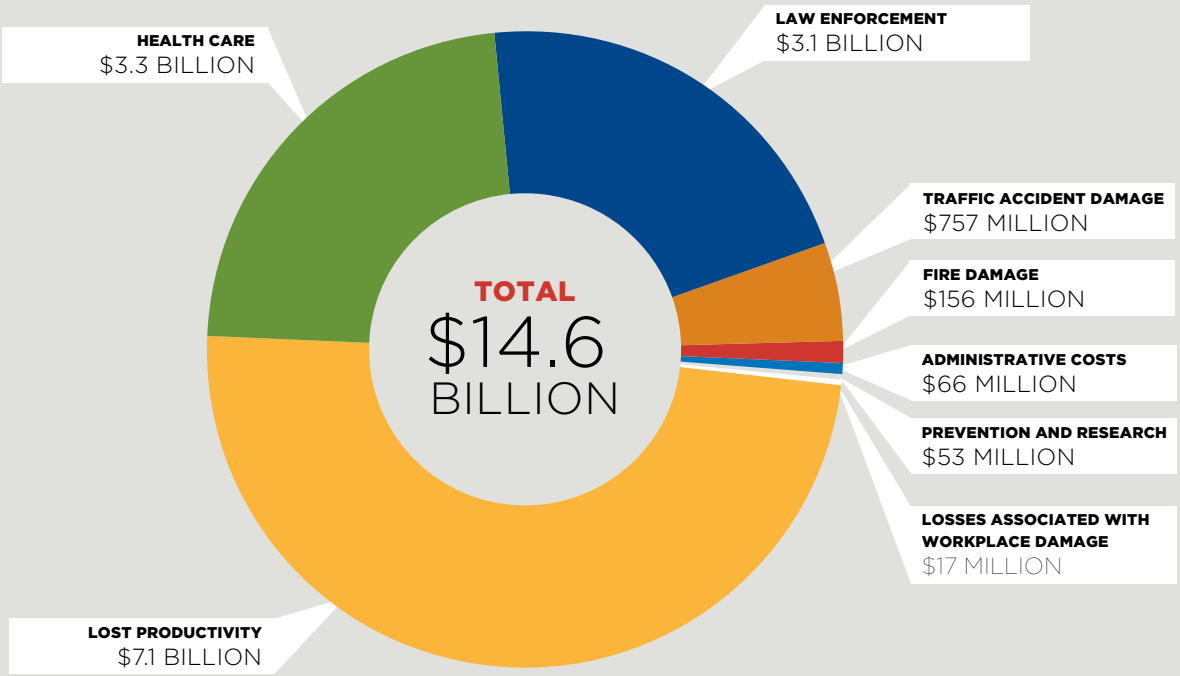
Sales of Alcoholic Beverages: Sales of alcoholic beverages can indirectly reflect how much Canadians are drinking. They also show how much Canadians are spending on alcoholic beverages. Sales continue to increase in Canada. From April 2013 to March 2014, Canadians bought $20.5 billion worth of alcohol, which was 1.1% higher than the previous year. Sales of ciders, coolers, and other refreshment alcoholic beverages accounted for most of this increase, although sales of wine and spirits are also increasing. Beer remains the most popular alcoholic beverage in Canada.[7]

The alcohol industry ensures that regulated alcoholic beverages are available to Canadians while sales contribute to the Canadian economy. For example, production and sales provide employment while taxes and pricing provide revenue for provincial and federal governments.[156] Net income and government revenue from the control and sale of alcoholic beverages was $10.5 billion in 2013/2014.[7] In most provinces, revenue from alcohol does not exceed societal costs from drinking.[156]

Overall Costs: The estimated cost of alcohol abuse in Canada in 2002 was $14.6 billion (see Figure 4).[6] This information is dated and the cost has likely changed over time. In fact, more recent data show that the cost of hospitalizations for substance use disorders from psychoactive drugs has been increasing, reaching $267 million in 2011, over half of which was due to alcohol.[9] These data do not fully capture hospitalizations from alcohol consumption as they are limited to alcohol use disorders.[9]

Impaired driving also creates a high financial burden, through both law enforcement and damage from accidents. When the health and social costs for deaths, injuries and damage to vehicles are included, costs related to impaired driving (including alcohol and other drugs) were estimated at over $20.6 billion a year in 2010.[157]

Figure 4:
BREAKDOWN OF ESTIMATED COSTS OF ALCOHOL ABUSE IN CANADA IN 2002[6]



Alcohol-Related Mortality and Morbidity in Canada

In Canada, alcohol is one of the top ten risk factors for disease among all Canadians and the top risk factor for Canadians aged 15 to 49 years.[158] In 2002, 4,258 deaths in Canada were related to alcohol abuse.[6] The majority of these deaths were due to alcoholic liver disease, motor vehicle accidents and alcohol-related suicides.[6]

In terms of health, consuming alcohol can have long- and short-term effects on the body with each having different underlying, although sometimes overlapping, causes. Drinking can also impact well-being over both the short and long term.

Globally, alcohol contributes to: [48]

- 100% of deaths and disability from alcohol use disorders and fetal alcohol spectrum disorder;
- 50% of deaths and disability for liver disease;
- 20-30% of deaths and disability from oral/pharynx cancer, laryngeal cancer, oesophageal cancer, pancreatitis, violence or self-harm;
- 10-15% of deaths and disability from liver cancer, tuberculosis, epilepsy, haemorrhagic stroke, unintentional injuries, falls, traffic injuries, drowning or fires; and
- less than 10% of deaths and disability from breast cancer, heart disease, ischaemic stroke, lower respiratory infections or HIV.

Long-term Impacts

Long-term impacts can be caused by a variety of mechanisms that are usually disease-specific. Outlined below are examples of long-term impacts of alcohol consumption, most of which are dose-dependent:

Alcoholic liver disease: The number of deaths in Canada from alcoholic liver disease has been increasing, from 1,104 in 2000 to 1,535 in 2011.[159] Risk factors for developing alcoholic liver disease include dose, frequency of drinking, type of drink, genetics, and the presence of other disorders. [160-162]

Fetal alcohol spectrum disorder (FASD): FASD is a lifelong chronic disorder that is the leading known cause of preventable developmental disability in Canada. [163, 164] It is estimated that more than 3,000 babies are born with FASD every year in Canada and that more than 330,000 people in Canada are affected.[165, 166] Estimates suggest that 2% to 5% of people in western countries may be affected by FASD.[167] Higher rates have been estimated for some Aboriginal communities in Canada. [168]

Alcohol is a teratogen (i.e., a substance that crosses the placenta in a pregnant woman to the baby and can cause malformation of an embryo) that can permanently affect the development of the fetus, resulting in a child born with FASD. FASD includes physical and central nervous system defects with impacts ranging from mild to severe. The greatest effects are on the brain, resulting in cognitive, behavioural and emotional impacts.[169]

People with FASD experience difficulties with judgment, planning, memory, impulsivity, communication, and other impairments. As a result, they are at greater risk for experiencing problems at school, mental health issues, problems with alcohol and other drugs, employment challenges, and involvement with the criminal justice system.[170]

Experts recommend that the safest choice is to not drink any type of alcohol at any time during pregnancy or when planning to become pregnant.[42] This recommendation may be difficult to follow as 50% of pregnancies are unplanned.[171] Mothers are also advised to limit alcohol consumption while breastfeeding and plan their breastfeeding schedule to ensure that alcohol is eliminated from their system before breastfeeding.[172, 173]

What about binge drinking and long-term health?

The impact of binge drinking (or heavy episodic drinking) on long-term health is a complex and evolving story. Evidence suggests that binge drinking is linked to negative impacts on the liver, the brain, cancer and cardiovascular health. [189-192] In some cases, the impacts of binge drinking are no different than drinking the same amount over a longer period. [193, 194] Binge drinking is also linked to higher rates of behaviours that put people's health at risk (e.g., smoking).[189, 193]

Examples of how alcohol consumption leads to disease: [96, 109, 115, 127, 189, 195–199]

- Alcohol is toxic for the liver, heart, pancreas and nervous system.
- Alcohol has a dose-dependent effect on the immune system with low doses being beneficial and higher doses being detrimental.
- There are many ways that alcohol might lead to cancer. For example, some metabolic by-products that result from drinking can cause tumours. This effect may depend on genetics.
- Evidence suggests that alcohol impacts various aspects of the cardiovascular system, some being direct (e.g., increased cell death in the heart) and some being indirect (e.g., through damage to the liver).

