



School-based and school-linked prevention of substance use problems

A knowledge summary

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The opinions expressed in this report are those of the authors and do not necessarily represent those of their organizations, the Canadian Association for School Health or Health Canada.

An Ongoing Dialogue

The Canadian Association for School Health aims to collaborate with others to keep this Knowledge Summary current. To that end, we have created a wiki-based dialogue among researchers, practitioners, officials and policy-makers at:
<http://schoolssubstanceabuseprevention.wetpaint.com/>

In keeping with the goal to stimulate international discussion of the research evidence, we have combined this summary with similar documents from other sources using the common features of school-based health promotion, social development, safety/crime prevention and learning described by the International School Health Network.

Using funding from this Canadian project and other sources, we have started the process of identifying experts, practitioners and others who are willing to create and maintain specific pages within that wiki so as to elaborate upon and illustrate the general knowledge described herein. If you would like to participate in that dialogue, please contact
dmccall@internationalschoolhealth.org

We would be very pleased to hear from readers on any matters relating to the findings of the Summary. Simply go to the wiki web site noted immediately above and use the tools provided to comment upon this material or related content from similar sources.

Executive Summary

Substance abuse and learning

Alcohol and tobacco and, to a lesser extent, illicit drug use are responsible for enormous costs in Canada due to death, disease and disability. The first use of alcohol, cannabis, tobacco and other drugs usually begins during adolescence, so attention to adolescent substance use by schools and others is seen as an important opportunity to avoid future costs to society. While the role of schools in addressing broad societal problems such as substance abuse may be debated, the need for schools to play a role on this issue becomes clearer when it is understood that student substance use can affect learning, and that prevention activity can improve student performance.

Although the relationship is complex, it is clear that substance involvement and academic performance are linked. Substance abuse can hamper a young person's ability to master key developmental tasks (cognitive, emotional and social). Students with positive teacher, learning and social connectedness fare best in terms of later mental health and involvement in health risk behaviours, and are more likely to have good educational outcomes.

While a significant proportion of Canadian middle school students do not use any substance, the use of alcohol becomes normative in the high school years and cannabis and tobacco use becomes common. Regarding alcohol, students in Grades 7 and 8 may be more accurately termed "not-yet-users" rather than "non-users". With increasing age, the rate of hazardous patterns of use also increases, and use of tobacco often goes hand in hand with these patterns.

Widespread use of alcohol and other substances by young people is not surprising given their developmental stage (e.g. their need to experiment, take risks, and gain autonomy) and various messages they receive. These universal factors are in many ways limited to the adolescent period and call for universal programming to help students navigate this period and to keep safe.

Some young people clearly experience a greater accumulation of risk factors. These usually arise early in life (e.g. personality, family) and interact with early school adjustment pathways. It is these young people that appear at particular risk for early use of legal substances, harmful use of illicit substances and for problems that endure beyond adolescence. Targeted programming is necessary to shift the developmental trajectories of these higher risk children and youth.

Effective programs

A range of universal and targeted programs has been evaluated and while there is no silver bullet, a number of programs or initiatives have been found to be effective. Increasingly researchers are measuring the benefits of school prevention programs against their costs, and a number are indeed showing savings to society.

Elementary level

Addressing early use (age 12/13) of tobacco, alcohol and cannabis needs to be a priority for school prevention programs. Because early use is often due to factors evident in earlier childhood, universal and targeted programming prior to middle school is important. Until grades 5 or 6, elementary school programming need not be substance abuse-specific. Programs aiming to develop self-management skills among either a universal or targeted population by providing guidance to teachers, parents or both are important. Family skills programs delivered to universal or higher risk families are effective in improving relationship skills and have been shown to prevent later youth substance use. Comprehensive programs that focus on improving parenting skills and modifying teaching practices with the general student body or higher risk children have been shown to help students learn and to prevent later problem behaviours, including hazardous substance use.

Middle / High school

Substance-specific education is particularly important at the middle school level and has been shown to be modestly effective. The model best supported by research is the Social Influences Model which helps students gain a greater awareness of media and social influences, and develop skills to analyze and minimize their impact. Programs shown to be effective invariably emphasize student-to-student (rather than student-to-teacher) interactivity, so it is critically important that teachers or leaders are comfortable with this approach. They need to be able to create a non-judgmental atmosphere and ensure that students acquire accurate information that is free of moralizing.

In many Canadian communities and school populations, the percentage of students using alcohol hazardously is disturbingly high. Because hazardous alcohol or other substance use can result in a range of problems, including unwanted sexual activity, injury, overdose and death, it is important to consider programming that explicitly helps students avoid these patterns of use and resulting harms. While few programs with these aims have been evaluated, those that have been show promising results.

At this level, comprehensive programs that combine attention to substance education with attention to the school environment are showing promise in reducing substance use, mental health problems, early sexual activity, and antisocial behaviour.

Of course, many of the factors contributing to student substance use problems fall outside the purview of the school, so while it is more laborious, schools should consider linking and integrating their programs with community programs; doing so can address a broader range of individual and environmental factors and may delay use of alcohol among adolescents more so than either initiative on their own.

For students at risk, including Aboriginal students, Canadian research is showing brief interventions (fewer than 4 sessions) to hold promise in promoting abstinence and reduced hazardous drinking and alcohol problems.

School policies are important in setting norms and expectations for all students. As challenging as it may be, school policies need to try to help higher-risk students maintain links with school and with 'non-deviant' peers. Suspension often has the effect of increasing antisocial behaviour.

Implementation in Canadian schools

The research shows that school-based and linked prevention programs can delay use of substances and can reduce hazardous use and harms. However, this research has been conducted in controlled settings, so it is fair to question whether these effects can be expected in the real-world circumstances in which Canadian teachers, counsellors and administrators work. In our schools there are a number of variables that affect how well a new initiative will be implemented, including system-level factors (e.g. school readiness, leadership, stakeholder support), teacher-related factors (e.g. self-efficacy, burnout, perception of the program's acceptability, training) and qualities of the program itself (e.g. preparation time, complexity). Viewed in this way, training of everyone concerned (i.e. teachers, counsellors, police and addiction and mental health professionals) should be seen as vitally important – but not sufficient. Substance abuse prevention in schools will be most effectively enhanced through a broad workforce development approach that accounts for and addresses the range of system and classroom level factors affecting practice.

Virtually all of the initiatives shown to be effective in this knowledge summary require precious resources and schools are justifiably hesitant to add another "project" to an often daunting workload. Rather, it may be more fruitful to integrate substance abuse prevention and health promotion initiatives into the core aims of schools by focusing on factors that affect both learning and well-being. This shift from program cooperation toward program integration calls for educators and substance abuse/health promotion professionals to work together to identify shared values, goals, and strategies and to develop joint agendas to improve the range of student outcomes.

I. Introduction

The aim of this Knowledge Summary is to provide evidence-based guidance on preventing student substance use problems through interventions that are based in, or linked to schools. The Summary itself and briefs drawn from it are intended to support Canadian policy makers and practitioners in the education and health fields on this issue. While differing in scope the Summary helps update Health Canada's *Preventing Substance Use Problems among Young People: A Compendium of Best Practices (2001)*.

The Knowledge Summary is a publication of the Canadian Association for School Health (CASH). The mission of CASH is to promote a comprehensive approach to addressing the range of school health issues facing Canadian students. Comprehensive in this sense means combining curriculum with attention to physical and social environments and services for students experiencing health problems. A key belief is that a broad approach brings with it efficiencies by addressing root factors shared by a number of health and learning issues. The Association recognizes that the core business of schooling is learning, but contends that paying attention to student health pays off in terms of improved learning capacity.

Method: The structure of the Knowledge Summary follows questions posed by the Canadian School Health Research Network to help clarify the level of evidence surrounding various student health issues. The range of topics covered in the Summary is quite broad and the intended audience is diverse. Every attempt has been made to summarize the findings with accuracy while using language and terms that can be broadly understood. The Summary will note where the evidence is lacking or conflicting. Where the weight of evidence is clear, a good practice statement is presented.

A primary consideration in determining a methodology was the limited time and resources available for identifying, accessing, and reviewing a relatively broad range of literature. A number of reviews of the literature have been undertaken to assess the evidence base for school-based substance abuse prevention. English language reviews found in peer reviewed journals or published by federal governments were accepted for this review. Primary studies published since most of the reviews (2003) were also searched and reviewed. Several of the topics of the knowledge summary have not been reviewed so rigorous primary studies or credible discussions were sought and reviewed to provide guidance on those questions.

To be included in this review, reviews and primary studies must have:

- included interventions that are based in schools (Gr. 1-12) or linked to schools;
- measured the effect of interventions on student substance use or adolescent problem behaviours more generally;
- included or used only experimental or quasi-experimental study designs;
- been published since 1997 in the case of reviews, and 2003 in the case of primary studies (at times, older studies were cited in this review to provide context to discussion);
- in the case of reviews, clearly articulated the aim of the review, an intent to search at least the English-language peer-reviewed literature, and identified databases and years searched.

The following databases were searched for English language journal articles: ERIC; PubMed; Medline; PsycINFO; ETOH Archival Database (Alcohol and Alcohol Problems Science); and Cochrane Library. Websites from Australia, New Zealand, United Kingdom, United States, and Canada, as well as the United Nations and World Health Organization were searched for grey literature (e.g. government reports). Canadian studies were of particular interest.

Development of the topic area "Cultural competence and Aboriginal students" originated with recognition of the need for an analysis of larger systems and structures in society that impact the health of Aboriginal youth. This discussion draws from the empirical literature and the lived experiences of Aboriginal people.

II. Impact of substance use on health and learning

Worldwide, alcohol, tobacco and illicit drug use is responsible for a very significant proportion of death, disease and disability. It has been estimated that 4% of disease and disability is due to alcohol and tobacco each, and 0.8% to illicit drug use.¹ In Canada, it has been estimated that tobacco, alcohol and illegal drug use contribute to 21% of all deaths, 25% of potential years of life lost, and 19% of days spent in hospital.² The various costs of substance abuse to Canadians were estimated to total \$39 million in 2002.³ Tobacco use looms largest as a cause of ill-health, but among young people, alcohol represents huge costs due to its role in injuries and accidents.

The first use of alcohol, cannabis, tobacco and other drugs usually begins during adolescence, so attention to adolescent substance use by schools and others is seen as an important opportunity to avoid future costs to society. But some of the impacts of student substance use are immediate and in themselves provide a clear rationale for schools to act on the issue. Many of these impacts are obvious (e.g. vehicle crashes, overdoses), while some may be less so. Young people have not reached full maturity, physically, psychologically or socially, and substance use may interrupt those crucial developmental processes. It is difficult to measure lost potential, but substance use may hamper a young person's ability to master key developmental tasks and make it difficult to reach full potential.⁴

It is clear that substance involvement and academic performance are linked but the relationship is complex and it is generally agreed that the causal direction can take different forms. That is, substance use can lead to poor school performance and vice versa, and it is likely that in some cases, both poor school performance and early or heavy substance use are due to prior risk factors (for related discussion See Section VI, Health and Learning Benefits of Preventing Student Substance Use Problems).^{5 6 7}

Regardless, a student who is intoxicated or hung over during the school day experiences impaired learning during those periods, and a pattern of ongoing heavy, frequent substance use will interfere with academic performance. Heavy ongoing use of commonly used substances can interfere with adolescent brain development and cause cognitive impairment (see alcohol and cannabis below). Student substance use is often associated with other emotional, behavioural, or social difficulties which can cause disruptive behaviour patterns in the classroom that have a negative effect on the social and academic environment for other students.^{8 9}

To summarize impacts of the three most commonly used substances:

Alcohol: Alcohol intoxication can cause a range of immediate physical and social harms to the individual and to others. Among the harms at least occasionally experienced by Canadian students are: injuring themselves or others, damaging property, having unplanned sex, being pushed, shoved, or physically assaulted, having a disagreement with family or friends, driving impaired, and having trouble with the police. Alcohol intoxication is associated with aggression and violence, especially among young males.¹⁰ Also, alcohol can cause death by overdose. Some but not all studies suggest that frequent alcohol use at an early age (around age 15) increases the likelihood of becoming engaged with delinquency and crime in early adulthood. The dependence rate of those who initiate alcohol use by age 14 is four times as high as those who start by age 20.¹¹ Alcohol dependence among adolescents can cause cognitive deficits, anxiety or depression. Loxley and colleagues report that findings relevant to education are not conclusive with one study showing binge drinking to affect high school retention while others found attitudes to school were not linked to frequent alcohol use. However, chronic heavy exposure of the adolescent brain to alcohol can interfere with brain development and cause memory loss and other cognitive deficits.¹²

Cannabis: Regular, prolonged cannabis use is associated with a range of adverse physical health effects, including cognitive impairment and respiratory illnesses. Several, but not all, recent

studies have found a relationship between adolescent cannabis use and later mental health problems (depression, personality disorder; psychotic symptoms). Adolescent cannabis use is linked to various social problems in late adolescence and early adulthood. For example, in one longitudinal study, a significant relationship was found between cannabis use at age 15 to 16 years and early school drop out, unemployment, violent offending, police contact and property offending within two or three years.¹³ Early adolescent cannabis use has been consistently shown to be associated with poor school performance and leaving school early.¹⁴

Tobacco: Tobacco use has immediate effects in children and adolescents that can be overlooked due to concerns with long-term consequences. Early use of tobacco by school students can bring about respiratory problems within weeks of beginning to smoke. Adolescent smokers cough more than non-smokers of the same age. They are more likely to develop respiratory tract infections than non-smokers, are more likely to experience shortness of breath with exertion, and have more asthma and allergy symptoms.¹⁵ Early frequent use has been shown to lead to respiratory and other health problems by the early 20s. Most studies that have followed young smokers have found that early tobacco use is also linked to mental health problems by early adulthood, and the possibility that youth involvement in tobacco use leads to social problems has been suggested from one study. A recent analysis of young people age 15-19 from across Canada found that those who smoke tobacco are more likely to use alcohol and cannabis in hazardous ways and more likely to experience various harms from their substance use than non-smokers.¹⁶

III. The extent of substance use and substance use problems

Substance use patterns of students in Canada are determined by many factors and are constantly evolving. It is important that school-based and school-linked initiatives base their activity as fully as possible on data that accurately describe current patterns of use. Knowing the average age at first use, the proportion of users to non-users, gender, age and cultural differences, the point of peak use and the extent of hazardous use and consequent harms can help greatly in determining the aims, timing and key messages for a school district. This section reviews the most recent national and provincial surveys of student substance use.ⁱ

Student surveys typically give an indication of the substance use patterns of youth in grades between 7 and 12. The surveys do not generally include students in private schools, in institutions, those being home schooled, those absent from school or school drop-outs.ⁱⁱ This is noteworthy because youth who have left school or are at risk of doing so are at higher risk for substance use problems.¹⁷

A. Recent trends in use

Overall long-term trend (1977-2007)

Ontario's Centre for Addiction and Mental Health has sponsored the longest ongoing Canadian survey of student substance use, the Ontario Student Drug Use Survey (OSDUS), and provides an indication of long-term trends. This series of surveys shows that, after peaking in 1979, the percentage of students using various substances – legal and illegal – declined steadily until the early 1990s. During the 1990s the percentage of students using these substances generally increased, and have since stabilized or declined.¹⁸

Shorter-term trends (1997-2007)

Although there isn't yet a national student survey, various national and provincial surveys occasionally update findings from earlier surveys, allowing for reporting of shorter term trends.

Rates of use:

Through most of these years the most commonly used substances in Canadian jurisdictions were alcohol, tobacco and cannabis. During this period, cannabis replaced tobacco as the second most commonly used substance, and in the most recent Ontario survey, student use of opioid pain relief pillsⁱⁱⁱ (e.g. Percocet, Demerol, Tylenol #3, etc) without a prescription was more common than tobacco use.

According to the most recent available evidence, rates of past-year alcohol use have been fairly stable. Rates of cannabis use have also been fairly stable, although showing a decline in Atlantic Canada from 2002. The most dramatic change is the decline in the percentage of students using tobacco reported by all surveys during this decade.

It appears that rates of use of other substances have been generally stable or have declined. For example, the 2007 OSDUS reports that rates of use for 14 of 23 substances show a decline from

ⁱ Reviewed were: recent student surveys from the Atlantic Provinces (2007), Ontario (2007), Manitoba (2004), Alberta (2005), and British Columbia (2004); the national Youth Smoking Survey 2002-2004; as well as Canada's contribution to the International Health Behaviours of School Age Children study (Boyce, 2004).

ⁱⁱ Students with more days absent from school are more likely to be having substance use issues. In fact, their absence may be the result of suspension for alcohol or other drug use, or their inability to attend school due to excessive use the previous evening. This may lead to student surveys underreporting the prevalence and severity of substance use patterns (Patton, Wiebe, and Begin, 2003).

ⁱⁱⁱ 2007 was the first year students in Ontario were asked about these substances.

1999. It is important to bear in mind that, in spite of some declines from the late 1990s (during which rates of use were at or near historic highs), rates remain relatively high.

Age at first use:

Early first use of substances is a major risk factor for later substance use problems.¹⁹ From information limited to Ontario, the age at which young people begin to use the most common substances – tobacco, alcohol and cannabis – has gone up (i.e. they're starting at an older age). For example, in 2007, 31% of 7th-graders used alcohol by grade 6, compared to 42% in 2003 and 50% in 1981.²⁰

Hazardous patterns:

The percentage of students engaging in hazardous behaviours, such as drinking to intoxication, drinking under the influence, or being a passenger in a car driven by someone under the influence remains a serious concern because of the immediate harms linked with these behaviours.^{21 22}

Attitudes:

Attitudes toward various substances constantly shift and are important to monitor because a shift in disapproval or perceived level of risk for a substance has been found to precede a shift in use patterns for that substance.²³ Generally, more students disapprove or see a risk of harm in experimenting with various substances (i.e. ecstasy, LSD, smoking 1 or 2 cigarettes a day, trying cannabis) than was the case in the late 1990s.²⁴

B. Current picture (Gr. 7-12)

Although rates of use vary from region to region, alcohol and cannabis are the most popular substances among young people in this country. Alcohol is by far the most commonly used psychoactive substance among Canadian students. Cannabis (marijuana, hash, hash oil) is by far the most used illegal substance world-wide, and Canadian students have rates of use among the highest in the world.²⁵ More Canadian students have used cannabis in the past year than have used tobacco (more than a puff), a shift which began in the late 1990s due to a dramatic decline in tobacco use. In Ontario, non-medical use of opioid medicines has been found to be common among students.

Non-use:

About 25-40% of Canadian high school students (i.e., grade 7-12) used no drug (including alcohol or tobacco) in the past year, with younger students and girls being more likely to be non-users.²⁶
²⁷

Most commonly used substances:

Half to two-thirds of junior and senior high students are current users of alcohol. A significant minority (around 40%) limit their use to special occasions. Approximately one quarter to one third of students report past year cannabis use, depending on the jurisdiction. In Ontario, 21% of students report use of opioid pain relief pills (e.g. Percocet, Demerol, Tylenol #3, etc) without a prescription, with girls more likely to do so. Past-year cigarette use (more than a few puffs) by junior and senior high school students ranges from 12% to 16% in the most recent surveys.^{28 29}

Moderately common substances:

Rates of use for drugs other than alcohol, cannabis and tobacco vary by region, but the next most commonly used drugs appear to be hallucinogens (e.g., psilocybin, mescaline and to a lesser extent, LSD) and amphetamines non-medically, with between 5-15% of students reporting past year use.

