BEST PRACTICES FOR PREVENTING SUBSTANCE USE PROBLEMS IN NOVA SCOTIA

November 2008

NOVA SCOTIA
Health Promotion and Protection

Addiction Services

BEST PRACTICES FOR PREVENTING SUBSTANCE USE PROBLEMS IN NOVA SCOTIA

November 2008

NOVA SCOTIA
Health Promotion and Protection

Addiction Services

BEST PRACTICES FOR PREVENTING SUBSTANCE USE PROBLEMS IN NOVA SCOTIA

ISBN 978-1-55457-285-4

Submitted to: Nova Scotia Department of Health Promotion and Protection
Addiction Services
PO Box 487, Halifax, NS B3J 2R7

Written by: Gary Roberts and Associates
Ottawa, Canada

Acknowledgements: Bette Reimer conducted the search of the literature, and Gary Roberts reviewed the literature and drafted the report. Earlier drafts of this report were revised based on reviews by officials of Addiction Services Department of Health Promotion and Protection, and District Health Authorities.

CONTENTS

EXECUTIVE SUMMARY 2

SECTION 1: INTRODUCTION 3

Aim of the report 3

Method 3

Theoretic basis of the report 3

SECTION 2: EPIDEMIOLOGY OF SUBSTANCE USE PROBLEMS 5

Factors linked to experimentation with substances 5

Factors linked to substance use problems 6

1. Risk and protective factors by life stage 9

a. Prior to birth 9

b. Infancy and early childhood 9

c. Later childhood 9

d. Adolescence 9

e. Adulthood 10

f. Older adulthood and retirement 10

2. Factors spanning several or all life stages 11

a. Social or structural determinants of health 11

b. Culture 11

c. Social inequity 11

d. Demographic and economic shifts 12

e. Social cohesion 12

Prevalence of substance use and substance use problems in Nova Scotia 13

1. Prior to birth (hazardous use of substances by expectant mothers) 13

2. Adolescents 14

3. Young adults (19-29) 15

4. Older adults 17

5. Conclusion 18

SECTION 3: EVIDENCE SUPPORTING PREVENTION MEASURES 19

A framework for prevention 19

Health promotion 19

1. Addressing the broad determinants of health 19

2. Early childhood and early school interventions 20

a. Home visit programs 20

b. Parenting programs 21

c. Early childhood education programs 21

d. Early school programs 21

Supply reduction measures 22
1. Substance-specific policy to reduce substance abuse 22
a. Alcohol 22
b. Tobacco 24
c. Psychoactive pharmaceutical products 25
d. Illegal substances 25
Demand reduction 26
1. Universal prevention 26
a. Mass media 26
b. School programming 29
c. Community-based strategies 32
d. Programming for families and parents 35
e. Programming for older adults 36
f. Workplace policy and programming 36
2. Targeted demand reduction 38
a. Interventions for higher risk families 38
b. Targeted school-based and school-linked programs 39
c. Brief interventions 42
Harm reduction measures 45
1. Measures to reduce harms linked to illicit substance use 46
a. Needle and syringe programmes (NSPs) 46
b. Supervised Consumption Facilities (SCF) 46
c. Heroin prescribing 47
d. Pill testing/drug analysis 48
e. Outreach approaches for persons at risk for substance use and other problems . 48
f. Affordable housing 49
2. Measures to reduce alcohol-related harms 50
a. Night life initiatives 50
b. Drinking and driving-related measures 51
3. Measures to reduce tobacco-related harms 52
SECTION 4: CONCLUSION 54
1. Potential harmful effects in prevention 54
2. Summary list of recommended practices 55
SECTION 5: GLOSSARY 57
SECTION 6: REFERENCES 60

EXECUTIVE SUMMARY

The use of various substances (including alcohol, tobacco, mood-altering pharmaceutical products, and illegal drugs) may hold benefits in some cases and be viewed as benign in others, but it does lead to very significant suffering and economic costs for Nova Scotians. Most would agree that concerted efforts are warranted to minimize these harms and costs.

Within a concerted approach, prevention is considered key. In the context used here, prevention refers to preventing and reducing immediate and long-term harms related to substance use. This aim may be achieved by preventing, delaying or reducing use or hazardous use through supply and demand reduction activities and by reducing the negative consequences of use through harm reduction activities. It may also be achieved by increasing access to the broad determinants of health across a population, and promoting child and youth development.

These aims are best approached by addressing the factors (protective and risk) that appear most linked to substance use problems. These factors can be best understood as arising from the personal (e.g. genetics, personality), interpersonal (e.g. family, friends) and broader societal (e.g. community norms, media) realms. Factors come into play at particular life stages and a developmental pathways approach challenges prevention workers to view them in a time and life context. Some factors, such as societal attitudes toward substance use, span all life stages and prevention workers need to determine whether and if so how they might realistically engage at that level. Prevention workers may also legitimately join others in the community trying to better understand the impact of Western values such as individualism and consumerism, on community health and substance use patterns.

Although prevention needs and opportunities exist across the life span, adolescents and young adults warrant particular attention because it is during this period that most substance use is initiated, and when patterns of use tend to be most hazardous. Alcohol, cannabis and tobacco are the substances of greatest general concern with this population in Nova Scotia, as with the rest of the country. Adolescents and young unmarried adults, particularly males, experience more than their share of harms. Incidents of hazardous use in this population result in injuries or deaths due to traffic crashes, injuries and deaths, suicide, and violence. Many of these harms and costs arise from hazardous patterns of alcohol use, hence reducing these rates should be viewed a priority. Driving under the influence of cannabis by Nova Scotian adolescents and their counterparts across the country has emerged as an important concern.

Prescription substance abuse has been viewed as a particular concern among older populations. Although there are challenges in defining prescription substance abuse, indications are that it may be an increasing concern in other age groups, including adolescents. Nevertheless, as the baby boom population ages, by virtue of their sheer numbers, prescription drug problems in this group may increase. It is likely there will be a need to better understand this issue in the province and to consider preventive action based on the evidence.

Prevention workers need to see themselves as having a health promotion mandate. Increasing evidence links at least some substance use problems to poor access to the determinants of health, so this review calls for prevention workers to monitor this evidence and work with others to promote more equitable access to these determinants for all Nova Scotians. Among the most potent determinants affecting later health, including substance use problems, are early childhood nurturance and development. Prevention workers need to support efforts aimed at supporting healthy child development in their communities.

Beyond broader health promotion opportunities lay a number of substance abuse-specific measures and activities that are supported by scientific evidence.

SUPPLY REDUCTION:

With legally available products such as alcohol and tobacco, supply reduction through increased pricing and reduced physical availability is an important lever and is generally acknowledged as among the most effective forms of prevention. The extent to which various initiatives to control the supply of illegal drugs has been effective is unknown because these initiatives are rarely subjected to scientific evaluation.

DEMAND REDUCTION:

Media campaigns aiming to change substance use patterns tend to show little effect on their own; the likelihood of effectiveness increases when messages are clearly defined and reinforced by local community initiatives. Evidence is stronger for media campaigns that aim to shift public attitudes toward support for "supply reduction" policy measures.

School programming is often seen as synonymous with prevention. While the best drug education programs (interactive programs based on the social influence model) have been shown to be effective when delivered as designed, the reality is that teachers don't generally have the time or training to deliver them in this way. There is no one solution to this dilemma but one step is to weave related health issues (e.g. mental health, bullying, sexuality, substance abuse) together rather than sequentially to better use precious time in the health curriculum. Initiatives that aim to improve the school environment for all students have been shown to produce benefits in term of mental health and substance use.

Community-based initiatives that are well designed, sustained and that focus on a specific issue (e.g. impaired driving among youth) have been shown to be effective. Effective initiatives tend to have several components (e.g. parent training, school programming, media support, and attention to alcohol sales).

Local data may indicate that targeted programming (based on an accumulation of risk factors or hazardous patterns of use) is warranted. Among targeted programs best supported by the evidence are family skills development programs (such as the Strengthening Families Program) and brief interventions. Brief motivational-based interventions are proving to be effective with a range of populations and contexts, including primary care patients, Aboriginal high school students, post-secondary students, non-dependent pregnant women, and with on-line formats providing immediate feedback to substance users.

HARM REDUCTION:

Measures that aim to reduce harms without necessarily changing patterns of use are rooted in a public health perspective. These measures focus on cultivating a healthier or safer context or environment in which substance use is occurring. Needle and syringe exchange programs have strong research support and should be available as needed. Other illicit drug-related harm reduction measures for which there is promising evidence of effectiveness are supervised consumption facilities and heroin prescription for long term injection drug users who have not responded to other measures, and outreach and affordable housing. Safer bar initiatives show good promise in reducing violence and various drinking and driving countermeasures have clearly demonstrated a reduction of alcohol/driving harms. There is good evidence to promote increased use of pharmaceutical nicotine with chronic smokers and to further explore the use of smokeless tobacco products within a rigorous regulatory scheme. It is important to bear in mind that these various measures need to be evaluated and appraised on the basis of their objectives (i.e. to reduce various harms) rather than an imposed objective (e.g. to promote abstinence).

While a number of the reviewed programs and measures have been shown to be effective on their own, there is good reason to believe, though the research support is limited at this point, that integrating specific programs into broader multi-component efforts is more powerful still. Effective multi-component efforts (whether set in schools, communities, nightclubs or workplaces, etc) include attention to policy or structural changes, and feature strong collaboration between the various elements. Substance use problems arise from many factors and a mix of health promotion and supply, demand and harm reduction measures will be needed to address them. What that mix actually consists of in each community or jurisdiction needs to be based on careful assessment of protective/risk factors and community capacity. Ultimately, the success of prevention efforts lies in the ability of prevention professionals to anchor initiatives in the core mission of the groups they are working with, whether schools, workplaces, nightclubs or any other setting.

SECTION 1: INTRODUCTION

AIM OF THE REPORT

The Nova Scotia Department of Health Promotion and Protection has initiated a process to establish standards of practice for prevention field workers that are informed by evidence. This report, and a companion report, Best Advice for Preventing Gambling Problems in Nova Scotia, support this initiative by providing summaries of the current scientific evidence in the two areas of practice. The findings of this review, particularly the best advice statements, will inform the drafting of provincial prevention standards.

The report is primarily intended for prevention professionals in the province. Technical terms are used, which are defined where they arise in the report (either in the text or in a footnote), and are listed in the Glossary on page 56. Though primarily intended for prevention professionals, the report presents recommendations for research that will be of particular interest to researchers and policy-makers.

METHOD

Given the breadth of literature addressing the prevention of substance use problems, first sought were recent credible reviews and meta-analyses of the full prevention literature. Secondly, reviews of particular prevention approaches (e.g. family-based programming) were searched. Finally, reports of rigorous primary studies published after these reviews were completed were searched. "Rigorous" in this sense means peer-reviewed studies with control or comparison group designs, control for attrition and measurement of effects at least one year following the intervention, as these provide the strongest evidence of effectiveness.

Databases searched were ERIC, Cochrane Library, Criminal Justice Abstracts, Human Resources Abstracts, Management and Organization Studies, MEDLINE, psycINFO, and Social Sciences Citation Index.

THEORETIC BASIS OF THE REPORT

Prevention is a broad, inter-disciplinary field and can be conceptualized in a number of ways. Consequently, it is important to be clear on the underlying theory and organizing logic for this type of review.

Substance use may have immediate (e.g. unintentional injury, overdose) or long-term (e.g. family stress, dependency, organ damage) consequences or harms. One doesn't need to be dependent on a substance to experience immediate or ongoing harms. Substance use problems are understood to lie on a continuum of severity – there is no sharp distinction between problematic and non-problematic use (Institute of Medicine, 1990). Within the Diagnostic and Statistical Manual (DSM)-IV, the American Psychological Association has nevertheless attempted to classify problems, distinguishing between substance abuse and substance dependence (APA, 1994).

The Institute of Medicine has adopted a framework that aligns with the DSM-IV by distinguishing between Universal prevention (targeting those without known risk or problems), Selective prevention (targeting on the basis of risk factors), Indicated prevention (targeting individuals engaged in "substance abuse") and Treatment (targeting persons with "substance dependence").

The DSM IV and Institute of Medicine frameworks have been very helpful in adding clarity to the understanding of substance use problems; however they have the effect of focusing on the individual without consideration of the broader context. These tools imply that substance use problems are the result of "pathology" within the individual, and understate the importance of various external factors and influences that may contribute to the individual's problem.

The Public or Population Health model provides a broader perspective on substance use problems. This model recognizes the broad range of associated factors and distinguishes between those pertaining to the Host, the Agent and the Environment. In the context of substance use, Host or Individual factors include genetic, personality and mental health issues; factors pertaining to the Agent pertain to the substance (e.g. toxicity, purity), and the Environment includes such factors as family and peer factors, and community and cultural norms.

Acknowledging the role of the Determinants of Health (including income, social status, social support networks,

education, employment, working conditions, physical environment, biology and genetics, personal health practices, coping skills, healthy child development and health services) is an explicit aspect of a public or population health perspective (Public Health Agency of Canada, 2004a).

Recognizing the broad range of contributing factors, this model accordingly calls for attention to a broad range of preventative measures, focusing on the individual, the substance as well as the environment. Stockwell (2006) proposed definitions for a public health-oriented classification scheme that will be used in this report:

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.

For the purpose of this review, "Prevention" refers to the prevention and reduction of immediate and long-term harms related to substance use. This aim may be achieved by preventing, delaying or reducing use or hazardous use through supply and demand reduction activities and by reducing the negative consequences of use through harm reduction activities. It may also be achieved by working toward more equitable access to the determinants of health across a population. The term "substance use problem" is used in this report as a generic term referring to immediate and long-term problems, substance abuse, substance dependence, as well as societal problems.

SECTION 2: EPIDEMIOLOGY OF SUBSTANCE USE PROBLEMS

FACTORS LINKED TO EXPERIMENTATION WITH SUBSTANCES

People have used substances throughout history to satisfy a need or serve a function. A drug may meet some needs or desires through its effects (e.g., relief of pain, feeling of pleasure), or through the symbolism associated with its use (e.g., feeling of belonging, sense of rebellion).

While this review will investigate substance use issues throughout the life course, substance use prevention is often discussed in relation to young people. This makes sense, for while there are very significant drug issues among other populations, it is during the younger years that most substance use begins. Moreover, young people tend to use substances in riskier ways than older people and this behaviour can result in significant problems, particularly in the short term. Because delaying the initiation of use is a reasonable prevention strategy, it is important to review factors that contribute to young people starting to use or "experiment" with one or more substances.

Adults and young people alike use substances for many of the same reasons (e.g., for stress relief, to heighten enjoyment); among youth there are also some reasons that arise from needs specifically related to adolescent development. 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 (Evans and Bosworth, 1997).

Access to mood altering substances in the form of alcohol, tobacco, pharmaceuticals, alternative medicines, nutraceuticals and illegal drugs has never been greater in Nova Scotia, locally and through the Internet. The availability of these various substances, the active marketing of the legal products, along with the norms and values of the community and broader culture are the backdrop against which substance use decisions are made (Ellickson et al., 2005).

Beyond the broad influences there are interpersonal influences involved in a young person's decisions to experiment with substances. A young person's sense of how common or normative use of a substance is may influence their use. 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 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 (Paglia, 1998). For some youth substance use is part of a lifestyle choice within which the substance use goes hand in hand with alienation, rebellion or the search for freedom and friendship (Caputo et al., 1996). What adults consider "deviant" behaviour may be viewed quite differently by adolescents. As one researcher notes: "Whereas adults notoriously underestimate negative behaviour to put themselves in a good light, youth notoriously overestimate negative behaviour to put themselves in a "good" light (Shaffer, 2007).

Decisions around substance use are also linked to perceptions of risk associated with a particular drug. As perceived risk associated with use of a drug increases, rates of use decline (Johnston et al., 2000). 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 (Johnston et al.). Adolescent attitudes and beliefs about substance use and risk tend to change rapidly and become more tolerant with age. More so than adults, youth tend to minimize the risks posed by their own substance use, with young males tending to do so more than young women (Paglia, 1998). It has long been acknowledged that young people tend to give less attention to long-term risks associated with substance use than they do to the more immediate social consequences (Dusenbury and Falco, 1995).

Any substance use presents the potential for problems. Even a single drug-using experience or a pattern of so-called "experimental" use can result in serious problems through, for example, overdose, an injury event, or in the case of illicit drugs, criminal prosecution. Many youth who do experiment with or continue to use substances do so in risky ways (e.g. large amounts possibly in unsafe settings) and these patterns can lead to a range of harm to themselves or others described further in the next section.

Continued use of a substance(s) will occur if in general a person perceives the positive effects (i.e. changed mood, perceptions or feelings) to more important and more

frequently experienced than negative effects (e.g. conflict with others, criminality, effect on relationships, anxiety, 'hangover effects', negative effects on education, work, and finances). "Substance use problems" are experienced occasionally by many who use alcohol or other substances; more regularly experiencing problems and nevertheless continuing to use is defined as "substance abuse" or "substance dependence" depending on the severity of the problems.

FACTORS LINKED TO SUBSTANCE USE PROBLEMS

Years of research have identified a wide range of factors that are linked to substance use problems. The terms "protective factors" and "risk factors" are often used to identify aspects of a person and his or her environment that make the development of a given problem less (i.e., protective) or more likely (i.e., risk) (Spooner et al., 2001). Some individuals experience several of these factors (e.g., older persons living alone with few financial resources and no extended family) and these persons are considered to be at risk for substance use and other problems. Increasing levels of risk are associated with greater prevalence of problems. The presence of more protective factors has been shown to lower the level of risk and it has been suggested that the effect of protective factors is greatest at higher levels of risk (Catalano, 2002; Cahill et al., 2005).

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 at risk as a population. Eckersley (2005), for example, 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. While there is some merit to this view, some individuals and families clearly experience more risk factors than the norm.

Table 1 depicts a summary of those factors that have been identified by rigorous research drawn from Loxley and colleagues (2004). The many factors that contribute to individual well-being or substance use problems can be organized according to those pertaining to an individual, his or her family, the community and the broader society or macro-environment (and for young people, friends and the educational experience also loom large). The extent of social support a person experiences at various points through the lifespan represents a substrate that will mitigate or aggravate all the other factors. Also, one's social position and their perception of it is also an important backdrop with health implications throughout the lifespan (see discussion of the macro-environment). Factors in all of these domains interact with each other to form a complex web of causation at any given point in the life of an individual. For example, a change in the young person's personality at a particular developmental point will affect, and be affected by, changes in parenting practices or parent relationships (Lerner and Castellino, 2002).

There are limitations and cautions that need to be noted with risk factor analysis. As has been noted in this review, the reasons some youth initiate use of a substance, continue to use, or use in a problematic way all have different factors associated with them. However, studies do not use common measures of a substance use problem, with some studies measuring 'past year use' in relation to various factors. Moreover, what some may view as "problem behaviours" are viewed by youth themselves as normative and endorsed by their culture.

A developmental pathways approach is being advocated as a way of better reflecting the dynamic relationship between various factors, as perceived by the individual (France and Homel, 2006). With a developmental pathways approach (Spooner and Heatherington, 2004):

- 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. an older adult who has just retired and lost a spouse).
- The balance of the number of risk factors relative to the number of protective factors is important in determining likelihood of problem behaviours.
- Interventions early in problem pathways, not just early in life are advocated. It sees life transition points, such as beginning school, and moving from one level of schooling to the next (i.e. junior high or middle school to high school), beginning working career, retirement) as important developmental points during which an individual may find themselves at increased risk. Other events such as moving to a new community, the

separation of one's parents also represent transitions that are points of possible vulnerability.

- 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).
- Individuals around whom a number of risk factors have accumulated are generally viewed as being at high risk.
- Risk factors can also be environmental or situational; for example, features of licensed premises can impact upon levels of violence.

The various problem behaviours (e.g. problematic substance use, mental health problems, teen pregnancy, violence and criminal activity) share many, but not all, of the same risk factors and developmental pathways; one study concluded that most risk factors associated with substance use were nested within the risk factors associated with delinquency, but over half of the risk factors associated with delinquency were not linked to substance use (Spooner and Heatherington).

With adolescents, it is important to bear in mind that some measure of deviance[1] can be seen as part of normal development. From the criminology literature two distinct forms of deviance with very different trajectories have been identified: a life-course persistent deviance and adolescence-limited deviance . While it has been suggested that there is blurring across these forms of deviance, it does raise the question of whether a similar distinction for adolescent substance use may exist (Spooner and Heatherington).

There is much to learn about the complex relationships, pathways and mechanisms by which the various factors operate, however a developmental pathways approach shows promise in explaining how the various factors operate in the lives of individuals and in identifying shared strategies for substance use prevention practitioners and those working to prevent other problems such as mental health, violence and crime prevention.

[1] Some scientists distinguish between young people whose deviant behaviour ends as the person passes from adolescence (adolescent-limited deviance) and those whose behaviour persists into adulthood (life course persistent). Offending behaviour has also been conceptualised as a continuum with adolescent limited at one extreme and life course persistent at the other, and considerable blurring in the middle.

Table 1: Factors associated with gambling problems by life stage (Protective factors are italicized)

	Prior to Birth	Infancy and Early Childhood	Later Childhood Early School	Secondary School	Adulthood	Older Adulthood
Individual	Genetic Factors	Temperment and early behaviour	Conduct disorder Aggression *Social and emotional competence* *Shy temperament and personality*	Dlinquency and conduct problems Sensation seeking and adventurous personality Favourable attitudes toward substance use Gender	Earlier substance use behaviour Unemployment in early adulthood Mental health problem Gender	Earlier high levels of non-problematic use Loneliness and boredom Overall health and increasing age (adverse drug reactions) Change in role
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 *Parental harmony* and parent-adolescent conflict Parental attitudes to substance use Alcohol and other drug problems in the family Parental communication and monitoring Family rules and discipline Religion	Marriage in early adulthood	Change in role
Peer				Substance-using peers		
School			Early school failure	School engagement		
Community				Lack of positive contact with adults Community disadvantage and disorganisation	*A well-managed environment for alcohol use*	Social isolation
Factors spanning the life stages						
Culture Social inequity Demographic and economic factors Social cohesion						

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

1. Risk and protective factors by life stage

The impact of various risk factors varies with when they occur during the life course; this summary, drawn unless otherwise noted from a review by Loxley and colleagues (2004), 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 and provisional).

a. 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 (Bray et al., 2001).

b. 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-going 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.

c. 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 Canadian study found that young people living on the street were less likely to have a history of abuse than a history involving frequent moves and dislocation (for example, from one guardian's house to another, or from foster home to foster home) (Benoit and Jansson, 2006).

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

d. 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

through adolescence is a protective factor, reducing alcohol problems, whereas parent-adolescent conflict is a risk factor for early age substance use.

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

Alcohol and other drug problems in the family: 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.

Parental communication and monitoring: Parental communication in early adolescence is a protective factor, reducing the influence of risk factors for harmful youth substance use.

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

School engagement: poor marks, little attachment to secondary school or not completing school is a risk factor for early adult substance problems. However, it may be that this relationship is explained by earlier developmental influences (Eggert and Harrington, 1993; Fuller et al., 2002).

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; while young people may appear to be socialized into delinquent behaviour by peers, selection of companions plays a major role in accounting for similarities in drug use among friends (Velleman et al., 2005). 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 (Government of New Zealand, 2003).

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.

e. Adulthood

Earlier substance use behaviour: Frequent substance use in late adolescence is a risk factor for substance-related harm in adulthood.

Gender: While rates of use are similar between young men and women, young men are more likely to use in hazardous and harmful ways.

Environment for alcohol use: Some venues contribute to alcohol-related violence (e.g. overly lax or aggressive staff). A well-managed environment for the sale and use of alcohol in adulthood is a protective factor, reducing the risk of harms associated with alcohol use.

Marriage and partners: Marriage in early adulthood is a protective factor, reducing the risk of harms associated with alcohol use.

Early unemployment: Unemployment in early adulthood is associated with harmful alcohol use but it is unclear whether its influence is maintained after adjusting for earlier risk factors.

Mental health problem: Having a mental health problem in adulthood is associated with harmful substance use. It is unclear whether mental health problems determine substance use.

f. Older adulthood and retirement

Earlier drinking patterns: A continuation of high levels of non-problematic social drinking earlier in life, which become problematic because of changes in metabolism.

Social isolation: Based on clinical impressions, losing a spouse, loneliness and reduced social support have been associated with late-onset drinking problems in the elderly.

Change in role and function: Other psychological stresses associated with aging that have been anecdotally linked with late-onset drinking problems in the elderly include a loss of economic status, unrealistic expectations of retirement and a sense of role loss.

Loneliness and boredom: Loneliness and boredom are frequently cited experiences of late onset alcohol abusers.

Health: Increasing age is a significant risk factor for an adverse reaction to medicinal substances

2. Factors spanning several or all life stages

a. Social or structural determinants of health

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 (Public Health Agency of Canada, 2004a). Several of these determinants are specific to particular life stages and are identified in the above discussion (i.e. biology, genetics, healthy child development). Several others transcend and have impact on several or all the life stages (e.g. income and social status; social support networks; education; employment, working conditions; social and physical environments; and culture).

Understanding of the relationship between these social determinants and substance abuse is increasing. Single (1999) suggested that substance use in itself can be a determinant of health, but that it is also one of the key reasons why these determinants have the effect they do on population health. More recently, Spooner and colleagues at the Australian National Drug and Alcohol Research Centre have led in synthesizing research on the relationship between these determinants and substance use problems (Spooner, 2006; Spooner, 2005; Spooner, 2001; Spooner and Heatherington, 2004).

b. Culture

At its broadest, Western culture holds several implicit values that influence how our society is organized. Although these values get to the root of who we are as a people, they have not generally been viewed as relevant to discussions around the prevention of substance use problems. Western culture and values have no doubt benefited population health in some ways (e.g. decreased stigma experienced by GLBT persons), however, increasingly these values are being considered for their negative impact on substance use problems (Eckersley, 2005):

Individualism: 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 (Spooner and Heatherington, 2004). 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.

Secularism: Western society has become increasingly secularized – that is, our society does not give importance to religion or religious belief in civic affairs. An outcome is that youth and adults often lack a common set of higher values that can help to bind people and provide a sense of purpose or meaning. A society in which a sense of higher purpose beyond one's own gratification is not so obvious provides a fertile environment for use of substances. Religiosity is well accepted as a protective factor for substance use and other social problems (Hawkins et al., 1992).