Cancer: Cancer is linked to 30% of all Canadian deaths, making it the leading cause of death in Canada. An estimated 40% of Canadians will develop cancer at some point during their lifetime.[174] Alcohol is considered to be carcinogenic and is strongly associated with an increased risk for certain types of cancer such as colorectal cancer, breast cancer, some cancers of the central nervous system, and cancers of the larynx, pharynx, oesophagus, and liver. [4, 48, 49, 52, 72, 82, 83, 88, 175–181]

Heavy drinking increases the risk for oral, pharyngeal, and oesophageal cancers by five times, for laryngeal cancer by two and a half times and for colorectal and breast cancers by 50%.[182, 183] There are sex differences in these effects. For example, men have a higher risk for alcohol-related colorectal cancer than women. Recent research shows that one drink a day may increase the risk for breast cancer in women.[183, 184-188] Every additional drink per day may further increase the risk for breast cancer as does the number of years a woman has consumed alcohol. [183, 184, 186]

Cardiovascular disease: Some evidence suggests that the effects of alcohol on the cardiovascular system are dose-dependent. Low to moderate doses can be beneficial in some cases.[42, 63, 89, 200] These beneficial effects may not be directly due to alcohol consumption with recent research raising many questions about this association.[200-203] Heavy drinking can lead to increased mortality, coronary heart disease, peripheral artery disease, heart failure, stroke, hypertension, and abnormal amounts of cholesterol or fat in the blood.[56, 63, 204-206] The effects on stroke depend on type – low to moderate drinking may only protect against ischemic stroke (blood clots) and not other types of stroke, while heavy drinking increases the risk for all types of stroke. [205, 207]

Short-term Impacts

Short-term impacts are often a result of being intoxicated ("being drunk") or drinking enough to impair judgement. In extreme cases, alcohol poisoning can occur. Outlined below are examples of short-term impacts of alcohol consumption:

Alcohol poisoning: When levels of alcohol in the brain are high or toxic enough to have an impact on areas important for essential functions, alcohol poisoning can occur.[208, 209] Symptoms include: confusion, stupor, coma, inability to wake up, vomiting, seizures, slowed breathing, irregular breathing, hypothermia, and suppressed vital functions.[209] Between 2009 and 2011, an average of 232 deaths per year from alcohol poisoning occurred in Canadians 15 years of age and older.[210]

Homicide: Homicide has been decreasing substantially over time. In 2013, it constituted approximately 0.1% of all violent crimes in Canada, resulting in 505 homicides in 2013.[211] Alcohol and other drug use is common in homicides in Canada, for both the accused and the victim. In 2013, an estimated 40% of accused and 32% of victims involved in a homicide in Canada had used alcohol at the time of the crime.[211]

Who is drinking and driving in Canada?[1, 8]

- Most people charged with impaired driving are men, but the gap has been closing recently with the rate of women being charged with impaired driving increasing since 2005.
- Rates of impaired driving are highest in the Northwest Territories, the Yukon, and Saskatchewan and lowest in Ontario and Quebec.
- Rates of impaired driving are lowest in metropolitan areas.
- Impaired driving incidents happen most often during weekends and soon after bars close.
- For licensed drivers, rates of impaired driving are highest in 20 to 24 year olds followed by 25 to 34 year olds.
- However, the third highest rate of impaired driving is found in 16 to 19 year olds despite the fact that fewer people in this age group drink than any other age group.

What is intoxication?
According to the World Health Organization, intoxication is a condition that results from taking a psychoactive drug. It depends on the dose taken and a person's unique characteristics, such as level of tolerance. For alcohol, intoxication is often called 'being drunk' and can lead to feeling flushed, slurred speech, lack of coordination, euphoria, being more active and talkative, disorderly behaviour, slower reactions, and impaired judgement.

Impaired driving: Impaired driving is the leading cause of criminal death in Canada.[8] In 2012, 523 Canadians died in fatal accidents involving alcohol, which is a decrease from 1,296 in 1995.[212, 213] In 2012, this accounted for a third of all fatalities in motor vehicle accidents in Canada.[213]

The *Criminal Code of Canada*'s section 253 describes the offence of operating a vehicle while impaired and includes a threshold for blood alcohol levels. As levels of alcohol in a driver's bloodstream increase, so does the risk for vehicle accidents.[214] Provinces and territories also have legislation and programs to reduce impaired driving.[5]

Since the 1980s, incidents of impaired driving have decreased substantially. In 1998, there were over 87,000 incidents of impaired driving linked to alcohol. The number of incidents has fluctuated over the years, reaching a low of over 76,000 incidents in 2006 before increasing again to a high of over 86,000 in 2009. More recently, the number of incidents has again decreased to over 72,000 in 2014.[2, 215]

Impacts on Mental Health

Alcohol is a risk factor for several mental illnesses while some mental illnesses precede heavy drinking.[216-219] At the same time, many of the risk and protective factors are the same for both, meaning that mental illness and drinking may be driven by other factors.[220]

In Canada, rates of death from alcohol-related suicide are linked to drinking patterns within a population.[221] Data from the early 2000s show that approximately 25 to 30% of suicides in Canada were linked to alcohol.[221] However, the link between alcohol and suicide is part of the broader and complex connection between alcohol and mental health.

Alcohol and Families: Problems with drinking tend to run in families due to a complicated interaction among alcohol consumption, genetics, and the social/family environment.[246-248] For example:

- The earlier people start drinking, the more likely genetics plays a role in the development of alcohol dependence.[246]
- Children of parents who drank heavily per occasion tended to have their first drink earlier, drink more as they get older and experience more negative life events in adulthood.[19, 36]
- University students with a family history of problems with alcohol have a higher risk for harm from drinking alcohol.[249]

These intergenerational effects interact to create a complicated web of impact on children and future generations.[250]

Depression: Alcohol and depression are strongly linked.[222, 223] Rates of alcohol use are higher in people with depression. Heavy drinking per occasion is linked to an increased risk for major depression, especially for women.[222, 224–226] Some evidence suggests that alcohol abuse or dependence could lead to depression.[225]

Post-traumatic stress disorder (PTSD): A link exists between alcohol use disorders and PTSD.[227–232] Alcohol is sometimes used to cope with the symptoms of PTSD, despite the fact that drinking is associated with the onset of PTSD and the severity of its symptoms.[230, 232, 233]

Anxiety: Anxiety is linked to alcohol use.[234–239] In the short-term, alcohol can reduce anxiety and panic, but withdrawal from alcohol can increase anxiety.[234] Women are more likely to drink to cope with social anxiety than are men.[240]

Personality disorders: Alcohol is linked to a variety of personality disorders, including antisocial personality disorder and narcissistic personality disorder.[241-245]

Health Benefits from Drinking Alcohol

Some evidence suggests alcohol may be beneficial for a limited portion of the population, with the effect being most associated with wine.[251–256] Research indicates that youth do not benefit from alcohol at any dose.[42] Low to moderate levels of alcohol consumption have been linked to reduced mortality from some diseases and lower rates of diseases such as diabetes, cardiovascular problems, and cognitive impairments. However, this is a complex story, as some evidence suggests that the benefits from alcohol consumption are not relevant for all individuals, at all ages or in all situations. Benefits could also be due to other factors in some cases or are based on research with methodological issues.[53, 54, 56, 57, 59, 61, 63–65, 69, 73, 76–80, 84, 87, 89, 90–92, 256–261]

Moreover, risks and benefits can occur at the same time. While low and moderate levels of alcohol consumption maybe beneficial in some situations, one drink more than the recommended amounts can increase the risk for several types of chronic illnesses.[42, 184, 186, 187, 262] There are other less risky behaviours that can be adopted to achieve the reported health benefits of low to moderate alcohol consumption, such as a healthy diet and physical activity.[e.g., 263–265]

Social Benefits: Drinking alcohol may also have social benefits, such as being part of some cultural traditions.[266] Drinking alcohol is strongly tied to being social, enjoyment and positive social experiences.[31, 32, 267]

Alcohol consumption can be a powerful social motivator that can help form new friendships and strengthen existing ones.[32, 268, 269] For some people, drinking is associated with positive mood, relaxation and in some cases, positive mental well-being. However, these benefits may be culturally specific and can occur at the same time as negative outcomes on other measures of health.[267, 270–271]

In addition, it is possible that the benefits are not from alcohol per se, but rather the positive social expectations and experiences associated with drinking.[271]

PATHWAYS TO IMPACTS: FROM BRAIN TO BEHAVIOUR

Alcohol can have a variety of direct immediate or short-term effects on biology that can result in impacts on health, well-being, and behaviour. In order to understand how alcohol creates social impacts, it is important to understand drinking patterns and alcohol's pathway from the brain to behaviour.

Importance of Drinking Patterns

How much and how often an individual drinks are key factors that increases or decreases the risk for impacts from alcohol. Abstinence prevents all direct alcohol-related impacts on an individual. Some negative health impacts are temporary and can be reversed or reduced once a person stops drinking or drinks within recommended guidelines.[e.g., 272, 273]

Alcohol's impacts are dose-dependent (e.g., volume consumed), but also depend on type of drink and the pattern of consumption over time (e.g., drinking patterns). To that end, experts have developed low-risk drinking guidelines to help Canadians understand how much is too much.[42]

Categories of diagnostic criteria: [274]

- Risky use
- Lack of control over use
- Social and occupational impairment
- Needing more drug over time to have an effect (i.e. tolerance) and/or experiencing withdrawal symptoms

Alcohol use disorders: Alcohol use disorders are associated with heavy drinking, but are not diagnosed by use alone. The Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-V) is a diagnostic tool used by health care professionals to diagnose and determine treatment for mental health disorders.[274] Previous editions defined problems with psychoactive substances through two distinct categories of abuse (based on risky use and the resulting social and occupational impairments) and dependence (based on resulting health problems, physiological dependence, cravings, lack of control over use, and time spent seeking, using or recovering from use).[275] In 2012, approximately 5 million Canadians (or 18 % of the population) aged 15 years and older met the criteria for alcohol abuse or dependence at some point in their lifetime.[276]

The DSM-V defines substance use disorders along a continuum of severity rather than as distinct conditions. For diagnosis, there are a variety of criteria that must be met with severity being gauged by how many criteria a person fits. Substances use disorders are defined for nine groups of psychoactive substances: alcohol; cannabis; hallucinogens; inhalants; opioids; sedatives, hypnotics and anxiolytics; stimulants; tobacco; and, other substances.[274]

CANADA'S LOW-RISK ALCOHOL DRINKING GUIDELINES RECOMMEND THAT:

To reduce risks of *short-term* injury and harm:

- Women should have no more than 3 standard drinks on any single occasion.
- Men should have no more than 4 standard drinks on any single occasion

To reduce *long-term* health risks:

- Women should have no more than 10 standard drinks a week, with no more than 2 drinks a day on most days.
- Men should have no more than 15 standard drinks a week, with no more than 3 drinks a day on most days.