Less common substances:

Typically less than 5% of junior/senior high school students report use of ecstasy, cocaine, heroin, PCP and non-medical use of other medications, although ecstasy use increased to 7% in Nova Scotia and Newfoundland and Labrador in the most recent surveys. Less than 2% of Ontario students (the only province collecting this information) used Ketamine, Rohypnol (roofies)

or GHB, so-called date rape drugs, in the past year.³⁰ Although the abuse of certain drugs such as methamphetamine (including crystal meth or ice) and OxyContin is raising concerns in some parts of Canada, available statistics show that past-year use among students for each is relatively low at 2-3%,^{31 32} (nevertheless, the rate of 2% for OxyContin use in Ontario represents a recent increase). Ritalin has important medical value in the treatment of attention-deficit hyperactivity disorder (ADHD) but is sometimes used non-medically (e.g. 1% in Ontario).³³

Age differences:

When considering the above figures it's important to note that the percentage of students using substances increases quite dramatically from Gr. 7 to Gr. 12. For example, in Nova Scotia 52% of Gr. 7-12 students used alcohol in the previous year but within that average is an increase from 12% of Gr. 7 students to 80% of Gr. 12s.³⁴ Solvent/inhalant use is an issue in some communities – in these cases use goes down during the high school years after peaking in early junior high.³⁵

Age at first use:

Studies show that the average age of first tobacco and alcohol use is about 13, while first use of alcohol to intoxication is about 14, as is first use of cannabis.^{36 37}

Gender differences:

When discussing differences in consumption between males and females, it is important to note that girls and women have a lower threshold to the effects of alcohol. Given the same amount of alcohol, women will become more intoxicated, get intoxicated faster and stay intoxicated longer.³⁸ While the percentage of girls using various substances has converged with or is approaching that of boys in recent years, boys tend to engage in more hazardous patterns (see below). Nevertheless, young women tend to experience problems and dependence at about the same rate as men.³⁹

Hazardous patterns:

All substance use poses some level of risk but some patterns are more risky than others. Adolescents, along with young adults, are more likely than other age groups to use substances in risky ways, and older and male students are generally more likely still:

- **Binge drinking** is common among junior/senior high school students. Past-month binge drinking was reported by 29% of students in Newfoundland and Labrador, 28% of Nova Scotia students, 34% of BC students, and 26% of Ontario students. The prevalence of drinking and binge drinking (69% and 44% in the past year) reported by Quebec students appears higher than other Canadian provinces.^{40 41}
- Driving under the influence of any substance is dangerous. The prevalence of **driving after drinking** has been in steep decline over the long-term in this country. However, among older students who drive, driving within an hour of consuming alcohol still occurs, with 10-16% of older students with licenses in Atlantic Canada and Ontario reporting doing so in the past year.
- Among older students who drive, **driving after using cannabis** has become more common than driving after using alcohol in jurisdictions reporting this information (e.g. 16% vs. 12% (ON); and 23% vs. 14% (NS). Use of both cannabis and alcohol together is raising concern among road safety experts.⁴²
- A significant minority of students have been **passengers in a motor vehicle with a driver who has been drinking alcohol or using cannabis** on at least one occasion in the past year (e.g., in the Atlantic region, alcohol: 19%; cannabis: 23% of students).⁴³
- Unplanned sexual activity and substance use often go together for young people. For example, of sexually active grade 9, 10 and 12 students in the Atlantic region, about 33%

- reported having **unplanned sex** while under the influence of a substance at least once during the course of the year.⁴⁴
- 15% of Ontario students in Grades 7-12 reported **being drunk or high at school** at least once in the past year. This ranges from 3% of Grade 7s to up to about 24% of 12th graders. About 21% of Ontario students report that they've been **offered or sold an illegal drug on school property** in the past year.⁴⁵
 - A significant percentage of students report **having used more than one substance** in the past – usually some combination of alcohol, cannabis and tobacco.⁴⁶
 - **Using more than one substance at a time** can be particularly risky and may lead to unpredictable and serious harms. The extent to which Canadian students use multiple drugs on an occasion is not known, but it is generally agreed that this is not uncommon.⁴⁷
 - It appears that **frequent use of cannabis** (6 or more times in the past year), as well as daily cannabis use, is higher than in the past. About 2.5 and 4.5% of students report **daily cannabis use** in Ontario and the Atlantic region respectively.⁴⁸ It should be noted that even small percentages can represent quite a few students (for example, 3% in Ontario represents 27,000 students).
 - While **tobacco use** among high school students has declined significantly (between 12-16% past year use in various surveys), it is increasingly considered to be a marker for hazardous substance use patterns. According to an analysis of a national survey (2004), young people who smoke are more likely to binge drink, use cannabis frequently and use other substances.⁴⁹ The 2007 Ontario survey found that virtually no students use only tobacco; smokers use at least one other substance, usually alcohol.⁵⁰
 - **Injection drug use** poses risk of blood borne infection and overdose. Age of first injection among the few that ever use this method often occurs in late adolescence and early adulthood. In Ontario, the only province collecting this information, about 1% of students report injecting drugs.⁵¹

Gender differences:

While the percentage of males and females who have used various substances has converged and is similar in many cases, males tend to use more frequently and heavily. They also appear more likely to drive after drinking (ON males =14%; females=9%).

Harms reported:

As discussed in Section II, Impact of Substance Use on Health and Learning, substance use can result in a wide range of short- and long-term physical (e.g. poisoning, overdose, cancers, dependence), social (e.g. family problems, damaging property), and academic (e.g. truancy, academic failure) harms. Due to risky patterns of use among some students, prevalence of harms reported by students is high relative to other population groups and is a cause of significant concern. Harms reported by students in particular jurisdictions include the following:

- Driving while under the influence of alcohol or other drugs remains a major cause of **injury and death** for young people in Canada. In 2001, 25% of drivers aged 19 and younger who died behind the wheel and were tested were over the legal alcohol limit.⁵²
- **Causing damage to property** and **causing injury to oneself** are among the most common harms associated with alcohol and drug use among students.⁵³

- **School problems** arising from drinking or drug use are an issue for a small percentage of students. For example, 5.1% of Senior 4 (Gr. 12) students in a non-representative sample of Manitoba students reported missing classes as a result of alcohol use, while 2.2% of Atlantic students (Gr. 7-12) reported that school work or exams had been affected by their drinking.^{54 55}
- Provincial surveys show that about 3-5% of junior high and high school students report having been in **trouble with the police** because of their alcohol or drug use.^{56 57}
- About 6% of Canadian youth aged 15–19 may be **dependent on alcohol**, and about 3% may be **dependent on an illicit drug**.⁵⁸ About 10% of Ontario students who use cannabis show signs of dependence.⁵⁹

Aboriginal students:

In Canada, 4.4% of the population identify themselves as Aboriginal.⁶⁰ Less information is available on the extent of substance use among Canadian Aboriginal students. A good source is a B.C. survey of students in Grades 7-12 which sampled 2,478 students who identified themselves as Aboriginal within a larger sample of 30,500 students, a replication of studies conducted in 1998 and 1992.⁶¹

The resulting report, *Raven's Children II*, found that the percentage of Aboriginal students (Gr. 7-12) who have tried alcohol is higher than their non-Aboriginal counterparts, with 67% reporting having ever tried alcohol compared with 57%. The Aboriginal rate reflects a steady decline, from 80% in 1992 to 67% in 2003. Aboriginal females were more likely to report having tried alcohol than Aboriginal males (69% vs. 64%), and were just as likely as males to report binge drinking in the past month (49% of those reporting drinking). This compares to 44% of non-Aboriginal youth.

Overall, marijuana use among Aboriginal students mirrors the long-term trend among BC students generally, having increased between 1992 and 1998, from 46% to 60%, and decreasing to 53% in 2003. However, Aboriginal youth (53%) are much more likely than non-Aboriginal students (36%) to report having ever used marijuana. As with alcohol, Aboriginal females are slightly more likely to have used marijuana than males (55% and 51% respectively).

Rates of use for various illegal drugs other than marijuana were stable or declined from 1998. The most commonly used illegal substances other than cannabis were mushrooms (psilocybin) (21%) and other hallucinogens (10%).

Aboriginal youth are a diverse population so the results of this survey of British Columbia Aboriginal students should not be seen as representative of the Canadian population. Socio-economic factors that affect educational attainment are among the layers of complexity that need to be considered when reviewing reported Aboriginal youth substance use rates. Additional challenges surrounding educational attainment and well-being are discussed in Section IX. B: Cultural Competence and Aboriginal Students.

C. Conclusion

While a significant proportion of Canadian middle school students do not use any substance, the use of alcohol becomes normative in the high school years, and cannabis and tobacco use becomes common. Students in Grades 7 and 8 may be more accurately termed “not-yet-users” rather than “non-users” of alcohol. With increasing age, the rate of hazardous patterns of use also increases, and use of tobacco is a marker for these patterns. Addressing early use of tobacco, alcohol and cannabis needs to be a priority for school prevention programs. Because significant numbers of older students use these and other substances in hazardous ways, and given the significant immediate harms that can arise from these patterns, prevention that explicitly aims to

prevent hazardous use and possible harms needs to be considered for the high school prevention agenda.

Best Advice 1: schools need to base their substance use policies and programs on the best available local information on the nature and extent of student substance use and substance use problems; substance use needs to be understood in relation to age, gender, culture and ethnicity among other factors.

Best Advice 2: schools need to make preventing or delaying the early use (i.e. age 12/13 or earlier) of tobacco, alcohol and cannabis a priority. Because early use of these and other substances often results from factors evident in earlier childhood, universal and targeted programming prior to middle school is important.

Best Advice 3: at grade levels or in communities where rates of alcohol (including binge use) or other substance use are placing a significant proportion of students at risk, schools should consider delivering and evaluating drug education that aims to prevent or reduce hazardous use and harmful consequences.

IV. The nature of risk and protective factors

Much attention is given to preventing substance use problems among adolescents. This makes sense, for while there are very significant drug issues among other populations, it is during adolescence that most substance use begins. Moreover, young people tend to use substances in more hazardous ways than older people and these patterns can result in significant harms, in the short and longer term.

During the course of a young person's development, numerous factors interact in complex ways to determine whether a person will experiment with substances and whether use may become problematic. The terms "protective factors" and "risk factors" are often used to identify aspects of a person and their environment that make the development of a given problem less (i.e., *protective*) or more likely (i.e., *risk*).⁶²

Although there is much that remains unclear^{iv}, it is commonly accepted that the factors linked to a young person trying or "experimenting" with a substance differ from those that are linked to harmful use by some students.

A. Factors influencing experimentation with substances

All young people can be seen as being at some risk by virtue of a range of influences that everyone is exposed to in some measure. The influences or factors can be organized according to the following "spheres":

- Personal factors (genetic, personality)
- Interpersonal factors (family, peer)
- Broad, social cultural factors (socio-economic status, norms)

Personal factors

Through the course of normal adolescent development, young people experience a number of needs that alcohol and other drugs can, in their own way, address. These needs include: taking risks, demonstrating autonomy and independence, developing values distinct from parental and societal authority, signalling entry into a peer group, seeking novel and exciting experiences, and satisfying curiosity.⁶³

Whether a young person chooses to use a substance is linked to their **perception of risk** associated with that drug. As perceived risk linked to a drug increases, rates of use decline.⁶⁴ The reverse is also true, so an emerging drug may experience a "grace period" during which there is little information available about risks or harms.⁶⁵ Substances may be used or combined with little knowledge of the possible effects, so even initial or experimental use can be hazardous.⁶⁶

Interpersonal factors

Beyond the personal influences there are interpersonal influences involved in a young person's decisions to experiment with substances. Family norms and substance use patterns are of course highly influential. Young people are also influenced strongly by their perception of how common or "**normative**" substance use is. For example, if one's friends smoke, drink or use other substances or if there is a sense that others in their networks do, a young person is more

^{iv} Studies do not use common measures of a substance use problem; for example, some studies analyze various factors against 'past year use', which provides little information on the nature and extent of use.

likely to do so. Some young people may use substances as consumer items, along with clothes and music, to establish an identity or image for themselves.⁶⁷

Broad factors

Young people in Canada are growing up in an environment that is tolerant of various forms of substance use, both medical and non-medical. A vast array of mood altering substances in the form of alcohol, tobacco, pharmaceuticals, alternative medicines, nutraceuticals and illegal drugs in Canada, locally and through the Internet has created easy access. Unprecedented access to media by young people has meant that more young people than ever are “consuming” a globalized pop culture that tends to tolerate substance use.⁶⁸ The powerful marketing capacities of the alcohol and tobacco industries contribute to this environment by directing much of their attention to a youthful market.⁶⁹ Even these capacities, however, are dwarfed by the scale of the illicit drug industry, which has been estimated to account for approximately 8% of world trade – more than iron and steel and about the same as textiles.⁷⁰ This is occurring in a world that is fast-paced and highly unpredictable, as one commentator puts it, a “runaway world”.⁷¹ Community factors such as general attitudes toward alcohol and other substance use as well as the leisure options perceived by youth affect their substance use decisions.

Because all students are exposed to most of these influences in some measure, it is not surprising that the use of alcohol, cannabis and tobacco is common among Canadian students regardless of whether they are viewed as being at higher or lower levels of developmental risk. Any substance use presents the potential for problems. Even a single drug-using experience or occasional use by a naïve user can result in harm through, for example, overdose, an injury event, or in the case of illegal drugs, criminal prosecution.⁷² Many youth who do experiment with or continue to use substances do so in risky ways (e.g. large amounts in unsafe settings).

In fact, some contend that all young people, by virtue of the developmental changes they all undergo, and the various societal factors they all experience, should be considered a population “at risk”. One observer questions the value of distinguishing between a mainstream who are “OK” and a minority who are at risk, suggesting that the pace of social change means many young people will experience risk factors such as depression or unemployment at some point or another in their lives.⁷³ While there is merit to this view, some young people and families clearly experience more risk factors than the norm.

The picture that emerges from research is that of two populations of youth with different trajectories – those that are subject to the usual range of environmental and social influences and who engage in some amount of deviant and risky behaviour as part of normal adolescent development, and a second population that experiences more severe challenges through their life course and whose deviance may be more extreme and long-term (i.e. adolescence-limited vs. life-course deviance).⁷⁴

B. Factors contributing to substance use problems

When children begin school, they already bring different experiences that will serve to protect them or to place them at risk (e.g. fetal exposure to alcohol and tobacco, early nurturance, attachment to their parents, neglect, good nutrition, or early onset behavioural problems). A developmental pathway continues to take form as the child’s characteristics interact with the school and family environment through the early school years to influence academic failure and success, behaviour, relationships with peers and teachers and attitudes to school.⁷⁵

These interactions form a complex web of causation at any given point in a child’s life, and opportunities for shifting a trajectory exist at these various points. For example, changes in parenting practices will affect, and be affected by a young person’s personality at a particular developmental point.⁷⁶ Through the school years these earlier factors will interact with a child’s academic and social experiences and for some, lead to characteristics that are linked to substance use problems, for example, having anti-social or substance-using friends, or engaging in truancy and other anti-social behaviour.

Risk and protective factors by life stage

The levels of risk and protection may shift through the life course and their impact varies with when they occur. Below is a summary, drawn (unless otherwise indicated) from a review by Loxley and colleagues (2004), which provides the best available evidence on when, during the life course, various factors have the greatest impact (bearing in mind that risk factor research is a work in progress).⁷⁷

Prior to birth:

Parental substance use problems: Maternal alcohol use may result in lifelong cognitive, behavioural and social deficits that increase risk for a range of difficulties including harmful substance use; smoking prior to birth, and environmental tobacco smoke are risk factors for impaired child development; this impairment may initiate a pathway of poor child adjustment, leading to harmful substance use.

Genetic factors: Although there is much yet to learn, it is likely that a combination of genetic factors influence behaviour through their interaction with environmental factors.

Material poverty: Being born or raised in a family experiencing extreme economic deprivation is a risk factor for harm associated with substance use.

Poor family management and breakdown: Low level of parent-child attachment, and being born or raised in a sole parent household is a risk factor for more frequent substance use in adolescence.⁷⁸

Infancy and early childhood:

Parental abuse and neglect: Child neglect and abuse is a risk factor for impaired child development and this impairment may initiate a pathway of poor child adjustment leading to harmful substance use.

Temperament and early behaviour: Easy temperament in early childhood is a protective factor for positive child adjustment and reduces the influence of other risk factors, leading to lower rates of involvement in harmful substance use. Aggression in early childhood is a strong risk factor for later delinquency and substance use problems.⁷⁹

Later childhood

Shy temperament and personality: shy and cautious temperament in childhood is a protective factor, reducing the influence of risk factors for early adolescent multiple and illegal substance use in early adulthood.

Child social and emotional competence: Social and emotional competence in childhood is a protective factor, reducing the influence of risk factors for alcohol and other substance use.

Conduct disorder: Conduct disorder in childhood is a risk factor for higher levels of alcohol consumption in adolescence. The influence of conduct disorder on alcohol abuse may be increased by family vulnerability to alcohol problems or by earlier age alcohol use.

Aggression: Aggression in childhood is a risk factor for early adolescent multiple-drug use and adult alcohol abuse.

Unsettled home situations: a study found that young people living on the street in Victoria, British Columbia were less likely to have a history of abuse than a history of frequent moves and dislocation (for example, from one guardian's house to another, or from foster home to foster home).⁸⁰

School failure: Early school failure is a risk factor for various later problems including alcohol use problems.

Adolescence

Gender: while rates of use are similar between girls and boys, boys are more likely to use in hazardous and harmful ways.

Low positive contact with adults: Low involvement in activities with adults in adolescence is a risk factor for early adolescent multiple-drug use.

Community disadvantage and disorganization: Community disadvantage and disorganization in adolescence has been associated with adolescent substance use.

Favourable attitudes toward drug use: Favourable attitudes towards drug use behaviour in early adolescence are associated with an increased involvement in subsequent drug use.

Family attachment: Attachment to the family in adolescence is a protective factor, reducing risk factors for early adolescent multiple-drug use.

Parental harmony and parent-adolescent conflict: Low parental conflict (parental harmony) from late childhood and in adolescence is a protective factor, reducing alcohol problems, and parent-adolescent conflict is a risk factor for early age substance use.

Parental attitudes toward substance use: Favourable parental attitudes to substance use from late childhood through adolescence is a risk factor for early age initiation of the same substance.

Parental alcohol and other drug problems: Parental alcohol and other drug problems early in their offspring's adolescence is a risk factor for earlier age alcohol use and higher levels of alcohol use later in adolescence. The Canadian Task Force on Preventive Health Care has estimated that one million children in Canada under the age of 19 live with an alcohol dependent parent.⁸¹

Parental communication and monitoring: Parental communication in early adolescence is a protective factor, reducing the influence of risk factors for harmful youth substance use. Youth with greater expendable income (e.g. larger allowances) have been shown to be more likely to drink hazardously than other youth.⁸²

Family rules and discipline: Parental rules permitting substance use in childhood or early adolescence is a risk factor for early age substance use.

Peer relationships: Relationships with peers who are involved in substance use in late childhood or adolescence is a risk factor for problematic alcohol and other substance use. However, the phenomenon of peer influence as a risk factor is complex; some research concludes that peers are less a factor in starting to use than in encouraging and maintaining a certain level of use that fits with group norms.⁸³

Externalizing behaviour problems—delinquency and conduct problems: Delinquency in adolescence is a risk factor for problematic alcohol and other substance use.

Sensation seeking and adventurous personality: in adolescence are risk factors for multiple-drug use.

Religion: Religious involvement in adolescence is a protective factor, reducing the influence of risk factors for harmful substance use.

Focus: protective and risk factors in the school setting

Considering the amount of time students spend in school, it should not be a surprise to learn that there are important opportunities to contribute to student well-being in this setting. There is good evidence that supportive and caring relationships within schools promote academic motivation and performance among students.⁸⁴ Less is known about the influence of the school environment on adolescent health risk behaviours but it is getting increasing research attention.^{85 86}

This research on the social environment of schools (and to a lesser extent the physical environment), employs various terms such as “school connectedness”, “school bonding”, “school engagement” “school culture”, “school ethos”, “social ecology” and “social inclusion”. Because it is a relatively young area of research, it lacks a clear theoretic basis and the social environment isn’t yet consistently defined.

School connectedness is often seen as comprising student-teacher relationships and social or peer relationships.⁸⁷ The Social Development Model has been suggested as a theoretic model, viewing connectedness to family, schools, peers, and community as protective against substance use and antisocial behaviour.^{88 89 90} Another model, Schools as Communities, promotes a culture characterized by caring and supportive student and teacher relationships and student input into school policy and classroom practices as a route to both academic success and health.⁹¹

Student-teacher connectedness: It is apparent that a perception of teacher connectedness has a protective effect on substance use and a wide range of other problem behaviours at the late elementary, middle and high school levels.^{92 93 94} In an Alberta high school, students who liked only half their teachers or less (44% of the student total) were 70% more likely to use marijuana, 20% more likely to smoke, 43% more sexually active and two and a half times more likely to report depression.⁹⁵ Middle school appears to be a period when students often sense a lack of connectedness; when they do perceive it during this period, it bodes well for them in high school.^{96 97 98} By concentrating not only on the curriculum content but also on the context, relationships, and processes for learning and teaching, teachers can contribute to well-being and academic success.^{99 100}

Social connectedness: It also appears that social or peer bonding may have a protective or risk enhancing effect depending on the nature and quality of the relationships; if bonding occurs with non-conventional peers or if social life is characterized by bullying or being threatened, social connections will have a risk enhancing effect. Ongoing teacher connectedness can offset the effects of poorer social connections.^{101 102}

Overall school connectedness: Students with positive teacher, learning and social connectedness fare best in terms of later mental health and involvement in health risk behaviours, and are more likely to have good educational outcomes. So, it is important to consider how to enhance both teacher connectedness and social connectedness in ways that promote learning and well being.¹⁰³

Lack of school connectedness: Young people who are not engaged with learning and who have poor relationships with peers and teachers (e.g. being bullied, feelings of not belonging and feeling under stress) are more likely to experience academic problems, mental health problems and be involved in various health risk behaviours including substance use.^{104 105 106}

Higher risk students: Even students at high risk (e.g. having been suspended or detained) who perceive a connectedness with teachers are less likely to become involved in harmful substance use or other problem behaviours than counterparts who don’t have that sense.^{107 108}

Gender: Because girls tend to give greater priority to relationships than do boys, they are more likely to judge school culture in favourable terms and express a stronger sense of school

belonging and attachment. Interpersonal dimensions of school environment are likely to have a stronger impact on their level of classroom participation and motivation for learning.¹⁰⁹

School norms: Students in junior and senior high school are more likely to use substances when the norms in school reflect a greater tolerance for substance use. These findings hold even after controlling for students' own disapproval and for other student and school demographic characteristics.^{110 111}

Physical environment: Unsafe or "un-owned" places, such as hallways, dining areas, and parking lots, where school personnel are not typically present and rules are more difficult to enforce can contribute to problems, including substance use problems by interacting with social norms and behaviour (e.g. verbal bullying; victimization). This interaction is important in understanding the problem as well as how best to intervene.¹¹²

The importance of leadership: many elements feed into the nature and quality of the relationships that determine the level of protection or risk to be found in a school but it is apparent that the tone needs to be set by school leadership. Leadership will determine the kinds of policies, the consistency with which they are enforced, and the extent to which students are able to contribute to them. Leadership (through hiring, training and modelling) can also influence the nature of the teacher-student relationship toward high expectations, respect, and task-focused learning (rather than a preoccupation with a "results" focus).^{113 114}

School effect: It is important to note that much of this research is based on cross-sectional surveys that are not able to determine causal effect. So, much of the school connection research is not designed to determine how much of the sense of connection comes from attributes of teachers and schools and how much is due to student traits and motivation or even parent or neighbourhood attributes. One recent study did show evidence of a "school effect" – a study of 2,500 Scottish students who attended elementary schools that had a positive school "ethos" (i.e. students felt attached to school, engagement with education, and got along with their teachers) and which took account of a wide range of other possible contributing factors (e.g. social class, deprivation, religion, family structure, parenting, disposable income and parental health behaviours, as well as prior health behaviours) found that they were less likely to smoke, drink and use illegal drugs at age 13 and 15 than students attending schools with a poor "ethos".^{115 116}

Although there is much to learn, it is clear that modification of the school environment to promote school connectedness (i.e. teacher and social bonding) has the potential to impact substance use, other problem behaviours and academic performance for an entire school population. Research on the effectiveness of interventions designed to do this can be found in Section IV D, Comprehensive Whole-school Approaches.