Consumerism: 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 (Eckersley, 2005; Boyle et al., 2006). A sense of identity that is heavily influenced by the material goods one possesses has particular impact on contemporary children and youth who are the subject of intense marketing efforts. A UK think tank recently drew a connection between this phenomenon and various youth social problems, suggesting that one's possessions are increasingly a determinant of a young person's position on the social hierarchy (Margo et al., 2006).

c. Social inequity

Socio-economic status or social position is largely driven by wealth but is closely tied in with education, employment and housing issues. Wealth is increasing in Canada, but the gap between the rich and the poor is also increasing (Morissette and Zhang, 2006). A systematic relationship between social position and health has been documented; that is, allowing for individual variation (for example, due to genetics, ones' constitution, and the role of chance or luck), the higher one falls in the social strata, the better health enjoyed. To illustrate, 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 (Public Health Agency of Canada, 2004a). This relationship holds true for socio-economic position and mental health (Dulberg et al., 2000).

The degree to which social position affects substance use problems is increasingly understood (Spooner, 2006; Spooner and Heatherington, 2004; Spooner, 2001).

- The relationship between social positioning and health holds to some extent for substance use problems; a gradient of increasing substance dependence from the most to the least affluent has been demonstrated.
- There is a considerable body of work that demonstrates an association between social determinants such as unemployment, homelessness and poverty, and health-damaging behaviours, including substance misuse (Loxley et al., 2004).
- The relationship between deprivation and substance use is clearest for cigarette smoking, which is more frequent among lower SES groups, people living in rented dwellings, those without private transport, the unemployed and people living in crowded accommodations. There is also a gradient by education level and by marital status, with those who are divorced, separated or lone parents more likely to be smokers.
- A pattern of heightened prevalence of non-medical use of the prescribed opiate Oxycontin® in economically depressed North American communities has been observed (Lewis, 2006; Covell, 2004).
- The causal relationship between low socio-economic status and substance use runs in both directions; low socio-economic status can cause increased substance use and, to a lesser extent, substance use can serve to lower one's socio-economic status. Hence, a self-perpetuating cycle can exist between low socio-economic status and substance use, which is likely to embed itself within disadvantaged sectors of the community.
- Low socio-economic status can affect substance use and related harms in a number of ways. For instance, low socio-economic status can create chronic stress resulting in negative impacts upon an individual's mental health and immune responses; it can also lead to reduced access to resources such as mental health services, education, recreation and social support. Children raised in low socio-economic status families (particularly working poor who work long hours for little pay) experience less supervision and care, which can lead to the development of adolescent substance use problems. Low socio-economic status communities are often characterized by high unemployment and crime which provide an environment that is conducive to problematic substance use (Spooner and Heatherington, 2004).

d. Demographic and economic shifts

Fuelled by technology, economic globalization and policies favouring open markets have brought unprecedented choice for consumers and wealth to some; it has also had the effect of placing competitive pressures on virtually all organizations in the public, private and non-profit sectors. Some of the results include:

- Longer working hours for full-time workers; increased job demands.
- Growth in part-time and casual jobs (without benefits), particularly for women and youth.
- Less job security.
- Increased competition for work.
- Scarcity of "quality" jobs.
- Later transitioning into marriage and starting a family.

These changes are placing increased pressure on Canadians at various stages of life, but particularly parents who strain to balance increased work demands with family needs (Daly, 2004). It has also been suggested that globalization has led to identity confusion and a sense of powerlessness among young people, which can result in depression and substance use problems (Spooner and Heatherington, 2004).

e. Social cohesion

Terms such as social cohesion, social capital, social bonds and community empowerment are not well defined and sometimes used interchangeably. Often included in definitions are concepts such as trust, reciprocity and mutual aid, a network of voluntary associations that hold a society together (sometimes referred to as civil society; having the effect of keeping individuals from becoming isolated, protecting them from the state), and; institutions of conflict management such as a responsive democracy and an independent judiciary (Spooner and Heatherington).

Spooner and Heatherington cite research by Sampson and colleagues that linked aspects of social cohesion with levels of crime. Specifically they examined:

- The level or density of social ties between neighbours, frequency of social interactions between neighbours, patterns of neighbouring.
- The capacity for informal social control and social cohesion, including monitoring of adolescents.
- The quality, quantity and diversity of institutions that address the needs of young people, including childcare, health care, educational facilities, recreational infrastructure and employment opportunities.
- Land use patterns and the distribution of daily routine activities (for example, the presence of schools, public parks, shops, industrial units, public transportation, and large flows of night-time visitors).

They found evidence in support of a link between crime and various neighbourhood processes such as neighbourhood ties and informal social control. There is little research on the role of community-level psychosocial factors on substance use and outcomes, but, given the link between problematic substance use and crime and the work of Sampson and others demonstrating links between community-level social processes and crime, it is likely that these processes also impact upon substance use problems.

PREVALENCE OF SUBSTANCE USE AND SUBSTANCE USE PROBLEMS IN NOVA SCOTIA

Use of various mood altering substances provide perceived benefits to users but they also take a significant toll on some users, their families, communities and the province generally. The cost of alcohol and illicit substance use to Nova Scotians was estimated to be $619 million in 2002 Rehm et al., 2006). These costs generally arise either from substance-involved incidents (e.g. unintended injury, suicide or homicide or other violence), or chronic conditions resulting from longer term use, and the various social, health, criminal justice and lost productivity costs incurred by these forms of problematic use (as well as the cost of the various measures taken to try to reduce or avoid these costs).

Data on use and harms need to be viewed with caution because they may under-report the extent of use/harms. For example, self-reported alcohol use by respondents to the Canadian Addiction Survey (Adlaf et al., 2005a) accounted for just 32.1% of per capita consumption of alcohol nationally as calculated using sales receipts. Reasons for this are not known but could include the fact that heavier drinkers (e.g. young males) are less likely to make themselves available for surveys. There is also reason to think that medical authorities may not identify and accurately attribute all cases of alcohol or illegal drug-related injury or chronic conditions (e.g. cirrhosis, FASD) (Graham, 2005).

Substance use patterns are determined by many factors and are constantly evolving. It is important that policies and programs be based as fully as possible on data describing current patterns of use. This section will present the most current available data on alcohol and other substance use and harms in Nova Scotia for each life stage.

1. Prior to birth (hazardous use of substances by expectant mothers)

Alcohol: Fetal Alcohol Spectrum Disorder (FASD) is the result of a child being exposed to alcohol in utero (often with other possible contributing factors) and is regarded as the leading cause of developmental delay among children in this country Public Health Agency of Canada, 2003). While no safe limit of alcohol use during pregnancy has been identified, and subtle effects have been identified among children whose mothers have been termed "moderate" drinkers[2], it is understood that the greatest risk for FASD involves binge drinking.

There is no information on the extent of alcohol use during pregnancy among Nova Scotia women; in the country generally, approximately 14% of women report drinking alcohol at some point through their pregnancy (McCourt et al., 2005; Dell and Roberts, 2006). From 1999 to 2003, it is estimated that 403 babies born in Nova Scotia were affected by prenatal exposure to alcohol (Fetal Alcohol Spectrum Disorder, FASD); approximately 81 babies a year. Of these infants, it is estimated that between 54 and 161 have Fetal Alcohol Syndrome (FAS), averaging 32 babies born each year with this lifelong condition (Graham, 2005).

[2] There are, however, concerns with these studies due to a lack of consensus on what constitutes low and moderate drinking, and due to their not accounting for different drinking patterns. In several studies, drinking patterns are defined on the basis of weekly averages that could hide high consumption during one or two occasions during the week. Since fetal damage is a function of blood alcohol level, the difference in drinking patterns is a critical factor.

Other substances: among substances of abuse, the effects of alcohol use during pregnancy are understood to be severe. While the nature of the effects of other substances is not as well understood, it has been suggested that they range from mild to relatively severe (Roberts and Nanson, 2001).

No data were found on the extent of other substance use during pregnancy in Nova Scotia or any other Canadian jurisdiction.

2. Adolescents

General prevalence, age at first use, the proportion of users vs. non-users, and gender and age differences all hold important implications for aims, timing and messages of interventions during adolescence. It isn't possible to predict which experimental or occasional use patterns will pass uneventfully or progress into a harmful pattern. For this reason and because even occasional use of substances by adolescence is characterized by binge and other hazardous patterns of use, all adolescent substance use is a concern (Tupker, 2004).

General prevalence: Alcohol, cannabis and tobacco are the substances adolescents in Nova Scotia schools most commonly report using (Poulin and Elliott, 2007). The 2007 provincial student drug use survey found that rates of use for all substances in question were either stable or declined with the exception of MDMA (ecstasy) when compared to 2002 survey results. Among students in Grades 7 to 12, about half reported consuming alcohol, about one third reported using cannabis and fewer than one in six reported cigarette use in the 12 months before the survey. Eight percent of students reported using psilocybin or mescaline and seven percent reported use of MDMA (ecstasy) compared to 4.4% in 2002.

No other substance was used by 5% of the student population in the year before the survey (i.e., amphetamines or methylphenidate (Ritalin) without a prescription: 4%; LSD: 3.7%; Inhalants: 4.4%; Non-medical tranquilizers: 3.0%; MDMA (Ecstasy): 4.4%; Cocaine or crack: 4.3%; Anabolic steroids: 1.7%; and Methamphetamine: 1.6%). A survey of schools in selected Cape Breton communities (Covell, 2004) found that an average of 1.9% of junior/senior high school students reported use of the prescribed opiate, Oxycontin, in the past 30 days.

There is reason to think that school drop-outs and those living "out of the mainstream" are either at higher risk, or are already regular or heavy substance users. A study of seventy Halifax street youth (Karabanow, 2006) found that the vast majority were on the street due to poverty, family dysfunction, sexual, emotional or physical abuse, as well as dissatisfaction or problems with social services and\or child welfare. Of the 70 young people (male: 48; female: 22; average age: 19.82), twenty-seven respondents described their use of drug or alcohol as problematic or as an addiction, while twelve indicated that they used regularly. Six youth described occasional or rare drug use, and 22 respondents did not discuss their use of drugs and alcohol. A significant number of the youth commented on depression (n=19), suicidal ideation and/or suicide attempts (n=13), or other mental health issues (n=12).

Prevalence of non-use: Overall, 42% of Nova Scotian students reported not using any substance in 2007 (up from 40% in 2002). The percentage declines through the grades (rapidly in the case of alcohol and cannabis). For example, in Grade 7, the prevalence of non-use of alcohol in the past year was 88% with the figure declining to 20% by Grade 12.

Age on onset: The age when use of various substances begins is important because early onset has been associated with a number of later harms (e.g. mental health problems and dependency)[3]. The average age of first use reported by Nova Scotian students was 12.9 years of age for alcohol and tobacco and 13.5 years for cannabis. The average age of onset has been steadily declining for several decades.

Gender differences in general prevalence: there are few gender differences in the general prevalence of alcohol, tobacco and cannabis use in the high school population overall.

Hazardous substance use: Drinking to the point of drunkenness is potentially harmful in any context; almost 3 in 10 students reported at least one episode of drinking five or more drinks and/or had been drunk in the 30 days prior to the provincial student drug use survey.

Frequent use of any substance is a sign that it is becoming more important in a person's life. Among Grade 7-12 Nova

[3] It should be noted however that early use may itself be a marker for other early problems, such as conduct disorder, child abuse or family management issues, so delaying substance use is often best managed by addressing these problems.

Scotia students, 30% of students reported drinking at least monthly in the past year.

Any non-medical substance use (and some pharmaceutical drug use) in combination with driving poses serious risks. In 2007, 14% of Nova Scotia senior students with a driver's license drove a motor vehicle within an hour of having used alcohol, while 23% did so after cannabis use. Among all students, 19% reported being a passenger in a car driven by an impaired driver, with girls more likely to report this.

Any non-medical substance use in combination with sexual activity poses serious risks. One in three students in grades 9, 10 and 12 who had sex in the previous 12 months indicated they had had unplanned sex after using alcohol or other drugs, on at least one occasion during the year.

Gender differences in hazardous behaviours: While prevalence rates between the genders are similar, boys are more likely to use substances in hazardous ways according to the 2002 survey – a pattern that holds true in most student surveys (Johnson et al., 2002; Adlaf and Boak, 2005). In Nova Scotia, males were more likely to report daily cannabis use, and driving under the influence of alcohol or cannabis, while females were more likely to report being in a car with a drinking driver. Notably, females are as likely as males to report past month binge drinking and drinking to drunkenness.

Gender differences in reported harms: The percentage of males and females who reported experiencing various harms arising from their use of alcohol or other substances was essentially the same except for males being more likely to report having trouble with police and damaging things.

3. Young adults (19-29)

As adolescents make the transition into adulthood, rates of use, hazardous use and harmful use remain high relative to older age groups. Most young people who complete school and settle into a conventional lifestyle tend to reduce their use of substances or shift their patterns (for example, to avoid hangovers at work) (Parker and Williams, 2001); however, many young Canadian adults are delaying this transition (Myles, n/d). It is apparent that getting married and beginning a family generally has a greater impact on reducing substance use rates than entering the workforce (Bachman et al., 1997).

General prevalence: rates of use for alcohol and cannabis remain high during these years, with 90% of 19-29 year old Nova Scotians having reported drinking in the past year; age-related figures for past year cannabis use are not available for NS, however 42% of Canadians between 18-24 years of age report past-year cannabis use. Past-year use of illegal substances other than cannabis is much less common; although age-related figures are not available, 2.3% of the NS population age 15 and over report having used an illegal substance other than cannabis in the past year (Adlaf, Begin, and Sawka, 2005).

In Cape Breton, media reports have highlighted concerns with non-medical use of the prescribed opiate, Oxycontin. In examining the issue, Lewis (2006) found that the data was uneven but drawing information from a number of sources concluded that the problem in the spring of 2004 was serious. No demographic details were reported.

The Canadian Campus Survey (Adlaf et al., 2005), which surveyed a sample of undergraduates (mean age 22 years), found that among students in Atlantic Canadian universities 91% reported alcohol use, 37% reported cannabis use and 11% reported illegal drug use other than cannabis in the past year. The reported prevalence of cannabis use in the Atlantic Region represented an increase from 26.5% to 36.9% between 1998 and 2004.

Table 2: Selected results from 2004 Canadian Campus Study

Indicator	Total	Male	Female	Atlantic
Alcohol				
Past year use	85.7	84.0	87.1	90.9
Past month use	77.1	76.5	77.7	83.2
Heavy frequent drinker	16.1	20.6	12.5	24.5
Hazardous/harmful drinking (AUDIT8+)	32.0	37.6	27.5	46.5
1+ harms (AUDIT)	43.9	45.9	42.4	55.9
1+ dependence symptoms (AUDIT)	31.6	32.5	30.9	36.4
Experiencing alcohol-related assault	10.0	10.8	9.3	16.1
Reporting alcohol-related sexual harassment	9.8	4.2	14.3	14.8
Unplanned sexual relations due to alcohol	14.1	15.8	12.8	19.9
Other drugs				
Current smoker	12.7	12.0	13.2	16.9
Cannabis use last year	32.1	34.5	30.1	36.9
Cannabis use last 30 days	16.7	19.7	14.2	20.6
Other ilicit drug use last year	8.7	9.7	7.9	10.9
Other illicit drug use last 30 days	2.2	2.3	2.1	2.2

Rates of hazardous use: rates of hazardous alcohol use (as measured by frequency of heavy drinking, AUDIT scores, and exceeding low-risk drinking guidelines) are clearly higher for younger adults. For example, youth 19-24 years were seven times more likely to report heavy monthly drinking than current drinkers aged 30 years and older. In the university population (according to the AUDIT), students in Atlantic institutions reported significantly higher rates of frequent drinking and hazardous drinking than the national average. Driving under the influence of cannabis use has emerged as an issue among young people in this country. Although figures for Nova Scotia are not available, 12.2% of 20-24 year old Canadian drivers had driven after cannabis use, higher than any other age group except those 16-19 (Bierness and Davis, 2006). No other data on hazardous or higher risk cannabis or other illegal drug use among young adults were available.

Rates of harmful use: nationally, young adults 19-24 were more likely to experience harms in the past 12 months from their use of illegal drugs. Students in Atlantic universities reported significantly higher rates of harmful drinking and harms experienced than the national average.

Gender differences (in the population of drinkers age 15+): while general prevalence rates for alcohol use are similar between women and men, men are much more likely to use alcohol in hazardous ways. For example, men were almost four times more likely than women to report being a high-risk drinker. Men are also twice as likely to report harm from their own use of alcohol. Gender differences among young adults is not so pronounced; among university students nationally for example, 42.4% of women reported one or more harms from their drinking and 30.9% reported one or more symptoms of alcohol dependency, compared to 45.9% and 32.5% of their male counterparts respectively. Women were also more likely to report being victims of alcohol-related sexual harassment.

Street populations: Use of various illegal substances, often by injection, has characterized Canada's street populations in large and mid-size communities for decades. In a 2004 interview study of 76 homeless youth in Toronto, 84% reported using marijuana, 60% reported using cocaine and 37% reported using methamphetamines, all representing significantly higher rates than their "mainstream" counterparts. The use of prescription drugs and other street drugs was also common, as was multiple drug

use (Research Group on Drugs in Toronto, 2004). Street populations are also more likely to be involved in drug injection practices, a pattern that has raised long-standing concerns around HIV and hepatitis C infection. Fischer and colleagues (2006) now note that many illegal opioid users increasingly use prescription opioids (hydromorphone) and that the rate of heroin and cocaine (including crack) and related high-risk behaviours (e.g. needle use, sharing) use has been declining since 2001. Although it is not clear whether supply or demand is behind this switch, Canada is the top per capita user of prescription opioid products and the level of monitoring and surveillance is known to be weak.

4. Older adults

Canada has an aging population, with those 65 years and over being the fastest growing population group (Public Health Agency of Canada, 2005a). For instance, the percentage of seniors in Nova Scotia is projected to increase to 21.3% of the population in 2021, from 13.2% in 2000 (Health Canada, 2002). It is estimated that by 2041, older adults will make up over 25% of the Canadian population (Public Health Agency of Canada, 2005a). An analysis of the U.S. National Survey on Drug Use and Health has projected that the number of adults ages 50 and older using illegal drugs in the past year will more than double between 2001 and 2020, with even larger increases projected for past year cannabis use and the non-medical use of prescription medicines (i.e., analgesics, tranquilizers, stimulants, or sedatives) (Colliver et al., 2006).

Prevalence of alcohol and most other substance use declines in later years of life. For example, Nova Scotians aged 60 years and older were less likely than any of the other age groups to be current drinkers (at 55.5%), and nationally, less than one in a hundred seniors reported heavy weekly drinking compared to two in ten young adults 19-24. However, this is a period of transition for many as a result of retirement and possibly the loss of spouse and friends, with loneliness, isolation and boredom often resulting. Some, particularly women, will commence a pattern of hazardous drinking as a result; however the majority of older adults who drink problematically continue a pattern established earlier in life (Loxley et al., 2004).

It is important to bear in mind that individuals tend to experience greater effects from alcohol and other substances as they age due to lower tolerance, increased sensitivity, and interaction with medications. So a person who simply continues a pattern established earlier in life may begin to experience problems as a result (Loxley et al., 2004). Alcohol use among older adults can give rise to cognitive and functional impairments and in unintentional injury. It is important to note that women 45 years of age and over and men 40 and over may derive cardiovascular benefits from light alcohol use (National Health and Medical Research Council, Australia, 2001).

Along with alcohol, the substances of greatest concern among older adults are psychoactive medications. It is commonly accepted that the prevalence of benzodiazepines and other depressant medication use (over-the-counter and prescription pain relievers, or heart and blood medications) is high relative to other age groups. A study of benzodiazepine prescribing to Nova Scotia seniors found that 25% of this population had been prescribed benzodiazepine in1995/96. Although this represented a decline from 1993/94, the study found that a high percentage of prescriptions were inappropriate (i.e. for more than 30 days, and for long-acting products), and that women were much more likely to have been prescribed these medications (Rojas- Fernandez et al., 1999). A study of persons ages 55 and over in New Brunswick living in private households reported the following use of prescription medication: 17% used medication to assist sleep; 9.5% to treat depression and; 9.4% to reduce anxiety/panic attacks (Schellinck et al., 2002).

The CAS did not include questions about the use of these substances. However, some questions about prescription drug use were included in Canada's Alcohol and Other Drug Use Survey. Analyses of that survey reported by Health Canada (MacNeil and Webster, 1997) showed that the percentage of Canadians age 65 or older who reported using pain medication, sleeping pills, tranquilizers, antidepressants or diet pills was 27.4 %, compared with 18.5 per cent among those aged 15-24 years. The differences were particularly marked for use of tranquilizers, sleeping pills and anti-depressants. In a sample of Ontario treatment clients, problems with benzodiazepines tended to cluster in the older age groups (e.g. 6.5% of those 65 and over). Benzodiazepine use among older adults has been linked to motor vehicle crashes, hip fractures resulting from falls, excessive day-time sedation, and reduced capacity for self-care (Wang et al., 2001).

The New Brunswick survey found that less than 1% of the population ages 55 and over had used cannabis in

the past year but it has been suggested that an upward trend in cannabis use may occur in this country due to the increasing number of "baby boomers" having more experience with recreational drug use reaching this age (Baron et al., 2004).

5. Conclusion

Considering the rates of harmful use, alcohol, cannabis and tobacco need to be viewed as the substances of greatest concern in Nova Scotia, as with the rest of the country. Adolescents and young unmarried adults, particularly males, experience more than their share of harms. Incidents of hazardous use in this population result in injuries or deaths due to traffic crashes, injuries and deaths, suicide, and violence leading to significant costs to society and a large percentage of Person-Years of Life Lost[4]. Various indicators of hazardous and harmful use suggest that substance use problems are more prevalent among students in Atlantic Canadian universities than elsewhere.

Due to increases in rates of driving under the influence of cannabis in this population, this issue is emerging as important. While general prevalence rates for cannabis use in Nova Scotia are similar to the rest of Canada, levels of frequent use are higher with 64.6% of Nova Scotia past year cannabis users using at least monthly vs. 53% for the rest of Canada.

Given the elevated risk for HIV and hepatitis C infection associated with injection drug use, its prevention is normally an important aim, but because Fischer and colleagues (2006) have reported generally reduced IDU use in this country and no data were found on the number of injection drug users in the province, the level of priority this issue should be given is unclear.

An issue that is emerging for which little local or Canadian data were found is prescription drug misuse or problems. U.S. surveys indicate a concern among various populations, including youth (CESAR FAX, 2006). There is an indication that declining heroin use in Canadian cities has been replaced by prescription opioids (Fischer et al.). As the baby boom population ages, by virtue of their sheer numbers, prescription drug problems in this group may increase. All of these factors point to the need to better understand the issue in the province and to consider preventive attention, including prescription monitoring and other regulatory and enforcement measures.

[4] A calculation of the average number of years lost per person due to premature death based on average life expectancy.

SECTION 3: EVIDENCE SUPPORTING PREVENTION MEASURES

A FRAMEWORK FOR PREVENTION

Human use of various substances, legal and illegal, and the problems that sometimes arise from this use, is a complex study. For years, three variables have been seen to be basic to understanding substance use and substance use problems: characteristics of the person, the drug and the context of use – at the individual level, a mix of these factors determine the effects and level of risk involved with a drug-using situation (classically termed, drug, set and setting) (Zinberg, 1984). Much research and practice over the past three decades have been devoted to increasing our understanding of how these variables (which can also be seen as risk and protective factors) interact with each other and how responses can be tailored to promote health, reduce problems and avoid the considerable costs associated with substance use problems. Opportunities to respond exist at the broader (i.e. global, national, provincial, regional) and more local (i.e. community, family and individual) levels.

As noted in the previous section, potent opportunities lie at the broad societal level. Those concerned with the prevention of substance use problems need to work with others to impress upon Nova Scotian citizens and leaders that our values and priorities have a significant bearing on our health, our use of substances and our ability to respond to problems. It is challenging to find the levers of influence with broad societal, even global trends; however, it is becoming increasingly apparent that attention needs to be devoted to that level in light of the evidence (see for example the various articles by Spooner and colleagues). Activities and measures that aim to affect broad social structures, environments and policies are the realm of Health Promotion Strategies and are an important part of the mix of responsibilities for substance use prevention practitioners (Weisz et al., 2005; Ottawa Charter for Health Promotion, 1986). These social policy activities are not substance-use specific, but it is important to begin to measure substance use outcomes in relation to them.

A range of substance abuse-specific measures are called for by the scientific literature. As noted in the Introduction (p. 1) definitions offered by Stockwell (2006) help to distinguish between these measures and will be used in this review. Supply reduction was defined as "strategies that are intended to achieve social, health, and safety benefits by reducing the physical availability of a particular substance". Harm reduction was defined as "strategies that reduce the likelihood of harm to health and safety without necessarily requiring a change in the pattern or level of substance use", distinguishing it from demand reduction which was defined as "strategies which succeed by motivating users to consume less overall and/or less per occasion, but don't necessarily call for abstinence".

HEALTH PROMOTION

Much of the research and early policy formulation concerning the social determinants of health was synthesized in Canada in the early 1990s (Evans et al., 1994). This is a complex area of investigation and the concepts, their relationships and the dynamics at play need to receive more research, particularly in relation to the role of substance use.

1. Addressing the broad determinants of health

Because substance use and related problems result from the complex interplay between the individual and the environment across the life span, Spooner (2005) suggests that a number of points are increasingly clear:

- Individuals shape and are shaped by the environment.
- Substance use and related problems arise from a chain of events over time and in specific contexts, not from specific risk factors in isolation.
- The chain of events that results in problematic drug use can also result in other problem behaviours (such as delinquency) and various problem outcomes (such as depression and suicide).
- The social environment is a powerful influence on health and social outcomes.
- Social institutions or structures (such as social policies) can affect the environment in a manner that can influence drug use and related problems.

This review has identified several social or structural factors that are likely to affect substance use problems: Western culture; social inequality; working conditions; and

social cohesion. These structural factors are often part of international trends that play out in the lives of Nova Scotians and other Canadians as national, provincial or local government policies. Given their breadth, they may appear to be beyond the purview of district prevention and community education staff. Nevertheless, because it is increasingly clear that the way a society is organized has a fundamental influence on the health and substance use patterns of a population, and the way a democratic society is organized is a function of various choices and decisions made on behalf of Canadians, anyone with a mandate for prevention must be prepared to consider and address these factors appropriately.

