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Alcohol and Health

Alcohol consumption

Drinking patterns and Canada's low-risk alcohol drinking guidelines

Most Canadians drink alcohol, and the consumption per capita exceeds that of many countries.¹ In 2011, Canada developed low-risk alcohol drinking guidelines that set the maximum number of standard drinks men and women should consume on a single occasion and on a weekly basis (Diagram 1).² No alcohol consumption is advocated for pregnant women; those on medications known to interact with alcohol; and those doing high-risk activities such as driving a motor vehicle. In a 2012 survey, about one-quarter of Canadians had heard of these guidelines.³

Of Canadians who consume alcohol, a substantial number drink amounts that present an increased risk of acute and long-term health effects (Figure 1). A 2012 Health Canada survey showed that, in the seven days prior to the survey, 14.2 per cent of New Brunswick drinkers aged 15 years and older exceeded the acute alcohol drinking guideline and 20.5 per cent exceeded the chronic alcohol drinking guideline, compared to 12.8 per cent and 18.6 per cent, respectively, for Canada.³ In a 2012 survey by Statistics Canada, an estimated 126,000 New Brunswickers aged 12 years and older were heavy drinkers, having five or more drinks on one occasion at least once every month during the past year.⁴ Survey rounds between 2009 and 2012 indicated about 30 per cent of New Brunswick males were heavy drinkers, compared to approximately 10 per cent of females (Figure 2).

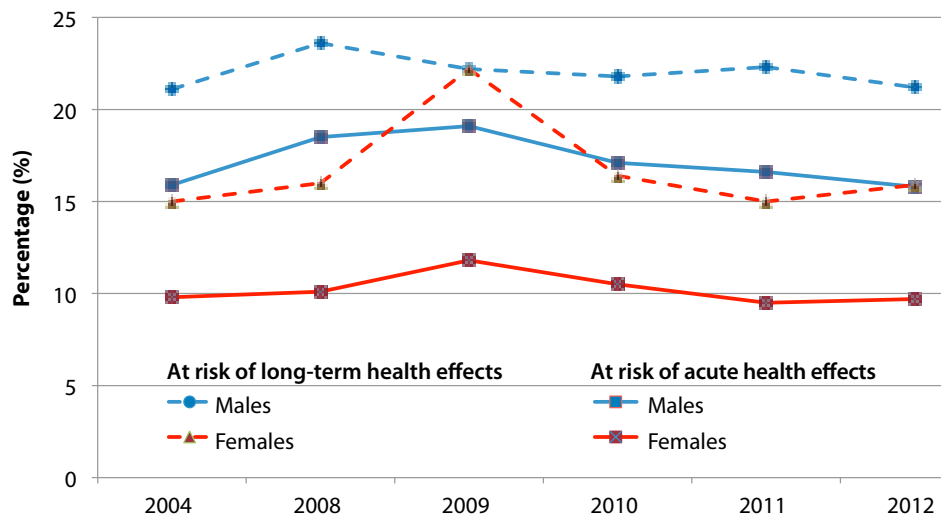
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Diagram 1. Low-risk alcohol drinking guidelines

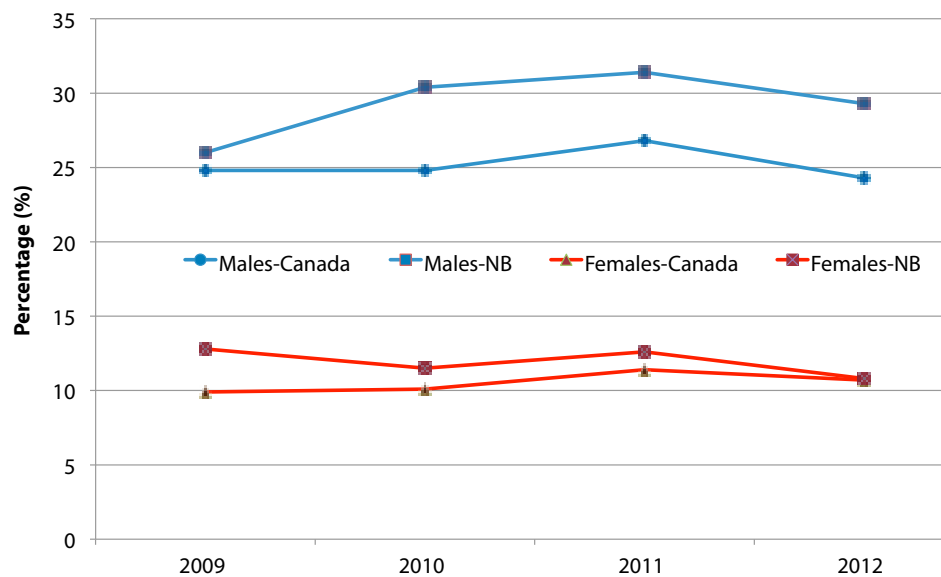


Figure 1. Percentage of Canadian drinkers 15 years and older who exceeded the chronic and acute low-risk drinking guidelines, by sex, 2004-2012



Note: Guideline exceedances are for the past week
Data Source: Health Canada, Canadian Alcohol and Drug Use Measures Survey

Figure 2. Percentage of the population aged 12 and older who were heavy drinkers, by sex, New Brunswick and Canada, 2009-2012