Overarching societal factors:

As a result of a body of international research, much of it synthesized in Canada, it is now commonly accepted that a number of "social determinants" have great influence over the health of a population. The factors that are generally understood to influence population health are: income and social status; social support networks; education; employment/working conditions; social environments; physical environments; personal health practices and coping skills; healthy child development; biology and genetic endowment; health services; gender; and culture.¹¹⁷ Several of these determinants are specific to particular life stages and are identified in the above discussion (i.e. biology, genetics, healthy child development). Others transcend and have impact on several or all the life stages. For example, unresolved historical events such as the direct and intergenerational impacts of residential schools and the fragmentation of families have greatly affected Aboriginal peoples and their communities across the country.

While a full discussion of their impact on children, youth and substance use behaviours is beyond the scope of this summary, it is worth questioning the role of several of these overarching factors in influencing youth health. Toumbourou and colleagues (2004) suggest that these macro-level social forces operate indirectly and are most easily seen in their early impacts on child

development. The influence becomes more diffused in adolescence, increasing the likelihood of problems in any one of several areas of health and development, including substance use.¹¹⁸

At its broadest, Western culture holds implicit values that influence how our society is organized. Although these values get to the root of who Canadians are as a people, they have not generally been viewed as relevant to discussions around the prevention of substance use harms. Canadian culture and values have no doubt benefited population health in some ways (e.g. decreased stigma experienced by gay, lesbian, bisexual and transgender persons), however, increasingly some values are being considered for their negative impact on substance use problems.¹¹⁹

Individualism and lack of social support: places a premium on individual autonomy and a “winner take all” philosophy that diminishes the role of collective action and the notion of the common good.¹²⁰ It has been suggested that drug use may loom as an option for some who feel unable to achieve an individual identity in another way. A community that is organized to emphasize individualism will be less likely to adopt policies that promote community cohesion and will be less concerned with social exclusion. In contrast, a community that is organized to emphasize “the collective” will be likely to adopt policies that promote community engagement and skill building through strong social support. For example, the holistic view basic to many Aboriginal philosophies includes physical, emotional, mental, and spiritual development. The knowledge of these aspects of development is passed on from generation to generation through traditional teachings and participation in traditional healing and cultural activities. Within many traditional Aboriginal cultures (and among people who live by traditional teachings as a way of life) each of these areas guides daily activity. These traditional ways of looking at and understanding the world can offer a depth and richness to life, and likely have a protective effect.

For young people, the nature and extent of the adult and community support experienced while growing up represents a substrate that will mitigate or aggravate all the other factors. It has been understood for some time that having positive adult contact (that is, contact with adults who are supportive and hold clear positive expectations of a child) is an important protective factor.¹²¹

Affluent U.S. suburban student populations that might otherwise be viewed as low-risk populations have been shown to have high rates of anxiety, depression and substance use that are linked to high achievement pressures and low sense of connection with parents (particularly mothers). There is some indication that substance use in this population has a self-medicating value and it may be wrong to assume that help is available or even sought given the high value placed on self-sufficiency and the social isolation that can be a part of suburban life.¹²²

Consumerism and social inequity: Canadians and other people in Western countries have unprecedented choice and access to material goods, but there is increasing evidence that this does not translate into happiness.^{123 124} Moreover, these material goods are not equally available. Wealth is increasing in Canada, but the gap between the rich and the poor is also increasing.¹²⁵ This has very large implications for Canadian families. Health Canada reports that only 47% of Canadians in the lowest income bracket rate their health as very good or excellent, compared with 73% of Canadians in the highest income group.¹²⁶ This relationship holds true for socio-economic position and mental health also.¹²⁷

It appears that social inequity is a powerful determinant of health for children and adolescents also, in part because children and youth are the target of unprecedented marketing efforts. A recent UK study found children in lower socio-economic groups in that country are less likely to be able to improve their circumstances than ever before. The study found that families and communities are less likely than in the past to provide them the tools needed and that they are becoming more dependent on brands to give them a sense of what aspirations, values and possessions are important and acceptable – that is, brands are beginning to dictate social position. The report linked this phenomenon and various youth social problems.¹²⁸ The relationship between socio-economic status and substance use is not straightforward however.¹²⁹

Aboriginal culture: Historic inequities have left Aboriginal children, youth, and families without much-needed supports and services. Significant education and employment barriers contribute to a high incidence of poverty among Aboriginal people. Reportedly, First Nations children in Western countries live in Third World conditions, with an estimated 80% of urban Aboriginal children under the age of 6 living in poverty.¹³⁰

Aboriginal youth are over-represented in the youth justice^{131 132 133} and child welfare¹³⁴ systems. Indeed, First Nations youth in Canada are more likely to be incarcerated than to graduate from high school.¹³⁵ In *Urban Poverty in Canada: A Statistical Profile* (CCSD, 2000) evidence from the 1996 Census data showed that Aboriginal people living in urban areas were more than twice as likely to live in poverty as non-Aboriginal people.¹³⁶

Manitoba has the lowest rate of school attendance among Aboriginal youth of any province or territory in Canada¹³⁷; only 46.9% of Aboriginal youth aged 15-24 in that province were attending school either full or part-time, at the time of the 2001 Census. The national average for Aboriginal youth was 51%.¹³⁸

Among the major challenges identified by the Department of Indian and Northern Affairs Canada (INAC) to closing the education gap are: socio-economic factors that affect educational attainment; rapidly increasing populations; the legacy of residential schools; the diversity of Aboriginal communities and needs; and the need for improved support for First Nations' control of their education system.¹³⁹ Factors such as lack of employment opportunities, lack of education, discrimination, poverty, and low self-esteem have created a cycle of dependence that prevent Aboriginal people, including youth, from fully participating in Canadian society.¹⁴⁰

Gender: male gender was mentioned earlier as a discrete risk factor in adolescence but given its importance as a cultural construction (that is, the roles defined for girls and boys and the way they see themselves and are seen by society is a function of cultural factors) and as a determinant of health, the role of gender in relation to risk factors for substance use problems is worth examining. There has been surprisingly little research on this but some information is available and has been synthesized by Amaro et al (2001).¹⁴¹

Certain risk and protective factors may hold equal importance for boys and girls (for example, social support, academic achievement, poverty) but get expressed in different ways. Other risk factors might be more important for girls, such as negative self-image or self-esteem, weight concerns and dieting, eating disorders, physical and sexual abuse, early onset of puberty, higher levels of anxiety and depression, or boyfriend's drug use. Similarly, certain protective factors, such as parental support and consistent discipline or self-control, might be more important for girls. Girls might be particularly vulnerable to the influence of peers, friends with problem behaviour, and peer or parental disapproval/approval of substance use.¹⁴²

It is important to note that alcohol affects women differently. Women generally have a lower percentage of body fluid than men of similar body weight (so there is less fluid in which the alcohol is distributed), resulting in higher concentrations (i.e. a higher BAC) after drinking the same amount of alcohol. Also, the ability to break down alcohol is a function of the liver, and women generally have smaller livers. The resulting higher concentrations of alcohol in the body lead to a greater level of intoxication for a given amount of alcohol consumed (which can be worsened still by dieting). Over the longer term, women experience liver damage at lower levels of consumption. The risk of breast cancer increases with the amount drunk over time.¹⁴³

Table 1. Factors associated with substance use problems during school years (protective factors are *italicized*)^v

	<i>Prior to birth</i>	<i>Infancy and early childhood</i>	<i>Later childhood early school</i>	<i>Secondary school</i>
Individual	Genetic factors	Temperament and early behaviour	Conduct disorder Aggression <i>Social and emotional competence</i> <i>Shy temperament and personality</i>	Delinquency and conduct problems Sensation seeking and adventurous personality Favourable attitudes toward substance use Gender
Family	Maternal smoking, alcohol and other substance use during pregnancy Material poverty Poor family management and breakdown	Parental abuse and neglect	Unsettled home situation	Attachment to family <i>Parental harmony</i> and parent-adolescent conflict Parental attitudes to substance use Parental alcohol and other drug problems Parental communication and monitoring Family rules and discipline Religion
Peer				Substance-using peers
School			Early school failure	School engagement
Comm-unity				Lack of positive contact with adults Community disadvantage and disorganisation
F a c t o r s s p a n n i n g s e v e r a l o r a l l l i f e s t a g e s C u l t u r e S o c i a l i n e q u i t y D e m o g r a p h i c a n d e c o n o m i c f a c t o r s S o c i a l c o h e s i o n				

Areas where research is unclear

- ♦ The role of ADHD in predicting youth substance use
- ♦ The role of childhood depressive symptoms in predicting youth substance use
- ♦ The role of childhood intelligence in predicting youth substance use

^v Drawn largely from an extensive review of the literature by Loxley, W., Toumbourou, J., Stockwell, T.R., Haines, B. et al. (2004). *The Prevention of Substance Use, Risk and Harm in Australia: A Review of the Evidence*. Canberra: Australian Government Department of Health and Ageing.

As mentioned, protective and risk factors are best seen within a developmental pathways perspective that reflects the dynamic relationship between various factors, as perceived by the individual.¹⁴⁴

Viewing factors according to a developmental pathways perspective suggests:

- there is no single risk factor that is directly related to developmental problems such as substance misuse; rather, risk factors vary through the life course and often affect development through their cumulative impact over time;
- a combination of factors at a particular life stage can, on the other hand, combine to place a person at particular risk (e.g. a student whose parents have just separated and is now going to a new school);
- risk factor exposure early in life can have a snowball effect, altering the subsequent course of development; that is, upcoming risk factors tend to stick and accumulate (e.g. weak child-parent attachment at infancy contributes to behaviour problems, which affect school performance and engagement with peers).

The balance of the number of risk factors in relation to the number of protective factors is important in determining the likelihood of problem behaviours; individuals experiencing a disproportionate number of risk factors are generally viewed as being at heightened risk for various academic and social problems.

How does heightened risk manifest itself in terms of substance use? As has been noted, alcohol, cannabis and tobacco use are common among Canadian adolescents, as is binge drinking – and harms do arise from this use. It isn't possible to predict with certainty how even a minimal-use pattern will proceed. It may pass without incident or evolve into a hazardous lifestyle. Moreover, as has been noted, even "low-risk" youth experience risk factors that shouldn't be ignored. But young people living with an accumulation of risk factors tend to engage in heavier and more frequent use of these substances and are more likely to use other illegal substances.¹⁴⁵ They are also more likely to begin using at an earlier age. As Toumbourou (2004, p 5) observes, "*early use of legal substances and harmful use of illicit substances (frequent cannabis use and other illicit drug use) may be particularly influenced by the cumulative exposure to early risk factors and their interaction with early school adjustment pathways, which may in turn be more prevalent within disadvantaged and lower SES families*".

Paglia-Boak and Adlaf contend that special attention be given to early use (i.e. before age 13 or 14) of substances in adolescence.¹⁴⁶ It is clear from research that early substance use is linked to several significant harms with life-long consequences. Early use:

- increases the likelihood of regular heavy use, use of various substances, legal problems, violence, injuries, mental health problems and dependence in early adulthood;
- hampers the young person's ability to make expected transitions from adolescence into adulthood—for example, attaining higher education and finding success in marriage.

A U.S. analysis of a longitudinal study found that the likelihood of alcohol dependence decreased by 14% with each additional year of delayed initiation.¹⁴⁷ Consequently, efforts by schools and parents to delay or prevent substance use are important and some drug education programs have this as a specific aim. However, it is important to see that early use of substances likely arises from experiences in earlier years that are more effectively addressed at an earlier point.¹⁴⁸

Although the various problem behaviours (e.g. problematic substance use, mental health problems, teen pregnancy, violence and criminal activity) appear to share many root factors, there is much to learn about the complex relationships, pathways and mechanisms by which the various factors operate and lead to problems.¹⁴⁹ The science behind the identification of risk factors is not completely helpful because it can have the effect of removing the person from their context, and does not reflect the complex and dynamic manner in which factors play out in people's lives. It can contribute to an overemphasis on individual human deficit while de-emphasizing other environmental or structural factors, such as marketing and cultural norms, that

are not so easily understood through typical experimental research.¹⁵⁰ However a developmental pathways approach shows promise in explaining how the various factors operate in the lives of individuals and in identifying common bases of concern among those working to prevent substance use and other problems such as mental health, violence and crime.

C. Conclusion

All young people can be seen as “at risk” for substance use by virtue of their developmental needs and the various cultural messages to which they are exposed. While many Canadian students choose not to use any substances, many others do, often in hazardous ways. These students would benefit from school-based opportunities to discern the strength of the various influences in their lives, develop personal and social skills to effectively cope with these influences and to learn how to avoid harming themselves or others when they choose to use a substance. The classroom and the broader school environments (particularly social but also physical) can offer important protection for learning, and help reduce substance use and other problem behaviours.

For children and young people experiencing many more risk than protective factors, interventions early in problem pathways are advocated. Prevention experiences early in school are very important but it is also important to focus on later transition points (e.g. moving from junior high or middle school to high school). Preventive effect may be gained from a positive overall school environment but it may also be necessary to select these students for particular programming. In pre and early adolescence the aim of the programming needs to focus on delaying use of alcohol, tobacco and other substances, while later programming would more appropriately aim to reduce hazardous use (e.g. frequent, heavy use or use in hazardous contexts) of alcohol, cannabis and, possibly, other drugs.

Best advice 4: recognize that the many factors that either increase risk or provide protection for substance use harms present themselves at different points in the life of a child and call for different responses during each developmental phase.

IV. Preventing student substance use problems

Smoking, alcohol and other drug use are the behaviours most commonly addressed in school health programs.¹⁵¹ Like health education generally, alcohol and other drug education has evolved over the years. In its earliest form, drug education was based on the premise that young people only needed sound information in order to make healthy decisions. Typically these programs consisted of teachers presenting information on drug effects and dangers in the hope that the new knowledge would influence student behaviour. Although accurate, balanced drug-specific information is an important component of current good practice, the drug lectures that many grew up with are not effective (in fact they've been shown to be harmful in that they served to increase experimentation¹⁵²). These knowledge-based programs were replaced by affective education programs that focused on attitudes and values. These also failed to produce desired effects, perhaps because they were too abstract to truly engage young people – that is, they did not explicitly relate skill-building to drug-specific situations.¹⁵³

The next generation of drug education curriculum-based programs had stronger theoretic roots, drawing from Social Learning Theory¹⁵⁴ and the Health Belief Model¹⁵⁵ among others. The two dominant models currently in use – the **Social Influences Model** and **Competency Enhancement or Life Skills Model** – are derived from these and have been the subject of numerous evaluations over the years.¹⁵⁶ These evaluated programs (most of which originate in the U.S.) have been delivered mainly to junior high/middle school students and, to a lesser extent those in late elementary and senior high, and have aims that are typically abstinence-based.

The inescapable conclusion, drawn by virtually all researchers, is that the best of these universal curriculum-based programs are only modestly effective, with effects eroding after a year or two, and with benefits limited to those least at risk.^{157 158 159 160 161 162 163 164 165 166 167} This important conclusion has elicited or given voice to four quite different views from the research community on how school substance use prevention can be best strengthened:

- [a] given the range of harms linked to early substance use, these programs are worth continuing if they can **delay use** by even a few students for a year or two;¹⁶⁸
- [b] achieving abstinence for all students is unrealistic; consider **other positive substance use outcomes** in addition to abstinence;^{169 170}
- [c] focus efforts on **higher risk students** rather than or in addition to the general (universal) student population,¹⁷¹ and;
- [d] attention to curriculum is necessary but not sufficient – it needs to be couched in a **whole-school, comprehensive approach**.¹⁷²

These perspectives do not need to exclude each other; in fact together they represent the best current hopes for advancing the prevention of student substance use problems. They are accompanied by their own evidence-base; however universal classroom drug education has been subjected to much more empirical study than the other approaches. The state of the evidence for each will form the basis of this section of the knowledge summary.

A. Curriculum for universal student populations

The vast majority of the student substance abuse prevention programs that have been evaluated are universal curriculum-based programs. The benefits of even the most effective of these drug education programs tend to erode. Studies show that groups that receive what is usually a 10-session program are generally found to be using substances at a similar rate to comparison groups one or two years following the completion of the program. Some observers see this as a failure of drug education, while others suggest that it is not surprising that the effects do not last too long considering the various influences at play in the lives of youth.¹⁷³ They contend that even a delay in use or reduced use over one or two adolescent years is an important contribution during a period when use can be particularly risky and prevalence rates escalate quickly. Seen in this light, the erosion effect simply highlights the

need for yearly attention to the issue in the classroom and ongoing research to better understand the most effective components of these programs.

Many of the factors that can influence youthful substance use lie beyond the school grounds. When attempting to support young people in navigating through adolescence with a minimum of substance-related harm, educators and community members are up against major societal forces. Among the many individual, social, and cultural factors that can come into play as a young person makes his or her way to adulthood, teachers are in a position to influence only a few of these factors through curriculum and instruction.¹⁷⁴ The opportunities lie in the realm of understanding and coping effectively with social influences that promote substance use, and supporting the development of pertinent personal and social skills (e.g., assertiveness, decision-making and stress management).^{175 176}

Social influence programs

The **Social Influences Model** views adolescent use of substances to be the result of influences from family, peers and the media.¹⁷⁷ These influences may be in the form of substance use by family, peers and media personalities or messages condoning or encouraging use. This model aims to create greater awareness of the various influences, and to help students develop skills to analyze and minimize their impact on their substance use.

In their earliest forms, social influence programs included a component referred to as **psychological inoculation**, which exposed students to increasingly persuasive pro-drug messages as a way of inoculating them or building resistance to real-life drug-related messages. Studies have not shown inoculation to contribute to the effectiveness of drug education, so more recent program designs do not include this element.¹⁷⁸

An element of social influence programs that continues to be popular is **resistance skills training**. This element is based on the assumption that adolescents begin to use substances largely because they lack the confidence or skills to resist social influences to smoke, drink, or use other drugs. Therefore, this approach focuses on identifying instances when these types of influences are at play. Emphasis is often placed on teaching students to identify the techniques used by advertisers to influence consumer behaviour. Once these instances and messages are recognized and identified, students can be taught tactics for dealing with the messages. For example, students may be made more aware of advertising designed to sell tobacco products or alcoholic beverages and given the chance to formulate counter-arguments. Similarly, they learn about various situations involving peer influence, and develop a repertoire of responses to the influences. Attention is paid to the content of responses, their tone, and accompanying body language.¹⁷⁹

Resistance skills training is controversial in the research community in that some continue to advocate its use while others contend that a portion of it is based on a faulty assumption.^{180 181} The evidence indicates that peer pressure has been exaggerated as a causal factor in risk behaviours. First of all, anyone who begins to use a substance, including young people, does so for a variety of reasons, and to fulfill a range of needs. The influence is often nuanced and might be better termed 'peer preference,' with a young person picking a peer group on the basis of its preferences on a number of fronts, such as music, clothing, use of substances, or social justice concerns.¹⁸² While they may not have been pressured into using by peers, they may be pressured not to quit, or to drink or use at a certain level.^{183 184} A common element of this approach for which there is no scientific evidence is making a public commitment not to smoke, drink, and/or use other substances.¹⁸⁵ Cuipers (2002) concluded that research has not found resistance skills training to contribute to the effectiveness of programs.¹⁸⁶ In their meta-analysis, Roona et al. (2000) found that interactive middle school drug education programs that did not teach refusal skills were just as effective as interactive middle school programs that did so.¹⁸⁷

An element in social influence programming that is better supported by scientific evidence is **normative education**.^{188 189} It is commonly accepted that young people tend to overestimate the prevalence of

smoking, drinking, and other drug use among other adolescents and adults. This leads to an inaccurate sense of how 'normal,' or accepted alcohol and other drug use is in a young person's school, neighbourhood, or community. Normative approaches are designed to correct the misperception that 'everyone is doing it.' A method that has been used to modify or correct normative expectations involves providing students with information about the prevalence of drug use from national or local surveys. Since the actual rates of substance use in most classes, schools, and communities is consistently quite a bit lower than adolescents believe, this activity helps correct misperceptions and shift norms.

However, this approach can obviously only work with substances and student populations where the percentage of users is in fact relatively low (for example, less than 40% of students using in the past year).¹⁹⁰ Using the 40% benchmark with Ontario students (because of the availability of recent data), normative education would have been appropriate in 2005 for alcohol in Grades 7 and 8, cannabis in Grades 7-10 and tobacco in Grades 7-12.

