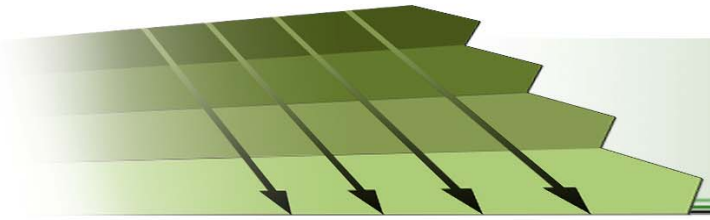

CORE
Public Health Functions for BC

Evidence Review:
Prevention of Mental Disorders

Population Health and Wellness
BC Ministry of Health

June 2007

This is a review of evidence and best practice that should be seen as a guide to understanding the scientific and community-based research, rather than as a formula for achieving success. This review does not necessarily represent ministry policy, and may include practices that are not currently implemented throughout the public health system in BC. This is to be expected as the purpose of the Core Public Health Functions process—consistent with the quality improvement approach widely adopted in private and public sector organizations across Canada—is to put in place a performance improvement process to move the public health system in BC towards evidence-based best practice. Health authorities will develop public performance improvement plans with feasible performance targets and will develop and implement performance improvement strategies that move them towards best practice in the program component areas identified in the Model Program Paper. These strategies, while informed by the evidence in this review, will be tailored to local context.

This Evidence Review should be read in conjunction with the accompanying Model Core Program Paper.

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Evidence Review accepted by:
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1.0 OVERVIEW/ SETTING THE CONTEXT

In 2005, the British Columbia Ministry of Health released a policy framework to support the delivery of effective public health services. The *Framework for Core Functions in Public Health* identifies prevention of mental disorders as one of the 21 core programs that a health authority provides in a renewed and comprehensive public health system.

The process for developing performance improvement plans for each core program involves completion of an evidence review used to inform the development of a model core program paper. These resources are then utilized by the health authority in their performance improvement planning processes.

This evidence review was developed to identify the current state of the evidence based on the research literature and accepted standards that have proven to be effective, especially at the health authority level. In addition, the evidence review identifies best practices and benchmarks where this information is available.

1.1 An Introduction to This Paper

1.1.1 Purpose and Context

This evidence review paper provides a summary of the best available evidence on ways to prevent mental disorders across the life course in the general population and among specific population groups, and outlines prevention approaches that target specific mental disorders.

Mental disorder prevention focuses on reducing risk factors and enhancing protective factors associated with the determinants of mental health, with the aim of reducing risk, incidence, prevalence and recurrence of mental disorders, time spent with symptoms, or the risk condition for a mental illness; preventing or delaying recurrences; and decreasing the severity and impact of illness on individuals, families and society (World Health Organization [WHO], 2004a; Mrazek & Haggerty, 1994).

This paper will inform the development of a model core program on the primary prevention of mental disorders for the British Columbia Ministry of Health, health authorities and their partners, and is available as a resource for policy makers and service providers at the provincial, regional and local levels. By summarizing both proven and promising interventions from the research literature, this paper is intended to support and inform the development of evidence-based approaches to preventing mental disorders in the home, school, workplace and community.

A companion evidence review on mental health promotion (Ministry of Health [MOH], 2007) examines proven and promising approaches to mental health promotion. This companion review contains considerable complementary discussion and evidence, since mental health promotion strategies make an important contribution to the prevention of mental disorders—positive mental health serves as a powerful protective factor against mental illness: “The distinction between mental health promotion and mental disorder prevention lies in their targeted outcomes. Mental health promotion aims to promote positive mental health by increasing psychological well-being, competence and resilience, and by creating supporting living conditions and environments.

Mental disorder prevention has as its target the reduction of symptoms and ultimately of mental disorders" (Saxena, Jané-Llopis, & Hosman, 2006, p. 6).

An additional evidence review, *Evidence Review: Prevention of Harms Associated with Substances* (MOH, Population Health and Wellness [PHW], 2006), offers health authorities and partners current evidence on effective approaches to reducing substance-related harms, including substance dependence. Readers interested in the prevention of substance use disorders are also directed to *Following the Evidence: Preventing Harms from Substance Use in BC* (MOH, 2006).

1.1.2 Mental Disorders and Burden of Disease

Around the world, mental and behavioural disorders are common— affecting men and women of all ages and nations and cultures. Estimates suggest mental disorders affect more than 25 per cent of all people at some time during their lives and are present at any point in time in about 10 per cent of a given adult population (WHO, 2001a). As long ago as 1990, five mental disorders were identified among the top ten causes of disability world wide: unipolar major depression; alcohol use disorder; bipolar disorder; schizophrenia; and obsessive compulsive disorders (Murray & Lopez, 1996). Approximately 20 per cent of all patients seen by primary health care professionals have one or more mental disorders (WHO, 2001a). In addition, poor mental health plays a significant role in diminished immune functioning, and the development of certain physical illnesses (WHO, 2001a).

Mental and behavioural disorders have an enormous and growing impact on the quality of life of individuals and families, and a growing economic impact on communities and societies. In 1990, mental and behavioural disorders accounted for almost 11 per cent of total disability-adjusted life years (DALYs) lost due to all diseases and injuries, and psychiatric and neurological conditions together accounted for 28 per cent of all years lived with a disability (Murray & Lopez, 1996). The DALY is a health gap measure that extends the concept of potential years of life lost due to premature death to include equivalent years of "healthy" life lost in states of less than full health, broadly termed "disability." By 2000, mental and behavioural disorders accounted for about 12 per cent of total DALYs lost (WHO, 2001a), and future projections suggest that psychiatric and neurological conditions could increase their share of the total global burden to approximately 15 per cent in 2020 (Murray & Lopez, 1996); "This is a bigger proportionate increase than that for cardiovascular diseases" (Murray & Lopez, 1996).

British Columbia is no exception to this trend. Mental disorders are the third largest contributor to the province's overall disease burden (after cancer and cardiovascular disease)—and the largest contributor to disease burden among British Columbians ages 15–34; mental disorders are the leading cause of disability in the province (MOH, 2001). At any given time in British Columbia, more than 140,000 children experience significant symptoms and impaired functioning associated with mental disorders (Waddell, McEwan, Shepherd, Offord & Hua, 2005).

1.1.3 Economic Costs of Mental Disorders

A Health Canada study using administrative and survey data, including physician billing data, hospitalization data, and data on self reported activity restriction estimated the cost of mental disorders in Canada to be $7.3 billion in 1993 dollars (Moore, Mao, Zhang, & Clarke, 1997). A

more recent Canadian study drawing upon an expanded dataset estimated the annual economic impact of mental health problems in Canada to be approximately $14.4 billion, of which $6.3 billion accrued to medical treatment and $8.1 billion to lost productivity (Stephens & Joubert, 2001). Authors of both studies cautioned that data limitations prevented complete data capture and thus, these estimates likely underestimate true costs.

The Global Business and Economic Roundtable on Addiction and Mental Health (GBERAMH) estimates workplace mental disorders and sub-clinical mental health problems in Canada annually result in $33 billion in lost industrial production. This estimate does not include costs related to health care or social service systems, costs transferred from the workplace to these systems or employer costs originating from medical conditions triggered by factors outside the workplace (GBERAMH, 2006).

British Columbia spends approximately $1 billion each year on mental health and addictions services delivered through the health system (Committee of Supply, 2004).

1.1.4 Why prevention?

Increased emphasis on prevention is essential given the magnitude of the burden of illness associated with mental disorders, and the associated economic costs. A public health approach that emphasizes prevention benefits individuals and families when mental disorder onset is prevented or delayed; communities when burden is lowered; and society when mental disorder prevention helps reduce accidents and injuries associated with alcohol use, and the social and economic costs of disabilities.

The systematic development of science-based mental disorder prevention programs and controlled studies to test their effectiveness emerged almost 30 years ago. Since then, this approach has been supported by a growing understanding of the role health determinants and malleable risk and protective factors play in pathways to mental disorder onset. A growing body of evidence shows that preventive interventions can influence these risk and protective factors and reduce the incidence and prevalence of some mental disorders (WHO, 2004a).

2.0 METHODOLOGY

2.1 Search Strategy

The evidence selected for this paper was drawn from systematic reviews and well-designed individual studies published after 1980. Searches were conducted on Medline, PsycINFO, Campbell Database of Systematic Reviews and Cochrane Database of Systematic Reviews. General Internet searches for specific reports in "pdf" and "html" format were also performed using GOOGLE search engine.

A number of thorough and comprehensive reviews of the best evidence associated with the prevention of mental disorders have been recently published, or are currently in press, and provided additional background material for this paper.

Prevention of Mental Disorders: Summary Report (WHO, 2004a) was released by the WHO in 2004, and includes a selective review of the available evidence drawn from a range of countries and cultures. This summary report is based on *Prevention of Mental Disorders: Effective Interventions and Policy Options* (Hosman, Jané-Llopis and Saxena, Eds., in press), which includes a thorough review of the field and extensive recommendations for research, policy and practice; this updates an earlier review, *Primary Prevention of Mental, Neurological and Psychosocial Disorders* (WHO, 1998).

The Children's Health Policy Centre at Simon Fraser University has conducted a series of systematic reviews of research on programs that could potentially be implemented in British Columbia to prevent specific mental disorders among children and adolescents, in support of the British Columbia Ministry of Children and Family Development's *Child and Youth Mental Health Plan for British Columbia* (2003). These reviews include:

- *Preventing Substance Use Disorders in Children and Youth* (Schwartz, Harrison, Garland & Waddell, 2007).
- *Preventing and Treating Depression in Children and Youth* (Waddell, Hua, Godderis & McEwan, 2004).
- *Preventing and Treating Anxiety Disorders in Children and Youth* (Waddell, Godderis, Hua, McEwan & Wong, 2004).
- *Preventing and Treating Conduct Disorder in Children and Youth* (Waddell, Wong, Hua & Godderis, 2004).
- *Preventing Suicide in Youth: Taking Action with Imperfect Knowledge* (White, 2005).
- *Preventing and Treating Eating Disorders in Children and Youth* (Waddell, Godderis, Schwartz & Garland, 2005).
- *The Mental Health and Well-Being of Aboriginal Children and Youth: Guidance for New Approaches and Services* (Mussell, Cardiff & White, 2004, in collaboration with the Sal'i'shan Institute).

In the area of substance disorder prevention, two recent, comprehensive reviews are available:

- *The Prevention of Substance Use, Risk and Harm in Australia: A Review of the Evidence* (Loxley, Toumbourou & Stockwell, 2004).
- *Preventing Psychoactive Substance Use and Related Harms Among Children and Adolescents: A Review of Theory and Global Best Practices to Address Psychosocial And Neurobiological Factors* (Stockwell, Fishbein, Toumbourou, Tarter & Eldreth, 2005).

The results of these reviews are summarized into best advice for British Columbia's health system in the document *Evidence Review: Prevention of Harms Associated with Substances* (MOH, PHW, 2006).

2.2 Assessing and Presenting the Evidence

The randomized controlled trial is widely accepted as the best strategy to reduce the risk of invalid conclusions from research. However, in research involving prevention there are limitations associated with randomized controlled trials, given they are best suited for studying causal influences at an individual level using interventions in highly controlled contexts (Jané-Llopis, Katschnig, McDaid et al., 2006; WHO, 2004a; McQueen & Anderson, 2001; Nutbeam, 1999). Many public health preventive interventions address large groups, communities or whole populations, where such designs are often challenging. In addition, ethical barriers may constrain research design such as randomized controlled trials in some areas of mental disorder prevention—for example in the realm of suicide prevention (White, 2005). Therefore, research designs such as quasi-experimental studies and time-series designs are also considered valuable for developing useful evidence in the area of preventing mental disorders (Jané-Llopis et al., 2006; WHO, 2004a).

This report is based on conclusions from studies using evidence from randomized controlled trials. Where evidence from randomized controlled trials is not available, the conclusions from studies using quasi-experimental and qualitative research methods are considered. Evidence that relies on expert opinion is not included.

Interventions are considered when their primary outcome seeks to prevent onset of mental disorders. Interventions are also considered when they seek to influence evidence-based risk and protective factors— many problems are related or share common risk factors that can be addressed simultaneously. For example, optimal prenatal care, childhood immunization and exercise programs for seniors address risk and protective factors for mental disorders, while contributing to physical health and generating broader social and economic benefits. Few population-wide multi-outcome strategies have been evaluated for their specific impact on the prevention of mental disorders. According to the WHO, prevention science and policy has often compartmentalized its approach to mental, social, educational, behavioural and legal problems; accumulating multiple proximal outcomes across domains of functioning should be seen as an opportunity to "bring about more efficient strategies than collections of programs with fragmented outcomes" (WHO, 2004a, p. 53). Therefore, selected examples of promising population-wide strategies whose primary purpose is not specifically mental health-related, but that influence evidence-based risk and protective factors—such as unemployment insurance and workplace health and safety legislation—are referenced in relevant sections of this review. These

strategies and others provide an important societal foundation for specific interventions that address individual, family and community risk and protective factors. Strategies and interventions are not referenced in this report where there were no empirical or theoretical grounds suggesting the intervention might potentially play a role in mental disorder prevention, or limited research has not yet established efficacy or program design suitable for replication on a wider basis.

Evidence for implementation denotes an intervention where published studies provide a sound theoretical rationale for the strategy or approach; report positive outcomes at the individual, community or population level when it has been applied in well-controlled circumstances, including research settings and/or limited "real world" settings such as demonstration projects; and clearly describe how it could or should be implemented. Limited "real world" implementation, in conjunction with rigorous evaluation, may be warranted.

Evidence for outcomes denotes strategies or interventions where published studies consistently report positive outcomes at the individual, community or population level, sustained beyond program duration, from the use of the strategy in well-controlled interventions of sufficient scale to warrant their consideration for larger-scale "real world" implementation in diverse settings, in conjunction with rigorous evaluation and careful attention to longer term follow-up to ensure positive effects are sustained over time.

Evidence for dissemination denotes strategies or interventions where published studies demonstrate positive outcomes at the individual, community or population level with program effect sustained over time, and where feasibility is confirmed through successful delivery in diverse larger scale "real world" settings by service delivery organizations rather than research teams. These strategies or interventions should receive priority consideration for dissemination in British Columbia.

Current standard of care denotes existing strategies or interventions within the health sector whose primary intended outcome is not explicitly linked with the prevention of mental disorders. A sound theoretical rationale exists to suggest secondary outcomes in the mental health realm, usually through positive impact on evidence-based risk and protective factors—though concrete evidence may be lacking. These existing strategies or interventions merit rigorous assessment for their secondary mental health outcomes to ensure the mental health benefits of such programs inform future health system planning.

Recommended given corollary outcomes denotes strategies or interventions delivered by allied sectors beyond health, education and child and family development whose primary intended outcome is not explicitly linked with the prevention of mental disorders, but whose role in preventing mental disorders and promoting mental health is consistently referenced in the literature. A sound theoretical rationale exists to suggest secondary outcomes in the mental health realm, usually through positive impact on evidence-based risk and protective factors—though concrete outcomes evidence may be lacking. These strategies or interventions merit explicit support from British Columbia's health system and research communities and rigorous assessment for their secondary mental health outcomes to ensure the mental health benefits of such programs form part of informed public discourse.

This paper reviews the status of the evidence across the life course and across domains of mental disorders, and presents findings in a series of tables. Specific strategies and interventions may be listed more than once in the body of the report. For example, some universal interventions have been adapted for selective and indicated applications. Interventions that are effective in preventing specific mental disorders may also appear as illustrative examples in the appropriate place in the life course discussion. For ease of reference, a summary table of interventions is provided in Section 10.0, and Section 11.0 includes a table listing only strategies and interventions for which there is evidence for dissemination, are current standards or care, or which are recommended given corollary outcomes.

As noted above, strategies and interventions are not referenced in this report where there are no empirical or theoretical grounds suggesting the intervention might potentially play a role in mental disorder prevention, or limited research has not yet established efficacy or program design suitable for replication on a wider basis. However, the growing evidence base for effective primary prevention of mental disorders is a recent phenomenon, and requires an ongoing commitment to research, to piloting new approaches, to evaluating demonstration projects, and ultimately, to ensuring cutting edge prevention science innovation is applied to the growing public health issue presented by mental disorders. Research and evaluation effort is required in dealing with specific mental disorders, such as eating disorders, where the evidence base for effective primary prevention remains weak. Efforts are also required in complex settings such as schools, where there is a strong evidence base for specific interventions that help prevent specific disorders, while much work remains to be done in evaluating the effectiveness of broader strategies that attempt to address multiple positive outcomes across distinct health and educational domains. Finally, support is required for promising approaches to reaching and engaging specific sub-populations in targeted prevention efforts—for example, gay, lesbian, bisexual or transgendered communities, or families who are refugees from conflict zones. While not specifically addressed in this paper, there is a wealth of literature describing innovative approaches and promising programs to address the prevention of mental disorders.

3.0 BACKGROUND

This review of preventive interventions is based on three basic assumptions well represented in the literature, and eight evidence-based principles adapted from the WHO (Mrazek & Haggerty, 1994; WHO, 2004a).

3.1 Basic Assumptions

1. Programs and policies aimed at risk reduction, which can include both reduction of causal risk factors and enhancement of protective factors, can prevent the initial onset of some mental disorders.

2. Programs to prevent mental disorders can be implemented at the universal, selective and indicated levels.

3. Mental disorder prevention efforts can be initiated throughout the life span.

3.2 Principles

1. Prevent mental disorders as a public health priority

   One person in four will develop one or more mental disorders during their lifetime (WHO, 2001a). Mental disorders account for five of the ten leading causes of disability and premature death worldwide (Murray & Lopez, 1996). Given the current limitations in effectiveness of treatment modalities, the only sustainable method for reducing the burden caused by these disorders is prevention (WHO, 2004a; Saxena et al., 2006).

2. Take multi-pronged action to address multiple determinants of mental disorders

   Our understanding of the role played by risk and protective factors in the developmental pathways to mental disorders is growing—malleable biological, psychological, social and societal risk and protective factors and their interactions have been identified across the lifespan, and are potential targets for prevention measures (Saxena et al., 2006). High co-morbidity among mental disorders and their interrelatedness with physical illnesses and social problems demand integrated public health policies that target clusters of related problems, common determinants, early stages of multi-problem trajectories and populations at multiple risk (WHO, 2004a).

3. Reduce the risk of mental disorders with effective prevention

   A broad range of evidence-based preventive programs and policies are available for implementation—programs proven to reduce risk factors, strengthen protective factors and decrease psychiatric symptoms, disability and the onset of some mental disorders. Research is beginning to show significant long-term outcomes (Mrazek & Haggerty, 1994; WHO, 2004a; Saxena et al., 2006).

4. Use available evidence to guide implementation

   For ethical reasons, and to make optimal use of limited prevention resources, priority must be given to preventive programs and policies that show scientific evidence of their effectiveness (WHO, 2004a).

5. Profile successful programs

   Profiling effective programs and their conditions for implementation can provide communities with a broader spectrum of preventive tools to address mental disorders (Saxena et al., 2006; WHO, 2004a).

6. Expand knowledge on evidence for effectiveness

   Repeated evaluation of implemented programs and policies is required to expand the range of effective interventions, and information about successful programs must be translated into guidelines that permit further systematic implementation (Saxena et al., 2006).

7. Reach across sectors for effective prevention

   Preventing mental disorders must form an integral part of public health, health promotion and treatment approaches, encompassing horizontal action on mental health determinants across different sectors, including environment, housing, income support, employment, education, criminal justice and human rights. Such integration generates a wide range of health, social and economic benefits (WHO, 2004a; WHO, 2001a).

8. Protect human rights as strategy to prevent mental disorders

   Child abuse, violence, discrimination and poverty have a significant impact on the development of mental ill-health and the onset of mental disorders—actions and policies that improve the protection of basic human rights are powerful preventive strategies (WHO, 2004a).

4.0 ABORIGINAL MENTAL HEALTH

The impact of colonization, residential schools and multi-generational loss has contributed to poorer health outcomes among Aboriginal British Columbians for a range of preventable illnesses when compared to the general population, including suicide and alcohol-related deaths (Provincial Health Officer, 2002). Accordingly, the *Transformative Change Accord: First Nations Health Plan* (TCA, 2005) identifies four action areas to close health gaps by 2015, including the establishment of Aboriginal mental health programs to address substance use and youth suicide.