Fundamentally, district prevention staff needs to continue to support efforts to erode vertically structured government departments, and to view substance use issues within a broader developmental health policy (recognizing the need for retaining focus on specific issues). Other possible roles of district prevention staff include:

Mainstream culture (non-drug specific):

- Monitor cultural trends on an ongoing basis for their implications on health and substance use problems in local communities.
- Participate in or support initiatives that question or challenge aspects of mainstream culture that are known to or may well have an impact on substance use problems.

Social inequality:

- Address local policies that support existing social-group inequalities.
- Ensure local policies do not worsen existing disadvantages experienced by social groups.
- Participate in local initiatives that give attention to social inequality and the health of local citizens.
- Act on or support actions on poverty and factors known to alleviate it, for example:
  - Taxation policies that benefit lower income families.
  - Adequate minimum wages and levels of social assistance that will allow everyone access to the basic necessities for healthy living.
  - Universal access to adequate housing and food.
  - Protection and strengthening of high quality public education and early childhood education and care (Public Health Agency of Canada, 2004b).

Working conditions:

- Advocate or support efforts to increase access to full employment, quality jobs, job security, healthy working conditions and employer policies that support families and parents.

Social cohesion:

- Participate in community development and community-building strategies with the aim of creating psychosocially healthy communities that support families to raise healthy children, facilitate the socialization of young people and assist people with substance use problems.
- Promote policies of social inclusion to reduce inequities related to income, race, gender, ethnicity, geographic location, age, ability and sexual orientation.

Recommended practice 1: monitor local impacts of the social determinants of health, particularly social inequality, and work with others to take appropriate action.

Recommended practice 2: take steps, both formal and informal, to increase the level of inter-departmental and inter-agency collaboration and joint action on social determinants and other shared protective and risk factors.

2. Early childhood and early school interventions

Initiatives to promote the health and social development of children in their pre-school (0-6 yrs) and early school (7-12 years) years can have the effect of averting a range of problems, including substance use problems, in adolescence and beyond. The most prominent intervention approaches at this life stage – home visit programs, parenting programs, early childhood education programs and multi-component programs – have all shown benefits for substance use and other later behaviours in medium and long-term studies (Lonczak, 2002; Schweinhart et al., 1993).

a. Home visit programs

Loxley and colleagues find nurse home visit programs directed to at-risk families (based on poverty, youthfulness, lack of partner support, substance use or other risk factors) to be a well-supported intervention for the pre-school years. These programs involve a longer-term (e.g. two year) intensive relationship with the mother and family beginning prior to or just after delivery. Typically, the aim

of visitation programs is to support the mother with her own health needs, with child development issues and with helping access services. For example, the Nurse Home Visitation Program in the U.S. aimed to promote the well-being of first time, low-income mothers and their children. Specifically, the program aimed to: (a) help the mother improve her own health by reducing smoking and use of alcohol and drugs; (b) improve the child's health and development by teaching parents how to provide better care, and; (c) improve families' economic self-sufficiency by helping parents plan for future pregnancies, further their education, and secure employment. Program components are provided from pregnancy until the child's second birthday and include home visits by trained nurses, referrals to community resources, and helping develop family resources for the care of the child.

The study followed up children of these mothers fifteen years later and found that they were less likely to be arrested or charged with crimes, less likely to use cigarettes, alcohol or other drugs, less likely to run away from home or to be sexually precocious than their counterparts in the control group. While relatively costly, the return on investment was estimated to be $4 for every $1 invested (Olds et al., 1998).

b. Parenting programs

Parent management programs, based on cognitive social learning theory, are one of the most widely used parent education techniques. Parenting programs based on this approach are directed to families of children between the age of two and eight years and aim to reduce early child behaviour problems (such as non-compliance and conduct disorder), improve parenting practices, and help parents create an environment that will maintain and reinforce positive child development. These areas represent important risk factors for a range of later problems including substance abuse, delinquency and mental health problems (Loxley et al., 2004).

c. Early childhood education programs

A review of this literature concludes that early childhood education programs can improve academic and social performance among disadvantaged children which endure over the long-term (Foley et al., 2000). A well-known randomized study of a program that followed children to age 40, the Perry Preschool Program, 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 years obtained positive life-long benefits in a range of life areas, including academic achievement, income, criminal activity and substance use. It was calculated that the average annual adjusted cost of the 2-year Perry Preschool Program was $14,716 per participant (in 2001 U.S. 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 (Schweinhart, 2004).

d. Early school programs

Also in the U.S., researchers with the Fast Track project are studying the effect of using school and family interventions to improve the environment for healthy child development and to reduce anti-social or problematic behaviours in adolescence and adulthood. 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 2 years of elementary school and at the transition to middle school. Interventions included parent training, home visits, 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. While early follow ups (to the end of grade 5) have shown improvements in most areas, the long-term impact on substance use has not yet been reported (Conduct Problems Prevention Research Group, 2004).

Recommended practice 3: invest in home visit programs, parenting programs, early childhood and early school programs to prevent substance use problems and other later behaviours over the long term.

SUPPLY REDUCTION MEASURES

This section of the review is concerned with public policies that have an influence on the problematic use of alcohol, tobacco or other substances; these policies differ from the social policies discussed above in that they are substance-specific. Holder (2003) claims that successful policy-based approaches to reduce problematic substance use (as with health promotion policy discussed above) reduce the need for specialized and costly media, school-based and family-focused interventions. To some extent this may be so, but most experts suggest that a balance of supply, demand and harm reduction measures that are integrated and mutually reinforcing is most effective.

1. Substance-specific policy to reduce substance abuse

a. Alcohol

Alcohol problems exact an enormous cost on Canadian society, estimated at $14.6 billion in 2002, and ranks in the top 5 causes of death and disability worldwide (Rehm et al., 2006; Chisholm et al., 2004). Consequently, reducing the short and long term harms associated with alcohol has been identified as a top priority for Western countries (Stockwell et al., 2005). As a legally available but government controlled intoxicant in this country, there has always been a tension between the control and marketing functions for alcohol. In recent years economic globalization and trends toward freer trade have led to reduced controls and heightened marketing of alcohol products. Aspects of this trend include an increased number of on- and off-premise points of sale, longer hours, relaxed controls over advertising and marketing, and relatively low pricing.

Long-standing research has shown an association between availability and the level of consumption in a jurisdiction, and in turn between the level of consumption and the prevalence of certain problems (Stockwell, 2006). Small amounts of alcohol can bestow cardiovascular benefits to older persons. However most alcohol consumed in this country can be categorized as hazardous or harmful. Analysis of a national survey found that over 70% of the alcohol consumed exceeded Canadian low-risk guidelines (Stockwell et al., 2007). Among Canadian young people between 15 and 24 years of age, over 90% of the alcohol consumed by males exceeds these guidelines; over 85% of that consumed by women of this age do so. Among Nova Scotians, 23.4% of current drinkers exceed the guidelines; almost half (49.1%) of young current drinkers (aged 19-24 years) do so (Graham, 2005).

Pricing: demand for alcohol, like other consumer products, can be influenced by manipulating its cost. Increasing prices through taxation is the prevention measure with the strongest empirical support. A recent cost analysis concluded that taxation was the most cost-effective measure for reducing alcohol-related harm in Western countries with a high prevalence of hazardous drinking (Chisholm et al., 2004). Youth are particularly affected by increased prices because of limited income. Among youth, there is evidence that increased prices are associated with reduced drinking and driving, greater proportion of high school and university graduates, and reduced violent behaviour. Heavy drinkers are also more likely to be affected by increased prices because they need to spend a greater proportion of their income as a result of a price increase. An Australian state-level increase in the price of a standard drink by $.05 produced significant reductions in road deaths, other deaths and traffic injuries over four years. There is also evidence that higher prices would lower child abuse and violence toward children (Holder, 2003).

Evidence also suggests that taxation in favour of low-strength beverages has the effect of reducing road crashes, lower levels of alcohol-related violence and hospital admissions (Loxley et al., 2004). Reduced prices or taxation schemes that favour bulk quantities of alcohol (i.e. kegs) have been shown to increase harms (Loxley et al.).

While shown to be effective, increasing prices is also usually the least popular prevention measure because public opinion generally favours increased access to alcoholic beverages. Possible unintended effects have been raised in relation to these policies, but they do not stand up to scrutiny. The increase in smuggling of tobacco that followed higher tobacco excise taxes in Canada in the 1990s might be seen as a cautionary experience that could occur with alcohol; however, because alcohol prices have not kept up with increases in inflation over the

years, there is likely a sizable margin for price increases before smuggling would become a risk (Chaloupka, 2002). Another possible unintended effect of price increases that has not seen enough study is the substitution of other intoxicants, particularly cannabis, for alcohol (Chaloupka and Adit, 1997). But, while posing important risks, cannabis is not associated with as much harm as alcohol, so this may actually have a net effect of reducing harms. A third possible unintended effect of price increases – the loss of heart-health benefits – is unlikely because those who derive benefits (i.e. older adults who drink small amounts) are less likely to be affected by price increases than younger, heavier consumers, who do not derive any benefits (Loxley et al., 2004).

Physical availability: Convenience and physical availability of a product has been shown to influence its use. In Canada, the United States, and elsewhere, studies have shown that raising the drinking age significantly decreases drinking among youth and drinking and driving (Holder, 2003). Studies have also shown that even moderate increases in enforcement of the minimum drinking laws can reduce sales to minors by as much as 35-40%, when combined with media and other measures.

There is a trend in Canada and in most other developed countries to liberalize controls around alcohol sales. However, studies have shown that increasing the hours or days of sale is strongly associated with increases in heavy drinking and associated harms (e.g., public drunkenness, violence, traffic crashes), and that restricting hours or days of sale reduces these problems. Evidence indicates that later closing hours are associated with increased violence.

Similarly, while the number of alcohol outlets has generally expanded over the past twenty years, the evidence is clear that, overall, higher alcohol outlet density leads to higher alcohol consumption and related harms in a community, so reducing or placing a hold on the number of alcohol outlets in a community is well supported by the evidence. Local context is important and the effect of modifying outlet density appears to vary according to the type of alcohol product; for example, restaurants that serve high quality alcohol may be expected to have little harmful effect and may actually reduce harm, due to less of the premium alcohol being consumed (because of the higher price and due to the controlled setting) (Loxley et al., 2004). What is currently lacking is a model for balancing consumer demand and public health and safety concerns on this issue.

Because regulations for serving liquor to intoxicated, disruptive and under-age patrons are often poorly enforced, mandated responsible beverage service programs have been evaluated and are available in a number of jurisdictions. Much of the incentive for the hospitality industry stems from dram shop laws that give licensed establishments some measure of responsibility with intoxicated patrons. Responsible Beverage Service (RBS) involves creating clear policies to train servers in licensed establishments on how to refuse service to intoxicated patrons and minors. Studies show that RBS is effective in reducing the number of intoxicated persons leaving a bar, and the number of traffic crashes, but the evidence for reductions in sales to minors has not been clearly established. While the potential for these measures is strong, their effectiveness depends on strong enforcement of the liquor laws pertaining to service to intoxication (Holder, 2003).

Municipal alcohol policies: The way alcohol is made available in a community (including through special or occasional licences) contributes greatly to the social norms around alcohol use. Recognizing this, researchers in Ontario have worked with various municipalities in the province to test the effectiveness of policies for the sale of alcohol associated with recreational and social events. The process involved working with a wide range of stakeholders toward policy that supported public health aims and minimized alcohol-related harms, such as underage drinking, fights, vandalism and public intoxication. Although controlled studies failed to show an effect on general population consumption, those municipalities that fully implemented a policy reported a decline in alcohol-related harm (Douglas et al., 1997).

Restricting Promotion: Producers of alcoholic beverages use marketing approaches that are highly appealing to young people and that contribute significantly to shaping alcohol norms in our society (Jernigan, 2001; Jernigan, 2003). The effect of alcohol marketing efforts is to portray alcohol as a normal and important element of contemporary living. These practices have raised broad concerns among public health officials over the years but research in this area is challenging (Jernigan, 2003). Research does consistently show a small but significant association between awareness and enjoyment of alcohol advertising in adolescence and risky drinking in adulthood, suggesting that reducing this exposure could have positive effects. Generally, econometric studies of the

effects of alcohol advertising restrictions on consumption and related problems have generally shown inconsistent results (Holder, 2003). Most studies over the years have shown a relationship between the extent of advertising exposures and drinking behaviour but the causal direction has not been clarified. A more recent study of middle school students and exposure to various forms of alcohol advertising in a U.S. state found evidence that exposure to advertising predicted alcohol use, but its findings need replication (Ellickson et al., 2005). It has been observed that the hypothesis 'alcohol marketing does not contribute to increased consumption' is not particularly plausible (Romanus, 2003). A challenge for this strategy lies in reducing all forms of marketing, including product placement and event sponsorship (Chisholm et al., 2004).

Drinking and driving countermeasures: In addition to some of the economic and physical measures to limit availability reviewed above which have been shown to have an effect on drinking and driving, several other specific countermeasures have been shown to be effective:

- Random Breath Testing (RBT)
- Reducing allowable limits for driving impairment
- Graduated licensing
- Zero alcohol limits for young drivers (enforcement levels and youth awareness are important factors)
- Roadside administrative sanctions

Warning labels regarding Fetal Alcohol Spectrum Disorder (FASD): Mandated warning labels on beverage containers are the most studied universal prevention measure on FASD, with almost all of the research originating in the U.S. which enacted this policy in 1989. In a 2002 review of studies on warning labels in the U.S., Hankin and colleagues found that "low risk" pregnant women reduced their alcohol consumption following the implementation of the warning label, but women who drank heavily during pregnancy did not (Hankin et al., 2001). The authors further found that after several years of heightened awareness of the labels and their messages, general population awareness levels tended to slip somewhat. Stockwell (2005) suggested that rotating and changing the messages would have the effect of keeping them fresh and would reduce this "slippage" in awareness.

In interpreting this research some suggest that even small benefits justify a measure that would cost government nothing and private industry very little (Greenfield et al., 1999); others caution that harm may be caused by public awareness messages that recommend abstinence as the only safe option for pregnant women. They argue that, given the high percentage of women of childbearing age that drink, the high number of unplanned pregnancies discovered later in their term, and the fact that FASD is diagnosed primarily in the children of heavy drinking women, these public messages are unduly "alarmist". The contention is that these messages may lead to unnecessary anxiety and possible termination of pregnancy among low-risk women, while failing to reach the women at greatest risk (Caprara et al., 2004; Abel, 1998).

b. Tobacco

Economic availability: As with alcohol, demand is affected by the price of tobacco, particularly among youth. Given that most tobacco use is initiated during the adolescent years, this is one of the most effective measures for reducing the overall prevalence of smoking in a population (Holder, 2003). As has been demonstrated in this country during the 1990s, there is a definite upper limit for pricing beyond which smuggling occurs and use rates will increase.

Physical availability: Stepped up enforcement of laws against sales to minors can reduce adolescent access to tobacco, however enforcement schemes are expensive and the cost effectiveness of these measures have been questioned (Holder, 2003). A Cochrane review concluded that "interventions with retailers can lead to large decreases in the number of outlets selling tobacco to youths. However, few of the communities studied in this review achieved sustained levels of high compliance" (Stead and Lancaster, 2004).

Restrictions on smoking locations: Workplace environmental tobacco smoke (ETS) exposure has been shown to cause lung cancer and coronary heart disease, and is related to an increased risk of asthma in adults and reduced birth weight in newborns. Relatively strong evidence links ETS exposure to chronic obstructive pulmonary disease and stroke. Smokers who are employed in workplaces with smoking bans are likely to consume fewer cigarettes per day, are more likely to consider quitting, and quit at an increased rate compared with

smokers employed in workplaces with no or weaker policies (although many of the relevant studies are cross-sectional in nature and can't demonstrate a causal effect (Brownson et al., 2002).

Advertising and sponsorship controls: There is good evidence to suggest that exposure to tobacco advertising and promotion is related to increased likelihood of initiation of smoking by adolescents (Loxley et al., 2004). Advertising controls and restrictions on the promotion of tobacco can reduce tobacco consumption in the general community, but broad restrictions are required to avoid industry moving to other media (Loxley et al., 2004).

Package warning labels: Canada has implemented some of the strongest graphic health warnings on cigarette packages; while this measure has seen limited research, self-report studies in this country have indicated that 20% of smokers reported smoking less as a result of the labels (Hammond, 2003).

c. Psychoactive pharmaceutical products

Very little is known world-wide about the characteristics of individuals who abuse pharmaceutical products. Nor is there much information on the effectiveness of measures to prevent abuse of these products. A discussion paper commissioned by the National Framework for Action to Reduce the Harms Associated with Alcohol, Other Drugs and Substances in Canada (Health Canada; Canadian Centre on Substance Abuse, 2005) discussed the current environment and proposed a number of measures including (Sproule, 2006):

- Arrive at a standard definition of pharmaceutical product abuse.
- Increase national monitoring of prescription drug abuse.
- Evaluate provincial schemes such as Nova Scotia's plan to develop an electronic prescription database to address prescription drug abuse concerns.
- Provide further training of health care professionals concerning inappropriate prescribing and detecting, and managing abuse in their practices.
- Increase patient education about the risks of pharmaceutical product abuse. Recommended components include:
  - Establishing a webpage to be used as a one-stop comprehensive place where individuals, the media, students, parents etc. can all obtain relevant information.
  - Preparing materials for use by health care professionals to distribute to patients and to facilitate discussion with patients.
  - Ensuring the information is accurate and balanced.
  - Providing information on statistics related to the problem, detailing which drugs have a risk for abuse, factors that increase the risk for individuals, and where to go to for help.
  - Clearly explaining the difference between physical dependence and addiction.

In noting the move from heroin to prescription opioid use among street populations in a number of Canadian cities, Fischer and colleagues (2006) call for greater efforts in monitoring and controlling these substances. Just the same, this move away from injectable drugs would appear to have some public health benefits.

d. Illegal substances

Reducing availability: As with other substances, the demand for illegal drugs can be influenced by raising prices; the only mechanism for achieving this is through increasing supply reduction activity by the law enforcement community. Theoretically, concerted supply reduction efforts increase costs to producers that get passed on to the consumer. The extent to which this actually occurs in the real world of drug commerce is unclear. Supply reduction measures are costly initiatives that are not easily evaluated; to date, they have not been subjected to rigorous study and their cost effectiveness is unknown. Mathematical modelling of the impact of increasing interdiction activity (i.e. enforcement of drug manufacturing, trafficking and possession laws) casts doubt on their effectiveness in controlling supply and prices (Holder, 2003). When supplies are effectively tightened as a result of enforcement efforts, the resulting higher prices could have the effect of increasing the level of criminal activity on the part of users to cover the higher costs. Nevertheless, it is not known what size the illegal drug industry and market would assume without law enforcement's role.

Community policing to reduce local drug selling within a larger crime prevention strategy has not been rigorously evaluated but models have suggested that these efforts

can have a significant effect on violent crime and citizen perceptions of the quality of life (Holder, 2003).

Seeing nightclubs as venues in which the use of illegal substances may be prevalent, some researchers are studying the effectiveness of working with owner/managers and staff toward health promoting policies and procedures to prevent club drug use in night clubs in the UK and elsewhere in Europe (Bellis et al., 2002).

Contributing to reduced demand: Laws on the production, sale and use of illegal drugs likely contribute to social attitudes toward these substances. However, the experience with cannabis in Canada and elsewhere shows that social norms can shift in spite of existing laws. This is a complex area and no literature investigating it was found (Loxley et al., 2004).

It is possible that users of a substance will seek an alternate substance when the availability of a particular drug is suppressed. For example, Chaloupka (1997) found an unintended negative effect from the U.S. War on Drugs which reduced availability and demand for marijuana in the U.S. This policy resulted in more youth using alcohol, and increases in car crash deaths, emergency ward trauma and violent crime.

Recommended practice 4: measures to control and reduce the physical and economic availability of alcohol and tobacco are among the most effective for reducing the harms and costs associated with these substances and should be given priority at the provincial and local levels. Priority should also be given to educating the public on the strong rationale that exists for these measures.

Recommended practice 5: increase monitoring and research on the extent and nature of misuse and abuse of prescribed mood-altering substances in the province.

DEMAND REDUCTION

Demand reduction may be pursued through Universal and Targeted Prevention measures (some researchers and practitioners distinguish between Selective Prevention and Indicated Prevention measures[5], however for the purposes of this review these levels of prevention will be rolled together as Targeted Prevention). It should also be noted that treatment programs may be seen as contributing to demand reduction, however the contribution must be seen as modest at best – that is, one successfully treated patient or client at a time. (While treatment and harm reduction activities may not have large impact on substance demand, they can nevertheless have a significant impact on societal costs).

1. Universal prevention

a. Mass media

The research literature generally distinguishes between use of media for social marketing purposes, promoting normative practices and for advocacy. Social marketing approaches use marketing principles to encourage adoption of desired behaviours or cessation of unhealthy behaviours on the part of individuals. Social norm campaigns use social marketing principles to shift perceptions of community norms. Advocacy approaches blend political science, social justice and public health principles to encourage change at the structural (vs. individual) level.

i. Social marketing campaigns

Good practice in social marketing includes: clearly defining the target group; formative research to understand the target group; pre-testing the messages; using messages that build on current knowledge and satisfy pre-existing needs and motives; addressing knowledge and beliefs which impede adoption of the desired behaviour; a media plan that gives sufficient exposure and a long term commitment to the campaign (Hawks et al., 2002).

There are few rigorous studies evaluating social marketing campaigns because they are difficult to undertake in the general population. The evidence shows that health-focused campaigns can increase knowledge and awareness but they generally show only small, if any, effects on behaviour (Hawks et al., 2002; Holder, 2003; Agostinelli and Grube, 2003). Snyder and colleagues conducted a meta-analysis of health communication

[5] Selective prevention targets groups who are identified because they share a significant risk factor and mounts interventions designed to counter that risk. Indicated prevention intervenes with those who have significant symptoms of a disorder (in this case, substance abuse as defined by the DSM-IV) but do not currently meet diagnostic criteria for the disorder (Weisz et al., 2005).

campaigns which was relevant to this review in that it distinguished between campaigns to change addictive and non-addictive behaviours. All campaigns showed weak, short-term effects, and not surprisingly, those focusing on addictive behaviours showed more poorly still (Snyder et al., 2004).

Development and distribution of print materials is often a part of awareness events and health promotion campaigns. A review of the literature on health promotion print materials found that certain content (e.g. short words, short sentences) and design (e.g. use of headings, sufficiently large font), characteristics were more likely to be effective (Paul et al., 2003). In a randomized control trial, Paul and colleagues (2004) found that adding a behavioural element (e.g. providing a prize for undertaking the desired behaviour, including a reply-paid envelope, pre-completing a person's name and address on a return form, including a reminder to return the form, providing toll-free numbers, including quotes from those who've made desired changes) to print items with strong content and design characteristics increased the likelihood of behavioural change. The review by Paul and colleagues concluded that knowledge and attitude change (rather than behaviour change) are more feasible aims of this media. However, well conceived and targeted pamphlet literature may effect changes in behaviour when there is a readiness to change, which is more likely to be the case among a patient population for example (in effect, constituting a brief intervention), than the general public. The review also found that pamphlets were more effective when used in the context of larger initiatives.

These campaigns swim against a strong current – the very significant marketing resources of the alcohol, pharmaceutical, tobacco, leisure and pop culture industries contribute to an environment that condones and encourages various forms of substance use. Given this environment and the prevalence of substance use behaviours, "counter advertising" messages need to be carefully constructed to have any effect and to avoid sounding coercive or negative. Clearly, counter advertising also needs to be well-resourced and sustained. The U.S. Institute of Medicine examined the usefulness of health communication campaigns in reaching diverse populations with health behaviour change messages and concluded that "under-resourced and under-exposed campaigns are unlikely to be effective … This concern is magnified in the context of a campaign that intends to address multiple diverse elements, when resource demands are even higher" (Institute of Medicine, 2002).

Underscoring the challenge of inducing behaviour change through media is the outcome of the very well resourced National Youth Anti-Drug Media Campaign by the U.S. Office of National Drug Control Policy, which aimed to prevent and reduce youth drug use (primarily marijuana and inhalants). In spite of a budget of $1.2 billion, there was no evidence that exposure to the campaign affected initiation or cessation of marijuana use during the campaign (1998-2006) (CESAR, 2006a).

The accumulation of evidence would suggest that expectations for traditional mass media campaigns to bring about changes in behaviour are unrealistic. Aguirre-Molina and Gorman (1996) warn that stand-alone campaigns focusing on the behaviour of individuals have the potential to be harmful by drawing public attention away from structural determinants of hazardous substance use. Nevertheless, well-conceived social-marketing campaigns that support or are supported by local community action have more potential to contribute to behaviour change (Loxley et al, 2004).

ii. Social-norms marketing campaigns

Social-norms campaigns have emerged as an alternative to more traditional approaches designed to reduce undesirable behaviour, including hazardous alcohol use (Shultz et al., 2007). Social norm marketing campaigns have become particularly prevalent among post-secondary institutions in the U.S., and also in Canada. The central premise of these interventions is that students generally over-estimate the frequency and quantity of alcohol typically consumed by peers. Research has shown that a university student's use of alcohol is closely linked with their perception of drinking norms among their peers; these interventions aim to modify the perceptions of the normative climate and change alcohol norms on campus (Perkins et al., 2005).

Social "norming" typically involves the use of various media (e.g. placards, newspaper articles and advertisements, college television, and radio spots) to present self-reported data on alcohol use drawn from campus surveys indicating that the majority of students on the campus, contrary to the perceived norm, are not excessive alcohol users (Granfield, 2004).

Despite widespread adoption of social-norms marketing campaigns, evidence for their success is mixed. Although many studies appear to confirm the effectiveness of the social marketing approach, other studies have failed to show significant change and some have actually increased the undesirable behaviours and misperceptions they set out to decrease (Shultz et al., 2007).

Shultz and colleagues suggest this may be because people measure the appropriateness of their behaviour by how far away they are from the norm – consequently not using alcohol or drinking below the norm could be seen as being "deviant". Although the majority of college students do overestimate the prevalence of alcohol consumption on campus, a substantial proportion of them actually underestimate its prevalence. So, normative information might have an unintended boomerang effect of inducing more alcohol use among those that had underestimated its prevalence.

Distinguishing between "descriptive" norms (i.e. perceptions of what is commonly done in a given situation) and "injunctive" norms (i.e. perceptions of what is commonly approved or disapproved in the culture), a study by Shultz and colleagues found that adding an injunctive normative message for those individuals who were already engaging in the constructive behaviour proved to be a buffer to the boomerang effect.