The logic of a normative approach also applies to hazardous use (rather than any use per se). Norms around hazardous behaviours, such as binge drinking or riding with someone who is impaired, could also be the focus of normative education, if supporting data are available. There is some evidence from a meta-analysis that normative education is effective in reducing incidents of heavy drinking at the junior high school level.¹⁹¹ More recently, Agostinelli and Grube (2002) tested two versions of a normative approach against a control in a randomized sample of older high school students in the U.S. With one version, students were provided with information about student drinking patterns in their locale; in the second, students received this information along with personalized information comparing their own drinking patterns against the norm, while the control students received neither. Both approaches were effective in reducing the tendency to underestimate the number of students who did not engage in heavy drinking, but only the personalized approach resulted in students adopting more conservative personal standards.¹⁹²

Media-based campaigns addressing perceptions of "social norms" have become prevalent, particularly among post-secondary institutions in the U.S., and also in Canada.¹⁹³ One caution deserves note. When reviewing the broader literature on these social norm campaigns, Shultz and colleagues (2007) have found mixed results and suggest this may be because people measure the appropriateness of their behaviour by how far away they are from the norm – consequently students not using alcohol or drinking below the norm might see themselves as "deviant". Although the majority of students do overestimate the prevalence of alcohol consumption, some actually underestimate its prevalence. So, normative information might have the unintended effect of inducing more alcohol use among those that had underestimated its prevalence.¹⁹⁴

The review by Shultz and colleagues focused on media-based campaigns, but it is possible this problem could arise with school instructional programs also. It is apparent that a good knowledge of students' perceptions is important when using a social norms approach and that care be taken to construct a message that is health promoting for all students.¹⁹⁵

Competency Enhancement or Skills Training Model

The second model that has been extensively studied and receives some support in the literature is the *Competency Enhancement Model*.¹⁹⁶ This model emphasizes the teaching of personal and social skills either alone or in combination with elements of the social influence approach. These skills are taught using a combination of well-supported cognitive-behavioural skills training methods that can include instruction and demonstration, behavioural rehearsal (in-class practice), feedback and reinforcement, and out-of-class practice through behavioural homework assignments. The personal and social skills typically included in competence enhancement approaches are decision-making and problem-solving skills, cognitive skills for resisting peer and media influences, skills for increasing personal control and enhancing self esteem (e.g., goal-setting and self-directed behaviour change techniques), coping strategies for managing stress and anxiety, and assertive skills. This approach has been a common

element in prevention programs to help young people address a number of issue areas (e.g., mental health, sexuality). Proponents of this approach however claim that the approach is only effective in reducing youth substance use if the skills practice and development are tied directly to drug-related situations or scenarios (rather than generic scenarios).¹⁹⁷

Historically, skills training programs have been held to be more effective than social influence programs.^{198 199} However, Roona and colleagues (2000), in their meta-analysis of 128 interactive drug education programs, found that skills training approaches were no more effective than social influence programs, and at the middle school level were in fact, less effective. Also, the most visible of the competence enhancement programs, Botvin's Life Skills Training (LST) program has been criticized by several reviewers on a number of grounds, including failing to report negative results on alcohol use, as well as for issues surrounding sample selection and attrition.^{200 201 202 203} A recent test of two delivery methods of the LST program by researchers independent of the program found neither method to be better than no program at all.²⁰⁴

Foxcroft (2003), employing the stringent standards of the Cochrane Collaboration, concluded that the evidence for long-term effectiveness (greater than 3 yrs) of the Life Skills Training (LST) program is not very convincing for alcohol prevention.²⁰⁵ McGrath and colleagues (2006) suggested that the positive effects found with LST are mainly limited to legal substances and confined to students whose drug use is already low, and/or to those who received the complete program (hence likely to exclude those students already using drugs or those at most risk).²⁰⁶ The meta-analysis by Tobler et al. (2000) found that adding life-skills training to social influence programs may strengthen the effects of prevention programs.²⁰⁷

Best advice 5: at the junior/middle school level particularly, annually deliver universal substance education based on the Social Influences Model; this model can create a greater awareness of media and social influences, and help students develop skills to analyze and minimize their impact. Within this approach, accurate information that is free of moralizing needs to be available to students.

Factors that may affect outcomes

Delivery methods

The element of drug education programs with the strongest base of research support is **student interactivity**,^{208 209 210 211} having been found to be 2-4 times more effective than non-interactive programs.²¹² Tobler and Stratton's meta-analysis (1997) provided useful insight into the type of interactivity that is most effective. They found that programs emphasizing student-to-student, rather than student-to-teacher interaction, showed significantly more positive effects on student substance use. They assert that it is the structured and unstructured task-oriented peer interaction between classmates that is the important variable in effectiveness. In this process, students need to have the opportunity to interact in a small group context, to test out and exchange ideas on how to handle drug use situations and to gain peer feedback about the acceptability of their ideas in a safe environment. Tobler (2000) even goes so far as to suggest that it is the exchange of ideas and experiences between students, and the opportunity to practice new skills and to obtain feedback on skills practice that acts as a catalyst for change rather than any critical content of the program.

The role of the teacher/leader in these types of sessions is to set an open, non-judgmental atmosphere, manage the process as a facilitator (rather than as a presenter), and maximize the opportunity for peer interchange and skills practice. The teacher also plays an important role in correcting misperceptions that may arise, and in offering information as needed.²¹³ The specific techniques that work well in this process are role-plays, Socratic questioning, simulations, brainstorming, cooperative learning, peer-to-peer discussion and service-learning projects.

Best advice 6: universal substance education needs to emphasize student-to-student, rather than student-to-teacher, interactivity; this may involve role-plays, Socratic questioning, simulations, brainstorming, cooperative learning, peer-to-peer discussion and service-learning projects.

Teacher/leader qualities

While most evaluated programs have been led by trained teachers, many others, particularly peers, have also led programs. Gottfredson and Wilson (2003), in their meta-analysis of 94 drug education programs, found programs that were led by peers unassisted by teachers to be clearly more effective than teacher-led programs or programs co-led by teachers and peer leaders.²¹⁴

A common role for peer leaders is to lead the normative component of the program to enhance the believability of normative information on drug use.²¹⁵ Often peer leaders gain greater benefit than classroom students from peer led programs.²¹⁶ Cautions have been identified in using peer leaders, particularly the need for careful selection and training of appropriate leaders.^{217 218} Peer programs also require more planning. Practical considerations include timetabling, peer training, peer leader absence, length of time between peer leader training and their use in the classroom, and any additional funding required to conduct such programs.²¹⁹

The Tobler et al 1998 meta-analysis found mental health practitioners and peer leaders were superior to general classroom teachers, but not significantly.²²⁰ It is often concluded that drug education is best taught by classroom teachers due to: the challenges of sustaining a peer-led program; their having first-hand knowledge of students' needs and developmental level, and being best placed to deliver (and if necessary to modify) program components at an appropriate time and level for their students.²²¹

The question of who delivers is quite possibly secondary to the question of what qualities are important for the person who delivers. It is speculated that mental health practitioners are effective because they have skills and training in facilitation and group process, for example creating a non-judgmental atmosphere, being comfortable in a non-directive role (e.g., with ambivalence, and with remaining silent to facilitate dialogue).

Regardless of who is delivering, best results can be expected from selecting teacher/leaders with these qualities, acquired through some mix of personal attributes and pre- or in-service training.²²² Guest presenters are often considered for drug education sessions. Given this evidence, it is important that guest presenters be able to address curriculum objectives and work interactively with the students, rather than present an isolated session unconnected with the curriculum.²²³ Newer interactive technologies (e.g., CD-ROM, DVD, Internet) to present or reinforce relevant knowledge and skills may be a useful adjunct to classroom prevention programs.²²⁴

Best advice 7: classroom lessons are best led by teachers or leaders that are comfortable with and have competence in promoting interactivity among students on substance use issues. Teachers / leaders need to create a non-judgmental atmosphere in order to effectively lead these activities.

Timing of program

Elementary school

While relatively few in number, elementary school programs (for children aged 6-12 years) aiming to prevent later substance use do exist and a few have been evaluated. A challenge for these programs is the length of time required for follow-up in order to show results. When asked, teachers suggested that early elementary school drug education is best suited to address the safe handling of medication and alternatives to medication and that drug issues are best placed within much broader questions such as "how do I make healthy decisions about life" and "how do I make decisions about my health".²²⁵ Overall, there is little evidence supporting the effectiveness

of drug education curriculum at the elementary level.^{226 227 228} The limited literature available suggests that elementary school interventions should focus more so on fundamental risk factors and devote attention to family/parent programming, school organisation and behavioural management.²²⁹ (See the sections on Targeted and Comprehensive Whole School Approaches).

Middle/Junior High School

Most drug education programs and evaluations are directed to middle/junior high school students. Gottredson and Wilson (2003) found that programs directed to this population were more effective than those directed to younger and older students, but that the effects were weak in all cases.^{230 231} The meta-analysis by Roona et al (2000) found that the most effective method at this level was the social influence model.²³²

Senior High School

Another approach to determining timing of programming is to base the decision on local student drug use data. McBride (2003) has put forward a three-stage approach that is based on students' behavioural development and use patterns.²³³ No evidence was found on the value of this approach but it is based on data and theory. The suggested age ranges presented here are based on the general Canadian picture (if there is reason to believe that the situation differs in a particular school or region, the curriculum should be adjusted accordingly).

According to this approach, the first stage of drug education is **inoculation**, which should occur prior to the average age of first use of a substance but when interest in the substance is occurring (e.g., for alcohol, about age 11-12 years or Grade 5-6). **Early relevance**, when most students are experiencing initial exposure and some are experimenting with the substance is the second stage (e.g., for alcohol about 13-14 years of age or Grade 7-8). An increasing number of students are beginning to use alcohol at this time, so providing relevant interactive opportunities to engage on issues relevant to them is likely to have meaning and practical value. The third and final stage is **later relevance**. The later relevance stage should be delivered at a point when students are exposed to higher risk forms of use, different situations, and/or different substances (e.g., alcohol, 15-17 years of age or Grade 9-11). Later relevance messages need to account for the level and pattern of use (for example, an alcohol abstinence message in a class where 60-70% of the students have used in the past year, and a quarter to a third have been drunk, will likely not be taken seriously by many). Recognizing that those students who choose not to use need to be supported in that decision, strategies for promoting safety and minimizing hazardous patterns of use also need to be considered for relevant substances at this point.²³⁴

Programs can be best tailored to a population by using local prevalence data.^{235 236} It is likewise important to have some insight into local youth culture, which tends to evolve rapidly.²³⁷ This represents an impossible challenge to most adults so it is best accomplished through activities that allow students to create their own 'real world' scenarios.²³⁸ Doing this builds in a flexibility that allows the targeting of drug issues as they arise or become pertinent, and the delivery of sessions that engage students with real, rather than abstract, scenarios.

Program length

Does the number of program hours have a bearing on effectiveness? In the literature this question is often discussed in terms of duration (e.g. number of weeks it takes to deliver the program) and intensity (e.g. hours per session and sessions per week). It has been commonly accepted that when it comes to program effectiveness, more program hours is better.^{239 240 241} For example, McBride suggests that 10 or more sessions per year through junior high school is preferable but if that is not possible, to follow the initial 10-session module with 4-8 sessions, followed by 3-8 second boosters and, if prevalence indicates, 3-5 third boosters in each subsequent year.²⁴² White and Pitt (1998) in their review of programs focusing on illicit drugs found that 80% of effective programs had 10 or more sessions.²⁴³ However, Cuiper 2002 concluded that there is no definite evidence that intense programs are more effective than less

intense programs.²⁴⁴ Gottfredson and Wilson (2003) found no difference in effectiveness between programs longer than 4.5 months duration and those shorter, but they acknowledged that duration may be a poor proxy for number of contact hours.^{245 246} While it remains clear that ‘one-offs’ or occasional presentations have no measurable effect on behaviours,^{247 248} the research on this question is not clear, and it may be in part due to confusion around the terms “intensity” and “duration”.

Evidence concerning booster sessions (i.e. shorter programs [3-5 sessions] offered in succeeding years to reinforce concepts and skills) is similarly mixed. Skara and Sussman (2003) found that programs using booster sessions were less likely to decay over the longer term (2 or more years),²⁴⁹ while Gottfredson and Wilson (2003) found no evidence that booster sessions improved outcomes.²⁵⁰

It may seem counterintuitive that a shorter program can be as effective as a longer one, but brief interventions (1-6 sessions) have been found effective with various higher risk populations (See Section IV C, Targeted Curriculum and Services for Higher Risk Students). While awaiting research to provide more clarity on this, decisions around program length are best driven by the particular aims of a program, bearing in mind that recommended interactive programs tend to require more time to process than lecture-based programs.

Delivering program as designed

The extent to which Canadian schools or boards use evidence-based drug education curriculum is unknown and it is not known how fully teachers implement the programs they do use. Across the U.S., Rorbach and colleagues (2005) found that less than half the school districts (i.e. boards) reported using evidence-based curriculum in at least one middle school.²⁵¹ How a particular program is identified for use in a district is an important question, with this same study finding that district drug coordinators had the most influence, followed by principals and teachers.

A number of drug education-related studies have shown that programs are more likely to have a significant impact on key outcomes when they are delivered as intended.²⁵² This is referred to as delivering the program with “fidelity” and it has been measured in five ways: (1) adherence to the program; (2) the amount delivered; (3) quality of program delivery; (4) participant responsiveness; and (5) program differentiation [extent to which key elements are present]. A survey of a national sample of U.S. middle school drug educators found that most of these teachers reported presenting the content as designed but fewer than 1 in 5 reported that they used interactive teaching methods more often than non-interactive methods, and only 14% implemented both content and process as designed.²⁵³

Similarly when Sobek and colleagues (2006) checked teachers' logs in a local survey, they found that interactive lessons were least likely to be used.²⁵⁴ The extent to which teacher deviation or adaptation should be discouraged has been debated, with some contending that any “program drift” will diminish outcomes and others arguing that some adaptation to meet local needs is often acceptable and necessary.²⁵⁵ However, if the most common adaptation or deviation is to deliver interactive programs in a didactic manner, outcomes are undoubtedly being affected and this should be viewed as a serious problem. See Section V. G., Factors Affecting Program Implementation in the Real World, for discussion on implementation and capacity issues.

Conclusion

A challenge for universal curriculum-based programs is in arriving at a successful “one size fits all” program.²⁵⁶ Universal programs are unable to tailor their content for minority groups or for higher risk youth who may be in those classes. Therefore, the intensity, dosage, content and method of delivery may not match particular needs. It appears that universal programs are more effective with lower-risk students.

Nevertheless, the literature points to modest, short-term effects for universal classroom substance education programs. Evidence-based interactive programs directed to middle/junior high school students have shown more promise than other levels. They can be expected to delay or prevent onset of use, hazardous use and harmful consequences among some of the students exposed to the programming.

This modest effectiveness can translate into a sizable public health benefit with broadly delivered programs. Caulkins (2002) estimated that for every \$US150 per participant in a school program (he based the analysis on Project ALERT) \$US840 is saved in health care, economic, and social costs.²⁵⁷ This figure takes into account that the studied program, as is the case for even the more effective programs, is not able to sustain its effects beyond a year or two. (For more information on cost effectiveness of this and other models, see Section V. F. Cost Effectiveness in Preventing Substance Use Problems through Schools).

Indeed, to put the effectiveness of school drug education into perspective, Tobler and Stratton (1997) note that the average effect size of interactive programs (averaging 10 hours duration) at 0.2 compares favourably to effectiveness trials in the medical field, where for example it was deemed unethical to withhold the release of aspirin because of its effect size of 0.035.²⁵⁸ So, universal junior high school curriculum-based programs have the potential to provide an important contribution to the prevention of adolescent substance use problems. The evidence is weaker for elementary and senior high school curriculum-based programs.

But even with active and widespread dissemination of evidence-based programs and guidelines in the U.S., research in that country has shown that the use of evidence-based school drug education programs is not common in that country. Moreover, the evidence-based programs in use in the U.S. are often not being delivered as intended. The situation in Canada isn't known but doesn't likely differ greatly.

B. Universal curriculum with aims other than abstinence

Over the past 10 years, some researchers have increasingly advocated for the implementation and testing of school drug education programs that include attention to outcomes other than abstinence from substances.^{259 260 261} This is based on the fact that a significant percentage of students in Western societies use alcohol and other substances (particularly cannabis) in the later high school years, often in risky ways. However current school programs often do not reflect this reality. In this context, a program that promotes abstinence as the only viable option may not be taken seriously by students.^{262 263} Even though official U.S. drug policy does not support outcomes to interventions other than abstinence, a U.S. review has expressed support for this approach. As a result of their meta-analysis, Roona and colleagues (2000) concluded that “promoting abstinence may not be a viable objective when substance use is normative in the culture, but preventing abuse and its attendant harms may be viable” (p. 20).²⁶⁴

Since a mistake or poor choice can result in drug-related harm or even death, high school students need to be encouraged to avoid hazardous patterns of use common in that population, and when hazardous use has occurred, to avoid harms. By neglecting to give attention to risky patterns or situations and how to avoid them or to minimize harms associated with them, a program misses an important opportunity to provide practical – possibly lifesaving – instruction on this issue.²⁶⁵ This message is best presented alongside a message that identifies abstinence as the most promising option for avoiding risks and harms. McBride suggests replacing resistance skills training (which has been shown to be based on faulty assumptions) with skills training to help youth reduce hazardous use patterns and harms when they do occur.²⁶⁶

There is limited information on when to introduce these types of aims and messages, but the decision is best made on the basis of the consumption patterns in a region – the most relevant information being the prevalence of hazardous patterns (e.g., binge drinking, drunkenness, use of more than one

substance, and use in risky situations such as before driving), however, the prevalence of past year use of a substance is also relevant (this may be the only information available for cannabis and other illegal substances). Each school board and health district needs to make its own determination on when, based on local data, it is necessary to focus on reducing hazardous patterns of use. For example, if in Nova Scotia (based on 2002 data) a rate of 50% or more of students having used alcohol or 25% having gotten drunk in the past year were seen as benchmarks, then a focus on reducing patterns of hazardous alcohol use would begin in Grade 9. This type of safety-oriented instruction should be provided within an overall message emphasizing abstinence as the safest option.

This has been referred to as “harm reduction” education and it has been controversial, with some stakeholders feeling uneasy about the approach. Research in Nova Scotia found that harm reduction messaging was viewed by stakeholders (i.e. parents, health officials, school personnel, and students) in 1998-2002 as acceptable with senior high school populations and not acceptable at the junior high level (with less clarity around Grade 9 appropriateness).²⁶⁷ A common concern around use of this strategy with younger students was that they didn’t have the capacity to make informed decisions concerning the context of substance use. This study didn’t distinguish between substances in discussions around acceptability.

The use of the term harm reduction for this kind of instruction is a red flag for some, and in some cases, may not even be a fully accurate term; much of it would be more accurately termed hazardous use reduction or simply demand reduction. According to definitions proposed by Stockwell (2006), harm reduction best refers to programs or policies that do not necessarily call for reduced consumption or a change in consumption on the part of the user.^{vi} Accordingly, instruction aiming to delay the onset of use, or reduce the frequency of use, the amount used or other hazardous use by students would all be considered “demand reduction”. The following are examples of hazardous use prevention or harm reduction messages relevant to adolescent populations, noting there is no research evidence to support their use at this point:

Hazardous use prevention:

- Do not use too much or combine two drugs – this use greatly increases the chance of unintentional injury and overdose.
- Do not use in risky situations such as before driving a car, boat, ATV or snowmobile, or being in a vehicle operated by a person who has been using, or before using other machinery; before studying or working; before sports or other physical activity; before sexual activity; when pregnant; when using medication; or when sick.
- Most street drugs have uncertain ingredients, which makes the effects of these drugs unpredictable and possibly dangerous. Also, street drugs are illegal, and a criminal record can present real problems in later life. If intent on using, try only a little bit at first to determine the strength of the effect.
- Do not use too often. If you are drinking or using other drugs regularly, ask yourself why? It may be that substance use is becoming too central an activity in your life, possibly masking other problems that you should be dealing with.

^{vi} In an attempt to reduce the confusion still surrounding these terms, Stockwell (2006) has proposed a breakdown drawn from a public health perspective which recognizes the need to address the agent (through supply reduction), the individual (through demand reduction) and the environmental context (harm reduction).

- Supply reduction: strategies that are intended to achieve social, health, and safety benefits by reducing the physical availability of a particular substance.
- Demand reduction: strategies which succeed by motivating users to consume less overall and/or less per occasion, but don’t necessarily call for abstinence.
- Harm reduction: strategies that reduce the likelihood of harm to health and safety without *necessarily* requiring a change in the pattern or level of substance use.

Harm reduction:

- Learn the signs and symptoms of overdose for alcohol (and possibly other substances) to allow you to respond effectively when emergency measures are required.
- Closely monitor someone who has used too much to ensure their own safety by, for example, helping them avoid a high-risk context (e.g., driving a vehicle).
- In the case of individuals who appear agitated or restless from use of a substance, provide calm support.
- In cases of ecstasy use, ensure that breaks are taken from dancing. Cool down and drink water regularly (to replace that lost by sweating) to prevent overheating and dehydration. Drinking too much water all at once can also be dangerous. Instead, sipping no more than a pint of water an hour when dancing is recommended.
- If someone you know is being harmed by their own substance use or that of a parent, learn what resources are available locally, and in a sensitive way, provide them this information.

These hazardous use reduction and harm reduction messages would be best developed with the active participation of students because they have an understanding of the hazardous patterns and contexts that occur in their community.

Most research on drug education originates from the United States, where the emphasis of drug education is on non-use of tobacco and illegal drug use, and postponement of alcohol use until at least age 21 (the minimum legal age of consumption). Generally, program evaluations have measured the extent to which young people abstain from, or delay, substance use after the program has been completed, and they may under-report or fail to detect some of the program's effects.²⁶⁸ As a consequence, programs may be assessed as ineffective even though they do have risk or harm-reducing effects that are not recognised by the evaluation measures used.²⁶⁹ Roona and colleagues (2000) however argued in the other direction suggesting an abstinence program may promote drinking games and other high-risk activities among those youths who are predisposed to consume alcohol because these activities are never discussed in an abstinence-oriented session.²⁷⁰

Although, little research has been conducted on the effectiveness of this type of instruction, Poulin and Nicholson (2005) reported encouraging results on the prevalence of several risk behaviours as well as use of several substances with a program that gave attention to risky use with a sample of senior high school students in Nova Scotia.²⁷¹

Likewise, McBride and Farrington (2004) reported lower levels of total and risky consumption of alcohol, and lower levels of harms associated with alcohol use in their evaluation of what they termed a harm reduction-oriented program (but which would more precisely be considered a mix of demand reduction/hazardous use prevention and harm reduction) for 13- to 16-year-old students in Australia.²⁷² Rather than focusing on skills to resist pressure to use, the **School Alcohol Harm Reduction Program (SHAHRP)** gave attention to skills to reduce risk and to reduce the impact of the harm.

The intervention was conducted in two phases over a 2-year period. The initial phase was implemented during the first year of secondary school when the majority of students were 13 years of age. It consisted of 17 skill-based activities conducted over eight to ten lessons (depending on lesson length of either 40 or 60 minutes). Phase 2 was conducted in the following year when the students were 14 years of age. It consisted of 12 activities delivered over 5–7 weeks.