Regardless of variations in histories and health beliefs of First Nations and other Aboriginal people across Canada, many understand the concept of health as incorporating aspects of physical, mental, emotional and, especially, spiritual being—a whole person's being—along with the physical and social environment in which individuals and communities live (Smye & Mussell, 2001). Illness is considered the outcome of a lack of harmony among the physical, mental, emotional or spiritual aspects of life. European-introduced disease, shifts in diet, colonization, reserves and residential schools have all contributed to the disruption to Aboriginal cultures, communities and family structures and, as a consequence, to the disruption to their mental health (Mussell, Cardiff & White, 2004; Smye & Mussell, 2001; TCA, 2005).
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As with other Aboriginal health initiatives, the prevention of mental disorders in Aboriginal communities must use the collective well-being of communities as a focal point for action. First Nations must be full partners in the design and delivery of health initiatives to benefit them and their communities (TCA, 2005), and formal research evidence must be blended with the knowledge and life experience of Aboriginal practitioners and leaders: "while not without its tensions…pairing of science and local wisdom marks a new and important way of thinking about knowledge and evidence for program policy-makers, practitioners and community members" (Mussell, Cardiff & White, 2004, p. 18). Effective prevention initiatives, including the prevention of mental health problems and prevention of mental disorders, require building culturally sensitive strategies that are situated within an Aboriginal worldview in order to sustain long-term, community-based change.

In order to support government's overall efforts to address mental health and substance use in BC, and ensure these efforts are informed by Aboriginal evidence and wisdom, a background paper outlining effective approaches to Aboriginal mental health is being prepared for the Ministry of Health, Aboriginal communities, health authorities and their health system partners.

5.0 DETERMINANTS OF HEALTH, RISK AND PROTECTIVE FACTORS

5.1 Determinants of Health

An effective approach to preventing mental disorders requires an acknowledgement of the role played by determinants of health, and related risk and protective factors. At every stage of life, health is determined by complex interactions between biological, social and economic factors, the physical environment and individual behaviour. The combined impact of the determinants of health, and the ability to influence how determinants are expressed in developmental pathways as risk and protective factors, ultimately determines effectiveness in preventing mental disorders. The determinants of health can be broadly grouped as living and working conditions; individual capacities and coping skills; gender, culture and social environment; and health services.

5.2 Living and Working Conditions

The relationship between living and working conditions and mental health is complex and multidimensional. Income, social status, housing, education and the physical environment are interrelated domains each containing risk and protective factors that are open to influence.

Adequate income simply means having the financial resources required for a reasonable standard of living. Poverty, however, is more than just insufficient income; in its broadest sense, it can be understood as the state of having insufficient means, which may include the lack of social or educational resources. Low income, poverty and associated conditions such as unemployment, low education, deprivation and homelessness affect a sizeable minority of Canadians. While there is no official statistic defining the number of Canadians living in poverty, in 2005 there were an estimated 655,000 low-income families across Canada, defined as families that may be in constrained circumstances because they have to spend a greater portion of income on food, clothing and shelter than does the average family of similar size (Statistics Canada, 2007).

The prevalence of mental and behavioural disorders, including substance use disorders, is higher among those living in deprived circumstances. This may be explained both by higher causation of disorders among the poor and by the drift of the mentally ill into poverty; the available evidence suggests that both factors are relevant (Patel, 2001). Higher social status may be linked with a range of protective factors including sufficient social resources, higher educational attainment and supportive working environments.

Safe and adequate housing is a determinant of good mental health, while unsafe or overcrowded housing, located in chaotic or violent neighbourhoods, is linked with poor physical and mental health outcomes.

Education is another important determinant of physical and mental health. Low literacy and low levels of education severely limit the ability of individuals to access economic entitlements. Completion of at least 10 to 12 years of formal education appears to be a significant protective factor (Patel, 2001), pointing to the importance of efforts to reach and retain in formal educational programs those at risk for school leaving. In 2001, a total of 886,000 British Columbians aged 15 or over had left formal education prior to completing secondary school and receiving a credential (Select Standing Committee on Education [SSCE], 2006). While there have been impressive

gains in improving literacy levels in Canada through better educational programs targeting children, nearly 1 million British Columbia adults lack the minimum literacy level for coping with the demands of modern society, and nearly 400,000 score at the lowest literacy level (SSCE, 2006).

Meaningful employment in a safe workplace with acceptable working conditions is also a determinant of good mental health—in fact, employment provides not just income, but also a sense of identity and purpose, and social contact: work has a significant impact on physical, mental and social health (Public Health Agency of Canada [PHAC], 2004). When a person loses these benefits, the results can be devastating to both the health of the individual and his or her family. Unemployed people have a reduced life expectancy and suffer significantly more physical and mental health problems than people who have a job. When unemployment affects entire communities, the results are amplified; for example, economic reform and restructuring and burgeoning unemployment rates in countries such as Hungary (Kopp, Skrabski & Szedmark, 2000) and Thailand (Tangchararoensathien, Harnvoravongchai, Pitayarangsarit & Kasemsup, 2000) led to associated increases in rates of mental disorders and suicides. British Columbia is not immune to such macroeconomic influences, as can be seen in the changing economic structure of many coastal communities once heavily reliant on resource sector employment. Mitigating these risks requires maximizing employment opportunities for the population as a whole, and retaining people in the workforce whenever possible (WHO, 2001a).

A healthy physical environment—clean air and water, safe and well-designed communities, and access to recreation—promotes physical and mental health for all. Conversely, factors in the physical environment can also negatively affect mental health: loud noise sources like airports elevate psychological distress, and insufficient daylight is reliably associated with increased depressive symptoms (Evans, 2003).

5.3 Individual Capacities and Skills

Experiences from conception to age six help connect and sculpt the brain's neural pathways, with lifelong influence (PHAC, 2004). Positive stimulation early in life with affectionate, attentive and stable care supports infants and young children to develop language, intellect and emotional regulation, and support learning and health into adulthood; a loving, secure attachment in the first 18 months of life is a powerful protective factor, helping children to develop trust, self-esteem, emotional control and positive relationships with others. Children deprived of such care are more likely to develop mental and behavioural disorders, either during childhood or later in life (WHO, 2001a), and neglect or abuse in the early years places children at higher risk for injuries and behavioural, social and cognitive problems (PHAC, 2004).

Coping skills, which seem to be acquired primarily in the first few years of life, are another important protective factor in pathways to mental disorders. People use coping skills to interact effectively with the world around them, and to deal with the events, challenges and stress they encounter in their day-to-day lives (PHAC, 2004). As people grow older they experience a series of significant life events, such as completion of school, marriage and partnership, career changes, relocation and bereavement. Often, there is an accumulation of life events—both desirable and undesirable—immediately before the onset of mental disorders (Leff et al., 1987). Significant life

events are stressful and, coming in quick succession, predispose individuals to mental disorders; thus, adaptability and the ability to cope with change become important protective factors (WHO, 2001a). Effective coping skills enable people to be self-reliant, solve problems and make informed choices that enhance health. These skills help people face life's challenges in positive ways (PHAC, 2004).

Genetics can also influence risk for a range of severe mental disorders. Studies of mental disorders within extended multigenerational families, and studies comparing the risk of mental disorders in identical and fraternal twins conclude common mental disorders "predominantly result from the interaction of multiple risk genes with environmental factors: a genetic predisposition to develop a particular mental or behavioural disorder may manifest only in people who also experience specific environmental stressors that elicit the pathology" (WHO, 2001a, p. 12).

5.4 Gender, Culture and Social Environments

Gender has a powerful influence on all aspects of health, including mental health. Gender differences in the prevalence of mental disorders vary across age groups. Conduct disorder is the most common mental disorder in childhood, with more boys than girls being affected (Scott, 1998). During adolescence, girls have a higher prevalence of depression and eating disorders, and engage more in suicidal ideation and suicide attempts than boys, who are more prone to engage in high-risk behaviours and who commit suicide more frequently (Parker & Roy, 2001). In adulthood, the prevalence of most affective disorders and non-affective psychosis is higher among women (Ustin & Sartorius, 1995), while men experience higher rates of substance use disorders and antisocial personality disorder (Linzer et al., 1996).

In addition to differences in the rates of specific disorders or their differential time of onset or course, a range of factors can differentially affect male and female vulnerability, risk or susceptibility, diagnosis, treatment and adjustment to mental disorders (Astbury, 2006). Socially constructed differences between women and men—for example, responsibilities, status and power—interact with biological differences to contribute to differences in the nature of mental health problems suffered, if and how those affected seek help, and the response encountered in the health sector and society as a whole. More work is needed to better understand how gender differences influence women's and men's risk and vulnerability in different settings and social groups and at different points in the life cycle (WHO, 2002a).

In multicultural Canada, some persons or groups may face additional health risks due to conditions such as marginalization, stigmatization, loss or devaluation of language and culture and lack of access to culturally appropriate health care and services (PHAC, 2004). For example, the annual suicide rate averaged over 10 years (1986 to 1996) among Inuit in Canada was nearly 70 per 100,000, while rates over the same period in the general Canadian population were approximately 15 per 100,000 (Isaacs, Keogh, Menard & Hockin, 2000). Conversely, aspects of culture may also function as protective factors—the 1996/1997 National Longitudinal Survey of Children and Youth found that many immigrant and refugee children were doing better emotionally and academically than their Canadian-born peers, even though far more of the former lived in low-income households (Beiser, Hou, Hyman & Tousignant, 1998).

Interactions with the social environment, particularly in infancy and early childhood, also help shape human behaviour in desirable or undesirable ways. A society's values and norms influence the health and well-being of individuals and populations: social stability, recognition of diversity, safety, good working relationships, and cohesive communities provide a supportive society that reduces or avoids many potential risks to good health, including good mental health (PHAC, 2004). Conversely, a hostile social environment can impact negatively on mental health— a systematic review of 10 studies with more than 15,000 respondents from diverse racial groups in North America found a clear association between experiences of racism and psychological distress (Williams & Williams-Morris, 2000). Research on learning and behaviour has found that individuals learn both directly and from observing others, and has suggested that people are more likely to engage in behaviours that are rewarded by the environment, and less likely to engage in behaviours that are ignored or punished. This can result in maladaptive ways of thinking, and over time can contribute to the development of mental and behavioural disorders. Macro environments where there is conflict, war or other stressful or traumatic factors, or where dislocation or social isolation is fostered, can also lead to mental health problems and mental disorders, especially among those who have difficulty coping with stressful life events.

5.5 Health Services

Health services, particularly those designed to maintain and promote health, to prevent disease, and to restore health and function contribute to population physical and mental health (PHAC, 2004). In evidence based approaches to preventing mental disorders, formal health service providers must often work in partnership with allied systems and sectors whose primary concern may not be improved population level mental health and the reducing the incidence and prevalence of mental disorders. Effective programs are often located in school and community settings, meaning the health service sector must nurture and sustain broad partnerships for action on population mental health and mental disorder prevention.

5.6 Risk and Protective Factors

Most empirically based programs intended to prevent the onset of a mental disorder use risk factors linked with the determinants of health to identify populations for intervention, and then implement programs designed to change risk factors and foster and enhance protective factors among individuals and groups (WHO, 2004a).

Risk factors can be described as "characteristics, variables or hazards that, if present, make it more likely that a particular individual, rather than someone selected at random from the general population, will develop a mental disorder" (United States Department of Health and Human Services [USDHHS], 1999, p. 29). Some risk factors, such as family history and genetic endowment, cannot be altered; others, such as low literacy, exposure to violence and trauma or lack of social support can be changed through strategic intervention. Researchers continue to explore the interplay between fixed and malleable factors to assess the degree to which interventions influence vulnerability. Accumulating evidence suggests childhood is an optimal time to influence determinants of social and emotional well-being (McEwan, Waddell & Barker, 2007).

Some risk factors, especially those found in early years, are linked with the onset of more than one type of mental health problem. Risk factors common to many disorders include individual

neurophysiological deficits, chronic physical illness, and below-average intelligence; family issues such as family conflict, poverty, overcrowded living situations, and parental mental disorder; and community risk factors such as violent or chaotic neighbourhoods and communities (Institute of Medicine, 1994). Some risk factors are more specific, such as major depression, which is specifically linked to suicide (WHO, 2004a). Accumulations of individual, family and community risk factors can present multiple pathways to mental health problems and mental disorders. By targeting malleable factors along these pathways, interventions seek to prevent the onset of mental disorders.

Protective factors, which can reside in individuals, families and communities, reduce the likelihood of negative outcomes when risk conditions are present (WHO, 2004a). Protective factors operate at several levels simultaneously, and can include social-cognitive skills and temperamental characteristics of individuals; secure attachment within families and social networks rooted in pro-social values; and community values and regulatory environments that create and sustain good schools, safe neighbourhoods, healthy housing and respect for human rights (USDHHS, 1999). Enhancing protective factors may prevent the initial occurrence of risk factors, work directly to decrease dysfunction, interact with risk factors to buffer their effects, and/or disrupt the pathway whereby risk leads to disorder (Coie et al., 1993). Table 1 provides a summary list of both fixed and malleable risk and protective factors.

Table 1: Risk and Protective Factors that Influence Development of Mental Disorders

Risk Factors	Protective Factors
• Academic failure and scholastic demoralization • Attention deficits • Caring for chronically ill or dementia patients • Child abuse and neglect • Chronic insomnia • Chronic pain • Communication deviance • Early pregnancies • Elder abuse • Emotional immaturity and dyscontrol • Excessive substance use • Exposure to aggression, violence and trauma • Family conflict or family disorganization • Genetic risk factors • Loneliness • Low birth weight • Low social class • Medical illness • Neurochemical imbalance • Parental mental illness • Parental problematic substance use • Perinatal complications • Personal loss – bereavement • Poor work skills and habits • Reading disabilities • Sensory disabilities or organic handicaps • Social incompetence • Stressful life events • Substance use during pregnancy	• Ability to cope with stress • Ability to face adversity • Adaptability • Autonomy • Early cognitive stimulation • Exercise • Feelings of security • Feelings of mastery and control • Good parenting • Literacy • Mental health- promoting school and workplaces • Positive attachment and early bonding • Positive parent-child interaction • Problem-solving skills • Pro-social behaviour • Safe and supportive communities • Safe maternal behaviour during pregnancy • Self-esteem • Skills for life • Social and conflict management skills • Socio-emotional growth • Social support of family and friends • Stress management

Source: Adapted from Saxena et al., 2006.

5.7 Primary Prevention: Universal, Selective and Indicated Interventions

This evidence review focuses on universal, selective and indicated primary prevention approaches. Interventions are generally designed to change risk factors, to enhance protective factors or to act on both risk and protective factors simultaneously. Universal prevention approaches target the general public or whole population groups. Selective prevention engages individuals or subpopulations at significantly increased risk for developing a mental disorder, as evidenced by biological, psychological or social risk factors. Indicated prevention engages people who are identified as having minimal but detectable signs or symptoms foreshadowing mental disorder, or biological markers indicating predisposition for mental disorder, but who do not meet diagnostic criteria for disorder (Mrazek & Haggerty, 1994, pp. 22–24).

This report also profiles several indicated primary prevention interventions intended to prevent and delay mental disorder onset; these programs also have secondary and tertiary prevention benefits. Secondary prevention seeks to reduce mental disorder prevalence through early detection and treatment, while tertiary prevention includes interventions that reduce disability, promote rehabilitation and prevent relapses and recurrences (WHO, 2004a). Interventions with secondary and tertiary prevention benefits are only included in this report where available evidence supports corollary primary prevention outcomes.

5.8 Preventing Mental Disorders by Promoting Mental Health

Mental disorders and positive mental health are overlapping and interrelated components of a single concept of mental health—prevention and promotion elements are often present within the same mental health programs and strategies, involving similar activities and producing different but complementary outcomes (Detels, McEwan, & Beaglehole, 2002; Saxena et al., 2006). Therefore, this evidence review examines a range of proven and promising programs and strategies—some of which are proven mental health promotion strategies—from the perspective of their potential to contribute to diverse mental disorder prevention goals across the lifespan. As mentioned earlier, a companion evidence review prepared for British Columbia's public health system, *Evidence Review: Mental Health Promotion* (MOH, PHW, 2007), examines proven and promising approaches to mental health promotion.

6.0 A LIFE COURSE APPROACH TO PREVENTING MENTAL DISORDERS

An effective approach to mental disorder prevention addresses risk factors and nurtures protective factors across the life span. Special attention must be given to key developmental stages and transition points, and recognition given to the foundational importance a healthy start in the early years can provide in terms of good mental health later in life. Key developmental stages include reproductive decisions, prenatal/postnatal period and infancy; the transition to school; adolescence; transition to independence and adult life, including family and work; and retirement.

6.1 Reproductive Decisions, Prenatal and Postnatal Period, and Infancy

Adults prepared emotionally, socially and economically for having children—for the responsibilities of pregnancy, childbirth and parenting—are most likely to succeed in raising healthy and well-adjusted children. Early pregnancies, perinatal complications, substance use during pregnancy, low birth weight, parental mental illness, family conflict or family disorganization, child neglect and child abuse are all risk factors that can contribute to the development of mental health problems as children grow up. Multiple responses are available to mitigate these risks, and many children do well in spite of significant challenges early in life. Safe maternal behaviour during pregnancy, positive attachment and early bonding are important protective factors.

Early pregnancies are a risk factor for both maternal and infant mental health problems and, for the infant, the development of mental disorders later in life. Pregnant teens often lose opportunities to learn skills necessary for employment and self-survival as adults. Rates of live births to teenage women are high in North America at 55 per 1,000 women aged 15–19 in the United States, and 25 per 1,000 women aged 15–19 in Canada. Much lower rates are reported in France (7 per 1,000 women aged 15–19 years) and the Netherlands (5 per 1,000 women aged 15–19) (Social Exclusion Unit, 1999). Teenage pregnancy rates increase with deprivation levels, and the likelihood of teenage pregnancies continuing to term is greater among the socio-economically deprived, as teenagers in more affluent environments are more likely to terminate the pregnancy (Boulton-Jones & McInneny, 1995; Smith, 1993; Social Exclusion Unit, 1999).

A recent systematic review examined 38 randomized trials from 31 studies with more than 37,000 participants in interventions intended to reduce sexual experience, unprotected sexual activity and pregnancy rates among teenagers (Scher, Maynard & Stagner, 2006). The reviewers examined studies of one-time interventions such as counseling, abstinence-focused programs, sex education programs with a contraception component, and multi-component youth development programs, concluding that only multi-component youth development programs yielded consistently promising results for reducing both pregnancy risk and pregnancy rates among female participants; there was no evidence to suggest one-time interventions such as consultations had any impact on sexual risk-taking among participants, or that participants in abstinence-focused programs were less likely to initiate sex or more or less likely to use contraception.

Health authorities should explore options for the provision of multi-component youth development programs to reduce unprotected sexual activity and early pregnancies; when

unwanted pregnancies occur, access to legal and safe provision of abortion services within a health care setting should be ensured.

Inadequate prenatal care can lead to a range of preventable disorders that appear in low birth weight babies, including behavioural, emotional and learning problems (Institute of Medicine, 1985). Delivering optimal prenatal care to all pregnant women decreases the prevalence of low birth weight and associated developmental risks.

There is strong evidence for the negative impact of alcohol, tobacco and drug use during pregnancy on the likelihood of premature deliveries, low birth weight, perinatal mortality and long-term neurological and cognitive emotional development problems (Brown & Sturgeon, 2005). Educational programs to encourage pregnant women to abstain from substance use can have long-term mental health benefits. For example, a 15-minute behavioural intervention for pregnant smokers showed a 6 per cent increase in cessation. The babies of mothers who stopped smoking were 200 grams heavier at birth, while babies of mothers who reduced rather than stopped smoking were 100 grams heavier at birth (Windsor et al., 1993).

Postpartum depression can have negative consequences for both mother and infant. Reviews have identified a range of factors that predict postpartum depression—prenatal depression, child care stress, life stress, prenatal anxiety, low social support, maternity blues, low marital satisfaction, history of depression, difficult infant temperament, low self-esteem, single marital status, low socio-economic status and unplanned or unwanted pregnancy (Beck, 1996, 2001). The strongest predictors of postpartum depression are prenatal depression, low self-esteem, child care stress and prenatal anxiety. Recently, considerable attention has been given to the use of pharmacotherapy in the treatment of women with a history of postpartum depression to prevent recurrence after subsequent pregnancies. However, while a recent systematic review found evidence from one trial that sertraline was effective both in reducing the incidence of recurrent postpartum depression and in increasing the time to recurrence, the small numbers of women who participated and the absence of intention to treat analyses prevented reviewers from drawing firm conclusions about the use of this antidepressant in the prevention of postnatal depression (Howard, Hoffbrand, Henshaw, Boath & Bradley, 2005).

British Columbia's reproductive mental health program at the Provincial Health Services Authority, in partnership with the BC Ministry of Health, developed a framework for addressing perinatal depression, which was released in 2006. This framework is intended to improve recognition, diagnosis, treatment and follow-up for women affected by perinatal depression in BC (Provincial Health Services Authority & MOH, 2006).