Data Source: Statistics Canada, CANSIM Table 105-0501

Binge drinking is a form of excessive, harmful drinking more common in youth than in adults.^{3,5} In comparison with other countries, the prevalence of binge drinking among young Canadians is one of the highest in the world.¹ Although alcohol sales to minors are not legally permitted in Canada, a significant percentage consume alcohol. The 2012 *New Brunswick Student Drug Use Survey* of grades

7, 9, 10 and 12 reported that 48 per cent of students drank alcohol within the past year and 12 per cent drank weekly.⁶ In contrast to the heavier drinking behaviour of adult males seen in the general population compared to females, a higher percentage of female students drank alcohol compared to males. A 2011 Canadian report on student alcohol and drug use indicated there was no significant

difference in the proportion of male and female students who had five or more drinks on one occasion within the past month.⁷ It also indicated that 25.3 per cent of New Brunswick students in grades 7, 9, 10 and 12 were binge drinking at least once in the past month. Of eight provinces that asked the same question about binge drinking in the past month, Alberta students had the lowest percentage of binge drinkers (19.3 per cent), and Newfoundland and Labrador, the highest (29.7 per cent). In New Brunswick, binge drinking was highest in Grade 12 students (43.9 per cent) and lowest in Grade 7 students (3.4 per cent).⁷

An indicator of alcohol consumption at the population level is the volume of alcohol sales per person. New Brunswick per capita sales of alcohol increased between 2000 and 2010, then decreased between 2010 and 2013 (Figure 3). In 2013, New Brunswickers consumed an average of 6.5 litres of absolute (or pure) alcohol per capita compared to 8.0 litres for Canada.⁸ These estimates do not include alcohol bought from cross-border shopping or home brews made from natural products.

Alcohol-attributable morbidity and mortality

Worldwide, the harmful use of alcohol ranks in the top five risk factors for morbidity, disability and mortality, and it is a causal factor in more than 200 diseases and conditions, the most common being alcohol dependence, liver cirrhosis, cancers and injuries.¹ Alcohol can have a wide range of physical, mental and social effects (Diagram 2).

Some diseases and conditions, such as fetal alcohol syndrome, are 100 per cent attributable to alcohol while others, such as certain cancers, are partially alcohol-related. In 2012, 5.1 per cent of the

Diagram 2. Common effects of alcohol abuse

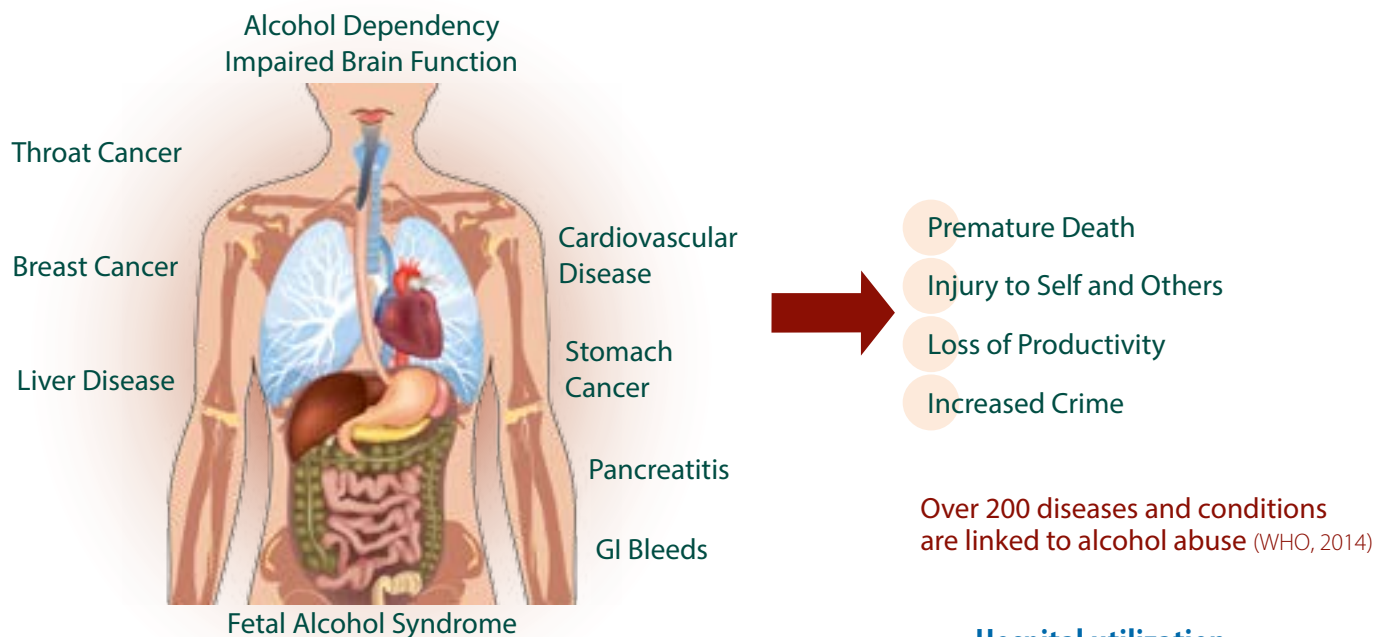
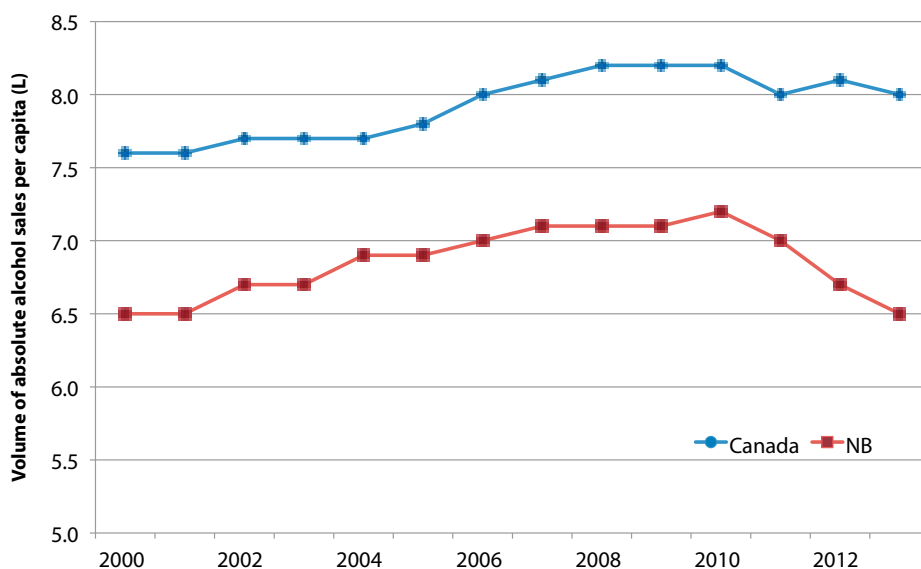