The program activities incorporated various strategies for interactive dissemination including delivery of utility information; skill rehearsal; individual and small group decision making; and discussions based on scenarios suggested by students, with an emphasis on identifying alcohol-related harm and strategies to reduce harm. The program allowed students to discuss and

practice behaviours in a low-risk situation, using real-life scenarios, giving them relevant skills they could take with them into actual situations.

The authors reported that the results of this approach show behavioural change equal to or greater than programs that have adopted a resistance skills training approach. At 15 months following program completion, differences between intervention and comparison students were beginning to converge; nevertheless at that point students who participated in the program consumed 9% less alcohol, were 4.2% less likely to consume to hazardous levels, experienced 23% less harm from their own use of alcohol and 13% less harm from others' use of alcohol than did the comparison group.²⁷³ These are encouraging results and call for more investigation of the effectiveness of school-based programming aiming to reduce hazardous use and possible harms among students.

While the rationale is sound and the few findings are promising, it has been argued that the bar for evidence needs to be set particularly high for school programming that accepts youth activity that falls outside the law. As noted by Poulin (2005), school administrators have a duty of care to under-aged youth through the law and formal policy.²⁷⁴ It could be argued that well-based hazardous use prevention and harm reduction programming is in fact an important contribution to a school's duty of care responsibilities; nevertheless, that contention needs to be supported by more research to fully demonstrate the effectiveness of school prevention programs that include hazardous use prevention or harm reduction elements. In the meantime, schools and communities need to continue to seek acceptable responses to widespread hazardous use of alcohol and to a lesser extent other substances by young people in this country.

C. Targeted curriculum and services for higher risk students

Universal drug education curricula have been criticized for having insufficient focus and intensity to effectively address the needs of higher risk youth. Studies of the effect of universal programs on substance-using youth have shown either no effect or an increase in use.^{275 276} Youth may be considered higher risk on the basis of the accumulation of risk factors they are living with or on the basis of already engaging in early, hazardous substance use.

Some researchers and programmers group these populations together as "targeted" populations; others distinguish between them, referring to "Selective" prevention for those living with various risk factors (e.g. family and school factors), and "Indicated" prevention for those using substances in a hazardous way, but not at the level of dependency. Because there is significant overlap between these two populations during adolescence (i.e. adolescents with a number of risk factors tend to use substances more hazardously) and the evaluation research does not define these areas of risk in a consistent way, this review will group all programming directed to at-risk students together but specify the characteristics of the target group as closely as possible.

It has been suggested that the young people who benefit from targeted programming are those who present a "life course deviance" profile (as opposed to adolescence-limited).^{277 278} They have often experienced a range of challenges in earlier childhood as summarized in Section IV. Early substance use is considered an important risk factor for ongoing problems (e.g., school truancy and drop-out, theft, violence, heightened sexual activity, substance dependence and suicide), but the early use is itself usually an outgrowth of earlier factors. Consequently, while programming in early adolescence when unhealthy behaviours may be forming is called for, so too is programming earlier in the life course when risk factors may be more amenable to change.²⁷⁹

Early childhood/elementary level multi-component programs

Because of the length of the follow-up period, only a few studies have assessed effects of elementary level programming on later substance use, but those few have generally produced positive results on substance use outcomes.^{280 281} These early school interventions do not pay

direct attention to substance use but rather aim to improve educational environments, reduce social exclusion and aggressive and disruptive behaviour.^{282 283} Notably, they almost always have more than one component. Apparently central to the success of these programs is the school-parent partnership that leads parents and teachers to feeling more supported in their efforts and results in more success than those that target either teachers or parents or children alone.²⁸⁴ As is often the case with multi-component interventions, the extent to which each component is responsible for the behaviour change is not clear for these interventions.

Well designed targeted pre and early school programming can have long-term impact on a range of problem behaviours.²⁸⁵ In what would be regarded in the context of this report as a “school-linked” program, the well-known **High/Scope Perry Preschool Program** (Michigan) showed enduring impact. This randomized study followed at-risk children to age 40 and found that those receiving a daily high quality (including low child-teacher ratio) 2.5 hour class in addition to weekly family visits for two pre-school years obtained positive life-long benefits in a range of life areas, including academic achievement, income, criminal activity and substance use, when compared to controls.²⁸⁶ While intensive, the program demonstrated cost effectiveness (see Section V. F.).

The Montreal Longitudinal Experimental Study for high-risk boys included classroom social-cognitive skills training and a home-based parent training program over two years (ages 7-9). Tremblay and colleagues identified 366 disruptive boys at age 6, and randomly assigned them to experimental and control conditions. The boys in the experimental condition received school-based training to foster social skills and self-control. Coaching, peer modeling, role playing, and reinforcement were used in small group sessions on topics such as, “What to do when you are angry” and “How to react to teasing.” Also, their parents were trained at home approximately once every 3 weeks over a 2-year span. (The average number of sessions was 17.4.) The combination of parent and child training for these high-risk children in kindergarten and first grade reduced rates of delinquency and school adjustment problems at age 12. By age 12, the boys in the experimental condition were less likely to get drunk, committed less theft, were less likely to be involved in fights and had higher achievement than controls. The program also demonstrated a snowball effect in that the differences between the experimental and control boys increased as time went on.²⁸⁷

In the U.S., researchers with the **Fast Track** project are studying the effects of a multi-component school and family intervention to shift the trajectory of children considered to be at high risk for later anti-social and problematic behaviours. Fast Track is a randomized, controlled trial that distributed 891 children from 55 schools between intervention and control conditions.

The theoretic underpinning of this trial is that aggressiveness is an important risk factor for a number of later academic and social problems and that it arises from a mix of individual, family and school factors that cluster, interact and amplify each other in some children (for example, disruptive temperament in early childhood and weak parenting practices have the effect of aggravating and worsening each other).

This large trial identified children in kindergarten who were beginning to show signs of disruptive behaviour at home and school, and provided a mix of family and school interventions from Grade 1 through to Grade 10 with heavier programming in the first two years of elementary school and at the transition to middle school. Interventions included parent training, home visits, children’s social skills groups, peer-pairing sessions and a universal social skills development curriculum; the aim was to improve relationships with parents during the early primary school years, and (starting in grade 1) improve home-school relations, and the child’s social problem solving, peer relations, school bonding and academic performance. The ultimate goals are to reduce various problematic behaviours (e.g. violent and aggressive behaviour, substance use, delinquency, risky sexual behaviour, and mental health problems) during adolescence and into adulthood.

The latest reported follow ups (end of grade 5) showed improvements in social functioning, deviant peer involvement, and serious antisocial behaviour in their home and community, but notably did not have an effect on academic performance or school behaviour. It remains to be

seen whether the relatively small effects seen in these areas of functioning will have an impact on later substance use.²⁸⁸

The program had much more effect on higher risk children with fewer than half as many cases of conduct disorder diagnosed in the intervention group as in the control group at grade 5. A discussion of program costs vs. costs of crime and delinquency concluded that the program was cost-effective in reducing conduct disorder and delinquency, but only for those who were very high-risk as young children.²⁸⁹

Best advice 8: organize targeted elementary school programming to help parents and teachers impart basic personal and social skills to higher risk children; this programming can help students learn and prevent later problem behaviours, including hazardous substance use.

School-linked targeted family programs

It appears that “family-based” interventions are more effective than “parent-only” or “child only” programming in building protective factors and reducing substance use.²⁹⁰ For example, the **Focus on Family Program**, consisting of parent skill building without an intervention for children showed no effect on children’s substance use.²⁹¹ Typically, effective family programming aims to build relationship and communication skills separately among the parents and the children, along with opportunities to learn and practice skills as a family unit. These programs have shown positive effects on a number of risk and protective factors and have brought about reductions in youth substance use. The provision of transportation, food and childcare during sessions, as well as advocacy and crisis support programs increase the likelihood of attracting and retaining families and are considered important elements of these programs.²⁹²

The **Strengthening Families Program (SFP)** is a well-replicated example of a family program that has been shown to be effective with targeted as well as universal populations (See Section D, Comprehensive Whole School Approaches). The program involves whole families coming together in a school, community centre, or other public place. The format for each week of the 14 session SFP involves parents and children first participate in skill-building activities after which families come together to practice the skills (e.g. communication and conflict-resolution skills). Free meals, transportation, and childcare are provided.

The SFP has been evaluated in several randomized control trials over a five-year follow-up period. The results showed that, compared with the control group, children in the experimental groups were significantly less likely to use substances and engage in other adolescent problem behaviours. The program has been adapted with positive results for lower risk families, families with older children and families of various cultural backgrounds.²⁹³

A recent adaptation involved a three-year multi-site randomized controlled trial with Ontario families (along with families in New York State) recently affected by alcohol problems. To be eligible for the study, parents must have had an alcohol problem in the past five years and primary parenting responsibility for a child age 9-12 years.

Over the 14-week period, the **Ontario SFP** families met once a week in the evening for three hours. The program contained four components: dinner hour, Child Skills Training Program, Parent Skills Training Program, and Family Skills Training Program. Four trained facilitators delivered the program sessions (two in the parent session and two in the child session). SFP participants also attended a two-hour booster session delivered immediately after the first study follow-up assessment designed to reinforce the skills taught in the 14-week program. In addition to the assessment immediately following the program, families were assessed at 4 months and 12 months after program completion. The control group received the Parent Intervention Program which comprised written material on parenting and local contact information.

Although the trial has not published its results, the author has reported immediate and sustained positive effects for several family and child psychosocial outcomes, including: improved family functioning, more effective parenting techniques, reduced parent hostility and aggression, reduced symptoms of parent depression, reductions in children's externalizing behaviour problems, better child social skills and better child coping skills. SFP children also displayed a 37% reduction in alcohol sipping relative to controls.²⁹⁴

A review of targeted family programs has concluded that effective programs:²⁹⁵

- take a skills enhancing perspective;
- have broad-based content; program content includes cognitive, behavioural, and affective components;
- have a program length typically greater than 20 hours for children and families at elevated risk of developing problems;
- intervene as early as the risk factors can be clearly identified;
- are developmentally focused. (i.e., targeted at specific ages);
- use a collaborative process with parents, teachers, and children;
- focus on parents' and children's strengths (not deficits);
- utilize performance training methods; for example, programs that utilize videotape methods, live modeling, role-play or practice exercises, and weekly home practice activities are more effective than programs relying on didactic presentations;
- educate participants not only in strategies, but also in the developmental and behavioural principles behind them;
- promote partnerships between parents and teachers;
- emphasize the clinical skills of the intervention staff;
- are sensitive to barriers for low socioeconomic families and are culturally sensitive;
- have been empirically validated in control and comparison group studies using multiple methods and provide follow-up data;

Webster-Stratton and Taylor (2001) note that family or parent training can mistakenly assume that parent training simply involves didactically sharing information or teaching about child management strategies or behaviour modification principles. It might be assumed that this is relatively simple, that it makes little difference how clinically skilled the instructor is, and that the relationship focus is secondary to teaching parents particular skills. For higher risk families experiencing multiple stressors, or for those whose children already exhibit high levels of behaviour problems, they suggest a more clinically sophisticated therapeutic approach is needed when conducting parent training.²⁹⁶

Best advice 9: consider family skills programs to help higher risk families with elementary age children improve relationship skills; these programs can contribute significantly to family and child health and prevent later youth substance use.

Middle/high school programs

The most commonly evaluated approach to working with at-risk pre- and early adolescent youth is school-based life-skills programming.²⁹⁷ Programs targeting young at-risk adolescents in transition school years have been evaluated in Canada and the U.S. Ontario's Opening Doors program by DeWitt and colleagues (2000) assessed an in-school program aimed at preventing or reducing drug use and other deviant behaviour in high-risk young people during their transition from Grade 8 to 9.²⁹⁸

Opening Doors selected high-risk students using a screening test assessing demographic and behavioural characteristics. The program consisted of two separate program components running concurrently – a student program and a parent program. The student program consisted of instruction using a social skills training approach and a peer support component. Seventeen

sessions of approximately one hour in length were offered once or twice weekly over a 10-week period. Through group activities and discussion the program aimed to help students develop personal and social skills to enhance their school experience and relationship with peers, teachers, and parents. The program was intended to accommodate 10 to 12 students at a time.

The parent program consisted of five evening sessions of approximately two hours in length held on alternate weeks over the duration of the student program. It was intended to foster a positive home environment in which parents actively support and reinforce their children's school experience. It was hoped that improved parent-child interactions, better management of their children's behavioural problems, and reinforcement and support of the student program would contribute to a reduction of the prevalence and frequency of substance abuse, school drop-out, violent and other antisocial behaviour, and an improvement in academic achievement.

Participants in the experimental group showed several behavioural improvements immediately following the program; the effects had eroded by the 6-month follow-up, but were still somewhat in evidence relative to the comparison group.

The Opening Doors program is similar to the **Reconnecting Youth** program tested and widely disseminated in the U.S. In the Reconnecting Youth program, students at risk of dropping out of Grades 9 to 12 were offered "personal growth classes", small classes offering group support, friendship development, and school bonding. A specific skills training course was also offered based on four units: self-esteem enhancement, decision making, personal control, and interpersonal communication. Those receiving the program reported improvements in school bonding, self-esteem and reductions in deviant peer associations and were less likely to initiate substance use. However, the design of the study was relatively weak and reviewers have called for more rigorous evaluation of this program.²⁹⁹

Cho et al (2005) replicated the Reconnecting Youth program using a stronger study design and failed to demonstrate positive findings. In fact, at follow-up there were indications of the experimental group doing more poorly than the controls, and the authors raised the possibility that "deviancy training" had occurred among the high-risk youth in the experimental group. As the authors noted, "*Clustering high-risk students in the Reconnecting Youth classroom setting provides a consistent opportunity to affiliate and bond with deviant peers and removes the opportunity to spend that time in a regular class with more conventional peers*" (p. 371).³⁰⁰

Until further light is shed on this question, schools should carefully consider the potential for harm when selecting groups of at-risk middle or high school students for special programming.

Programs for Aboriginal students

Because relevance is important in all programming, culturally appropriate substance education programming is likely to increase the potential of programs for First Nations students. However, using Aboriginal culture as simply an "add on" to program content creates only vague awareness of cultural issues. The integration of both Aboriginal content and perception entails a deeper understanding of cultural values, practices and symbols.^{301 302} It also means recognizing that Aboriginal students are not a homogeneous population and can vary greatly in their perspective according to geography and location (e.g. reserve or urban). In their review of programming for Native American adolescents, Hawkins and colleagues found bi-cultural competence approaches to skills training to be most promising for reducing prevalence of drug use in Native American youth.³⁰³ This approach aims to equip young people with coping skills to negotiate between mainstream and Aboriginal cultures.³⁰⁴ In addition to coping skills training, the process of respectful relationship building (i.e., caring and sharing) with teachers, role models and Elders can profoundly influence a young person's sense of belonging to their community and to society.

Schinke and colleagues (2000) reported a long-term follow-up of a culturally-focused school and community intervention with about 1,400 Native American students in 27 schools in the U.S. Two

interventions were tested against a control condition: a school-based skills development program, and the skills plus a community involvement program. Youths in schools assigned to the control arm did not receive any intervention. Students in Grades 3-5 received 15 50-minute weekly sessions that combined conventional cognitive-behavioural skills development with culturally tailored content and activities. Cultural content addressed substance use issues and holistic concepts of health and health promotion among Native people. In the context of culturally specific situations, youths acquired new skills by applying them initially to role-play situations, then subsequently to situations volunteered by youths from their daily lives. The program included exercises that increased students' awareness of Native cultural traditions that run counter to substance abuse. Every session included homework assignments for youths to gather information and testimonies on relevant topics.

The school plus community involvement component aimed at reinforcing the skills developed in school. Substance prevention awareness messages were presented through a number of channels, including the students' families, teachers and school guidance counsellors, neighbourhood residents, law enforcement officials, and commercial establishments frequented by youths. Flyers and posters were distributed to businesses, health and social service agencies, schools, and churches. Informational meetings were also held for parents, neighbours, and teachers, informing them about intervention components youths were receiving. Informational sessions took place at local schools and included poster-making exercises, mural painting, skits, and problem-solving contests. Semi-annually, students in the two intervention arms received two 50-minute sessions booster sessions.

At the 3.5 year follow-up, both the students in the curriculum and curriculum + community arm were using alcohol and cannabis at a lower rate than the control students; neither intervention had any effect on cigarette use. Notably, the students in the curriculum arm were using these substances at a lower rate than those participating in the curriculum + community arm, which runs counter to accepted wisdom. This interesting finding could reflect networks of communication in a collective society, i.e., extended family culture and its influence on peer support could have impacted the behavioural choices of students participating only in the curriculum. The study reported gender differences and found that boys were more likely to have high rates of alcohol use, while girls were more likely to use cigarettes regularly, and there was little difference with cannabis use.

For his Cochrane review, Foxcroft (2003) concluded that this approach is one of the more promising approaches in the adolescent alcohol prevention literature.³⁰⁵

Best advice 10: for Aboriginal students, deliver substance education that employs a bi-cultural competence approach to equip students with skills to cope effectively in mainstream and Aboriginal cultures; this approach calls for ongoing trust building and collaboration between schools, public health and Elders and other respected Aboriginal leaders.

Brief interventions

For populations using substances hazardously but who aren't necessarily dependent, brief interventions employing cognitive-behavioural and/or motivational principles are increasingly used. These approaches, having shown substantial promise for addressing hazardous use of alcohol, tobacco, and other drugs with a range of populations and settings,^{306 307 308} are increasingly being evaluated for the secondary school setting.

Cognitive-behavioural approaches focus on methodically building skills to deal with current issues of the client/student. These approaches often include an assessment of the current situation followed by identification of personalised, usually time-limited goals and strategies which are monitored and evaluated. The approach is inherently empowering in nature, the outcome being to focus on acquiring and utilising new skills, with an emphasis on putting what has been learned into practice between sessions through homework.

Motivational interviewing, developed by Miller and Rollnick is a person-centered interviewing style with the goal of resolving conflicts regarding the pros and cons of change, enhancing motivation, and encouraging positive changes in behaviour. The interviewer's style is characterised by empathy and acceptance, with an avoidance of direct confrontation. Any statements about positive behaviour change brought up by the person in the discussion are encouraged to support self-efficacy and a commitment to take action.³⁰⁹

There is no consensus on what constitutes a "brief" intervention. Interventions may range from four sessions to 5 min to receipt of one or more feedback sheets in the mail. They are often conducted by a health professional in which case a screening instrument is used to identify those using substances at hazardous levels (for example, the Rutgers Alcohol Problem Index (RAPI), which includes questions designed to assess consequences of problems, such as hangovers, cognitive impairment, and interpersonal conflict).³¹⁰ However because hazardous drinkers are often reluctant to discuss their drinking with a doctor or other practitioner, online self-assessment followed by brief intervention in the form of personalized feedback about one's drinking has been found to be a popular intervention strategy among younger people.

There is some indication that targeted programming using these formats may be more effective for higher-risk adolescents than universal programs, but the evidence base is small because few programs have been rigorously evaluated. The meta-analysis by Gottfredson and Wilson (2003) found that cognitive-behaviourally oriented programs were more effective for higher-risk youth than others, but they called for more study in this area before drawing firm conclusions.

In their review of brief interventions for adolescents, Tait and Hulse (2003) found that brief interventions directed to adolescents were effective across a diverse range of settings (dental clinics, schools, universities, substance treatment centres) and, therefore, probably diverse clients. Most of the interventions reviewed drew on motivational principles; those focusing on alcohol had a small effect, and those addressing tobacco had no effect, while the effect for the few concerned with multiple substances appeared substantial, but the sample was too small to generalize broadly. Although the size of the effect for these interventions tends to be modest, it needs to be weighed against the amount of contact time involved.³¹¹

In a review and discussion of school-based brief interventions, Winters and colleagues (2007) did not identify any actually set in schools; they found 3 studies of brief interventions for adolescents based in other settings, all of which showed modest results.³¹²

At the post-secondary level, brief interventions (including online versions) have been found effective in reducing alcohol-related harms, and may have application in senior high school settings. One example is the Brief Alcohol Screening in College Students (BASICS) program which has been found effective in reducing binge and excessive drinking in college students in several long-term follow-up studies. BASICS consists of two one-on-one interviews designed to promote reduced alcohol consumption or abstinence among high-risk drinkers. The format consists of personalised feedback, including descriptive graphs presenting the person's own drinking patterns in relation to normative trends, negative consequences of drinking, and related attitudes and beliefs. An attempt is made to resolve ambivalence about changing one's drinking behaviour and to move toward a safer drinking plan.³¹³

A promising example of a brief intervention for alcohol problems in the secondary school setting has been rigorously tested in this country. Conrod, Stewart, Comeau and MacLean conducted a randomized controlled trial of the effect of a brief intervention targeting one of three personality profiles: anxiety sensitivity (AS), hopelessness (H), and sensation seeking (SS) in high schools in urban British Columbia and rural Nova Scotia.^{314 315} Students were randomly assigned to the appropriate personality intervention or to a no-treatment control group at each site and then reassessed 4 months later. All participating students had consumed alcohol in the previous 4 months; they were viewed as not yet having demonstrated significant drinking problems but at risk for doing so based on their personalities.

Interventions were delivered by therapists and research assistants and consisted of two 90-minute sessions spread across 2 weeks; the number of students per group ranged from 2 to 7. Each intervention incorporated principles from the motivational and cognitive-behavioural literatures. The three main components of the interventions were (a) psycho-education, (b) behavioural coping skills training, and (c) cognitive coping skills training.

The interventions began with the psycho-educational component – girls and boys were educated about the personality variable in question and the problematic coping behaviours associated with that personality style. Students were encouraged to discuss the short-term reinforcing properties of a variety of problematic coping strategies (including alcohol use) to help them understand their specific motivations for engaging in problematic and risky behaviours.

This was followed by a motivational intervention (weighing the short- and long-term positive and negative consequences of a particular behaviour) around the use of problematic behavioural strategies for coping with that particular personality dimension. Next, cognitive coping skills training helped students learn how to identify and challenge cognitive distortions specific to each personality, using stories and exercises from students' lives.