Another recent systematic review examined 15 trials with 7,600 participants to more specifically compare usual prenatal and postnatal care with psychosocial and psychological interventions for their impact on preventing postpartum depression (Dennis & Creedy, 2004). While the reviewers found no consistent evidence to suggest psychosocial interventions reduce the numbers of women who develop postpartum depression, a promising intervention is the provision of intensive, professionally-based postpartum support by public health nurses or midwives.
In infancy, the biopsychosocial risk factors that can hinder development include preventable infections, disease or injuries that can cause brain damage, behavioural disorders, problems of

parent-infant attachment or parenting, lack of cognitive and language stimulation, economic deprivation and child neglect or abuse. Corresponding protective factors include robust health and good parenting, positive parent-child interaction and early cognitive stimulation (Saxena et al., 2006).

Preventive intervention strategies that have been used during infancy to target infants and their parents include optimal postnatal care, childhood immunization and regular home visitation; parenting education, promotion of healthy parent-infant interaction and appropriate cognitive and language stimulation; well-baby health care, family support and center-based infant day care.

Childhood immunization, like prenatal care, is a universal preventive intervention directed at the entire population even though it is given to individuals. Immunization is an example of the traditional public health model—in which each vaccine can confer long-lasting, often lifetime, protection against a specific physical disease, and if delivered widely, can confer broader population benefits in the form of "herd immunity."

By protecting against communicable diseases, immunization can also help prevent complications which can have long term negative effects on the brain and are associated neurodevelopmental problems that can lead to mental disorders. For example, when children are not immunized for Hib and meningitis occurs, complications can lead to neurodevelopmental problems, learning disability, and psychological and behavioral disorders (Ward, Lieberman & Cochi, 1994). Measles or rubella leads to encephalitis in approximately 1 in every 1,000 cases, and infants who survive this complication often experience delayed intellectual development, or in some cases permanent brain damage; measles during pregnancy also leads to increased rates of low birth weight infants, low birth weight being an evidence-based risk factor for mental disorders later in life (Centers for Disease Control and Prevention [CDC], 1989; Saxena et al., 2006). Rubella and pertussis can also lead to a range of serious health problems, including neurodevelopmental problems, especially among very young children (CDC, 1986; CDC, 1991).

In British Columbia, residents are routinely immunized against these and other communicable diseases during infancy and at appropriate ages across the life course. Strategies for strengthening British Columbia's immunization program are outlined in *Immunize BC: A Strategic Framework for Immunization in British Columbia*, developed by the Ministry of Health and health authorities to ensure optimal immunization for all British Columbia residents (MOH, 2007).

There is good evidence to show that individual parent training given by nurses in homes during pregnancy and after delivery can have long-lasting positive outcomes for both mothers and their infants. For example, the Prenatal/Early Infancy Project was a nurse visitation program that targeted young low-income pregnant women during their first pregnancy. Nurses promoted behaviours associated with positive child development, including reducing maternal substance use. During postpartum visits, nurses helped women understand child communication signals and taught play skills that promote emotional and cognitive development. This approach is consistent with attachment theory, which suggests that the quality of relationship between the infant and his or her primary caretaker in the early years contributes to healthy emotional development and mental health later in life (Bachar, Canetti, Kaplan De-Nour, Galili-Weisstub & Shalev, 1997; Schore, 2001).

Multiple, large-scale randomized controlled trials have demonstrated both short-term and long-term positive outcomes associated with program participation. Short-term outcomes include better prenatal health behaviours; improved pregnancy and birth outcomes; and improved child neurodevelopmental functioning, child mental health and functioning. Follow-up at age 15 found program completion was associated with significantly fewer cases of child abuse and neglect; fewer pregnancies, more time between pregnancies, reduced welfare use and fewer arrests for mothers; and fewer episodes of running away, fewer arrests, fewer sexual partners and reduced substance use for children (Eckenrode et al., 2001; Olds, 1997, 2002; see also Saxena et al., 2006; Waddell, Wong, et al., 2004).

Evidence-based programs have been developed to promote maternal mental health among teenaged parents, in turn promoting protective factors such as self-esteem, life skills and positive parent-child interaction. A recent systematic review of the impact of individual and group-based parenting programs on psychosocial outcomes for teenaged parents and their children suggests such programs are promising vehicles for improving maternal mental health among teenagers (Coren & Barlow, 2002). An earlier review concluded parenting programs can be effective in improving maternal psychosocial health, including aspects of maternal functioning such as self-esteem among all mothers, not just teens (Barlow & Coren, 2000).

Table 2 provides a summary of interventions linked with reproductive decisions, prenatal and postnatal care, and infancy.

Table 2: Interventions: Reproductive Decisions, Prenatal and Postnatal Period, and Infancy

Intervention	Examples	Status	Appropriateness
Universal			
Multi-component youth development programs to reduce pregnancy rates among adolescents.	(Scher, Maynard & Stagner, 2006)	Evidence for outcomes. Dissemination recommended given corollary benefits.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development.
Availability of safe and legal services for the termination of unwanted pregnancies in a health care setting.		Current standard of care.	Falls within scope and mandate of health authorities.
Optimal prenatal care to reduce likelihood of low birth weight.		Current standard of care.	Falls within scope and mandate of health authorities.
Behavioural interventions to encourage women to reduce or stop substance use during pregnancy.	Brief counselling to encourage women to stop or reduce smoking during pregnancy (Windsor et al., 1993).	Current standard of care.	Falls within scope and mandate of health authorities.
Immunization to prevent vaccine-preventable, disease-linked neurodevelopmental problems, and behavioural and psychological problems.	Immunization for Hib to prevent meningitis (Ward, Lieberman & Cochi, 1994).	Current standard of care.	Falls within scope and mandate of health authorities.
Selected			

Intervention	Examples	Status	Appropriateness
Postpartum support to prevent maternal depression.	Public health nurse or midwife delivered intensive postpartum support (Dennis & Creedy, 2004).	Evidence for implementation.	Falls within scope and mandate of health authorities.
Individual parent training given by nurses in homes.	Nurse Family Partnership Program (Olds, Robinson, Song, Little, & Hill, 1999; Olds, 1997: Eckenrode et al., 2001).	Evidence for dissemination. Exceptionally long follow-up has demonstrated sustained outcomes through early adult years.	Falls within scope and mandate of health authorities.
Individual and group-based parenting programs.	Individual and group-based parenting programs for teenaged parents and their children (Coren & Barlow, 2002).	Evidence for implementation.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development.

6.2 Early Childhood, Preschool and Kindergarten Years

The growth of language skills and initial development of social competence and impulse control both occur in early childhood, and all three are foundations for ongoing social and cognitive development. Developmental delays in these areas are associated with later behavioural and school maladjustment, and mental health problems later in life (Hawkins, Catalano & Miller, 1992).

Simon Fraser University's Children's Health Policy Centre has conducted applied research in support of the Ministry of Children and Family Development's *Child and Youth Mental Health Plan for BC*, which aims to improve children's mental health not only by providing treatment and support, but also by reducing risk, building capacity and monitoring outcomes. In reviewing the research on effective preventive interventions for children from infancy through adolescence, the Centre has identified 6 preventive programs—addressing either conduct disorders, anxiety or depression—that are noteworthy based on rigorous study designs and strong evidence for effectiveness at long term follow up. *Nurse Visitation Program; Perry Preschool Program*, *Johns Hopkins Program*, and *Fast Track* for preventing conduct disorder; *FRIENDS* program for preventing anxiety (and depression); and *Coping with Stress* for preventing depression. These programs and others are referenced in this evidence review. For complete listing of Children's Health Policy Centre publications on the prevention and treatment of mental disorders in children, please refer to their website at http://www.childhealthpolicy.sfu.ca/index.html

Multi-component preventive interventions designed to enhance social competence, through teaching interpersonal problem-solving skills at ages four and five in urban day care and school settings and through parents training their children in these skills at home, have produced lasting effects and reduced conduct problems in children. One example of a program targeted at children from extreme poverty is the Perry Preschool Program, consisting of daily participation in preschool over a one- to two-year period, along with weekly home visits by trained teachers. The experimental intervention was associated with positive effects on academic performance and social adjustment when randomly assigned experimental and control subjects were followed up and compared later in childhood and adolescence, including at age 19 (Berrueta-Clement, Schweinhart, Barnett, Epstein, and Weikart, 1984) and age 23 (Schweinhart & Weikart, 1997). By age 19, experimental preschool participants had lower arrest rates and fewer lifetime arrests, as well as lower rates of self-reported fighting, than control subjects. They also had higher rates of secondary school completion, lower rates of placement in special education classes, and higher grade point averages than their control counterparts (Berrueta-Clement et al., 1984); results were sustained nearly 20 years after the intervention, at age 23 (Schweinhart & Weikart, 1997).

Indicated early childhood interventions can also have positive long-term effects on academic performance and social adjustment. Children are first identified for the Fast Track program in kindergarten (Conduct Problems Prevention Research Group, 2002). Throughout their school years, the children participate in a variety of interventions, including social and problem-solving skills training, play sessions with pro-social peer partners and academic tutoring. Parents participate in parent management training groups, and parents and children participate in planned skill training activities. Families also receive regular home visits and case management assistance. The results of a randomized trial at follow-up three years after the initial intervention indicated that children in the Fast Track program displayed and sustained lower levels of conduct problems (Eddy, 2005).

Table 3 provides a summary of interventions linked with early childhood, preschool and kindergarten years.

Table 3: Interventions: Early Childhood, Preschool and Kindergarten Years

Intervention[1]	Examples	Status	Appropriateness
Selected			
Multi-component home and preschool programs for children of low income, low birth weight or low education backgrounds.	Perry Preschool Program (Schweinhart & Weikart, 1997).	Evidence for dissemination.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Indicated			
Multi-component intervention for children identified as having conduct problems in kindergarten.	Fast Track (Conduct Problems Prevention Research Group, 2002; Eddy, 2005).	Evidence for dissemination.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.

6.3 Middle to Late Childhood

Middle to late childhood (ages 6 to 12) is a period of rapid cognitive and social development. At this age, the family environment may contribute to risk—poor parenting practices, high levels of conflict in the family, and a low degree of bonding between children and parents, appear to increase the risk for mental disorders. Conversely, good parenting, feelings of security and positive parent-child interaction and exercise function as protective factors.

A recent review of trials suggests that exercise has positive short-term effects on self-esteem in children and young people, and concludes that exercise may be an important universal approach to improving children's self-esteem, which in turn may help prevent the development of psychological and behavioural problems in children and adolescents (Ekeland, Heian, Hagen, Abbott & Nordheim, 2004). A further review found six small trials indicating that exercise decreases reported anxiety scores in healthy children when compared to no intervention, and five small, promising trials indicating that exercise decreases reported depression scores when

[1] See Section 9.0 for additional interventions/program examples for preventing conduct disorders, anxiety and depression in children.

compared to no intervention; larger studies are needed (Larun, Nordheim, Ekeland, Hagen & Heian, 2006).

At this age, most children learn to read and to interact competently with other children. Those children who struggle with academic tasks or develop social incompetence, impulsivity and aggressive behaviour during this period are at risk for developing mental disorders, especially substance use, conduct disorder, and depressive disorders (Mrazek & Haggerty, 1994). High-risk factors for children, including early behaviour problems, have been addressed by enhancing social competence and academic achievement, through multi-pronged interventions that combine school-based social skills training with complementary home-based parent training.

For example, a two-year indicated intervention program for disruptive seven-year-old boys, the Montreal Longitudinal-Experimental Study (Tremblay et al., 1991), combined home-based family management skills training for parents offered once every two weeks for a two-year period, with social skills training delivered in schools to disruptive boys within small groups of prosocial male peers. Parents received an average of 17 parenting sessions over the two-year period, and boys were provided with 19 training sessions over the same period. Sessions for the children focused on initiating social interaction, improving interpersonal skills, making verbal requests, following rules, handling anger, and mastering "look and listen" techniques for regaining self-control.

The intervention was field tested with a sample of 172 boys from low socio-economic areas of Montreal who were assessed by their teachers at the end of kindergarten as highly disruptive. Boys were randomly assigned to an experimental group (received intervention), an observational group (received attention but no intervention) or a control group. Teacher ratings indicated that boys in the experimental group became significantly less aggressive than boys who did not receive the intervention, a difference observed in follow-up seven years later. Over time, significantly more control boys were retained in a lower school grade or placed in special classes, schools or institutions. Twice as many boys in the control group as boys in the experimental group were rated as having serious adjustment problems, and significantly more boys in the control group had initiated minor delinquency by age 12 (Tremblay et al., 1991; Tremblay et al., 1992; Tremblay, Pagani-Kurtz, Mâsse, Vitaro, & Pihl, 1995).

The appearance of a link between poor achievement and early depression has led researchers to explore interventions focused on the promotion of academic achievement as a preventive intervention (Kellam, Rebok, Ialongo & Mayer, 1994). Similarly, evidence that poor academic achievement predicts both later problematic substance use and delinquency (Hawkins et al., 1992) has led to the investigation of enhancement of academic competence as a component of preventive interventions.

Some intervention trials have trained elementary grade teachers in the use of effective instructional methods, including the use of interactive and mastery teaching methods, in which teachers frequently monitor students' performance. Teachers are trained to use the results of these frequent assessments to adjust instruction or provide more intensive support, such as tutoring or co-operative learning groups, to increase the academic and cognitive development of all students, including those at risk of poor achievement.

An experimental community-based study, Community Epidemiological Preventive Intervention: Mastery Learning and Good Behavior Game, used mastery learning methods in grade 1 classrooms in 19 socio-demographically diverse public schools in Baltimore, Maryland, and found positive effects on reading achievement (Kellam & Rebok, 1992; Kellam et al., 1994). Virtually all of the reading gains occurred among students initially showing depressive symptoms and among those with initially low reading scores, suggesting that this universal intervention may have greater benefits for those at risk for depressive disorders. The Good Behavior Game program also had positive effects on aggressive and shy behaviour, with the largest effects found in the most aggressive children.

Table 4 provides a summary of interventions linked with middle to late childhood.

Table 4: Interventions: Middle to Late Childhood

Intervention[2]	Examples	Status	Appropriateness
Universal			
Mastery learning methods and Good Behavior Game.	Good Behavior Game (Kellam & Rebok, 1992).	Evidence for outcomes.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Exercise programs for children.	(Laren et al., 2006).	Evidence for implementation. Larger studies needed, but worthy of consideration given established physical health benefits.	Falls within scope and mandate of health authorities.
Indicated			
School-based social skills training for disruptive 7-year-old boys, and home-based training for their parents.	Montreal Study (Tremblay et al., 1995).	Evidence for implementation.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.

6.4 Adolescence

Biological events associated with puberty have come to symbolize the transition from childhood to adolescence. Adolescence includes much of the 12–26 year age range, which represents the peak period for onset of mental disorders across the lifespan (Moon, Meyer & Grau, 1999; Patton, 1996). Risk factors during the transition to adolescence include academic failure and scholastic demoralization, family conflict or family disorganization, depressive symptoms, anxiety, bullying and early substance use. Protective factors include problem-solving skills, social and conflict management skills, and safe and supportive communities.

The early initiation of delinquent behaviours or substance use has been shown to be strongly predictive of antisocial personality or substance use disorders. Thus, efforts to prevent conduct disorder and substance use disorders during adolescence have focused largely on reducing the incidence of disorders by preventing early onset. Even though the co-morbidity of numerous

[2] See Section 9.0 for additional interventions/program examples for preventing conduct disorders, anxiety and depression in children.

disorders, including substance dependence, conduct, and mood disorders, has been well established (Elliott, Huizinga, and Menard, 1989), most research on preventive interventions for adolescents has been focused on the prevention of substance use disorders, and to a lesser extent, on the prevention of conduct disorder.

Secondary school-based programs can influence positive mental health and reduce risk factors and emotional and behavioural problems in adolescence through social–emotional learning and ecological interventions (Domitrovich, Weare, Elias, Greenberg, & Weissberg, 2005). Some interventions target the whole school in an integrated approach across years, while others target students in a given grade or identified to be at risk. Most school-based programs are universal in nature and target a range of generic risk and protective factors. Outcomes include academic improvement, increased problem-solving skills and social competence, as well as reductions in depressive symptoms, anxiety, bullying, substance use and aggressive and delinquent behaviour.

A large Australian study, the Gatehouse Project, conducted a randomized controlled trial involving 26 secondary schools in the greater Melbourne area (12 intervention, 14 control), randomized by district to minimize program exposure for control school teachers in professional development sessions. Each intervention school developed a combination of classroom, whole school and school/community strategies in three domains: security, communication and positive regard. Researchers found young people's experiences of early secondary school and their relationships at school continued to predict moods and substance use in later years, and the likelihood of completing secondary school. Students with good school connectedness, including relationships with peers, teachers and the learning process, as well as good social connectedness, were less likely to experience subsequent mental health issues and be involved in health risk behaviours, and were more likely to have good educational outcomes (Bond et al., 2007). The approach has been replicated in other parts of Victoria, Australia.

Adolescence can also be a key period for the emergence of transgenerational mental health problems, discussed in more detail in Section 8.0. Adolescent offspring of depressed parents are at high risk for development of depression. Cognitive behavioural therapy holds promise for preventing progression to depressive episodes. For example, the Coping with Stress Course targeted children of parents with psychiatric problems and subclinical depressive symptoms or a past episode of major depression. Cognitive therapy methods were used during 15 group sessions to identify and challenge negative thinking patterns in the children and to generate more realistic and positive counter-thoughts. A randomized control study showed a lower incidence of depression in the experimental group (9.3 per cent) than in the control group (28.8 per cent) at 14-month follow-up (Clarke et al., 2001).

Concern with violence as a major public health problem (Rosenberg & Mercy, 1991; Sullivan, 1991) has led to the development of interventions focused on preventing those violent behaviours that are included in the diagnostic criteria for conduct disorder (see Section 9.0 for a complete summary of interventions and program examples to prevent conduct disorder, violence and aggression in children).

Olweus's Intervention Campaign Against Bully-Victim Problems was designed to prevent bullying among children and adolescents in Norway by establishing commonly shared concerns

regarding antisocial behaviour and discouraging such behaviour in the media, schools and homes (Olweus, 1991). The intervention program was implemented as a nationwide campaign, and components included an educational booklet on the bullying problem distributed to all schools, parent education (in the form of a booklet) on the bullying problem and possible solutions, a 25-minute video with stories about the lives of bullied children available for rent or sale, and a self-report questionnaire for completion by participants. This universal intervention was evaluated by using a quasi-experimental cohort sequential design, and time-lagged comparisons were made between age-equivalent groups. The sample consisted of 2,400 students in grades 4 through 7 from 42 primary and secondary schools. Although the design does not completely rule out potential sources of influence, findings indicated a 50 per cent reduction in the levels of bully-victim problems at both the 8-month and 20-month follow-up assessments. Youths also reported a reduction in reports of antisocial behaviour such as vandalism, theft and truancy, and increased satisfaction with school life (Olweus, 1991; Saxena et al., 2006).

Adolescents of divorced parents are more likely to leave school before completion, experience early pregnancies, and are themselves at higher risk of divorce and premature mortality. Some promising interventions have been developed (Sandler, Ayers & Dawson-McClure, 2005). School-based programs that teach cognitive behavioural coping skills to children of divorced parents, such as the Children's Support Group, and the Children of Divorce Intervention Program have led to decreases in depressive symptoms and behaviour problems at one-year follow-up, though few randomized controlled trials exist and sample sizes are small (Wolchik et al., 2000; Wolchik et al., 1993). Similarly, parent-focused programs to improve parenting skills and deal with emotions associated with divorce have improved mother-child relationship quality and reduced internalizing and externalizing problems in the children. One 6-year randomized follow-up study found 11 per cent of adolescents in the experimental group had a 1-year prevalence of diagnosed mental disorders, compared with 23.5 per cent in the control group (Wolchik et al., 2002); more studies are needed.

Table 5 provides a summary of interventions linked with adolescence.

Table 5: Interventions: Adolescence

Intervention[3]	Examples	Status	Appropriateness
Universal			
Ecological approaches that promote school connectedness through classroom, whole school and school/community strategies.	Gatehouse Project (Bond et al., 2007).	Evidence for dissemination.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Multi-component approaches to influence social environments to prevent bullying.	Intervention Campaign Against Bully-Victim Problems (Olweus, 1991).	Evidence for implementation.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Selected			
School-based cognitive behavioural coping skills programs for children of divorced parents.	Children of Divorce Intervention Program, Children's Support Group (Wolchik et al., 2000; Wolchik et al., 1993).	Evidence for implementation. Requires further replication and evaluation in diverse settings.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Indicated			
Cognitive therapy for adolescent children of parents with psychiatric problems and subclinical depressive symptoms, or a past episode of major depression.	Coping with Stress Course (Clarke et al., 2001).	Evidence for dissemination.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development.

6.5 Adulthood

The transition to adulthood involves both significant life changes and changes in the nature of risk and protective factors. For many, commitment to successful childbearing and effective parenting must be juggled with the demands of employment. For some, adulthood also entails assuming caregiver responsibilities for aging parents in declining health. Risk factors include early pregnancy, excessive substance use, loneliness, poor work skills and habits, reading disabilities and stressful life events. Protective factors include the ability to cope with stress, the ability to deal with adversity, problem-solving skills, literacy, social support from family and friends, and social and conflict management skills.

