



Adolescent Substance Use and Related Harms in British Columbia

Duncan Stewart¹
 Kate Vallance²
 Tim Stockwell²
 Bette Reimer²
 Annie Smith¹,
 Dan Reist², & Elizabeth Saewyc¹
 McCreary Centre Society,
 Vancouver, British Columbia,
 Canada¹
 Centre for Addictions Research of
 BC, University of Victoria, British
 Columbia, Canada²



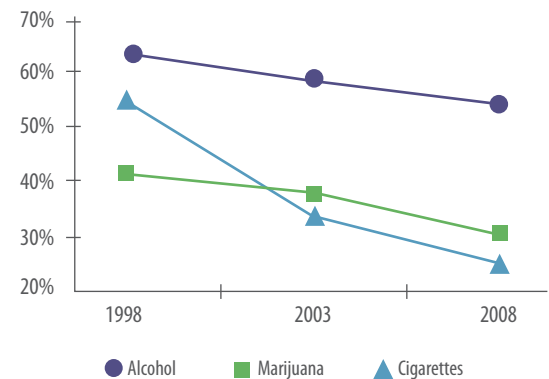
Overview

The 2008 BC Adolescent Health Survey IV (N=29,440) included 50 of BC's 59 school districts and 92% of public school students (grades 7 to 12). There have been encouraging downward trends in usage rates for alcohol, tobacco and marijuana over the past 10 years in BC. However, rates of risky use and related harms remain a significant concern, particularly among older students.

Trends of use among school-aged youth

- Overall, the rates of students ever using alcohol, marijuana and tobacco have declined in BC over the last 10 years. However, alcohol remains the most commonly used substance among youth of all ages.
- The rate of students ever using prescribed drugs without a doctor's consent, and the rate of students using hallucinogens such as ecstasy have increased since 2003.

Figure 1: Trends for students ever trying alcohol, marijuana or cigarettes (Tables A1, A2¹)



Students who have tried substances

- By age 18, 78% of students had tried alcohol, 50% had tried marijuana, and 40% had tried tobacco. Around 15% of students had tried ecstasy, 10% had tried cocaine, and close to 3% had tried crystal meth. Numbers were lower for younger students.
- Females were more likely to have tried smoking cigarettes or taking prescription medications without a doctor's consent. Males were more likely to have tried hallucinogens, heroin and steroids.

¹ - Appendix of detailed tables is available at www.AODmonitoring.ca or www.carbc.ca under the publications link.

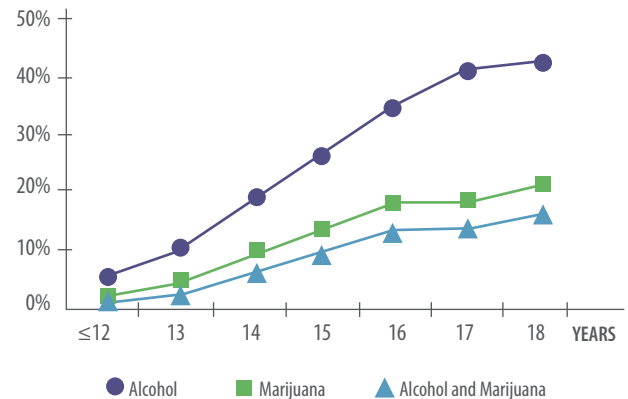
Risky patterns of 'previous Saturday' use

- One quarter of students drank alcohol the Saturday prior to the survey. About 17% had five or more drinks while 9% had between one and four.
- Approximately 16% of 18-year-olds reported using alcohol and marijuana in combination on one occasion compared with just over 1% of students 12-years-old or younger.
- Nearly 5% of students reported having smoked one to two marijuana joints the previous Saturday with close to 3% having smoked five joints or more.

Abstinence and consequences of use

- Nearly 95% of students aged 12 or younger, and around 60% of 18-year-olds either abstained completely or reported using substances with no related consequences.
- Older students were more likely to report problems associated with substance use. While 31% of 18-year-olds reported no problems, 25% had passed out as a result of their substance use, and 31% were unable to remember things they had said or done.