Figure 3. Trend in the volume of alcohol sales in Canada and New Brunswick, 2000-2013



Note: Per capita sales based on New Brunswickers aged 15 years and older.
Data Source: Statistics Canada, CANSIM Table 183-0019

total global burden of diseases and injury was attributable to alcohol, representing 139 million disability-adjusted life years (DALYs). The largest percentage (45 per cent) of alcohol-related DALYs was for unintentional injuries and neuropsychiatric disorders caused or causally impacted by alcohol consumption, including alcohol use disorders (harmful use

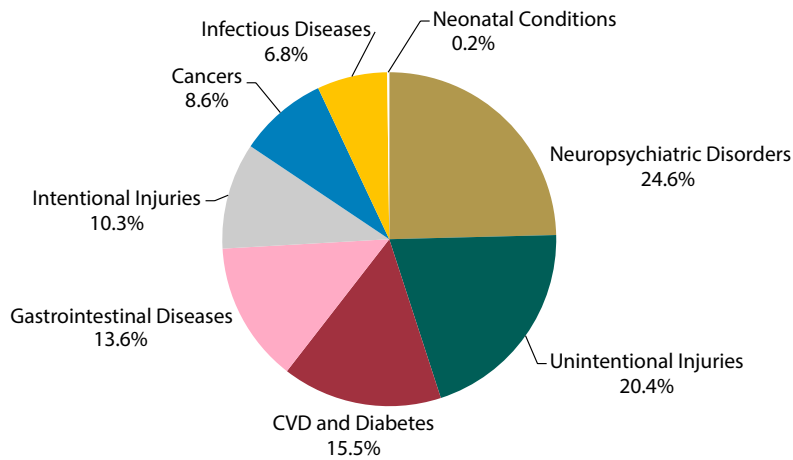
of alcohol, alcohol dependence) and epilepsy (Figure 4).¹ Many other neuropsychiatric conditions, such as depression and anxiety disorders, are affected by alcohol consumption, but the complexity of the pathways of these associations prevented their inclusion in the estimates of alcohol-attributable disease burden.

Hospital utilization

Hospital use can be used to measure the burden of alcohol on the health care system. Between 2003 and 2014, the average length of hospital stay (ALOS) for alcohol-related conditions in New Brunswick increased by 29 per cent (from 10 to 14 days), while the total length of hospital stay (TLOS) increased by 21 per cent (from 12,737 to 16,203 days) (Figure 5). During the same timeframe, the number of patients treated for these conditions decreased by 11 per cent (from 1,278 to 1,138 patients), an indication that patients are staying longer in hospitals for alcohol-related conditions. In 2013-14, New Brunswick had the second highest ALOS (14.2 days) for alcohol-related conditions in the country (Figure 6).

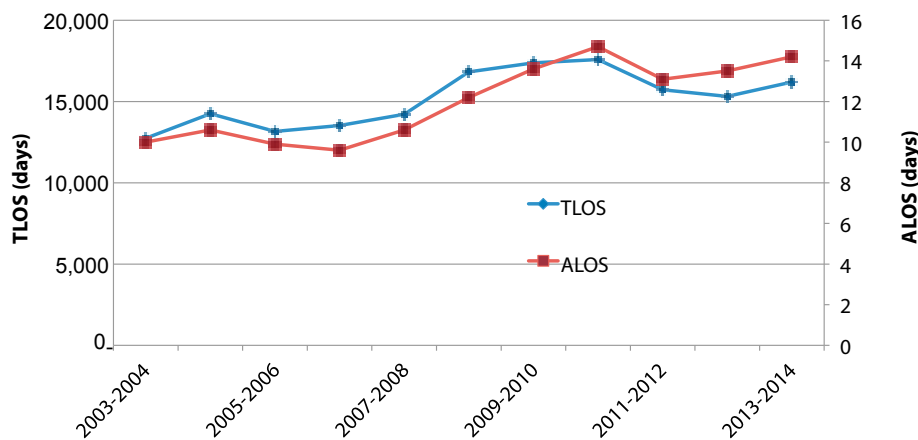
The cost for a hospital stay depends on the type of treatment received by the patient and factors such as age and co-morbid conditions.⁹ In 2013-2014, New Brunswick in-patient cost per day for those on hospital wards ranged between \$609 and \$1,358. Applying these rates to the TLOS for alcohol-related cases treated in hospitals that year, the total cost