Due to the health risks involved, abstinence is recommended:

- During pregnancy or when planning to become pregnant, and before breastfeeding;
- Before and while driving or using machinery and tools;
- When complications with medications or other drugs are possible;
- When living with mental or physical health problems; and
- Before and during any activities that need judgment, physical skill, balance and endurance.

WHAT IS A STANDARD DRINK?

REGULAR BEER
341 mL = 12 oz
5% alcohol

WINE
142 mL = 5 oz
12% alcohol

FORTIFIED WINE
85 mL =3 oz
16–18% alcohol

HARD LIQUOR
43 mL = 1.5 oz
40% alcohol

Youth should delay drinking alcohol as long as possible, at least until reaching the legal drinking age.

Stress and Alcohol

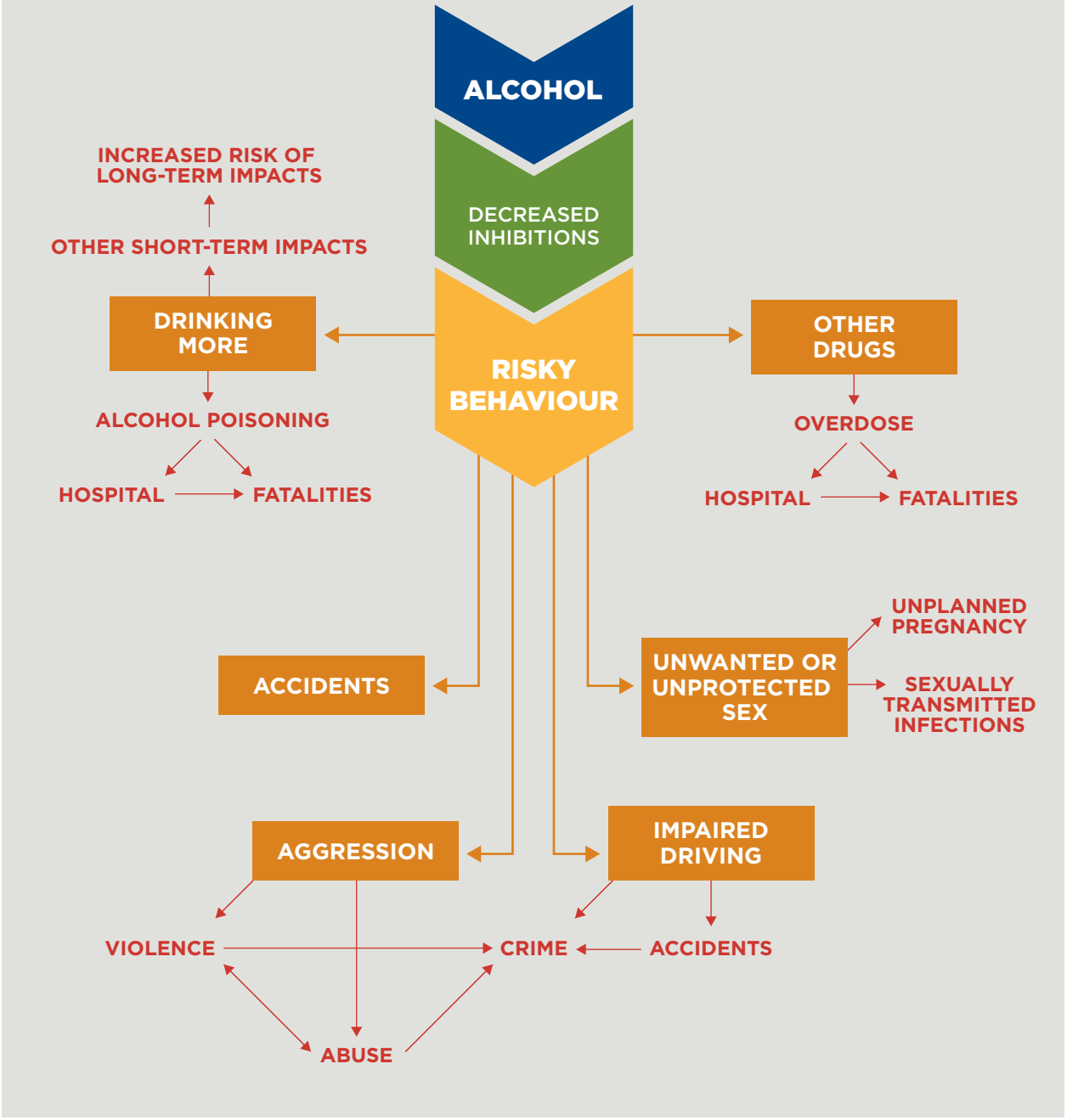
A healthy response to stress is essential for good health.[283] Drinking alcohol can negatively affect how the body reacts to stress,[284–291] which in turn, may underlie some of alcohol's effects on health and well-being.[290]

From Brain to Behaviour

As a psychoactive drug, alcohol acts on the brain, leading to changes in behaviour.

Alcohol's effects are dose-dependent and differ from individual to individual. Generally, alcohol initially acts as a stimulant then a depressant.[277] Alcohol interacts with two widespread chemicals in the brain: gamma-aminobutyric acid (GABA) and glutamate. Alcohol stimulates GABA receptors (which are inhibitory) and inhibits glutamate receptors (which are excitatory), leading them to work together to suppress activity in certain areas of the brain.[45, 100]

Figure 5:
A SCHEMATIC OF THE WIDESPREAD IMPACTS OF ALCOHOL ON RISKY BEHAVIOUR



References: 4, 6, 9, 42–44, 86, 93, 125, 146, 208-210, 214, 295, 309, 311, 312, 315-327.

Drinking alcohol acts on the brain to create a pleasant feeling and has a reinforcing effect on the brain's reward (dopamine) system with the help of other brain chemicals (e.g., opioids, stress hormones). Alcohol's effect on the reward system is thought to be the mechanism by which addiction to alcohol develops.[45, 95, 124, 262, 278-280]

Alcohol easily reaches the brain and can adversely affect processes that are essential for healthy brain growth and functioning. At higher amounts, it can also damage a wide range of areas in the brain that are important for learning, memory, decision making, motor control, and emotion.[100, 208, 281, 282]

From Behaviour to Social Impacts

Over the short term, alcohol consumption can decrease inhibitions and increase risky behaviour.[e.g., 93, 291-293] This can lead to a variety of potential impacts (see Figure 5) including risky decisions such as deciding to drive after drinking or having unprotected sex.[93, 295] Drinking patterns are also linked to unwanted sex and rape among students.[296–298] Alcohol can be considered a date rape drug.[296] Drinking alcohol can also be used to help ease sexual interactions in consensual situations.[299]

Alcohol dependence can also increase emotional reactivity and lead to an inability to interpret emotions, language and humour.[300–302] In some cases, heavy drinking is associated with increased social rejection and smaller, less diverse social networks.[303, 304] Families can also be affected by alcohol. For example, how much a person drinks can influence how much their partner drinks.[305] Marital dissatisfaction and divorce can result when one partner drinks heavily.[305–307] An increased risk for partner violence, negative interactions, aggression, and child abuse and neglect is also linked to heavy use of alcohol.[248, 307–313]

SUMMARY OF ALCOHOL'S IMPACTS ON BEHAVIOUR

- Alcohol-induced disinhibition can facilitate risky behaviour which can lead to a variety of negative outcomes such as impaired driving, accidents, rape, sexually transmitted infections, aggression, and violence.
- Alcohol's effect on cognition can affect a person's ability to learn and work effectively, leading to poor academic performance and impaired occupational functioning. In turn, this can lead to dropping out of school or unemployment.
- Alcohol can have a negative impact on relationships with family and friends. Parents, other adults and older siblings can act as role models for children and youth, passing on risky drinking patterns to the next generation.
- Impaired motor skills from drinking alcohol can lead to an inability to drive safely, leading to a higher risk for accidents that can affect the drinker and other Canadians.