Figure 2: Substance use last Saturday by age for alcohol, marijuana, and both (Tables A3, A4)



Introduction

In this fifth CARBC Statistical Bulletin, data from the McCreary Centre Society's 2008 BC Adolescent Health Survey (AHS) present a detailed snapshot of substance-use patterns and related harms among BC's school-aged youth. Collaboration with the McCreary Centre Society stems from recognition that school- and community-based surveys of adolescent drug use, repeated at regular intervals, can be a key source of tracking long-term population trends in substance use among youth. They can also serve as a strong evidence-based source of prevention strategies and policy-planning recommendations.

The AHS is also linked to a national collaboration with the Canadian Centre on Substance Abuse (CCSA). This collaboration will seek to increase consistency between provincial school surveys and produce an in-depth national report. The data presented here focuses on the prevalence of substance use across the last three Adolescent Health Surveys (1998, 2003, and 2008), as well as patterns of increasing use and related harms as participating students get older. The bulletin also sheds light on overall substance-use trends such as the frequency and types of substances used. In addition, it includes information about riskier substance-use behaviour and negative consequences experienced by some adolescents in BC.

Methods

The Adolescent Health Survey is conducted every five years and examines a broad range of youth behaviours. Four of these surveys have been conducted since 1992. The latest survey was completed by 29,440 students in 1,760 classrooms between February and June of 2008. The AHS IV covered 50 of BC's 59 school districts which contain 92% of all students enrolled in grades 7 through 12 in public schools across the province. Coverage rates were at or near 100% in all Health Service Delivery Areas (HSDA), except for Northeast HSDA and Fraser Valley HSDA.

McCreary Centre Society researchers conducted analyses on the 2003 AHS to increase the ability for results' comparison across other surveys both provincially and nationally. Additional questions regarding students' substance use 'last Saturday' were also incorporated into the 2008 survey to make it easier to explore students' recent weekend use patterns. Another element of the 'last Saturday' question inquired specifically about the number of marijuana joints smoked at one time, as higher doses on a single occasion can be a strong predictor of acute harm.

Statistics Canada weighted the data to ensure it was representative of youth in grades 7 through 12 in every region of the province. All comparisons and associations reported in this study have been tested and are statistically significant at $p < .05$. However, the graphs and charts show frequencies that are not necessarily statistically significant at every point.

Questions about alcohol, tobacco, marijuana and other drug use are of special relevance to this bulletin. For students who indicated they have used these substances, ensuing questions inquired about frequency of use and related consequences. Students who reported that they have not used drugs, alcohol or tobacco were directed to skip these questions. A detailed methodology fact sheet for the survey is available at <http://www.mcs.bc.ca>. It discusses the source and rationale for the questions used in the AHS IV.

Findings

This bulletin and the Appendix with detailed tables are both available for download at www.AODmonitoring.ca or www.carbc.ca under the publications link and on the McCreary Centre Society website at www.mcs.bc.ca. The McCreary Centre Society's 2008 publication, *A Picture of Health: Highlights from the 2008 BC Adolescent Health Survey*, is also available for download at www.mcs.bc.ca.

Trends of Substance Use over Time

Alcohol emerged as the most commonly tried substance by BC youth at all ages between 1998 and 2008. However, overall rates of students ever trying alcohol, marijuana and tobacco in BC have been steadily declining over the last 10 years. The AHS IV showed that fewer young people had tried alcohol at some point than in earlier surveys (**Figure 1**). The percentage of BC students who had smoked cigarettes in 2008 dropped by half in comparison to a decade earlier, with more students having tried marijuana (30%) than cigarettes (26%) in 2008. While marijuana remains the second most commonly used substance after alcohol for students aged 14 and over, the number of students who had tried marijuana decreased from 40% in 1998 to 30% in 2008 (**Figure 2**). Approximately 26% of students had tried smoking cigarettes (compared to 34% in 2003 and 56% in 1998).

