



Alcohol Indicators  
Report 2011





# Alcohol Indicators Report 2011

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# Executive Summary

This report follows the 2005 Alcohol Indicators Report. It includes information to describe trends in per capita consumption, outlet density, alcohol-related morbidity and mortality, and incidents of alcohol-related offences. Data regarding patterns of use, alcohol-related harms, and treatment rates among adults and underage youth have been updated. Alcohol use and harms in undergraduate students and a benefit/cost analysis of alcohol use in Nova Scotia were added.

The major findings of the report are:

- Per capita consumption by Nova Scotians increased 6.6 per cent over a 20-year period, going from 7.6 litres of pure alcohol in 1991 to 8.1 litres in 2010.
- Increased access to alcohol in Nova Scotia has been led by a 65.0 per cent increase in retail outlets from 2000 to 2009, and a 20.0 per cent increase in licensed eating establishments and lounges from 2004 to 2008.
- Heavy-drinking rates in the province are high. In 2007–2008, 38.9 per cent of males and 17.5 per cent of females engaged in heavy monthly drinking. During the same time frame, 17.9 per cent of males and 7.0 per cent of females engaged in heavy weekly drinking.
- Heavy-drinking rates are particularly high among young adults. In 2004, the usual consumption pattern for 51.7 per cent of Nova Scotia university undergraduate students was five or more drinks on the days they drank, with 27.2 per cent of all university students drinking heavily at least once a week.
- Heavy drinking by underage youth has remained stable over the years, but heavy drinking by underage female youth is now on par with underage male youth.
- The average age of first alcohol use among Nova Scotia students in grades 7, 9, 10, and 12 was 12.9 years.
- Young adults (19–24 years) account for only 12.0 to 13.0 per cent of clients treated at Addiction Services.

- The alcohol-related mortality rate increased by 27.0 per cent between 2002 and 2008. In the latest reporting years, 252 Nova Scotians died from alcohol-related causes in 2007 and 231 in 2008. If the current heavy-drinking rates continue in Nova Scotia, it is expected that these numbers and rates will increase over time.
- Although rates of impaired driving have decreased over the years, drinking and driving is still a significant problem in Nova Scotia. From 2003 to 2007, 23.1 per cent to 26.2 per cent of drivers involved in crashes that caused serious injury had consumed alcohol. The Canadian rates for the same period ranged from 18.0 per cent to 19.5 per cent.
- The number of alcohol-attributed crimes in Nova Scotia was 23,310 in 2002, accounting for 31.2 per cent of all crimes committed. The total policing, court, and corrections costs for these crimes were \$78.09 million dollars. With the increase seen in heavy or high-risk alcohol use in the province since 2002, these numbers are likely much higher now.
- Although the economic benefits of alcohol in Nova Scotia are high, the costs are even higher. In 2006, the fiscal revenue to the provincial government was \$224.2 million. The costs to Nova Scotia were more than twice as much. Direct social costs were estimated at \$242.9 million and indirect social costs at \$249.6 million.

# Introduction

The recreational use of small quantities of alcohol generally poses few problems. For older men and women, moderate drinking (two to seven drinks per week) may have a protective effect for all-cause mortality.<sup>1</sup> Conversely, for the majority of the general population who consume, the relationship between low alcohol consumption and health benefits may be confounded by other factors that influence health such as gender, age, socioeconomic status, diet, and physical fitness.<sup>2</sup> Moreover, risks offset by alcohol for one type of disease could further increase the risk for others. Hazardous alcohol use is a significant cause of chronic disease, injury, Fetal Alcohol Spectrum Disorder (FASD), risky sexual behaviour, crime, and social problems. In addition, alcohol has a negative effect on the Nova Scotia economy causing increased spending on health care and the justice system, and lost productivity that surpasses the amount collected through alcohol-related revenue and taxation, as will be discussed in the section titled “Benefits and Costs of Alcohol.”

In 2004, harmful alcohol use was identified by the Government of Nova Scotia as an important public health issue. Nova Scotia Health Promotion and Protection (NSHPP) was instructed to develop an alcohol strategy that would prevent and reduce alcohol-related harm in the province. The 2007 Alcohol Strategy, *Changing the Culture of Alcohol Use in Nova Scotia*, provides the direction for priority planning and implementation of initiatives to prevent and reduce alcohol-related acute and chronic health, social, and economic harms, and related costs in the province.<sup>3</sup>

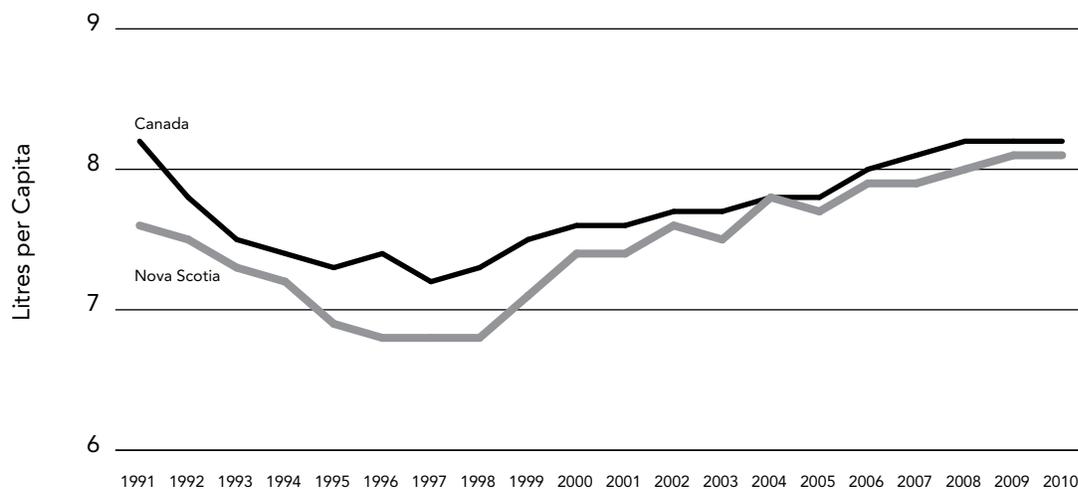
Using the framework established for provincial monitoring in the 2005 Alcohol Indicators Report, the 2010 Alcohol Indicators Report builds upon the World Health Organization’s recommendations for alcohol indicators best practices by incorporating a benefit/cost of alcohol use in Nova Scotia.<sup>4,5</sup> With research and evaluation being critical components of the Department of Health and Wellness’ strategy to reduce alcohol-related harms, a few new indicators were added to track the success of current and future initiatives implemented to reach the intermediate and long-term goals of the 2007 Alcohol Strategy.

# Alcohol Consumption

## Per capita Consumption

Per capita consumption for Nova Scotia and Canada increased over the 20-year period ending in 2010 (Figure 1). For Nova Scotians aged 15 years and older, per capita consumption ranged from a low of 7.6 litres in 1991 to a high of 8.1 litres of pure alcohol in 2010.

**Figure 1** Per Capita Consumption of Pure Alcohol, Nova Scotia and Canada, 1991–2010



**Source:** Statistics Canada, CANSIM Table 183–0019. Per capita consumption estimates determined using population aged 15 years and over.

The per capita consumption data used by Statistics Canada to determine these rates are based on sales of alcoholic beverages by volume by liquor authorities and their agents. True per capita consumption in Nova Scotia is probably slightly higher than the data presented in Figure 1. Consumption from homemade wine and beer, sales in duty-free shops and private wine stores, and “unrecorded transactions” are missing from these calculations.<sup>6</sup> In addition, Statistics Canada uses typical alcohol strengths in its calculations which may not accurately reflect the alcohol purchased in Nova Scotia. For example, a 4.3 per cent increase in per capita consumption was noted for 2006 in BC when U-Vin and U-Brew sales were included and more accurate estimates of alcohol strength in wine and coolers sold in BC were used in calculations.<sup>7</sup> The revised per capita estimate for BC was 8.76 litres of pure alcohol compared to the Statistics Canada estimate of 8.4 litres.

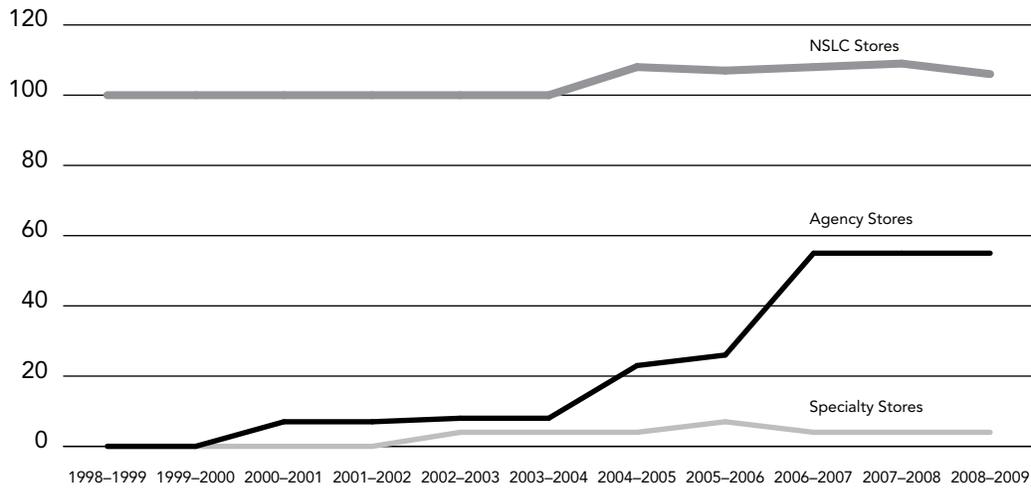
## Outlet Density

The introduction of privately-owned agency stores and private wine and specialty stores, and an increase in permanent liquor licenses are likely strong factors in this observed increase in per capita consumption in Nova Scotia. The Centre for Addictions Research of British Columbia recently conducted a study to determine the impact of an increase in outlet density and private versus government ownership of liquor stores on per capita consumption.<sup>8</sup> The investigators showed a positive relationship between number of outlets per 10,000 population and per capita sales. In particular, a positive relationship was observed for restaurants, bars, and private stores but not for government stores.

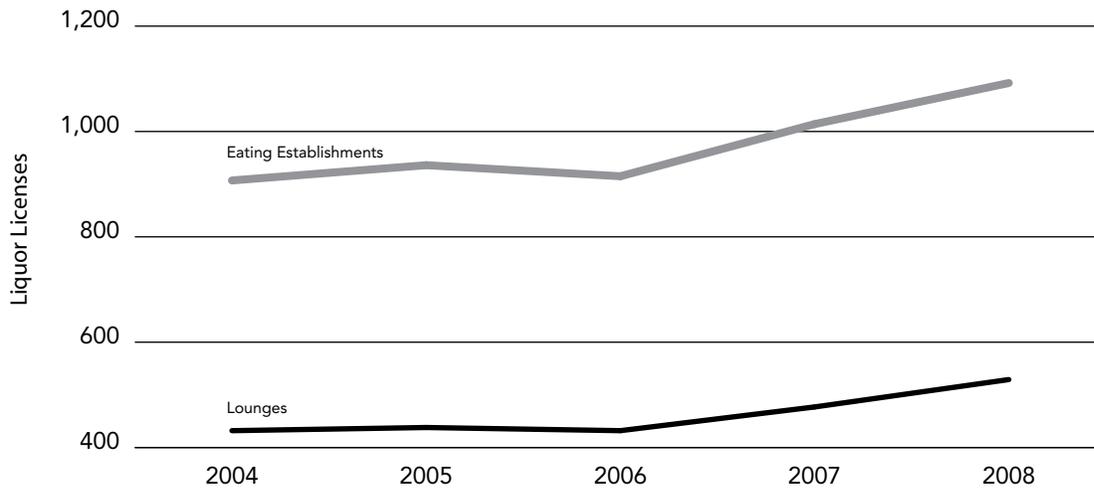
From fiscal year 2000–2001 to 2008–2009, the number of retail outlets selling liquor in Nova Scotia increased by 65.0 per cent (Figure 2). In 2000, 8 agency stores were introduced in convenient locations (e.g., grocery stores and gas stations) around Nova Scotia. By 2006, there were 55 agency stores in the province and 4 private wine and specialty stores. Accessibility to alcohol in Nova Scotia was further increased through the issuance of 290 additional active permanent liquor licenses between 2004 and 2008.<sup>9</sup> As shown in Figure 3, there was a 19.0 per cent increase in licensed eating establishments and a 22.0 per cent increase in lounges.