INFLUENCING FACTORS

A variety of factors play an important role in whether or not alcohol impacts an individual or population. Some factors are risk factors and some are protective; however, many are linked to the social determinants of health. The social determinants of health play a role in health inequities and help define an individual's or a population's social, economic, and physical environment, as well as an individual's characteristics and behaviours.[328, 329]

Social acceptability: When a drug is socially acceptable, people are more likely to use it and pressure others to use it too. Alcohol is an example of a drug that is socially acceptable in some areas of the world despite its risks for harm. Alcohol is most often consumed for enjoyment, to be social, and to celebrate despite awareness of the risks involved.[31, 32, 267] In some situations drinking alcohol is not acceptable, such as when it leads to violence, before and while driving, when underage or during pregnancy.[42]

Stigma and discrimination: Despite being socially acceptable, the use of alcohol can also lead to stigma and discrimination, particularly for those who are being treated for alcohol use disorders.[304, 334–336] On the other hand, stigma is also attached to abstinence. Non-drinkers can be reluctant to disclose their non-drinking status because of this stigma and in order to be socially accepted.[336, 338]

HISTORY

- Humans have a long history and, arguably, fascination with mind-altering drugs, including alcohol.[266, 330, 331] Not long ago, alcohol was illegal in many jurisdictions and remains highly regulated in some areas of the world today.[48]
- Prohibition of alcohol in the early 1900s in North America arose out of concerns for its negative impacts. Based on data from the United States, prohibition of alcohol initially decreased drinking rates. These rates returned to pre-Prohibition levels in the decade following the end of Prohibition.[332]
- Like other psychoactive drugs, alcohol was explored for its medical qualities. More specifically, the idea that moderate drinking could have health benefits started in the 19th century.[333] Until recently; however, it was less clear what defined the difference between low- and high-risk drinking.[42]

CANADA AND THE WORLD[48]

From 2008 to 2010, average alcohol consumption per person in Canada was below the alcohol consumption of many developed countries.

Canada

- Canadians reported drinking 8.2 litres of pure alcohol per year.
- 23% of drinkers drink heavily.

United States

- Americans reported drinking 8.7 litres of pure alcohol per year.
- 24.5% of drinkers drink heavily.

United Kingdom

- People from the UK reported drinking 10.4 litres of pure alcohol per year.
- 33.4% of drinkers drink heavily.

Australia

- Australians reported drinking 10.4 litres of pure alcohol per year.
- 13% of drinkers drink heavily.

* Annual consumption was averaged from 2008 to 2010 and measured in pure alcohol per capita in Canadians aged 15 years and older.

** For these data, heavy drinking was defined as consuming at least 60 grams or more of pure alcohol on at least one occasion in the previous month.

Note: 10 litres of pure alcohol is equivalent to over 580 drinks of regular beer (at 5% alcohol and 341 mL per drink).

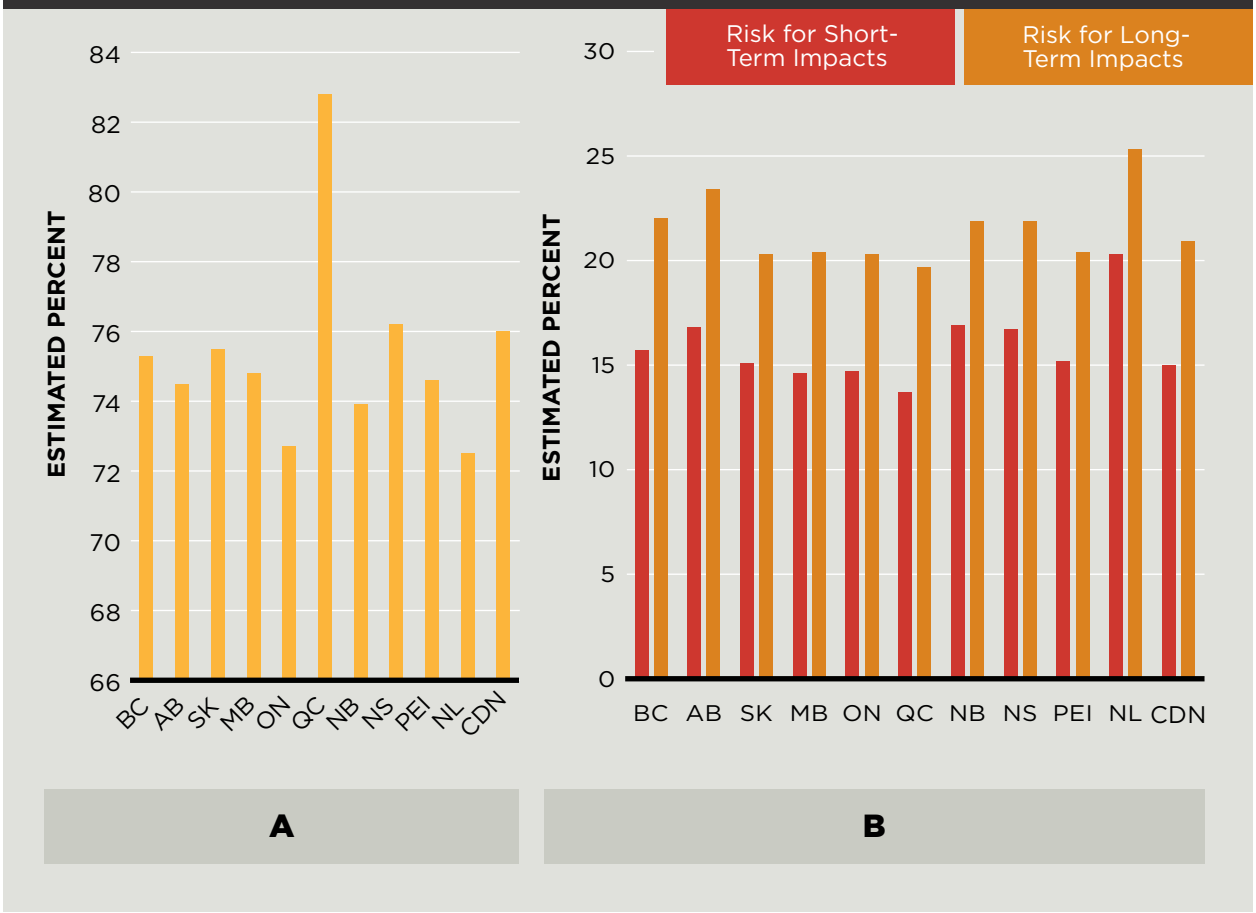
LOCAL CONTEXT

Drinking patterns differ across the world, shaped by the local context of where people live, including: local laws, regulations, and policies related to alcohol; history, cultural and religious beliefs and attitudes; and, the social determinants of health.[31, 48, 331] In addition, major political, economic and social events can influence a country's drinking pattern.[339–341]

Drinking around the world: Globally, developed countries show the highest rates of alcohol use while eastern Mediterranean countries have very low rates.[48] In many developed countries, rates of risky drinking are increasing in young people, particularly in young women.[342] Other shifts in drinking rates are occurring in different areas of the world. For example, India and China are currently seeing large increases in drinking. These increases are strongly influencing the overall picture of global drinking patterns.[48]

There are also shifts in alcohol consumption being experienced in the United Kingdom and France, areas of the world with specific stereotypes related to alcohol. In the United Kingdom, rates of binge drinking have been decreasing while in France, rates of binge drinking have been increasing in youth.[343-345]

Figure 6:
WHAT PERCENTAGE OF CANADIANS A) DRANK ALCOHOL IN THE PREVIOUS YEAR OR B) UNDERTOOK RISKY DRINKING IN 2013?



Estimated percentage of Canadians 15 years of age and older who had a) consumed alcohol in the year previous or b) consumed alcohol **the week prior to a 2013 survey** in amounts that exceeded the guidelines for risks of immediate impacts or long-term impacts. Data from the territories were not collected.[1]

Drinking patterns across Canada: Even within a country, drinking patterns can differ. In 2013, rates of past year use of alcohol were highest in Quebec and lowest in Newfoundland and Labrador. However, rates of risky drinking among drinkers were highest in Newfoundland and Labrador and lowest in Quebec[1] (see Figure 6). Other surveys show that people in the Maritimes drink more alcohol in a sitting while people in the Prairies drink less, both in terms of amount and frequency. People from Quebec, Ontario and British Columbia drink more frequently and drink most often during a meal.[3,4,6]

Statistics Canada also collects data on drinking that exceeds the guidelines for short-term risks (i.e., 5 drinks or more for men and 4 drinks or more for women on one occasion at least once a month in the previous year). This provides a more comprehensive picture of risky drinking than asking about drinking in the previous week.

In 2014, almost 18% of Canadians reported drinking heavily.[347] Ontario and British Columbia consistently had rates below the overall Canadian rate (both approximately 16% in 2014) while data from Nunavut suggest similarly lower rates. The Northwest Territories (32.7%), the Yukon (27.8%) and Newfoundland and Labrador (25.4%) had the highest rates (see Table 3).[347]

Table 3: RATES OF HEAVY DRINKING IN 2014

	TOTAL	MEN	WOMEN
British Columbia	15.8	19.9	11.8
Alberta	18.9	23.1	14.6
Saskatchewan	19.5	25.7	13.3
Manitoba	17.8	22.5	13.2
Ontario	16.2	20.7	11.8
Quebec	20.2	25.8	14.8
New Brunswick	21.4	27.8	15.3
Nova Scotia	20.1	24.5	15.9
Prince Edward Island	16.9	21.0	13.1
Newfoundland and Labrador	25.4	33.2	18.0
Yukon	27.8	32.6	22.7
Northwest Territories	32.7	39.1	26.3
Nunavut	14.3*	17.4*	11.0*
Canada	17.9	22.7	13.2

Estimated percentage of Canadians 12 years of age and older in 2014 who had reported drinking heavily on one occasion at least once a month in the previous year. Heavy drinking was defined as drinking 5 drinks or more for men and 4 drinks or more for women.[347]
* Data should be used with caution.[347]

INDIVIDUAL FACTORS

Drinking patterns not only differ significantly across populations, they also vary widely between individuals. There are several factors that influence how much people drink and their risk for impacts from drinking alcohol.