There are similar trends over the last 10 years for students' use of tobacco, alcohol and marijuana during the month previous to the survey (**Table A2**). Although the rate of marijuana use in the 30 days prior to the survey stayed the same between 1998 and 2003 at 21%, it dropped to 17% in 2008. The decrease in students who used alcohol in the past month was more consistent, from 43% in 1998 to 40% in 2003, and then 37% for 2008. Although the rate of students who smoked in the same time period dropped substantially from 1998 to 2003 (from 25% down to 13%), there was no significant difference in 2008 (12%).

Significant changes over time have also occurred in adolescents' use of illicit drugs. As shown in **Table 1**, in 2008 fewer students reported ever having tried mushrooms, cocaine and amphetamines (including crystal meth) as compared to 2003. However, there were increases in the number of students who had ever used hallucinogens (including ecstasy), steroids and prescription pills without a doctor's consent. **Table 1** also shows small but significant rises in the percentages of students who had ever tried heroin or injected drugs.

Table 1: Changes in "ever trying" substances since 2003

	2003	2008	CHANGE
Alcohol	58%	54%	↓
Marijuana	37%	30%	↓
Cigarettes	34%	26%	↓
Prescription pills	9%	15%	↑
Hallucinogens*	7%	9%	↑
Mushrooms	13%	8%	↓
Cocaine	5%	4%	↓
Inhalants	4%	4%	--
Amphetamines**	4%	2%	↓
Steroids	1%	2%	↑
Heroin	<1%	1%	↑
Injected an illegal drug	<1%	1%	↑

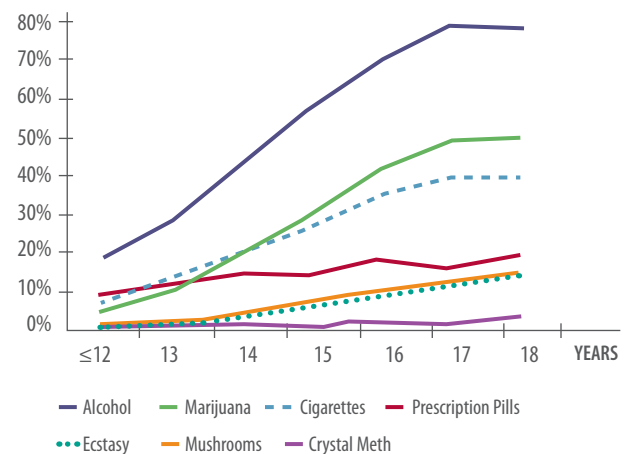
Note: ↑ indicates a statistically significant increase, and ↓ indicates a decrease from 2003.

* Includes ecstasy **Includes crystal meth

Students Who Have Ever Tried Substances

When considering students who have ever tried substances, rates increase with age. Among students aged 12 or younger, 19% have tried alcohol, 6% have tried marijuana and 8% have tried tobacco. In contrast, by age 18, 78% of students have tried alcohol, 50% have tried marijuana and 40% of students have tried tobacco (**Figure 3**). Patterns for use of ecstasy and mushrooms are similar to each other - approximately 15% of students have tried these substances by age 18. Inhalants are the fifth most commonly reported substance for students 13 or younger, with approximately 3% of students ever trying. However, by the time students are 18 years old, fewer than 5% have ever tried inhalants and less than 3% have tried crystal meth.