Over the 10-year span between 2001 and 2010, per capita consumption increased 9.5 per cent in Nova Scotia, from 7.4 litres in 2001 to 8.1 litres in 2010 (Figure 1). Based on research conducted in other jurisdictions, it is likely that greater access in Nova Scotia is associated with higher rates of alcohol sales and consumption in the province.<sup>10</sup> Further analyses would be required to confirm this observation.

**Figure 2** Number of Retail Liquor Stores, Nova Scotia, 1998–1999/2008–2009



**Figure 3** Number of Liquor Licenses at Eating Establishments and Lounges, Nova Scotia, 2004–2008



## Patterns of Use

When examining consumption, it is important to consider patterns of drinking. A person who has one drink per day will consume the same amount of pure alcohol as someone who drinks seven at one weekly sitting, but the effect of consumption is likely to be much different.<sup>5</sup> The risk of injury or death from acute alcohol-related harm increases exponentially with the amount of alcohol consumed at a sitting.<sup>10</sup> Furthermore, there is a linear relationship between chronic harms and quantity of alcohol consumed over time.<sup>10</sup>

This section looks at different patterns of drinking: the number of Nova Scotians who consumed alcohol in the past year, the number who exceeded low-risk drinking guidelines, the number of heavy drinkers, and the number of hazardous drinkers. The data was largely drawn from three sources: the Canadian Community Health Survey (CCHS); Canadian Alcohol and Drug Use Monitoring Survey (CADUMS); and the Canadian Addiction Survey (CAS) 2004.<sup>11</sup> In addition to using previously published results, further analyses were performed using these data sources to adequately assess the impact of alcohol use in Nova Scotia. The CADUMS is an on-going general population survey of alcohol and illicit drug use among Canadians aged 15 and older. It is derived from the 2004 CAS.

Sample size and representativeness are important issues when interpreting population-based survey results.<sup>5</sup> The CCHS surveys have had excellent response rates in Nova Scotia of over 80 per cent with sample sizes (ages 12 years and older) of over 4,500. The sample sizes for CAS of 1,002 (ages 15 years and older) and CADUMS of 1,008 for 2009 and 1,328 for 2010 (ages 15 years and older) are about 20.0 per cent of those used by CCHS. The response rates for CAS and CADUMS are also much lower. The 2004 CAS response rate in Nova Scotia was 49.9 per cent and the 2009 CADUMS response rate was 47.3 per cent. Hence, CCHS findings can be viewed with much more confidence than those from CAS or CADUMS.

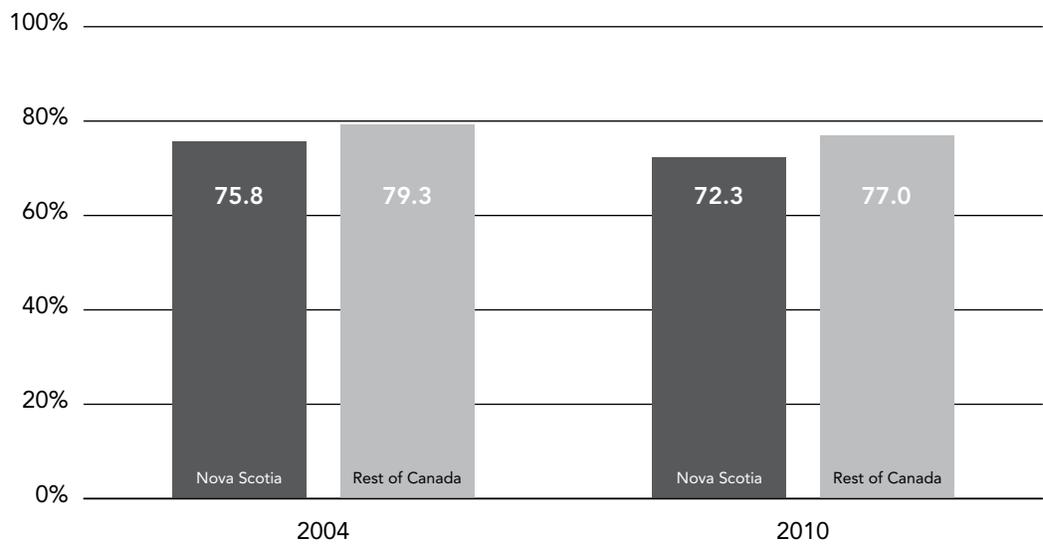
Survey data have been shown in the past to severely underestimate true consumption rates. Per capita consumption using the 2004 CAS was less than one-third of that found when calculated using Nova Scotia alcohol sales data.<sup>4</sup> Survey data are still useful when determining patterns and harms of alcohol use. However, in view of the small sample size and low response rates for CAS and CADUMS, the patterns-of-use findings for these surveys may also be underestimated. In addition, since survey data are self-reported and because some alcohol behaviours are socially unacceptable, they may be under-reported.

### Past-year Use

In 2010, 72.3 per cent of Nova Scotians age 15 years and older reported that they had consumed alcohol in the past year. This rate was lower than the Canadian rate (77.0 per cent) and the Nova Scotia rate in 2004 (Figure 4).

Based on 2009 data, males (79.3 per cent) reported past year use more than females (71.2 per cent). Past year drinking rates for the youngest (15–17 years) and oldest (65+ years) age groups were the lowest among Nova Scotians at 60.9 per cent and 61.0 per cent respectively. The 35–44 year old age group had the highest past year drinking rates (84.9 per cent).

**Figure 4** Past-Year Drinking in Nova Scotia and Canada for those aged 15+ Years, 2004 and 2010



Source: CADUMS 2010 and CAS 2004.

### Exceeding Low-risk Drinking Guidelines

Low-risk drinking guidelines (currently under review in Canada) recommend that healthy individuals should not exceed two standard drinks per day and weekly limits should be no higher than fourteen standard drinks for men and nine for women.<sup>40</sup>

Standard Drinks (13.6 grams of pure alcohol)		
Type of drink	millilitres	ounces
Beer and coolers (bottle or draft)	341	12
Wine	147.64	5
Spirits	44.3	1.5

In 2009, 17.8 per cent of adult Nova Scotians (15+ years) exceeded the low-risk drinking guidelines during the past seven days at the time of survey. The 2009 CADUMS rate for Nova Scotia was similar to that observed for other Canadians at 17.7 per cent. The CAS rate in 2004 for exceeding the low-risk drinking guidelines in Nova Scotia was 17.7 per cent.

Rates of exceeding the low-risk drinking guidelines varied significantly by gender and age group. Males were still much more likely to exceed the low-risk drinking guidelines than female drinkers (23.0 per cent versus 13.2 per cent, respectively). Young adults aged 18 to 24 years had the highest rate for exceeding the guidelines (31.6 per cent).

In view of the steady increase in per capita sales previously noted, as well as the decrease in the proportion of Nova Scotians who consumed alcohol in the past year, these results are likely lower estimates of true alcohol patterns in Nova Scotia and Canada. In contrast, the overall heavy-drinking rates reported by CCHS have steadily increased over the years, much in keeping with the increase seen in per capita consumption. As stated previously, CCHS findings should be viewed with greater confidence due to the more rigorous methodology.

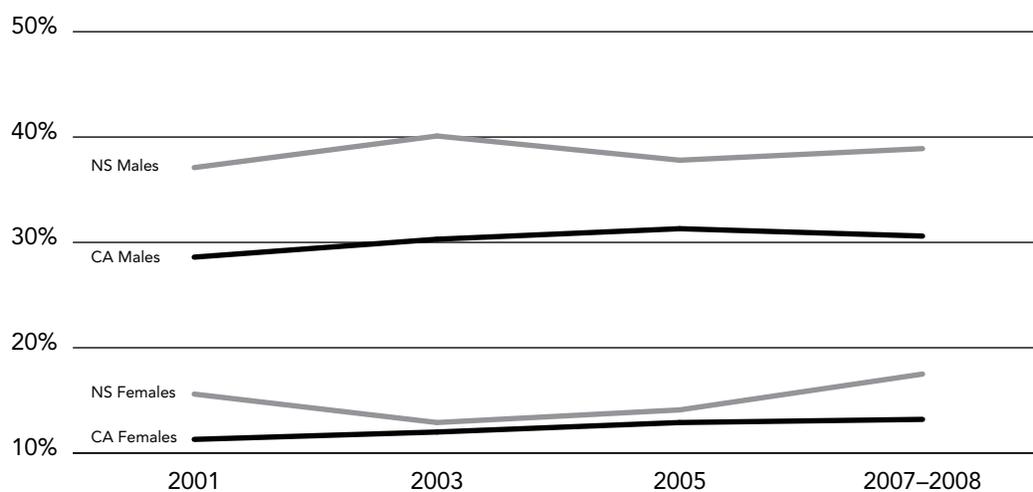
## Heavy Drinking

Heavy drinking is defined as consuming five or more drinks on one occasion for men and four or more drinks on one occasion for women. For the purposes of this report it is defined as five or more drinks for both men and women. This is the definition more consistently used in survey data for all age groups: adults, university students, and underage youth.

According to CCHS data, Nova Scotians were more likely than all Canadians to engage in heavy monthly and/or weekly drinking. Based on 2008 data, 28.1 per cent of Nova Scotians who had a drink in the past 12 months were heavy drinkers, an increase from 26.3 per cent in 2001. The heavy weekly drinking rate (five or more drinks on one occasion at least once a week) in Nova Scotia increased fairly steadily over the same period, going from 9.0 per cent in 2001 to 12.4 per cent in 2007-2008.

Nova Scotian men and women consistently drink more heavily than their Canadian counterparts (see Figure 5). In 2007–2008, 38.9 per cent of males and 17.5 per cent of females engaged in heavy monthly drinking, and 17.9 per cent of males and 7.0 per cent of females engaged in heavy weekly drinking. The 20–34 year age group had the highest rate of heavy monthly drinking (41.1 per cent) followed by the 12-19 year age group (35.8 per cent).

**Figure 5** Trend in Heavy Monthly Drinking by Gender in Nova Scotia and Canada, 2001–2008



**Source:** CCHS 2001, 2003, 2005, 2007–2008.

A one-time Nova Scotia study (2008) used a gendered definition of heavy drinking (five or more drinks for men and four or more drinks for women on one occasion) and found that among those who consume alcohol, 37.7 per cent of males and 17.9 per cent of females, 15 years of age and older, reported heavy drinking at least once a month.<sup>12</sup>

In 2009, Statistics Canada changed the way it reports heavy drinking in the CCHS survey. Previously, the heavy drinking data reports the rate of heavy drinkers from among the population that reported having at least one drink in the past 12 months. The sample now includes the population that does not drink. This has had the effect of reducing the rates overall.

Based on the new reporting method, in 2010, 20.2 per cent of Nova Scotians reported heavy monthly drinking (including non-drinkers). Males have a heavy drinking rate of 25.9 per cent and females have a rate of 15.0 per cent. The rate of heavy drinking for males dropped four percent between 2009 and 2010 and between 2003 and 2009 males consistently had a heavy drinking rate hovering around 30 per cent. Females, on the other hand, have increasing rates of heavy drinking, going from 9.9 per cent in 2003 to 15.0 per cent in 2010. The 20–34 year age group continues to be the heaviest monthly drinkers: 41.2 per cent of males and 26.6 per cent of females age 20–34 reported heavy monthly drinking. Again, if this survey included only those who consumed alcohol, the rates of heavy drinking would be higher.