Motives for drinking define why people drink alcohol. Generally, there are four main reasons why people drink: to be social, to create a positive mood, to cope, or to conform.[348-350] Coping and conforming are considered negative motives, with drinking to cope more likely to be associated with alcohol use disorders.[348–351] How alcohol is linked to a person's identity and self-image plays a role in the impact that motives have on drinking patterns.[349]

Heavy drinking among young adults is often the result of intending to drink heavily. Many factors influence this decision-making process, including social norms and future plans.[352] Factors that occur during a drinking episode can also change how much is consumed, including available funds, behaviour of friends, mood and transportation options.[352]

Cues that are unique to an individual and related to alcohol, such as certain friends or specific locations, can increase the need for alcohol as well as the potential for negative consequences.[355, 356] How a person feels while drinking can affect their subsequent alcohol use. When heavy drinkers drink alcohol, they experience a more intense stimulating effect and a less intense depressive effect than do light drinkers. This effect was linked to an increased risk of binge drinking among heavy drinkers at a later date and of developing an alcohol use disorder.[357–359]

Different **locations** can strongly influence drinking patterns. Generally speaking, certain locations are associated with drinking and tend to increase the potential for heavy drinking.[360–364] Drinking at locations such as pubs and off-campus housing can lead to more drinking among university students.[365, 366] Drinking at a friend's house or in a restaurant is associated with lower levels of drinking among adults.[364, 367] Becoming a parent is related to decreased drinking, which is likely at least partially due to less time spent at locations where heavy drinking is more prevalent (e.g., bars).[364]

Friends strongly influence drinking habits. Drinking alcohol is strongly linked to being social. In fact, young people will emphasize positive social experiences associated with drinking to compensate for the negative impacts.[267] Drinking patterns within a social network have an important impact on use.[26] Having more friends who drink is linked to heavy drinking, although loneliness is also linked to heavy use.[365, 366] Social support can sometimes decrease how much alcohol is consumed.[365, 367–370]

Context is also important – drinking alcohol with meals tends not to lead to the same negative impacts as drinking alcohol at other times.[428, 429] When many people are intoxicated together or drinking games are involved, more alcohol tends to be consumed.[360]

Some **personality traits** have been linked to increased risk for impacts from alcohol. Impulsivity and sensation seeking are associated with increased alcohol consumption. In turn, these traits are linked to increased alcohol-related negative health impacts, including alcohol use disorders.[98, 104, 107, 116, 430–435]

For some people, **stress** can trigger a need for alcohol as a method of coping, which can create a cycle of stress and alcohol use.[348, 367, 404, 406–411, 414, 415, 417, 419, 423, 427, 436]

MODIFYING RISK FACTORS

In addition to personal triggers, there are other risk factors that can result in some people being more at risk for negative impacts than others. These include:

- **Genetics and Epigenetics:** Genetics play a strong role in becoming dependent on alcohol,[437–442] with some evidence suggesting that genetics contribute approximately 50%.[438, 440] Genetics affect the risk for impacts from alcohol through a variety of mechanisms. For example, genes can affect how people metabolize alcohol or the development of personality traits that are linked to alcohol use.[443–445]

  Epigenetics looks at how different factors can turn genes on or off and how these changes in gene activation can be passed on to future generations.[446] This is still a growing area of research, including for alcohol.[447–449] The epigenetic effects of alcohol can be seen through the impacts of drinking before conception. For example, heavy drinking during the preconception period by a mother or father can affect the development of their child.[450, 451] Epigenetics also plays a role in a variety of risk factors that influence the use of alcohol such as stress and early development.[452–457]

- **Biology:** Alcohol is most often consumed as a beverage and enters the bloodstream via the digestive tract. Blood levels of alcohol depend on a person's metabolism and increase when more alcohol is consumed, when people have a higher body fat content, when less food is present in the digestive system and with the use of some medications.[45, 100]

HOW DO EXPECTATIONS INFLUENCE ALCOHOL'S EFFECTS?

The effects of alcohol are mediated by the expectations of the drinker. People are poor at judging how intoxicated they are, leading to the belief that they are more capable of doing certain activities such as driving safely, than they actually are.[353,354]

Various events that happen over a person's lifespan affect drinking patterns and the risk for impacts from alcohol.[93, 305–307, 348–427] For example:

- Poor academic performance
- Problems at school
- Dropping out
- Moving from high school to university/college
- Unemployment
- Stress at work
- Divorce
- Marital conflict/dissatisfaction
- Partner who drinks heavily
- Stressful life events
- Marriage
- Becoming a parent
- Retirement
- Aging

Sex: Women and men tend to differ in body fat percentage and in how they metabolize alcohol. Reduced amounts of certain enzymes and other sex differences in metabolism lead to more alcohol entering the bloodstream in women than men when the same amount is consumed.[45, 100]

Aging: With age, risks from alcohol may increase as people become more sensitive and less tolerant to alcohol.[386, 458-464] As a result, alcohol has a greater impact on people who are older than 65. People tend to drink less alcohol as they age, although this may be changing.[465]

Stress, depression and life events and transitions linked to aging such as death of a spouse or divorce, loss of social networks, a change in health status or retirement can impact drinking patterns.[466]

- **Underlying health conditions:** Alcohol can exacerbate poor health. Generally, alcohol impairs the immune system, although it does so in a dose-dependent manner.[96, 109, 115, 127] Alcohol's impacts on the immune system could make existing health conditions worse.[96, 109, 115, 127] Alcohol also contributes to the development and progression of non-alcoholic fatty liver disease, which is largely caused by obesity.[467] It can also hasten the progression of HIV and hepatitis C.[468-473] Alcohol can modify the effectiveness of various medications, including drugs for conditions such as arthritis, diabetes, heart disease, enlarged prostate, high cholesterol, heartburn, indigestion, high blood pressure, infections, depression, anxiety, epilepsy, seizures, attention deficit/hyperactivity disorder, blood clots, nausea, insomnia, and allergies. Other examples include pain killers, cough syrups, anti-cancer drugs and anti-retrovirals.[474–476]

- **Socioeconomic status (SES):** SES is a factor that is based largely on income, education and employment.[477] As a risk factor for problems with alcohol, the link between SES and alcohol is complex and influenced by other factors, such as drinking pattern, age, gender, parental/childhood SES, neighbourhood characteristics and country of residence.[478–493] In Canada, men and women with high SES are more likely to drink and undertake risky drinking than those with low SES.[342] In general, people with low SES are more likely to experience negative impacts from drinking.[490, 492, 493]

- **Occupation:** Beyond its role in SES, employment can modify alcohol's impacts on health. In Canada, different types of jobs were not linked to risky drinking.[494] Characteristics of work or the labour market rather than the job per se were more likely to affect drinking patterns. For example, social support, job motivation, and job satisfaction were related to low alcohol consumption. Stress, overwork, long hours, harassment, and job insecurity were linked to risky drinking. Control over decisions was linked to both high and low alcohol consumption.[495–506] Factors outside the workplace seem to have a greater impact on drinking patterns than work-related factors.[494]

  Certain types of jobs or activities involve a sub-culture of drinking alcohol. For example, alcohol is an integral part of life for musicians, as is job insecurity, stress and the need to socialize for work all of which are linked to risky drinking.[507, 508] Alcohol is also a part of sports culture. Student athletes are more likely to drink than student non-athletes, although this depends on time of year (e.g., on- versus off-season), sex, level of competition and type of sport in some situations.[509–519] In addition, students who were fans of sports at college were also more likely to drink and drink heavily.[520] There is some evidence that teenagers' involvement in sports may lead to heavier drinking later on.[521, 522]

- **Alcohol and Other Drugs:** Drugs are often discussed in isolation, but in reality, some are frequently used together (known as polydrug use). The risks for harm increase with polydrug use.[97, 318, 324, 326, 523] For example:
  - **Alcohol and caffeine** is a combination that is a public health concern, particularly with respect to youth and the use of energy drinks.[524, 525] Caffeine and alcohol together may increase the risks for harm from alcohol. People who combine alcohol and caffeine often increase their consumption of alcohol and report feeling less tired and more alert, as well as feeling less intoxicated than they actually are.[525–532] Mixing alcohol and caffeine is also often associated with increased risky behaviour.[533, 534]
  - When combined, **alcohol and marijuana** can increase motor control problems, leading to higher risks for motor vehicle accidents than the use of either drug alone.[535] This is likely due to the fact that alcohol increases marijuana metabolites in the bloodstream, increasing the impacts of marijuana on behaviour.[536, 537]
  - Separately, **alcohol and tobacco** can strongly impact long-term health. Together, they can further increase this impact. For example, the risk for oral and pharyngeal cancers in people who both drink heavily and smoke tobacco is 300 times higher than for people who neither drink nor smoke.[538]

PROTECTIVE FACTORS

Certain factors can protect against the negative impacts of alcohol, notably reducing consumption. Many protective factors are the same for adolescents as they are for young adults.[539] Attending religious services or activities, being more attached to parents, having high levels of family support, strong family management (e.g., rules, monitoring, consistent discipline, reinforcing good behaviour), having good social skills and sense of morality. social conformity, and being prosocial (e.g., working hard at school, helping at home, being involved in community activities, etc.) are all factors that are linked to reduced drinking among youth and young adults.[539, 540]

Protective and risk factors are not the same everywhere, with differences contributing to drinking rates and patterns.[541] Some traits, such as self-esteem, can also have an impact on alcohol consumption, although the effect is complex and can depend on drinking motives or context.[542, 543]