It is apparent that a detailed knowledge of the perceptions of the target population is important to mount a social norms campaign. For example, the meaning of alcohol use among students and particularly the meanings that students construct of the social norm intervention (i.e. is it credible?) must be learned (Granfield, 2004). Nevertheless, a well-constructed norms campaign has the advantage of reaching a large audience at low cost, and being embedded into larger initiatives. Another use of normative information is through provision of individual feedback using online methods (see p. 57).

iii. Mass media for agenda-setting and advocacy purposes

While social marketing campaigns typically aim to change individual behaviours, advocacy-oriented campaigns address the processes or structures of public policy to help set a public health agenda. These campaigns generally try to move debates from individually focused, simple definitions of a substance use problem to a level where the targeted problem is seen as a product of the interaction between the individual and the environment. For example, media advocacy can be used to (Loxley et al., 2004):

- Set a public agenda by heightening the profile of a drug-related problem through the presentation of research findings.
- Highlight the benefits or success of a program or intervention in order to support its refunding.
- Publicly oppose or question the actions of members of the alcohol or tobacco industry when those actions are likely to increase harm.
- Support the call for increased resource allocation to address drug-related problems.
- Bring attention to the inadequacies of government action to address drug problems

Offord (2000) suggests that universal awareness-raising strategies can be very helpful in increasing public acceptance of more intensive, costly or controversial public health measures. Advocacy measures aim to shift attitudes rather than behaviours – perhaps a more feasible aim. Plans to undertake advocacy activity need to anticipate a reaction from the alcohol or hospitality industries. For example, the Australian experience in media advocacy for various alcohol-related measures (e.g., standard drink labelling, taxation) was that the more directly alcohol industry profits were jeopardized, the more strenuous the counter advocacy of the industry (Loxley et al., 2004).

In practice, media advocacy can involve various actions, for example, releasing information to the media or issuing a media release related to concerns about an alcohol product or a community service in jeopardy.

Holder and Treno (1997) drew the following conclusions from their efforts in using media advocacy to support a larger project:

1. Mass communication in itself is not enough to reduce harms but can be used effectively to reinforce specific environmental efforts to reduce high-risk alcohol-related activities, such as drinking-driving.
2. Local communication is best presented through local news media and can focus public attention on problems without having to use professionally produced material.
3. Media advocacy can be taken up by community members and institutionalized within the community if appropriate training is provided.

In sum, mass media has been used to deliver messages to individuals concerning their behaviours (i.e. social marketing), to affect the normative climate (i.e. social norm campaigns) and to effect attitude changes around public policy or structures (advocacy). Traditional stand alone social marketing campaigns have generally not been able to show changes in health risk behaviour, including hazardous substance use, whereas social norm campaigns have shown more promise.

Because advocacy seeks attitudinal rather than behavioural change, the prospect for effectiveness of these campaigns may be greater. Nevertheless, used alone, media advocacy measures are not likely to have much effect, but by their nature, they are usually imbedded into larger campaigns that together aim to shift attitudes and behaviours (see Community-based Strategies below) (Holder et al., 1997).

Recommended practice 6: consider use of social norm mass marketing initiatives to correct perceptions of post-secondary populations, ensuring a strong understanding of the target populations.

Recommended practice 7: the best use of media investment at the local and provincial levels is to build knowledge and attitudes favouring public health-oriented structural or policy changes. Social marketing campaigns focusing on behaviours should only be implemented when well supported by other components within a larger initiative.

b. School programming

Schools are most effective in preventing drug problems when they are truly effective as schools. It has been suggested that reduced student substance use is most likely to occur in schools that (Foster, 2001):

- Promote and support high levels of student attachment to school.
- Provide clear and consistent expectations for student behaviour.
- Offer smaller school sizes.
- Connect students and their families to well-coordinated support services.
- Actively engage parents in their children's education.

This broadly based advice is consistent with a model that is variously known as the "health promoting school", "whole school" or "comprehensive school health" approach. It is commonly accepted by proponents of this approach that student health outcomes on a range of issues will be improved when several elements are combined: [a] evidence-based health/drug instruction, with [b] good access to health services, and [c] health promoting physical and social environments policy attention (Canadian Association for School Health, 2006). A recent systematic review of the literature on the effectiveness of the health promoting schools approach concluded that, while there is wide variability among programs, school health promotion can improve the health and well-being of children and youth (Stewart-Brown, 2006). The logic is based on these broader programs being able to address more of the protective and risk factors (i.e. the environmental factors) than a program based solely on health curriculum.

i. Curriculum

Health and drug education need to employ varied materials and media, cross-curricular learning opportunities, and culturally sensitive and developmentally appropriate learning strategies. Some drug education models, such as the Social Influences and Life Skills approaches, are showing modest effect when carefully implemented. Drug education needs to be age and developmentally appropriate, focus on risk and protective factors, and address local substance use patterns (that is, only those substances for which there is a pattern of use in a population should be addressed).

A review-of-reviews examining health education programs across four areas – substance abuse, risky sexual behaviour, school failure, and juvenile delinquency and violence – found that effective prevention programs consistently featured the following characteristics (Nation et al., 2003):

- Were comprehensive
- Included varied teaching methods
- Provided sufficient dosage
- Were theory driven
- Provided opportunities for positive relationships
- Were appropriately timed
- Were socio-culturally relevant
- Included outcome evaluation
- Involved well-trained staff

The most important feature of effective drug education is the use of truly interactive approaches where honest, non-judgmental dialogue can occur among students and teachers without fear of discipline. For detail on effective drug education at the junior high school level, see the Nova Scotia government publication, Literature Review: Best practices in School-Based Drug Education for Grades 7-9 (http://www.gov.ns.ca/hpp/repPub/DrugEdLit_2007.pdf).

Hazardous use prevention or harm reduction programming: Although it hasn't been studied sufficiently, it has been suggested that drug education at the high school level, where a greater proportion of students is likely to use alcohol and other substances (and use them hazardously), should take a pragmatic and realistic approach that incorporates the following features (Skager, 2001):

- Ensure aims are realistic, and include reducing use and associated harms.
- Create awareness of bad times and situations to be using drugs.
- Aim to reduce problematic use including bingeing, mixing drugs, and using unknown or impure substances.
- Promote responsibility for self and others, and awareness of signs of abuse and dependency, how to approach and help someone showing signs of problematic use, and awareness of helping resources in the school and community.

One program reflecting this approach, the Australian SHAHRP program, found that students receiving this program had greater alcohol-related knowledge, lower levels of total and risky consumption; and lower levels of harm associated with alcohol when compared to control students (McBride et al., 2004).

This type of program is often referred to as having harm reduction aims; however according to Stockwell's earlier-mentioned definition (2006), many of the messages in these programs might be better termed "demand reduction" or "hazardous use" prevention. Regardless, using this approach with young people remains controversial in Canada (Poulin, 2006). Among stakeholders in Nova Scotia, this orientation has been found to be acceptable for high school students but not acceptable at the middle school level (Poulin and Nicholson, 2005).

Integrating mental health and substance abuse curriculum: A growing body of research shows that mental health and substance use problems (along with delinquency, school failure and teen pregnancy) share many of the same risk factors and often occur together (Greenberg et al., 2003). Although little research was found to test the hypothesis, several researchers contend that by addressing these overlapping risk factors (best organized as personal, social and environmental factors) a curriculum may have a preventative effect with both of these issue areas (Stewart-Brown, 2006; Lister-Sharp et al., 1999; Greenberg et al., 2003; Loxley et al., 2004). Loxley and colleagues concluded that "the available evidence suggests that mental health investment should form one component in programs aiming to prevent early age or regular drug use in adolescence" (p. 155).

Reviews don't provide a great deal of direction on which topics are most likely to be positively influenced by curriculum. However, programs more likely to be effective address self-concept, emotional awareness and positive interpersonal behaviours (Wells et al., 2003). Programs that include stress management appear effective in improving coping skills, anger management, anxiety and self-esteem (Lister-Sharp et al., 1999). Tilford et al. (1997) point to three key factors which may mediate between mental health and the causes of mental-ill health: coping skills, self-esteem and social support. It should be noted that many of the evaluated mental health promotion programs were conducted by mental health professionals rather than teachers (Harden et al., 2001).

Mental health and substance use problems are closely entwined, sharing a number of the same risk factors and in some cases, causing or worsening each other. It could therefore be expected that mental health promotion would contribute to preventing substance use problems. While no review of this evidence was found, evidence from primary research is accumulating. For example, see the school-based Gatehouse Project (p. 42) and the workplace-based stress-reduction initiative (p. 49).

Targeted curriculum: Instructional programs targeting students at risk should be considered within a comprehensive school health approach. For discussion on the evidence for these programs, see Section D2b, Targeted school-based and school-linked programs (p. 53).

ii. Health other support services

The availability and accessibility of supportive health services are keys to the early identification and treatment of many problems that can lead to long-term learning difficulties if not addressed. Not all these services are the responsibility of the school; they may be delivered through public health, social service organizations, government/ non-government agencies and other local agencies and community partners. However, the school can serve as an important access point for students and families. Examples of supportive services include (Public Health Agency of Canada, 2005b):

- Social and psychological screening/appraisals for early identification and appropriate referral
- Child protection and other social work services
- Public health services
- Guidance services, psychological counselling and mental health promotion
- Services for special needs students
- Treatment, post-treatment support and rehabilitation services
- Police services
- Recreational services
- After-school programming
- Pre-service and in-service training of health and other professionals
- Active coordination of services and programs

iii. School drug/health policy

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 the process by which they are developed, communicated and enforced. 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.

Since the Evans-Whipp review, an international 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. Although much variation exists, when violations occur, the tendency in U.S. schools is towards punishment rather than remediation (Hemphill, 2006). 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 use of 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", withdrawal of privileges (e.g., school camp, school excursions), 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. Most notably it was found 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, (e.g. providing the opportunity for those suspended to meet 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.

Yamaguchi and colleagues (2003) analyzed school drug testing policies against student drug use across the U.S. and found no link between whether a school conducted drug testing and the prevalence of marijuana or other illegal drug use among student athletes.

iv. Evidence in support of a comprehensive approach

While the theory behind the comprehensive school health approach is strong, it is challenging to evaluate multi-component programs such as these and the research support is limited. The Gatehouse Project 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 aims to improve the emotional well-being of secondary students through both individual- and environment-focused approaches. Rather than providing a set program, Gatehouse involves 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 environmental 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 (Patton et al., 2006; Bond et al., 2004; Bond et al., 2001).

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 eight schools per year. The main goal (like Gatehouse) is to reduce depression and the first pilot school is already showing impacts on substance use. Among the differences between the Gatehouse and the CORE initiatives is that CORE targets teachers and the school as a workplace and it lasts for three years instead of two. 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 (University of Calgary, n/d).

At the post-secondary level, the most promising universal prevention programs appear to be those that use a similar settings-based or environmental approach that engages key stakeholders (i.e., students, health care providers, licensed establishments, and the alcohol industry) in identifying and pursuing policy-level strategies (for example, reducing access, implementing responsible beverage services) to reduce high-risk drinking (Weitzman et al., 2003). As noted in Section D.1.a.ii, social norm campaigns are common on university and college campuses.

Recommended practice 8: schools should aim to imbed drug education curriculum into a comprehensive health promoting approach that also gives attention to the school's social and physical environment and support services.

Recommended practice 9: school substance abuse policy development should engage the full school community and favour remediation over punishment.

c. Community-based strategies

In the substance abuse field, it has been understood for some time that interventions need to extend beyond single-focused awareness or education programs toward comprehensive approaches. These multi-component approaches attempt to not only influence the individual but to engage community members and institutions in addressing the environmental and social factors that influence a particular substance use problem (Aguirre-Molina and Gorman, 1996).

Most of the research-driven community-based programs

have focused on alcohol and tobacco because they present a greater public health burden than the illegal substances and there are more intervention mechanisms available with these legal substances (e.g., taxation, control of sales). Although programs differ with respect to aims and content, they typically include some combination of school-based education, public information programs, media advocacy, organizing and mobilizing of different community groups and populations, promotion of environmental changes (control of sales, etc.), efforts to publicize and enhance enforcement of existing laws pertaining to the use of alcohol, tobacco or other drugs, and possibly medical screening and treatment. Programs might also provide social and entertainment activities that are alcohol, drug or tobacco free or that promote healthy lifestyles such as exercise and good nutrition (Aguirre-Molina and Gorman).

Holder and colleagues (2000) provide a strong example of a community-based approach with the five-year Community Alcohol Trials Project, a rigorously evaluated study of a multi-component community intervention to reduce alcohol-related harm (rather than consumption) (Holder et al., 2000). Local media and mobilization of key community members were used to cultivate support for several measures:

- Responsible beverage service in licensed establishments
- Enforcement of sales to minors laws
- Enforcement of drinking and driving laws
- Reduced access to alcohol

This study showed significant reductions in self-reported driving after having too much to drink; night time injury crashes, assault injuries in emergency departments, alcohol sales to minors, and problematic alcohol use in the intervention communities.

Project Northland is another example of a rigorously evaluated long-term multi-component project (Perry et al., 2002). 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 sale of alcohol to adolescents.

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 seemed to return to the level of drinking that was normative 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.

Coalition building, leadership development, and extensive public participation form the foundation of a strong community-based prevention plan, and awareness and advocacy activities can buttress these elements. Aguirre-Molina and Gorman, in their review of community-based drug prevention programs, found that programs with the greatest promise:

- Relied heavily on community action as the means of achieving change.
- Sought to empower the community through involvement in all decision making.
- Were comprehensive in terms of targets and strategies.
- Drew on the public health model to identify factors other than the individual contributing to problems.
- Drew on the best available research to guide interventions.

A 2002 review of comprehensive community interventions by Hingson and Howland drew the following conclusions:

- Targeting behaviours with immediate consequences

(such as binge drinking and overdosing) vs. those with distant health consequences (e.g., smoking and lung cancer) were more likely to be effective.

- Programs that targeted youth to prevent them from starting new health-compromising behaviours tended to be more successful than programs aimed at modifying pre-existing habits among adults.
- Programs that combined environmental and institutional policy change with theory-based education programs were the most likely to be successful.
- Programs tailored to local conditions by the communities themselves tended to achieve more behaviour change than programs imported from the outside.

While supported by the evidence, comprehensive initiatives are not easy to implement. Well coordinated community programs are complex undertakings that require long-term commitment, reasonable resources and some measure of public and political support. They may also, by their nature, engender resistance among those comfortable with the status quo. A review of community-based interventions concerned with alcohol use (Gorman and Speer, 1996 as reported in Loxley et al., 2004, p. 167) reported that most programs experienced difficulties in generating the necessary community involvement and in shifting community processes. The programs that reported most success had focused objectives such as reducing drinking and driving, or limiting alcohol use in specific locations.

In that vein, the Communities Mobilizing for Change on Alcohol (CMCA) project pursued a focused objective and generated knowledge on engaging community members (Wagenaar et al., 1999). The randomized 15-community trial was designed to develop, implement, and evaluate a community organizing intervention to change policies and practices of community establishments around alcohol. Because the 6-year project significantly affected the behaviour of 18- to 20-year-olds, and changed the selling and serving practices of bars, restaurants, and taverns in the intervention communities, it is worth reviewing the process and lessons learned.

The process followed by experimental communities was:

1. Assess community interests.
2. Build a core base of support in the community.
3. Expand the base.
4. Develop a plan of action.
5. Implement the plan.
6. Maintain the effort and institutionalize it.
7. Evaluate and disseminate results.

Lessons learned from the CMCA project were:

- Allow adequate time for the process. The process of gathering consensus around a campaign issue, identifying appropriate policy responses, and moving policies through the approval process is often both difficult and lengthy.
- Work with communities that are ready and experienced. It may be easier to work with communities that demonstrate readiness to change local policies than with communities that have little experience with prevention policies.
- Do your homework. In the organizing process, it is extremely important that the organizer know the issue as thoroughly as possible. Organizers should be familiar with the research and other evidence that both supports and refutes their claims.
- Recruit supporters one-by-one. The heart of organizing is careful building of interpersonal relationships, one-by-one. Rarely do people join local organizing efforts en masse; most often they come one at a time, recruited by the organizer or others active in the core group.
- Use multiple packaging for the issue. Most issues can be presented in ways that increase their appeal to various sectors. For example, underage alcohol use can be presented as a public health issue to local health workers, a family issue when talking to parents, a business issue for local stores and shops, a crime issue when talking with police and other enforcement agencies, a productivity issue for employers, a budget issue for city leaders, and so on.
- Build a large base and recognize the value of allies. While action is essential to successful organizing, premature action can weaken the effort and unnecessarily alienate potential allies. External support, in the form of formal endorsements or informal cooperation, is an essential ingredient for success.
- Cultivate ownership. Any group works best if its members are confident of their own authority and power to act. It is important to clarify as early as possible the focus of the effort, interests and respective roles of participants and the process by which decisions will be made.

- Don't unnecessarily delay action. It is action, rather than talk, that will move the process forward and attract new participants.
- Celebrate victories. It is important to claim victories, however small or partial, to build morale and cultivate a sense of momentum. The organizing process should serve to empower people and their organizations by celebrating the achievements of their work.

For young people, "community" increasingly involves Internet-based or on-line relationships and interests. While the use of the Internet to present health information and foster online communities has burgeoned, there is little evaluation research to guide work in this area. Skinner and colleagues associated with the University of Toronto (2006) have been exploring the role of Internet-based health promotion applications directed to youth for a number of years. They suggest that online programs need to employ sound program planning principles in order to be successful (e.g. theory and data-driven, engagement of the target group, use of formative research, ongoing evaluation and improvement). Their STAR and Teennet programs use a Participatory Action Research method and the following principles as a basis to their work (Skinner et al., 2006):

- Participatory: key involvement (ownership) at all stages by youth
- Relevance: focus on personal, health, and social issues identified by youth
- Active Learning, Fun: engaging, flexible and highly interactive, stimulates self-directed learning
- Autonomy Supporting: respects individual choice and exploration of options regarding health behaviour
- Access: designed and adapted to be accessible and relevant to diverse groups and settings, especially marginalized populations

Although it is difficult to tease out the contributions of the various components, comprehensive campaigns have shown positive effect on substance use measures. These initiatives however, are complex undertakings requiring capable leadership and strong community participation.

Recommended practice 10: community-based initiatives should focus on specific community-level structural changes rather than general community mobilization.

d. Programming for families and parents

Parent and family programs directed to at-risk families (see Interventions for Higher Risk Families below) have more research support than universally delivered programs. Some have suggested that selective programs that have been effective in reducing substance use be tested with universal populations (Holder, 2003). The seven-session Iowa Strengthening Families Program (ISFP) is one such program, having recently been tested with all families within late primary school (6th grade). 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 (Kumpfer et al., 2003).

The ISFP program is delivered within parent, youth, and family sessions using narrated videos that portray typical youth and parent situations. Sessions are highly 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 combine to one group 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 (Mitchell et al., 2001).

It appears that programs that work with families (that is, parents and children together) have more promise than those working with parents only. 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. Programs that help parents develop the following skills appear to have most promise for preventing substance use:

- Improving parent-child relations by using positive reinforcement, listening and communication skills, and problem solving.
- Providing consistent discipline and rulemaking.
- Monitoring children's activities during adolescence.
- Strengthening family bonding.

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 (Sanders, 2005), Small trials delivered by researchers have shown positive results at one year follow-up for Triple P interventions (Loxley et al., 2004).

Recommended practice 11: universal family programs directed to parents and their children (such as the Strengthening Families Program) are recommended, particularly within a larger initiative.

e. Programming for older adults

Although no reviews of the universal prevention literature for older adults were found, as discussed in Section II, substance use among this population looms as an emerging issue by virtue of sheer demographics. Older adults may be especially vulnerable to certain types of alcohol and drug-related problems due to changes in body mass, poor health and concurrent use of prescription drugs (Baron et al., 2004). Limited research suggests that promising universal prevention practices would include:

- Clarify and focus on risk and protective factors. Give attention to the catalysts or triggers for drinking and medication use in old age; various health and seniors' services could help people prepare for imminent life changes, for example by improving social support and providing pre-retirement health checks, counselling and advice.
- Disseminate information about alcohol and medication consumption to groups of older people and those approaching retirement. Options include peer approaches and incorporating substance use-related information and support into general advice concerning life issues (e.g. isolation, poverty and access to services) provided by the various organizations serving older adults.
- Consider lower alcohol limits for older adults. Even modest alcohol use in old age is potentially harmful due to increased vulnerability and interaction with prescribed medications, contributing to falls, compromised memory, mismanagement of medication, inadequate diet and limitations on independent living.
- Clarify that in order to receive alcohol's cardiovascular protective effect older adults need only drink as little as one drink every other day. Non-drinkers are not encouraged to start drinking alcohol for its protective effect against heart disease because there are less risky alternatives, such as exercise, diet, managing stress and quitting smoking (and small increases in the risk of some cancers begin from just one drink a day) (National Health and Medical Research Council, Australia, 2001).
- Prescribe benzodiazepines cautiously to older populations, and choose shorter duration benzodiazepines because they are less likely to accumulate in the blood, which increases the risk of harmful side effects (Loxley et al., 2004).
- Put older adult issues on the public agenda: because of the demographic shifts, advocate for increased attention to the prevention of alcohol-related harm in old age on the agenda of public, private and voluntary organizations.

f. Workplace policy and programming

i. Workplace health promotion

Given the dominant role of work in the lives of most adults, working conditions, that is, the physical and social environment in workplaces need to be recognized as important factors in either contributing to or reducing substance use problems. Factors such as high demand/low control conditions, repetitive, boring tasks, lack of supervision, lack of opportunity for promotion, and drinking culture are known to be workplace risk factors for substance use and other health problems. From a health promotion perspective, a pattern of substance abuse in a company might be a "red flag" for organizational or work design problems. (e.g., in a company or work-site where prescription drug use is higher than normal, it is reasonable to question whether the working conditions are in some way contributing to employee stress, sleeping disturbances or physical problems).

ii. Substance abuse-specific measures

As most people who use alcohol or other substances are employed, substance use patterns in a community or region will, all else being equal, be reflected in employee substance use patterns. Consequently, patterns affecting workplace-related use might be addressed through community-wide interventions. On the other hand, the workplace offers a venue for delivering messages and interventions to some, including family members, who might not otherwise be reached in the community.

Although illegal drugs in the workplace receive more attention, the substance of greatest concern is alcohol due to prevalence of use and impairing effects of intoxication and hangovers. Employee alcohol and other substance use may result in a variety of workplace concerns such as absenteeism, productivity, accidents and injuries, job satisfaction, employee turnover, the social climate of the workplace and the image of the company. As a result, governments and the private sector have for years seen the need for attention on this issue (Butler, 1993).

Nevertheless, there is little Canadian legislation pertaining to this area of activity. The Canada Labour Code and provincial health and safety legislation indirectly call employers to address substance abuse within efforts to create a safe workplace. Also, federal and provincial human rights laws prohibit discrimination on the basis of a disability and current and former substance dependence is viewed as a disability. U.S. legislation requires all Canadian companies who truck or bus into the U.S. to have substance abuse policies centered on drug and alcohol testing (Butler, 1993).

Companies, particularly larger ones, tend to see attention to this issue as good human resource practice, good for their image in the community and consistent with measures to achieve high quality and ethical standards. Companies with safety-sensitive positions (i.e. public transport, mining, forestry, construction, etc) become involved in this issue out of concern with the safety and liability implications of employee substance use. Smaller companies (i.e. fewer than 100 employees) typically give less concerted attention to the issue for a number of reasons, including lack of awareness of health and safety regulations and lack of resources (Eakin, 1992).

While there are numerous arguments in favour of the workplace as a setting for prevention, the quality of the research evidence in support of any particular practice or measure is weak.

Promising preventative interventions include (Cook and Schlenger, 2002)

- Stress management sessions that don't directly address substance use have been shown to shift substance use-related attitudes and practices (e.g. 10–15 hour-long training sessions designed to teach workers a wide range of coping strategies for stress showed impact on some stress coping skills, psychological symptoms and tobacco and alcohol use).
- Similarly, cardiovascular wellness programs have been found to be effective as a route to reducing employee alcohol abuse. A brief workplace "counselling" intervention that emphasized the role of alcohol abuse as a potential health risk, developed employee's confidence to make successful behaviour changes, provided social support for making the changes, and provided information on alternative health behaviours was found to reduce the proportion of heavy drinkers (and smokers) from initial screening to re-screening.
- Policy that promotes low-risk use of alcohol and limits the availability of alcohol to employees.

As with other universal educational programs the effect on behaviour that can be expected from these types of initiatives on their own is limited. They may however have the effect of increasing support for other more targeted or comprehensive prevention programs. Comprehensive programs that address both individual (such as the educational programs above), and environmental factors (e.g. targeting features of the physical working environment that may encourage problematic alcohol and other drug use) have more promise but are more challenging to implement.

iii. Employee Assistance Programming (EAP)

Contemporary Employee Assistance Programs (EAPs) tend to be broad-brushed comprehensive programs that assist workers whose job performance is, or may in the future be, negatively affected by any one of a number of personal problems. EAPs aim to help reduce accidents, workers' compensation claims and absenteeism, and contribute to

improved productivity and employee morale. There are a number of ways of offering the service, with some EAPs using a peer approach to identification and referral, others relying more on professionals either within the company or provided by a commercial vendor. In Canada, 67% of companies with over 100 employees report having an EAP. EAPs are more prevalent in larger, unionized workplaces with fewer ethnic minorities and less established in smaller companies (Macdonald et al., 2006).

No controlled evaluations that show EAPs to be an effective means of addressing substance use problems were found and there are weaknesses with many of the studies that have been conducted. One Canadian study failed to demonstrate EAP effectiveness (Macdonald, 1997). Nonetheless, various Canadian companies have claimed good return on investment from their EAP (Csiernik, 1995).

Because employees using EAPs for substance use problems have been found to be seen for fewer sessions and were less likely to have their problem resolved through the EAP than employees with other problems, brief, motivational interventions have been suggested as potentially useful given their effectiveness in other settings (Chan et al., 2004).

iv. Employee drug testing

Employee drug testing is a relatively common workplace measure in Canada with about 10% of private sector companies of 100 employees or more reporting that they have a drug testing program. The proportion is greater among U.S.-based companies and those with safety-sensitive positions. There are several types of drug tests (e.g., pre-employment, random, post accident) and a number of different aims that a company may have for its testing program, so determining effectiveness is not straightforward. Although a number of studies have been conducted on drug testing in the United States, many suffer from methodological weaknesses. For example, a number of studies have attributed reductions in accident rates and improvements in productivity to drug testing without accounting for the influence of other substance abuse program elements or organizational developments, such as improvements in equipment (Macdonald and Wells, 1994).