These brief interventions led to significantly better outcomes compared to the control group students as measured by rates of abstinence, reduced drinking quantity, binge drinking rates, and alcohol problems. Interestingly, the intervention appeared to have effects on aspect of drinking behaviour particularly linked to each of the personality types. For example, the sensation-seeking group was more likely to engage in binge drinking than the other two personality groups, and the intervention appeared to have more impact on this drinking variable for the sensation-seeking group than the other two groups.

The outcomes for this three-hour intervention were quite promising at four months and demonstrate the potential of a well targeted intervention, but it will be important to determine whether the effects are maintained over a longer period, and to replicate findings. It will also be interesting to learn whether a sustainable delivery format can be found, given that this trial was conducted by specifically trained therapists.

A bi-cultural competence approach has also been shown to be effective within a brief intervention program for Aboriginal youth which similarly targets personality and motivational factors.³¹⁶ Recent community collaboration led to the development and testing of a culturally relevant brief intervention program for First Nation youth in Nova Scotia designed to address the issue of alcohol abuse and prevention of alcohol problems among Mi'maq adolescents.

The pilot results were positive in that compared to pre-intervention, students who participated in the intervention drank less, engaged in less binge-drinking episodes, had fewer alcohol-related problems, were more likely to abstain from alcohol use, and reduced their marijuana use at four-months post-intervention. No such significant changes were observed in a non-random group of eligible students who did not participate in the intervention.

Future research should determine if the methodology for development of a similar intervention is effective for at-risk youth in other Aboriginal communities across Canada, and whether the promising, but preliminary results with marijuana mean that the benefits of the intervention might extend to adolescents' use of substances other than alcohol. This 2 x 90 minute program was delivered in a sustainable format through the training of local First Nation school guidance counsellors and police officers as co-facilitators.³¹⁷

Best advice 11: with at-risk students (including Aboriginal students), consider school-based brief interventions (fewer than 4 sessions); these interventions, when guided by principles of recognition, respect, sharing, and responsibility, have been found to promote abstinence and reduced hazardous drinking and alcohol problems.

D. Comprehensive whole-school approaches

The realisation that universal classroom substance education has been able to demonstrate only a small and short-term effect on student substance use has led some to call for a broader approach. The rationale is that so-called comprehensive approaches are better able to tap into the many spheres of influence or risk and protective factors at play in the lives of students in a way that's not possible with a strictly instructional approach.

In many cases, these factors (e.g. weak family management, early childhood aggressiveness) are linked to several problems (e.g. poor academic performance, deviancy, substance use problems), so the prospect of preventing multiple problems through a single broad initiative is another important rationale for comprehensive approaches. Nation (2003) suggests there are two important dimensions to comprehensive programming: *multiple interventions* (e.g. instruction, policy and services) and *multiple settings* (e.g. school, family, community, mass media).³¹⁸

Some comprehensive programs aim to address a number of risk factors, while others focus on building protective factors; their goal is to optimize students' relationships with the school so that it can provide a stable protective force—rather than, or in addition to, focusing more directly on the risk factors per se.³¹⁹

These “school connectedness” programs see building connections between teachers, learning and students as a way of achieving broad benefits both academically and in terms of well-being. Proponents contend that a focus on risk factors pertaining to single issues, such as substance abuse, has had a splintering effect on school efforts, and that attention to the school environment can not only help students learn more effectively but also reduce rates of bullying, violence, substance use, mental health problems, pregnancy, school dropout, and delinquency. The assumption is that a focus on school environment will be more effective and enduring than has been shown with single-issue education programs. Some nevertheless include a curricular component hoping to augment effects (it is possible that curriculum will help students to internalize abilities in a way that environmental approaches may not).^{320 321}

Greenberg et al (2003), in reviewing meta-analyses of comprehensive programs promoting youth development, concluded that effective programs:³²²

- involve student-focused, relationship-oriented classroom and school-level organizational changes;
- teach children to apply personal and social skills and ethical values in daily life through interactive classroom instruction and providing frequent opportunities for student self-direction, participation, and school or community service;
- foster respectful, supportive relationships among students, school staff, and parents, and;
- support and reward positive social, health, and academic behaviour through systematic school–family–community approaches.

Comprehensive initiatives can require more effort and resources, but proponents argue that resources can often be shared among different parties, and that moreover, they should not be seen as “add-on” projects but rather as a shift or reform in the way schools carry out their mandate. There is growing evidence for comprehensive approaches, including those focusing on school connectedness.^{323 324 325} Because the question of costs vs. benefits is an important issue, it would be helpful to know particularly “active ingredients” in these broader approaches; at this point, the relative contribution of the various elements is not clear.³²⁶

Elementary level

A growing body of research that includes a number of controlled studies suggests that interventions focusing on improving primary school environments can contribute to better learning outcomes while also reducing pathways to harmful substance use.³²⁷ Below are two elementary

level programs that aimed to build school bonding among students as a route to promoting academic success and preventing later behavioural problems.

The Seattle Social Development Project, developed by Hawkins and colleagues, is a universal intervention for students in Grades 1-6 that combines parent training with modified teaching practices. The intervention was conducted in 18 Seattle elementary schools, with students randomly assigned to experimental or control classrooms. The teachers were trained in proactive classroom management (i.e. providing clear expectations for behaviour, recognizing and rewarding compliance, use of encouragement and praise), interactive teaching, and cooperative learning. The parent training component consisted of optional parent classes offered in first through third grades, covering child behaviour management, academic support through improved communication, and prevention of antisocial behaviour.³²⁸

The 6-year follow-up compared results for three groups of students: those who had received a “full intervention” (grades 1 through 6), those who had received a “late intervention” (grades 5 and 6 only), and a no-intervention control group. The late intervention group showed little long-term effect while the full intervention group scored significantly higher than the control group on measures of school commitment and attachment, school achievement, misbehaviour, lifetime violence and sexual activity by age 18. At the end of high school, heavy drinking was reported by fewer of the students who had received the full intervention (15.4%) relative to those in the control schools (25.6%).

The researchers speculate that the program’s emphasis on school bonding and achievement may set children on a developmental path toward school completion and success that is naturally reinforced both by teachers responsive to motivated students and by the students’ own commitment to schooling.

The Child Development Project developed by Battistich and colleagues was intended to transform schools into “caring communities of learners”. Components include school staff training in the use of cooperative learning and a language arts model that fostered cooperative learning, buddy activities, and classroom decision-making. School-wide community-building activities were used to promote school bonding and parent involvement activities, such as interactive homework. This program was evaluated in a quasi-experimental study with 4,500 third to sixth grade students (average age 11 years) in 24 schools. Intervention and control schools were well matched. Results showed improvements in interpersonal and problem solving skills and in substance use and anti-social behaviour. When a sample of students was followed up in middle school, a number of positive effects were maintained, however effects on alcohol and cannabis use were no longer evident.³²⁹

Best advice 12: at the elementary school level, implement comprehensive programs that focus on improving parenting skills and modifying teaching practices; these programs can increase school commitment and school achievement, and reduce misbehaviour, lifetime violence, sexual activity and hazardous drinking over the long-term.

Middle and high school

Less research has been conducted on the effectiveness of social environments at the middle and high school level. The available research is inconclusive, but does suggest that secondary school re-organization and behaviour management practices may influence young people’s drug use.³³⁰

Dewit and colleagues (2002) reviewed this literature and identified several fundamental ingredients or components of school bonding or connectedness interventions that must be present to increase the likelihood of positive change in student learning and behavioural outcomes:³³¹

- Efforts to change the social environment of schools should be guided by an overarching set of principles that when implemented help to organize and guide the selection of

- programs and strategies (e.g. social development, or schools as community models). Incorporating these principles into the fabric of whole school programs allows the activities associated with one program component to reinforce and complement the activities of another and hence improve the likelihood of positive student outcomes.
- School reforms aimed at improving sense of school connections and other student outcomes need to recognize that children’s educational experiences occur within several imbedded contexts, starting at the classroom level and extending outwards to broader contextual influences. Programs that focus on just one of these areas at the exclusion of the others are less likely to succeed.
 - Programs that target school connectedness need to be sensitive to the developmental needs of students. For example, secondary students need to provide opportunities for decision-making at the classroom level at a time when there is a growing need for autonomy and independence.
 - Sustainable committees or networks consisting of students, teachers, administrators, parents, and members of the community operating according to a specified framework for action are needed.
 - Finally, whole-school programs may be effective in preventing the escalation of some behavioural problems but are unlikely to address the specific needs of individuals with severe problems. For this reason, school-connectedness programs should be supplemented with specialized in-school services such as student assistance programs that provide referrals, service recommendations, and follow-up support programs for students in greatest need of help

The Gatehouse Project reflects much of this advice and provides the best evidence of the potential for this approach at the middle/high school level. It is a well-evaluated initiative focused on Grade 8 students in 26 schools in Melbourne, Australia that aimed to improve the emotional well-being of secondary students through both individual- and environment-focused approaches. Rather than providing a set program, Gatehouse involved a structured process comprising:

- feedback from a student survey about students’ sense of personal safety, communication with teachers, and participation in broader school life;
- recruitment of staff in each school to a coordinating action team;
- an average of 40 hours of consultation and training for staff on specific curriculum or whole school strategies.

The interventions included:

- the individual-focused curriculum: an average of 15 hours of instruction in English, Health, or Personal Development classes that aimed to enhance understanding and skills for dealing with difficult situations and emotions;
- the environment focus: using whole-school strategies to address particular risk and protective factors in the school environment identified in the review of the current situation.

Strategies varied between schools according to students’ perception of the situation, but the implementation of school policy and curriculum elements that focused on social and emotional skills and strategies to promote inclusive relationships in the classroom were a part of all initiatives.

The project has been evaluated through a randomised, controlled trial design, and at 4-year follow-up a 25% reduction in marked health risk behaviours (i.e. substance use, early sexual activity, antisocial behaviour) was found between the intervention and control schools.³³² Interestingly, no differences on measures of school engagement or emotional problems were found between the two groups at 4-year follow-up.

An Alberta adaptation of the Gatehouse Project, Creating Opportunities for Resilience and Engagement (CORE) consists of a trial in 60 schools with a roll out and test in 8 schools per year. As with the Gatehouse project, the main goal is to reduce depression and the first pilot school is

already showing impacts on substance use. CORE involves the original Gatehouse investigators as collaborators. It differs from the original Gatehouse in that it gives attention to teachers and the school as a workplace; it measures social connectedness differently; and it lasts for three years instead of two. Importantly, the CORE trial will also include an economic evaluation, calculating the cost per case of smoking prevented and the cost per case of depression prevented.³³³

Best advice 13: at the junior high/middle school level, implement comprehensive programs that give attention to substance education as well as the school environment; these initiatives can be effective in reducing substance use, mental health problems, early sexual activity, and antisocial behaviour.

High school substance use-related norms and policies

What students, teachers and administrators say and do (i.e. their attitude and behaviours or behavioural intentions) in regard to substance use and abuse come together to form a school's norms on the disapproval/acceptability of different forms of substance use. A school's norms are the product of many influences including parents, the broader community and the informal and formal messages presented in school.

A clear association between school norms and substance use levels in schools has been found in the U.S. A nationally representative study found that in grades 8, 10, and 12, the probability of using cigarettes, alcohol, or marijuana was higher in schools where the norms reflected a greater tolerance for use of that substance, controlling for their own disapproval and for student and school demographic characteristics.³³⁴ The effect of school norms on one's own substance use was found to be greatest for Grade 8 students.

School drug policies are an important mechanism available to schools to address substance use issues and to influence a school's norms and culture. The content of policies is important but so is how they are developed, communicated and enforced.³³⁵ Evans-Whipp and colleagues (2004) recently reviewed the international literature on school drug policies and reported only a few studies of their impact, most of which were focused on tobacco policy.³³⁶

Most of the current knowledge on school drug policies is from the United States. The majority of U.S. schools have written policies prohibiting alcohol and other drug use. Although variation exists, when violations occur, the tendency in U.S. schools is towards punishment rather than remediation.³³⁷ Two-thirds of schools responding to a national survey reported that they "always or almost always" suspend a student for an alcohol or illegal drug use violation. However, many schools also take at least one remedial action in these instances. Referral to a school counsellor, suspension from school and encouragement to participate in a student assistance program are frequent responses; for illegal drug use violations referral to the legal authorities is a typical response.³³⁸

Since the Evans-Whipp review, a collaborative, longitudinal research project, the International Youth Development Study, has begun examining school drug policy in Victoria, Australia, and Washington State in the United States and has reported findings. Australia and the U.S. were selected due to the differences in their policies in relation to antisocial behaviour and substance use. About 3,000 students in either Gr. 5, 7 or 9 participated in each state, and students reported similar levels of anti-social behaviour in both locales.

Both states reported a range of alternatives to out-of-school suspensions. These included in-school suspensions (student sits outside the Principal's office or in the office area with work to complete), time out in off-site "teaching units" for periods of time, withdrawal of privileges (e.g., school camp, school excursions), writing a contract stating the terms under which the student can remain at school (e.g., attend counselling, anger management training), and recommending that a student move to another school for a new start to keep the student connected to school.

The study found that, controlling for other factors, U.S. males were much more likely to receive a punitive response (i.e. suspension or arrest) from their anti-social behaviour, and importantly, that school suspensions significantly increased the likelihood of antisocial behaviour 12 months later.

The authors speculated on why school suspension increased antisocial behaviour in this sample, suggesting the following possibilities:

- students who experience suspension may rebel by engaging in further antisocial behaviour;
- suspending students from school may disconnect them from a positive social environment and increase their exposure to other risk factors for antisocial behaviour (e.g., failure to complete schooling);
- students who have been suspended from school may also experience a negative stigma within the school community;
- suspending students may increase contact with other at-risk young people, for example, by providing the opportunity for those suspended to meet together while excluded from school.

They further suggested that assisting high-risk youth to maintain links with school and facilitating interactions with 'non-deviant' peers may be important.³³⁹

Best advice 14: develop school policies that help higher-risk students maintain links with school and with 'non-deviant' peers; this approach is more likely to promote their well-being, whereas suspension increases likelihood of increased antisocial behaviour.

Role of the physical environment

As noted in the chapter on risk factors, the physical environment can serve as a risk factor for substance use and violence through unsafe or "un-owned" places in and around schools, such as hallways, dining areas, and parking lots, where school personnel are not typically present. Reid (2006) argues that the role of the physical environment in relation to school problems needs to recognize the interplay that exists between the individual (e.g. personality; not enough to do), the situation (e.g. bullying incident), and the environmental context (e.g. lack of enforcement of school rules) when substance use and violence issues arise in a school setting. Recognizing this, Reid contends simply identifying and altering places that have the potential to act as niches may not be sufficient. Multi-level intervention that looks at school norms or patterns during the school day, development of a broader range of extracurricular options, as well as possible alterations in the physical environment should be considered.³⁴⁰

School-community programs

Interest in school-community partnerships on various issues has burgeoned in recent years. These initiatives reflect various levels of formality and orientation but they generally share a recognition that single issue/single intervention efforts are less likely to succeed and tend to fragment precious resources. Some partnerships are connected to efforts to reform community health and social services; some stem from the youth development movement; a few are driven by school reform; and others arise from community development initiatives.³⁴¹ These programs are sometimes referred to as **school-linked services**, defined in Adelman and Taylor (2003) as "the coordinated linking of school and community resources to support the needs of school-aged children and their families" (p. 353). These initiatives differ in terms of the degree of system change required and have been categorized as informal, coordinated, partnerships, collaborations, or integrated services.³⁴² As would be anticipated, most initial efforts focus on developing informal relationships and beginning to coordinate services. They may have any number of specific aims that in some way address substance abuse concerns, for example:

- improve access to health services (including substance abuse programs) and access to social service programs, such as foster care, child care;

- expand after-school academic, recreation, and enrichment, such as tutoring, youth sports and clubs, art, music, museum programs;
- build systems of care, such as case management and specialized assistance;
- reduce anti-social behaviour (preventing drug abuse and truancy, providing conflict mediation and reducing violence);
- enhance transitions to work/career/post-secondary education, and;
- enhance life in school and community, such as programs to adopt-a-school, use of volunteer and peer supports, and building neighbourhood coalitions.

As Adelman and Taylor (2003) report, the logic of comprehensive, school-linked approaches is appealing, however their complexity can be overwhelming, and implementation and evaluation extremely daunting.³⁴³ Due to the poor methodology of the studies that have examined multi-component programmes, Flay (2000) found little evidence that combining 'social environment change' (such as parent training, mass media and community-wide programmes) with school-based interventions was more effective than delivering school-based interventions alone.³⁴⁴ However, the Tobler et al meta-analysis (2000) found that "system-wide change" programs significantly increase the effect size of classroom programs (i.e. system-wide change = .27; and social influences: = .12; life-skills = .17 on their own). They identified two kinds of system-wide change programs: those that focus on shifting school climate and/or engage students in the learning process (as discussed in the previous section); and broader schemes supported by families and communities.

Project Northland is a rare example of a rigorously evaluated long-term school-community project.³⁴⁵ It was designed as a multi-component intervention that included demand (individual level) and supply (environmental-level) reduction strategies. In this way, Project Northland sought not only to teach students skills to effectively negotiate social influences to drink — but, at the same time, attempted to directly modify the social environment of youth (i.e., peers, parents, school, and community).³⁴⁶

Designed to prevent or reduce alcohol use among students, the intervention was conducted in three phases in 20 randomized school districts. Phase 1 was delivered when the students were in grades 6 to 8 and included a school-based program (social influence curriculum with peer leaders), parental education, peer leadership of alcohol-free extracurricular activities, and community-wide task forces. An interim (second) phase of the study occurred when the students were in grades 9 and 10. During those years, only minimal intervention (i.e., a short classroom program) took place. Phase 3 was implemented when the students were in grades 11 and 12 and focused on community organization and policies to reduce youth access to alcohol (e.g., responsible beverage service). Other components included a school-based curriculum on the legal consequences of underage alcohol use, parent education, print advertising of community events, and a campaign to discourage providing alcohol to adolescents.³⁴⁷

Patterns of alcohol use between the intervention and control groups were analyzed for each phase. During Phase 1, the increase in alcohol use was significantly greater in the control group when compared with the intervention group. Conversely, during the interim phase the increase in alcohol use was significantly greater in the intervention group when compared with the control group. During this phase, the students in the intervention group returned to the same level of drinking as others in their communities. During Phase 3, the increase in alcohol use was again greater in the control group than in the intervention group however, the effect was not as strong as was found in Phase 1. A significant reduction in alcohol sales to underage persons in the intervention group was reported in this phase.³⁴⁸ At 4-year follow-up there were no significant effects of the Project Northland intervention over the control group.

To address the need for more information on the effectiveness of components of comprehensive programs, Stigler et al (2006) conducted a later analysis of the five Phase I components of the above study: classroom curricula, peer leadership, youth-driven/led extra-curricular activities, parent involvement programs, and community activism. They found that the strongest effects

were documented for the planners of extra-curricular activities and parent program components. The classroom curricula showed moderate effectiveness, while the community activism component failed to show effect. The authors noted that “the interactions tested here did not provide support for synergistic effects between selected intervention components” (p. 269).

Best advice 15: understanding that many of the factors contributing to student substance use problems fall outside the purview of the school, consider linking and integrating school and community programs; doing so can address a broader range of individual and environmental factors and may delay use of alcohol among adolescents more so than either initiative on their own.

Universal family programs (school-linked)

As noted earlier, programs that work with families (that is, parents and children together) have more promise than those working with parents only.³⁴⁹ Programs need to focus on skill development rather than on simple education about appropriate parenting practices. Promising family strategies for preventing substance use include structured, home-based parent-child activities, and family skills training.

Parent and family programs directed to at-risk families (see Section C, Targeted Curriculum and Services for Higher Risk Students) have more research support than universally delivered programs. It has been suggested that selective programs that have proven effective in reducing substance use be tested with universal populations.³⁵⁰

The seven-session **Iowa Strengthening Families Program (ISFP)** is one such program, having recently been tested with all families in late primary school (6th grade). The ISFP program is delivered within parent, youth, and family sessions using videos that portray typical youth and parent situations. Sessions are interactive and include role-playing, discussions, learning games, and family projects. The sessions are structured such that children and parents are in separate groups for the first hour and come together to practice skills for the second hour. Young people's sessions in the ISFP focus on strengthening positive goals, dealing with stress and building social skills. Parent sessions focus on communication, monitoring and conflict resolution.³⁵¹

At the five-year follow up, effects on alcohol use and aggressive behaviour were found and a cost-benefit analysis found a return of US\$9.60 for every dollar invested (see Section V. F. for further discussion on cost effectiveness).^{352 353} Importantly, the effectiveness of this intervention seemed to increase over time, reflecting the developmental orientation of the intervention. The program needs to be evaluated on a larger scale and in different settings to confirm these results.³⁵⁴

Australia's **Triple P (Positive Parenting Program)** employs a broad multi-component approach recognizing that parenting practices occur in a community and societal context that is not always supportive. Triple P hypothesizes that parents have varying needs for information, support and assistance, depending on their circumstances, and that optimally, various levels of programming need to be available to respond. The Triple P model includes media based universal messaging, brief information, universal parenting programs focusing on children's transitions, more intensive parenting programs for at risk families, and therapeutic interventions for families experiencing significant problems all accessible in a manner that promotes parents' sense of self-efficacy,³⁵⁵ Small trials of Triple P interventions delivered by researchers have shown positive results at one-year follow-up.³⁵⁶

Best advice 16: for late elementary school level families, consider linking to universal family skills programs in the community that aim to develop relationship skills among family members; these programs reduce student alcohol use and violence over the long-term and are cost effective.