Certain strategies can also help protect against the negative impacts from alcohol, including setting limits, adjusting limits to recognize risk factors (e.g., age, body weight), drinking slowly, alternating between alcoholic and non-alcoholic drinks and eating before and while drinking.[544]

POPULATION HEALTH PERSPECTIVE

Based on existing information, alcohol consumption is discussed in three specific populations below — youth, women and Aboriginal populations:

YOUTH

Alcohol is a public health concern for youth because:

- Drinking patterns established during adolescence are important predictors of drinking patterns and their impacts in adulthood. The younger a person starts drinking, the higher their risk for poor health and problems with alcohol later in life.[545–555]
- Girls may experience more impacts from alcohol on the brain than boys.[556] While drinking rates for girls are lower than for boys, rates of becoming intoxicated are similar.[555]
- Teenage brains, particularly those of teenage girls, are more vulnerable to the effects of alcohol, resulting in various impacts on developing cognition and behaviour.[281, 555–567] How the brain influences drinking behaviour may differ between teenaged boys and girls.[556, 568]
- Youth who drink heavily can have trouble with attention, memory and decision-making and can experience social, emotional, and behaviour problems.[559, 565] Problems with alcohol can lead to poor academic performance, dropping out, poorer job possibilities, and social isolation.[93, 105, 299, 342, 569–572]
- Youth are strongly influenced by friends and family. For example, when youth believe that their friends are drinking heavily, they drink heavily too. Also, when friends and parents approve of drinking alcohol, youth are more likely to drink and suffer negative impacts from drinking.[571]

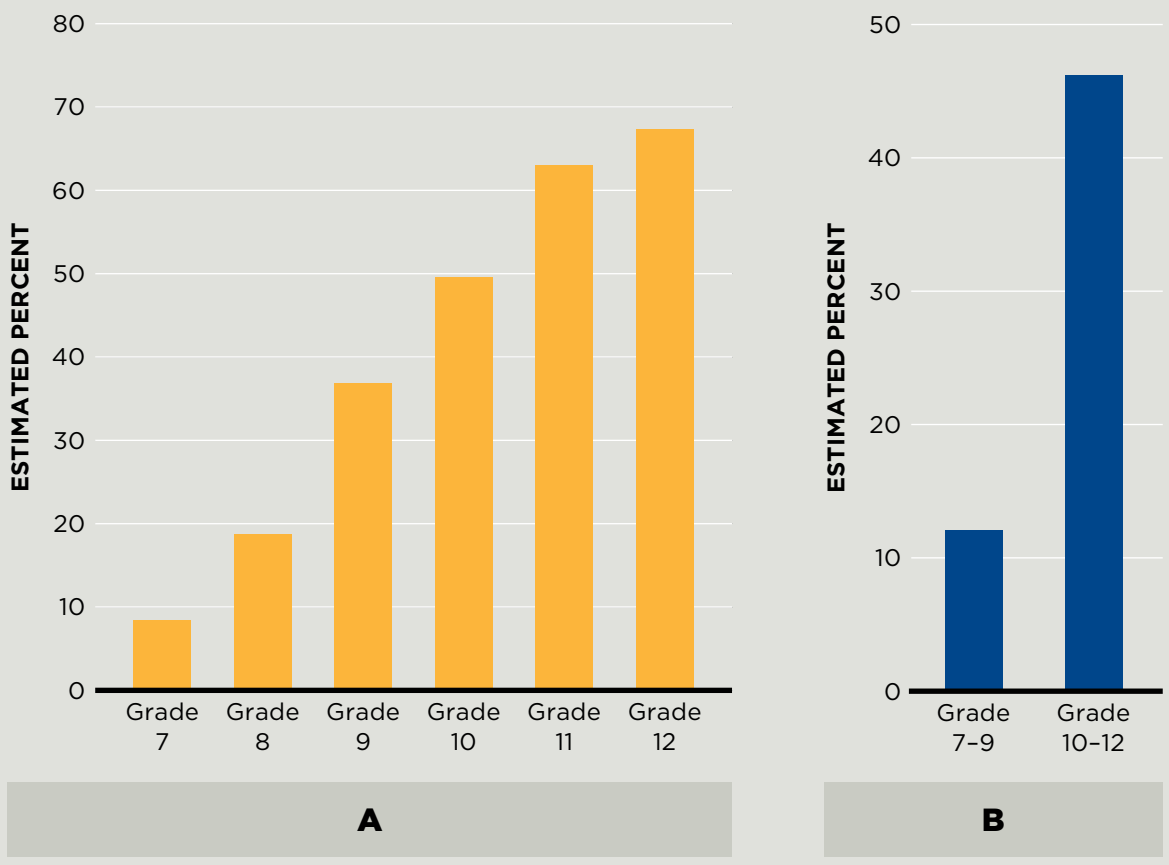
WHY DO YOUTH TRY ALCOHOL? [431, 467, 560-564, 568, 573-576]

- Youth tend to be more impulsive, seek out new experiences and take more risks.
- Youth also tend to have trouble with self-control and deal with stress differently than adults.
- Areas in the brain related to decision-making, motivation, emotion, and reward are still developing. In fact, brain development continues into young adulthood.

Data on Youth and Alcohol Consumption in Canada: The age at which youth take their first drink in Canada has been increasing.[599] An estimated 60% of Canadians aged 15 to 19 years drank alcohol in 2013. An estimated 15% of these youth drank enough to exceed the adult low-risk drinking guidelines for acute effects, while almost 20% exceeded the adult guidelines for chronic impacts.[1]

Many Canadians begin drinking before the age of 15. The phenomenon of students binge drinking or "getting drunk" is infrequent in lower grades and becomes much more common in higher grades (see Figure 7).[555, 599] By grades 10 to 12, almost 60% of teenagers reported having had a drink in the previous year while about 46% reported having undertaken binge drinking in 2012–2013. This is a decrease from previous years. For example, over 70% of students in Grades 10 to 12 reported drinking in the past year with almost 60% binge drinking in 2008-2009.[599-601] In 2012–2013, about 50% of youth reported having had their first drink of alcohol between the ages of 12 and 14.[602]

Figure 7: WHAT PERCENTAGE OF STUDENTS A) DRANK ALCOHOL OR B) UNDERTOOK BINGE DRINKING IN 2012–2013?



Estimated percentage of Canadians in Grades 7 to 12 who a) consumed alcohol or b) undertook binge drinking (5 or more drink on one occasion) in the year prior to the Youth Smoking Survey 2012–2013.[599]

Rates of drinking at least once a week by students in Grades 6, 8, and 10 have decreased, particularly for beer. However, rates of becoming intoxicated have been relatively stable since 1994.[555]

In every grade, boys consistently drink more beer than do girls, while consumption of wine, liquor and coolers is more similar across sexes. Consumption of beer increases across grades, while the consumption of wine and liquor is more stable.[555]

About 60% of students in Grades 6 to 10 think drinking "once in a while" carries little to no risk. Regular drinking is thought to be risky by around 80% of boys and 87% of girls in Grades 6 to 10.[602] Binge drinking (i.e., drinking 5 or more drinks in a single occasion for boys and 4 or more drinks for girls) in the previous year was linked to more emotional and behaviour problems, particularly in those who undertook binge drinking most often.[602]

WHERE DOES PARENTING FIT IN?

- Parents can have a negative influence on their children's future use of alcohol, health and well-being through abuse, neglect, and stress.[94, 99, 101, 305, 575-582]
- Parental drinking predicts alcohol use in youth.[583-585] Parental motives, rules, and attitudes also affect children's drinking.[585-590]
- Positive family relationships and parenting practices are linked to reduced drinking by teenagers, while negative family relationships, including divorce and family violence, are associated with more or earlier drinking.[591-598]

KEY FACTS ABOUT STUDENTS AND ALCOHOL: [11, 555, 599, 603–611]