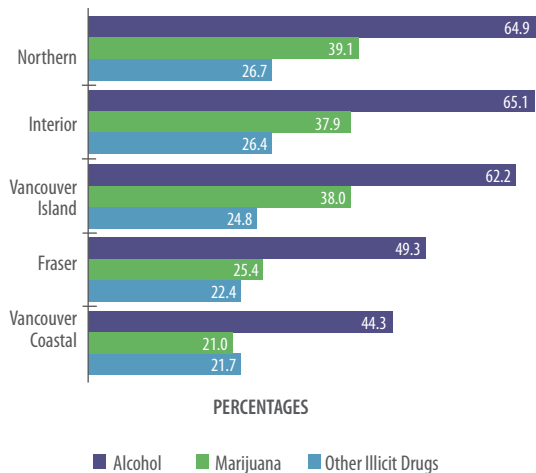
Figure 3: Students ever trying alcohol or drugs by age (Tables A5, A6)



Female students were more likely than males to report ever having smoked cigarettes (27% vs. 25%). The same is true for taking prescription medication without a doctor’s consent (18% vs. 13%). Male students had a higher likelihood of having used mushrooms (9% vs. 7%), hallucinogens (6% vs. 4%), and steroids (2% vs. 1%). Males were also more likely than females to have ever used street drugs such as heroin (2% vs. 1%) and crystal meth (2% vs. 1%), and to report having injected drugs (2% vs. 1%). There were no significant gender differences on having ever used the two most common substances, alcohol and marijuana (Table A6).

As Figure 4 illustrates, students in Northern, Interior, and Vancouver Island health authorities were more likely to have ever used alcohol, marijuana, or other illicit drugs such as hallucinogens or mushrooms compared to students in Vancouver Coastal and Fraser health authorities. There were no other regional differences in having ever used other illicit substances, including crystal meth.

Figure 4: Students ever trying alcohol, marijuana, or other drugs by health authority (Table A7)



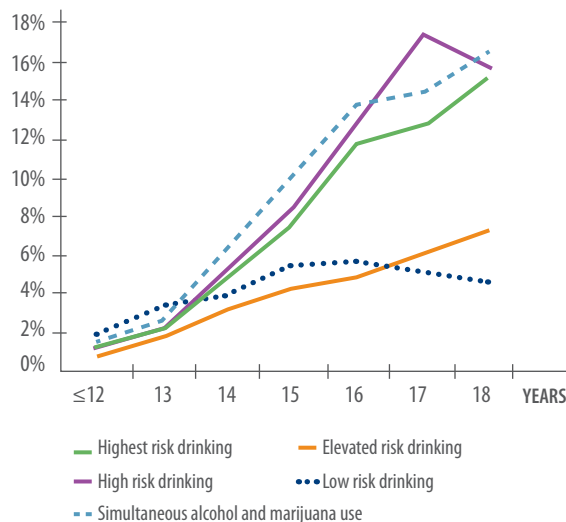
Risky Use of Alcohol—with and without Marijuana

One quarter of all students in BC drank alcohol the Saturday prior to filling out the survey. These students were divided into low-risk drinkers (one or two drinks), elevated-risk drinkers (three or four drinks), high-risk drinkers (between five and 10 drinks) and the highest-risk drinkers (more than 10 drinks). About 17% of students fell within the two highest-risk categories of

drinking last Saturday while just fewer than 9% reported low- or elevated-risk drinking the previous Saturday.

As Figure 5 illustrates, alcohol consumption among older students typically fell within the high-risk drinking category. Around 31% of 18-year-olds had five or more drinks last Saturday, compared with nearly 5% who had one or two drinks. Although males and females were equally likely to have been drinking alcohol last Saturday, females were more likely to engage in drinking that fell into the elevated-risk category (5% vs. 3%). Males were more likely to report the highest-risk type of drinking (9% vs. 7%) (Table A9). It is important to note that even though females drank at lower levels than males, according to low-risk drinking guidelines, intoxication can occur for females after fewer drinks.