## **Hazardous Drinking**

Heavy drinking is often synonymous with hazardous drinking – a pattern of drinking that increases the risk of harmful consequences for the user. Hazardous drinking is measured by the Alcohol Use Disorders Identification Test (AUDIT) – a valid and reliable assessment screening tool developed by the World Health Organization.<sup>13</sup> The AUDIT is used to identify hazardous consumption, harmful alcohol use patterns, and alcohol dependence. An AUDIT score of 8 is typically used as the cut-off point for harmful and hazardous drinking.<sup>14</sup> In the 2009 CADUMS, 12.6 per cent of Nova Scotians reported that they engaged in hazardous alcohol use in the prior year, a decrease from the 15.7 per cent reported in 2004. However, the small sample size and low response rate for the CADUMS may result in some uncertainty in these estimates. One would expect to see an increase in rates considering the rise in heavy monthly and weekly drinking over the years. According to the data, the proportion of Nova Scotians engaging in hazardous alcohol use was not significantly different from that found for other Canadians (12.0 per cent) in 2009. This is also surprising considering the heavy-drinking rates for both men and women are fairly consistently higher than those observed for all Canada.

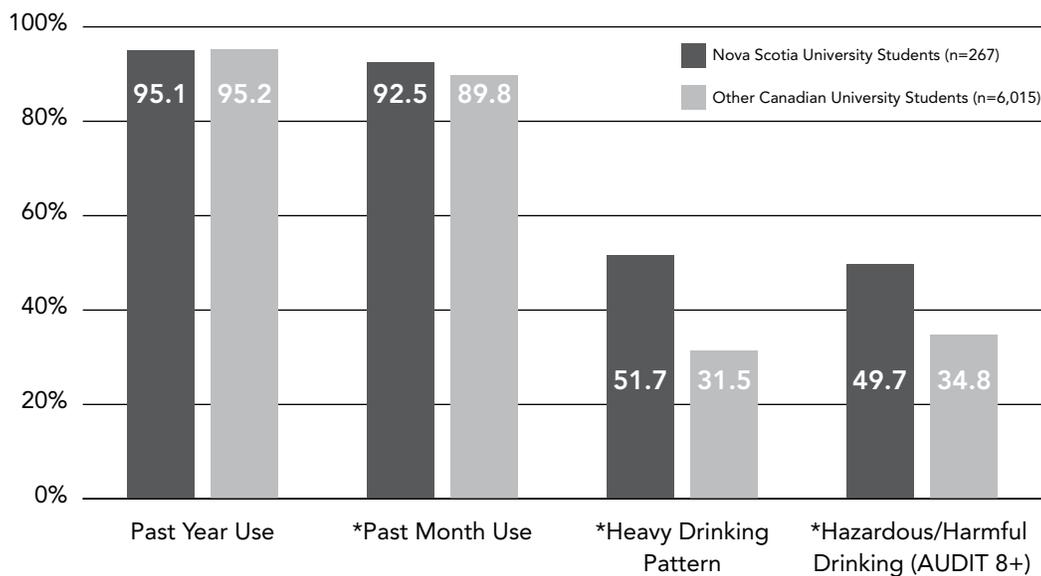
Gender and age were strong predictors of hazardous alcohol use in 2009 in Nova Scotia. Men (20.8 per cent) were twice as likely to engage in hazardous alcohol use as women (5.1 per cent). Young Nova Scotians aged 18 to 24 years (31.6 per cent) were most likely to put themselves at risk for harm as a result of their alcohol use in the prior 12 months.

## **Alcohol Use Among University Students in Nova Scotia**

The 2004 Canadian Campus Survey results were used to assess the drinking patterns of Nova Scotia university students and compare them to other university students across Canada.<sup>15</sup> The proportion of undergraduate university students in Nova Scotia who consumed alcohol in the year prior to the survey was similar to other universities across Canada (95.1 per cent versus 95.2 per cent, respectively), although a greater proportion of Nova Scotia university students consumed alcohol in the month prior to the survey compared to students at other universities (92.5 per cent versus 89.8 per cent, respectively, Figure 6). In addition, a greater proportion of university students in Nova Scotia engaged in heavy-drinking use over the past year (usual consumption of five or more drinks on the days they drank) and engaged in hazardous alcohol use (AUDIT score greater than 8) compared to other university students across Canada.

More than half of all university students surveyed in Nova Scotia reported engaging in heavy drinking with 27.2 per cent drinking heavily at least weekly (heavy frequent use) and 24.6 per cent drinking heavily less than weekly (heavy infrequent use). These proportions are much higher than those found among other university students in Canada, where 18.4 per cent reported heavy frequent use and 13.1 per cent reported heavy infrequent use. With this large university contingent engaging in heavy drinking in the province, it is no surprise that the Nova Scotia rate for hazardous or harmful alcohol use was significantly higher than that reported for other university students in Canada (49.7 per cent versus 34.8 per cent, respectively,  $p < 0.05$ ).

**Figure 6 Alcohol Use Among Undergraduate Students at Nova Scotia and Other Canadian Universities, 2004**



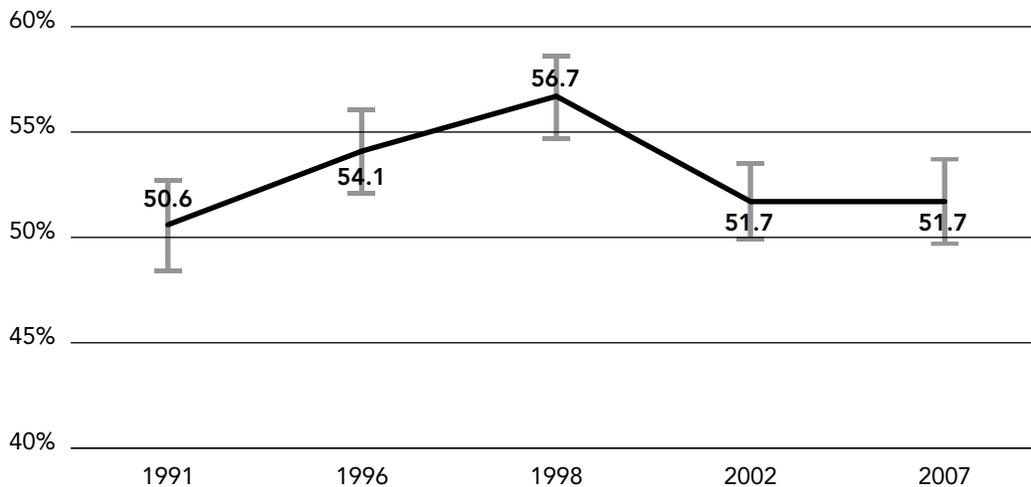
\* Statistically significant difference at 95% CI,  $p < 0.05$ . Source: Adlaf, Demers, & Gliksman, 2004.

## Alcohol Use by Underage Youth

The Student Drug Use Surveys (SDUS) are a valuable resource in assessing underage drinking by youth in Nova Scotia. The SDUS have been administered to students in grades 7, 9, 10, and 12 in randomly selected classes across the province since 1991.<sup>16, 17, 18, 19</sup> Figure 7 shows the trend in prevalence of alcohol use among underage youth in Nova Scotia. In 2007, 51.7 per cent of students consumed some alcohol in the prior year. Alcohol consumption peaked among underage youth in 1998 and since that time has steadily declined. In each of the study years, alcohol use increased significantly with age. The proportion of males and females reporting alcohol use in the prior year were about the same.

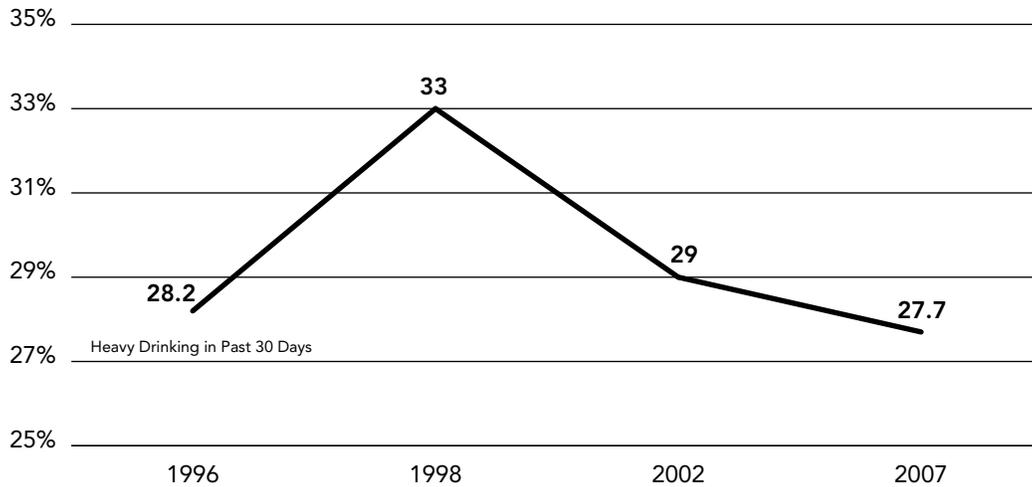
Except for 1998, the percentage of students reporting binge or heavy drinking (five or more drinks at a sitting) in the previous 30 days has been relatively stable over the years (Figure 8). However, heavy drinking among female students has increased in comparison to male students. In 2002 and 2007, no gender differences were noted among heavy drinkers compared to the earlier survey years in which male students were more likely to report heavy drinking than female students. In 2002 and 2007, young males had heavy drinking rates of 31.1 and 28.3 per cent, respectively. Young females had heavy drinking rates of 27.1 and 27.2 per cent, respectively. Over all years, heavy drinking increased with age.

**Figure 7** Trend in Prevalence of Alcohol Use among Underage Youth in Nova Scotia, 1991–2007



**Note:** Vertical bars denote the 95% confidence interval on the prevalence rate.

**Figure 8** Per Cent Reporting Heavy Drinking Among Students in Grade 7, 9, 10, and 12, 1996–2007



## Alcohol Use Age of Onset

The average age of first alcohol use among Nova Scotia students in grades 7, 9, 10, and 12 was 12.9 years in 2007.<sup>20</sup> In the 2008 CADUMS, the average age of first alcohol use was 19.5 years compared to the 18.5 years in the 2004 CAS. The Student Drug Use Survey age of first onset is likely a more accurate assessment of the current age of first alcohol consumption in Nova Scotia, as student results would not be influenced by the recall bias of older respondents in CAS and CADUMS. As a result, data from the SDUS are likely more reliable in assessing the effect of future initiatives aimed at increasing the age of first alcohol consumption in the province.

## Summary

- Per capita consumption increased in Nova Scotia over the 20-year period ending in 2010, going from 7.6 litres of pure alcohol in 1991 to 8.1 litres in 2010.
- A 65.0 per cent increase in retail outlets selling liquor from 2000 to 2009 across the province and the addition of 290 active permanent liquor licenses between 2004 and 2008 likely contributed to this increase in per capita consumption.
- The 2009 CADUMS Nova Scotia prevalence rates for past-year use, exceeding the low-risk drinking guidelines, and hazardous alcohol use were all lower than those reported in 2004 for adults 15 years of age and older. In view of the reliability of the data used in these calculations, caution should be exercised in viewing these results. In 2009
  - 72.3 per cent of Nova Scotians aged 15 years and older consumed alcohol in the prior year
  - 17.8 per cent of Nova Scotians aged 15 years and older exceeded the low-risk drinking guidelines
  - 12.6 per cent of Nova Scotians aged 15 years and older were identified as engaging in hazardous or harmful alcohol use through the AUDIT screening tool
- Heavy monthly and weekly drinking rates are rising among Nova Scotians aged 12 years and older.
  - In 2007–2008, 38.9 per cent of males and 17.5 per cent of females engaged in heavy monthly drinking. During the same time frame, 17.9 per cent of males and 7.0 per cent of females engaged in heavy weekly drinking.
- Similar to other undergraduate university students across Canada, nearly all Nova Scotia university students consumed alcohol in the past year (95.1 per cent). However, Nova Scotia students had much higher rates of heavy and hazardous alcohol use compared to university students in the rest of Canada.
  - The usual consumption pattern for 51.7 per cent of Nova Scotia university students was five or more drinks on the days they drank over the past year, with 27.2 per cent of all university students surveyed in the province drinking heavily once a week or more often.
  - 49.7 per cent of Nova Scotia university students were identified as being at high risk for harms as a result of their alcohol use compared to 34.8 per cent of other Canadian students.