Figure 4. Percent distribution of alcohol-attributable causes of disabilities, as a percentage of all alcohol-attributable DALYs, 2012



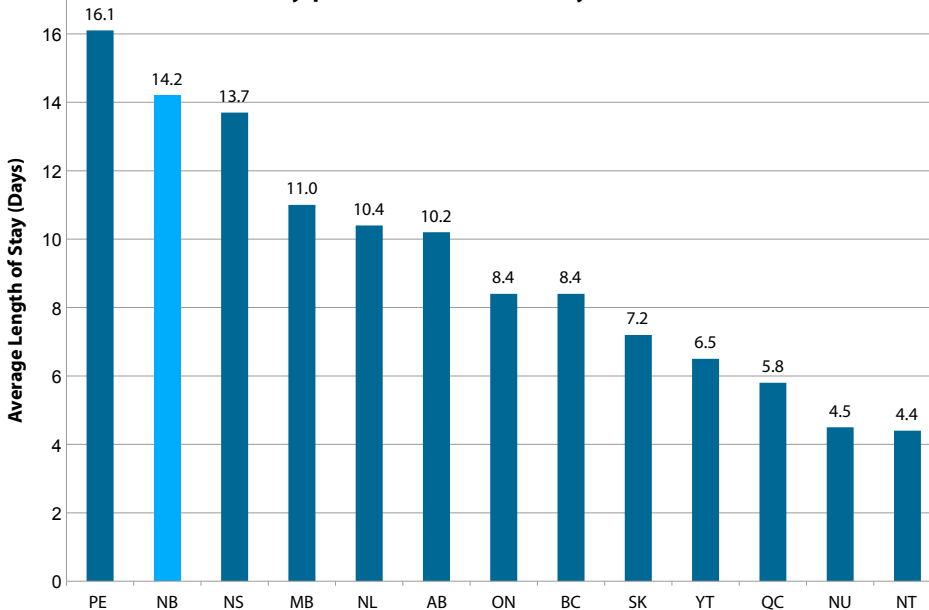
Source: World Health Organization, 2014.¹

Figure 5. Alcohol-related hospital care as total length of stay (TLOS) and average length of stay (ALOS), New Brunswick, 2003 to 2014



Data Source: Hospital Discharge Abstract Database. Health Information Management, NB Dept. of Health

Figure 6. Average length of hospital stay for alcohol-related diseases and conditions, by province and territory, 2013/2014



Data Source: Hospital Discharge Abstract Database. Health Information Management, NB Dept. of Health

was between \$10 million and \$22 million.

Deaths

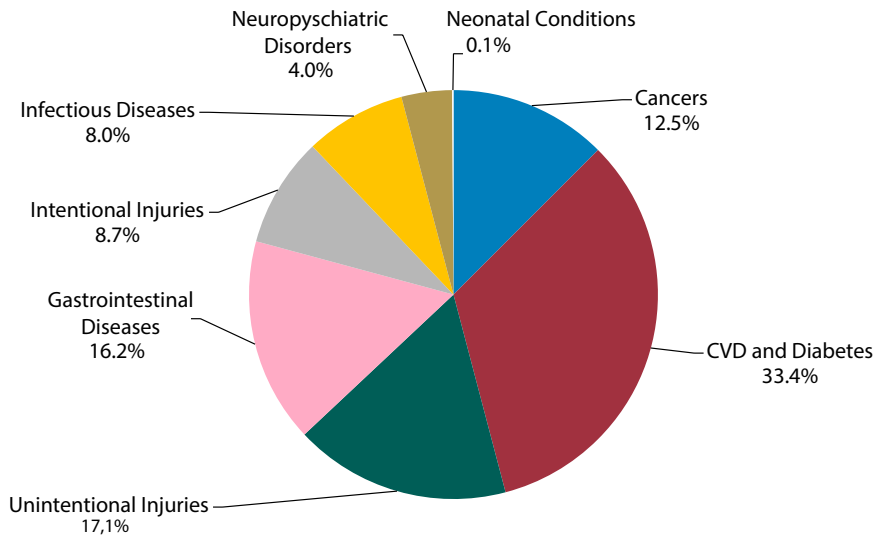
Worldwide, 5.9 per cent of total deaths (or 3.3 million) were attributable to alcohol in 2012.¹ Cardiovascular diseases and diabetes made up the largest percentage (33.4 per cent) of these deaths (Figure 7). The global percentage of deaths attributable to alcohol for males (7.6 per cent) was nearly double that for females (4.0 per cent).

British Columbia regularly reports alcohol-related deaths through its Vital Statistics Agency.¹⁰ In 2011, about 6.0 per cent of total deaths in that province were alcohol-related, similar to the global estimate (5.9 per cent).¹ If the percentage of alcohol-related deaths in British Columbia was extrapolated to New Brunswick, it would yield an estimated 418 deaths per year.