A number of studies have followed individuals after a pre-employment drug test that did not affect hiring or treatment decisions. While several have shown no difference, others have found individuals who test positive show higher absenteeism and turnover rates than those testing negative to a pre-employment test, suggesting that pre-employment screening may be moderately effective in reducing performance problems. Alcohol testing is considered more justifiable and potentially more effective than testing for other drugs because alcohol use is much more prevalent than other drug use, alcohol has been shown to have a greater impact on psychomotor functioning than most other drugs and alcohol (breathalyser) tests actually measure the degree of impairment (Macdonald, 1997).

Comprehensiveness in the workplace setting means addressing health promotion, prevention and employee awareness alongside identification of substance use problems and access to assistance (indicated prevention) as well as disciplinary measures (enforcement). There is some empirical support for bringing these elements together in a balanced policy developed in consultation with employees, and is well communicated and applied evenly and consistently(Cook and Schlenger, 2002; Butler, 1993).

2. Targeted demand reduction

Universal programs have been criticized for having insufficient focus and intensity to effectively address the needs of higher risk populations. Studies of the effect of universal programs on substance-using populations have shown either no effect or even an increase in use (McGrath et al., 2006). Individuals 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 (Offord, 2000). Because there is significant overlap between these two populations (i.e. those with a number of risk factors tend to use substances more hazardously), this section will group all targeted programming together

a. Interventions for higher risk families

It appears that “family-based” interventions are more

effective than "parent-only" or "child only" programming in building protective factors and reducing substance use (Kumpfer et al., 2003). For example, the Focus on Family program which provided for parent skill building without including an intervention for children showed no effect on children's substance use (Becker and Roe, 2005). 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.

A well-replicated example of a family program that has been shown to be effective with targeted as well as universal populations is the Strengthening Families Program (SFP). The format involves whole families coming together in a school, community centre, or other public place. The format for each week of the 14 session SFP is similar – 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). The program offers free meals, transportation, and childcare to help parents attend.

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 (Kumpfer et al., 2003).

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 ages 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 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 and included: 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 percent reduction in alcohol "sipping" relative to controls. (Dewit, n/d).

A review of selective family programs concluded the following about effective programs (Webster Stratton and Taylor, 2001):

- Take a skills enhancing perspective.
- Content is broad-based; program content includes cognitive, behavioural, and affective components.
- Length is 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.
- Developmentally focused (i.e., targeted at specific ages).
- Use a collaborative process with parents, teachers, and children.
- Focus on parents' and teachers' 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 rigorously evaluated in control and comparison group studies using multiple methods and provide follow-up data.

Recommended practice 12: family programs, such as the Strengthening Families Program, should be given priority as an intervention to support higher risk families.

b. Targeted school-based and school-linked programs

i. School engagement programs

All students may potentially benefit from universal prevention measures that aim to impart knowledge/life skills or improve the general school environment. Some students (e.g., those who are not succeeding in school, those with behavioural issues, with few peer contacts or those who are not involved in extra-curricular activities) are at risk for a variety of problems, including substance use, and may benefit from targeted prevention measures (Roberts et al., 2001). The most commonly evaluated approach to working with at-risk pre- and early adolescent youth is school-based life-skills programming (Becker and Roe, 2005). Two illustrative examples of this programming are the Reconnecting Youth program from the U.S. (Eggert et al., 1994) and a similar Canadian program, Opening Doors (Dewit et al., 2000).

Reconnecting Youth is a widely replicated example of a school-based targeted program that aims to build school connections among vulnerable young people. The program is aimed at youth in grades 9 through 12 (14 to 18 years old) at risk for school dropout. These youth may also experience other problems, such as substance abuse, aggression, depression, or suicide risk behaviours. Reconnecting Youth involves peers, school personnel, and parents and delivers interventions that address three program goals: decreased substance use; increased school performance; and decreased emotional distress. The program has four key components:

- A 50-minute class with a student-teacher ratio of 10-12 to 1 offered daily during regular school hours for 1 semester (80 sessions); among issues addressed in the class are self-esteem, decision-making, personal control and interpersonal communication.
- School bonding activities consisting of social, recreational, academic, and weekend activities that are designed to reconnect students to school and health-promoting activities as alternatives to drug involvement, loneliness, and depression.
- Parental involvement, required for student participation, is essential for at-home support of the skills students learn in class; school contact is maintained through notes and calls from teachers who also enlist parental support for activities and to provide progress reports.
- School crisis response planning provides teachers and school personnel with guidelines for recognizing warning signs of suicidal behaviours and suicide prevention approaches.

In the original trial, Reconnecting Youth was found to improve grades and school attendance, reduce drug involvement, decrease emotional distress, and increase self-esteem, personal control, pro-social peer bonding, and social support (Eggert et al.). However, the design of the study was relatively weak and reviewers have called for more rigorous evaluation of this program (Loxley et al., 2004).

Cho et al. (2005) did replicate 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).

Similar to the above program, the Opening Doors program was evaluated in several Ontario schools, aiming to prevent or reduce substance use and other problematic behaviour in at-risk youth during their transition from junior high to secondary school. A student and parent program ran concurrently. At the six-month follow-up (which is considered minimal for evaluation purposes) program participants, compared with the control group, reported less frequent drinking, cannabis use, non prescribed tranquilliser use, self-reported theft; and improved attitudes toward school. They also reported less supportive attitudes

toward alcohol, tobacco and cannabis use and less risky drinking behaviour. There were no program effects on personal/social competence measures (Dewit et al., 2002).

While school engagement programs have a good theory base, they also face potential problems, so school personnel considering this approach would need to consider how to obtain the benefits while avoiding the problems.

ii. Programs for Aboriginal students

Because relevance is critical, culturally appropriate substance education programming is likely to increase the potential of programs for First Nations students. However, culturally tailoring prevention programs means going beyond superficial language translation to modifications based on a deeper understanding of cultural values, practices and symbols. 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 (2004) found bicultural competence approaches to skills training to be most promising for reducing prevalence of drug use in Native American youth. This approach aims to equip young people with coping skills to negotiate between mainstream and Aboriginal cultures.

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 or 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 also using these substances at a lower rate than those participating in the curriculum + community arm, which runs counter to accepted wisdom. The study reported gender differences and found that boys were more likely to have high rates of alcohol use; girls were more likely to use cigarettes regularly, while there was little difference with cannabis use.

In their Cochrane review, Foxcroft et al. (2003) concluded that this approach is one of the more promising approaches in the adolescent alcohol prevention literature.

Recommended practice 13: universal drug education for Aboriginal students should reflect strong local cultural understanding and employ a bi-cultural competence approach.

iii. After-school programming

A review of the evaluations of 46 predominantly after-school programs for high-risk youth of junior high school age arrived at conclusions that are similar to the current

evidence for school-based programming. Specifically, the most promising programs featured:

- Strong theory base: were structured by a clear purpose and strategy than less coherent programs.
- Behavioural life skills development: for example, focusing on anger management, conflict resolution, decision making, social skills, academic enrichment, vocational support, or positive recreation experiences that focused on skill-development (e.g., wilderness adventures, ropes courses).
- Active participation: encouraging youth to play an active role in the intervention services as opposed to didactic instruction. Two types of delivery methods were identified as more effective.
  - Introspective or self-reflection learning method.
  - Connection building method involving techniques such as team building to help youth connect with others (vs. individualistic learning approaches).
  - Greater intensity: more intense programs were significantly more effective than less intense (Springer et al., 2004).

c. Brief interventions

For populations using substances hazardously but who aren't necessarily dependent, brief interventions (i.e. less than 6 sessions), 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 (Toumbourou et al., 2007; Wilson et al., 2001; Vasilaki et al., 2006).

Cognitive-behavioural approaches[6] 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 style is characterised by empathy and acceptance, with an avoidance of direct confrontation. Any statements associated with positive behaviour change that the patient brings up in the discussion are encouraged so as to support self-efficacy and a commitment to take action (Miller and Rollnick, 2002).

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) (Toumbourou et al., 2007).

i. Brief interventions in primary care settings

Brief interventions by primary care practitioners for both smoking and early stage alcohol problems are well supported by research. While the increase in the number of people reducing their consumption in response to brief interventions is small, this increase is highly consistent across numerous different studies. Given that brief intervention is inexpensive, takes very little time, and can be implemented by a wide range of health and welfare professionals, this is a highly cost-effective strategy with considerable potential for public health benefits when applied broadly (Loxley et al., 2004).

Monti and colleagues (1999) tested an intervention set in emergency rooms with adolescents who tested positive for alcohol, capitalizing on a "teachable moment" that follows an alcohol-related event and possible injury. Those in the experimental group received a brief motivational interview (MI) conducted by trained staff. The interviews featured personal feedback regarding drinking patterns and effects with an empathetic style and self-efficacy enhancement. As advised by Miller and Rollnick with motivational approaches, the session focused on developing discrepancy while reflecting empathy, avoiding argument, and emphasizing personal choice.

[6] Therapeutic approaches that combine the cognitive emphasis on the role of thoughts and attitudes in influencing motivations and response, with the behavioural emphasis on changing performance by giving attention to reinforcement and reward.

The 35 to 40 minute interviews were structured accordingly:

- Introduction and review of event circumstances
- Exploration of motivation (pros and cons)
- Personalized and computerized assessment feedback
- Imagining the future
- Establishing goals

Handouts were given as well as an information sheet about the effects of alcohol on driving and a personalized feedback sheet.

Patients were re-interviewed at 3 and 6 months. Six months after their emergency room visit, differences in drinking were negligible (all participants showed a decrease, possibly as a result of being injured) but the motivational interview group showed a 32% decrease in drinking and driving and had half the occurrence of alcohol-related injuries – that is, the approach produced a harm-reduction effect rather than reduced alcohol use.

ii. Brief interventions with students

A brief intervention directed to Canadian First Nations youth with selected personality risk factors is showing promise. In preliminary studies, investigators found that different personality types used alcohol to cope in different ways. Whereas alcohol helped youth with "anxiety sensitivity" feel less anxious in a social situation, it provided "sensation-seeking" youth with a satisfying outlet and helped youth who expressed a sense of hopelessness feel less sad about other concerns in their lives (Comeau et al., 2001).

Investigators then tailored personality-matched, motive-specific early interventions to meet the needs of at-risk adolescents with the intent of reducing alcohol use. Manuals were developed that featured the use of stories and images drawn by First Nation teen artists and developmentally appropriate cognitive-behavioural techniques. The intervention targeted three personality profiles: anxiety sensitivity, hopelessness, and sensation seeking.

The interventions were tested by randomly assigning 297 Canadian high school students in urban British Columbia and rural Nova Scotia (56% girls, average age 16, average grade 11) to either the two-session, group format intervention or to a no-treatment control group.

Interventions were delivered by therapists and research assistants and involved 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.

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 had been 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 (Conrod et al., 2006).

iii. Brief interventions with older adolescents and young adults

Brief interventions have been shown to be effective in reducing alcohol-related harm among young people in a number of settings. Baer and colleagues conducted a randomised controlled trial evaluating a brief intervention directed to high-risk university students (Baer et al., 2001). Participants were randomly assigned to the brief intervention or a control condition and were followed up annually for four years after the intervention. The intervention consisted of a single brief non-confrontational counselling session, with personalized individual feedback and motivational techniques. Each student was required to self monitor their drinking pattern in a diary for two weeks before the counselling session. An attempt is made to resolve ambivalence about changing one's drinking behaviour and to move toward a safer drinking plan.

Drinking levels were compared to norms for same-aged peers and became the basis of the personalized feedback. Follow-up assessments over four years showed that drinking problems declined significantly over time and the intervention produced significant differences in alcohol use and harmful consequences over the four years. High-risk students continued to experience more alcohol problems than the normative comparison group, though significantly less in the intervention group than high-risk controls. Among high-risk participants, 67% of the intervention group compared to 55% of high-risk controls had good outcomes over four years. Most students, overall, showed a decline in problems over time indicating a developmental maturational effect.

Hazardous drinkers are often reluctant to discuss their drinking with a doctor or any other practitioner and practitioners generally show reluctance to conduct this line of discussion (Kypri et al., 2003; Griffiths and Cooper, 2003); consequently, brief online formats have been the subject of recent research interest. These formats have the advantage of anonymity, a non-confrontational private environment, and the ability to reach large numbers of people. While relationship building is a critical element of longer-term therapies, a key to brief assessment/feedback sessions is the provision of normative feedback which can be easily provided online. When Koski-Jannes and Cunningham (2001) surveyed 1,257 current drinkers in a telephone survey of Ontario residents, 16% reported interest in receiving "a telephone call from a therapist to help them evaluate their drinking, 26% in receiving a self-help book, and 39% in a computerized summary comparing their drinking to that of other Canadians" (p. 91).

Saitz and colleagues (2004) showed the potential of this medium to reach large numbers of people with a Web-site designed to provide brief intervention. Over a 14-month period close to 40,000 people completed the site's questionnaire to describe their alcohol use, and their use of portions of the Web site that provided information and referral resources. Over 90% of those completing the alcohol screen drank at hazardous levels. One-fifth of visitors visited portions of the Web site that provided additional information about alcohol use and referrals. Visitors with possible alcohol use problems (i.e. higher level of risk) were more likely than others to visit a part of the Web site designed for those seeking additional help.

Online self-assessment followed by brief intervention in the form of personalized feedback may be particularly attractive to young people. Kypri et al. (2003) surveyed a random sample of 1,910 students (82% response rate; 902 women and 662 men; average age 20.5 years) on their preference for receiving information and support on alcohol problems among five options. Sixty two percent of the respondents scored as hazardous drinkers; among these students, the preferred option was the web-based format:

1. Anonymous web-based alcohol risk assessment and personalized feedback: 82%
2. Reading materials/leaflets about alcohol and its effects: 73%
3. Alcohol risk assessment and advice from a nurse, counsellor, or psychologist: 58%
4. Alcohol risk assessment and advice from a doctor: 58%
5. Health education seminars on alcohol: 40%

An email-based electronic screening and brief intervention with personalized normative feedback on alcohol use was offered to all 3,875 second term students at a university in Sweden (Bendtsen et al., 2006). The students received an email with a link to computerized alcohol use questions and were offered personalized feedback directly on the computer screen. The students evaluated the test and were asked to state whether they were going to consider changing or actually change their alcohol habits.

The response rate was 44%, with 742 female and 843 male students participating. The email-based computerized normative feedback was appreciated by the students and one-third of the females and one-fifth of the males believed that they would benefit from the normative feedback; 8% of the females and 3% of the males believed that they would actually change their habits after the feedback. Students with a risky drinking pattern, previous experiences of blackouts, being dissatisfied with their current drinking and students that had considered changing their habits before the intervention showed more motivation to change their drinking after having performed the intervention compared to students without those characteristics.

Kypri and colleagues (2004) tested the effectiveness of 10-15 minute web-based assessment and personalized feedback with a total of 167 students (17–26 years) against a leaflet-only control group. At 6 weeks, participants receiving the intervention reported significantly

lower total consumption, lower frequency of heavy sessions, and fewer personal problems. At 6 months personal problems remained lower, academic problems were lower, but consumption patterns had converged.

Saitz and colleagues (2007) tested the feasibility of an online alcohol screening and brief intervention with all freshmen students at a university in the U.S. (55% of students participated, completing the online screening). Overall, 37% of men and 26% of women scored as hazardous drinkers. A minimal (3 web pages) and more extensive brief intervention (3more pages) were tested. Results indicated that more extensive brief intervention was more effective for improving intention to seek help and readiness to change, but that even the minimal intervention may have decreased unhealthy alcohol use.

iv. Screening and brief interventions for non-dependent pregnant women

Some pregnant women with substance use issues are dependent and benefit from intensive case management, treatment and support for the many issues typically facing women who are substance dependent. Others may be non-dependent users who would benefit from brief motivational interventions.

Given the stakes involved, there is a strong argument for routine alcohol use screening among all women of childbearing age. However, given the resource implications for health systems that are under strain, routine alcohol screening of all pregnant women is more achievable (U.S. Preventive Services Task Force, 1996). Many women are able to stop using alcohol once they know they are pregnant or when planning pregnancy (Floyd et al., 1999); for others, simply being asked screening questions will prompt action (Handmaker and Wilbourne, 2001). Discomfort with alcohol screening typically experienced by both physicians and women is best addressed by creating a non-judgmental, respectful environment allowing the screening questions to be posed within a general health inquiry, and by providing physicians with more information on available pregnancy outreach and treatment programs. Two alcohol use screens designed specifically for pregnant women and demonstrated to be effective are the TWEAK and T-ACE (Russell, 1996; Chang, 2001).

Brief interventions consisting of one to five sessions by health or social service practitioners are showing evidence of effectiveness with non-dependent alcohol using pregnant women (Manwell et al., 2000; Chang et al., 2000; Hankin et al., 2000). Chang et al. tested a two-session intervention with pregnant women that focused on identifying alcohol use goals during pregnancy and found that the intervention assisted in the reduction of alcohol use. Hankin et al. conducted a randomized controlled trial to examine the effect of a brief intervention strategy on drinking in subsequent pregnancies. Upon follow-up, women in the experimental group were found to have consumed slightly more than half as much as women in the control condition. Women who reported the heaviest pre-pregnancy drinking showed the largest reduction in drinking following the brief intensive intervention and children born to women in the brief intensive intervention groups showed better growth outcomes at birth.

Motivational Interviewing (MI), as conceived by Miller and Rollnick, has shown some effectiveness as a brief intervention with pregnant women (Handmaker and Wilbourne, 2001; Valequez et al., 2003). Handmaker and Wilbourne tested a brief MI intervention with a small sample of drinking pregnant women in a prenatal care setting. After an assessment, those in the experimental sample participated in a one-hour intervention consisting of a discussion of what the woman already knew about the effects of drinking, feedback on the severity of her drinking, and comments intended to increase motivation to change. Those in the control condition were given the assessment and mailed information on potential risks associated with drinking during pregnancy. Women who had been reaching high blood alcohol concentrations (BACs) before the intervention were found to be drinking at much lower BAC levels compared to women in the control group.

Given the prevalence of binge drinking among adolescent and young adult women, the extent of their sexual activity, and their tendency to recognize pregnancy later in term (Cornelius et al., 1997), it would make sense to direct messages and interventions to this population; however, no studies were found.

In a well-controlled trial, Ondersma and colleagues (2007) tested a single computer-based session for reducing illegal drug use among 107 post-partum women who had reported using substances prior to pregnancy. The 20-minute computer-based session drew from motivational interviewing methods and was supplemented by a mail out brochure. All participants worked with a laptop with a

touch screen while in their hospital bed, using headphones for privacy. The brochures were mailed without identification at 4 and 9 months. The results showed that the session was moderately effective in reducing illegal drug use among these women.

Recommended practice 14: brief, motivational-based interventions should be field-tested with a wide range of targets, including primary care patients, personality-targeted Aboriginal high school students, post-secondary students, and non-dependent pregnant women; test use of on-line format to reach a broad population of Nova Scotian substance users.

HARM REDUCTION MEASURES

Harm reduction is generally (but not universally) seen as an important component of substance abuse or drug strategies. While some harm reduction strategies are decades old (e.g. heroin prescription and DWI countermeasures) harm reduction found momentum from the more recent concern that HIV was a greater threat to the community than the threat of injection drug use. As with HIV and injection drug use concerns, harm reduction measures are often understood to be of broad public health interest as well as of interest to the addictions field specifically. Because these measures may be controversial and polarizing, there is a particular need to base discussion and implementation on a sound understanding of the evidence and need, and accurate communication to stakeholders and the public.

1. Measures to reduce harms linked to illicit substance use

a. Needle and syringe programmes (NSPs)

Because needle sharing remains the single most important risk factor for spreading HIV and other infectious diseases within IDU populations, NSPs, which aim to reduce sharing continue to be an important harm reduction measure in Canada and around the world. There are a wide variety of NSPs – some services focus solely on the provision of injecting equipment, others are more comprehensive. Accordingly aims can range from a focus on reducing equipment sharing to broader aims, such as aiming to increase access to other harm reduction services and treatment services, provide information and advice about safer injecting and sexual practices, and engage hard-to-reach populations.

Hundreds of NSP evaluations have been reported and although the diversity of programs mentioned above presents some challenges in synthesizing the literature, it is nevertheless clear that NSPs are effective with their primary aim of reducing rates of needle sharing, and that multi-component services that include NSPs are more likely to be effective and confer broader benefits. While integral to reducing harms associated with injecting, it is generally understood that NSPs need to be augmented by other services to fully control HIV infection in an IDU population (WHO, 2004; Ritter and Cameron, 2005). An expert panel of the World Health Organization (2004) concluded that NSPs are cost effective and there is no convincing evidence of any major, unintended negative consequences. These same conclusions apply to NSPs in prison populations also (Hunt et al., n.d). It is clear that the degree of access or coverage has a large effect on utilization, and hence effectiveness. Although not a primary aim, there is evidence that NSPs do serve as a point of referral and access to drug treatment for a portion of IDUs (Hunt, et al., n.d.). The strength of the evidence for the effectiveness of NSPs in preventing HIV infection isn't so strong.

b. Supervised Consumption Facilities (SCF)

Typically found in locales with a large number of chronic users and a highly visible street drug scene, supervised consumption facilities usually aim to reduce both health problems for the user and public nuisance (most services are aimed at injection drug users (IDUs) but some target heroin or crack smokers). SCFs now exist in over 70 cities in six European countries, in Sydney, Australia and in the Downtown Eastside of Vancouver (Health Canada, 2007). They are typically "low threshold" services, that is, entry rules and restrictions are kept to a bare minimum. Some SCFs serve as single function facilities, offering sterile equipment, a safe place to inject and information services, while others also include access to detox and welfare and other services (e.g. shower, laundry and meals). The services offered at the Vancouver facility (Insite) are typical of SCFs in most jurisdictions:

- Supervision of injections including emergency response to drug overdoses.
- Injection-related first aid (wound dressing and skin abscess care).

- Assessment and referral to primary health care and service providers.
- Harm reduction teaching and counseling.
- Exchange of needles and other drug use paraphernalia and provision of condoms.

It is difficult to conduct rigorous evaluation research with this population so evidence of the effectiveness of these facilities in achieving their objectives is limited. To summarize:

- They may reduce overdose deaths but perhaps not to the extent claimed (Hunt et al., n.d.).
- There is little evidence at this time in relation to impact on blood borne virus transmission and crime (Ritter and Cameron, 2005).
- Evidence is strongest for reduction of public nuisance and discarded litter.

Beyond, these conclusions, these facilities can be a useful point of contact with the most marginalised or hard-to reach drug users including the homeless and commercial sex workers and promoting more hygienic injecting (Hunt et al., n.d.).

The expert panel assessing the evidence associated with Insite in Vancouver's DownTown East Side, drew the following conclusions:

1. Over 8,000 people have visited Insite to inject drugs. 18 per cent account for 86 per cent of the visits, and less than 10 per cent used Insite for all injections.
2. The average user has been injecting for 15 years; 51 per cent inject heroin and 32 per cent, cocaine.
3. The injections at Insite account for less than 5 per cent of injections in the Downtown Eastside.
4. Insite provides a clean environment for drug use.
5. Insite provides nursing services to a large number of users.
6. The general public has positive views of Insite.
7. Users rate the service as highly satisfactory.
8. Insite encourages users to seek counselling and treatment, which has resulted in an increase in treatment engagement.
9. Insite facilitated vaccination during an outbreak of pneumonia in 2006.
10. Mathematical modelling shows that Insite saves about one death by drug overdose each year.
11. The assumptions that researchers make about HIV prevention may not be entirely valid and are therefore inconclusive.
12. Between 6 weeks before and 12 weeks after Insite opened in 2003, there were reduced numbers of users injecting in public.
13. There is no evidence of increased loitering, dealing or petty crime in the area around Insite.
14. Analysis of police data shows no change in the crime rate in the Downtown Eastside.
15. There is no evidence that SISs influence rates of drug use in the community or increase relapse rates among injection drug users.
16. Insite costs $3 million per year to operate, or $14 per user visit.
17. Insite shows a positive cost/benefit ratio (with cautions as to the validity of the mathematical model used).

c. Heroin prescribing

The UK government has permitted injectable heroin prescription since the 1920s (known as the British system). Trials of either injectable or smoked heroin prescription have recently been completed in Switzerland (the Swiss government has approved use of prescription heroin for opiate addiction) and the Netherlands, while one in Canada (the North American Opiate Medication Initiative [NAOMI]) is in progress.

The rationale for heroin prescription is that even though methadone maintenance therapy is effective for many addicted to opiates, some individuals do not want it or are unable to benefit from it. These services aim to serve opiate addicted persons who do not respond to any other treatment, to improve their health and social functioning.

Because there has been relatively little research conducted, effectiveness of this method remains to be fully determined. Hunt et al. (n.d.) reported on a review of the evidence regarding heroin prescribing (conducted by Stimson and Metrebian, 2003). The main findings of the review are that:

- Prescribing heroin is practical in specialist treatment settings.

- The drug is as safe for patients as comparable treatments with injectable drugs.
- Prescribing is safe for clinic staff.
- Prescribing heroin does not pose problems for the community.
- Heroin is not diverted to the illicit market.
- Patients can be maintained on a stable dose of heroin.
- It is uncertain whether it attracts more drug users into treatment.
- It does not appear to discourage patients from accepting oral methadone treatment.
- Patients are retained in treatment as well as or better than methadone.
- Illicit use of heroin and other drugs decreases.
- Health improves.
- Social functioning improves.
- Patients commit less crime than before being prescribed heroin.
- Patients tend not to switch to methadone or oral routes of administration.
- It is not clear who does best on the treatment.
- At current levels of prescribing heroin probably does not undercut the illicit markets in drugs and reduce drug scenes.
- Prescribing heroin is more expensive than methadone but is nevertheless cost effective.
- It is uncertain if heroin prescribing is more cost-effective than methadone.