- Since 1995, alcohol use by underage youth in Nova Scotia continues to decline. In 2007, 51.7 per cent of students in grades 7, 9, 10, and 12 consumed some alcohol in the prior year. Binge or heavy drinking by students has remained stable over the years; however, heavy drinking by underage female students is now on par with underage male students.
- The average age of first alcohol use among Nova Scotia students in grades 7, 9, 10, and 12 was 12.9 years in 2007.

# Alcohol-Related Harms

## Alcohol-Related Morbidity and Mortality

Alcohol is an intoxicant directly linked to avoidable illness, injury, and death. Excessive patterns of consumption increase the likelihood of health-related harms and social problems; both can result from acute or chronic misuse. The former is connected with higher levels of morbidity and mortality than the latter.<sup>8</sup> Acute misuse is associated with alcohol poisoning, acute pancreatitis, acute cardiac arrhythmia, Fetal Alcohol Syndrome (FAS), falls, drowning, assaults, homicide, suicide, and motor vehicle deaths and injuries caused from drunk driving.<sup>21</sup> Chronic use has been linked to various forms of cancer, liver damage, neuropathy, stomach problems, alcohol dependency, and some infectious diseases.<sup>21, 22</sup>

The morbidity data used in this report were obtained from the Canadian Institute for Health Information (CIHI) Discharge Abstract Database (DAD). The mortality data for this report were obtained from Statistics Canada Vital Statistics Database. The calculations in this report were made by applying the 2002 Nova Scotia-specific attributable fractions to disease conditions known to be related to alcohol (see Appendix).<sup>23</sup>

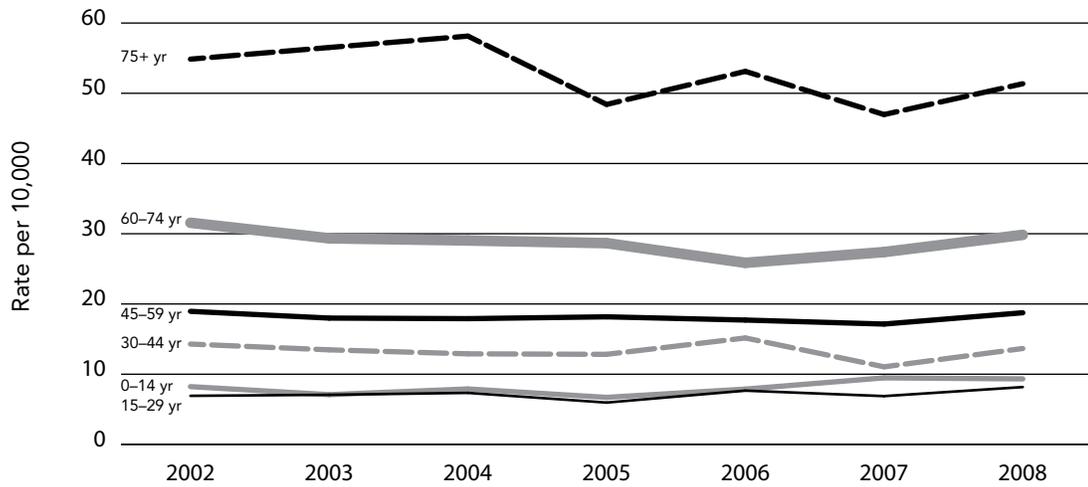
## Hospitalization

Alcohol-related hospitalization rates have varied over the past seven years in Nova Scotia (Table 1). The ratio of alcohol-related hospitalizations to all hospitalizations ranged from 2.33 to 2.48 per cent over the seven-year period. The highest alcohol-related hospitalization rates were observed in 2002 and the lowest in 2007, before rising again slightly in 2008. In contrast, hospitalization rates for all causes have decreased steadily in Nova Scotia since 2002. In view of the increase in per capita consumption in the province over the years, it is surprising to see the downward trend in alcohol-related hospitalization rates. Hospitalization rates are perhaps not as good an indicator of alcohol-related health effects as mortality. Hospitalization rates are influenced by the reorientation of health resources resulting in some reductions in the availability of hospital services and visits (e.g. bed closures).

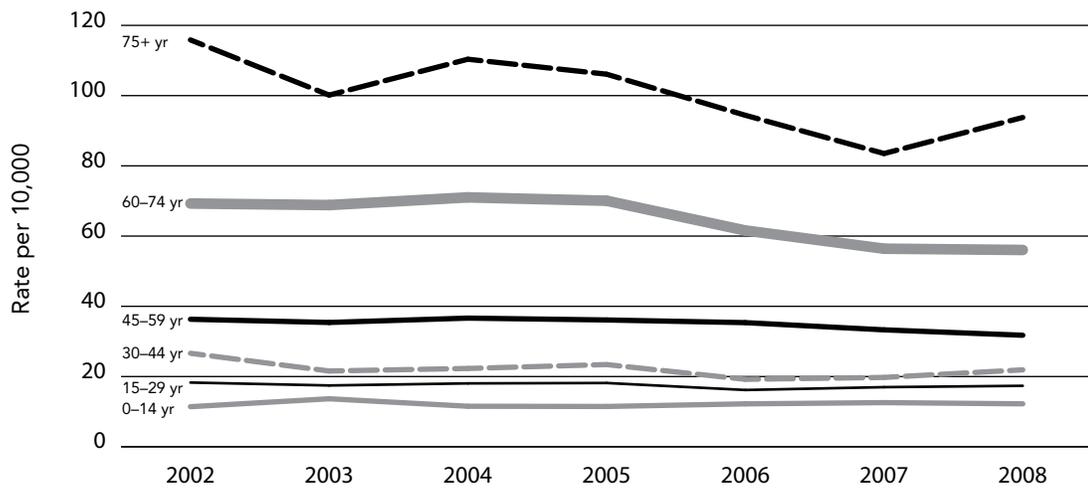
Year	Total Nova Scotia Population	Hospitalizations from All Causes		Alcohol-Related Hospitalizations		
		Number	Rate/10,000	Number	Rate/10,000	% of Total
2002	934,520	99,517	1,064.9	2,409.25	25.78	2.42
2003	936,527	99,002	1,057.1	2,309.78	24.66	2.33
2004	937,970	98,005	1,044.9	2,383.28	25.41	2.43
2005	936,000	96,118	1,026.9	2,332.01	24.91	2.43
2006	935,060	93,303	997.8	2,256.31	24.13	2.42
2007	934,312	91,898	983.6	2,162.56	23.14	2.35
2008	933,149	92,568	992.0	2,298.49	24.63	2.48

As shown in Figures 9 and 10, the rates of alcohol-related hospitalizations for men are much higher than those for women. The male hospitalization rate for alcohol-related conditions was 58.0 to 91.0 per cent higher than for women between 2002 and 2008. For both genders, the rates for alcohol-related hospitalizations increased with age. The female rates for all age groups fluctuated slightly over the years, but most rates in 2008 were similar to those in 2002. Hospitalizations for females aged 15 to 29 years showed the most variability ending 16.0 per cent higher in 2008 than 2002. All male hospitalization rates per 10,000 by age group decreased from 2002 to 2008 except the 0 to 14-year-old age group. The biggest decreases in hospitalization rates were seen in the 60 to 74-year-old age group and the 75 and older age group.

**Figure 9 Trends in Female Rates of Age-Specific Alcohol-Related Hospitalizations in Nova Scotia, 2002–2008**



**Figure 10 Trends in Male Rates of Age-Specific Alcohol-Related Hospitalizations in Nova Scotia, 2002–2008**



## Mortality

Table 2 shows the rate of deaths from all causes and alcohol-related deaths per 10,000 from 2002 to 2008. The rate per 10,000 for death from all causes fluctuated within a narrow margin from 2002 to 2008. However, while the rate for alcohol-related deaths per 10,000 did fluctuate, it also increased slightly over the seven-year time frame. The alcohol-related death rate in 2008 was 27 per cent higher than the 2002 rate. The alcohol-related percentage of total deaths has increased over the years.

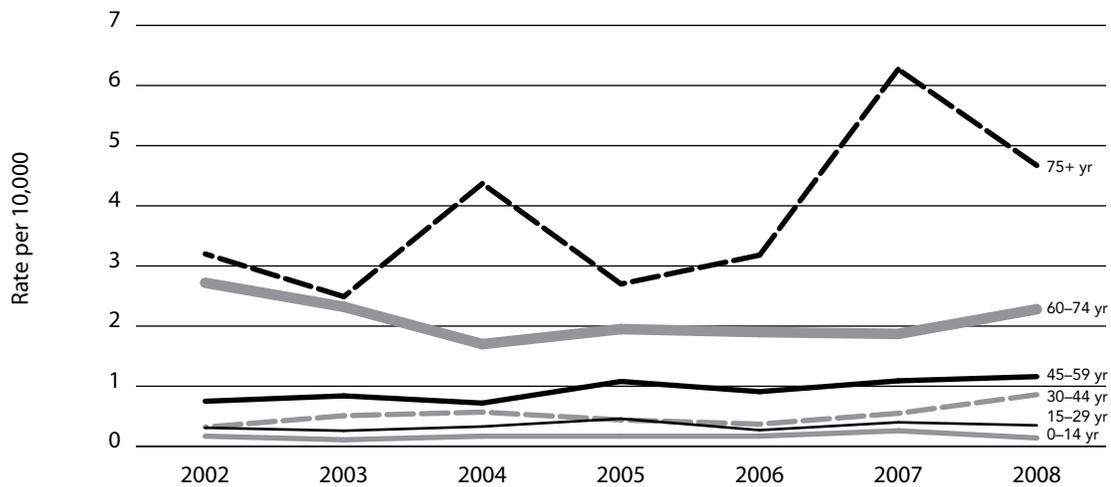
Year	Total Nova Scotia Population	Death from All Causes		Alcohol-Related Deaths		
		Number	Rate/10,000	Number	Rate/10,000	% of Total
2002	934,520	8,012	85.73	182	1.95	2.27
2003	936,527	8,099	86.48	172	1.84	2.12
2004	937,970	8,295	88.44	197	2.10	2.37
2005	936,000	8,307	88.75	221	2.36	2.66
2006	935,060	8,117	86.81	207	2.21	2.55
2007	934,312	8,395	89.85	252	2.70	3.00
2008	933,149	8,269	86.61	231	2.48	2.79

The trends in age-specific alcohol-related mortality are displayed in Figures 11 and 12. The rates of alcohol-related deaths for males were three to four times higher than those for females between 2002 and 2008. Although the rate of alcohol-related mortality increases with age for both genders, it is not as pronounced for women as it is for men.