Alcoholic liver disease

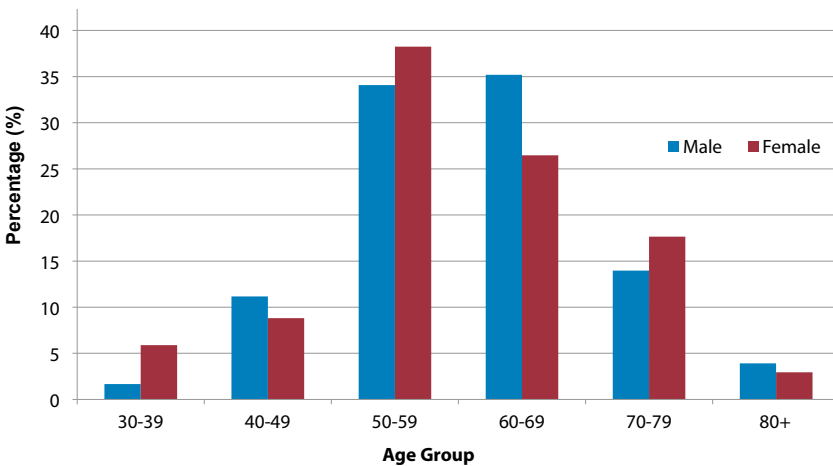
Death from chronic liver disease is on the rise in Canada. A report from the Canadian Liver Foundation estimates there were 5,049 deaths from liver disease in 2007, a 27.9 per cent increase from 2000 (3,964 deaths), and alcoholic liver disease (ALD) accounted for more than 25 per cent of these deaths.¹¹ Alcohol consumption is also a risk factor for liver cancer.¹² Between 2002 and 2012, there were 213 deaths due to ALD in New Brunswick. This represents an average of 20 deaths per year. Most of these deaths were premature, occurring in people younger than age 75. Although males made up the majority (84 per cent) of ALD deaths, age distribution patterns were similar in both sexes. The largest percentage of deaths was in the 50-59 and 60-69 year age groups (Figure 8).

Figure 7. Percent distribution of alcohol-attributable causes of deaths, as a percentage of all alcohol-attributable deaths, 2012



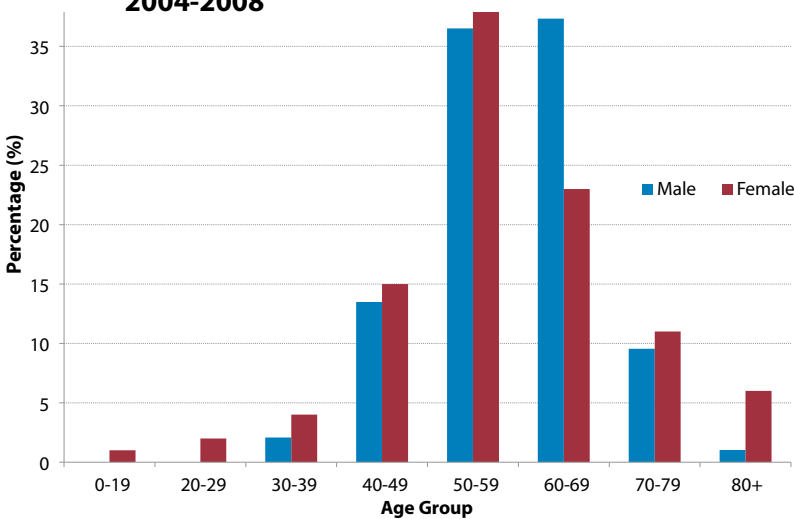
Source: World Health Organization, 2014.¹

Figure 8. Percent distribution of deaths due to Alcoholic Liver Disease, by age group and sex, New Brunswick, 2002-2012



Data Source: Vital Statistics, Service New Brunswick, GNB

Figure 9. Percent distribution of hospital separations for Alcoholic Liver Disease, by age group and sex, New Brunswick, 2004-2008



Data Source: Hospital Discharge Abstract Database, Health Information Management, NB Dept. of Health

Between 2004 and 2008, there were 582 hospital separations for ALD in New Brunswick (equivalent to about 116 per year), with males making up 83 per cent of these. Males being heavier drinkers than females could explain the higher percentages of hospital separations and deaths in males due to ALD. Hospital separations were highest in the 50-59 and 60-69 year age groups (Figure 9).

A total of 7,860 hospital care days were needed to treat patients with ALD during the same five-year period. Using 2006 as the reference year, the cost per patient-day for all diseases and conditions treated in hospitals ranged between \$501 and \$1,055. Applying these rates to the TLOS for ALD cases treated in New Brunswick hospitals between 2004 and 2008, the cost to treat these patients was between \$4 million and \$8 million.

Injuries

Worldwide, alcohol contributes to a significant percentage of injuries causing disability or death. In 2012, the percentage of disabilities attributable to alcohol for selected injuries were as follows: 20 per cent of inter-personal violence, 20 per cent of self-harm, 14 per cent of poisoning, 13 per cent of falls, 13 per cent of traffic injuries and 10 per cent of drowning (Figure 10).¹ A significant percentage of injuries causing death was likewise attributable to alcohol: 22 per cent of deaths from inter-personal violence, 22 per cent from self-harm, 18 per cent from poisoning, 16 per cent from falls, 15 per cent from traffic injuries and 13 per cent from drowning.¹ Alcohol is also a risk factor for depression and other health disorders that can lead to self-harm. Between 2000 and 2010, the average number of

suicides per year in New Brunswick was 94, equivalent to 12.5 suicides per 100,000 population.

In 2004, unintentional injuries in Canada were estimated to cost \$16 billion and intentional injuries, \$3.3 billion.¹³ In New Brunswick, injuries that year were estimated to cost the health care system \$284 million, with an economic burden of \$462 million.^{13,14}

Motor vehicle crashes

The relative risk of being injured in a motor vehicle or non-motor vehicle crash increases dramatically with the number of alcoholic drinks (Table 1).