The Canadian trial, NAOMI, began in 2005 in Vancouver and Montreal, with funding from the Canadian Institutes for Health Research (CIHR). To be eligible to participate, individuals needed to be 25 or older, addicted to opiates for at least five years, and have had at least two unsuccessful treatments for their addiction. The research is expected to wrap up and present final results late in 2008. Observations to date are that the treatment appears extremely safe and that no disruptions to the surrounding community have been reported (NAOMI, 2008).

d. Pill testing/drug analysis

The actual ingredients of substances presented as ecstasy or other amphetamine-type stimulants (ATS) are unknown to users – they may contain a variety of ingredients, some of which may present additional potential harms. Pill testing for ecstasy and other ATS has been available to some degree in several European countries (including the Netherlands, Austria, Belgium, Germany, Spain, France and Switzerland) for a number of years. While some schemes are found at dance sites and provide immediate results, others require a couple of days turn-around for the analysis. These initiatives then can be seen as having individual and community harm reduction aims, in that an immediate analysis could deter an individual from use of a substance on a particular occasion, while less immediate analysis could serve as an early warning of substances with unexpected ingredients in a city or region. There is some indication that warnings of this sort in European locales have had the effect of particular batches being removed from the market (EMCDDA, 2001). There is little good evidence of their effectiveness. The European Monitoring Centre on Drugs and Drug Addiction (EMCDDA) concluded in 2001 that:

- Pill testing interventions are important measures to enter into contact with hard to reach populations and to raise their interest in preventive and harm reduction messages.
- On-site pill testing interventions should closely be linked to information provision with preventive and “safer use” messages, through a wide range of information supports.
- Due to the lack and difficulties of evaluation, on the one hand there is still no strict scientific proof for the protective impact of on-site pill-testing interventions but on the other hand, there is also no scientific evidence to conclude that such interventions rather promote drug use or might be used by dealers for marketing purposes.
- There is a need for more research and evaluation studies on the whole range of effects of on-site pill-testing interventions. This appears to be a prerequisite in policymaking when completing the range of strategies to respond to drug issues in recreational settings.

Ritter and Cameron (2005) note the potential of iatrogenic (harmful) effects with these schemes in that the presence of a pill testing scheme may give an aura of acceptability to

a practice that is illegal and inherently hazardous. At this point, though a logical rationale exists for these schemes in regions or periods in which ATS use is prevalent, there is little good evidence to support their effectiveness or claims of potential harms.

e. Outreach approaches for persons at risk for substance use and other problems

Persons with substance use problems or persons who experience various risk factors may not, for various reasons, be inclined to accessing services. Outreach services aim to "identify and engage individuals known to have, or to be at risk of having, alcohol or other drug problems" (in this sense, this may be viewed as either targeted prevention or part of the treatment continuum) (British Columbia Ministry of Health Services, 2004). These services or programs tend to use professionals or peers to reach out to the target group in settings that work for them. Services are characterized by flexibility and may call for the involvement of groups who haven't traditionally played a role in addressing substance use and other problematic behaviours, such as housing authorities, shopping mall management and employment agencies. Outreach is an integral part of specialized services for older adults, for pregnant and parenting women whether on the streets or in their homes, for people with co-occurring mental health problems, and for those living and/or working on the street – youth, sex trade workers, the homeless.

In many cases, the targets for outreach programs are persons with a substance dependence, however outreach programs may be used to engage young people who do not currently have substance use problems but who may be at risk. The most vulnerable young people are often hard to reach, particularly if they no longer attend school. There are many examples of these types of programs but by their nature they present challenges to evaluate using standard experimental methods. Two examples of youth outreach programs that appear promising are Positive Futures and MPowerment.

Positive Futures is an outreach program for vulnerable young people aged 10-19. The program is an important element in the United Kingdom's drug strategy and has been closely documented. The basis of the program is the use of sport and other leisure activities to reach out to and engage with marginalized young people, develop their self-esteem and offer them informal education around substance use and other issues. Rather than using an experimental study design, organizers employed a participatory action research design that fit better with the engagement strategy and provided depth to the analyses over a three-year period.

Organizers of the program emphasize the need for a flexible approach within a non-hierarchical organizational structure. Also emphasized is the ability of project staff to develop relationships with the participants through their strong knowledge of local culture and their skill as sport coaches or leaders of other leisure activities. While sport or other leisure activities are the medium, personal and social development is the aim, and relationship building by the workers is a large part of the method. So, Positive Futures is as much a "relationship strategy" as a "drug strategy" or "sport and leisure development strategy". Although the approach is intended to prevent youth substance use and crime, it is not yet certain whether it does so (because the research didn't aim to answer this question). Nevertheless, there is some promising evidence indicating that participating young people improve their social skills, their performance at school and their ability to secure work. Smaller programs working with fewer youth tended to have better success engaging and retaining youth.

MPowerment is an outreach program for young gay men. Rates of mental health and substance use problems are higher among Lesbian, Gay, Bisexual and Trans-identified (LGBT) youth and adults. Because LGBT youth often face stigmatization, outreach is an important element of services for this population. The MPowerment program, which has been widely replicated in the U.S., and found to be cost effective (Kahn et al., 2001) uses formal and informal outreach methods to engage and empower young gay and bisexual men (ages 18–29) to address HIV prevention and related health and social issues. A core group of young gay men with the support of paid staff design and carry out all project activities. Youth are encouraged to pursue informal outreach by discussing health practices (e.g. safer sex, not using drugs) with friends. Formal outreach consists of teams of young gay men going to locations frequented by young gay men to discuss and promote safer sex, deliver appealing informational literature on HIV risk reduction, and distribute condoms. The team also creates their own drug-free social events to attract young gay men (e.g., dances, video parties, picnics, discussion groups) at which safer sex and drug-free social alternatives to bars and clubs can be promoted. The program has been reasonably well documented (see articles at www.mpowerment.org) but has only been evaluated on

the basis of its reduction of HIV (for which it was found to be cost effective) (Kahn, et al., 2001), so while presenting a conceptually strong format there is no documented information on its effectiveness in preventing or reducing substance use harms.

f. Affordable housing

There is no single pathway into a life of homelessness and substance use problems – the paths can range from a history of being physically or sexually abused, to having grown up in care of the state; being a lesbian, gay, bisexual, trans-identified young person; or having been exposed to alcohol prenatally. While pathways vary, various studies show that severe mental health and substance use problems and homelessness are often found together (Meyer and Estable, 2005; Social Planning and Research Council of BC, 2005), and employment, and relationship issues are common (Johnson, 2003; Neale, 2001). At both the individual and community level, these various factors can create a multi-layered array of issues that defy superficial attention.

Each of the several issues typically facing homeless persons can be difficult in and of themselves – together, they can present a picture of mutually aggravating circumstances that can appear intractable to the individual. For instance, among homeless substance-involved people surveyed in Ottawa, most reported that their lifestyle of intoxication, missing their medications, periods of hospitalization, rough partying, or drug dealing made it difficult to hold on to lodging, and not having secure lodging led to a still more chaotic pattern of living characterized by deteriorating health, and in many cases, criminal involvement (Meyer and Estable, 2005). For some then, progress on substance use problems is the most important factor associated with achieving stable housing over time (Zlotnick et al., 2003).

On the other hand, many studies find that most homeless people with substance use and other issues report that not having affordable lodging is the most pressing matter in their lives, and that this represents a very large impediment to dealing with their substance use and other issues (Social Planning and Research Council of BC, 2005; Meyer and Estable, 2005; Kraus et al., 2005). Nevertheless, some, particularly individuals with concurrent disorders, will not accept an environment that is too restrictive or rigid (Social Planning and Research Council of BC, 2005).

Consequently, a flexible housing arrangement based on a harm reduction orientation (that is, accepting some level of substance use) is commonly recommended as an important ingredient in promoting the health of these individuals (Kraus et al., 2005).

Supportive services appear equally important. "Housing first" is a client-centred approach that provides permanent, independent housing for homeless persons, and arranges the services and supports (e.g., mediation with landlords, assistance in financial management, links to treatment, education, employment and social/recreational resources) that the client identifies as necessary to allow them to maintain their housing choice. In some cases the stability and empowerment that this situation affords leads to successful management of substance use in itself; in others, it leads to a readiness for treatment. Although no scientific evaluation of this approach was found, a case study of 13 programs employing the "housing first" approach concluded that most persons with a long history of homelessness and substance use issues can be successfully housed directly from the street if they can access necessary supports when they need them (Kraus et al., 2005).

Recommended practice 15: Needle and Syringe Exchange Programs clearly reduce harms associated with injection drug use and should be fully available; Supervised Consumption Facilities (SCFs), Heroin Prescription, Outreach, and Affordable housing have shown promise in reducing harms associated with substance use, and where need has been well established (for long term injection drug users who have not responded to other measures in the case of SCFs and Heroin Prescription) should be implemented with a rigorous research framework.

2. Measures to reduce alcohol-related harms

a. Night life initiatives

For many adolescents and young adults, night clubbing and dancing are important leisure pursuits, providing opportunity for social contact, physical exercise and enjoyment. These settings also present risks to staff and patrons. Some public health experts contend the nightclub industry has an opportunity and responsibility to contribute to the healthy socialization of young people because it looms large in their lives at a time when other institutions (e.g., family, religious institutions) have declined in influence.

Because club owners typically have little inclination to address or even to discuss the issue, a "healthy settings" approach has been suggested, rather than focusing specifically on substance use (Bellis et al., 2002). It is argued that club owners and staff might be more easily engaged by inviting them to explore ways they may shift their club environment to reduce risks to patrons and staff. Measures that may be explored in this context are non-breakable glasses, reducing decibel levels, freely available water, and easy access to condoms. Evidence in support of the healthy settings approach was not found, but one specific measure, the use of shatterproof glassware has been shown to be effective in reducing violence-related and unintentional injury (Stockwell, 2006).

Focusing more specifically on alcohol use in the night club setting is the Safer Bar initiative. Differing slightly from responsible beverage service (RBS) programs which aim to reduce demand in licensed establishments, the Safer Bar programs focuses on reducing aggression and violence without attempting to change drinking patterns. A rigorous evaluation of the Safer Bars program in Toronto found that a relatively brief intervention directed to owner/managers and staff was quite effective in reducing acts of severe and moderate aggression. The intervention involved owner/managers completing a risk assessment workbook and along with staff, attending a 3-hour training session focusing on preventing the escalation of aggression, working as a team and resolving problem situations safely. A challenge found in sustaining these effects was turn-over of managers and door/security staff (Graham et al., 2004).

b. Drinking and driving-related measures

Because they focus specifically on reducing rates of driving after drinking alcohol (rather than reducing or changing drinking patterns) drinking and driving countermeasures are, by their nature, harm reduction-oriented. Evaluations of the more prominent of these measures will be summarized here.

Random breath testing (RBT) and Sobriety checkpoints: In RBT programs, motorists can be stopped without cause and required to take a breath test to establish Blood Alcohol Content (BAC) levels. Sobriety checkpoints differ from RBT initiatives in that they are often publicized in advance – their main purpose is to increase awareness of impaired driving and the perception that drinking drivers will be apprehended. In a sobriety checkpoint, police stop all vehicles, or a systematic selection of vehicles, to evaluate drivers for signs of alcohol or other drug impairment. Effectiveness of sobriety checkpoints hinges on that their being well publicized, conducted frequently, and have high public visibility can serve as a general deterrent to impaired driving. A review of studies concludes that the available evidence consistently indicates that both RBT and sobriety checkpoints reduce alcohol-related crashes, injuries, and fatalities (Transportation Research Board, 2005).

Alcohol interlock systems are devices that, when installed in a vehicle, prevents its operation by a driver whose BAC exceeds the specified threshold value. These may opted by an offender as a way of reducing their sentence or they may be mandated by a judge depending on the case and jurisdiction. Present alcohol interlock systems consist of a small breath-testing device linked to the vehicle ignition system that requires the driver to provide a breath sample every time an attempt is made to start the vehicle. The interlock device prevents the vehicle from being started unless the driver provides a breath sample that reveals an alcohol concentration below a threshold value – typically .02%. If the breath sample reveals a BAC above the threshold value, the interlock prevents the vehicle from starting, and the driver must wait a period of time before trying again.

The evidence to date consistently shows a strong beneficial impact of interlock programs while the device is installed. Once the device is removed, the drinking/driving rate among interlock participants does not differ from DWI offenders who did not participate in an interlock program. Their effectiveness during the program period is important - to extend the benefits of these programs after the device is removed, it is apparent concerted effort needs to be made to change the individual's alcohol consumption through treatment during the period the offender is under the control of the interlock program (Hawks et al, 2002; Transportation Research Board, 2005).

Designated driver or safe ride programs: Designated driver programs usually involve advertising to encourage groups of drinkers to select a member who is not to drink and who can then drive safely. In some cases incentives are offered to designated drivers by the drinking establishment (e.g., free non-alcoholic drinks). Although often strongly promoted, there is little available evidence of their effectiveness. Considerations with these initiatives include: drinkers may consume more on those occasions

when they have a designated driver; young people may simply identify the person in their group who had consumed the least alcohol as the designated driver, even though that may have been a significant amount; and they may work best when the designated driver takes their own vehicle (people are reluctant to leave their vehicles at the site of their drinking).

Safe rides programs are organized efforts to provide drinkers low-cost or free transportation as an alternative to driving themselves. As with designated driver programs, there is little available research on their effectiveness. Nonetheless, both types of initiatives tend to be used by heavier drinkers so may have some value in reducing drinking/driving harms.

Zero tolerance laws for young drivers: apply a lower legal BAC to underage drivers. Generally, these lower limits are set at the minimum BAC that can be reliably detected (e.g., 0.02%).The introduction of zero blood alcohol levels for young or probationary drivers, particularly if combined with extensive or targeted random stopping and awareness raising efforts, has been shown to reduce the proportion of such drivers involved in road traffic crashes (Hawks et al., 2002; Transportation Research Board, 2005).

.08 per se laws: mean it is illegal in and of itself to drive with a BAC of 0.08% or higher. If alcohol test results identify someone as driving at 0.08% or higher, no further evidence is needed to prove a person was driving while impaired. These have been reasonably well evaluated and have strong supporting evidence.

Recommended practice 16: Safer Bar initiatives, Random Breath Testing, Sobriety Checkpoints, Alcohol Interlock Systems, Zero Tolerance for Young Drivers, and .08 per se Laws, all have good supportive evidence as harm reduction measures.

3. Measures to reduce tobacco-related harms

A product may be considered to reduce tobacco-related harm if it lowers total tobacco-related mortality and morbidity even though use of that product may involve continued exposure to tobacco-related toxicants (Institute of Medicine, 2001, reported in Rodu and Godshall, 2006)

The rationale for use of tobacco harm reduction products such as smokeless tobacco and pharmaceutical nicotine may be summarized as follows:

- Although tobacco use has declined dramatically in the past 30 years, there is some indication that gains are beginning to level out.
- Tobacco cessation strategies are quite ineffective.
- Heavy smokers, those most likely to experience smoking-related harm, are least likely to be successful in quitting.
- Today's smoking population has a higher proportion of heavy smokers than in the past.
- Nicotine is an addictive agent but carries little to no risk of harm in itself (with the possible exception of use during pregnancy); rather, it is the method of delivering nicotine – inhalation of burning tobacco leaf – that is the main source of tobacco-related harm.

Smokeless tobacco products have a few different forms but the most used is moist snuff. Evidence to date suggests that the risks associated with smokeless tobacco are quite small compared to smoked tobacco. For products that have been treated to reduce levels of the carcinogenic Nitrosamines (such as Swedish snus), epidemiologists have concluded that there is minimal risk of oral and upper respiratory tract cancers, and no risk of elevated cardiovascular disease associated with smokeless tobacco (Hall, 2005; Rodu & Godshall, 2006). Other health issues linked to smokeless products include gum recession, inflammation and lesions of the oral cavity, tooth erosion and potentially tooth decay, and periodontal bone loss (Hatsukami et al., 2004).

Pharmaceutical nicotine is available in the form of gum, patches, inhalers, and sprays. These products are safe, effective and cost-effective ways to assist smokers to quit, with minimal risk of abuse, in part because they have been deliberately designed that way (Stratton, et al, 2001). Pharmaceutical nicotine can also be used over the long-term as an alternative to cigarette smoking. Research on the health effects of long-term pharmaceutical nicotine use is less available, in part because it is difficult to find populations that use with long-term usage patterns (not interrupted by periods of heavier smoking), and in part because funding for this type of research is not very available (Philips and Broda, n/d). Pharmaceutical nicotine may carry some health risks, such as an increased risk of

cardiovascular disease arising from chronic nicotine intake, but these are considered quite small compared with those of cigarette smoking (Hall, 2005).

Concerns linger that promoting use of smokeless tobacco and long term use of nicotine medications may serve as a gateway to smoked tobacco use, particularly among young people. No evidence to support this concern was found in this review, and the Swedish experience with smokeless tobacco suggests these products can be a gateway out of smoked tobacco use. The tobacco industry has marketed less hazardous cigarettes and cigarette-like devices. Because these either involve burning leaf (with the associated health probems) or closely mimic smoking, concerns of these products serving as gateways to tobacco smoking are widely seen as legitimate (Hall, 2005; Hatsukami et al., 2004).

There is good evidence to indicate that more active promotion of pharmaceutical nicotine that has a higher and more rapid delivery than currently available products to chronic smokers would hold public health benefits (Hall, 2005; Bodu and Godshall, 2006). While it is important to proceed cautiously, further research on the benefits and implications of promoting smokeless tobacco within a rigorous tobacco control scheme should be undertaken (Stratton et al., 2001; editorial, The Lancet, 2007).

Among a large part of the anti-tobacco movement, there is a continuing prohibitionist stance, which has limited the discourse and research on this topic and which some argue has resulted in a lack of accurate information on the relative harms and benefits of smoked and smokeless forms (Rodu and Godshall, 2006). This extreme stance has grown out of long-term intense advocacy against a tobacco industry that didn't feel hampered by accuracy or full disclosure of information. Nevertheless, considering the stakes and ethics involved, it is important that accurate information, based on sound research, be made available to both policy makers and consumers (Hall, 2005; Rodu and Godshall, 2006).

Recommended practice 17: There is good evidence to support more active promotion of pharmaceutical nicotine with chronic smokers and to conduct/monitor research on the benefits and implications of promoting smokeless tobacco within a rigorous tobacco control scheme.

SECTION 4: CONCLUSION

Substance use problems, particularly those associated with alcohol and tobacco, exact a very sizable toll on Nova Scotia families and society. Canadian jurisdictions have more levers at their disposal to control the sale and marketing of alcohol and tobacco than is the case with illegal substances, and it is important that governments and citizens understand that controlling the availability of these substances remains among the most effective of substance abuse prevention measures. More needs to be learned about the misuse and abuse of mood-altering pharmaceutical products in the province to support appropriate prevention policy and program design.

Prevention responses are often focused on young people, and there is good rationale for that, given that this population is more likely to use substances in hazardous ways, resulting in significant immediate and longer term consequences. However, it is important to recognize powerful opportunities to address risk and protective factors at the early childhood and early schooling levels. It is also important to monitor substance use patterns of older adults in Nova Scotia – their use may be an emerging issue warranting action.

Other options that appear most promising are focused community programs, media advocacy, brief interventions with a wide range of possible targets, use of online formats, comprehensive school health approaches, and measures to reduce violence in nightclubs. It is challenging to engage parents in family prevention programs but these programs have shown effectiveness with both general and higher risk populations and ought to be given priority.

While a number of the reviewed programs and measures have been shown to be effective on their own, there is good reason to believe, though the research support is limited at this point, that integrating specific programs into broader multi-component efforts is more powerful still. Multi-component efforts (whether set in schools, communities, nightclubs or workplaces, etc) usually include attention to policy or structural changes. It is attention to structural or systemic change that is most
critical – however, these efforts are very challenging, taking a great deal of time and resources.

For this reason, stakeholders often shy away from approaches requiring policy attention. This is particularly the case if the initiative is presented as another "project" to be accommodated. It is now clear that the long-term success of prevention efforts lies in the ability of prevention professionals to anchor initiatives in the core mission of the groups they are working with, whether schools, workplaces, nightclubs or any other setting. Failing to do so will hold prevention in a perpetual cycle of short-term initiatives that will have muted effect.

Embracing prevention through ongoing systemic change calls for a stable, trained, professional workforce such as that evolving in Nova Scotia. A tradition of professionalism over the longer term will create a virtuous circle, with competent staff being attracted to this important work by the positive outcomes being demonstrated.

1. Potential harmful effects in prevention

Taxation: may result in illegal production and trafficking of legal substances when prices are raised to the point that a market is created for these products (this is more likely to occur with tobacco than alcohol because alcohol prices have not kept up with inflationary costs over the years).

Illegal drug policy: an unintended negative effect of reducing demand for marijuana in the U.S. through various measures associated with the War on Drugs has been an increase in the percentage of youth using alcohol, and resulting increases in car crash deaths, emergency ward trauma and violent crime (Chaloupka and Adit, 1997).

Universal FASD messaging: some caution that a message of "no alcohol use during pregnancy" as might be found on posters and beverage warning labels may lead to harm by raising anxiety and possible termination of pregnancy among low-risk women, while failing to reach the women at greatest risk; it is argued that these public messages are unduly "alarmist, given the high percentage of women of childbearing age that drink, the high number of unplanned pregnancies discovered later in their term, and the fact that FASD is diagnosed primarily in the children of heavy drinking women (Caprara et al., 2004; Abel, 1998).

Stand alone media campaigns: stand-alone campaigns focusing on the behaviour of individuals have the potential of being harmful by drawing public attention away from

structural determinants of hazardous substance use (Aguirre-Molina and Gorman, 1996).

Drug education focusing on knowledge/attitudes/values: programs based on these models increased knowledge while decreasing perceived risk and increasing drug consumption (Wersh and Owen, 2002).

Resistance skill training among groups with a high acceptance of use: may have the opposite effect if students go into the sessions feeling that drug use is acceptable. It has been suggested that normative messages which show that the majority are not using need to precede the resistance training (Wersh and Owen).

Normative messaging among groups with a high proportion of users: normative messaging is a questionable practice in later adolescent years when significant percentages of youth are using particular substances (Wersh and Owen).

Normative messaging among groups with a high proportion of non-users: non-users or occasional drinkers likely underestimate the prevalence of drinking. Consequently, normative information might have the unintended boomerang effect of inducing more alcohol use among this group (Shultz et al., 2007).

Abstinence-based drug education directed to classes with a high percentage of users: A pattern of negative effects for youth who had already used substances prior to a program has been found with these programs. This suggests that program aims and intended outcomes need to match up with the proportion of drug-using youth in the class, and harm reduction knowledge and skills need to be employed (Wersh and Owen).

Targeted programming for higher-risk youth: some studies have found that bringing higher-risk youth together can result in "deviancy training" whereby participants become increasingly socialized into a negative peer culture (Cho et al., 2005).

School suspension: one international study found that, controlling for other factors, students who were suspended from school as a result of a misdemeanour were much more likely to engage in antisocial behaviour over the following 12 months.

2. Summary list of recommended practices

Recommended practice 1: monitor local impacts of the social determinants of health, particularly social inequality, and work with others to take appropriate action.

Recommended practice 2: take steps, both formal and informal, to increase the level of inter-departmental and inter-agency collaboration and joint action on social determinants and other shared protective and risk factors.

Recommended practice 3: invest in home visit programs, parenting programs, early childhood and early school programs to prevent substance use problems and other later behaviours over the long term.

Recommended practice 4: give priority to measures to control and reduce the physical and economic availability of alcohol and tobacco at the provincial and local levels given that they are among the most effective measures for reducing the harms and costs associated with these substances. Priority should also be given to educating the public on the strong rationale that exists for these measures.

Recommended practice 5: increase monitoring and research on the extent and nature of misuse and abuse of prescribed mood-altering substances in the province.

Recommended practice 6: consider use of social norm mass marketing initiatives to correct perceptions of post-secondary populations, ensuring a strong understanding of the target populations.

Recommended practice 7: the best use of media investment at the local and provincial levels is to build knowledge and attitudes favouring public health-oriented structural or policy changes. Social marketing campaigns focusing on behaviours should only be implemented when well supported by other components within a larger initiative.

Recommended practice 8: schools should aim to imbed drug education curriculum into a comprehensive health promoting approach that also gives attention to the school's social and physical environment and support services.

Recommended practice 9: school substance abuse policy development should engage the full school community and favour remediation over punishment.

Recommended practice 10: community-based initiatives should focus on specific community-level structural changes rather than general community mobilization.

Recommended practice 11: universal family programs directed to parents and their children (such as the Strengthening Families Program) are recommended, particularly within a larger initiative.

Recommended practice 12: family programs, such as the Strengthening Families Program, should be given priority as an intervention to support higher risk families.

Recommended practice 13: universal drug education for Aboriginal students should reflect strong local cultural understanding and employ a bi-cultural competence approach.

Recommended practice 14: brief, motivational-based interventions should be field-tested with a wide range of targets, including primary care patients, personality-targeted Aboriginal high school students, post-secondary students, and non-dependent pregnant women; test use of on-line format to reach a broad population of Nova Scotia substance users.

Recommended practice 15: Needle and Syringe Exchange Programs clearly reduce harms associated with injection drug use and should be fully available; Supervised Consumption Facilities (SCFs), Heroin Prescription, Outreach, and Affordable housing have shown promise in reducing harms associated with substance use, and where need has been well established (for long term injection drug users who have not responded to other measures in the case of SCFs and Heroin Prescription) should be implemented with a rigorous research framework.

Recommended practice 16: Safer Bar initiatives, Random Breath Testing, Sobriety Checkpoints, Alcohol Interlock Systems, Zero Tolerance for Young Drivers, and .08 per se Laws, all have good supportive evidence as harm reduction measures.

Recommended practice 17: there is good evidence to support more active promotion of pharmaceutical nicotine with chronic smokers and to conduct/monitor research on the benefits and implications of promoting smokeless tobacco within a rigorous tobacco control scheme.

SECTION 5: GLOSSARY

Bicultural competence approach: intervention designed to prevent substance use problems by Aboriginal adolescents by teaching them social skills in a way that blends the adaptive values and roles of both the Native American and North American cultures.

Brief intervention: an intervention typically of fewer than 6 sessions that usually employs cognitive-behavioural and/or motivational principles. It can take many forms, ranging from use of a screening instrument and/or five minutes of advice by a health professional, to mailed or online feedback on substance use patterns.

Civil society: a network of voluntary associations that have a number of functions, including keeping individuals from becoming isolated, protecting them from the state, advocating for particular issues, and generally holding a society together.