Conclusion

The factors associated with substance use overlap closely with the factors associated with social development and academic outcomes. Consequently school connectedness programs may simultaneously promote academic success and healthy social development, while also helping prevent substance abuse and other problem behaviour. This makes good intuitive sense and the limited available evidence is encouraging. While awaiting replication of efficacy trials such as the Gatehouse Project, the message is becoming clearer: those who are concerned with substance use and other problems behaviours need to begin to form alliances with each other and with those in the school community interested in whole school approaches to improving academic outcomes.^{357 358}

This perspective calls for prevention programmers and educators to see prevention and positive youth development as a central part of the school's mission and to shift away from the long-standing view of prevention as add-on, time-limited "projects".³⁵⁹ As Schaps and Battistich (1991, quoted in Adelman and Taylor, 2003) suggest, "*Under this conceptualization, the term 'prevention program' would be inappropriate. The program would disappear as a separate entity; it would be seen by both faculty and students as an integral, inseparable part of the school*" (p. 345).

Comprehensive, ecological approaches may also call for a shift in how evaluation is conducted. Some suggest that the experimental model doesn't lend itself well to evaluating these broad, multi-component efforts.³⁶⁰ For example, because each school in a trial must, by the very nature of these approaches, devise their own particular strategy it may be difficult to assess what is really occurring. Also, experimental studies, because they call for strict controls, lend themselves best to short discrete interventions while comprehensive initiatives require time to organize and to effect the school-wide changes being targeted.^{361 362}

The research issues are similarly complex for school-community initiatives. Due to their complexity, scope, and expense there are few evaluations conducted. Foxcroft (2003) in his Cochrane review, found little evidence of long-term effect for community initiatives focusing on youth alcohol use but concluded that they nevertheless ought to be considered by policy makers as the potential benefit may extend to other groups in a community, resulting in an economy of scale.³⁶³

E. Benefits to learning from addressing problematic substance use

As summarized in Section II, Impact of Substance Use on Health and Learning, although many adolescents that use substances do not experience problems as a result of their use, those that use frequently, heavily or in hazardous contexts are more likely to experience a range of immediate and longer-term harms. Effective school prevention efforts can be expected to help students avoid these various harms.

In terms of the academic benefits of addressing substance use, it is clear that substance involvement and academic performance are linked; but the nature of the association is debated.^{364 365 366} Some put forth a theory that academic problems lead to substances being used to cope with anxiety arising from the academic problems. They suggest that poor academic performers are more likely than high achievers to skip school, have disciplinary problems, and/or associate with deviant peers, and this may create a social structure that encourages substance use.³⁶⁷

Others contend that substance use leads to poorer academic motivation and achievement. This view sees high levels of substance use contributing to declining academic performance by reducing academic motivation and/or impairing cognitive ability. Substance users may place little value on academic performance and become less motivated to achieve high grades.

A third possibility exists – that both academic problems and substance use are the result of shared risk factors. According to this theory adolescent substance use and poor academic achievement are both caused by the same set of underlying personal and social risk factors. In effect, the degree to which students are likely to engage in substance use varies with their involvement in other behaviours (problem and conventional).³⁶⁸ The longitudinal study of New Zealand youth by Fergusson and colleagues supports this view. They found that youth who reported cannabis use before the age of 15 years were much more likely to have left school before age 16 than those who hadn't, but that the early cannabis users differed from the others *prior* to using cannabis. These students showed early tendencies to delinquency, poorer mental health and educational achievement, more affiliations with delinquent or substance-using peers and more family dysfunction.³⁶⁹

Due to limitations in study design, the question of which factor, poor academic grades or substance use, precedes the other in the course of adolescent development remains unclear. A national U.S. study conducted by Bryant et al (2003) found that poor academic grades coinciding with early cigarette use were a key risk factor for later substance use. Those who reported higher grades in early adolescence were less likely to increase their cigarette and marijuana use over time. A study following U.S. adolescents who had completed substance abuse treatment found that at one-year follow-up, those who had stopped or reduced use of alcohol, stimulants and other drug use showed improved school attendance after controlling for other factors. Interestingly, any use of cannabis beyond complete abstinence by this sample was associated with poorer school attendance.³⁷⁰

Although the causal pathway linking academic performance and substance use is not completely understood, it is generally agreed that adolescents with low academic grades are more likely to have substance use problems and vice versa. Lynskey (2006) suggests this explanation: that early or frequent substance use indicates and encourages movement into a peer and social network that promotes continued and escalating substance use while concurrently discouraging engagement with conventional roles and institutions.³⁷¹

Best advice 17: strive to fully infuse substance abuse prevention and health promotion initiatives with the core aims of schools; focusing on factors that affect both learning and well-being are more likely to be effective and sustained.

F. Cost effectiveness in preventing substance use problems through schools

As indicated in Section II, the economic costs of substance use problems to Canadian society are significant. While aiming to support the mission of schools, prevention programs can help to avoid some of these costs. A principle assumption surrounding the value of prevention programs is that they are less costly than the remedial and custodial interventions associated with later substance abuse and related problems. Yet there are few studies testing this assumption. Most of the evaluation research in this area still focuses on program effectiveness without specifying the resources needed.³⁷² One of the reasons is that economic evaluations are complex. In considering a program cost analysis, it is necessary to determine which costs to include.

According to Caulkins (1999), a “low cost” approach would include only program materials and teacher training time, accounting only for the costs that schools don't already cover.³⁷³ However, sound economic evaluation also calls for an estimation of the “opportunity costs”, that is, the value of all goods and services that society must give up in order to have the program, regardless of who pays for them. So, a “medium cost” analysis would include the low-cost expenditures but also include the teacher's salary while delivering program, because teacher time is being diverted from other subjects to the prevention program. A “high cost” analysis would include the medium costs plus the facility costs, permitting cost effectiveness comparisons with other drug demand reduction methods that usually include facility costs, like treatment and incarceration.³⁷⁴ In a school setting where the educational infrastructure of a school or school system is shared with the substance use prevention program it is challenging to separate and allocate these costs.³⁷⁵ It

has been suggested that potential costs of using valuable classroom time to deliver drug education programs can be minimized by designing activities that have broader educational value (e.g. promoting critical thinking).³⁷⁶

Cost analyses for multi-component programs need to account for other costs, such as direct costs to other agencies involved in the intervention. “In-kind” support given by other agencies in the form of volunteer time and donated resources has economic value and should be estimated.³⁷⁷ Adult participants in parenting programs or other school-community initiatives will incur direct costs (e.g. transport, baby-sitting) as well as indirect opportunity costs that reflect lost productivity as a result of participating in the program. Program research and evaluation costs need to be included in a full accounting.³⁷⁸

While few cost analyses of school substance abuse prevention have been conducted, analyses of several models of prevention have been reported.

Universal classroom drug education

Caulkins (1999) conducted an analysis of Project Alert, a 30-session middle school program whose effects on drug use were shown to erode by two-year follow-up. Accounting for this erosion, he calculated that the per-student benefit of the program was considerably greater (\$840) than the estimated cost of running it (\$150) when considering the avoided future costs of tobacco, alcohol, cannabis, and cocaine use. According to Caulkins, the greatest cost savings were obtained from delaying legal substance use – tobacco use (43.4% of the benefits), followed by alcohol (31.1%) – rather than the two illegal substances considered – cocaine (22.2%) and cannabis (3.3%).

As is known of universal drug education programs, the effect of Project Alert was small. For example, it was estimated that the program could decrease lifetime consumption of tobacco by just 2.3% and alcohol by 2.2%. The cost effectiveness was achieved not because the program was effective in preventing a large proportion of substance use but because the small effect leads to a small portion of the very considerable social costs of substance use problems being avoided.

Aos and colleagues (2004) conducted a cost-benefit analysis of a number of universal classroom drug education programs, and found that all had some cost-benefit for reasons cited by Caulkins above, and also due to the relatively low cost of these programs on a per-student basis.³⁷⁹

Targeted early intervention programs

The High/Scope Perry Preschool Program (Section V. C.), delivered to low income 3 and 4 year old children was not a substance abuse prevention program per se. Like other Head Start programs it aimed to support the educational success of at-risk children, but in following participants and control children into adulthood it was found that the program had an impact on a number of social measures including criminal activity, substance use and employment. Consequently, the costs of this high quality intervention had broad enduring benefits to society as well as participants.

Although substance use benefits were not published, the cost benefit that can be obtained by strong preschool experiences are broad-based and worth noting. It was calculated that the average annual adjusted cost of the 2-year Perry Preschool Program was \$14,716 per participant (in 2001 dollars). For this cost, the program yielded public benefits of \$105,324 per participant at age 27, that is, \$7.16 saved for every \$1 spent, which broke down as:

- \$68,584 saved by the potential victims of crimes never committed (some of which were undoubtedly drug-related), based on the typical in-court and out-of-court settlements for such crimes;
- \$15,240 in reduced justice system costs;

- \$10,537 brought in by increased taxes paid by preschool-program participants because they had higher earnings;
- \$7,488 saved in schooling, due primarily to reduced need for special education services, and despite increased college costs for preschool-program participants;
- \$3,475 in reduced welfare costs.

The Fast Track program, a targeted multi-component program focused on elementary school children (See Section V. C.) found that its effects on social functioning of children at risk of behavioural problems were modest when measured at Gr. 4-5. Results indicated that the intervention was not cost-effective for children moderately at risk but was for the children at highest risk (considering the disproportionate costs to society in crime and delinquency caused by a relatively small number of youth).

Universal family programs

Spoth et al (2002) conducted a cost analysis of the school-linked universal family program, the Iowa Strengthening Families Program (See Section V. C.). The analysis measured the benefits of the program in preventing later alcohol dependence among children whose families were involved in the program (the rationale based on Grant and Dawson's (1997) finding that every year of delayed initiation of alcohol use reduces the likelihood of alcohol dependence by 14%). The program didn't use facilities that were otherwise in demand so there was no opportunity cost in this regard. The authors chose not to include an opportunity cost for parent participants because the program was voluntary and assessed favourably by participants. It was calculated that 5.53 cases of alcohol dependence were avoided for every 100 families participating. Lifelong costs for a case of alcohol dependence were calculated at \$119,633, and program costs per participant were \$12,459, resulting in a benefit of \$9.60 saved for every \$1 invested (1992 dollars). The authors suggested this benefit may be conservative due to the assumptions made in the calculations and the fact that intervention benefits beyond alcohol dependence were not measured.³⁸⁰

Accounting for the various benefits to society for a given intervention, particularly broad-based interventions, is challenging. Foxcroft (2003) suggests that broad community programs that, for example, aim to reduce alcohol-related harms among young people may also have an impact on harms in other populations, rendering the program more cost effective.³⁸¹ Similarly, Room and Paglia (1999) suggest that the broad application of several prevention programs in a population may have a cumulative positive effect that is less apparent in the evaluation of any of the specific programs.³⁸² Regardless, although more attention to cost analysis is needed, it is apparent from those that have been conducted that several school prevention models do have the potential to yield savings to society.

H. Factors affecting program implementation in the real world

A major question that arises from the experimental or quasi-experimental research findings reported in this knowledge summary (much of it conducted in the U.S. and other countries) is: how hard is it to take findings from controlled conditions and achieve the same results in programs in real-world settings in Canada? This is sometimes referred to as bridging research and practice, and it has generated considerable discussion and is increasingly the subject of study among researchers.

Given the sense of political and social urgency in the U.S., there has been a rush to disseminate programs that have been found to be effective in small, well-controlled efficacy trials, which has been criticized. Without replicating a program's findings with different populations in less controlled settings, it is far from certain whether the program will in fact prove to be effective outside the controlled conditions of an experiment.^{383 384}

There are a myriad of school drug prevention programs available that bill themselves as “evidence-based” according to the developing researchers or sponsors who understandably may be more enthusiastic about the program’s prospects than an objective observer. There are also a number of guides on evidence-based programs or principles that provide more objective advice, however these often reflect some bias as well.^{385 386} Consequently, school or public health personnel tasked with program selection or development need to be cautious and seek advice that is well-based.

If Canadian school personnel do not often refer to research articles or “best practice” guides when considering a new program (as their U.S. counterparts report)³⁸⁷ it is important that they seek advice from credible (e.g. government- or university-linked) public health or addictions experts. Also, to begin to understand the unresolved historical and contemporary issues facing Aboriginal peoples in Canada, school and public health personnel as well as researchers need to seek out information from elders or Aboriginal organizations.

Upon developing or selecting a program, a number of factors have been shown or suggested to influence whether implementation will be sustainable and of high quality. This section summarizes the research-based discussion on these factors for **classroom-based models** and **whole school approaches**.

Classroom-based drug education models

As was discussed in Section V. A., the extent to which teachers deliver evidence-based programs is low in the U.S. and believed to be low in this country. There are numerous factors that play into whether, and if so how, a teacher delivers a drug education program in a sustained high quality manner. These factors can be organized according to system-level and teacher-level factors.³⁸⁸

System level factors

School readiness: there are a number of factors linked to whether a school is ready to take on a new drug education program in an effective and sustainable manner. Schools well positioned to take on a new program:

- have formally assessed the need for programming;³⁸⁹
- have an open stance toward innovation and have built in processes for planning and preparing to implement new programs;^{390 391}
- have broad acceptance of the need and make the decision to take on a new program with teacher input rather than from the top-down.³⁹² It’s been suggested that a sense of personal commitment and ownership toward a new program/practice among teachers will result in stronger implementation than imposed requirements;^{393 394}
- have demands on teachers that are manageable(e.g. they are not overwhelmed by increasing class sizes or by preparing students for high-stakes standardized testing);³⁹⁵
- have determined how they can accommodate the program in a crowded curriculum;³⁹⁶
- consider a phased in approach:
 - Pre-implementation phase: this is the time to consider personnel capacities, materials required, total costs, space needs, school goals, the goodness of fit of a program, and time requirements for implementation. These types of issues become barriers to adoption and to permanence if not adequately addressed in the early stages. Upon addressing these issues, implementation plans are developed;³⁹⁷
 - Supported implementation phase: time during which teachers are trained in the program and receive ongoing in-classroom consultation on program; and;
 - Sustainability phase, when external support for implementation (i.e., training, consultation) has been withdrawn;³⁹⁸
- have confirmed the resources necessary to implement and sustain over the longer term (e.g. funding for training, to pay substitutes, etc.);³⁹⁹

- incorporate the program and program supports into the core business of the school; that is they “institutionalize” the program.^{400 401 402}

Swisher (2006) identifies the following as features of “institutionalization”:⁴⁰³

- being a line item in the permanent agency budget;
- having a place in the agency’s organization chart;
- having personnel or full time equivalents (FTEs) assigned to specific prevention tasks;
- having position descriptions that include prevention functions and level of effort;
- having facilities and equipment for program operations;
- developing an institutional memory for important agreements and understandings.

Leadership: leadership at the board and school level is critical to ensuring initial readiness and longer term implementation. Principals serve as “gatekeepers” for new programs that are introduced and implemented in their schools, so, their attitudes and behaviour can significantly affect teachers’ implementation of new programs.⁴⁰⁴ Knowledgeable and supportive school leadership can be instrumental in establishing school readiness as above (e.g. time, resources, incentives, and training allocated for the program as well as the expectation of accountability).⁴⁰⁵

Informal leaders, opinion leaders and champions in the community can be helpful in securing funds and overcoming barriers.⁴⁰⁶

Initial hands-on engagement by leaders needs to be continued to some degree. The pattern of handing off responsibility of the program following introduction often results in diminishing implementation over time.⁴⁰⁷ Sobeck and colleagues (2006) found that those to whom lead responsibilities are passed tend to have little authority to make decisions around resources or to deal with non-compliance. Nonetheless, an ongoing coordination position at the school or board level can be very helpful. A broad United Kingdom initiative to test widespread implementation of a drug education program (Blueprint, 2006) found a School Drug Advisor role to be vital for supporting ongoing implementation.⁴⁰⁸ Advisors’ tasks included:

- supporting classroom delivery, e.g. by working alongside school staff, teaching and advising on effective delivery of the lessons;
- acting as a link point for partnerships to support schools;
- acting as a local media contact;
- managing and co-ordinating a series of alliances in drug education designed to promote effective practice across schools with external contributors of drug education, and;
- managing a review of school drug policy.

Stakeholder support: Given the sensitivity around substance use issues, parents and other members of the community can undermine a prevention program if they do not accept or understand it.⁴⁰⁹ It is important to note that there may be two stakeholder perspectives in a community; one being an exaggerated anti-drug stance and the other a more realistic perspective about what schools can reasonably achieve. Hawthorne (2001) notes a paradox in that the former group can be instrumental in giving visibility to the issue but their rhetoric may lead to program criteria and expectations that are not realistic.⁴¹⁰ The need to harmonize stakeholder support is particularly important in considering drug education programs that aim to prevent or reduce hazardous use patterns and harms, particularly in relation to illegal drugs.

Murmane and colleagues (2002) in Australia note that the harm reduction and illegality issues create enormous dilemmas for schools, as they don’t wish to be perceived as “normalising” or being “soft on drugs”. When they consulted with school personnel they found that principals were concerned that drug education programming may lead to the school being seen as a “drug school” which will impact negatively on the school’s profile. Their work and the work by Poulin and Nicholson (2005) in Nova Scotia show that considerable confusion and concern exists among stakeholders around “harm reduction” programming in schools.⁴¹¹ Parent and community education and an open collaborative approach to arriving at clear program aims and elements are needed to reduce fears and misgivings.⁴¹²

Classroom level factors

Han and Weiss (2005) identified several classroom level factors that influence the quality and sustainability of classroom programs, including: (a) teachers' beliefs about their own abilities; (b) professional burnout, and; (c) their beliefs about the acceptability of the program.⁴¹³

Teacher self-efficacy: teachers' sense of their own abilities has been found to relate to educational outcomes such as instructional behaviour, persistence in a teaching situation, enthusiasm, and commitment to teaching, as well as student outcomes such as achievement, motivation, and students' own sense of efficacy. Moreover, teachers with a strong sense of efficacy appear more open to new ideas and more willing to experiment with new methods to better meet their students' needs.⁴¹⁴ This is noteworthy because there is evidence that teachers do not have a sense of efficacy with interactive methods or with this subject area.^{415 416}

Teacher burnout: Han and Weiss suggest three aspects of burnout with implications for teachers taking on new drug education programming:

- (a) emotional fatigue: a teacher that is tired and emotionally drained is not so likely to take up new additional programming.
- (b) depersonalization: educator no longer has positive feelings about students and display indifferent or even negative attitudes toward students.
- (c) a sense of low personal accomplishment from the job: teacher feels he/she no longer is contributing to students' development.

Teachers' perception of program acceptability: the issues mentioned above in relation to stakeholder support are particularly relevant to teachers. Drawing from Han and Weiss, several factors would likely affect teachers' judgments of a drug education program's acceptability, including: (a) their sense of the severity of their students' drug issues; (b) the acceptability of the aims and messages of the drug education program (as discussed above with stakeholders); (c) the effectiveness of the program⁴¹⁷ and; (d) the complexity and amount of time required to implement the program.⁴¹⁸ For example, Poulin and Nicholson found that harm reduction programming was viewed as unacceptable by teachers at the junior high school level in Nova Scotia in 1999.⁴¹⁹

Teacher professional development: given teachers' lack of comfort with the topic area and the fact that interactive methods, though critical to program success, tend not to be employed by teachers, professional development would seem to offer at least a partial solution. However, research doesn't provide strong direction. What appears clear is that training increases the likelihood that a teacher will actually implement a program,^{420 421 422} nevertheless implementation still declines over time (e.g. within the second year).⁴²³

Studies that compare live training workshops to video and self-instruction approaches sometimes but not always show the live sessions to result in higher implementation fidelity.^{424 425 426} Researchers have begun to explore the effectiveness of using new technologies to train teachers, such as online training and interactive training sessions via satellite television but no clear indication of effectiveness is available.⁴²⁷ Though research evidence is lacking at this point, there is a consensus that (whatever the mode) training needs to allow direct opportunities to observe, model, practice and receive feedback on interaction-based instructional skills in order to increase teachers' sense of competence with these methods.^{428 429}

Training may simply not be sufficient by itself to maintain quality implementation by teachers over the long term.⁴³⁰ In-class performance feedback has been shown to lead to enduring change in teacher performance.⁴³¹ When strong delivery of an effective program does occur, Han and Weiss suggest it will fuel a positive feedback loop, in that the teacher will experience success and be motivated to continue to correctly implement the program.⁴³²

Instructional skills training and opportunity for performance feedback are important when introducing a new drug education program but it is apparent that they are not sufficient to ensure ongoing quality implementation of the program. A broad workforce development approach, as is recommended in other areas of practice, is necessary.^{433 434} This approach would accept that advancing drug education practice requires long-term thinking and recognition of the importance of the organizational context within which programs are being implemented. A workforce development approach would also give attention to pre-service training for education students to improve their understanding and implementation of prevention methodologies. Swisher (2006) noted that most colleges of education in the U.S. are not providing this type of professional development;⁴³⁵ the situation in Canada is unknown but doesn't likely differ.

Best advice 18: employ a broad workforce development approach that accounts for the various factors affecting practice; the amount and quality of pre-service and in-service teacher education are very important but other factors are also at play.

Qualities of the program: although there is no evidence to date, it is quite possible that programs that are complex, that require significant preparation time, or have unclear guides, are less likely to be delivered as intended.^{436 437} This is also likely of programs requiring significant delivery time. It is clear that teachers have great difficulty finding enough time in their schedules to deliver extensive substance education programs along with the various other health and social development programs they may be called upon to deliver (e.g. HIV/AIDS, careers, character, civics, conflict resolution, delinquency, dropout, family life, health, morals, multiculturalism, pregnancy, service learning, truancy, and violence). The effect of this type of "issue de jour" approach has been criticized as having a fragmenting and disruptive effect on school efforts to address problems.⁴³⁸

Greenberg and colleagues argue for programming that not only better coordinates the issue areas but also ties them more closely to the academic aims of schools. They call for what they refer to as Social, Emotional and Academic Learning (SEAL) that recognizes and distills the common elements of the many health and social programs – but which importantly, also promote academic success. "SEAL" programming recognizes that many health, social and academic problems share common factors (self-knowledge, assertiveness, resolving conflicts, etc) that can be taught like academic skills in that learning is incremental, addressing increasingly complex situations students face with academics, social relationships, citizenship, and health.