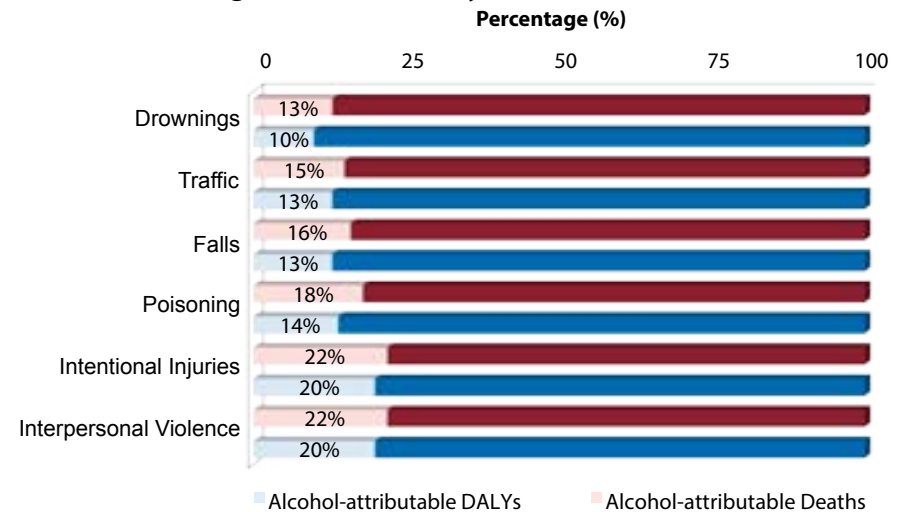
Table 1. Relative risk of motor vehicle and non-motor vehicle injuries in relation to the number of Canadian standard drinks consumed three hours before an injury

Number of drinks	Increase in risk (%)	
	Motor vehicle injuries	Non-motor vehicle injuries
0	0	0
1	57	40
2	145	92
3	283	162
4	500	256
5	838	384
6	1369	557
7	2198	790
8	3496	1107
9	5528	1534

Source: Taylor et al. in Butt et al., 2011. Alcohol and Health in Canada: A Summary of Evidence and Guidelines for Low-Risk Drinking.²

The World Health Organization estimates that 15 per cent of motor vehicle deaths and 13 per cent

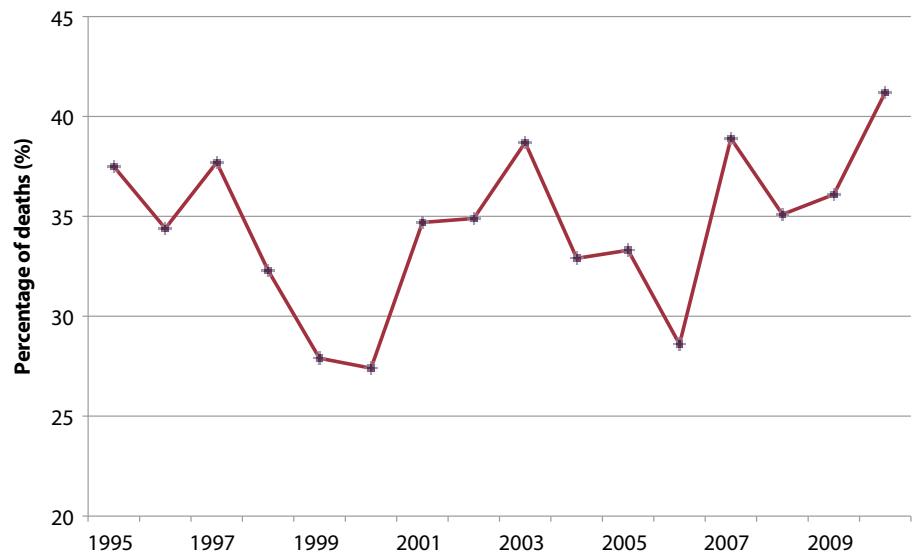
Figure 10. Alcohol-attributable fractions (%) for selected injuries causing death or disability, 2012



Source: World Health Organization, 2014.¹

of disabilities caused by motor vehicle crashes are attributable to alcohol.¹ Between 1995 and 2010, there were 1,535 motor vehicle fatalities in New Brunswick; 528 (34.4 per cent) involved drivers who had been drinking (Figure 11).¹⁵ In 2010, more than 40 per cent of motor vehicle deaths on New Brunswick’s public roads involved alcohol. In addition, there were 325 non-fatal but serious motor vehicle crashes that year, and 87 (or 26.8 per cent) were alcohol-related.¹⁵

Figure 11. Percentage of motor vehicle deaths involving a drinking driver, New Brunswick, 1995-2010



Note: Deaths on public roads for principal vehicle types; estimates based on available alcohol use data. **Data Source:** Traffic Injury Research Foundation, 2013

Alcohol is also involved in greater than 50 per cent of off-road fatalities in Canada.¹⁶ This is significant considering the popularity of snowmobiles and all-terrain vehicles (ATVs) in New Brunswick. In 2010, a total of 35,825 ATVs were registered in this province.¹⁷

Falls

Alcohol is an important factor contributing to falls. Worldwide, about 13 per cent of disabilities due to falls and 16 per cent of deaths due to falls are

attributable to alcohol.¹ In Canada, injuries due to falls increased by about 43 per cent between 2003 and 2010.¹⁶ Falls remain the leading cause of injury-related hospitalizations among Canadian seniors; 20 to 30 per cent of the seniors population experience one fall per year. A 2002 provincial survey indicated that about one-half of New Brunswickers 55 years and older drank alcohol in the past year, and one in 10 drinkers consumed alcohol daily.¹⁸