Cognitive behavioural intervention: a therapeutic approach that combines the cognitive emphasis on the role of thoughts and attitudes in influencing motivations and response, with the behavioural emphasis on changing performance by giving attention to reinforcement and reward.

Comprehensive school health: an approach to promoting student/staff health based on the view that student health outcomes on a range of issues will be improved when several elements are combined: [a] evidence-based health/drug instruction, with [b] good access to health services, and [c] health promoting physical and social environments, through policy attention.

Cross-sectional research: a research design where a large cross-section of the population is assessed at a single time and the differences between individual groups within the population compared. This kind of study is efficient at identifying association but may have trouble deciding cause and effect because data are collected at only one time point.

Demand reduction: prevention strategies which succeed by motivating users to consume less overall and/or less per occasion, but don't necessarily call for abstinence.

Determinants of health: broad factors that have been shown by research to affect the health of populations, often listed as: 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.

Developmental pathways model of prevention: a model that proposes that risk and protective factors be viewed over the long term and in the context of a person's life.

Employee Assistance Programs (EAP): a targeted workplace approach to identifying and providing support to workers whose job performance is, or may in the future be, negatively affected by any one of a number of personal or family problems.

Harm reduction: prevention strategies that reduce the likelihood of harm to health and safety without necessarily requiring a change in the pattern or level of substance use.

Health promotion: the process of enabling people to increase control over and to improve their health. It calls for action in five areas: building healthy public policy; creating supportive environments; strengthening community action; developing personal skills; and reorienting health services.

Iatrogenic effects: unintended harmful effects to the recipients of an intervention.

Indicated prevention: prevention activity directed to persons who engage in hazardous substance use; they do not meet clinical criteria for substance dependency, but are at high risk of doing so.

Interdiction activity: supply reduction-oriented activity directed to enforcement of drug manufacturing, cultivation, trafficking and possession laws.

Life-course persistent deviance and adolescence-limited deviance: a distinction made by some scientists between young people whose deviant behaviour ends as the person passes from adolescence (adolescent-limited deviance) and those whose behaviour persists into adulthood (life course persistent). Offending behaviour has also been conceptualised as a continuum with adolescent limited at one extreme and life course persistent at the other, and considerable blurring in the middle.

Motivational interviewing: a person-centered counselling style with the goal of resolving conflicts regarding the pros and cons of change, enhancing motivation, and encouraging positive changes in behaviour.

Participatory action research: systematic inquiry, involving close involvement of those affected by the issue being studied, for the purposes of education, taking action or effecting social change.

Person-years of life lost: a calculation of the average number of years lost per person due to premature death based on average life expectancy; used in economic cost estimation.

Prevention: activity that aims to reduce immediate and long-term harms related to substance use; may be achieved by preventing, delaying or reducing use or hazardous use through supply and demand reduction activities or by reducing the negative consequences of use through harm reduction activities. It may also be achieved by working toward more equitable access to the determinants of health across a population.

Protective factor: a factor that has been shown or suggested by research to protect a person from a health or social problem such as substance abuse. The presence of more protective factors in a person's life has been shown to lower the level of risk and it has been suggested that the effect of protective factors is greatest at higher levels of risk.

Risk factor: an aspect of a person and his or her environment that make the development of a given problem more likely. Some individuals experience a clustering of these factors (e.g., older persons living alone with few financial resources and no extended family) and these persons are considered to be at higher risk for substance use and other problems.

Selective prevention: prevention activity directed to individuals and families on the basis of risk factors (e.g. academic problems, family dysfunction, poverty, and family history of substance use problems). Participants are "selected" for tailored programming (e.g. building coping strategies and other life skills) on the basis of these risk factors.

Social norms campaign: an intervention designed to reduce undesirable behaviour, including hazardous alcohol use, particularly prevalent among post-secondary institutions in North America. The central premise of these interventions is that students generally over-estimate the frequency and quantity of alcohol typically consumed by peers. These interventions aim to shift perceptions of what is considered "normal" or normative.

Socioeconomic status: a measure of an individual or family's relative economic and social ranking, based on a combination of variables, including occupation, education, income, wealth, and place of residence.

Substance abuse: is often used with different meanings; according to the DSM-IV, substance abuse is defined as a maladaptive pattern of use indicated by continued use despite knowledge of having a persistent or recurrent social, occupational, psychological or physical problem that is caused or exacerbated by use or recurrent use in situations in which it is physically hazardous.

Substance use problem: a generic term referring to immediate and long-term problems, substance abuse, substance dependence, as well as societal problems.

Substance dependence: there are varying definitions; in DSM-IV, dependence is defined as a cluster of cognitive, behavioural and physiologic symptoms that indicate a person has impaired control of psychoactive substance use and continues use of the substance despite adverse consequences.

Supply reduction: prevention strategies that are intended to achieve social, health, and safety benefits by reducing the physical availability of a particular substance.

Universal prevention: prevention activity that targets a broad population (for example, all students in grades 5 and 6; a whole community) without any consideration of risk factors, and with the aim of preventing or delaying the onset of substance use, or hazardous substance use.

SECTION 6: REFERENCES

Abel, E. (1998). Prevention of alcohol abuse-related birth effects – I. Public education efforts. Alcohol and Alcoholism, 33(4), 411-416.

Adlaf, E.M., Begin, P., and Sawka, E. (Eds.) (2005). Canadian addiction survey (CAS): A national survey of Canadians' use of alcohol and other drugs: Prevalence of use and related harms: Detailed report. Ottawa, Ontario: Canadian Centre on Substance Abuse. Retrieved from http://www.ccsa.ca/NR/rdonlyres/B2C820A2-C987-4F08-8605-2BE999FE4DFC/0/ccsa0048042004.pdf

Adlaf E.M., Demers, A., and Gliksman, L. (Eds.) (2005). Canadian campus survey 2004. Toronto, Ontario, Canada: Centre for Addiction and Mental Health. Retrieved from http://www.camh.net/Research/Areas_of_research/Population_Life_Course_Studies/CCS_2004_report.pdf

Adlaf, E.M. and Paglia-Boak, A. (2005). Drug use among Ontario students: Detailed findings. Toronto, Ontario, Canada: Centre for Addiction and Mental Health. Retrieved from http://www.camh.net/Research/Areas_of_research/Population_Life_Course_Studies/OSDUS/OSDUS2005_DrugDetailed_final.pdf

Agostinelli, G. and Grube, J. (2002). Alcohol counter-advertising and the media: A review of recent research. Alcohol Research and Health, 26(1), 15-21.

Aguirre-Molina, M., and Gorman, D.M. (1996). Community-based approaches for the prevention of alcohol, tobacco, and other drug use. Annual Review of Public Health, 17, 337–358.

American Psychiatric Association. (1994). Diagnostic and Statistical Manual of Mental Disorders, 4th edition. Washington, DC: American Psychiatric Association.

Babor, T. F., Giesbrecht, N., Graham, K., Grube, J., Hill, L., Österberg, E., Rehm, J., Room, R. and Rossow, I. (2003). No ordinary commentary: a response to our gentle critics. Addiction, 98.

Bachman, J.G., Wadsworth, K.N., O'Malley, P.M., Johnston, L.D., and Schulenberg, J. (1997). Smoking, drinking and drug use in young adulthood: The impact of new freedoms and new responsibilities. Mahwah, New Jersey: Lawrence Erlbaum Associates.

Baer, J.S., Kivlahan, D.R., Blume, A.W., McKnight, P., and Marlatt, A.G. (2001). Brief intervention for heavy drinking college students: 4-year follow-up and natural history. American Journal of Public Health, 91(8), 1310–1316.

Baer, J. S., Peterson, P. L.,Wells, E. A. (2004). Rationale and design of a brief substance use intervention for homeless adolescents. Addiction Research Theory, 12(4), 317-334.

Baron, J., Barr, J., Carver, V., and Flower, M. (2004). Older Adults and Substance Abuse. In S. Harrison, and V. Carver (Eds.), Alcohol and drug problems: A practical guide for counsellors. (pp. 329-352). Toronto, Ontario, Canada: Centre for Addiction and Mental Health.

Becker, J., and Roe, S. (2005) Drug use among vulnerable groups of young people. Findings from the 2003 crime and justice survey. London: Home Office. Retrieved from http://www.homeoffice.gov.uk/rds/pdfs05/r254.pdf

Bellis, M.A., Hughes, K., and Lowey, H. (2002). Healthy nightclubs and recreational substance use – From a harm minimisation to a healthy settings approach. Addictive Behaviours, 27, 1025-1035.

Bendtsen, P., Johansson, T.K., and Akerlind, I. (2006). Feasibility of an email-based electronic screening and brief intervention (e-SBI) to college students in Sweden. Addictive Behaviors, 31, 777–787.

Benoit, C., and Jansson, M. (2006). Voices on the street. Research and discovery at the University of Victoria, 6(3), March.

Bernstein, J., Adlaf, E. and Boak, A. (2004). Drug use in Toronto. City of Toronto Research Group on Drugs. Retrieved from http://www.toronto.ca/health/rgdu/pdf/drug_use_in_toronto_2004.pdf

Bierness, D., and Davis, C. (2006) Driving Under the Influence of Cannabis. Ottawa, Ontario: Canadian Centre on Substance Abuse. Retrieved from http://www.ccsa.ca/NR/rdonlyres/56FFA36B-58FC-402C-9DFF-2257514FDE7B/0/ccsa0114812006.pdf

Bond, L., Glover, S., Godfrey, C., Butler, H., and Patton, G.C. (2001). Building capacity for system-level change in schools: Lessons from the gatehouse project. Health Education and Behaviour, 28(3), 368-383.

Bond, L., Thomas, L., Coffey, C., Glover, S., Butler, H., Carlin, J.B., and Patton, G. (2004). Long-term impact of the gatehouse project on cannabis use of 16-year-olds. The Journal of School Health, 74(1), 23-29.

Boyle, D., Cordon, C., and Potts, R. (2006). Are you happy? New economics past, present and future. London: New Economic Foundation. Retrieved from http://www.neweconomics.org/gen/uploads/nvtqrtftqta13k55xzo4jxbv12122006182754.pdf

Bray, J.H., Adams, G.J., Getz, J.G., and Baer, P.E. (2001). Developmental, family, and ethnic influences on adolescent alcohol usage: A growth curve approach. Journal of Family Psychology, 15, 301-314.

British Columbia Ministry of Health Services. (2004). Every Door is the Right Door – A British Columbia Planning Framework to Address Problematic Substance Use and Addiction. Retrieved from http://www.healthservices.gov.bc.ca/mhd/pdf/framework_for_substance_use_and_addiction.pdf

Brownson, R., Hopkins, D. Wakefield, M. (2002). Effects of smoking restrictions in the workplace. Annual Review of Public Health, 23, 333-348.

Butler, B. (1993). Alcohol and drugs in the workplace. Toronto, Ontario, Canada: Butterworths.

Cahill, H., Murphy, B., and Hughes, A. (2005). A toolkit of interventions to assist young people to negotiate transitional pathways. Canberra, Australian Capital Territory: Australian Government Department of Health and Ageing. Retrieved from http://www.nationaldrugstrategy.gov.au/internet/drugstrategy/publishing.nsf/Content/499247D1160777C0CA2571A20021F1FB/$File/toolkit-interventions.pdf

Caprara, D., O. Soldin., and G. Koren. (2004). To label or not to label: The pros and cons of alcohol warning labels in pregnancy. Journal of FAS International, 2(9). Retrieved from http://www.motherisk.org/JFAS/index.jsp

Caputo, T., Weiler, R., and Anderson, J. (1996). The street lifestyle study. Ottawa, Ontario: Health Canada.

Catalano, R.F., Hawkins, J.D., Berglund, M.L., Pollard, J.A., and Arthur, M.W. (2002). Prevention science and positive youth development: Competitive or cooperative frameworks. Journal of Adolescent Science, 31, 230-239.

Center for Substance Abuse Research. (2006a). Evaluation provides credible evidence that national youth anti-drug media campaign was not effective in reducing youth drug use. CESAR FAX, 15(44). Retrieved from http://www.cesar.umd.edu/cesar/cesarfax.asp

Center for Substance Abuse Research. (2006b). Nonmedical use of prescription drugs more prevalent in U.S. than use of most illicit drugs. CESAR FAX, 15(36). Retrieved from http://www.cesar.umd.edu/cesar/cesarfax.asp

Chaloupka, F., and Adit, J.L. (1997). Do youths substitute alcohol and marijuana? Some econometric evidence. Eastern Economic Journal, 25(3), 253-276.

Chaloupka, F. (2002). The effects of price on alcohol use, abuse and consequences. Paper presented to the national academy of sciences' committee on developing a strategy to reduce and prevent underage drinking's workshop on underage drinking: Issues and Approaches. Washington, DC. Retrieved from http://www.impacteen.org/generalarea_PDFs/alcpricefjc101102.pdf

Chan, K.K., Neighbors, C., and Marlatt, G.A. (2004). Treating addictive behaviours in the employee assistance program: Implications for brief interventions. Addictive Behaviours, 29(9),1883-1887.

Chang, G. (2001). Alcohol-screening instruments for pregnant women. Alcohol Research and Health, 25(3), 204-209.

Chang, G., Goetz, M.A., Wilkins-Haug, L., and Berman, S. (2000). A brief intervention for prenatal alcohol use: An in-depth look. Journal of Substance Abuse Treatment, 18, 365-369.

Chisholm, D., Rehm, J., Van Ommeren, M., and Monteiro, M. (2004). Reducing the global burden of hazardous alcohol use: A comparative cost-effectiveness analysis. Journal of Studies on Alcohol, 65, 872-793.

Cho, H., Hallfors, D.D., and Sanchez, V. (2005). Evaluation of a high school peer group intervention for at-risk youth. Journal of Abnormal Child Psychology, 33(3), 363–374.

Colliver, J., Compton, W., Wilson, M., Gfroerer, J., and Condon, T. (2006). Projecting drug use among aging baby boomers in 2020. Annals of Epidemiology, 16(4), 257–265.

Comeau, N., Stewart, S.H., and Loba, P. (2001). The relations of trait anxiety, anxiety sensitivity, and sensation seeking to adolescents' motivations for alcohol, cigarette, and marijuana use. Addictive Behaviours, 26, 803-825.

Conduct Problems Prevention Research Group. (2004). The Fast Track experiment: Translating the developmental model into a prevention design. In J.B. Kupersmidt, and K.A. Dodge (Eds.), Children's peer relations: From development to intervention (pp. 181-208). Washington, DC: American Psychological Association.

Cornelius, M., Lebow, H., and Day, N. (1997). Attitudes and knowledge about drinking: Relationships with drinking behaviour among pregnant teenagers. Journal of Drug Education, 27(3), 231-243.

Daly, K. (2004). The Changing Culture of Parenting. Ottawa, Ontario, Canada: Vanier Institute.

Conrod, P., Stewart, S., Comeau, N., and Maclean, A.M. (2006). Efficacy of cognitive–behavioural interventions targeting personality risk factors for youth alcohol misuse. Journal of Clinical Child and Adolescent Psychology, 35(4), 550–563.

Cook, R., and Schlenger, W. (2002). Prevention of substance abuse in the workplace: Review of research on the delivery of services. The Journal of Primary Prevention, 23(1), 115-142.

Covell, K. (2004). Adolescents and drug use in Cape Breton: A focus on risk factors and prevention. Sydney, Nova Scotia, Canada: Cape Breton Victoria Regional School Board.

Csiernik, R. (1995). A profile of Canadian employee assistance programs. Employee Assistance Research Supplement, 2(1), 1-8.

Dell, C., and Roberts, G. (2006). Alcohol use and pregnancy: An important Canadian public health and social issue. Ottawa, Ontario: Health Canada. Retrieved from http://www.phac-aspc.gc.ca/publicat/fasd-ru-ectaf-pr-06/pdf/fasd-ru-ectaf-pr-06_e.pdf

De Wit, D. (n/d). Strengthening Families for the Future. Executive Summary of Outcome Evaluation. Toronto: Centre for Addiction and Mental Health.

Dewit, D.J., Steep, B., Silverman, G., Stevens-Lavigne, A., Ellis, K., Smythe, C., Rye, B.J., Braun, K., and Wood, E. (2000). Evaluating an in-school drug prevention program for at-risk youth. The Alberta Journal of Education Research, 46(2), 117–33.

Douglas, R., Narbonne-Fortin, C. and Lauzon, R. (1997). Making it work: Getting municipalities involved in alcohol policy. Prevention pipeline, 10(4), 31-33.

Dulberg, C., Stevens, T., and Joubert, N. (2000). Mental health of the Canadian population: A comprehensive analysis. Chronic diseases in Canada, 20(3), 118-126.

Dusenbury, L., and Falco, M. (1995). Eleven components of effective drug abuse prevention curricula. Journal of School Health, 65(10), 420-425.

Eakin, J.M. (1992). Leaving it up to the workers: Sociological perspective on the management of health and safety in small workplaces. International Journal of Health Services, 22(4), 689-704.

Eckersley, R.M. (2005). 'Cultural fraud': The role of culture in drug abuse. Drug and Alcohol Review, 24(2), 157-163.

Editorial. (2007). Adding harm reduction to tobacco control. The Lancet; 370(9594), 1189.

Eggert, L.L., and Herting, J.R. (1993). Drug involvement among potential dropouts and "typical" youth. Journal of Drug Education, 23(1), 31-55.

Eggert, L.L., Thompson, E.A., Herting, J.R., Nicholas, L.J., and Dicker, B.G. (1994). Preventing adolescent drug abuse and high school dropout through an intensive school-based social network development program. American Journal of Health Promotion, 8(3), 202-215.

Ellickson, P., Collins, R., Hambarsoomians, K., and McCaffrey, D. (2005). Does alcohol advertising promote adolescent drinking? Results from a longitudinal assessment. Addiction, 100, 235–246.

Evans, R.G., Barer, M.L., and Marmor, T.R. (1994). Why are some people healthy and others not? The determinants of health of populations. New York: Aldine De Gruyter.

Evans, A. and Bosworth, K. (1997). Building effective drug education programs. Research Bulletin 19. Bloomington, Indiana: Phi Delta Kappa Center for Evaluation, Development and Research. Retrieved from http://www.pdkintl.org/research/reshome.htm

Evans-Whipp, T., Beyers, J., Lloyd, S., Lafazia, A., Toumbourou, J., Arthur, M. and Catalano, R. (2004). A review of school drug policies and their impact on youth substance use. Health Promotion International, 19(2), 227-234.

Fischer, B., Rehm, J., Patra, J., and Firestone Cruz, M. (2006). Changes in illicit opioid use across Canada. Canadian Medical Association Journal, 175, 1385.

Floyd, L., Decoufle, P., and Hungerford, D. (1999). Alcohol use prior to pregnancy recognition. American Journal of Preventive Medicine, 17(2), 101-107.

Foley, D. Goldfeld, D. McLoughlin, J. Nagorcka, S., Oberklaid, F., Wake, M. (2000). A review of the early childhood literature. Canberra, Australia: Department of Family and Community Services. Retrieved from http://www.facs.gov.au/internet/facsinternet.nsf/vIA/families/$file/early_childhood.pdf

Foster, S. (2001). Malignant neglect: substance abuse and America's schools. New York: National Center on Addiction and Substance Abuse of Columbia University, NY. Retrieved from http://www.omegalabs.net/media/documents/pdf/MalNeglect.pdf

Foxcroft, D., Ireland, D. J., Lister-Sharp, D., Lowe, G. and Breen, R. (2003). Longer-term primary prevention for alcohol misuse in young people: a systematic review. Addiction, 98, 397–411.

France, A. and Homel, R. (2006). Societal access routes and developmental pathways. Putting social structure and young people's voice into the analysis of pathways into and out of crime. Australian and New Zealand Journal of Criminology. 39(3).

Fuller, C., Vlahov, D., Ompad, D.C., Shah, N., Arria, A., Strathdee, S.A. (2002). High risk behaviours associated with transition from illicit non-injection to injection drug use among adolescent and young adult injection drug users: A case-controlled study. Drug and Alcohol Dependence, 66, 189-198.

Government of New Zealand. (2003). Effective drug education for young people: literature review and analysis. Wellington: Ministry of Youth and Development, New Zealand. Retrieved from http://www.myd.govt.nz/uploads/docs/0.7.1.1%20effective%20drug%20ed.pdf

Graham, K., Osgood, D.W., Zibrowski, E., Purcell, J., Gliksman, L.K., Pernanen, K., Salts, R.F., and Toomey, T.L. (2004). The effect of the safer bars programme on physical aggression in bars: Results of a randomized control trial. Drug and Alcohol Review, 23(1), 31-41.

Graham, L. (2005). Alcohol indicators report: A framework of alcohol indicators describing the consumption of use, patterns of use, and alcohol-related harms in Nova Scotia. Halifax, Canada: Nova Scotia Health Promotion Addiction Services. Retrieved from http://www.gov.ns.ca/hpp/publications/ExecSumFINAL.pdf

Granfield, R. (2004). Alcohol use in college: Limitations on the transformation of social norms. Addiction Research and Theory, 13(3), 281–292.

Greenberg, M.T., Weissberg, R.P., O'Brien, M.U., Zins, J.E., Fredricks, L., Resnik, H. et al. (2003). Enhancing school-based prevention and youth development through coordinated social, emotional, and academic learning. American Psychologist, 58, 466–474.

Greenfield, T., Graves, K., and Kaskutas, L. (1999). Long-term effects of alcohol warning labels: Findings from a comparison of the United States and Canada. Psychology and Marketing, 16(3), 261-282.

Griffiths, M., and Cooper, G. (2003). Online therapy: Implications for problem gamblers and clinicians. British Journal of Guidance and Counselling, 31(1), 113-135.

Hall, W. (2005). The prospects for tobacco harm reduction. Commentary. International Journal of Drug Policy, 16, 139–142

Hammond, D., Fong, G., McDonald, P., Cameron, R., and Brown, K. (2003). Impact of the graphic Canadian warning labels on adult smoking behaviour. Tobacco Control, 12:391-395.

Handmaker, N., and Wilbourne., P. (2001). Motivational interviewing in prenatal clinics. Alcohol Research and Health, 25(3), 219-229.

Hankin, J.R., Firestone, I.J., Sloan, J.J., Ager, J.W., Goodman, A.C., Sokol, R.J., and Martier, S.S. (2001). The impact of the alcohol warning label on drinking during pregnancy. Journal of Public Policy and Marketing, 12(1), 10-18.

Hankin, J.R., McCaul, M., and Heussner, J. (2000). Pregnant, alcohol-abusing women. Alcoholism: Clinical and Experimental Research, 24(8), 1276-1286.

Harden, A., Rees, R., Shepherd, J., Brunton, G., Oliver, S., and Oakley, A. (2001). Young people and mental health: a systematic review of research on barriers and facilitators. London: EPPI Centre. Retrieved from http://eppi.ioe.ac.uk/EPPIWebContent/hp/reports/mental_health/mental_health.pdf

Hatsukami, D. Lemmonds, C., Tomar, S. (2004). Smokeless tobacco use: harm reduction or induction approach? Preventive Medicine 38, 309–317.

Hawkins, D., Catalano, R., and Miller, Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. Psychological Bulletin, 112(1), 64-105.

Hawkins, E., Cummins, L.H., and Marlatt, G. (2004). Preventing substance abuse in American, Indian and Alaska native youth: Promising strategies for healthier communities. Psychological Bulletin, 130, 304–323.

Hawks, D., Scott, K., and McBride, M. (2002). Prevention of psychoactive substance use: A selected review of what works in the area of prevention. Geneva, Switzerland: World Health Organization. Retrieved from http://www.who.int/mental_health/evidence/en/prevention_intro.pdf

Health Canada; Canadian Centre on Substance Abuse (2005). National framework for action to reduce the harms associated with alcohol, other drugs and substances in Canada. Ottawa, Canada. Retrieved from http://www.nationalframework-cadrenational.ca/uploads/files/HOME/NatFRA1steditionEN.pdf

Health Canada (2002). Canada's aging population. Ottawa: Minister of Public Works and Government Services Canada. Retrieved from http://www.phac-aspc.gc.ca/seniors-aines/pubs/fed_paper/pdfs/fedpager_e.pdf

Hingson, R., and Howland, J. (2002). Comprehensive Community Interventions to Promote Health: Implications for College-Age Drinking Problems. Journal of Studies on Alcohol, 14(Suppl.).

Hemphill, S., Toumbourou, J., Herrenkohl, T., McMorris, B., Catalano, R. (2006). The Effect of School Suspensions and Arrests on Subsequent Adolescent Antisocial Behavior in Australia and the United States. Journal of Adolescent Health, 39(5), 736-744.

Holder, H.D., Gruenewald, P.J., Ponicki, W.R., Treno, A.J., Grube, J.W., Saltz, R.F. et al. (2000). Effect of community-based interventions on high-risk drinking and alcohol-related injuries. Journal of the American Medical Association, 284(18), 2341-2347.

Holder, H.D., Saltz, R.F., Grube, J.W., Treno, A., Reynolds, R.I., Voas, R.B. et al. (1997). Summing up: Lessons from a comprehensive community prevention trial. Addiction, 92(Suppl. 2), S293–S301.

Holder, H.D., and Treno, A.J. (1997). Media advocacy in community prevention: News as a means to advance policy change. Addiction, 92(Suppl. 2), S189–S199.

Holder, H. (2003). Strategies for reducing substance abuse problems: What research tells us. Paper presented at the NDRI International Research Symposium: Preventing Substance Use, Risky Use, and Harm: What is Evidenced-Based Policy?, Fremantle, Australia.

Institute of Medicine, National Academy of Sciences (2002). Speaking of health: Assessing health communication strategies for diverse populations. Washington, DC: National Academies Press. Retrieved from http://www.iom.edu/Object.File/Master/15/432/speakingofhealth8pgFINAL.pdf

Institute of Medicine, National Academy of Sciences (1990). Broadening the Base of Treatment for Alcohol Problems. Washington, DC: National Academy of Science Press. Retrieved from http://books.nap.edu/openbook.php?isbn=0309040388

Jernigan, D. (2003). Messages on alcohol matter. Comment on chapter 10: regulating alcohol promotion, and chapter 11: education and persuasion strategies. Addiction, 98.

Jernigan D (2001). Global status report – alcohol and young people. Geneva: World Health Organization. Retrieved from http://whqlibdoc.who.int/hq/2001/WHO_MSD_MSB_01.1.pdf

Johnson, T.P. (2003). Introduction. Substance Use and Misuse, 38(3–6), 307–310.