A range of universal, selective and indicated interventions for parents and their children have already been described; many interventions linked with ages and school grades through childhood and adolescence contain parent training and support components designed to improve parental mental health and build protective factors for the benefit of the whole family. Evidence-based interventions that address risk factors for adults in their parenting role include interventions to prevent early pregnancies, access to reproductive care, optimal prenatal and postnatal care, nurse visiting programs and parent training programs as components of multi-component interventions.

[3] See Section 9.0 for additional interventions/program examples for preventing suicide, anxiety, substance use disorders, psychotic disorders and depression in adolescents.

Work life can provide a sense of mastery and satisfaction, as well as paid employment. Holding a job is a critical factor in reducing the chronic stress that can be linked with financial hardship; from a population perspective, higher levels of parental employment are associated with lower rates of child poverty and family stressors, and overall child well-being (UNICEF, 2007). Societies that combine low levels of family joblessness and effective income redistribution policies do particularly well in this regard (Whiteford & Adema, 2007). Conversely, work stress and involuntary job loss can increase the likelihood of depression, anxiety, alcohol-related problems, family problems and suicidal behaviour.

Adults employed full-time may spend between 30 and 40 percent of their waking hours in their workplace. Minimizing exposure to unsafe workplaces is an important physical and mental health protective factor—significant stress and mental health risks are associated with violent, unsafe workplaces, hazardous working conditions and excessive hours of work. . Promoting safe workplaces is best accomplished through a combination of policies and practices developed by employers and employees, and jurisdictional standards supported by regulation and legislation. In British Columbia, hours of work are regulated and authority to set and enforce occupational health and safety standards is delegated to WorkSafeBC, the Workers' Compensation Board of British Columbia (*Workers Compensation Act*, 1996). For example, policy developed under the Act prohibits "improper activity or behaviour…including physical force…or any threatening statement or behaviour" (Workers' Compensation Board of British Columbia, 2000, R4.25-1), and compels employers to develop workplace violence prevention programs. These standards are complemented by other legislation and regulations such as environmental health regulations.

Additional specific workplace interventions designed to improve work/life balance may help reduce workplace stress; for example, flexible working arrangements, job sharing, on-site child care programs, employee transportation and ride/share commuting schemes and on-site fitness programs and fitness centres. In addition, some interventions may use technical approaches to address ergonomic issues, workload, and noise levels (Saxena et al., 2006). By and large, however, workplace stress reduction programs aim to improve an employee's ability to cope with stressors, rather than eliminate or reduce the sources of stress (Price & Kompier, 2005).

Epidemiological evidence suggests that involuntary job loss is associated with increased mental health problems, particularly symptoms of depressive and anxiety disorders (Kessler, Turner & House, 1988). While no empirical evidence exists on the potential of employment insurance programs to mitigate risk factors and protect the mental health of those who lose their jobs, common sense suggests employment insurance schemes reduce the likelihood of finance-related stress following job loss (Saxena et al., 2006).

For those who experience involuntary job loss, programs that assist with social support, motivation and coping skills and teach basic job search skills show improved rates of re-employment, improved job search self-efficacy and mastery, and reductions in depression and distress. For example, data analysis of a randomized field experiment from the Unites States with 1,801 participants found that two years after participation in the JOBS program, the experimental group had significantly higher levels of re-employment and monthly income, lower levels of depressive symptoms, lower likelihood of experiencing a major depressive episode in the last year, and better role and emotional functioning compared with the control group (Vinokur, Schul,

Vuori & Price, 2000). The program was replicated in Finland, where 1,261 unemployed job seekers participated in a randomized field study. At 6-month follow-up, the program had a beneficial impact on the quality of re-employment, and also significantly decreased psychological distress (Vuori, Silvonen, Vinokur & Price, 2002).

A recent systematic review found brief interventions in primary care settings can reduce high risk alcohol use and hazardous drinking patterns: structured brief interventions and brief advice in health care settings has been shown to be effective at reducing alcohol consumption (Kaner et al., 2007). Incorporating brief assessments and interventions into standard primary care protocols can have a significant population level impact with relatively little investment of time and resources (Heather, 2004; Kaner et al., 2007; Roche, 2004).

Those who provide care to chronically ill and elderly persons are vulnerable to elevated levels of stress and depression. Sorensen, Pinquart and Duberstein (2002) used meta-analysis to synthesize the effects of 78 controlled caregiver intervention studies for 6 outcome variables, and found psycho-educational interventions for family caregivers of older adults resulted in significant improvements in caregiver burden, depression, subjective well-being and perceived caregiver satisfaction. These interventions made use of lectures, group information sessions and written materials that provided information about the disease of the person being cared for, and special training in responding effectively to disease-specific problems.
Table 6 provides a summary of interventions linked with adults.

Table 6: Interventions: Adulthood

Intervention	Examples	Status	Appropriateness
Universal			
Minimize exposure to workplace hazards, violence.	Application of existing legislation and regulations (*Workers Compensation Act*, 1996).	Recommended given corollary benefits.	Requires collaboration and advocacy with additional sectors.
Selected			
Jobs skills programs that incorporate social support, job search skills motivation and coping skills for those who lose their employment.	JOBS program (Vinokur et al., 2000; Vuori et al., 2002).	Recommended given corollary benefits.	Requires collaboration and advocacy with additional sectors.
Psycho-educational interventions for family caregivers of older adults.	(Sorensen et al., 2002).	Evidence for outcomes.	Falls within scope and mandate of health authorities.
Indicated			
Brief interventions in primary care to reduce risky alcohol use among adults.	(Heather, 2004; Kaner et al., 2007; Roche, 2004).	Evidence for dissemination.	Falls within scope and mandate of health authorities.

6.6 Senior Years

Old age brings important changes, including changes to risk factors, and a need for compensating protective factors. Among many seniors, work becomes less important and new challenges emerge. Retirement becomes a milestone for persons who earned their living outside the home, while for some, becoming a grandparent marks an important life change. The senior years may also herald disability or illness, and the death of a spouse or other loved one. Accordingly, risk factors for seniors include relationship loss and bereavement, chronic illness and caregiver burden, social isolation and loss of meaningful social roles. Protective factors include social support (family, peers, informal relationships, and more formal support groups), responsive health and social services such as respite care, and opportunities for new productive social roles.

Different types of universal, selective and indicated interventions have been successful in improving seniors' mental health (Jané-Llopis, Muñoz, & Patel, 2005). Exercise interventions and improving social support through befriending are examples of universal strategies. While depression is prevalent among seniors, few controlled studies exist on depression prevention and suicide prevention for this group. Preliminary evidence suggests that life review meetings and reminiscence therapy may reduce the risk of depression among seniors, especially among residents of long-term care facilities (Haight, Michel & Hendrix, 1998), although benefits seem to disappear over time, suggesting the need for continued support. Available evidence suggests improved social relationships and fewer depressive symptoms among participants in befriending programs for older women.

For example, Widow-to-Widow: A Mutual Help Program for the Widowed recruited widows who had some perspective on their own grief and were in a position to reach out to other widowed persons in their transition state. Widowed helpers were recruited by word-of-mouth and through local community action programs. Identification of the newly widowed was done through funeral directors, who became involved as sponsors and served on advisory boards. Outreach typically began with a first contact by mail two months after the death, and initial social visits later evolved into group discussions.

Vachon et al. (1980, 1982) originally evaluated the Widow-to-Widow program in a research trial in Toronto, randomly assigning 162 newly widowed women to control and experimental groups. The intervention consisted of one-to-one support by another widow, practical help in locating community resources, and small group meetings. The intervention was not limited to any predefined duration or phase of bereavement. Widows who participated in the program were more apt to have begun new relationships and activities and did so more quickly. They also experienced fewer depressive symptoms on a psychiatric screening instrument than women in the control group. This was particularly true for women who experienced high stress immediately after the death of their spouse. Over the two years of the randomized trial, most women recovered with or without help; however, those receiving the intervention recovered more quickly (Vachon et al., 1980). A more recent quasi-experimental outcome study showed that befriending programs for older women can promote the formation of new friendships and significantly reduce loneliness (Stevens & van Tilburg, 2000).

Brief interventions in primary care settings can reduce high-risk alcohol use and hazardous drinking among older adults. Structured brief interventions and brief advice in health care settings have been shown to be effective at reducing alcohol consumption in this population. Women over the age of 65 are the population group in BC given the most prescriptions for benzodiazepines such as Xanax, Ativan, and Halcion; this group is also the most vulnerable to adverse effects from these drugs. A recent assessment concluded that the pattern of benzodiazepine use in BC is inconsistent with recommendations of educational groups, regulators and manufacturers (Therapeutics Initiative, 2004).

Other promising preventive interventions for selective and indicated seniors populations include the use of patient education methods among chronically ill elderly and their caregivers, early screening, interventions in primary care and programs using life review techniques. Patient education techniques that teach about the prognosis and management strategies to deal with chronic conditions have shown short-term beneficial effects like reductions in depressive symptoms (Riemsma, Kirwan, Taal, & Rasker, 2002).

Two strategies seem to have shown stronger evidence of their link to prevention or delay of onset of dementia. The first is the prevention of craniocerebral traumas earlier in life through highway speed limits, use of crash helmets and seatbelts, drinking and driving laws and vehicle licensing laws (Cooper, 2002). The second deals with vascular disease, an evidence-based risk factor for dementia. A double-blind European study suggests that reductions of high systolic blood pressure through antihypertensive therapy in elderly at-risk patients can reduce the onset of dementia by over 50 per cent (Forette et al., 1998, 2002).

Delirium, a mental disorder that is characterized by acute onset, disturbances in orientation, memory, thought, perception, mood, psychomotor activity, attention and the sleep-wake cycle, is more common in the elderly, those who are extremely physically unwell, those with head injuries or other brain insults such as strokes or meningitis, patients who are intoxicated or withdrawing from alcohol or other drugs, and after a general anaesthetic (American Psychiatric Association, 1999). Delirium is strongly associated with increased morbidity and death, increased length and cost of hospitalization, increased difficulty in the provision of care by nursing, medical and allied health staff and increased trauma and distress for the patient and the patient's family (American Psychiatric Association, 1999; Hallberg, 1999).

A recent systematic review of interventions intended to reduce or prevent post-surgical delirium in hospital settings found 6 studies with 833 participants that met inclusion criteria, and found evidence to suggest that proactive geriatric consultation may reduce delirium incidence and severity in patients undergoing surgery for hip fracture (Siddiqi, Stockdale, Britton, & Holmes, 2007). One well-designed study of 126 hip fracture patients that compared proactive geriatric consultation with usual care was sufficiently powered to detect a difference in the primary outcome, incident delirium. Total cumulative delirium incidence during admission was reduced in the intervention group suggesting a “number needed to treat” of 5.6 patients to prevent 1 case. The intervention was particularly effective in preventing severe delirium.

Table 7 provides a summary of interventions linked with seniors.

Table 7: Interventions: Seniors

Intervention	Examples	Status	Appropriateness
Universal			
Exercise programs for seniors.	Tai Chi (Li et al., 2001).	Evidence for implementation. Warrants further research, merits support given established physical health benefits.	Requires collaboration and advocacy with additional sectors.
Prevention of craniocerebral traumas earlier in life to prevent or delay onset of dementia.	Highway speed limits, use of crash helmets and seatbelts, vehicle licensing and drinking and driving legislation (Cooper, 2002).	Evidence for outcomes. Recommended given corollary benefits.	Requires collaboration and advocacy with additional sectors.
Selected			
Befriending programs for older women.	Widow-to-Widow Program (Vachon et al., 1980; Stevens & van Tilberg, 2000).	Evidence for implementation.	Requires collaboration and advocacy with additional sectors.
Proactive geriatric consultation to prevent and reduce severity of post-surgical delirium.	Proactive consultation with hip fracture patients (Siddiqi et al., 2007).	Evidence for implementation..	Falls within the scope and mandate of health authorities.
Indicated			
Treatment of vascular disease to prevent or delay the onset of dementia.	Reduction of high systolic blood pressure through antihypertensive therapy (Forette et al., 1998, 2002).	Evidence for outcomes. Dissemination recommended given corollary benefits. Current standard of care.	Falls within the scope and mandate of health authorities.
Brief interventions in primary care to reduce risky alcohol use among seniors.	(Kaner et al., 2007).	Evidence for dissemination.	Falls within the scope and mandate of health authorities.

7.0 UNIVERSAL AND SELECTIVE INTERVENTIONS AFFECTING MULTIPLE AGE GROUPS

7.1 Improving Nutrition

Chronic hunger and energy deprivation affects mood and responsiveness, and is characterized by a slowing of non-essential body functions. People with a consistently low energy intake often feel apathetic, sad or hopeless.

Developing fetuses and young infants are particularly susceptible to harm from hunger and malnutrition. Fetal exposure to famine has been associated with increased risk for the development of schizophrenia later in life (Hoek, Brown & Susser, 1998; McClellan, Susser & King, 2006). Malnutrition among infants and young children has been associated with below-normal intelligence, and functional and cognitive defects. For example, lack of iodine is a well-documented micronutrient deficiency that causes mental impairment that lowers intellectual prowess at home, at school, and at work; while the implementation of global programs to iodize salt counts as one of the great triumphs of public health, estimates suggest more than 700 million people worldwide—spread across 130 countries—continue to suffer some degree of iodine deficiency disorder (WHO, 2001b). While iodine deficiency disorder has been largely eliminated in Canada, iodine deficiency remains a public health concern in Europe, the Eastern Mediterranean, Africa and South-East Asia (Andersson, Takkouche, Egli, Allen, & de Benoist, 2005). Iron deficiency has been conclusively found to delay psychomotor development and impair cognitive performance in infants, and many of the effects of iron deficiency anemia are unlikely to be corrected by subsequent iron therapy (WHO, 2001c).

While famine, severe malnutrition and hunger are not common in Canada, the 2001 Canadian Community Health Survey found 8.16 per cent of British Columbia residents reported sometimes or often not having enough to eat (unpublished data, Ministry of Health Services, cited in Ministry of Health Services, 2004). Studies conducted across 10 United States jurisdictions found children from families that reported multiple experiences of food insufficiency and hunger were more likely to show behavioural, emotional and academic problems on a standardized measure of psychosocial dysfunction than children from the same low-income communities whose families did not report experiences of hunger (Kleinman et al., 1998); while study design precludes the determination of causality, such findings suggest food insufficiency and hunger merit close attention from public health.

In British Columbia, considerable attention has been given to school meal programs, especially in schools with disproportionate numbers of low-income families living in their catchments. A recent systematic review of research supports this approach as a strategy to build protective factors, suggesting school feeding programs targeting disadvantaged elementary school children can contribute to improved fluid intelligence, processing speed and numeracy (Kristjansson et al., 2007).

7.2 Improving Housing

A British systematic review suggests housing improvement has a promising impact on physical and mental health outcomes (Thomson, Petticrew & Morrison, 2001). The review found that improvement in housing is linked with improvement in self-reported physical and mental health and less mental health strain, as well as broader positive social impacts on factors such as perceptions of safety, crime and social and community participation. In all, 18 studies were included, one of which was a large prospective controlled study that found a dose/response relationship between the extent of housing improvement and the degree of improvement in mental health.

A recent systematic review from Australia found overall health outcomes were improved through improvements in the quality, location and suitability of housing, and that housing renewal programs, including repair and retrofit grants and home safety initiatives were generally associated with positive physical and mental effects (Bridge, Flatau, Whelan, Wood & Yates, 2007). Indoor air quality was found to be very important—poor health outcomes (including morbidity, mortality and mental ill-health) stemmed from a range of problems related to poor heating, insulation, ventilation and plumbing. Suitability of dwelling type was also found to be important—overcrowding increased anxiety and negative mental health effects. However, reviewers also found housing renewal had the potential for negative outcomes—control over one's physical environment is an important factor in mental health, and renewal that does not involve consultation can increase stress for residents.

There is a small but growing evidence base demonstrating the positive impact of improved housing on mental health. More large-scale controlled studies of housing interventions are required to establish a clear link between improved housing and the prevention of mental disorders.

7.3 Improving Access and Retention in Education

An important determinant of mental health is education. As discussed earlier, completion of at least 10 to 12 years of formal education appears to be a significant protective factor (Patel, 2001), pointing to the importance of efforts to reach and retain in formal educational programs those at risk for school leaving. According to the 2001 census, 53 percent of British Columbia's adult population had some post-secondary education, while a total of 886,000 British Columbians aged 15 or over had left formal education prior to completing secondary school and receiving a credential (SSCE, 2006). Research sponsored by the United States federal government found that improving the rate of youth retained in school through graduation could be accomplished through intensive services for at-risk youth, such as smaller classes, intensive counseling, and accelerated instruction aimed at helping students catch up with their peers. Intensive interventions include both "schools-within-schools" and alternative schools with their own settings (Dynarski & Gleason, 1998) and, while maintaining a primary focus on educational progress, these interventions incorporate highly personalized supports and services, strong relationships with adult counselors, systematic strategies to monitor and address malleable risk factors, formal coaching in specific problem-solving strategies, communication with and support for parents, and connections among schools, families and community services (Anderson, Christenson, Sinclair & Lehr, 2004; Dynarski & Gleason, 1998).

Literacy is an important protective factor in mental disorder prevention: in fact, literacy skills predict health status even more accurately than education level, income, ethnic background or any other socio-demographic variable (Weiss, 2001). Efforts must be directed to helping low-literacy adults as well as ensuring literacy and numeracy skills among those completing secondary school. In British Columbia, nearly 1 million adults—35 percent of the working age population—lack the minimum literacy level for coping with the increasing demands of today's knowledge-based economy and society, approximately 400,000 of whom score at the lowest literacy level (SSCE, 2006). Systematic reviews of randomized controlled trials on adult literacy and numeracy programs (Torgerson et al., 2004: Togerson, Porterhouse & Brookes, 2003) have identified 6 promising interventions or pedagogies for improving literacy and numeracy; insufficient and poor quality data left reviewers unable to reach conclusions on the wider benefits of these interventions. British Columbia's Select Standing Committee on Education has recognized literacy is the crucial link to personal empowerment, opening doors to educational and employment opportunities and improving personal health and wellbeing; the committee has proposed an adult literacy strategy for British Columbia that is integrated, learner-centered and preventive to help improve literacy in the province (SSCE, 2006).

7.4 Reducing Economic Insecurity

Populations living in poor socio-economic circumstances are at increased risk of poor mental health, depression and lower subjective well-being (Patel & Jané-Llopis, 2005; Robins, Locke & Reiger, 1991). Longitudinal data confirms the link between poverty and depression (Gilman, Kawachi, Fitzmaurice & Buka, 2002). Reducing economic insecurity for those in poor socio-economic circumstances requires a complex policy mix involving taxation levels, employment regulation, and income redistribution. Reducing levels of child poverty is a recurrent public policy theme in Canada and other rich countries. A recent study for the Organization for Economic Development and Cooperation found that all member countries with very low child poverty rates combine low levels of family joblessness and effective income redistribution policies—supporting the view that successful anti-poverty strategies require a balanced approach combining improved benefits where necessary and improved structural incentives for increased employment (Whiteford & Adema, 2007).

A recent UNICEF survey examined 6 dimensions of child well-being in rich countries; among 21 countries examined, Canada's performance ranked sixth on material well-being for children. However, Canada's poor performance in other dimensions, such as peer and family relationships, meant overall performance was middle-of-the-pack—on par with Greece and slightly better than Poland. Top-ranking countries for overall performance on child well-being were Spain, Switzerland, the Netherlands and Scandinavian countries; the United States and the United Kingdom were ranked at the bottom (UNICEF, 2007).

However, more research is needed to better understand the link between specific policies and programs that reduce economic security and mental disorder prevention. Systematic research on the health impact of policies and approaches that effectively reduce economic insecurity has been spurred by the recent health system focus on a closely related subject—reducing health inequalities. A Cochrane Equity Field has been registered to help deal with the methodological

issues that arise from incorporating equity into systematic reviews, and a parallel process is under way with the Campbell Collaboration (Tugwell et al., 2006).

7.5 Strengthening Community Networks

Strengthening community networks—nurturing empowering processes and fostering a sense of social responsibility—can help address risk factors and build protective factors that prevent psychiatric symptoms and new cases of mental disorders (Saxena et al., 2006). This can be accomplished through simultaneous action on multiple levels. Action on public policy and public discourse at the community and societal levels, adapting school organization or educational practices in schools, and supporting families and individuals with parent training and individual social competence skills are examples of complementary approaches to strengthening community networks.