Trauma attributable to alcohol

Five hundred and four (504) assault cases were treated at the Saint John Regional Hospital in 2008-09; 149 (30 per cent) of these were alcohol-related.¹⁴ Of the 233 patients treated for major trauma at The Moncton Hospital and the Saint John Regional Hospital between 2011 and 2013, 21 (or 9 per cent) of injuries were alcohol-related.¹⁹

Socio-economic costs of alcohol

In addition to the direct health effects from the harmful use of alcohol, there are social and economic costs, such as lost productivity due to absenteeism, unemployment, lost working years due to premature work cessation or death, and increased crime and social dysfunction.^{1,20} Measures of the social costs of alcohol abuse are mostly incomplete due to deficiencies in available data.¹ In a 2012 Canadian survey, one in seven Canadians reported suffering some manner of harm from someone else's drinking within the

past year.³ Alcohol consumption patterns are positively associated with the accessibility of alcohol. Those with higher income or socio-economic status are likely to drink more than other groups; in contrast, people with lower socio-economic status are more likely to experience alcohol-related harms.¹ Children, adolescents and the elderly are typically most vulnerable to alcohol-related harms.¹

It was estimated that alcohol abuse in Canada cost \$14.6 billion in 2002, or \$463 for every Canadian. This included \$7.1 billion in disability and premature death, \$3.3 billion in direct health care costs and \$3.1 billion in direct law enforcement costs.^{21,22} In New Brunswick, the estimated cost associated with alcohol misuse in 2002, including expenses for health care, law enforcement and social costs, was \$597 per capita (Figure 12). This yields an overall cost of about \$448 million. The direct health care cost attributable to alcohol that year was estimated to be \$121 million.²¹ In 2012-13, NB Liquor reported a net

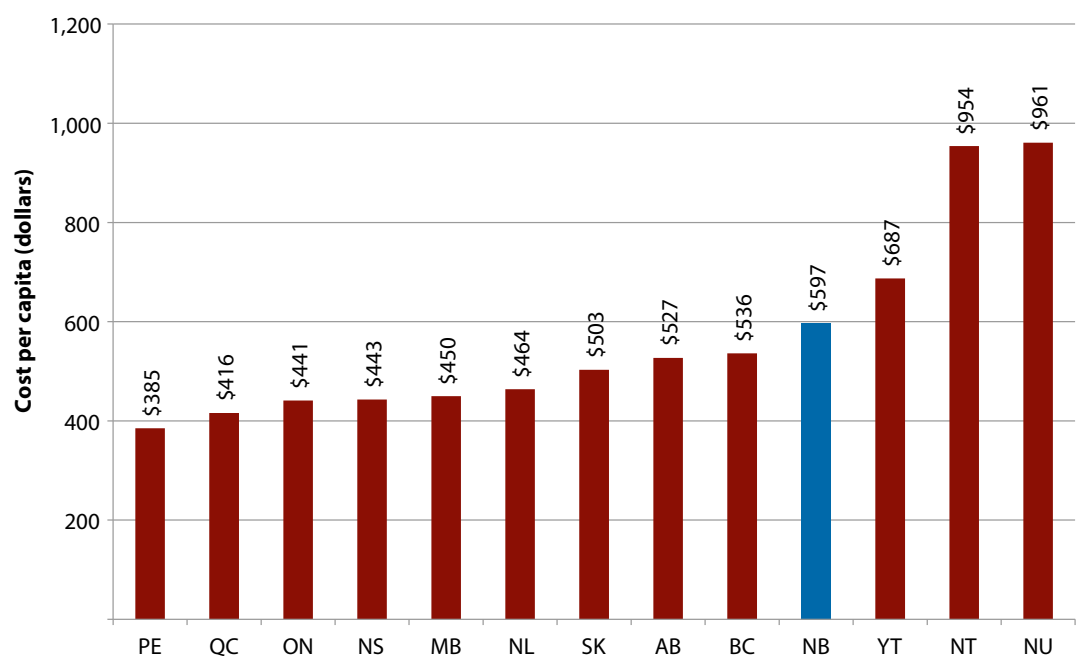
income of \$164 million from liquor sales.²³

Strategies to reduce harmful use of alcohol

Strategies to reduce the health care burden and other costs to society from alcohol abuse are emerging at the international, national and regional levels. Currently, Canada and some provinces have alcohol strategies to reduce the harms of alcohol, primarily by increasing public awareness of the low-risk drinking guidelines, by restricting availability of alcohol, and through active advertising of the harms of alcohol, such as including warning labels on alcohol bottles.^{24,25,26,27} Most of the policies in Canada's National Alcohol Strategy require provincial action.