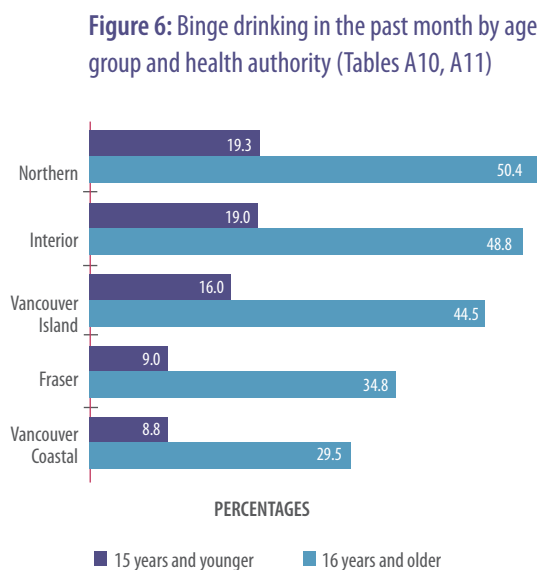
Figure 5: Rates of risky drinking last Saturday by age (Tables A8, A9)



The likelihood of students mixing substances such as alcohol and marijuana was also shown to increase as they got older. Figure 5 indicates that just over 16% of 18-year-olds reported mixing alcohol with marijuana the previous Saturday compared to just over 1% of students 12 or younger reporting this type of substance use. Overall, male students were more likely than females to mix alcohol with marijuana use the Saturday before (10% vs. 8%) (Table A9).

“Binge drinking” (defined by the AHS as having five or more drinks of alcohol within a couple of hours) was shown to be fairly common among older students on at least one occasion in the past month. About 39% of students aged 16 and older reported binge drinking at least once during the past month compared to only 13% of students aged 15 or younger. Rates of binge drinking in the past month for male and female students aged 15 or younger were significantly different (11.8% males vs. 13.4% females). There was also a significant gender difference at age 16 and older (41% vs. 37%), however, males were more likely to binge drink than females in the older age group (Table A11). Overall, rates of binge drinking during the past month have decreased but the proportion has remained about the same.

Figure 6 illustrates some regional variation in binge drinking among BC students. The Northern and Interior health authorities reported the highest rates of binge drinking in the past month for youth of all ages, with Vancouver Island Health Authority fairly close behind. Vancouver Coastal and Fraser health authorities reported the lowest levels of binge drinking in the past month for all ages. The difference in rates of binge drinking among younger and older age groups across the province is also highlighted in Figure 6.

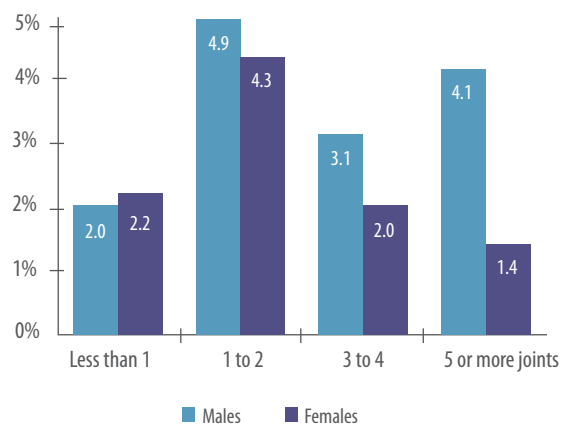


Risky Marijuana Use

Marijuana is the second most commonly used substance among adolescents in BC. Nearly 5% of all students reported smoking one to two joints the previous Saturday with close to 3% having smoked five joints or more. Similar to alcohol, the students’ use of marijuana increased with age. Less than 2% of students age 12 or younger had smoked marijuana the previous Saturday and just over 1% had smoked one joint or more. Among 18 year olds, 5% of students reported smoking five or more joints the previous Saturday (Table A13).

Figure 7 highlights the gender variation for risky marijuana use the previous Saturday. Male students were more than twice as likely as females to have smoked five or more joints the Saturday before (4% vs. 1%). In addition to fairly significant gender variation for this level of consumption, there were also differences between males in younger and older age groups. Nearly 7% of male students aged 16 and older reported smoking five or more joints the previous Saturday while only 2% of males 15 or younger reported this level of use (Table A14).