One approach from the United States—replicated in Australia, the Netherlands and the United Kingdom—is the Communities that Care program. Originally intended to address violence and problematic substance use, it has been widely implemented as a crime prevention program and more recently recognized for its contribution to mental health promotion and mental disorder prevention, particularly in child and adolescent health (Hawkins, Catalano & Arthur, 2002). A "whole community" approach is used to develop a local assessment and prioritize intervention goals to reduce prevalent or elevated risk factors and to nurture and build depressed protective factors.

For example, in 2001, the Greater Bunbury community in West Australia conducted an extensive youth survey, and found the two protective factors absent in the highest number of respondents were community acknowledgement for young people who decided to get involved in pro-social activities, and social skills. Enhancing these protective factors became, in turn, central to a collaborative, community-wide action plan that outlined a range of evidence-based interventions and strategies to help promote the healthy development of children and young people within the Greater Bunbury region. Using a similar approach, the Communities that Care plan in Mornington Peninsula Shire in Victoria, Australia emphasizes attachment to school and positive schooling experiences through the You Can Do It program, which teaches and rewards positive behaviour, persistence, emotional resilience and confidence (Royal Children's Hospital Melbourne, 2006).

As a component of its Communities that Care program, the Dallastown Area School District, Susquehanna Valley, Pennsylvania has implemented a Big Buddy Program. This program, which has been replicated in other communities, pairs high school students with elementary children experiencing difficulty with school. Teens volunteer to contact their new friend at least weekly, and during visits, the older student encourages the younger to be successful in school while relating their own positive school experiences. Dallastown Area School District evaluations show the majority of the children in this program make improvements in school as a direct result of the Big Buddy Program (Dallastown Area School District, 2006).

The United States Department of Health and Human Services [USDHHS] has compiled an inventory of programs, policies and practices to support community efforts to address risk and protective factors—these interventions have been evaluated for effectiveness and have produced

materials to support accurate replication (USDHHS, n.d.). Interventions, and the evaluation approaches used to determine evidence for effectiveness, are presented in summary form on USDHHS's Substance Abuse and Mental Health Services Administration website (http://www.samhsa.gov).

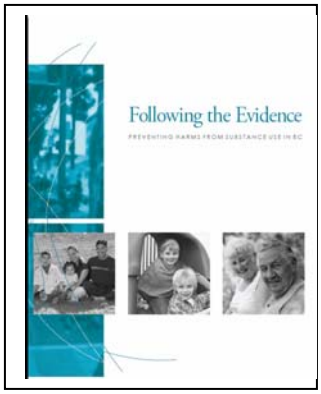
7.6 Reducing Substance-Related Harm

More than any other area examined in this paper, the prevention of substance use disorders has benefited from a sustained international applied research effort to evaluate effective policies, strategies and programs. *Following the Evidence: Preventing Harms from Substance Use in BC* (MOH, 2006) offers a wide range of evidence-based prevention and harm reduction strategies grouped in five strategic directions that have the most impact on preventing harms from substance use, including the development of substance dependence and substance use disorder. The following section outlines the nature of each strategic direction and highlights two effective interventions, one individual and one societal: brief interventions in primary care to reduce risky substance use, and reducing the economic availability of tobacco and alcohol and influence pathways to alcohol use disorder, the most common substance use disorder affecting more than 75 million people worldwide (WHO, 2004c). Section 9.0 presents evidence-based approaches to delaying or reducing early substance use, which is a predictor of substance use problems later in life. Companion documents should be consulted for a full array of preventive approaches across all five strategic directions.

Following the Evidence: Preventing Harms from Substance Use in BC (MOH, 2006) presents five, evidence-based strategic directions for reducing and preventing substance use harms at the population level:

1. Influence developmental pathways, acknowledging that different life stages present differing risks and protective factors for harms.

2. Delay and prevent alcohol, tobacco and cannabis use during adolescence, when problematic patterns of use for these substances can lead to significant harms later in life.



3. Reduce risky patterns of substance use, emphasizing interventions that can impact those types of substance use that have the greatest likelihood of causing harm.

4. Create safer contexts, acknowledging that the setting or environment where substance use occurs can affect the risk of harms.

5. Influence economic availability, whereby pricing mechanisms are used to influence the use of substances such as alcohol and tobacco.

Following the Evidence can be found at www.health.gov.bc.ca/prevent/pdf/followingtheevidence.pdf

The first strategic direction aims to influence developmental pathways, acknowledging that different life stages present differing risks and protective factors for harms. Particular attention to those transition points at which problems from substance use often emerge is important. Such key developmental stages include the prenatal/postnatal period, the transition to school, adolescence and the transition to high school, transition to independence (going to college or entering the workforce), and transitions relating to family and occupation, including retirement.

The second strategic direction aims to delay and prevent alcohol, tobacco and cannabis use during adolescence, when problematic patterns of use for these substances can lead to significant harms later in life. Preventing the uptake of tobacco use and delaying the use of alcohol by teenagers can be achieved through many strategies, thereby preventing serious problems in later life. Reducing tobacco use may also have beneficial effects on rates of cannabis use, but separate strategies also need to be developed and tested for reducing, delaying and preventing cannabis use in this age group.

The third strategic direction aims to reduce risky patterns of substance use, emphasizing interventions that can impact those types of substance use that have the greatest likelihood of causing harm. In some cases, this means the goal is to eliminate or at least reduce use, whereas, in other situations, it may involve identifying and reducing risky patterns of use or promoting an understanding of safer use. Binge drinking and heavy alcohol use are especially prevalent among young adults, and are associated with tobacco use, other substance use, depression and suicide, as well as motor vehicle crashes, injuries, violence, spinal cord trauma and unwanted sexual experiences (Statistics Canada, 2003). Brief interventions in primary health care for high-risk alcohol users typically involve a primary care health provider screening patients for these and other health risk behaviours. Practitioners are trained to discuss the health effects of the behaviour in a non-judgmental way that includes sympathetic advice for behaviour change. Approximately 10 to 15 per cent of patients respond to these interventions, and men appear more likely than women to reduce their alcohol use as a result (Heather, 2004; Kaner, et al., 2007; Roche, 2004). Nevertheless, the brevity of these interventions means they are cost-effective and capable of significant impact when offered on a population basis.

The fourth strategic direction aims to create safer contexts, which acknowledges that the setting or environment where substance use occurs can affect the risk of harms. Harm reduction strategies often focus on changing the environment in significant ways that will result in reduced harm for the community, which includes the people who use psychoactive substances. Such strategies are complementary to those which seek to create changes in individual behaviour. The history of harm reduction is connected to the rise of injection drug use as a means of HIV transmission, and harm reduction continues to be associated with strategies to prevent the spread of blood-borne illnesses related to injection drug use. However, the concept has much wider application, and incorporates a wide range of effective strategies for preventing harm by creating safer contexts.

The fifth strategic direction aims to influence economic availability, whereby pricing mechanisms are used to influence the use of substances such as alcohol and tobacco. As with other products, the prices and marketing of alcoholic drinks, cigarettes, cannabis and other illegal drugs strongly affect levels of consumer demand. Effective strategies are available to governments and local communities to influence the price of psychoactive substances, thereby reducing consumption and related problems. Taxation strategies to maintain or increase the price of legal substances are among the most effective means of preventing risky substance use and harm (Babor et al., 2003; Holder, Treno & Levy, 2005; Younie, Scolo, Hill & Borland, 2005). Provincial and local regulatory frameworks can be used to minimize high densities of liquor outlets and avert discounting and irresponsible serving to drunk and underage customers (Homel, McIlwain & Carvolth, 2001). Young people and heavy consumers of tobacco and alcohol, who are particularly

at risk of harm, are most likely to reduce their consumption when costs increase and marketing strategies are controlled.

An evidence-based approach to preventing substance use-related harms, including substance use disorders, requires that the health system work in partnership with other public systems in British Columbia, including education, social services, law enforcement, housing, courts, corrections and all levels of government.

Table 8 provides a summary of interventions affecting multiple age groups.

Table 8: Interventions: Universal and Selected Approaches Affecting Multiple Age Groups

Intervention	Examples	Status	Appropriateness
Universal, Selected and Indicated			
Improving nutrition and food security.	School feeding programs targeting disadvantaged elementary school children (Kristjansson et al., 2007).	Evidence for implementation. Dissemination recommended given corollary benefits.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
	Iodized salt to address iodine deficiency disorder (WHO, 2001b).	Evidence for dissemination.	Requires collaboration and advocacy with additional sectors.
Housing improvement programs involving safety, repairs, quality, location and suitability.	Repair and retrofit grants and home safety initiatives (Bridge et al., 2007).	Evidence for implementation. Dissemination recommended given corollary benefits.	Requires collaboration and advocacy with additional sectors.
Improving secondary school graduation rates – school system efforts to reach and retain in formal educational programs those at risk for school leaving.	Intensive programs for youth at risk for school leaving before secondary school completion (Dynarski & Gleason, 1998).	Evidence for implementation. Dissemination recommended given corollary benefits.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Extra efforts to improve literacy of those who are falling behind academically.	Anderson, Christenson, Sinclair & Lehr, 2004; Dynarski & Gleason, 1998.	Recommended given corollary benefits.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Improving literacy and numeracy for school leavers and low literacy adults.	A range of programs help improve adult literacy and numeracy, but data to support secondary mental health outcomes is not yet available (Torgerson et al., 2004).	Dissemination recommended given corollary benefits.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Interventions that function simultaneously at multiple levels to strengthen community networks.	Communities that Care (Hawkins et al., 2002).	Evidence for dissemination.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.

Intervention	Examples	Status	Appropriateness
Pricing mechanisms to maintain or increase the price of legal substances.	Evaluated policy examples available from multiple jurisdictions (Babor et al., 2003; Holder et al., 2005; Younie et al., 2005).	Evidence for dissemination.	Requires collaboration and advocacy with additional sectors.
Screening and brief interventions in primary health care for smokers and high-risk alcohol users.	Health professionals working in a community setting (Roche, 2004).	Evidence for dissemination.	Falls within scope and mandate of health authorities.
Regulation of the physical availability of alcohol.	Limits on late trading hours and liquor outlet density (Babor et al., 2003; Chikritzhs & Stockwell, 2002)	Evidence for dissemination.	Requires collaboration and advocacy with additional sectors.

8.0 ENGAGING VULNERABLE POPULATIONS

A social model of health identifies key determinants that influence broader patterns of health and illness within populations. Key determinants include socio-economic status, culture, gender and education. So, for example, those with higher income or higher social status generally enjoy better health than those with lower income or status in British Columbia. The health system is also a key determinant of population health. Public health programs and services must include a focus on the needs of disadvantaged individuals, populations and communities to avoid the risk of increasing rather than reducing health disparities (Advisory Committee on Population Health and Health Security, 2004). Identifying patterns of mental health inequalities across the province, and focusing efforts on the needs of vulnerable groups within British Columbia's population as a whole, can help reduce mental health disparities. Effective action requires engaging vulnerable groups and affected populations to develop and adapt evidence-based interventions in culturally appropriate and sensitive ways. While a more complete picture of sub-population vulnerability is required, this section presents information about five vulnerable groups in British Columbia.

8.1 Children and Families of Parents Living With Mental Disorders

Mental disorders in parents represent a risk for their children—children of parents with mental illness or substance use disorders are among those at highest risk for psychiatric problems. While many children in this situation cope well, especially when parental illness is short-term or well-managed, children of depressed parents face a roughly 50 per cent risk of developing a depressive disorder before age 20 (Beardslee et al., 1988). The risk is stronger when the parent's disorder is manic-depressive disorder, schizophrenia, alcohol use disorder or other substance use disorder, or major depression. Risk is exacerbated when both parents are mentally ill, or when children have been abused, neglected, witnessed violence, or live in poverty or inadequate housing (Goepfert, Webster & Seeman, 1996; Scott, Shaw & Joughin, 2001).

Transgenerational transfer of mental disorders, especially depression and anxiety disorder, is the result of interactions among genetic, biological, psychological and social risk factors from as early as pregnancy and infancy (van Doesum, Hosman & Riksen-Walraven, 2005). In recent years, researchers and practitioners from the United States, Europe and Australia have developed a range of interventions aimed at preventing transgenerational transfer by addressing risk and protective factors in both children and their families. Some interventions are targeted at early parent–child interaction; others use a whole family approach during childhood and early adolescence or focus on the children at-risk themselves. Controlled outcome studies on such programs remain scarce, although some show promising outcomes (Beardslee, Solantaus & van Doesum, 2005).

The following is an example of a promising intervention for this group. The Clinician-Based Cognitive Psychoeducational Intervention targets families with parents with significant mood disorder. The program provides information about mood disorders to parents, equips parents with skills to communicate this information to their children and promotes dialogue in families about the effects of parental depression. The intervention consists of 6 to 11 sessions with separate meetings with parents and children, family meetings, and telephone contacts or refresher meetings at 6- to 9-month intervals. Sessions are conducted by psychologists, social workers, and nurses

who have received special training. Program elements include assessing all family members, teaching information about affective disorders and risks and resilience in children, linking information to the family's life experience, decreasing feelings of guilt and blame in children, and helping children to develop relationships within and outside the family to facilitate independent functioning in school and community activities (USDHHS, n.d.).

The original trial of the Clinician-Based Cognitive Psychoeducational Intervention for Families involved approximately 100 families randomized to 2 active conditions (group discussions or the family talk intervention) in Boston, Massachusetts; after 54 months, sustained effects were seen in both groups, subsequently replicated in further Boston-area trials. The Clinician-Based Cognitive Psychoeducational Intervention for Families has been implemented in the Netherlands as a regular part of prevention practice, while in Finland the approach has been adopted for countrywide use (Solantaus & Toikka, 2006). The intervention also has been implemented in Norway.

Cognitive behavioural therapy also holds promise for preventing progression to depressive episodes among offspring of depressed parents. The Coping with Stress Course targeted children of parents with psychiatric problems and subclinical depressive symptoms or a past episode of major depression: 15 group cognitive therapy sessions were used to identify and challenge negative thinking patterns and generate more realistic and positive counter-thoughts. A randomized controlled study showed lower incidence of depression in the experimental group (9.3 per cent) than in the control group (28.8 per cent) at 14-month follow-up (Clarke et al., 2001).

Medical, mental health or social service professionals working with parents with mental disorders should enquire about the mental health and emotional development of children and family members. Providing more attention and support to the children of a mentally disordered parent, and supporting families to work with positive elements in the home and the natural strengths of the child, is an important way to help prevent mental disorders from passing from one generation to the next.

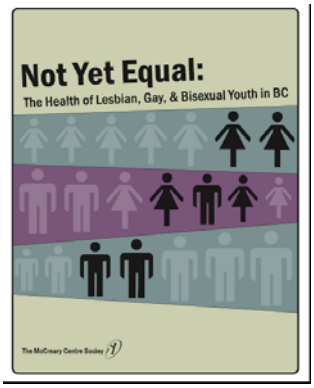
8.2 Lesbian, Gay, Bisexual and Transgendered People

Lesbian, gay, bisexual and transgendered people’s experiences of sexual orientation and gender identity discrimination can lead to higher rates of mental problems and disorders than in the heterosexual population (Brown, Perlesz & Proctor, 2002). That many gay, lesbian, bisexual and transgendered people experience such discrimination from an early age is well documented in the literature (Savin-Williams, 1994; U.S. Centers for Disease Control and Prevention and Massachusetts Department of Education, 1997). In British Columbia, lesbian, gay and bisexual youth are two to three times more likely to have experienced physical and sexual abuse, harassment in school, and discrimination about race/ethnicity, sexual orientation and other issues in the community compared to heterosexual teens, and rates of discrimination appear to be rising (Saewyc, Poon Wang, Homma, Smith, & the McCreary Centre Society, 2007). Stigmatization and acts of psychological and physical abuse can lead to reduced self-esteem, social withdrawal and isolation, all of which are risk factors for mental illness (Brown et al., 2002).

A number of mental health problems and mental disorders appear to be disproportionately present among gay men, lesbians, bisexuals and transgendered persons. For example, a large study from England and Wales found gay men and lesbians reported more psychological distress than heterosexuals, despite similar levels of social support and quality of physical health as heterosexual men and women (King et al., 2003). Studies examining suicide-related deaths among gay, lesbian, bisexual and transgendered people are fraught with methodological challenges; however, research from the United States and New Zealand have found that rates of depression and suicide attempts among homosexuals are higher than among heterosexuals (Cochran & Mays, 2000; Welch, Collings & Howden-Chapman, 2000; Remafedi, 1999), while same-sex attracted people living in rural areas are at particular risk (Garofalo, Wolf, Wissow, Woods & Goodman, 1999). A large Dutch study found mood disorders, anxiety disorders and substance use disorders were more prevalent among homosexually active people than heterosexually active people (Sandfort, de Graaf, Bijl & Schnabel, 2001), with similar findings for the United States reported by Gilman et al. (2001). In Ontario, gay, lesbian, bisexual or transgendered youth are at higher risk for mood-related disorders and self-mutilation (Adlaf & Paglia, 2002), and in Scotland and Ireland, gay men and transgendered people report higher rates of eating disorder than the general population (Myers, McCollum & Woodhouse, 2005)

In *Not Yet Equal: the Health of Lesbian, Gay & Bisexual Youth in BC* (2007), researchers from the University of British Columbia and the McCreary Centre Society present the results of a series of studies about the health and lives of lesbian, gay, and bisexual youth in schools across British Columbia over more than a decade.

"All young people, regardless of sexual orientation, deserve the opportunity to grow and thrive, in their families and their communities, reaching the promise of a healthy and productive adult life. Understanding risks and protective factors in their lives can help guide strategies for creating those opportunities."



In the United Kingdom, self-reported levels of substance use disorders were higher among gay men, bisexual men and lesbians, and they were also more likely than their heterosexual counterparts to have used illegal drugs. Lesbians were more likely than heterosexual women to drink alcohol excessively (King et al., 2003). A United States study pooled data provided by 12,000 lesbian and bisexual women who participated in seven public health surveys and found the prevalence of alcohol use problems to be far greater than either the unstandardized or standardized United States estimates for prevalence of alcohol use problems among women; similarly, the same study determined that current and previous smoking prevalence rates for lesbians greatly exceed United States norms for women (Cochran et al., 2001). A recent United Kingdom survey of 16,426 gay and bisexual men found respondents started smoking at an earlier age than the wider male population and continued smoking for longer (Hickson, Weatherburn, Reid, Jessop & Hammond, 2007). Closer to home, a recent British Columbia study found that men who have sex with men were more than twice as likely to have smoked tobacco in the past year than men in the general British Columbia population, and tobacco smoking among men who have sex with men was significantly associated with younger age and greater number of depressive symptoms (Lampinen, Bonner, Rusch & Hogg, 2006).

On the universal level, approaches that reduce incidence of risk factors such as discrimination, harassment and abuse are required. In addition, evidence-based protective factors such as family connectedness, teacher caring, other adult caring and school safety should be fostered and sustained (Eisenberg & Resnick, 2006). Adapting selected and indicated preventions to reach and engage gay, lesbian, bisexual and transgendered youth must also be considered. Screening programs that focus on the clinical signs of depressive symptoms can evaluate and refer youth at serious risk of self-harm or suicide, while engaging them in preventive programs intended to reduce the likelihood of major depressive episodes in the future. Similarly, targeted approaches to delaying or preventing onset of substance use are required.

Vancouver Coastal Health Authority has developed some promising programs, such as Prism Alcohol & Drug Services, that aim to reach and engage gay, lesbian, bisexual and transgendered communities, while offering training and education to other health care providers also interested in developing effective services for these communities (http://www.vch.ca/prism/).

8.3 Immigrant and Refugee Mental Health

Recent evidence documents the harmful impact of conflict and war trauma on the mental health of affected individuals, families and communities. The mental health impacts of war trauma can span generations, with negative outcomes in the public health and socio-economic development domains. Considerable human suffering and psychiatric disability exists in exiles and refugees, traumatized communities located or formerly located in conflict zones, physically or sexually tortured war victims and combatants. Most commonly, conflict and war-linked mental health problems involve post-traumatic stress disorder, depression and anxiety, which are frequently associated with problematic substance use, personality changes, dissociations, psychotic decompensation and suicidal behaviour (Musisi, Mollica & Weiss, 2005).

The most effective approach to preventing conflict-related trauma is to prevent war and mitigate its aftermath at the geopolitical level through international peacekeeping efforts, advocacy and commitment to human rights. Health system preventive efforts to reduce the onset of mental disorders in post-conflict situations should focus primarily on providing early interventions after trauma, preventing the negative consequences of conflict such as epidemics or problems with family reconciliation, rebuilding physical and mental health services and social infrastructures, providing mental health education, restoring human rights, and offering emotional, social and economic support to displaced people (Musisi et al., 2005). Unfortunately, apart from interventions to prevent post-traumatic stress disorder, few of these approaches have been evaluated in rigorous outcome studies.