Johnston, L.D., O'Malley, P., and Bachman, J.G. (2000). Monitoring the future: National survey results on adolescent drug use: Overview of key findings, 1999. Rockville, MD: U.S. Department of Health and Human Services. Retrieved from http://www.monitoringthefuture.org/pubs/monographs/overview1999.pdf

Johnston, L.D., O'Malley, P., and Bachman, J.G., (2002). Monitoring the future: National survey results on adolescent drug use: Overview of key findings, 2001. Rockville, MD: U.S. Department of Health and Human Services. Retrieved from http://www.monitoringthefuture.org/pubs/monographs/overview2001.pdf

Kahn, J., Kegeles, S., Hays, R. and Beltzer, N. (2001). Cost-Effectiveness of the Mpowerment Project, a Community-Level Intervention for Young Gay Men. Journal of Acquired Immune Deficiency Syndromes, 27, 482–491.

Karabanow, J. (2006). Exploring salient issues of youth homelessness in Halifax, Nova Scotia. Ottawa, Ontario: Human Resources Development Canada. Retrieved from http://www.halifax.ca/qol/documents/HRDCfinalREPORT.pdf

Koski-Jannes, A., and Cunningham, J. (2001). Interest in different forms of self-help in a general population sample of drinkers. Addictive Behaviors, 26, 91–99.

Kraus, D., Serge, L., Goldberg, M. (2005). Homelessness, Housing, and Harm Reduction: Stable Housing for Homeless People with Substance Use Issues. Ottawa: Canada Mortgage and Housing Corporation. Retrieved from http://www03.cmhc-schl.gc.ca/b2c/b2c/mimes/pdf/64031.pdf

Kriener, H., Billeth, R., Gollner, C., Lachout, S., Neubauer, P., & Schmid, R. (2001). An inventory of on-site pill-testing interventions in the EU. Vienna, Austria: European Monitoring Centre for Drugs and Drug Addiction.

Kumpfer, K.L., Alvarado, R., and Whiteside, H.O. (2003). Family-based interventions for substance use and misuse prevention. Substance Use and Misuse, 38(11-13), 1759-1787.

Kypri, K., Saunders, J.B., and Gallagher, S.J. (2003). Acceptability of various brief intervention approaches for hazardous drinking among university students. Alcohol and Alcoholism, 38, 626–628.

Kypri, K., Saunders, J., Williams, S., McGee, R., Langley, J., Cashell-Smith, M., and Gallagher, S. (2004). Web-based screening and brief intervention for hazardous drinking: A double-blind randomized controlled trial. Addiction, 99, 1410–1417.

Lerner, R.M., and Castellino, D.R. (2002). Contemporary developmental theory and adolescence: Developmental systems and applied developmental science. Journal of Adolescent Health, 31(Suppl. 6), 122-135.

Lewis, J. (2006). Painting the picture of prescription drug abuse in Cape Breton. A baseline study. Sydney, Nova Scotia, Canada: Cape Breton University Press.

Lister-Sharp, D., Chapman, S., Stewart-Brown, S., and Sowden, A. (1999). Health promotion in schools: Two systematic reviews. Health Technology Assessment, 3(22), 1–207.

Lonczak, H.S. (2002). Effects of the Seattle social development project on sexual behaviour, pregnancy, birth, and sexually transmitted disease outcomes by age 21 years. Archives of Pediatrics and Adolescent Medicine, 156(5), 438-447.

Loxley, W., Toumbourou, J.W., and Stockwell, T. (2004). The prevention of substance use, risk and harm in Australia: A review of the evidence. Perth, Western Australia: Australian Government of Department of Health and Aging. Retrieved from http://www.health.gov.au/internet/wcms/Publishing.nsf/content/health-pubhlth-publicat-document-mono_prevention-cnt.htm

Macdonald, S., Csiernik, R., Durand, P., Rylett, M., and Wild, T.C. (2006). Prevalence and factors related to Canadian workplace health programs. Canadian Journal of Public Health, 97(2), 121-125.

MacDonald, S. (1997). Evaluation of an EAP in a transportation company. Evaluation and Program Planning, 20(4), 495-505.

MacDonald, S., and Wells, S. (1994). Effectiveness of testing programs. In S. Macdonald, and P. Roman (Eds.), Drug testing in the workplace (pp. 121-142). New York: Plenum Press.

MacDonald, S. (1997). Work-place alcohol and other drug testing: A review of the scientific evidence. Drug and Alcohol Review, 16(3), 251-259.

MacNeil, P., and Webster, I. (1997). Canada's alcohol and other drugs survey 1994: A discussion of the findings. Ottawa, Ontario: Health Canada. Retrieved from http://dsp-psd.pwgsc.gc.ca/Collection/H39-338-1-1994E.pdf

Manwell, L., Fleming, M., Mumdt, M., Stauffacher, E., and Barry, K. (2000). Treatment of problem alcohol use in women of childbearing age: Results of a brief intervention trial. Clinical and Experimental Research, 24(10), 1517-1524.

Margo, J., Dixon, M., Pearce, N., and Reed, H. (2006). Freedom's orphans: Raising youth in a changing world. Executive Summary. London: Institute for Public Policy Research. Retrieved from http://www.ippr.org/members/download.asp?f=%2Fecomm%2Ffiles%2Ffreedoms%5Forphans%5Fexec%5Fsumm%2Epdf

McBride, N., Farringdon, F., Midford, R., Meuleners, L., and Philips, M. (2004). Harm minimisation in schools. Final results of the school health and alcohol harm reduction project (SHAHRP). Addiction, 91, 278-291.

McCourt, C., Paquette, D., Pelletier, L., and Reyes, F. (2005). Report on maternal and child health in Canada. Making every mother and child count. Ottawa, Ontario: Public Health Agency of Canada. Retrieved from http://www.phac-aspc.gc.ca/rhs-ssg/pdf/whd_05epi_e.pdf

McGrath, Y., Sumnall, H., McVeigh, J., and Bellis, M. (2006). Drug use prevention among young people: A review of reviews evidence briefing update. London: National Institute for Health and Clinical Excellence. Retrieved from www.nice.org.uk/download.aspx?o=529849

Meyer, M. and Estable, A. (2005). Homelessness and Substance Use: Exploring Cross-sectoral Service Needs from the Clients' Perspective. Steering Committee of the Substance Use in the Homeless Population Working Group of Ottawa. Retrieved from http://www.socialsciences.uottawa.ca/crcs/pdf/Homelessness%20-%20Gentium%20Report%202003.pdf

Mitchell, P., Sanson, A., Spooner, C., Copeland, J., Vimpani, G., Toumbourou, J.W. et al. (2001). The role of families in the development, identification, prevention and treatment of illicit drug problems. Canberra, Australian Capital Territory, Australia: National Health and Medical Research Council. Retrieved from http://www.nhmrc.gov.au/publications/synopses/_files/ds8.pdf

Miller, W.R., and Rollnick, S. (2002). Motivational interviewing: Preparing people for change, 2nd Edition. New York: Guilford Press.

Monti, P.M., Spirito, A., Myers, M., Colby, S.M., Barnett, N.P., Rohsenow, D.J. et al. (1999). Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department. Journal of Consulting Clinical Psychology, 67(6), 989–994.

Morissette, R., and Zhang, X. (2006). Revisiting wealth inequality. Perspectives on labour and income, (7)12. Retrieved from http://www.statcan.ca/english/freepub/75-001-XIE/75-001-XIE2006112.pdf

Myles, J. (n.d.). Postponed adulthood: Dealing with the new economic inequality. Ottawa, Ontario: Canadian Council on Social Development. Retrieved from http://www.ccsd.ca/pubs/2005/pa/pa.pdf

NAOMI status report, March 2008. Retrieved on September 19, 2008 from: http://www.naomistudy.ca/pdfs/March2008NAOMIUpdate.pdf

National Health and Medical Research Council. (2001). Australian alcohol guidelines: Health risks and benefits. Canberra, Australian Capital Territory: Government of Australia. Retrieved from http://www.nhmrc.gov.au/publications/synopses/_files/ds9.pdf

Nation, M., Crusto, C., Wandersman, A., Kumpfer, K., Seybolt,D., Morrissey-Kane, E., and Davino, K., (2003). What Works in Prevention: Principles of Effective Prevention Programs. American Psychologist, 58(6/7), 449–456.

Neale, J. (2001) Homelessness amongst drug users: A double jeopardy explored. International Journal of Drug Policy, 12, 353-369.

Neighors, C., Larimer, M., and Lewis, M. (2004). Targeting misperceptions of descriptive drinking norms: Efficacy of a computer-delivered personalized normative feedback intervention. Journal of Consulting and Clinical Psychology, 72(3), 434–447.

Offord, D. (2000). Selection of levels of prevention. Addictive Behaviors, 25(6), 833-842.

Ogborne et al. (2008). Vancouver's INSITE service and other Supervised injection sites: What has been learned from research? Final report of the Expert Advisory Committee. Ottawa: Health Canada.

Olds, D., Henderson, C.R. Jr., Cole, R., Eckenrode, J., Kitzman, H., and Luckey, D. et al. (1998). Long-term effects of nurse home visitation on children's criminal and antisocial behaviour: 15-year follow-up of a randomized controlled trial. Journal of the American Medical Association, 280(14), 1238-1244.

Ondersma, S., Svikis, D., and Schuster, C. (2007). Computer-based brief intervention: A randomized trial with postpartum women. American Journal of Preventive Medicine, 32(3), 231-238.

Ottawa Charter for Health Promotion. (1986). First International Conference on Health Promotion, Ottawa, 21 November 1986. Ottawa: Canadian Public Health Association, Health and Welfare Canada, and the World Health Organization. Retrieved from http://www.phac-aspc.gc.ca/ph-sp/phdd/pdf/charter.pdf

Paglia, A. (1998). Tobacco risk communication strategy for youth: A literature review. Ottawa: Health Canada.

Parker, H., and Williams, L. (2001). Alcohol, cannabis, ecstasy and cocaine: drugs of reasoned choice amongst young adults in England. International Journal of Drug Policy, 12 (5/6), 397-413.

Patton, G., Bond, L., Carlin, J., Thomas, L. et al. (2006). Promoting social inclusion in schools: a group-randomized trial of effects on student health risk behavior and well-being. American Journal of Public Health, 96(9).

Paul, C., Redman, S., and Sanson-Fisher, R.W. (2004). A cost-effective approach to the development of printed materials: A randomized control trial of three strategies. Health education research, 19(6), 698-706.

Paul, C. L., Redman, S. and Sanson-Fisher, R. W. (2003). Print material content and design: is it relevant to effectiveness? Health Education Research, 18(2), 181-190.

Perkins, H., Haines, M., and Rice, R. (2005). Misperceiving the college drinking norm and related problems: A nationwide study of exposure to prevention information, perceived norms and student alcohol misuse. Journal of Studies on Alcohol, 66, 470-478.

Perry, C.L., Williams, C.L., Komro, K.A., Veblen-Mortenson, S., Stigler, M.H., Munson, K.A. et al. (2002). Project northland: Long-term outcomes of community action to reduce adolescent alcohol use. Health Education Research: Theory and Practice, 17(1), 117-132.

Poulin, C. (2006). Harm reduction policies and programs for youth. Harm reduction for special populations in Canada #2. Ottawa: Canadian Centre on Substance Abuse. Retrieved from http://www.ccsa.ca/NR/rdonlyres/D0254373-5F2B-459D-BB79-6EE7C22CC303/0/ccsa113402006.pdf

Poulin, C., & Elliott, D. (2007). Student drug use survey in the Atlantic Provinces 2007. Atlantic Technical Report. Retrieved from http://www.health.gov.nl.ca/health/publications/pdfiles/Atl_Tech_Report_2007_web_cover.pdf

Poulin, C., and McDonald, W. (2007). Nova Scotia student drug use survey 2007: Highlights report. Halifax: Nova Scotia Department of Health, Addiction Services and Dalhousie University. Retrieved from http://www.gov.ns.ca/ohp/repPub/NS_Highlights_2007.pdf

Poulin, C., and Nicholson, J. (2005). Should harm minimization as an approach to adolescent substance use be embraced by junior and senior high schools? Empirical evidence from an integrated school- and community-based demonstration intervention addressing drug use among adolescents. International Journal of Drug Policy, 16, 403–414.

Public Health Agency of Canada. (2003). Fetal alcohol spectrum disorder (FASD): a framework for action. Government of Canada. Retrieved from http://www.phac-aspc.gc.ca/publicat/fasd-fw-etcaf-ca/framework_e.html

Public Health Agency of Canada. (2004a). What determines health? Retrieved from http://www.phac-aspc.gc.ca/ph-sp/phdd/determinants/determinants.html

Public Health Agency of Canada (2004b). Six Key Strategies to Enhance the Social Determinants of Health. Retrieved from http://www.phac-aspc.gc.ca/ph-sp/phdd/overview_implications/01_overview.html

Public Health Agency of Canada. (2005a). Canada's Seniors: A Growing Population. Retrieved from http://www.phac-aspc.gc.ca/seniors-aines/pubs/factoids/2001/toc_e.htm

Public Health Agency of Canada. (2005b). Children-Adolescents – 7-18 Years. Comprehensive School Health. Retrieved from http://www.phac-aspc.gc.ca/dca-dea/7-18yrs-ans/comphealth_e.html

Rehm J, Baliunas D, Brochu S, Fischer B, Gnam W, Patra J, Popova S, Sarnocinska-Hart A, Taylor, B. The Costs of Substance Abuse in Canada 2002: Highlights. Ottawa: Canadian Centre on Substance Abuse, 2006. Retrieved from http://www.ccsa.ca/NR/rdonlyres/18F3415E-2CAC-4D21-86E2-CEE549EC47A9/0/ccsa0113322006.pdf

Ritter, A. & Cameron, J. (2005). Monograph No. 06: A systematic review of harm reduction. DPMP Monograph Series. Fitzroy: Turning Point Alcohol and Drug Centre.

Roberts, G., Nanson, J. (2001). Best practices: FAS/FAD and the effects of other substance use during pregnancy. Health Canada.

Roberts, G., McCall, D., Stevens-Lavigne, A., Anderson, J., Paglia, A., Bollenbach, S., Wiebe, J., and Gliksman, L. (2001). Preventing substance use problems among young people: A compendium of best practices. Ottawa, ON: Health Canada. Retrieved from http://www.hc-sc.gc.ca/hl-vs/alt_formats/hecs-sesc/pdf/pubs/adp-apd/prevent/young-jeune_e.pdf

Rodu B, & Godshall WT (2006). Tobacco harm reduction: an alternative cessation strategy for inveterate smokers. Harm Reduction Journal 3, 37.

Rojas- Fernandez, C.H., Carver, D. and Tonks, R. (1999). Population trends in the prevalence of benzodiazepine use in the older population of Nova Scotia: A cause for concern? Canadian Journal of Clinical Pharmacology, 6 (3), 149-56.

Romanus, G. (2003). Don't prejudge what is politically possible'. Comment on chapter 16 Addiction, 98.

Ross C. Brownson, David P. Hopkins, Melanie A. Wakefield. (2002). Effects of smoking restrictions in the workplace. Annual Review of Public Health, 23, 333-348.

Russell, M. et al. (1996). Detecting risk drinking during pregnancy: A comparison of four screening questionnaires. American Journal of Public Health, 86(10), 1435-1439.

Sanders, M. (2003). Triple P - Positive Parenting Program: A population approach to promoting competent parenting Australian e-Journal for the Advancement of Mental Health (AeJAMH), 2(3).

Saitz, R., Helmuth, E.D., Aromaa, S.E., Guard, A., Belanger, M., & Rosenbloom, D.L. (2004). Web-based screening and brief intervention for the spectrum of alcohol problems. Preventive Medicine, 39, 969–975.

Saitz, R., Palfai, T., Freedner, N., Winter, M., Macdonald, A., Lu, J., Ozonoff, A., Rosenbloom, D., and Dejong, W. (2007). Screening and brief intervention online for college students: the ihealth study. Alcohol and Alcoholism, 42(1), 28–36.

Schinke, S.P., Tepavac, L., Cole, K.C. (2000). Preventing substance use among Native American youth: three-year results. Addictive Behaviors; 25, 387–397.

Schultz, W., Nolan, J., Cialdini, R., Goldstein, N., Griskevicius, V. (2007). The Constructive, Destructive, and Reconstructive Power of Social Norms. Psychological science, 18(5).

Schweinhart, L. (2004). The High/Scope Perry Preschool Study Through Age 40. Summary, Conclusions, and Frequently Asked Questions. High/Scope Educational Research Foundation. Retrieved from http://www.nippa.org/pages/Highscope/PerryAge40SumWeb.pdf

Schweinhart, L.J., Barnes, H.V., Weikart, D.P. (1993). Significant Benefits: The High/Scope Perry Preschool Study Through Age 27. Ypsilanti, MI: High Scope Press.

Schellinck, T. Schrans, G. Walsh, J. Grace, (2002). 2002 Seniors Survey – Prevalence of Substance Use and Gambling Among New Brunswick Adults Aged 55+. Fredericton, New Brunswick: New Brunswick Department of Health and Wellness. Retrieved from http://www.gnb.ca/0378/pdf/SeniorsFinalReport2002ENG.pdf

Shaffer, H. (2007). Op-Ed/Editorials - The State of Public Health Research on Internet Gambling. The Basis: Brief Addiction Science Information Source. Harvard Medical School.

Single E: Substance Abuse and Population Health. Workshop on Addiction and Population Health, Edmonton, Canadian Centre on Substance Abuse, 1999.

Skager, R. (2001). Research and Theory Supporting an Alternative Perspective on Drug Education for Youth. Retrieved from http://www.safety1st.org

Skinner, H., Maley, O., Norman, C. (2006). Developing Internet-Based eHealth Promotion Programs: The Spiral Technology Action Research (STAR) Model. Health Promotion Practice, 7, 406.

Snyder, L.B., Hamilton, M.A., Mitchell, E.W., Kiwanuka-Tondo, J., Fleming-Milici, F., and Proctor, D. (2004). A meta-analysis of the effect of mediated health communication campaigns on behaviour change in the United States. Journal of Health Communication, 9(Suppl. 1), 71-96.

Social Planning and Research Council of BC. (2005). Innovative Approaches for Providing Services to Homeless People with Concurrent Disorders (Substance Use and Mental Illness). National Research Program National Secretariat on Homelessness Health and Homelessness Issues in Canada. Retrieved from www.sparc.bc.ca/index.php?option=com_docman&task=doc_download&gid=154&catid=127&Itemid=110

Spooner, C., Hall, W., Lynskey, M. (2001). Structural determinants of youth drug abuse. ANCD Research Paper 2. Canberra: Australian National Council on Drugs. Retrieved from http://www.ancd.org.au/publications/pdf/rp2_youth_drug_use.pdf

Spooner, C. and Heatherington, K. (2004). Social determinants of drug use. Technical report #228. National drug and alcohol research centre, University of New South Wales. p 20. Retrieved from http://ndarc.med.unsw.edu.au/ndarcweb.nsf/website/Publications.reports.TR228

Spooner C. (2005). Structural determinants of drug use - a plea for broadening our thinking. Drug and Alcohol Review, 24 (2).

Spooner, C. (Sept 2006). Social determinants of health: Frameworks and strategies for the addictions. Presentation at 2nd International Summer School on Inequality and Addictive Behaviours. A fair go for all? Adelaide, 18–19 September, South Australia. Retrieved from http://www.nceta.flinders.edu.au/events/documents/CatherineSpoonerpaper.pdf

Springer, J., Sale, E., Hermann, J., Sambrano, S., Kasim,R. and Nistler, M. (2004). Characteristics of Effective Substance Abuse Prevention Programs for High-Risk Youth. The Journal of Primary Prevention, 25(2).

Sproule, B. (2006). Discussion Document for the National Workshop on Preventing the Problematic Use of Psychotropic Pharmaceuticals. Ottawa, March 21-22, Toronto: Centre for Addiction and Mental Health. Retrieved from http://www.nationalframework-cadrenational.ca/uploads/files/TWS_PsychoPharma/Discussion_Document_EN_march_06.pdf

Stead LF, Lancaster T. (2004). Interventions for preventing tobacco sales to minors. The Cochrane Collaboration. Abstract. Retrieved from http://mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD001497/frame.html

Stewart-Brown, S. (2006). What is the evidence on school health promotion in improving health or preventing disease and, specifically, what is the effectiveness of the health promoting schools approach? Geneva: World Health Organization. Retrieved from http://www.euro.who.int/Document/E88185.pdf

Stockwell, T. (2006). Alcohol supply, demand and harm reduction: what is the strongest cocktail? International Journal of Drug Policy, 17, 269-277.

Stockwell, T. (April 7, 2005). Presentation to the Standing Committee on Health, 38th Parliament, 1st Session. Ottawa, Canada. Retrieved from http://cmte.parl.gc.ca/Content/HOC/Committee/381/HESA/Evidence/EV1738599/HESAEV30-E.PDF

Stockwell, T., Grunewald, P., Toumbourou, J., and Loxley, W. (Eds.) (2005). Preventing harmful substance use: the evidence base for policy and practice. Chichester,United Kingdom: John Wiley and Sons.

Stockwell, T., Sturge, J., and Macdonald, S. (2007). Patterns of Risky Alcohol Use in British Columbia– Results of the 2004 Canadian Addiction Survey. Bulletin 1 - December 2005; Revised April 2007. Victoria, BC: Centre for Addictions Research of BC. Retrieved from http://www.carbc.uvic.ca/pubs/AlcoholBulletin2005.pdf

Stockwell, T., Sturge, J., and Macdonald, S. (2007). Patterns of Risky Alcohol Use in British Columbia– Results of the 2004 Canadian Addiction Survey. Victoria: Centre for Addictions Research of BC. CARBC Bulletin 1 - December 2005; Revised April 2007. Retrieved from http://carbc.uvic.ca/pubs/AlcoholBulletin2005.pdf

Stratton, K., Shetty, P., Wallace, R., & Bandurant, S. (2001). Clearing the smoke: Assessing the science base for tobacco harm reduction. Washington, DC: National Academy Press.

Tilford, S., Delaney, F., Vogels, M. (1997). Effectiveness of Mental Health Promotion Interventions: A Review. London: Health Education Authority, Effectiveness Review (4). Retrieved from www.nice.org.uk/download.aspx?o=502207

Toumbourou, J. W., Stockwell, T., Neighbors, C., Marlatt, G. A., Sturge, J., Rehm, J. (2007). Interventions to reduce harm associated with adolescent substance use: An international review. Lancet, 369, 1391-1401.

Transportation Research Board. (2005). Implementing Impaired Driving Countermeasures: Putting Research into Action. Washington DC: National Research Council.

Tupker, E. (2004). Youth and drugs and mental health: A resource for professionals. Toronto: Centre for Addiction and Mental Health.

US Preventive Services Task Force. (1996). Guide to clinical preventive services: Report of the US Preventive Services Task Force. Rockville, MD: US Department of Health and Human Services. Retrieved from http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=hstat3.chapter.10062

University of Calgary. (n/d). Feeling alienated at school: how risky health behaviours start. Population health intervention research centre. Retrieved from http://www.ucalgary.ca/PHIRC/snapshots.html

Valequez, M. et al. (2003). Reducing the risk of alcohol-exposed pregnancies: A study of a motivational intervention in community settings. Pediatrics (111)5, 1131-1135.

Vasilaki EI, Hosier SG, Cox WM. (2006). The efficacy of motivational interviewing as a brief intervention for excessive drinking: a meta-analytic review. Alcohol and Alcoholism, 41(3), 328-35.

Velleman, R., Templeton, L., and Copello, A. (2005). The role of the family in preventing and intervening with substance use and misuse: a comprehensive review of family interventions, with a focus on young people. Drug and Alcohol Review, 24, 93-109.

Von Sydow, K. et al. (2002). Use, abuse and dependence of ecstasy and related drugs in adolescents and young adults – a transient phenomenon? results from a longitudinal community study. Drug and Alcohol Dependence, 66,147-158.

Wagenaar, A.C., Gehan, J.P., Jones-Webb, R., Toomey, T.L., Forster, J.L., Wolfson, M. and Murray, D.M. (1999). Communities mobilizing for change on alcohol: Lessons and results from a 15-community randomized trial. Journal of Community Psychology, 27, 315-326.

Wang, P.S., Bohn, R.L., Glynn, R.J., Mogun, H., Avorn, J. (2001). Hazardous benzodiazepine regimens in the elderly: effects of half-life, dosage, and duration on risk of hip fracture. American Journal of Psychiatry, 158, 892–898.

Webster-Stratton. C., and Taylor, T. (2001). Nipping Early Risk Factors in the Bud: Preventing Substance Abuse, Delinquency, and Violence in Adolescence Through Interventions Targeted at Young Children (0–8 Years) Prevention Science, 2(3).

Weisz, J., Sandler, I., Durlak, J., Anton, B. (2005). Promoting and Protecting Youth Mental Health Through Evidence-Based Prevention and Treatment. American Psychologist 60(6) 628–648.

Weitzman, E., Nelson, T., Wechsler, H. (2003). Assessing success in a coalition-based environmental prevention programme targeting alcohol abuse and harms: Process measures from the Harvard School of Public Health "A Matter of Degree" programme evaluation Nordisk Alkohol- and Narkotikatidskrift 20. (ENGLISH SUPPLEMENT).

Wells, J., Barlow, J., Stewart-Brown, S. (2003). A systematic review of universal approaches to mental health promotion in schools. Health Education, 103(4).

Werch, C. and Owen, D. (2002). Iatrogenic effects of alcohol and drug prevention programs. Journal of Studies on Alcohol, 63(5), 581-90.

Wilson, D., Gottfredson, D., Najaka, S. (2001). School-Based Prevention of Problem Behaviors: A Meta-Analysis. Journal of Quantitative Criminology, 17(3).

World Health Organization (2004) Effectiveness of sterile needle and syringe programming in reducing HIV/AIDS among injecting drug users. Geneva: WHO.

Yamaguchi, R., Johnston, L., O'Malley, P. (2003). Relationship between student illicit drug use and school drug-testing policies. Journal of School Health, 73(4), 159-164.

Zinberg, N. (1984). Drug, Set, and Setting: The Basis for Controlled Intoxicant Use. Yale University Press.

Zlotnick, C., Tam, T., Robertson. M. (2003). Disaffiliation, Substance Use, and Exiting Homelessness. Substance Use and Misuse, 38 (3-6), 577 – 599.