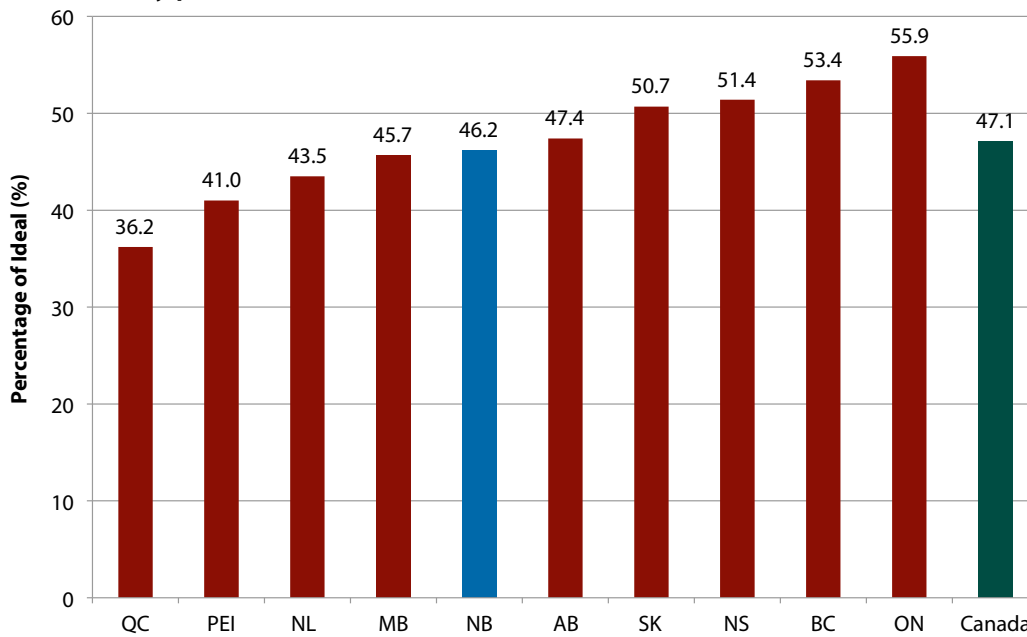
In a 2013 Canadian review of strategies to reduce alcohol-related harms and costs, New Brunswick ranked slightly below the national average (Figure 13).²⁶ The review focused on 10 alcohol policy dimensions: pricing; alcohol control

Figure 12. Estimated cost per capita for alcohol abuse, by Canadian jurisdiction, 2002



Note: The estimated costs include expenses for health care, law enforcement and social costs.
Data Source: Rehm J, et al., 2006.²²

Figure 13. Weighted score of ten alcohol-related policy dimensions, by province, 2013



Data Source: Giesbrecht et al., 2013.²⁷

system; availability; drinking and driving; marketing and advertising; legal drinking age; Screening-Brief Intervention-Referral; server training and the Challenge-Refusal Program; provincial alcohol strategy; and warning labels and signs. New Brunswick scored high in the alcohol control system category because the provincial government has a controlling monopoly on alcohol sales. It scored below the national average on legal drinking age policies, mainly because flexibility is exercised in permitting under-age drinking at social hosting parties. The province was also one of three jurisdictions that did not have a Screening-Brief Intervention-Referral Program, thus scored zero in that policy dimension.

Determining the success of alcohol strategies in Canada requires consistent measurements of selected alcohol-related health indicators across the provinces and territories. The International Classification of Diseases coding system is not adapted to capture alcohol as a primary factor in

most alcohol-related diseases and conditions. Therefore, the weight of evidence of alcohol-related illness is not easily measured and reported in a consistent manner. Some provincial jurisdictions, such as British Columbia, have adapted their population health databases to measure and report alcohol-related conditions regularly.

This issue of *New Brunswick Health Indicators* outlines some of the latest evidence on the health effects of alcohol abuse. However, it does not fully capture the extent of the problem, and much work remains. Many New Brunswickers drink in amounts causing short-term and life-time harms to themselves and others. The social and economic burden of alcohol abuse to the health care system and to society is significant in New Brunswick. Providing evidence on the health effects of alcohol abuse and its costs to New Brunswick are important first steps in recognizing and reducing the problem.

Glossary

Absolute alcohol: Alcohol that contains at least 99 per cent ethanol, also referred to as pure alcohol.

Alcohol dependence: Also known as alcoholism or alcohol dependence syndrome, is defined by the World Health Organization as a cluster of behavioural, cognitive and physiological phenomena that develop after repeated alcohol use, and that typically include a strong desire to consume alcohol, difficulties in controlling its use, persisting in its use despite harmful consequences, a higher priority given to alcohol use than to other activities and obligations, increased tolerance, and sometimes a physiological withdrawal state.

Acute low-risk alcohol drinking guideline: The maximum amount of alcohol that can be consumed on a single occasion that minimizes the short-term harms of alcohol, such as injuries and acute illnesses – three standard drinks for women and four standard drinks for men.

Binge drinking: Consuming large quantities of alcohol on a single occasion, defined as consuming five or more drinks for a man and four or more drinks for a woman.

Chronic low-risk alcohol drinking guideline: The maximum amount of alcohol that can be consumed which minimizes the long-term harms of alcohol, such as liver disease and alcohol dependency – 10 standard drinks a week with no more than two drinks a day most days for women, and 15 standard drinks a week with no more than three drinks a day most days for men.

Disability-adjusted life years: A time-based measure of overall burden of disease for a given population. It represents the sum of total years of life lost due to premature death and total years of life lost due to years lived in less than full health.

Harmful use of alcohol: A pattern of alcohol use that causes damage to health. The damage may be physical, such as liver cirrhosis, or mental, such as depressive episodes as a result of heavy consumption of alcohol.

Heavy drinking: This refers to males who consume five or more drinks, or women who consume four or more drinks, on a single occasion, and at least once a month.

Heavy episodic drinking: The World Health Organization defines it as consuming 60 grams of pure alcohol (equivalent to six standard drinks in most countries) on a single occasion and at least once a month.

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