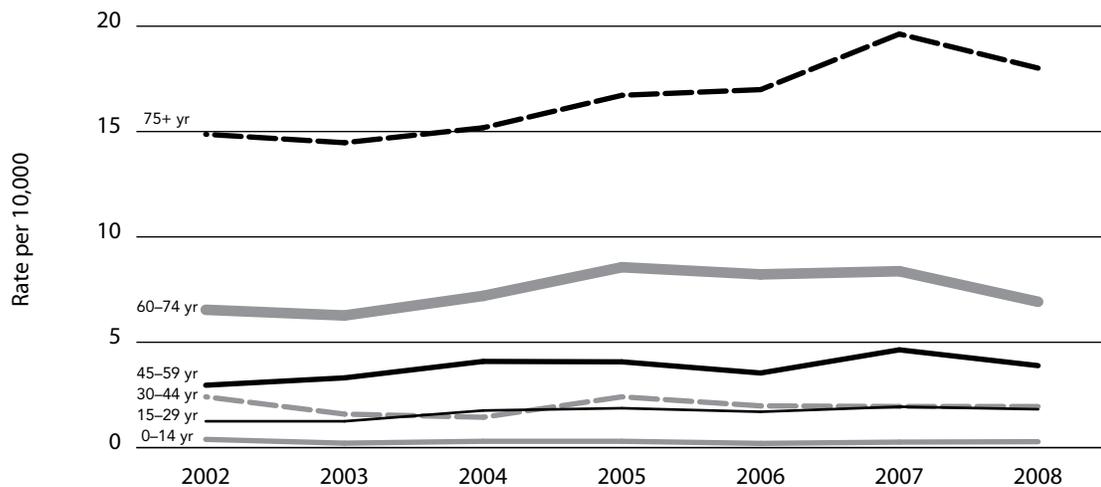
The alcohol-related mortality rate for females aged 0 to 29 years varied little over the years. For women aged 30 to 44 years, the alcohol-related mortality rate peaked in 2008 at 0.86 per 10,000 from a low of 0.32 per 10,000 in 2002. The mortality rate for women aged 45 to 59 years also increased over the years from a low of 0.72 per 10,000 in 2000 to 1.16 per 10,000 in 2008. The rates for women in the 60 to 74 year age group decreased over the years from a high of 2.73 per 10,000 in 2002. The rates for women aged 75 years and older varied the most over the years peaking at 6.27 per 10,000 in 2007.

The alcohol-related mortality rates for males aged 0 to 59 years fluctuated within a narrow margin over the years. The mortality rates for males aged 60 to 74 years increased from 2002 to 2005 before decreasing again. A steady increase in alcohol-related mortality rates for men aged 75 years and older was observed between 2002 and 2007 before decreasing slightly in 2008.

**Figure 11 Trends in Female Rates of Age-Specific Alcohol-Related Mortality in Nova Scotia, 2002–2008**



**Figure 12 Trends in Male Rates of Age-Specific Alcohol-Related Mortality in Nova Scotia, 2002–2008**



It will be important to monitor these trends, particularly with the increase in heavy and high-risk alcohol use among youth and young adults in Nova Scotia. If the current heavy-drinking rates continue in the province, the proportion of total deaths from alcohol will continue to rise.

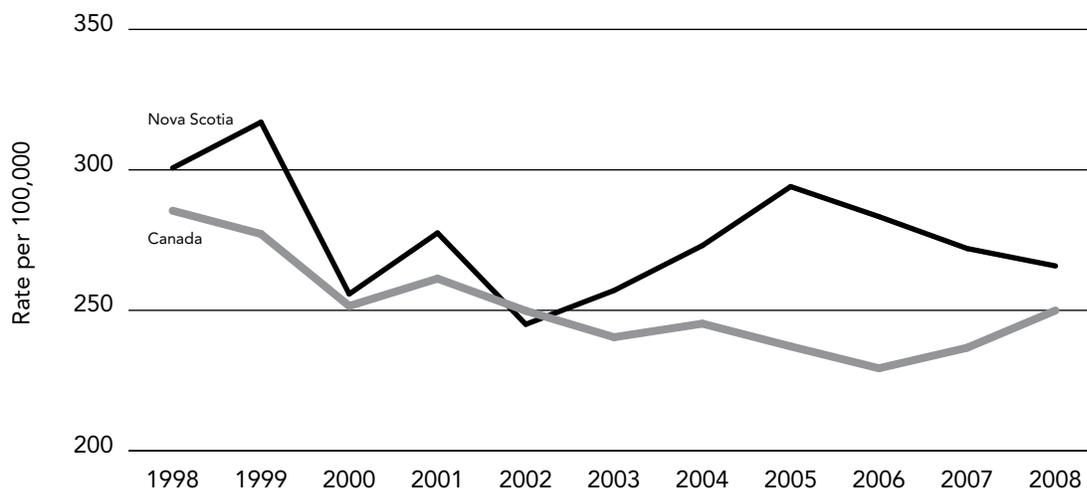
## Incidents of Alcohol-Related Offences

### Alcohol-impaired Driving

Drinking and driving has a major impact on the lives of Canadians, the economy, and the health care system. Impaired driving (where blood alcohol content (BAC) is .08 per cent or higher) is currently the leading criminal cause of death in Canada.<sup>24</sup> This section draws on data from several different sources: Nova Scotia Department of Transportation and Infrastructure Renewal, Statistics Canada, and the Traffic Injury Research Foundation of Canada.

In 2010 there were 21 alcohol-related fatalities on provincially-maintained roadways. This was 30.4 per cent of all motor vehicle fatalities and includes fatalities involving motorcycles, bicycles, farm tractors, and all-terrain vehicles.<sup>25</sup> Alcohol was also a factor in 8.1 per cent of all motor vehicles serious injuries in 2010. While overall rates of motor vehicle collisions have been declining for more than ten years, fatalities and serious injuries associated with alcohol impaired driving in Nova Scotia have remained relatively consistent.

**Figure 13** Rates of Impaired-driving Charges\* and Refusal to Provide Breath Sample, Nova Scotia and Canada, 1998–2008



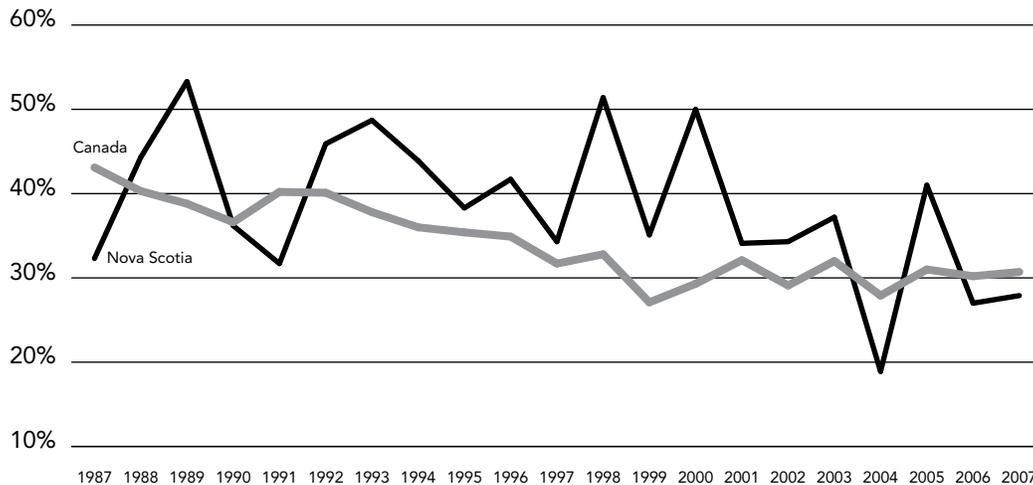
\* Rates/100,000 population of impaired operation of a motor vehicle over 0.08 blood-alcohol concentration.

Source: Statistics Canada, CANSIM Table 252-0013.

The Nova Scotia rates of impaired driving and refusal to provide a breath sample between 1998 and 2008 are displayed in Figure 13. While both the Canada and Nova Scotia charge rates have declined over the 10-year period, the rates in Nova Scotia show more fluctuation and, with one exception, are consistently higher than the national rates.

Figure 14 shows the percentage of fatally injured drivers testing 0.08 BAC or higher in Nova Scotia and Canada. The average percentage of fatally injured drivers who had minimum 0.08 BAC was 4.4 per cent higher in Nova Scotia than the all-Canada percentage between 1987 and 2007. Although the percentage of impaired fatally injured drivers in Nova Scotia continues to rise and fall, the peaks have been lower since the last large spike in 2000. The 2006 and 2007 percentages were fairly consistent at 27.0 per cent and 27.9 per cent, respectively.

**Figure 14** Percentage of Fatally Injured Drivers with a Blood-alcohol Concentration of 0.08 or Higher, Nova Scotia and Canada, 1987–2007



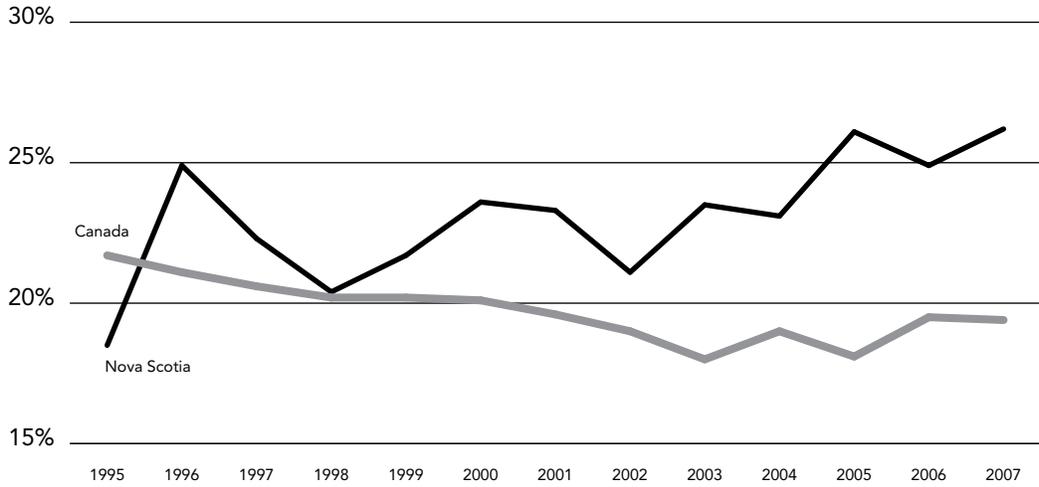
**Note:** Percentage is among those fatally injured drivers who were tested for BAC and died within six hours. Excluded are operators of bicycles, snowmobiles, farm tractors, and other non-highway vehicles.

**Source:** Traffic Injury Research Foundation of Canada, 2007.

Although the incidence of fatally injured drivers in Nova Scotia seems to have declined recently, the percentage of drivers in serious crashes (defined as a crash that resulted in a person being admitted to hospital) involving alcohol has risen. As seen in Figure 15, the percentage of drivers in serious-injury crashes involving alcohol in Nova Scotia has increased since 1995, while the Canadian percentage has decreased. (British Columbia and the Yukon are excluded from the Canada totals because relevant information on serious injury was not available for these jurisdictions in all of the years examined.) From 2003 to 2007, 23.1 per cent to 26.2 per cent of drivers involved in crashes in Nova Scotia that caused serious injury had consumed alcohol. The average Nova Scotia percentage of drivers in serious-injury crashes involving alcohol was 3.3 per cent higher than the Canadian rate from 1995 to 2007.

Impaired drivers killed in alcohol-related motor-vehicle collisions are most often male (92.9 per cent), with impaired drivers aged 26 to 45 years accounting for half of all impaired drivers killed in Nova Scotia.<sup>26</sup> Young drivers aged 16 to 19 years accounted for the highest percentage (24.2 per cent) of drivers involved in alcohol-related serious-injury crashes.<sup>26</sup> Again, the majority of drivers in this age group involved in alcohol-related serious-injury crashes were males (81.1 per cent).<sup>26</sup>

**Figure 15** Percentage of All Drivers in Serious-Injury Crashes Involving Alcohol, Nova Scotia and Canada, 1995–2007



**Note:** Excluded are operators of bicycles, snowmobiles, farm tractors, and other non-highway vehicles.  
**Source:** Traffic Injury Research Foundation of Canada, 2007.