Figure 7: Rates of risky marijuana use last Saturday by gender (Tables A12-A15)

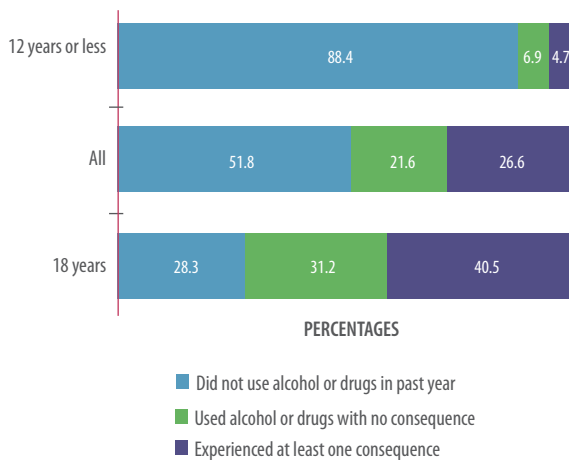


Within the health authorities, rates of students aged 16 and older who smoked five or more joints last Saturday were higher in Northern (8%), Interior (5%), and Vancouver Island (5%) health authorities while lower rates were reported in Vancouver Coastal and Fraser health authorities at 3% each (Table A15).

Consequences of Substance Use

Because older teens are more likely to use substances, a larger percentage also reported negative consequences from substance use. As **Figure 8** indicates, around 40% of 18-year-old students had experienced at least one related consequence while less than 5% of students aged 12 or younger reported any harms related to substance use in the past year. Among 18-year-olds, the consequences reported most frequently were passing out (25%) or being unable to remember things they had done (31%). Overall, an encouraging number of students in BC also reported little or no substance use in the past year.

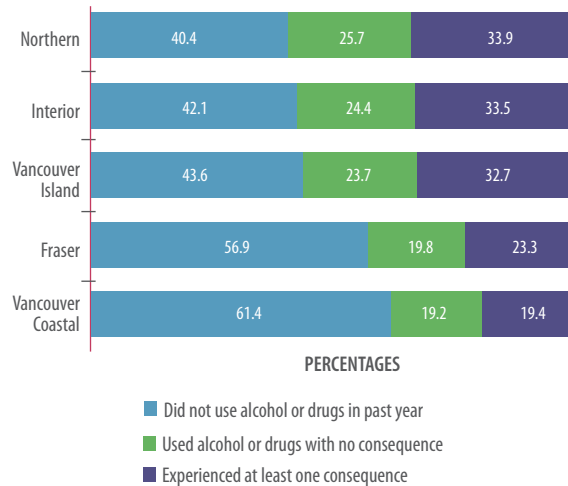
Figure 8: Consequences of substance use by age (Tables A16, A17)



Some gender variation is evident in the type of consequences male and female students experienced as a result of substance use in the year prior to the survey. Female students were more likely to report passing out (17% vs. 14%), being unable to remember their actions (23% vs. 17%) or arguing with family members (11% vs. 6%). Males were more likely to experience violence from physical fights (6% vs. 4%), damage property (7% vs. 4%), or have problems with the police (6% vs. 4%). There were no significant gender differences for other consequences such as getting into car accidents, getting treatment for alcohol or drug abuse, overdosing, or having sex when not wanting to. There was no significant variation in the number of males and females who did not use substances (53% vs. 51%), or in those who used substances and experienced no related consequences (22% vs. 21%) (**Table A17**).

In general, consequences of drinking and using substances were higher in the same health authorities that reported higher rates of substance use in the past year. As **Figure 9** shows, students in Northern, Interior, and Vancouver Island health authorities were more likely to report one or more consequences as a result of substance use. Fraser and Vancouver Coastal health authorities reported slightly lower rates of substance use with no related consequences, as well as higher numbers of students who abstained than the other three health authorities.