For many decades, Canada has been largely free of widespread catastrophic conflict, or extensive participation through large-scale military involvement in such conflict. Nevertheless, British Columbia is home to a significant number of people who have migrated from conflict zones. Canada's *Immigration and Refugee Protection Act* (2001) has specific objectives relating to refugees so Canada can meet its international obligations to the displaced and persecuted as defined under the 1951 Geneva Convention Relating to the Status of Refugees. In 2005, British Columbia received 44,767 new permanent residents, of whom 30,198 arrived as economic immigrants, 11,720 in the family reunification class, and 2,156 as refugees, while 944 adults were

granted temporary residence under the humanitarian category. In addition, 4,960 adult refugee claimants arrived in British Columbia in 2005 (Citizenship and Immigration Canada, Research and Evaluation Branch, 2006).

Not all people who arrive in British Columbia in the humanitarian and refugee categories are fleeing war, conflict or trauma. Conversely, immigrants in the family class may be rejoining relatives who previously fled conflict zones and resettled in Canada, and may themselves have been exposed to conflict-related trauma. Given the transgenerational impact of war and conflict-related trauma, and the available evidence-based approaches to preventing depression, anxiety and post-traumatic stress, British Columbia residents who have been exposed to conflict and war merit special attention from the health system.

8.4 Mental Disorders Among People Living With Other Disabilities

Because disability status has been traditionally equated with health status, the health and well-being of people living with disabilities has been addressed primarily through programs offering medical care, rehabilitation and long-term care, while less emphasis has been placed on health promotion and disease prevention activities. Depression and anxiety are seen more frequently among people with disabilities than those without disabilities—people who have activity limitations report having had more days of pain, depression, anxiety and sleeplessness and fewer days of vitality than people not reporting activity limitations (CDC, 1998). The United States National Health Interview Survey found 31 per cent of children and adolescents aged 4 to 11 years with disabilities were reported to be sad, unhappy or depressed, in contrast to 17 per cent of children the same age among the general population (National Center for Health Statistics, 1997).

Given the availability of evidence-based interventions that can reduce the risk of depression, people living with disabilities merit attention in preventive efforts, and should be screened and where needed, offered access to appropriate interventions. Appropriate interventions may differ when addressing the needs of people with different developmental disabilities or special needs. Children living with special needs including those at risk for behavioral problems, deaf children, and children with mild neurocognitive deficits may benefit from tailored efforts such as the specially adapted Promoting Alternative Thinking Strategies (PATHS) program, a classroom based approach which has shown promise but as yet lacks sufficient evidence to determine long-term effectiveness (University of Wisconsin Population Health Institute, 2005).

8.5 People Living With Health Issues That Predispose Them to Mental Disorders

Physical health and mental health are very much interconnected. For instance, people who have physical problems like heart problems and diabetes are more likely to develop mental health problems. Approximately 65 per cent of individuals who experience acute myocardial infarction subsequently report symptoms of depression, 15 to 22 per cent of whom report major depression. Conversely, depression is an independent risk factor in the development of and mortality associated with cardiovascular disease in otherwise healthy persons. People who are depressed and who have pre-existing cardiovascular disease have a 3.5 times greater risk of death than those who are not depressed and have cardiovascular disease (Guck, Kavan, Elsasser & Barone, 2001).

There is growing evidence that depression, anxiety, dementia and other general psychological issues are critical factors in the well-being of people living with HIV. A large Australian survey of people living with HIV reported that over a 6-month period, 25 per cent of respondents had been taking medication prescribed for depression, while 26.5 per cent had taken medication for anxiety (Grierson, Bartos, deVisser & McDonald, 2000). Episodes of major depression may be triggered by stress, difficult life events, side effects of medications, or the effects of HIV on the brain. As with any long-term serious illness, major depression can limit the energy needed to keep focused on staying healthy.

The nature of the association between depression and diabetes is unclear, though the presence of one condition is a risk factor for the other. Researchers have also found a longitudinal association between diabetes and depression among seniors. In one study of more than 4,600 men and women over age 65, those with the highest scores on the depression questionnaire were roughly 50 per cent more likely to develop diabetes than those with the lowest scores (Carnethon et al., 2007).

Clearly, for some people, mental health problems and mental disorders can be intertwined with physical health problems, and while pathways of risk and causality are not always clear, clinicians and care providers must be sensitive to these links in order to provide optimal care. Early intervention and optimal clinical management of heart disease, diabetes and HIV, among others, may reduce the likelihood of affected individuals developing serious mental health problems or mental disorders.

Table 9 provides a summary of interventions affecting vulnerable populations.

Table 9: Interventions: Vulnerable Populations

Intervention	Examples	Status	Appropriateness
Selected			
Identify patterns of mental health inequalities across the province, and focus preventive efforts on reaching and engaging vulnerable population groups.	See Sections 8.1 to 8.5.	Evidence for dissemination.	Requires collaboration and advocacy with additional sectors.

9.0 PREVENTING SPECIFIC MENTAL DISORDERS

9.1 Conduct Disorders, Aggression and Violence

Conduct disorder refers to severe and persistent antisocial behaviour in children. For a conduct disorder diagnosis a child must be under 18 years old and

> must exhibit several conduct problems such as aggression to people or animals, deceitfulness, theft, destruction of property or serious rule violations. These symptoms must be present for at least a year and must cause significant impairment in functioning at home, at school, with peers or in the community. There are no definitive biological or psychological tests for CD. Consequently, the diagnosis must be made clinically involving a multidisciplinary team assessment that includes reports from multiple informants (children, parents, teachers and others) (Waddell et al., 2004).

Estimates of the prevalence of conduct disorders in youth vary between 2 and 10 per cent. Such disorders are more likely in boys than in girls. Conduct disorders tend to co-occur with a variety of other serious problems such as academic failure and underachievement, adult problems in intimate relationships and work performance, problematic substance use, anxiety disorders and depression. The social and economic costs of conduct disorder and aggressive and violent behaviour are high. These include the costs of treatment, justice and the criminal system, social services, academic failure, and the emotional and economic costs for victims and families.

Malleable risk factors include maternal smoking during pregnancy, behavioural impulsivity, inept parenting, parental antisocial behaviour and substance use, child abuse, early aggressive behaviour and conduct problems, early substance use, deviant peer relationships, low popularity among peers and impoverished and socially disorganized neighbourhoods with high levels of crime. The most successful preventive interventions to reduce the risk of aggressive behaviour and conduct disorder focus on improving the social competence and pro-social behaviour of children, parents, peers and teachers. These interventions are developed in tandem with a consensus developmental model for conduct problems, with its emphasis on social interaction between children, caregivers and peers. New intervention attempts inform the model, and new cross-sectional and longitudinal research findings inform innovative intervention attempts.

Several universal interventions—all school-based—can successfully address conduct problems, and include classroom behaviour management, enhancing child social skills and multimodal strategies including the involvement of parents.

Classroom behaviour management programs attempt to help children better meet the social demands of the classroom through the overt encouragement of desired behaviours and the discouragement of undesired behaviours. Effective programs have resulted in decreased student conduct problems (e.g. decreased disruptive behaviour, decreased aggression) and better relationships among students and between students and teachers.

Child social skills programs attempt to provide children with cognitive skills that may help them cope better with difficult social situations. Commonly, skills related to listening, empathy, interpersonal problem-solving and conflict and anger management are taught, usually within the classroom context. These programs have been found to positively impact on cognitions related to problem-solving and reduce impulsive behaviours, at least for up to one year following intervention. Children and teachers report decreased conduct problems. (Eddy, 2005)

Multimodal interventions involve either multiple interventions within the school setting or multiple interventions across settings, such as combining a school-based child social skill intervention with parent management training. Multimodal programs are intended to provide both children and their caregivers with the skills to effectively encourage the development of pro-social behaviour patterns. These interventions have resulted in lower rates of aggression in the playground and decreases in a variety of conduct problems, including bullying, theft, vandalism, self-reported conduct problems and first arrests.

Multimodal school and family interventions have proven to be an effective approach to universal and selective prevention. For example, the Johns Hopkins program in the United Stated enrolled 5- to 7-year-old boys and girls from schools in economically disadvantaged neighbourhoods and offered a preventive multimodal family and school intervention over two years that combined classroom-centred curriculum and behaviour management (using the Good Behavior Game) with parent training, teacher training and weekly home-school learning. Improvements in antisocial behaviour were noted, and the effects maintained at five-year follow-up (Ialongo et al., 1999; Ialongo, Poduska, Werthamer & Kellam, 2001).

The Children's Health Policy Centre at Simon Fraser University prepared *Preventing and Treating Conduct Disorder in Children and Youth* (Waddell et al., 2004) as part of its series of systematic reviews of research on programs for children and youth that could potentially be implemented in support of *A Child and Youth Mental Health Plan for British Columbia*.

The centre's website provides updates of field at http://www.childhealthpolicy.sfu.ca.

Selective interventions designed for a variety of settings have been found to be effective in preventing conduct problems, including prenatal and/or early childhood programs and school or community-based programs. Prenatal and/or early childhood programs focus on improving the skills of parents to nurture, support and teach their children's prosocial behaviour patterns and/or to develop the social skills of children (e.g. Olds et al., 1999). These programs have shown a decrease in risk factors for conduct disorders, such as maternal smoking during pregnancy and child abuse and neglect, and decreases in child conduct problems during adolescence, including reductions in violence and police arrests. School- or community-based programs for selective child populations at risk have successfully targeted child social and problem-solving skills and/or parent management skills, resulting in a decrease in negative parent–child interactions and teacher ratings of conduct problems at school (Eddy, 2005).

Indicated interventions focus on preventing conduct disorder among children who have been identified by teachers and/or parents as clearly displaying significant conduct problems. Such programs have shown decreases in conduct problem displays through several middle school years as reported by teachers and the children themselves. An effective example that includes universal, selective and indicated components is Fast Track (Conduct Problems Prevention Research Group, 2002). In this program children are identified in kindergarten. Throughout their school years, the children participate in a wide variety of interventions, including social and problem-solving skills training, play sessions with prosocial peer partners and academic tutoring. Parents participate in parent management training groups and parents and children participate in planned skill training activities. Families also receive regular home visits and case management assistance. Results of a randomized trial after the first three years of intervention have indicated that children in the Fast Track program displayed lower levels of conduct problems as rated by both teachers and parents (Eddy, 2005).

Unlike programs that involve a school component, COPE is a community-based model developed in Ontario that focuses on 4 and 5 year old children with behavior problems at home, and includes parent skills training groups. COPE utilizes videotapes that model problem-solving processes with parents, who then participate in parent-facilitated small groups to solve common parenting problems, discussing their solutions with a larger therapist-facilitated group (Cunningham, Bremner & Boyle, 1995). The COPE model appears promising, and it has been replicated in limited settings in the United States (Chronis, Chacko, Fabiano, Wymbs & Pelham, 2004).

A promising multi-level approach developed in Australia, the Positive Parenting Program or Triple-P program, simultaneously addresses universal prevention through general parenting information, while providing specific health promotion information or advice for parents with specific concerns during routine well-child health care and more intensive training and support for parents in indicated circumstances. Follow-up studies suggest positive outcomes are sustained after one year (Ireland, Sanders & Markie-Dadds, 2003; Sanders, Markie-Dadds, Tully & Bor, 2000).

In Manitoba, the Triple-P program is being implemented through community agencies, health authorities, child care centres, family resource centres and other settings (Manitoba Healthy Child Committee of Cabinet, 2005). A description of how Manitoba is implementing Triple-P as a population-wide prevention strategy can be found at http://www.gov.mb.ca/healthychild/triplep/.

The Children's Health Policy Centre at Simon Fraser University prepared Preventing and Treating Conduct Disorder in Children and Youth (Waddell et al., 2004) as part of its series of systematic reviews of research on programs for children and youth that could potentially be implemented in British Columbia. The centre's website provides updates of new research in the field at http://www.childhealthpolicy.sfu.ca/

Table 10 provides a summary of preventive interventions associated with conduct disorders, aggression and violence.

Table 10: Interventions: Preventing Conduct Disorders, Aggression, Violence

Intervention	Examples	Status	Appropriateness
Universal			
Behaviour management.	Good Behavior Game (Kellam et al., 1994).	Evidence for outcomes. Greatest progress among most aggressive children.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Multimodal school and community programs.	Bullying Prevention Programs (Olweus, 1989).	Evidence for implementation. Warrants further research in settings outside Scandinavia.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Selected			
Multimodal school programs for children at risk.	High/Scope Perry Preschool (Schweinhart & Weikhart, 1997).	Evidence for dissemination. Outcomes sustained over very long-term follow-up.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
	Johns Hopkins—multimodal combined with Good Behavior Game (Ialongo et al., 1999; Ialongo, Poduska, Werthamer & Kellam, 2001).	Outcomes sustained in long-term follow-up. Evidence for dissemination.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
	Tri-Ministry (Boyle et al., 1999; Hundert et al., 1999).	Canadian example. No long-term follow-up. Warrants further research.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Prenatal/Early childhood programs.	Nurse Family Partnership Program (Olds et al., 1999; Olds, 1997: Eckenrode et al., 2001).	Evidence for dissemination. Outcomes sustained over very long-term follow-up.	Falls within scope and mandate of health authorities.
	Incredible Years Program (Webster-Stratton, 1990; Webster-Stratton & Reid, 2002; Hutchings et al., 2007).	Evidence for dissemination. Outcomes sustained in long-term follow-up.	Requires collaboration and advocacy with other health system partners including the Ministry of Children and Family Development.
School- or community-based programs.	Adolescent Transitions Program (Dishion & Andrews, 1995).	Evidence for outcomes.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
	Second Step Violence Prevention (Grossman et al., 1997; Taub, 2001).	Evidence for implementation. Longer term follow-up needed.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Indicated			
School multimodal programs for children at risk.	Fast Track (Conduct Problems Prevention Research Group, 2002).	Evidence for dissemination.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.

Intervention	Examples	Status	Appropriateness
	Montreal Prevention Study (McCord, Tremblay, Vitaro & Demerais-Gervais, 1994;Tremblay et al., 1991; Tremblay et al., 1995).	Evidence for outcomes. Canadian study, with outcomes sustained in long-term follow-up.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
	Peer Coping Skills Training (Prinz, Blechman & Dumas, 1994).	Evidence for implementation. Longer term follow-up needed.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
	SHIP—with Incredible Years based component (Barrera et al., 2002)	Evidence for outcomes.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Child and family intervention for children at risk.	COPE (Cunningham, Bremner & Boyle, 1995)	Evidence for implementation. Canadian study, longer term follow-up required.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Universal Intervention with Selected Components			
Multi-level family intervention, with self-help materials, positive parent training, intensive training and support for high-risk families.	Triple-P (Ireland, Sanders & Markie-Dadds, 2003; Sanders, Markie-Dadds, Tully & Bor, 2000).	Evidence for outcomes.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development.

9.2 Mood Disorders

Mood disorders include both unipolar depression and bipolar disorder. Depression represents one of the most prevalent psychiatric disorders, affecting around 340 million people worldwide. According to World Health Report 2004, unipolar depression now accounts for 4.5 per cent of all DALYs worldwide (WHO, 2004b), and is expected to become the second-ranked cause of disease burden by 2020, accounting for 5.7 per cent of DALYs, just behind ischemic heart disease (Murray & Lopez, 1996); thus, depression becomes the most important mental disorder to tackle (WHO, 2004a). Bipolar disorder is also a common and severe mental illness. Globally, the point prevalence of bipolar disorder is around 0.4 per cent (Mathers, Lopez & Murray, 2006), and the disorder is among the 10 leading causes of years of life lived with disability among adults aged 15–44 (WHO, 2001A).

The onset and recurrence of depression is influenced by a range of malleable risk and protective factors across the lifespan from infancy, including biological, psychological, family, social and societal factors that are unevenly distributed in the population and disproportionately present in populations at risk (Jané-Llopis et al., 2005). Depression-specific risk factors include parental depression, and generic risk factors include inadequate parenting, child abuse and neglect, and stressful life events. Protective factors include a sense of mastery, self-esteem and social support. As a consequence, effective community approaches to prevent depression in the population should comprise multiple actions including universal, selective and indicated interventions. On average, controlled studies show a significant but small effect of 11 per cent reduction in

depressive symptoms after intervention, with a large variation in effect size between programs. A few studies have found a significant reduction in the onset of depressive disorders.

Strengthening protective factors among populations has been found to reduce depressive symptomatology— programs for those with elevated levels of depressive symptoms but no depressive disorder have shown significant effects in reducing high levels of depressive symptoms and preventing depressive episodes. Examples include school-based psychological programs targeting cognitive, problem-solving and social skills of children and adolescents (Merry, McDowell, Hetrick, Bir, & Mullerm, 2004) and exercise programs for seniors (Li et al., 2001). Some school programs (e.g., The Resourceful Adolescent Program) found reductions in high depressive symptom levels of 50 per cent or more, one year after the intervention (Shochet et al., 2001). One small controlled study on the outcomes of a universal early home-based family counseling program in Finland found reductions in internalizing problems 10–15 years later during adolescence and early adulthood (Aronen & Kurkela, 1996). Some evidence-based interventions address proven risk and protective factors for the onset of depression. These include successful interventions to reduce child abuse and neglect and bullying (Jané-Llopis et al., 2005).

In contrast, school-based educational programs that provide information about depressive symptoms and available treatments have not been found to reduce depressive symptomology, though fewer studies are available on these programs (Merry et al., 2004). A meta-analysis to establish predictor of effect of prevention programs examined 69 interventions, and concluded those programs with larger effect sizes were multi-component, included competence techniques, had more than eight sessions, had sessions 60–90 minutes long, had high-quality research design and were delivered by a health care provider in targeted programs; older people benefited from social support, whereas behavioural methods were detrimental (Jane-Llopis, Hosman, Jenkins & Anderson, 2003).

Parenting interventions for parents of children with conduct problems, aimed at improving parental psychosocial well-being by information provision and by training in behavioural childrearing strategies, have repeatedly, if not consistently, shown reductions in parental depressive symptoms along with improvements in children's outcomes. In addition, several selective interventions targeted at coping with major life events have shown significant and long-term reductions of high levels of depressive symptoms, including programs for children with parental death or divorce, for those exposed to unemployment and for the chronically ill elderly.

Blocking the transgenerational transfer of depression and related problems through interventions for infants, adolescents and families of depressed parents is a promising strategy. In one application, the Coping with Stress Course used cognitive therapy methods over 15 sessions, targeting children of psychiatric parents with subclinical depressive symptoms or with a past episode of major depression. A randomized control study showed a lower incidence of depression in the experimental group (9.3 per cent) than in the control group (28.8 per cent) at 14-month follow-up.

Offered to indicated groups of school-aged children such as secondary school students with depressive symptoms, programs such as the Coping with Stress Course challenge negative thinking styles and improve problem-solving skills using a group format. A randomized control

study showed a lower incidence of first depressive episodes after one year in the experimental group (14.5 per cent) than in the control group (25.7 per cent) (Clarke et al., 1995).

Anxiety disorders frequently precede the onset of depression, suggesting evidence-based anxiety prevention programs, especially for indicated children and adolescents, are an indirect strategy for reducing the risk of depression. At least one controlled study confirmed a child-oriented anxiety program resulted in a significant reduction of depressive symptoms uniquely in those children with a high level of anxiety before the start of the intervention (Lowry-Webster, Barrett & Dadds, 2001).

Bipolar disorder is characterized by two types of recurrence: mania and depression. High rates of recurrence and associated adverse consequences occur in spite of a range of effective treatments. Early warning signs (EWS) interventions are targeted at improving the recognition and self-management of manic and depressive symptoms and training people with recurrent bipolar affective disorder to recognize early warning signs of recurrence; such interventions are preventive in nature insofar as they aim to prevent or reduce adverse outcomes associated with recurrence. Early results have been promising. A recent systematic review found that these interventions, in addition to treatment as usual, including medication and regular appointments with health professionals, have benefits on time to recurrence and hospitalization (Morriss et al., 2007). Compared with usual treatment only, EWS interventions also resulted in improved functioning at 18 months, although these data were sparse and the findings should be interpreted with caution. EWS was used in combination with other psychological interventions, and it is not entirely clear what proportion of the beneficial effect was due to the EWS intervention alone.

In summary, many prevention programs implemented across the lifespan have provided evidence of the reduction of elevated levels of depressive symptoms. The few that have been evaluated for their impact on preventing the onset of clinical depressive episodes have proven effective. A focus on reducing or preventing depressive symptoms is important given that high levels of depressive symptoms increase the risk for major depressive episodes (Jané-Llopis et al., 2005).

Table 11 provides a summary of preventive interventions associated with mood disorders.

Table 11: Interventions: Preventing Mood Disorders

Intervention	Examples	Status	Appropriateness
Universal			
School-based programs.	The Resourceful Adolescent Program (Shochet et al., 2001).	Evidence for outcomes.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Home-based family counseling.	Finnish Family Counselling Project (Aronen & Kurkela, 1996).	Evidence for implementation.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development.