## Alcohol-Related Crime

Researchers estimate that 25.0 to 40.0 per cent of crimes committed by federal and provincial inmates in Canada is attributable to the use of alcohol alone or alcohol in combination with illicit drugs.<sup>27</sup> Police believe that much of their workload revolves around substance abuse. Police in Nova Scotia estimate that 90.0 per cent of their work is related to drugs or alcohol.<sup>28</sup> Vancouver police are currently collecting data to determine the exact effect alcohol and drugs have on police-related incidents.<sup>29</sup>

In 2002, the percentage of alcohol-attributed crimes and charges in Nova Scotia (67.6 per cent) was slightly higher than it was for Canada (66.2 per cent) (Table 3). The costs to Nova Scotia for these alcohol-related crimes are very high. In 2002, the total provincial cost for policing, courts, and corrections amounted to \$78.09 million dollars for alcohol-related crimes.

	Nova Scotia			Canada		
	Number	Percentage of All	Cost (millions)	Number	Percentage of All	Cost (millions)
Alcohol-Attributed Crimes	23,310*	31.2%	\$41.53	761,638**	30.4%	\$1,898.76
Alcohol-Attributed Charges	5,916	36.4%	\$21.36	206,594	35.8%	\$513.07
Alcohol-Attributed Prison Sentences (Provincial and Federal)	486	n/a	\$15.2	28,162	n/a	\$660.4

**Note:** \*This includes an estimated 4,360 alcohol-attributed violent crimes for Nova Scotia.

**Note:** \*\*This includes an estimated 127,383 alcohol-attributed violent crimes for Canada.

**Source:** Rehm et al., 2006.

## Self-reported Harms

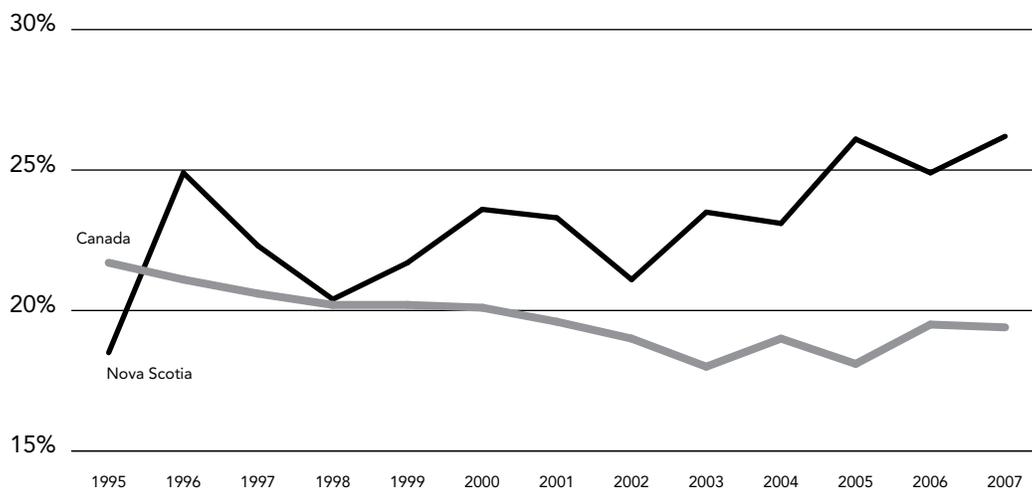
Alcohol use can lead to a number of personal and social harms that include health, relationship, occupational, legal, and housing problems.<sup>21</sup> Calculations were made using the 2009 CADUMS data and compared to the 2004 CAS results. In view of the weakness of both datasets, caution should be exercised in interpreting these results.

In 2009, the proportion of Nova Scotians aged 15 years and older who reported one or more of eight harms from their own alcohol use in the past year was roughly equivalent to the national average (6.8 per cent versus 6.5 per cent). (Alcohol-related harms include harms to physical health, friendships and social life, financial position, home life or marriage, work, studies or employment opportunities, legal problems, difficulty learning, and housing problems.) This is virtually unchanged from the 2004 CAS data analysis of 6.8 per cent of Nova Scotians reporting at least one alcohol-related harm from their own use in the prior year.

Women were less likely than men to report harmful alcohol use (4.3 per cent versus 9.5 per cent). However, young adults aged 18 to 24 years were much more likely to report one or more harms from their drinking than other adults with 20.2 per cent of young adults reporting at least one alcohol-related harm in the prior year. This is not surprising given the high proportion of young adults engaged in heavy and/or hazardous alcohol use found in the 2009 CADUMS.

The proportion of university students in Nova Scotia reporting alcohol-related harms, either due to their own drinking or that of others, was significantly higher than for other Canadian university students (Figure 16).<sup>15</sup> At some point during the 2003–2004 academic year, almost four in ten university students in Nova Scotia reported having a serious argument, being pushed, hit or assaulted, experiencing sexual harassment, or being a victim of sexual assault or date rape as a result of another student’s drinking. In addition, almost three in ten students had unplanned sex or unsafe sex due to their own drinking.

**Figure 16** Proportion of Students Experiencing Alcohol-Related Harms in 2004, Nova Scotia and Other Canadian Universities

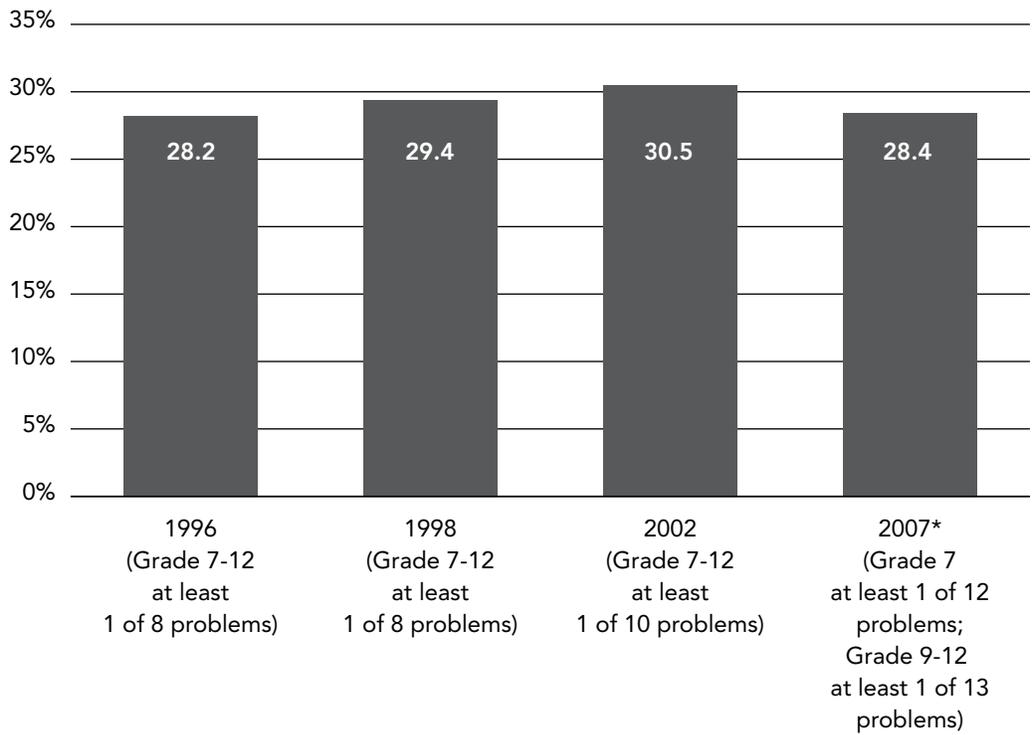


\* Statistically significant difference at 95% CI ( $p < 0.000$ ).

Source: Adlaf, Demers, & Gliksman, 2004.

Alcohol use among underage youth can also lead to harms (Figure 17). In 1996 and 1998, 28.2 per cent to 29.4 per cent of students in grades 7, 9, 10, and 12 reported having at least one of eight alcohol-related problems in the prior year.<sup>17, 18</sup> In 2002, 30.5 per cent of students in the same grades reported experiencing at least one of ten alcohol-related problems.<sup>19</sup> In 2007, 8.0 per cent of students in grade 7 reported experiencing at least one of twelve alcohol-related problems (students in grade 7 were not asked questions about sexual behaviour). Over 40.0 per cent of students in grades 9, 10, and 12 experienced one or more of thirteen alcohol-related problems.<sup>20</sup>

**Figure 17 Alcohol-Related Problems\* Reported Among Underage Youth in Nova Scotia, 1996–2007**



\* Students in 1996 and 1998 were asked about eight alcohol-related problems: damaged things when drinking, drinking caused one to injure oneself, cost of alcohol has prevented buying other things, drinking has caused tensions or disagreement with family or friends, consumed alcohol before or instead of breakfast, trouble with police as a result of drinking, school work or exams affected by drinking, and had a motor vehicle accident as a driver after drinking in the previous two hours. In 2002, driving under the influence of alcohol and unplanned sex under the influence of drugs were included. Additional indicators added in 2007 were using a fake ID or lying about age to get alcohol, drinking in a licensed venue, and riding with a drunk-driver.

**Note:** 2007 alcohol problem rate calculated using unweighted data and thus are slightly lower than the weighted findings

## Summary

- Alcohol-related hospitalization rates in Nova Scotia fluctuated between 2002 and 2008. The highest rate was observed in 2002 at 25.8 per 10,000 and the lowest in 2007 at 23.2 per 10,000. This observation could result from a mixing of effects when combining acute and chronic alcohol-related outcomes (see Appendix). Overall, hospitalization rates decreased over the years due to cost-saving measures such as bed closures.
- Alcohol-related mortality rates have risen fairly steadily since 2002, with the 2008 rate 27.0 per cent higher than the 2002 rate.
- In 2010 there were 21 alcohol-related fatalities on provincially-maintained roadways. This was 30.4 per cent of all motor vehicle fatalities. Alcohol-related rates have been relatively consistent for the past 10 years, despite a decline in overall rates of motor vehicle fatalities.
- In 2002, the percentage of alcohol-attributed crimes and charges in Nova Scotia was slightly higher than for Canada. The cost to Nova Scotians was \$78.09 million dollars for policing, courts, and corrections.
- In 2009, 6.8 per cent of Nova Scotians reported one or more of eight harms from their own alcohol use in the prior year. Young adults aged 18 to 24 years (20.2 per cent) were most likely to report one or more harms.
- In the 2003–2004 academic year, almost four in ten university students experienced harm as a result of another student’s drinking and three in ten students had unplanned or unsafe sex due to their own alcohol use.
- In 2007, more than 40.0 per cent of students in grades 9, 10, and 12 experienced one or more of thirteen alcohol-related problems and 8.0 per cent of students in grade 7 had at least one of twelve alcohol-related problems.