Figure 9: Consequences of substance use by health authority (Table A18)



Conclusions

There have been some encouraging downward trends in adolescent substance-use over the last 10 years. The 2008 BC AHS indicates lower prevalence of alcohol, tobacco and marijuana use compared with previous years. However, rates of risky substance-use and related harms within this population are still fairly widespread and remain a significant concern in the province. Survey results show that cigarette smoking and the use of alcohol and marijuana have declined since 1998. The same is true for the use of some drugs such as cocaine, amphetamines and mushrooms. The reduction in alcohol consumption is encouraging, though surprising, given evidence of an overall increase in per capita alcohol consumption in BC throughout most of this period (Office of the BC Provincial Health Officer, 2008). However, there were also increases in the use of some other psychoactive drugs. The most notable of these increases is the use of prescription drugs without a

doctor's consent (from 9% to 15%). Another significant trend since 2003 shows that students have been more likely in recent years to smoke marijuana than cigarettes. There were also small but significant increases in reports of the use of hallucinogens and some injectable drugs. Rates of amphetamine use including methamphetamine (crystal meth) declined.

While there was evidence of heavy and risky use of alcohol and marijuana, which increases with students' age, it is important to stress that a majority of school-age adolescents in BC are abstaining from substance use, or are using drugs with no associated problems. It is also noteworthy that even though when the students reported drinking alcohol they were most likely to do so at a risky or "binge" level, the proportion of drinkers who binged in BC has remained fairly constant over the past 10 years.

For the first time the AHS IV included questions about quantities of marijuana used on a recent occasion (the previous Saturday)* to complement existing questions about combined use with alcohol. While only a minority of respondents engaged in these behaviours, the proportion using higher quantities of marijuana and mixing marijuana with alcohol increased with students' age. Since the risky use of substances such as alcohol and marijuana among school-aged youth can be predictive of harms related to personal safety, mental and physical health or engagement with community and family, we recommend that preventive interventions focus on delaying use of these substances and on emphasizing the special risks of using high quantities of alcohol and marijuana, both separately and in combination.

Acknowledgments

We are indebted to BC Mental Health and Addiction Services (BCMHAS), Health Canada, the BC Mental Health and Addictions Research Network, CIHR, Vancouver Island Health Authority, Vancouver Coastal Health, the BC Ministry of Health, Fraser Health authority and the BC Ministry of Public Safety and Solicitor General for their financial support of the BC Alcohol and Other Drug Monitoring Project. Funding for the BC Adolescent Health Survey was provided by the Province of British Columbia, Child Health BC, CIHR and CARBC. The opinions included here do not necessarily represent the views of Health Canada, BC Mental Health and Addiction Services or the other funding bodies.

* It is recognized that the proportions based on 'last Saturday' use only capture some of those students who have recently used.

References

- Provincial Health Officer. (2008). *Public health approach to alcohol policy: An updated report from the Provincial Health Officer*. Victoria, BC: Ministry of Health Planning. Retrieved June 25, 2009, from <http://www.health.gov.bc.ca/library/publications/year/2008/alcoholpolicyreview.pdf>.
- Saewyc, E., Nicholson, D., Peled, M. (2007). *Large Scale Populations Surveys: Towards improved measurement of patterns of substance use in provincial school surveys in "Mapping Substance Use in BC and Canada: A report of the BC Pilot Alcohol and Other Drug Monitoring Project."* Victoria, British Columbia: CARBC, University of Victoria.
- Smith, A., Stewart D., Peled, M., Poon, C., Saewyc, E. and the McCreary Centre Society (2009). *A Picture of Health: Highlights from the 2008 BC Adolescent Health Survey*. Vancouver, BC: McCreary Centre Society.

Preferred Citation

- Stewart, D., Vallance, K., Stockwell, T., Reimer, B., Smith, A., Reist, D., & Saewyc, E. (2009). *Adolescent Substance Use and Related Harms in BC*. (CARBC and McCreary Centre Society Statistical Bulletin). Victoria, British Columbia: University of Victoria.



University
of Victoria
Centre for
Addictions
Research of BC