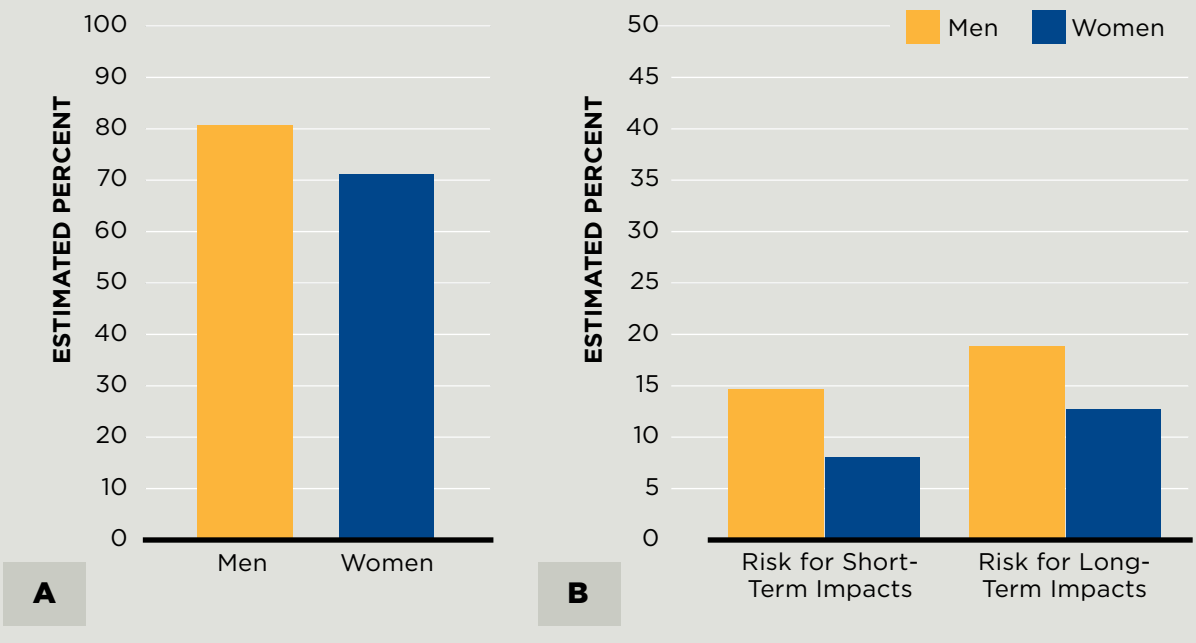
- Rates of drinking increase considerably from lower grades to higher grades and even more so after the transition to university and college.
- Many university and college students experience negative outcomes from their drinking, such as hangovers, fights, and poor academic performance.
- Some students rate negative impacts such as hangovers and blackouts as neutral or positive, which is more likely to lead them to drink more and experience negative health impacts.
- For some students, alcohol can have positive effects, such as making events or celebrations more fun. Positive impacts have a stronger effect on subsequent drinking than negative impacts.
- Drinking games are popular in high school and university/college and can lead to many negative impacts.
- Holidays and special events such as celebrating being legal age to drink, spring break, and athletic events, can increase drinking, even in students who tend to normally drink lower amounts.

WOMEN

Alcohol is a public health concern for women because:

- As a population, women are less at risk for negative impacts from alcohol because they tend to drink less than men. As individuals, women are more at risk for harm from alcohol due to biological and social factors.[1, 2, 45, 100, 342]
- Because more women are undertaking risky drinking over time, this increases the risk that with time, women will be more impacted by alcohol as a population.[1,2,342]
- Women can be more vulnerable to sexual assault or other violence when drinking beyond their capacity.[298, 299]
- Alcohol consumption can affect fertility. While moderate levels of drinking are linked to more sexual activity, they may also reduce the ovary's ability to release healthy eggs (which is essential for conception) in pre-menopausal women.[108, 612]
- Although the impacts of drinking during pregnancy are well known, over 10% of women in 2006–2007 who gave birth reported they drank while pregnant.[613] Drinking before conceiving can also have detrimental effects on the development of offspring.[450, 451] It is estimated that 50% of pregnancies are unplanned, meaning women may consume alcohol before knowing they are pregnant.[171]
- Alcohol's effects on women may be moderated by the impact of alcohol on hormones. For example, estrogen levels in women increase with every drink of alcohol, although the link between alcohol and estrogen is complex.[112, 117, 614] These changes in estrogen may be linked to alcohol-related effects on breast cancer and fertility.[102, 111, 615–617]

Figure 8:
WHAT PERCENTAGE OF CANADIANS A) DRANK ALCOHOL OR B) UNDERTOOK RISKY DRINKING IN 2013?



Estimated percentage of Canadians 15 years of age and older who consumed alcohol a) in the previous year or b) in **the week prior to a 2013 survey** in amounts that exceed the low-risk drinking guidelines.[1]

Data on Sex Differences in Alcohol Consumption in Canada: In Canada, a higher percentage of men than women drink alcohol both in general and in terms of risky drinking (see Figure 8).[1] However, risky drinking by women in Canada has increased,[1, 131, 132, 342], particularly in women above the age of 35.[1, 132]

Men tend to begin drinking and undertaking risky drinking at an earlier age than do women,[1, 618], although women progress more quickly from abuse to physical dependence and to treatment for problem use than men.[619] Men also tend to drink more for the positive effects and social aspects of alcohol than women do.[620]

ABORIGINAL POPULATIONS

Alcohol is a public health concern for some Aboriginal populations in Canada because:

- Many Aboriginal populations face major challenges that affect their health and well-being such as high unemployment, poverty, poor access to education, poor housing, being located far from health services, the displacement of Aboriginal language and culture, and social and economic marginalization.[621–629]
- In order to address health issues, there is a need to understand how Aboriginal social determinants of health affect and contribute to a holistic view of health. For Aboriginal populations, historically and culturally specific factors play a particularly important role.[621, 622, 625]

Data on Aboriginal Populations and Alcohol Consumption in Canada: Findings from the First Nations Regional Health Survey (2008-10) indicate that the rate of reported alcohol consumption for First Nations living on reserve is lower compared to the general Canadian population. However, the rate of reported heavy drinking is higher than the Canadian rate. Approximately 35% of First Nations adults living in First Nations communities did not drink in the past year, but of those who did drink, more than 60% drank heavily. First Nations youth living in First Nations communities are less likely to drink, with approximately 60% saying they did not drink in the past year. For those youth who did drink, approximately 50% drank heavily.[631] In addition, use and abuse of alcohol and drugs was ranked by First Nations on-reserve as the top challenge for community wellness.[631]

According to the 2012 Aboriginal Peoples Survey, 33% of Inuit 15 years of age and older did not drink in the previous year, although 26% drank heavily.[632] According to the 2007-2010 Canadian Community Health Survey, 27% of Métis aged 12 years and older drank heavily in the previous year.[633]

KEY DETERMINANTS OF HEALTH FOR ABORIGINAL POPULATIONS:

621–623, 625, 627, 630

- Community readiness
- Economic development
- Employment
- Environmental stewardship
- Gender
- Historical conditions and colonialism
- Housing
- Land and resources
- Language, heritage and strong cultural identity
- Legal and political equity
- Lifelong learning
- Living on- and off-reserve
- Racism and discrimination
- Self-determination and non-dominance
- Social services and supports
- Living in urban and rural areas

REDUCING HEALTH IMPACTS

Drinking alcohol is ingrained in Canadian culture. Because there are multiple levels and types of influence on drinking patterns (see Figure 9), many actors play a role in promoting responsible drinking and healthy behaviours. Many primary prevention strategies aim to reduce risky drinking and potential negative impacts of alcohol consumption; however, none of these are universally effective. The amount of variability across individuals, communities and societies means that there is no single way to reduce impacts of alcohol use on individuals and populations.[5, 342]

ADDRESSING INDIVIDUAL FACTORS

Not all factors that influence drinking can be addressed at the individual level. Individuals can reduce their drinking by recognizing factors that influence them to drink and that increase their risk for harm.

Reducing consumption: The amount of alcohol consumed plays a large role in the risk for both short- and long-term impacts.[42] Once an individual determines how much he or she drinks, *Canada's Low-Risk Alcohol Drinking Guidelines* can help determine whether or not the amount consumed is putting the individual and his or her family and friends at risk for harm. Some countries, including the United Kingdom, are currently revising their low-risk guidelines.[634]

Brief interventions for alcohol: Following a screening process, brief interventions aim to target at-risk individuals through personalized feedback and counselling to set goals, find effective strategies to change behaviour, and provide information and guidance. Interventions can range from one short session to multiple sessions depending on the individual's needs. Individuals can be identified for and referred to treatment through this process.[635]

- The World Health Organization has a variety of resources available on brief interventions.
- The Canadian Centre on Substance Abuse and the College of Family Physicians of Canada have developed a screening, brief intervention and referral guide.

Brief interventions have been noted as an important component for reducing the impacts of alcohol on individuals and act as a bridge between prevention and treatment.[635-637] A number of randomized trials in several countries have demonstrated that brief interventions are effective in many settings.[636] Brief interventions can reduce drinking, decrease mortality rates and improve health.[638-640]

Although brief interventions are effective, social norms interventions (i.e., providing information on how much other people are drinking) are largely ineffective.[641, 642]

Recognizing and addressing risk: Addressing risk factors that influence drinking is an important step in reducing the potential for impacts. For example, why people drink is an important factor in determining what approach would work best for an individual.[643] For those who use alcohol to cope with stress, healthy coping skills and lifestyles can help reduce drinking and related impacts.[644–646] Using protective behaviours such as eating before drinking, alternating non-alcoholic with alcohol drinks and pacing drinks, can decrease the negative impacts from alcohol.[647]

Figure 9: TYPES AND LEVELS OF INFLUENCE ON ALCOHOL CONSUMPTION

Attitudes and beliefs are also important considerations. For example, skills that help youth learn how to say no to alcohol seem only to help youth who already disapprove of drinking.[648] Evidence also suggests that changing parental attitudes on underage drinking by making them stricter can reduce heavy drinking in adolescents.[649–651] Changing parental behaviour seems to be a necessary component for reducing youth drinking over the long term, particularly for high risk youth.[652–655]

Other risk factors are more difficult to address. For example, interventions that target personality traits have mixed effects with some showing promise and some being largely ineffective.[656–658]

Health professionals can also influence people to recognize their risk for harm from alcohol. For example, educating women of child-bearing age about potential risks from alcohol to their health and the health of their developing baby is important.[659]

ADDRESSING AVAILABILITY AND EXPOSURE

Laws, regulations and policies aim to keep Canadians safe and help mitigate harm from alcohol by contributing to changing behaviour. They also contribute to variability in drinking patterns across different jurisdictions, including across provinces.[5] Many of these are related to controlling availability. For example:

- **Pricing and taxation** are tools that can discourage people from buying alcohol. As a consequence, this can reduce alcohol-related health and social impacts, including for impaired driving and alcohol-related crime.[660–663] Increasing the minimum price of alcohol is one of the more effective approaches that successfully decreases consumption, alcohol-related death and hospital admissions.[660, 662–665] Most provinces have introduced minimum pricing; however, policies on indexation and pricing on alcohol content are not well implemented across every Canadian province (data on territories were not analyzed).[5]
- **Control of sales and availability** also reduces the impacts of alcohol use by restricting eligibility to purchase and sell alcohol as well as restricting the number of alcohol outlets and days/hours of sale.[666] When alcohol sales are not controlled, there tends to be higher availability, more drinking, more alcohol related problems and increased acceptability of alcohol use.[5, 128, 666–673] Currently, alcohol is widely available across Canada.[5] The number of locations that are allowed to sell alcohol in an area is largely decided at the municipal level; however, provinces implement various other means of controlling sales and availability.[5]

Changing behaviour: Reducing risky drinking involves a change in behaviour. To change behaviour, it is important to understand:

- what is risky drinking; and
- how to reduce alcohol consumption.