# Treatment

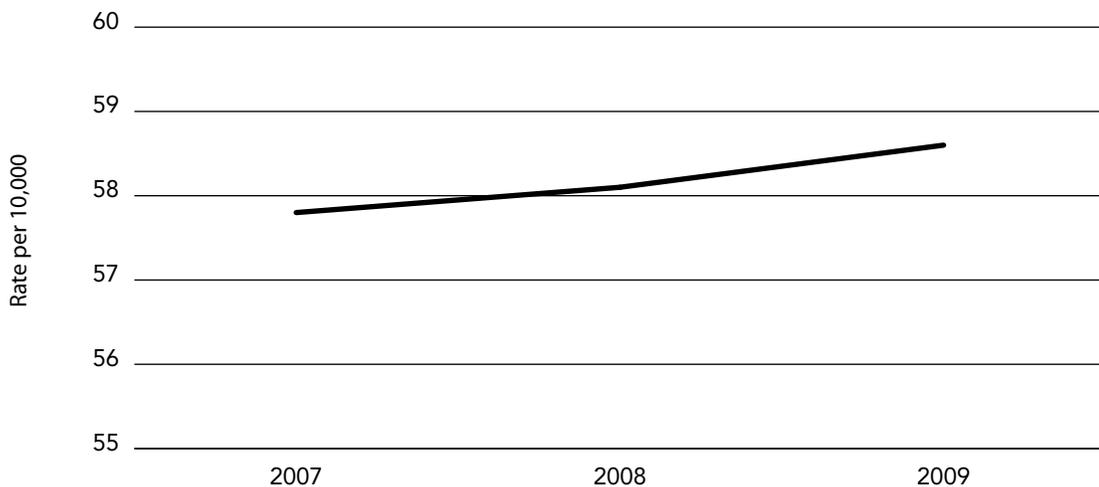
Addiction Services in the District Health Authorities and IWK Health Centre are responsible for the delivery of addiction prevention and treatment services in Nova Scotia. Addiction Services uses a comprehensive approach that involves providing programs, services, and supports to individuals based on current, evidence-informed literature. Services range from prevention and health promotion, to early identification, early intervention, brief intervention, and treatment for individuals and families who experience problems associated with alcohol use. Treatment programs, services, and supports specific to alcohol include: withdrawal management, community-based services (with enhanced services for rural women and youth), driving while impaired and alcohol ignition interlock programs, and structured treatment (21-day).

Alcohol-treatment rates for 2007 to 2009 have been relatively stable at 57.8 to 58.6 per 10,000 population (Figure 18). Although these rates seem lower than those calculated using the 2000 to 2004 data reported in the 2005 Alcohol Indicators Report at 62.5 to 72.0 per 10,000, these earlier rates cannot be directly compared to the current rates.<sup>4</sup> In the intervening years, a new information system (ASsist) was introduced. ASsist is more efficient at capturing unique clients in the province. In the 2005 report, clients were unique in regional tallies but not necessarily in the provincial count. Clients may have been treated in more than one region resulting in duplication in provincial counts. Compared to the old information system (StatIS), ASsist uses different data-collection processes, definitions, and reporting requirements. For example, in StatIS if a client was admitted for smoking cessation and reported using alcohol during their client assessment, they were also counted as an alcohol-treatment client even if they did not receive alcohol-specific treatment services. In addition to the change in information systems, several sites and programs experienced closures and/or restructuring resulting in a decrease in the numbers of clients receiving treatment from 2006 to 2008.

From 2000 to 2009, the male to female treatment ratio remained fairly consistent, with males comprising 68.0 to 75.0 per cent of all alcohol treatment clients. However, the proportion of clients 18 years of age and younger seeking alcohol treatment has decreased. From 2000 to 2004, 11.3 per cent of clients seeking treatment for alcohol issues were 18 years of age and younger. From 2005 to 2009, the proportion decreased to 9.2 per cent.

As reported earlier in the alcohol consumption and harms sections of this report, young adults have the highest rates in the province for past year drinking, exceeding low-risk drinking guidelines, and for heavy monthly drinking. Young adults were also the most likely to engage in hazardous alcohol use and cause harm to themselves and others as a result of their drinking. Yet, from 2007 to 2009, 19 to 24-year-olds accounted for only 12.0 to 13.0 per cent of all clients treated at Addiction Services. Perhaps some of these young adults are seeking treatment from their family practitioners or at campus health services for their alcohol issues. It is also as likely that they are not recognizing that they have a potential problem with their alcohol use. The 2007 Alcohol Strategy identified the need to increase outreach and engage individuals experiencing alcohol problems so that they access the appropriate services. It seems that this goal is more important than ever for this age group and appropriate interventions need to be created to decrease harmful alcohol use in young adults.

**Figure 18** Alcohol Treatment Rates in Nova Scotia (all ages), 2007–2009



## Summary

- Alcohol treatment rates were stable from 2007 to 2009 at 53.6 to 55.6 per 10,000 population.
- Males comprised 68.0 to 75.0 per cent of all alcohol treatment clients from 2000 to 2009.
- Young adults (19-24 years) have the highest rates in the province for past-year drinking, exceeding low-risk drinking guidelines, heavy drinking, engaging in hazardous alcohol use, and causing harm to themselves and others as a result of their drinking. However, they account for only 12.0 to 13.0 per cent of all the clients treated at Addiction Services from 2007 to 2009.
- The proportion of clients 18 years of age and younger engaged in treatment through Addiction Services decreased over the past five years from 11.3 in 2004 to 9.2 per cent in 2009.

# Benefits and Costs of Alcohol

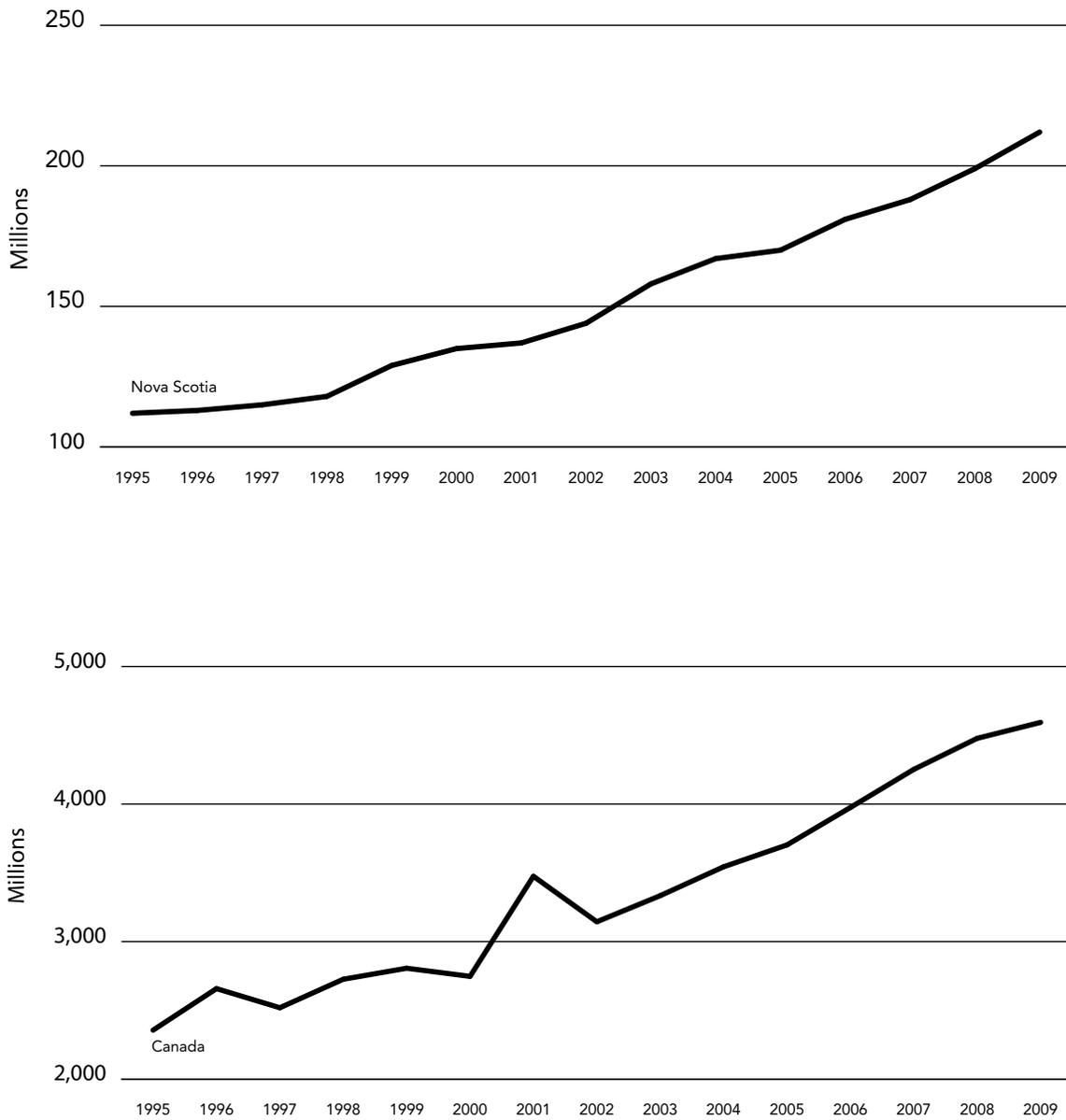
## Economic Benefits of Alcohol Consumption

Alcoholic beverages are important economic commodities. Production of alcohol, wholesale and retail alcohol sales, in combination with the tourism and service industries, generates economic and fiscal benefits to Nova Scotians through employment, revenues, and taxation. Between the years 1995 and 2009, Nova Scotia posted total revenues of \$2.28 billion and the Canadian total was \$50.31 billion (Figure 19).<sup>30</sup> Alcohol is also important to the tourism and service industry. Not including restaurants, liquor-licensed establishments posted \$68.1 million in receipts in 2008.<sup>31</sup>

## Health Benefits of Moderate Alcohol Consumption

Some studies suggest that low levels of alcohol consumption may have specific health benefits for some groups including lowering the risk of coronary heart disease, ischemic stroke, and possibly blood pressure.<sup>32, 33, 34, 35</sup> Individuals might also benefit from infrequent consumption of low levels of alcohol through lowered stress, increased sociability, and relaxation.<sup>36, 37</sup> However, the relationship between low alcohol consumption and health benefits may be confounded by factors such as gender, age, socioeconomic status, diet, and physical fitness. Moreover, risks offset by alcohol for one type of disease could further increase the risks for others. No pattern of drinking is without health risks and possible harm to self or others, and for young adults, in particular, the risks outweigh the benefits.<sup>32</sup>

**Figure 19** Annual Alcohol Liquor Profits, Nova Scotia and Canada, 1995–2009

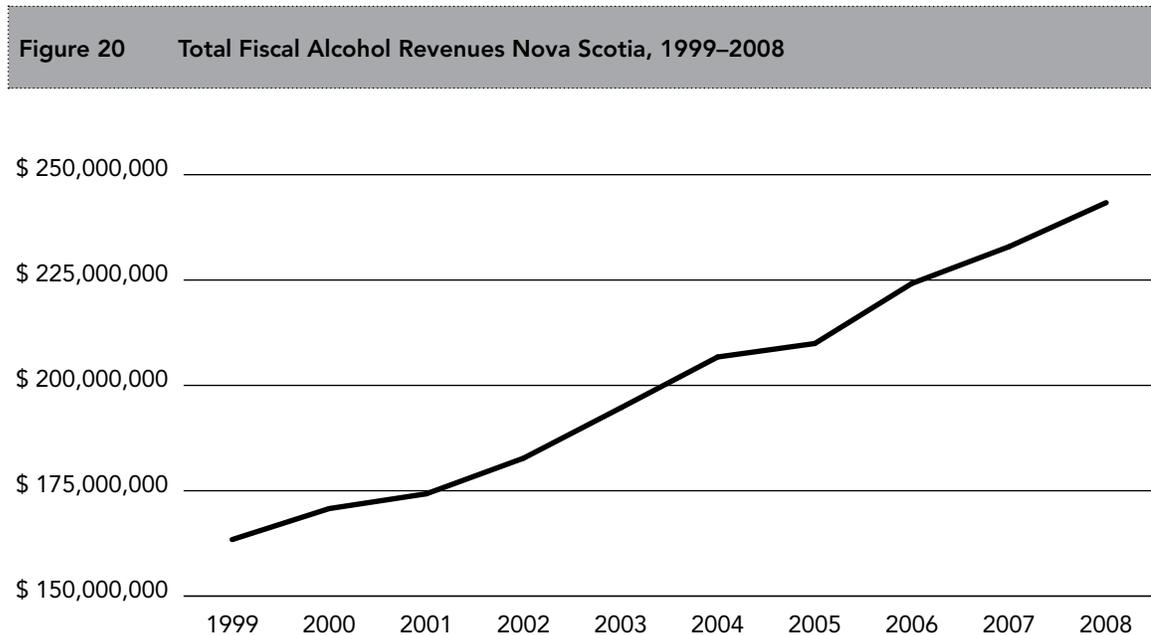


**Source** Statistics Canada, CANSIM Table 385-0002.

## Benefit/Cost Analysis

Alcohol is a legal commodity that provides economic, fiscal, and possible health benefits for citizens of the province of Nova Scotia. Provincial alcohol profits rose from \$163.4 million to \$243.4 million between the years 1999 and 2008 (Figure 20).<sup>38</sup> Nevertheless, alcohol-related harms to self and others produce costs for Nova Scotians. These costs can be direct (health, law enforcement, prevention and research, and other costs), or indirect costs, the latter of which are primarily concerned with productivity losses associated with alcohol consumption.