Intervention	Examples	Status	Appropriateness
Selected			
Cognitive behavioural therapy for at-risk school-aged children.	Coping with Stress (Clarke et al., 1995; Clarke et al., 2001).	Evidence for dissemination.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Exercise programs for seniors.	Tai Chi (Li et al., 2001).	Evidence for implementation. Warrants further research, merits support given established physical health benefits.	Requires collaboration and advocacy with additional sectors.
Indicated			
Anxiety prevention programs for indicated children and adolescents as an indirect strategy for reducing the risk of depression.	FRIENDS program (Lowry-Webster, Barrett & Lock, 2003).	Evidence for outcomes.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Early warning signs interventions for people with bipolar disorder or manic depressive psychosis.	Early Warning Signs—intervention to delay and/or reduce intensity of recurrence (Morriss et al., 2007).	Evidence for implementation.	Falls within scope and mandate of health authorities.

9.3 Anxiety, Panic and Post-Traumatic Stress Disorders

While rates vary by culture, anxiety disorders are among the most prevalent psychiatric problems, and include generalized anxiety disorders, social phobia, panic disorders and post-traumatic stress disorder—these areas being the focus of most primary prevention efforts to date. Vulnerable groups include children of anxious parents; victims of trauma including child abuse, accidents, violence, war or disasters; refugees; and professionals at risk of being robbed or treating trauma victims.

Malleable anxiety-specific or generic risk and protective factors for anxiety disorders include traumatizing events, childhood exposure to over-control by overanxious parents, feelings of lack of

The FRIENDS program, a school-based prevention and early intervention program focused on reducing the risk of anxiety disorders, teaches children how to cope with fears and worries and equips them with tools to help manage difficult situations, now and later in life. In BC, the FRIENDS program is sponsored by the Ministry of Children and Family Development, in co-operation with the Ministry of Education, enabling school professionals to deliver FRIENDS as a classroom-based, universal prevention program or as an early intervention to children who may be at higher risk for anxiety disorders.

More than 50,000 grade 4 and 5 students in BC have been exposed to FRIENDS, teaching them life skills to help them cope with worries and stress, and to reduce their risk of developing an anxiety disorder.

control, and low self-efficacy, coping strategies and social support; in addition, "early adverse life events create a neurobiological vulnerability that predispose to affective and anxiety disorders in adulthood through long-lived alterations in neurological stress response systems" (WHO, 2004a, p. 42). Protective factors include the ability to cope with stress, and supportive social networks.

Increased duration of exposure to traumatizing events is an evidence-based determinant of increased risk of psychiatric reactions in response to such events. Both exposure prevention and reduction of its duration can be realized by public measures such as preventing or limiting exposure to trauma sites during disasters and enhancing early detection and intervention in cases of violence or abuse (Hosman, Dadds, & Raphael, 2005). No evidence is yet available on the actual preventive impact of such measures.

One particularly effective preventive approach focuses on strengthening the emotional resilience and cognitive skills needed to avoid the development of anxiety disorders. Based on an effective treatment program for anxiety disorders, the FRIENDS program was developed in Australia in universal, selected and indicated formats for children from 7 to 16 years of age and is widely used in schools, health centres and hospitals (Farrell & Barrett, 2007). FRIENDS is a cognitive-behavioural program of 10 sessions that teaches children skills to cope with anxiety more effectively and builds emotional resilience, problem-solving abilities and self-confidence. A controlled trial showed that the program offered to children with pre-intervention elevated levels of anxiety symptoms reduced the first onset of a diagnosable anxiety disorder from 54 per cent in the control group to 16 per cent in the prevention condition in the 6 months following the intervention (Dadds, Spence, Hollands, Barrett & Laurens, 1997).

Controlled studies also show that when the program is offered to universal school populations and to selected groups of children and adolescents at risk, it leads to a significant drop in anxiety symptoms (Lowry-Webster, Barrett & Dadds, 2001). Follow-up at 12, 24 and 36 months have shown sustained prevention effects of a universal grade 6 program; for girls participating in a universal grade 9 program, prevention effects were sustained through 12- and 24-month follow-up, but not at 36 months (Barrett, Farrell, Ollendick, & Dadds, 2006). The program has been adapted for British Columbia, where it is offered in universal format and is sponsored by the Ministry of Children and Family Development and the Ministry of Education. By 2006, the program had reached approximately 50,000 grade 4 and 5 students across the province, and through a pilot project the program is exploring ways of better engaging Aboriginal children. An evaluation is under way through VP3: the Vancouver Primary Prevention Project.

The use of cognitive behavioural therapy as an early intervention method to prevent post-traumatic stress disorder has proved promising—cognitive-behavioural interventions during the acute aftermath of trauma exposure have yielded the most consistently positive results in terms of preventing subsequent post-traumatic psychopathology (Veterans Affairs Canada, 2004). Four randomized clinical trials related to early cognitive-behavioural interventions during the acute aftermath of trauma found that the cognitive behavioural therapy group experienced a greater reduction in post-traumatic stress disorder symptoms than comparison groups (Gidron et al., 2001; Bryant, Harvey, Dang, Sackville, & Basten, 1998; Bryant, Sackville, Dang, Moulds, & Guthrie, 1999; Echeburua, deCorral, Sarasua, & Zubizarreta, 1996). This approach uses education about trauma reactions, relaxation training, imaginal exposure to traumatic memories, cognitive

restructuring of fear-related beliefs and in vivo exposure to avoided situations. Controlled studies have shown that 5 weekly sessions of 1-1/2 hours can lower the 6 months incidence of post-traumatic stress disorder from 67 per cent to approximately 15 per cent (Bryant et al., 1998; Bryant et al., 1999).

Single session critical incident stress debriefing is another approach used after traumatic events such as a shootings or disasters. In general, debriefing encourages some form of emotional processing through recollection and reworking of the trauma 24 to 72 hours after the event. However, the conclusion from several controlled studies is that single session critical incident stress debriefing does not prevent the onset of post-traumatic stress disorder or other psychiatric disorders. In fact, in some instances such psychological debriefing can re-traumatize victims and can increase the risk of post-traumatic stress disorder (Hosman et al., 2005; Rose, Bisson, Churchill & Wessely, 2002).While participants may find debriefing a helpful experience, compulsory debriefing of victims of trauma should cease (Rose et al., 2002).

Preliminary evidence from a controlled study suggests that the onset of panic disorders can be reduced through a short-term cognitive workshop for those who have experienced a first panic attack (Hosman et al., 2005). Over a 6-month follow-up period, 2 per cent of those involved in the workshop developed a panic disorder in comparison to 14 per cent of the control group (Gardenswartz & Craske, 2001).

There is little evidence for effective approaches to primary prevention of obsessive compulsive disorder. Systematic reviews have concluded promising early interventions for children and adolescents include cognitive behavioural therapy and exposure and response prevention (O'Kearney, Anstey, & von Sanden, 2006; Waddell, Godderis, McEwan & Schwartz, 2005).

Table 12 provides a summary of preventive interventions associated with anxiety, panic and post-traumatic stress.

Table 12: Interventions: Preventing Anxiety, Panic and Post-Traumatic Stress Disorders

Intervention	Examples	Status	Appropriateness
Universal			
School-based cognitive behavioural programs to prevent anxiety.	FRIENDS (Farrell & Barrett, 2007; Lowry-Webster et al., 2001; Lowry-Webster et al., 2003).	Evidence for dissemination. The Ministry of Children and Family Development and the school system have scaled up the FRIENDS program for grade 4 and 5 children in BC schools.	Disseminated in British Columbia via collaboration between the Ministry of Children and Family Development and the school system.
Selected			
Cognitive behavioural anxiety prevention program for at-risk school-aged children.	FRIENDS (Farrell & Barrett, 2007; Lowry-Webster et al., 2001).	Evidence for dissemination.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.

Intervention	Examples	Status	Appropriateness
Indicated			
Cognitive behavioural therapy for survivors of trauma.	Five, 90-minute cognitive behavioural therapy sessions over 5 weeks (Bryant et al., 1998; Bryant et al., 1999).	Evidence for dissemination.	Falls within scope and mandate of health authorities.
Cognitive behavioural program for school-aged children with anxiety symptoms.	FRIENDS (Farrell & Barrett, 2007; Dadds et al., 1997).	Evidence for implementation.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Cognitive intervention after first panic attack experience to prevent panic disorder onset.	Short-term Cognitive Workshops (Gardenswartz & Craske, 2001).	Evidence for implementation.	Falls within scope and mandate of health authorities.

9.4 Eating Disorders

Eating disorders appear to be more common among women; women are also more likely to seek help (Hoerr, Bokram, Luvo, Bivins & Keast, 2002; Rubenstein, Pigott, L'Heureux, Hill, & Murphy, 1992). Studies conducted largely in the developed world suggest anorexia nervosa occurs in 0.5–1.0 per cent and bulimia nervosa in 0.9–4.1 per cent of the female adolescent and young adult population, while an additional 5–13 per cent of this population experiences partial syndrome eating disorders (Keel, Leon & Fulkerson, 2001; Kurth, Krahn, Nairn, & Drewnowski, 1995; Shisslak, Crago & Estes, 1995). A recent population-based study suggests gay and bisexual men are more likely to experience eating disorders than heterosexual men (Feldman & Meyer, 2007). In addition to anorexia nervosa and bulimia, compulsive eating disorder and eating disorder not otherwise specified are two related diagnoses.

The onset of anorexia nervosa generally occurs between 14 and 18 years, while for bulimia, onset is slightly later, around the time of transition from adolescence to early adulthood; approximately 25–33 per cent of those diagnosed with anorexia or bulimia nervosa develop a chronic disorder (Hosman, 2005). For example, one prospective long-term follow-up of 84 patients 21 years after first hospitalization for anorexia nervosa found that 50 per cent had achieved a full recovery, while 10 per cent still met full diagnostic criteria for anorexia nervosa, and 16 per cent had died from causes related to anorexia nervosa. Predictors of outcome included physical, social and psychological variables (Zipfel, Löwe, Reas, Deter, & Herzog, 2000).

The etiology of eating disorders remains poorly understood, though given that incidence varies widely across cultures, socio-cultural factors may play a significant role (Hoerr et al., 2002; Littlewood, 1995). Most studies on the etiology of eating disorders are marked by methodological limitations. However, a picture of risk factors is beginning to emerge—unhealthy dieting, excessive weight or body shape concerns and body dissatisfaction appear to be important disorder-specific attitudinal and behavioural risk factors, as well as family and social influences, media glamorizing of thinness and low media literacy. Insecure attachment, physical and sexual abuse, bullying, low self-esteem and difficulties in coping with affective stress and conflict are considered generic risk factors (Hosman, 2005). In addition to causing various physical health problems, eating disorders are linked with depression, problematic substance use, anxiety and, especially, obsessive/compulsive disorder.

Attempts to prevent the onset of eating disorders and reduce unhealthy eating have historically been targeted at elementary and secondary students, at specific groups at elevated risk such as ballet dancers, athletes, fashion models and cookery students, and at adolescent girls and young female adults who demonstrate unhealthy dieting behaviour at subclinical levels (Pratt & Woolfenden, 2002). Traditional universal educational programs succeeded in improving knowledge about eating problems and dieting behaviour among female adolescents, but were not successful in changing disturbed attitudes and behaviours. Recently, several controlled studies have evaluated the outcomes of newer multidimensional programs integrating traditional health education approaches in a broader mental health promotion strategy. A systematic review completed in 2002 (Pratt & Woolfenden) did not find empirical support for interventions directly addressing adolescent abnormal eating attitudes and behaviours, though it did reveal empirical support for the efficacy of interventions involving media literacy and advocacy in reducing internalization or acceptance of societal ideals of female appearance.

While there is a paucity of evidence on effective primary prevention of eating disorders, early intervention offers more hope. A recent systematic review suggests that there is some evidence that early interventions with either pure self help or guided self help approaches can reduce eating disorders symptoms in comparison to waiting list or control treatment and may produce comparable outcomes to formal therapist-delivered psychological therapies (Perkins, Murphy, Schmidt & Williams, 2006).

Given the mixed results of current studies, no firm conclusions can be drawn—available reviews are unable to identify any evidence for reduced onset of eating disorders as a result of eating disorder prevention programs (Hosman, 2005), as noted in Table 13.

Table 13: Interventions: Preventing Eating Disorders

Intervention	Examples	Status	Appropriateness
Universal, Selected, Indicated			
Available reviews unable to identify evidence of effective programs to reduce or prevent onset of eating disorders.			

9.5 Substance-Related Disorders

The prevention of mental and behavioural disorders due to psychoactive substance use includes the prevention of acute intoxication, harmful use and dependence. The term psychoactive substances encompasses tobacco, alcohol and illegal drugs such as opioids, cannabinoids and cocaine, as well as psychoactive prescription drugs and solvents (WHO, 2004a). Among psychoactive substances, tobacco and alcohol are of primary concern, and contribute overwhelmingly to the global burden of disease. For example, among approximately 2 billion people worldwide who consume alcoholic beverages, more than 75 million are diagnosed with alcohol use disorders (WHO, 2004c). Apart from the direct effects of intoxication and dependence resulting in alcohol use disorders, alcohol is estimated to cause about 20–30 per cent of each of the following worldwide: esophageal cancer, liver cancer, cirrhosis of the liver, homicide, epilepsy and motor vehicle accidents (Anderson, Biglan, & Holder, 2005).

The prevention of substance use disorders and substance-related harms benefits from a vast body of research. An extensive examination of evidence-based approaches to preventing harmful substance use, including acute intoxication and dependence has been undertaken in *Following the Evidence: Preventing Harms from Substance Use in BC* (MOH, 2006). Many of the most effective prevention strategies operate at the macro level, and involve taxation policy and pricing mechanisms, operating hours and locations for alcohol outlets, and altering community norms regarding patterns of use. *Following the Evidence* outlines five evidence-based strategic directions for preventing and reducing harmful substance use: influencing developmental pathways and acknowledging that different life stages present differing risks and protective factors for harms; delaying and preventing alcohol, tobacco and cannabis use among adolescents, a time of life when problematic patterns of use for these substances can lead to significant harms later in life; reducing risky patterns of substance use, emphasizing interventions that can impact those types of substance use that have the greatest likelihood of causing harm; creating safer contexts, which acknowledges that the setting or environment where substance use occurs can affect the risk of harms; and influencing economic availability, whereby pricing mechanisms can be used to influence the use of substances such as alcohol and tobacco. A more complete discussion of these five strategic directions is provided in Section 5.0.

This section will limit its focus to one of the five strategic directions: delaying and preventing alcohol, tobacco and cannabis use among children and adolescents, a time of life when problematic patterns of use for these substances can lead to significant harms later in life; however, it is important to emphasize that the simultaneous application of strategies from across all five strategic directions is required to achieve the most significant population-level results. For a complete review of evidence-based strategies across all five strategic directions, and best advice on their implementation for health authorities and British Columbia's health system, please refer to the core evidence review on prevention of the harms associated with substance use (MOH, PHW, 2006).

Some of the most effective prevention strategies involve regulation and legislation.
There is strong evidence supporting the effectiveness of enforcement of legal age restrictions on access to alcohol and tobacco as a strategy to reduce and delay substance use among young people (Loxley et al., 2004). According to Stockwell (2004) enforcement of existing laws regulating alcohol and tobacco has strong community support and such enforcement has an impact similar to outcomes achieved with less popular strategies, such as raising the age requirement for alcohol purchase, another evidence-based population-level strategy for reducing alcohol-related harm (Voas, Tippetts & Fell, 2003). Limiting density of alcohol establishments and hours of operation is another effective prevention strategy, especially for older teens and young adults (Chikritzhs & Stockwell, 2002). These approaches are also referenced in Section 7.0.

Voluntary codes and legal restrictions on youth access to solvents and precursor chemicals can greatly reduce opportunities for dangerous practices such as sniffing glue or other solvents and using psychostimulant drugs such as amphetamine and methamphetamine (Loxley et al 2004). It is also important to limit sensationalized presentation of these issues to minimize interest among young people in accessing these substances.

Schools offer the most systematic and efficient way of reaching young people. School-based drug education has been shown to be effective, especially in relation to tobacco and alcohol use (Loxley et al., 2004). Much of the available research examines programs from the United States, and a nation's social context and drug policies significantly influence the effectiveness of interventions (Faggiano et al., 2005). Nevertheless, key ingredients of successful programs have been identified. Effective programs include school-based social influence and harm reduction skills training interventions that include the use of student input to ensure interesting and interactive class exercises, investment in teacher training, and booster sessions throughout the secondary school years (Faggiano et al., 2005; McBride, 2005). Promising results have also been obtained from multi-setting school and community-based social influence interventions and community mobilization programs to reduce and prevent early drug use (Skara & Sussman, 2003; Toumbourou, Williams, Waters, & Patton, 2005). Some well-researched demonstration projects were effective at harnessing school and parent influences to alter the acceptability of and access to both legal and illegal substances by adolescents. Programs aimed exclusively at improving students' knowledge of drugs, their effects and their consequences have not been shown to be effective in reducing substance use (Faggiano et al., 2005).

In terms of interventions focused on families, a systematic review (Foxcroft, Ireland, Lowe & Breen, 2002) identified the Strengthening Families Program (Spoth, Redmond & Shin, 2001) as promising. This intervention focused on clarifying expectations, providing appropriate discipline, managing strong emotions and providing effective communication and peer skills for children; replication with more rigorous study design is under way elsewhere in the United States, in the United Kingdom and in Spain.

Brief interventions in primary health care for high-risk alcohol users are discussed in Section 7.0.

Table 14 provides a summary of interventions for delaying and preventing early substance use, which is associated with substance use problems, such as substance use disorder, later in life.

Table 14: Interventions: Preventing Substance Use Disorders

Intervention[4]	Examples	Status	Appropriateness
Universal			
School-based social influence and harm reduction skills training interventions to reduce and prevent early drug use.	Interesting, interactive class exercises developed with student input, teacher training, booster sessions through secondary school (McBride, 2003). May also involve external educators (Faggiano et al., 2005).	Evidence for dissemination.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.

[4] This table outlines interventions for preventing and delaying early drug use, a risk factor for developing substance use problems and disorders later in life—and one of five evidence-based strategic directions outlined in *Following the Evidence: Preventing Harms from Substance Use in BC* (MOH, 2006). For a list of strategies associated with all five strategic directions, see *Following the Evidence* and the Core Programs evidence review paper entitled *Evidence Review: Prevention of Harms Associated with Substances* (MOH, PHW, 2006).

Intervention[4]	Examples	Status	Appropriateness
Multi-setting school- and community-based social influence interventions to reduce and prevent early drug use.	Community mobilization programs (Skara & Sussman, 2003; Toumbourou et al., 2005).	Evidence for dissemination.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Family-focused interventions to prevent and reduce early drug use.	Strengthening Families Program (Spoth, Redmond & Shin, 2001).	Evidence for implementation. Research ongoing in various jurisdictions.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Indicated			
Brief interventions to reduce reduce risky alcohol use.	General practice- or primary care-based brief interventions (Kaner et al., 2007).	Evidence for dissemination.	Falls within scope and mandate of health authorities.

9.6 Psychotic Disorders

Psychotic disorders such as schizophrenia, schizoaffective disorder and affective and atypical psychoses have a profound impact on the lives of those who experience them. Psychotic illnesses have a peak onset in late adolescence and early adulthood (Kaplan, Sadock & Grebb, 1994).

Psychosis itself has not been considered a mental disorder for many years, but rather a symptom of mental illness in which contact with reality is distorted or lost. Psychosis can be experienced by people living with psychotic disorders as well as other disorders such as unipolar depression and delirium (Beer, 1995). In addition, psychosis can occur as part of an adverse reaction to medication or in association with the use of or withdrawal from psychoactive drugs. Brief reactive psychosis can be triggered by extreme stress. There is no evidence of effective approaches to primary prevention of onset of psychotic episodes; however, early intervention after a first episode of psychosis has been emphasized through efforts such as Vancouver's Early Psychosis Initiative program (Vancouver Coastal Health, 2006), and promising approaches to early detection and intervention for psychotic disorders are discussed further below.

Stimulant-induced psychosis has been the subject of much public attention—cocaine, amphetamines and methylphenidate all have the potential to produce a range of psychiatric symptoms including hallucinations, delusions and delirium, and to exacerbate pre-existing mental disorders (Gross-Tsur, Joseph & Shalev, 2004; Morton, 1999). In fact, a recent systematic review explored the use of anti-psychotic medications to treat cocaine dependence, but was unable to find evidence for efficacy (Amato, Minozzi, Pani & Davoli, 2007). There is remarkable consistency of some cocaine-induced psychotic symptoms across time and cultures. For example, delusions of parasitosis or "cocaine bugs", often leading to self-mutilation, which stem from neurotoxicity associated with chronic cocaine use, were described more than 125 years ago in France (Magnan & Saury, 1889), and remain common among chronic cocaine users today (Ford, 2004). This suggests these symptoms are direct neurobehavioral effects of the drug (Dhopesh, Cristancho, & Caroff, 2007). In the case of cocaine, hallucinations are rapidly resolved after drug use is discontinued; in the case of methamphetamines, psychiatric symptoms may persist several weeks after discontinuation, and some individuals may experience paranoia during withdrawal (Larson, 2006).