Proponents argue that there is a strong theoretic rationale for students' social/emotional competence contributing to improved academic performance in several ways (e.g. students who become more self-aware and confident about their learning abilities try harder, and students who motivate themselves, set goals, manage their stress, and organize their approach to work perform better). Programs advocated by these researchers (see <http://www.casel.org/>) may be curriculum-based, but they often have multiple components including family programming and attention to school environment. The ability of these programs to improve a range of academic, health and social outcomes has some research support (the Seattle Social Development project, Section V. D. an example) and the rationale is persuasive.⁴³⁹

Another way of tying together academic and health and social aims is to integrate health/social topics into other subject areas. This has been proposed over the years and teachers no doubt find ways of accomplishing this through their own means but there has been little research attention to this approach. Swisher (2000) notes that U.S. National Institute on Drug Abuse (NIDA) researchers were working with teachers to develop lessons that combine a basic instructional objective and a prevention objective simultaneously and suggests this kind of integration of the subject matter could help sustain prevention objectives over the longer term.⁴⁴⁰

Coordination of whole school, comprehensive approaches

By their nature, whole school approaches require still more attention to school readiness issues as discussed above. Because these initiatives usually call for attention to the school environment,

and closer ties with parents, often accompanied by new curricular programming, preparation is critical. Researchers associated with Australia's Gatehouse project conclude that a great challenge for these approaches involving systemic changes is that they take a great deal of time and resources.⁴⁴¹

It is possible that the breadth of the changes called for with this type of approach may lead schools to shy away from them. If this approach is presented to schools as another project to add on, they may indeed be very hesitant. The demands on schools to promote academic success and also implement various social and health programs advocated by community interests understandably make schools wary of another "add on" program. Schools are typically so preoccupied with ongoing instructional and management reforms that social and health programs are often seen as beyond the schools core business and dealt with "off the corner of the desk".⁴⁴²
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Consequently, researchers increasingly claim that the long term success of comprehensive health and social programs lies in their ability to anchor them in the core mission of schools.^{444 445}
446 That is, they must fully accept that schools are first and foremost accountable for educating young people, and that they tend to become concerned with a problem when it is clearly a barrier to student learning. But the majority of students who end up having academic difficulties often experience a range of social/health barriers (e.g., violence, substance use issues, frequent school changes, and the numerous problems confronting recent immigrants and families living in poverty). So, a strong case can be made that these various social and health issues also represent barriers to learning, and call for schools, families, and communities to work together to address both through a comprehensive approach.⁴⁴⁷

Gatehouse researchers found that many of the schools they worked with initially saw the project as a "welfare and student support" project. But through the process of implementation they found that a focus on student engagement and connectedness to school was a sound way to promote both emotional well-being and learning outcomes.⁴⁴⁸

Adleman and Taylor point out that comprehensive approaches that are intended to support health and learning aims can paradoxically bring a new form of fragmentation. In many cases fragmentation arises because these initiatives focus mostly on linking community services to schools (e.g. substance abuse counselling) with too little thought given to connecting community programs with existing programs operated by the school. So, parallel (rather than integrated) programming can arise and personnel co-located at schools can find themselves operating in relative isolation of existing school programs and services. They point out that as a consequence a student identified as at risk for substance abuse, dropout, and suicide may be involved in three counselling programs operating independently of each other. Consequently various researchers have called for parties to move beyond program *cooperation*, and strive for program *integration*—with health/social advocates and educators working together to identify shared values, goals, and strategies.^{449 450}

A long-term view is required when implementing comprehensive programs and policies. It is important to understand that these initiatives will not likely lead to immediate change at the individual level. So some researchers argue that other interim markers of success associated with process need to be identified earlier (e.g. level of student-teacher trust) to guide schools.⁴⁵¹ Others suggest these initiatives be rolled out in sequence to minimize the strain on resources and to maintain interest. This was the approach taken by the government of the United Kingdom in its strategy to implement comprehensive school programming across that country in support of its national drug strategy.⁴⁵²

To facilitate roll-out and effective relations between programs it may be helpful to consider a "stepped-care approach" as advocated by Abrams and Clayton (2001, p. 324).⁴⁵³ A guiding principle of this model is the use of the least intensive (and expensive) level first and "stepping up" a "client" when a less intensive intervention has not been effective. Three steps are often proposed and in the school setting could take the following form:

Step 1: universal classroom and school-wide programming

Step 2: screening for higher-risk students who receive targeted brief motivational interventions

Step 3: more intensive clinical interventions for the smaller but important subgroup with severe problems

Comprehensive approaches often involve parents and this summary has found that the evidence for universal as well as targeted school-family programming is good. However, there are significant challenges to involving families in school programming. Programs seeking to involve parents often have problems reaching them. Participation rates tend to be very low and programs often fail to attract parents whose offspring are at the highest risk of substance use or other problems.⁴⁵⁴ Stormshak (2005) reports on one approach at the middle school level, the Family Resource Centre (FRC), which allows for more focused attention to parent engagement. These centres, staffed by half-time professionals, deliver specific family programming and more generally support school personnel in their efforts to communicate and work with families. The study design was not controlled but the authors reported that FRC services significantly reduced the growth in problem behaviour over the three years of study.⁴⁵⁵

Teacher training is an important consideration in the implementation of comprehensive programming. As has been reported earlier in this summary, the Gatehouse project included 40 hours of teacher training that was evenly divided between the curriculum and the environmental elements of the project. Another Australian study tested teacher training in the management of school substance use issues, and found that participating teachers demonstrated more favourable attitudes and practices in regard to integrated, supportive management of these issues in comparison to non-participating teachers; however they found little change in school practices.⁴⁵⁶

So, as is the case with classroom practices, it appears that training for policy or environmental change has some value, but needs to be a part of a broader, workforce development approach that accounts for the various factors involved with changes in school practices. This approach would also involve reviewing university teacher and school psychologist education to determine how best they can be prepared to contribute to comprehensive school approaches.⁴⁵⁷ Any such effort needs to view teachers in a broad ecological perspective and examine ways that their training, development, and work as professionals can engage them to take part in efforts that attempt to create optimal environments for them and their students.⁴⁵⁸ At the same time, social scientists and school health advocates need to receive more training to help them understand how to enter and work with school systems. Such training could help these professionals learn how best to develop joint agendas with schools to improve the range of student outcomes discussed in this knowledge summary.⁴⁵⁹

Best advice 19: pre-service and in-service training of teachers, counsellors, and school psychologists, as well as partners (i.e. police and addiction and mental health professionals) need to include how each can contribute to the whole school environment and comprehensive approaches.

Best advice 20: those wishing to partner with schools to promote learning and prevent substance abuse and other health and social problems need to increase their understanding of how to effectively seek entry and work with school systems.

VI. Special topic

Cultural competence and Aboriginal students^{vii}

A culturally competent approach to the prevention of substance use problems among Aboriginal students requires an understanding of the diverse histories and cultures of various Aboriginal people, because these broad factors do shape young persons' relationships with substances. However, one factor shared by many is the residential school system, which endured for 100 years. The direct and intergenerational impacts of residential schools have been devastating for Aboriginal peoples and their communities (see Section IV for related discussion).

A culturally competent approach to preventing Canadian Aboriginal student substance use problems entails an understanding of this history and the need for healing processes.^{460 461 462 463} Healing needs to deal with both the unresolved historical issues^{464 465} and subsequent contemporary issues facing Aboriginal youth.^{466 467 468 469 470}

In a culturally competent approach, traditional Aboriginal knowledge and contemporary wisdom are presented as equally integral to a student's development. Aboriginal knowledge is holistic in nature and health is viewed as having spiritual, emotional, physical, and intellectual elements. This holistic perspective is very compatible with a comprehensive school health perspective.

Cultural competence calls for the effective use of traditional teachings to address contemporary issues facing Aboriginal youth. Combining indigenous knowledge and contemporary wisdom can foster life skills that support healthy life choices and improved health and social and academic functioning. Respect for traditional teachings and an appreciation for their current relevance plants seeds of integrity from which youth can begin to grow and develop themselves as productive members of society. The integration of these cultural values is also the basis of a profound sense of belonging to the land, community and to society. A sense of belonging directly impacts the way a young person will care for themselves and for others.

The Aboriginal belief system contained in the seven teachings which govern life (i.e., love, humility, courage, respect, honesty, wisdom, and truth) are perspectives that can help young people to orient themselves positively as Aboriginal people while establishing or strengthening their personal identities. Each Aboriginal culture has its own belief system. While the seven teachings are found within many Aboriginal cultures across Canada and parts of the United States they do not necessarily originate with each cultural group. Those who do follow the seven teachings will each have a unique understanding and expression of the teachings according to their own cultural knowledge and beliefs.

Through cultural activities, practises, and ceremonies, Elders and other respected community members can contribute greatly to the effective development and implementation of a comprehensive approach to addressing the range of school health issues facing Aboriginal students in Canada. A vision of Aboriginal educators and Elders is that youth become strengthened, inspired and find a peaceful inner balance by focusing on traditional wisdom.^{471 472}
⁴⁷³ Reconnection to the land (environmental stewardship, sharing caring), ancestral teachings (cultural identity, self-determination, motivation), and cultural roles (mentorship, leadership) are some of the insights and skills Elders and community service providers can provide to youth which can support health decision making concerning substance use and other issues.

Working together, Elders and other respected Aboriginal leaders, along with Aboriginal and non-Aboriginal services providers can effectively provide Aboriginal youth with knowledge and skills applicable to their current lives. This calls for those involved to work together in partnerships based on principles of recognition, respect, sharing, and responsibility.^{474 475 476} Partnerships

^{vii} Note also discussion of Aboriginal issues in Sections III, IV, and V C.

such as these, committed to the health and well-being of Aboriginal youth, provide the strongest base for long-term, sustained action.

Partners in a cultural competency approach need to assist with the integration of cultural understanding and skills that encourage both personal development and retention of cultural identity. Partnerships need to view success as holistic in nature. Knowledge and skills should be seen as relevant and transferable to every aspect of a student's development (i.e., spiritual, emotional, physical, and intellectual). The ability of students to make these connections to every aspect of their lives is key to them becoming culturally competent, productive members of their community and society as a whole.

Much of this work focuses on relationships. The Aboriginal Healing Foundation advises, "In order for Aboriginal people to devise culturally appropriate healing modalities that will help them to overcome social disorders resulting from the historic trauma they experienced, a people-centered and a people-directed approach has to be adopted"⁴⁷⁷ (p. 77). A people-centered and directed approach focuses on relationships and involves treating others as related,⁴⁷⁸ a social value that has transformative power for human relationships and needs to be extended to the natural world as well.⁴⁷⁹

VII. Best advice from the knowledge summary

I. Develop a response based on a strong understanding of the nature and extent of the problem

- 1** schools need to base their substance use policies and programs on the best available local information on the nature and extent of student substance use and substance use problems; substance use needs to be understood in relation to age, gender, culture and ethnicity among other factors.
- 2** schools need to make preventing or delaying the early use (i.e. age 12/13 or earlier) of tobacco, alcohol and cannabis a priority. Because early use of these and other substances often results from factors evident in earlier childhood, universal and targeted programming prior to middle school is important.
- 3** at grade levels or in communities where rates of alcohol (including binge use) or other substance use are placing a significant proportion of students at risk, schools should consider delivering and evaluating drug education that aims to prevent or reduce hazardous use and harmful consequences.
- 3** recognize that the many factors that either increase risk or provide protection for substance use harms present themselves at different points in the life of a child and call for different responses during each developmental phase.

II. Implement universal substance education

- 5** at the junior/middle school level particularly, annually deliver universal substance education based on the Social Influences Model; this model can create a greater awareness of media and social influences, and help students develop skills to analyze and minimize their impact. Within this approach, accurate information that is free of moralizing needs to be available to students.
- 6** universal substance education needs to emphasize student-to-student, rather than student-to-teacher, interactivity; this may involve role-plays, Socratic questioning, simulations, brainstorming, cooperative learning, peer-to-peer discussion and service-learning projects.
- 7** classroom lessons are best led by teachers or leaders that are comfortable with and have competence in promoting interactivity among students on substance use issues. Teachers / leaders need to create a non-judgmental atmosphere in order to effectively lead these activities.

III. Ensure targeted programming for higher-risk students

- 8** organize targeted elementary school programming to help parents and teachers impart basic personal and social skills to higher risk children; this programming can help students learn and prevent later problem behaviours, including hazardous substance use.
- 9** consider family skills programs to help higher risk families with elementary age children improve relationship skills; these programs can contribute significantly to family and child health and prevent later youth substance use.
- 10** for Aboriginal students, deliver substance education that employs a bi-cultural competence approach to equip students with skills to cope effectively in mainstream and Aboriginal cultures; this approach calls for ongoing trust building and collaboration between schools, public health and Elders and other respected Aboriginal leaders.
- 11** with at-risk students (including Aboriginal students), consider school-based brief interventions (fewer than 4 sessions); these interventions, when guided by principles of recognition, respect,

sharing, and responsibility, have been found to promote abstinence and reduced hazardous drinking and alcohol problems.

IV. Strive for a comprehensive, whole school approach

12 at the elementary school level, implement comprehensive programs that focus on improving parenting skills and modifying teaching practices; these programs can increase school commitment and school achievement, and reduce misbehaviour, lifetime violence, sexual activity and hazardous drinking over the long-term.

13 at the junior high/middle school level, implement comprehensive programs that give attention to substance education as well as the school environment; these initiatives can be effective in reducing substance use, mental health problems, early sexual activity, and antisocial behaviour.

14 develop school policies that help higher-risk students maintain links with school and with 'non-deviant' peers; this approach is more likely to promote their well-being, whereas suspension increases likelihood of increased antisocial behaviour.

15 understanding that many of the factors contributing to student substance use problems fall outside the purview of the school, consider linking and integrating school and community programs; doing so can address a broader range of individual and environmental factors and may delay use of alcohol among adolescents more so than either initiative on their own.

16 for late elementary school level families, consider linking to universal family skills programs in the community that aim to develop relationship skills among family members; these programs reduce student alcohol use and violence over the long-term and are cost effective.

V. Give attention to the requirements of real-world implementation

17 strive to fully infuse substance abuse prevention and health promotion initiatives with the core aims of schools; focusing on factors that affect both learning and well-being are more likely to be effective and sustained.

18 employ a broad workforce development approach that accounts for the various factors affecting practice; the amount and quality of pre-service and in-service teacher education are very important but other factors are also at play.

19 pre-service and in-service training of teachers, counsellors, and school psychologists, as well as partners (i.e. police and addiction and mental health professionals) need to include how each can contribute to the whole school environment and comprehensive approaches.

20 those wishing to partner with schools to promote learning and prevent substance abuse and other health and social problems need to increase their understanding of how to effectively seek entry and work with school systems.

VIII. Recommendations for research

I. Epidemiology

- 1 Continue to pursue a coordinated approach to surveying student substance use among provinces to permit comparisons.
- 2 Conduct longitudinal studies of age of initiation and patterns of use among Canadian youth, given that the substances of choice and patterns of use among our youth likely differ somewhat from other countries.
- 3 Conduct research to clarify the difference in risk and protective factors between experimental use and hazardous use.
- 4 Conduct longitudinal studies to increase understanding of the role and weight of the various factors affecting development in the lives of children and adolescents.
- 5 Conduct critical analyses to better understand how various factors (e.g. race, gender, ethnicity, socioeconomic status, sexual identity, disability and culture) interact in shaping young peoples' identities, social experiences and use of substances.
- 6 Pursue research to better understand the relationship between substance use and mental health among students.
- 7 Conduct research to determine more clearly the relationship between substance use and learning (distinguishing between experimental use and more hazardous use).

II. Program response

- 8 Replicate studies of programs shown to be effective in efficacy trials elsewhere.
- 9 Promote evaluation studies that measure outcomes beyond abstinence from substance use to arrive at a better understanding of the effect of universal programs in reducing hazardous use or harms.
- 10 Promote the inclusion of analyses by gender in school prevention effectiveness studies.
- 11 Conduct research to clarify the cognitive ability of youth at various life stages to understand and apply hazardous use and harm prevention/reduction messages.
- 12 Conduct research to clarify the minimum amount of delivery time required for effectiveness in universal substance education.
- 13 Continue to study the feasibility and effectiveness of school-based brief interventions, such as the promising personality-specific brief interventions programming for at-risk students.
- 14 Continue to explore and evaluate bi-cultural approaches to programming for Aboriginal youth.
- 15 Continue Canadian replications of "Gatehouse-type" programming (as is occurring with schools in Alberta).
- 16 Conduct research to determine the nature of alcohol/drug school policies across the country.
- 17 Explore research methods that are able to capture processes and outcomes of broad, environmental initiatives.

18 Promote the inclusion of a cost component to Canadian school substance abuse prevention studies.

19 Because costs vs. benefits are an important issue, conduct research to identify particularly “active ingredients” in classroom and whole-school approaches.

III. Capacity and implementation issues

20 Conduct research to determine the extent to which Canadian teachers deliver substance education programs as intended, and the factors affecting teacher delivery.

21 Conduct research to determine what is being taught to Canadian teachers / counsellors-in-training around effective curriculum and whole school approaches.

22 Study models for collaboration between public health practitioners, researchers and education stakeholders toward infusing prevention into core school activities.

IX. Expert panel biographical information

Angela Paglia-Boak, M.A., is a research coordinator at the Centre for Addiction and Mental Health (CAMH). She is responsible for coordinating the Ontario Student Drug Use and Health Survey, the longest ongoing school survey of adolescents in Canada, which includes monitoring of drug use among Ontario students. She has authored and co-authored articles and book chapters in the areas of substance use, policy and prevention, including the review *Preventing Substance Use Problems among Youth: A Literature Review and Recommendations*, co-authored with Robin Room.

Nancy Comeau (PhD Interdisciplinary: Community Health & Epidemiology, Philosophy, Psychology) - Research background involves an interdisciplinary approach to mental health and addictions within an ethical framework. Academic interests include development of culturally relevant substance abuse interventions focusing on preventing substance abuse problems or intervening early before risky substance use behavior becomes chronic and ingrained. Particular attention is given to making interventions meaningful to individuals' lives; focus on relevant personality and motivational factors underlying alcohol misuse; incorporation of cognitive behavioral strategies and motivational interviewing techniques; and attention to the needs of Aboriginal youth. Nancy has published in peer-refereed journals on RCT of brief cognitive behavioural interventions targeting personality risk factors for youth alcohol misuse.

Marvin Krank is currently Professor of Psychology and Dean of Graduate Studies at UBC Okanagan. Dr. Krank has a Ph.D. in Psychology with an active research program in substance use with an emphasis on adolescents. His research focuses on the psychological determinants of drug use and drug effects including seminal work on the drug tolerance, drug withdrawal and cognitive models of addiction. Dr. Krank currently leads the Project on Adolescent Trajectories and Health (PATH) and directs the Alternative Intervention for Marijuana Suspensions (AIMS) project. PATH is a longitudinal research project on the social and cognitive determinants of risk-taking behaviours and their health outcomes in youth. AIMS is a targeted prevention program for middle and secondary school students suspended for marijuana violations in school. The program uses brief assessment and motivational interviewing to reduce marijuana use.

Jodi Lane, M.A., is a researcher at the Alberta Alcohol and Drug Abuse Commission (AADAC). As the Population Surveillance Team Leader, she is responsible for coordinating population surveillance addictions research in Alberta. Currently, Jodi Lane is the Project Manager of The Alberta Youth Experience Survey (TAYES), an ongoing student survey examining youth substance use and gambling behaviour. She has over seven years of research experience that includes project management, data analysis, and academic, legal, and media research. She has a broad research background in quantitative and qualitative research, including undertaking large-scale population-based projects, studying vulnerable populations, and performing organizational analyses.

Komali Naidoo, M.Sc., has worked as a Senior Research Associate for a private research company in Edmonton, as well as a Research Assistant in the Department of Public Health at the University of Alberta. Komali has also worked in the international setting on maternal health community-based projects in Guyana, South America. As the Evaluation Team Leader at AADAC, Komali has worked on projects such as the development of the Tobacco Basics Handbook, project management of the Evaluation of the ATRS Tobacco Cessation, Prevention and Protection Programs for Youth, development and presentation of evaluation workshops for AADAC Community Grant recipients, as well as providing tobacco-related statistical information for briefing notes, the Tobacco Basics Handbook and other requests.

David Patton received his Ph.D. from the University of Manitoba in 1994. He has worked in the addictions area for about 20 years, mostly conducting research; including looking at personality characteristics associated with drinking and drug use. He has received research awards from the Social Sciences and Humanities Research Council, Manitoba Health Research Council and the National Health Research and Development Program. During graduate school he published a

number of articles in the addiction field and made numerous presentations at national and international conferences. In 2001 he co-authored a book with Dr. Barnes entitled "The Addiction Prone Personality". He has worked as a policy analyst with the Manitoba government, evaluating changes to the primary health care system. He has also conducted evaluations for local agencies and the federal government. Currently David is the Research Director at the Addictions Foundation of Manitoba, which is a Crown Corporation whose mandate is to deliver prevention and rehabilitation services related to addictions.

Gary Roberts, M.A. Curriculum and Instruction, operates his own consulting practice providing strategic advice on addictions and related issues. In this capacity, he assists the Canadian Association for School Health, Canada's agency promoting a comprehensive approach to school health promotion. Prior to launching his practice, Mr. Roberts was employed or associated with the Canadian Centre on Substance Abuse (CCSA) for 12 years. In recent years, he has led several investigations into good practice in prevention among youth, including a participatory research project on assessing and mobilizing communities for the UN/WHO Global Initiative on the Primary Prevention of Substance Abuse (2004); the Drug Abuse Chapter for the UN's 2003 World Youth Report; the *Prevention of amphetamine-type-stimulant (ATS) abuse among youth: Good practice guide (2006)* for the UN. In the fall 2007 he evaluated a UN multi-component youth drug abuse prevention project in Central Asia.

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