The direct social costs of alcohol use in 2006 exceeded the government's fiscal benefits (\$242.9 million in costs versus \$224.2 million in revenues) with a benefit/cost ratio of 0.92 (Table 4).<sup>38</sup> Direct social costs of alcohol rose \$37.6 million from 2002 to 2006. Indirect social costs through lost productivity were even higher at \$249.6 million in 2006 (Table 5).<sup>38</sup> From 2002 to 2006, the indirect social costs of alcohol in Nova Scotia increased by \$37.6 million. As shown in Figure 21, when the social costs of alcohol are combined (\$492,537,753) the result is more than double the fiscal revenue resulting in a benefit/cost ratio of 0.46 for 2006.<sup>38</sup>



**Source:** Foster 2010.

**Note:** The total revenue is the sum of net income from NSLC and revenue from licenses, permits, fines, and confiscations plus 8% provincial HST.

<b>Table 4 Social Costs of Alcohol Consumption – Direct Costs, Nova Scotia, 2002 and 2006</b>		
<b>Direct Costs</b>	<b>2002</b>	<b>2006</b>
<b>Direct Health Care</b>		
Morbidity – Acute-Care Hospitalization	\$50,870,211	\$54,596,634
Morbidity – Psychiatric Hospitalization	\$311,395	\$622,204
Inpatient Specialized Treatment	\$12,785,802	\$13,808,666
Outpatient Specialized Treatment	\$798,036	\$861,879
Ambulatory Care: Physician Fees	\$3,918,288	\$4,392,291
Family Physician Visit	\$4,888,386	\$6,174,793
Prescription Drugs	\$23,686,634	\$35,209,114
<b>Total Health Costs</b>	<b>\$97,258,752</b>	<b>\$115,665,581</b>
<b>Direct Law Enforcement</b>		
Police	\$41,530,000	\$51,111,514
Courts	\$21,360,000	\$23,585,532
Corrections (Including probation)	\$15,200,000	\$16,891,200
<b>Total Law Costs</b>	<b>\$78,090,000</b>	<b>\$91,588,246</b>
<b>Other</b>	<b>\$30,000,000</b>	<b>\$35,677,688</b>
<b>Total Direct Social Cost</b>	<b>\$205,348,752</b>	<b>\$242,931,515</b>

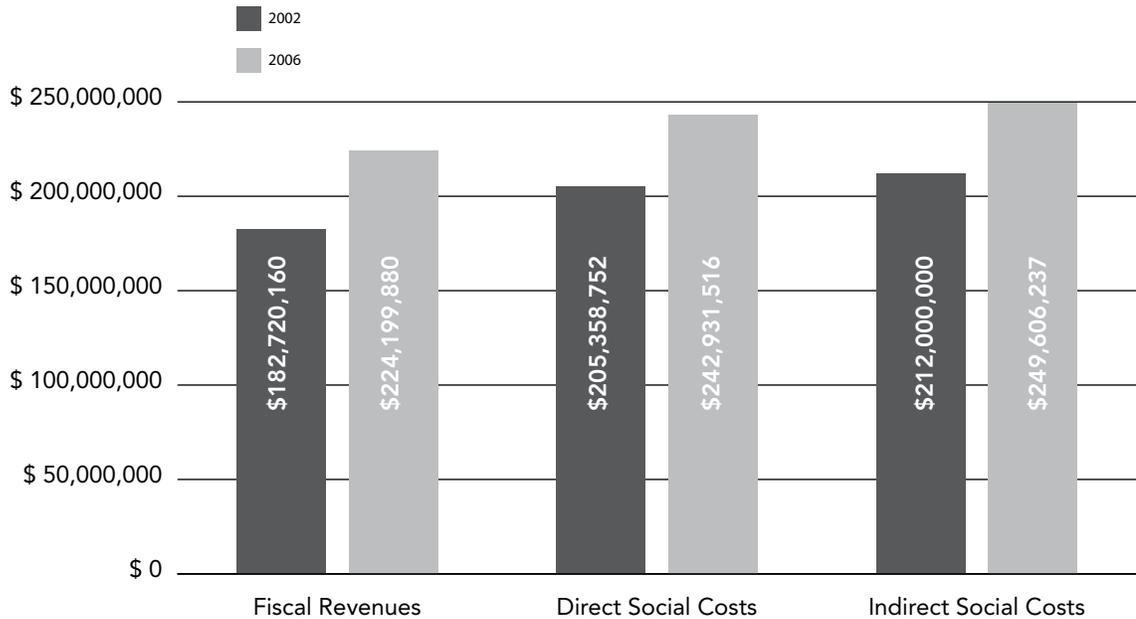
**Source:** Foster 2010.

**Note:** Other costs include fire damage, traffic accident damage, losses in workplace such as employee assistance programs, health promotion, drug testing, administrative costs for transfer payments such as social welfare and other programs, and worker's compensation. The data was updated using the total health costs as the escalator.

<b>Table 5 Social Costs of Alcohol Consumption – Indirect Costs, Nova Scotia, 2002 and 2006</b>		
<b>Indirect Cost</b>	<b>2002</b>	<b>2006</b>
Productivity Loss due to Short- and Long-Term Disability	\$182,500,000	\$214,873,294
Productivity Loss due to Premature Mortality	\$29,500,000	\$34,732,943
<b>Total</b>	<b>\$212,000,000</b>	<b>\$249,606,237</b>

**Source:** Foster 2010.

**Figure 21 Alcohol-Related Revenues and Costs in Nova Scotia, 2002 and 2006**



## Summary

The benefits and costs of alcohol use in Nova Scotia are considerable. In 2006

- fiscal revenue to the provincial government was \$224.2 million
- direct social costs from alcohol consumption were \$242.9 million
- indirect social costs from alcohol were estimated at \$249.6 million

# Glossary of Terms

**Agency stores** are privately-owned local businesses licensed to sell alcohol on behalf of NSLC in addition to their typical products. An agency store must be at least 14 kilometres from an existing NSLC outlet. Most are situated in small rural communities where the NSLC has deemed it not financially feasible to open a retail store.

**Direct costs due to alcohol** are costs which the individual incurs directly. These costs are primarily financed by government. Examples are health-care or law-enforcement costs.

**Hazardous drinking** is a pattern of drinking that increases the risk of harmful consequences for the user. It is measured by the **Alcohol Use Disorders Identification Test (AUDIT)**, a standard screen developed by the World Health Organization (WHO) to assess hazardous alcohol use. **Hazardous drinkers** are defined as those scoring 8 or more on the AUDIT scale.

**Heavy drinking** is defined as the consumption of five or more drinks at a sitting.

**Alcohol-related harms** include harms to physical health, friendships and social life, financial position, home life or marriage, work, studies, or employment opportunities, legal problems, difficulty learning, and housing problems.

**Indirect costs** due to alcohol refer to costs that are less clear and that are borne by society. These are not expenses. eg., the productivity lost due to long-term disability. Definition from <<http://www.ct.gov/ohca/hospitalstudy/HospToday.pdf>>.

**Low-risk drinking guidelines** recommend healthy individuals not exceed two drinks per day, and weekly limits of 14 drinks for men or nine drinks for women.

A **standard drink** refers to one 341 ml or 12 ounce bottle of beer or a glass of draft; one 142 ml or 5 ounce glass of wine; or one straight or mixed drink with one ounce and a half or 43 ml of liquor.

# Appendix

## ICD–9 and ICD–10 codes for disease conditions related to alcohol

### **Malignant neoplasms**

Oropharyngeal cancer: C00 – C14

Oesophageal cancer: C15

Liver cancer: C22

Laryngeal cancer: C32

Breast cancer: C50

Other neoplasms: D00 – D48

### **Diabetes**

Diabetes mellitus: E10 – E14

### **Neuro-psychiatric conditions**

Alcoholic psychoses: 291 F10.0, F10.3 – F10.9

Alcohol dependence syndrome: 303 F10.2

Alcohol abuse: 305 F10.1

Unipolar major depression: 300.4 F32 – F33

Degeneration of nervous system due to alcohol: G31.2

Epilepsy: G40 – G41

Alcoholic polyneuropathy: G62.1

### **Cardiovascular diseases**

Hypertensive disease: I10 – I15

Ischaemic heart disease: I20 – I25

Alcoholic cardiomyopathy: I42.6

Cardiac arrhythmias: I47 – I49

Heart failure and ill-defined complications of heart disease: I50 – I52, I23, I25.0, I97.0, I97.1, I98.1

Cerebrovascular disease: I60 – I69

Ischaemic stroke: I60 – I62

Haemorrhagic stroke: I63 – I66

Oesophageal varices: I85

### **Digestive diseases**

Alcoholic gastritis: K29.2

Cirrhosis of the liver: K70, K74

Cholelithiasis: K80

Acute and chronic pancreatitis: K85, K86.1

Chronic pancreatitis (alcohol induced): K86.0

### **Skin diseases**

Psoriasis: L40

### **Conditions arising during the perinatal period (maternal use)**

Foetal alcohol syndrome (dysmorphic): Q86.0

Excess alcohol blood level: R78.0

### **Unintentional injuries**

Motor vehicle accidents: §

Poisonings: X40 – X49

Accidental poisoning & exposure to alcohol: X45

Falls: W00 – W19

Fires: X00 – X09

Drowning: W65-W74

Other unintentional injuries: † Rest of V & W20 – W64, W75 – W99, X10 – X39, X50 – X59, Y40 -Y86, Y88, Y89

**Intentional injuries**

Self-inflicted injuries: X60 – X84, Y87.0

Intentional self-poisoning by and exposure to: X65

Homicide: X85 – Y09, Y87.1

Other intentional injuries: Y35

**Ethanol and methanol toxicity, undetermined**

Intent: Y15

Low birth weight & short gestation (as defined by the global burden of disease study):

\*P05 – P07

\* Relative risk refers to drinking of mothers

† Rest of V = V-series MINUS §.

§ V021–V029, V031–V039, V041–V049, V092, V093, V123–V129, V133–V139, V143–V149, V194–V196, V203–V209, V213–V219, V223–V229, V233–V239, V243–V249, V253–V259, V263–V269, V273–V279, V283–V289, V294–V299, V304–V309, V314–V319, V324–V329, V334–V339, V344–V349, V354–V359, V364–V369, V374–V379, V384–V389, V394–V399, V404–V409, V414–V419, V424–V429, V434–V439, V444–V449, V454–V459, V464–V469, V474–V479, V484–V489, V494–V499, V504–V509, V514–V519, V524–V529, V534–V539, V544–V549, V554–V559, V564–V569, V574–V579, V584–V589, V594–V599, V604–V609, V614–V619, V624–V629, V634–V639, V644–V649, V654–V659, V664–V669, V674–V679, V684–V689, V694–V699, V704–V709, V714–V719, V724–V729, V734–V739, V744–V749, V754–V759, V764–V769, V774–V779, V784–V789, V794–V799, V803–V805, V811, V821, V830–V833, V840–V843, V850–V853, V860–V863, V870–V878, V892.

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