The Canadian Centre on Substance Abuse Canadian Centre on Substance Abuse and Educ'alcool have a variety of tools to help use Canada's Low-Risk Alcohol Drinking Guidelines as well as tips and resources to drink responsibly.

Strategies and tools have been developed to help people reduce their drinking. For example:

- College of Family Physicians Canada and the Canadian Centre on Substance Abuse: Drinking Smart
- The World Health Organization: Self-help strategies for cutting down or stopping substance use
- Centre for Addiction and Mental Health: Saying When: How to quit drinking or cut down

Programs that aim at improving safety at drinking establishments (e.g., Safer Bars Program) show promise in reducing violence and physical aggression.[674, 675]

Responsible beverage server training is also effective in reducing risky drinking.[676, 677] Examples include SmartServe in Ontario and Serving it Right in British Columbia.

- **Minimum age laws** also restrict availability of alcohol by legally defining at what age people can buy and drink alcohol. When enforced, it is the most effective means of reducing drinking among underage youth.[678] Consequently, the impacts of alcohol on measures like mortality, overdoses, injuries, vehicle accidents and use of the health care system are also reduced.[679-684] In Canada, rates of fatalities, including from motor vehicle accidents, increase at the minimum legal drinking age, more so for men than women.[681] The legal drinking age is 19 years of age in Canada, except in Quebec, Manitoba, and Alberta where it is 18.[685]

- **Alcohol advertising:** In Canada, advertising of alcohol is regulated by a variety of federal and provincial statutes and regulations, including the *Food and Drugs Act*, *Television Broadcasting Regulations* and *Radio Regulations*. Commercial messages are also to observe the *Code for Broadcast Advertising of Alcoholic Beverages*.

  There is very limited research on the effects of alcohol advertising on Canadians. Based on research from the United States, evidence has found that alcohol marketing reaches a wide audience, including underage youth.[686-688] Some elements of alcohol ads are particularly appealing to a youth audience and exposure to particular brands do increase the likelihood that youth will drink that brand.[687, 689-691] However, research is mixed on if or how alcohol advertising affects drinking patterns. Some results suggest that advertising increases drinking in youth who are already more receptive to this type of advertising or more likely to undertake risky behaviour.[692-694] Other research suggests that there is a dose response to advertising – the greater the exposure to alcohol advertising, the more youth drink.[695] Promoting alcohol also occurs through other means. For example, in the United States, the alcohol industry sponsors a large number of events linked to sports and music. Brands that are popular with youth are more likely to sponsor such events.[696]

Safe Alcohol, Safe Drinking: Liquor control boards and commissions and the alcohol industry, including producers, restaurants, bars and night clubs, plays an important role in reducing risks associated with drinking alcohol. The safety of alcohol is regulated by various pieces of legislation, including through the *Food and Drug Act*.[697]

In addition, the alcohol industry in Canada works in collaboration with government, non-governmental organizations and other groups to promote responsible drinking. For example:

- Provincial and territorial liquor control boards and commissions support a wide variety of initiatives such as public awareness and education campaigns. For more information on the activities of Canada's liquor boards and commissions, see the Canadian Association of Liquor Jurisdictions.
- Several industry representatives are members of the National Alcohol Strategy Advisory Committee.
- Beer Canada, the Canadian Vintners Association and Spirits Canada provided support for the development of the Canadian Centre on Substance Abuse and the College of Family Physicians of Canada's screening, brief intervention and referral tools.
- Beer Canada is a partner in a variety of responsible use programs and supports a variety of research and knowledge exchange activities.
- The Canadian Vintners Association actively promotes Canada's Low Risk Alcohol Drinking Guidelines.
- Labatt Brewing Company and Anheuser-Busch InBev collaborated to develop Family Talk as a resource for families to help prevent underage drinking.

Stigma: Addressing stigma for both people who do not drink and those who are in treatment is important. For information on addressing stigma, see the Mental Health Commission of Canada.

ADDRESSING SOCIAL ACCEPTABILITY

Perhaps the most challenging aspect to tackle in terms of reducing the negative impacts of alcohol consumption is social acceptability. Addressing social acceptability must involve action at the individual, family, community, and societal levels.

Strategies on Alcohol: Alcohol is a recognized public health issue both globally and within Canada.

- The World Health Organization has developed the *Global Strategy to Reduce the Harmful Use of Alcohol* that outlines ten areas for national action: leadership, awareness and commitment; health services response; community action; drink-driving policies and countermeasures; availability of alcohol; marketing of alcoholic beverages; pricing policies; reducing the negative consequences of drinking and alcohol intoxication; reducing the public health impact of illicit alcohol and informally produced alcohol; and, monitoring and surveillance.
- Developed in 2007 in collaboration with a variety of alcohol stakeholders, *Reducing Alcohol-Related Harm in Canada: Toward a Culture of Moderation* identified a range of recommendations to form the basis of a National Alcohol Strategy.

Awareness campaigns: Developing messages about alcohol that resonate is challenging, making it difficult to create effective awareness campaigns.[342] Interestingly, alcohol is one of the few health-related topics where mass media campaigns are rarely effective.[698] Awareness campaigns have had the most success for impaired driving,[698–701], suggesting that specific and tangible topics where messages and actions are clear may benefit most from awareness campaigns.

Awareness campaigns are important for increasing knowledge and changing attitudes, but they do not always change drinking behaviour or the intention to drink.[342, 699] There is a lack of awareness among Canadians about the full impact of alcohol on health. For example, in 2008, almost 70% of Canadians were not aware that alcohol was linked to cancer, while almost half were not aware of its links to heart disease and diabetes.[702] Increasing knowledge and shifting attitudes is a key first step in the difficult process of changing societal views on drinking alcohol. This means awareness campaigns are an important component of a multi-faceted approach for reducing the negative impacts of alcohol consumption.

Canada's National Alcohol Strategy: Formed in 2008, the National Alcohol Strategy Advisory Committee (NASAC) leads the implementation, monitoring and evaluation of the National Alcohol Strategy. The committee is co-chaired by the Canadian Centre on Substance Abuse, Mothers Against Drunk Driving Canada, and the Nova Scotia Department of Health and Wellness and consists of experts from across Canada including federal and provincial government representatives, non-governmental organizations, public health including medical officers of health, First Nations, Inuit and Métis service providers, and the alcohol industry.

Progress has been made on a number of the recommendations, including: the development of Canada's Low-Risk Alcohol Drinking Guidelines launched in 2011; staff and server training programs; policies and programs for deterring underage drinking; and, community alcohol awareness campaigns.

In addition to the progress made on the Strategy, the Public Health Agency of Canada and Health Canada have also made progress on addressing fetal alcohol spectrum disorder.

Public health awareness campaigns that either use scare tactics or promote responsible drinking can increase drinking while knowledge of drinking guidelines does not always reduce risky drinking.[703–705]

CLOSING COMMENTS

My role as Canada's Chief Public Health Officer is to engage Canadians and this report is meant to support a public health dialogue about drinking and its risks. The evidence gathered in this report provides an overview of public health impacts within our Canadian culture that normalises drinking. Information is organised in a way that recognises that people may choose to read only certain sections as it is web-based.

As noted by the Canadian Public Health Association in their 2011 position paper on alcohol, tackling the problematic use of alcohol requires a combination of factors, including leadership and a broad base of support at all levels.

Since our National Alcohol Strategy was developed in 2007, there is emerging evidence on increased risks of cancers at low levels of drinking and a growing skepticism on alcohol's benefits. Our knowledge and understanding of alcohol consumption, drinking patterns, and the health impacts of alcohol in Canada is inadequate.

I suggest Canadians and our institutions take a closer look at our current approach and reflect if we are doing enough to reduce the harms associated with drinking alcohol.

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Data and information for this report were collected using a variety of methods, including key words searches through PubMed and Google Scholar as well as consultations with Canadian public health experts. The most up to date data and information available were used with all research and data cited in this report being from peer-reviewed scientific articles and trusted data sources, such as Statistics Canada. Terminology on drinking, such as heavy drinking, alcohol abuse, alcohol dependence, and alcohol use disorders, were used as appropriate and matched the terminology being used in the research and data being cited. Care was taken not use terms such as alcohol abuse, alcohol dependence, and alcohol use disorders unless relevant as these conditions are clinically diagnosed.

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