In recent years, many have proposed a causal relationship between cannabis use and psychotic disorders such as schizophrenia. Considerable research on this point has not yielded definitive answers; in fact, mathematical modeling suggests that if cannabis use caused schizophrenia among persons who would not otherwise develop the disorder, "significant increases would have occurred in the number of people with the illness…given the incidence of schizophrenia is unchanged or decreasing such a causal relationship is unlikely" (Degenhardt, Hall, & Lynskey, 2001, pp 31–32).

Nevertheless, a recent meta-analysis from prospective studies has identified a deleterious effect of cannabis use on the prognosis of individuals with high levels of liability to psychosis, while noting that further research on genetic-environment interaction is required to "understand the exact role cannabis may play in onset and persistence of psychotic disorders" (Henquet, Murray, Linszen, & van Os, 2005, p. 611). Another systematic review has also found cannabis use was a risk factor for the development of psychotic symptoms in vulnerable groups, including those who had previously experienced psychotic symptoms and those at high genetic risk for schizophrenia (Semple, McIntosh, & Lawrie, 2005). The uncertainty about whether cannabis causes psychosis is unlikely to be resolved by longitudinal studies; however, cannabis use appears to increase the risk of psychotic outcomes in some people independently of transient intoxification effects, and there appears to be a dose-response relationship insofar as risk is increased with amount consumed. A systematic review of longitudinal studies has concluded there is now sufficient evidence to warn young people that using cannabis could increase their risk of developing a psychotic illness later in life (Moore et al., 2007).

Schizophrenia is the most common psychotic illness, on a global level accounting for 2.8 per cent of years lost to death and 1.1 per cent of total disability-adjusted life years (Mathers, Lopez, & Murray, 2006). There are also significant economic costs associated with schizophrenia—World Health Report 2001 (WHO, 2001a) reported a 1991 estimate of $19 billion US in direct annual expenditures for schizophrenia in the United States alone. The etiology of schizophrenia is poorly understood but appears to involve environmental factors interacting with genetic vulnerability (Jablensky & Kalaydjieva, 2003; van Os & McGuffin, 2003). Contributory risk factors include obstetric complications, childhood trauma, migration, socio-economic disadvantage and urban birth (Jablensky et al., 2000; WHO, 2004a). Fetal development appears particularly important: prenatal exposure to severe famine is linked with increased risk for schizophrenia later in life (Hoek et al., 1998; McClellan et al., 2006).

Given the state of the science, universal prevention specific to schizophrenia and other psychotic disorders is not yet possible, although a number of evidence-based programs address contributory risk factors such as obstetric complications. Current evidence-based preventive strategies to address schizophrenia and other psychotic disorders include employing mental health literacy and improved approaches to early identification to help prevent, delay onset and reduce the intensity of psychotic disorder onset. These approaches fall on the margins of the traditional definition of primary prevention, but are worthy of review given that they are currently the only evidence-based strategies available for reducing the burden of psychotic disorders.

Early detection and treatment of psychotic disorders improves outcomes (Kupfer, Frank & Perel, 1989; Loebel, Lieberman, & Alvir, 1992), and population-based, indicated prevention and early

intervention strategies show promise in efforts to minimize the burden of these disorders. Treatment delays in first episodes are a known risk factor for the onset of subsequent episodes. A Scandinavian psychosis early detection research project, the Scandinavian Early Treatment and Identification of Psychosis Study (TIPS), targeted first-episode psychosis using a multimedia campaign to increase mental health literacy as an integral component of its strategy to promote early help-seeking and reduce delays in treatment (Johannessen et al., 2001). TIPS compared a geographically-based service sector that had undergone dual implementation of early detection teams and major public health information campaigns, with two service sectors utilizing existing detection and referral systems (Larsen et al., 2001). Delays in treatment were reduced in the early detection sector by 90 per cent and the public education media campaign was shown to be effective in enhancing mental health literacy and promoting early help-seeking.

The Compass Strategy built on the Scandinavian experience to develop an evidence-based community awareness campaign to promote early help-seeking for mental health problems among young people in Australia (Killackey, McGorry, Wright, Harris, & Juriansz, 2005). Community awareness campaigns proved effective in improving the mental health literacy of young people, their families and other relevant community members, resulting in increased rates of help-seeking and reduced delays in treatment of young people aged 12–25 years experiencing a first onset of mood disorder or psychosis. Program design is guided by the Precede-Proceed Model for Health Promotion (Green & Kreuter, 1999), utilizes participatory planning principles and has three core elements: community consultation mechanisms, campaign modules and an extensive evaluation structure.

Traditional approaches to identifying cohorts at high risk for psychotic disorders focused on individuals with a family history of psychotic disorder, usually schizophrenia, monitoring them from early childhood for up to 35 years. However, this approach yielded a low predictive value and many false positives. More recently, ultra-high-risk "close-in" strategies to identify populations with a higher rate of transition to psychosis, a lower false positive rate and shorter follow-up period than the traditional genetic studies have been central to the progress in very early preventive interventions for psychosis—and have been shown to delay the onset of the first psychotic episode (Killackey et al., 2005). These strategies use "multiple-gate screening" and "close-in" follow-up of cohorts selected as being at risk of developing a psychosis (Bell, 1992). At the PACE clinic in Melbourne, Australia, a randomized controlled trial has shown clear evidence that it is possible to delay the onset of first episode psychosis with a combination of low dose atypical antipsychotic medication and cognitive therapy (McGorry et al., 2002). This study is in the process of replication and extension both in Australia and in other clinical research programs around the world, including Nova Scotia, New York, Dublin, and Cologne (Good et al., 2002; Lewis, 2002).

Table 15 outlines indicated strategies involving preventing or delaying onset, and reducing time spent with symptoms of psychotic disorders.

Table 15: Interventions: Preventing Psychotic Disorders

Intervention	Examples	Status	Appropriateness
Universal, Selected			
Available evidence unable to identify universal or selected programs effective in prevention of psychotic disorders			
Indicated, Secondary Prevention			
Multimedia campaigns and mental health literacy to reduce delays in the early detection sector.	Compass Strategy (Killackey et al., 2005).	Evidence for implementation. The Ministry of Health and BC Partners for Mental Health and Addictions Information initiated a broad Information Plan to Promote Mental Health in May 2003.	Falls within scope and mandate of health authorities.
Multi-gate screening leading to "close in" follow-up and care for high-risk individuals.	PACE clinic – ultra high-risk individuals followed closely and engaged in low-dose atypical antipsychotic medication and cognitive therapy (McGorry et al., 2002).	Evidence for implementation. Warrants ongoing clinical research.	Falls within scope and mandate of health authorities.

9.7 Suicide

According to WHO estimates, in 2001 approximately 849,000 people died from suicide worldwide (WHO, 2002b).

In 2004, 515 British Columbians killed themselves (British Columbia Coroners Service, 2005), a rate of approximately 12.3 per 100,000. Mid-life adults aged 30 to 59 comprised approximately 59 per cent of people committing suicide in British Columbia in 2004. Males comprise roughly 75 per cent of those who commit suicide in British Columbia. Suicide is the second leading cause of death among youth aged 15–24 years in BC (White, 2005).

Evidence-based risk factors for suicide include psychiatric disorders such as depression and schizophrenia; past or recent social stressors such as childhood adversities, sexual or physical abuse, unemployment, social isolation, serious economic problems; suicide among family, friends or peers; low access to psychological help; and access to means to commit suicide (WHO, 2004a; Hosman, Wasserman & Bertolote, 2005).

Although the history of planned attempts to reduce the community rate of suicides covers a number of decades, the availability of evidence evaluating the effectiveness of these attempts is meager—"the evidence regarding the prevention of suicide is not only scarce, but often lacks methodological rigor, leading most reviewers to conclude that there is insufficient evidence regarding what works best to prevent youth suicide" (White, 2005). The opportunity to find significant effects in controlled studies is hampered by the relatively low incidence of suicides and the ethical barriers to the use of randomized controlled trials. Nonetheless, emerging evidence suggests several promising areas for action.

The most effective universal approach remains reducing access to the means to commit suicide, while broad, multi-faceted, school-based approaches appear to have promise where they incorporate the systematic screening of adolescents using evidence-based suicide predictors.

Assessment, counseling and skills-training programs targeted at high-risk youth also show promise. Multiple randomized controlled trials support effective antidepressant treatment as a suicide prevention measure.

The clearest evidence for effectiveness in universal suicide prevention is linked to public measures to reduce access to the means to commit suicide—for example detoxification of domestic gas and car exhaust, safety measures on high buildings and bridges, control of availability of sedatives and painkillers and restricted access to pesticides (Leenars, 2001; WHO, 2006). The WHO (1998) has proposed the reduction of access to means of suicide as an essential strategic component of its "human–ecological" model for suicide prevention. While hanging is the most prevalent suicide method in British Columbia, the use of poisons, medications and drugs, alcohol, falls, carbon monoxide, firearms and other methods amenable to public measures to reduce access were involved in more than half of British Columbia suicides in 2004 (British Columbia Coroners Service, 2005).

Outcome studies examining telephone suicide prevention hotlines and crises centres have not shown these interventions to have an impact on suicide rates (WHO, 2004a). However, combining a telephone hotline with other services is promising. For example, in Veneto, Italy, a telephone helpline for the elderly was combined with a home visiting service. In a quasi-experimental study over a period of 11 years, a 71 per cent drop in suicides was observed among the 18,641 elderly service users compared to a comparable population group (DeLeo, Dello Buono & Dwyer, 2002).

Universal suicide education in school settings has failed to show any impact on suicide behaviours. There is some indication that such education may increase the number of students who consider suicide as a possible solution to their problems. However, more holistic, school-based suicide prevention approaches that combine suicide policies, staff training and crisis response capacity appear more successful.

For example, a Suicide Prevention and School Crisis Management Program was implemented in a public school district in Florida, covering around 330,000 children and adolescents at elementary and secondary school levels. This comprehensive program encompassed the implementation of a suicide prevention school policy, teacher training and consultation, education to parents, stress management and life skills curriculum for students and the establishment of a crisis team in each school. A five-year longitudinal study found a 63 per cent reduction in the annual number of suicides among students and a 64 per cent reduction in suicide attempts (Zenere & Lazarus, 1997).

Systematic direct screening of adolescents, using evidence-based suicide predictors, is considered an effective public health strategy to address adolescent suicide. Program evaluations, in some cases based on strong experimental designs, have been conducted to assess the effectiveness of school-based targeted prevention programs for adolescents at risk for dropping out. "Results indicate that brief, skill-based, social support enhancement interventions can be effective in reducing risks for suicide immediately after the program, 10 weeks later and at 9-month follow-up" (White, 2005, p. 23).

For example, 341 high-risk participants from seven secondary schools in the United States Pacific Northwest participated in a targeted, school-based suicide prevention study, and were randomly assigned to one of the following groups: (1) Counsellors CARE (C-CARE) – a face-to-face, 2-hour assessment interview followed by a 1–2 hour counseling session and social connections intervention with parents and school staff; (2) Coping and Support Training (CAST) - a combination of the C-CARE intervention, and 12, one hour, small group skills training and social support sessions that took place over 6 weeks; and (3) control group, which included a brief, 30-minute assessment interview and a social-connections intervention with school staff and parents. Results indicated that adolescents in all three groups showed a significant decrease in suicide risk behaviour and depression. Reductions in depression were primarily the result of the C-CARE component of the program. Significant effects were observed for all three groups in anger control, self-esteem, personal control and problem-solving skills (Eggert, Thompson, Randall & Pike, 2002).

Suicide rates among First Nations people are five to six times higher than rates in the general population (Child and Youth Officer for British Columbia, 2006), though rates are not consistent across all communities and many Aboriginal communities in BC report no suicides in recent years. First Nations suicide rates are associated with community efforts to promote culture and to exert local control over important aspects of community life; those communities with the greatest degree of local control have the lowest suicide rates (Provincial Health Officer, 2001). There are several recent reports that outline strategies for action to prevent youth suicide in Aboriginal communities, including Health Canada's 2003 report entitled *Acting on What We Know: Preventing Suicide in First Nations Youth*, and a 2006 special report from British Columbia's Child and Youth Officer entitled *Sayt K'üülm Goot – Of One Heart: Preventing Aboriginal Youth Suicide Through Youth and Community Engagement*.

Suicidal thoughts and suicide attempts are an integral part of various depressions, and suicide attempts are relatively common in major depression, more so in recurrent brief depression, and rates are further increased when these depressions occur together (Montgomery, 1997). Combined depression, where recurrent brief depression and major depression coexist, is the strongest clinical predictor of suicide attempts in the literature. Multiple randomized controlled trials have found evidence for a very significant reduction in suicides as a result of prescribing antidepressive drugs to individuals living with unipolar depression. Recent studies suggested that suicide attempts increased among patients during early treatment with antidepressive medication and led to public warnings of this risk; however, methodological problems have been identified with the classifications used by the studies that reported increases in attempted suicides associated with antidepressant medication, and a more methodical, anchored approach to categorizing suicidality is currently being applied by the United States Federal Drug Administration to audits of antidepressants, trials of anticonvulsants and trials of other centrally acting agents and non-psychotropic drugs (Posner, Oquendo, Gould, Stanley & Davies, 2007). Concurrently, two large observational studies that together examined the records of more than 325,000 American patients diagnosed with depression have concluded that treatment with antidepressive drugs has a protective effect for suicide attempts (Gibbons et al., 2007; Simon & Savarino, 2007).

Training general practitioners to recognize and treat depression in primary care can improve the quantity and quality of early depression treatment. The Health Evidence Network has produced a

synthesis report on the most effective diagnostic and therapeutic strategies for the management of depression (Health Evidence Network, 2005). One non-randomized Swedish study found that such training may reduce the number of inpatient days for depression among primary care patients and the number of suicides (Rutz, von Knorring & Walinder, 1992), while more a recent systematic review found physician education in depression recognition and treatment reduced suicide rates (Mann et al., 2005). However, effects were temporary, pointing to the need for booster sessions and replications of education programs (Hosman et al., 2005). Evidence from institutional settings suggests that interventions focusing on community gatekeepers, such as clergy, caregivers of older patients, and other significant community members are also promising (Mann et al., 2005).

Given the elevated suicide risk among individuals with bipolar disorder, some have surmised that effective treatment may also help prevent suicide in this population. In a systematic review, Burgess et al. (2001) indicated that lithium is an efficacious maintenance treatment for bipolar disorder. However, they did not find definitive evidence as to whether or not lithium has an anti-suicidal effect, and their review recommends outcomes relating to death and suicidal behaviour should be included in all future mood disorder maintenance studies.

Table 16 provides a summary of suicide prevention interventions.

Table 16: Interventions: Preventing Suicide

Intervention	Examples	Status	Appropriateness
Universal			
Reducing access to means through controlling the environment.	Control access to painkillers and sedatives and restrict access to pesticides; safety barriers on tall buildings and bridges; control access to firearms (Leenars, 2001; WHO, 2006).	Evidence for dissemination.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Holistic school-based suicide prevention approaches.	Suicide Prevention and School Crisis Management Program (Zenere & Lazarus, 1997).	Evidence for outcomes.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Selected			
Multi-component support – telephone hotline and home visiting for seniors.	Telephone hotline in combination with home visits (DeLeo et al., 2002).	Evidence for implementation. Warrants further research. Requires replication in North America.	Requires collaboration and advocacy with additional sectors.
Programs targeting adolescents screened for suicide predictors.	C-CARE for students at risk for school leaving (Eggert et al., 2002).	Evidence for outcomes.	Requires collaboration and advocacy with other health system partners, including the Ministry of Children and Family Development and the school system.
Indicated			
Education of physicians to recognize and treat depression through continuous education and ongoing booster sessions.	(Mann et al., 2005).	Evidence for dissemination.	Falls within scope and mandate of health authorities.

10.0 SUMMARY TABLES

Currently, there is a wide range of evidence-based mental disorder prevention interventions. Many interventions fall exclusively within the scope and mandate of health authorities. Some interventions are already included in standard care, such as optimal prenatal care and immunizations to prevent meningitis. Other interventions, such as individual parent training given by nurses in homes during pregnancy and after delivery for at-risk families, is available in some communities across the province, but is not standard care for all at-risk families. Table 17 presents a range of universal, selected and indicated interventions that fall within health authority scope and mandate. Implementing a range of programs from this table would be a useful first step.

However, a comprehensive approach to the prevention of mental disorders in British Columbia requires the health system to collaborate and partner with other sectors. The Ministry of Children and Family Development (MCFD) and the school system have central roles to play, especially as childhood is the optimal time for influencing developmental pathways. MCFD delivers a mix of facility-based and community-based mental health services through Child and Youth Mental Health Services, Youth Forensic Psychiatric Services and the Maples Adolescent Treatment Centre, while the Ministry of Health and health authorities provide medical services, emergency services for psychiatric crisis and acute care psychiatric services for children and youth. In 2003, MCFD released A Child and Youth Mental Health Plan for BC, a key component in an overall public health approach to mental health problems and mental disorders. Preventive programs delivered under the plan make a significant contribution to addressing population mental health issues over time.

British Columbia's school system, through the Ministry of Education and local school boards, also has a critical role to play. There is a growing understanding that health and educational outcomes are inextricably linked, and that schools are an ideal setting to accomplish both (WHO, 1999). The FRIENDS anxiety prevention program, sponsored jointly by the Ministry of Children and Family Development and the school system, is a potent example of the population-level mental disorder prevention benefits that can accrue through cross-sector collaboration. Table 18 presents a range of universal, selected and indicated interventions that require collaboration between and among the health system, the Ministry of Children and Family Development, and the school system.

Finally, all sectors that influence the social and economic determinants of health, or that deliver programs considered to be foundational components of British Columbia's and Canada's social safety net, have a crucial role to play. Public policies that promote protective factors (e.g., employment, mental health promoting workplaces, literacy and safe communities) and minimize risk factors (e.g., exposure to violence and trauma) underpin achievement of population-level mental disorder prevention outcomes. The health system has a role to play in supporting such programs both through direct collaboration where appropriate, and through ensuring that the available evidence on the health and economic benefits of such programs contributes to informed public discourse. Table 19 provides examples of interventions that require health system collaboration and engagement with additional sectors.

Table 17: Interventions that Fall Within the Scope and Mandate of Health Authorities

Intervention	Status
Universal	
Availability of safe and legal services for the termination of unwanted pregnancies in a health care setting.	Current standard of care.
Optimal prenatal care to reduce likelihood of low birth weight.	Current standard of care.
Behavioural interventions to encourage women to reduce or stop substance use during pregnancy.	Current standard of care.
Immunization to prevent vaccine-preventable, disease-linked neurodevelopmental problems, and behavioural and psychological problems.	Current standard of care.
Exercise programs for children.	Evidence for implementation. Larger studies needed, but worthy of consideration given established physical health benefits.
Selected	
Individual parent training given by nurses in homes.	Evidence for dissemination. Exceptionally long follow-up has demonstrated sustained outcomes through early adult years.
Proactive geriatric consultation to prevent and reduce severity of post-surgical delirium.	Evidence for implementation.
Psycho-educational interventions for family caregivers of older adults.	Evidence for outcomes.
Public health nurse or midwife-delivered postpartum support to prevent maternal depression.	Evidence for implementation.
Indicated	
Brief interventions in primary care to reduce risky alcohol use among adults and seniors.	Evidence for dissemination.
Treatment of vascular disease to prevent or delay the onset of dementia.	Evidence for outcomes. Dissemination recommended given corollary benefits. Current standard of care.
Early warning signs interventions for people with bipolar disorder or manic depressive psychosis.	Evidence for implementation.
Cognitive behavioural therapy for survivors of trauma.	Evidence for dissemination.
Cognitive intervention after first panic attack experience to prevent panic disorder onset.	Evidence for implementation.
Multimedia campaigns and mental health literacy to reduce delays in the early detection sector.	Evidence for implementation. The Ministry of Health and BC Partners for Mental Health and Addictions Information initiated a broad Information Plan to Promote Mental Health in May 2003.
Multi-gate screening leading to "close in" follow-up and care for high-risk individuals.	Evidence for implementation. Warrants ongoing clinical research.
Education of physicians to recognize and treat depression through continuous education and ongoing booster sessions, in order to prevent suicide.	Evidence for dissemination.

Table 18: Interventions that Require Health Authority Collaboration with the Ministry of Children and Family Development and the School System

Intervention	Status
Universal	
Multi-component youth development programs to reduce pregnancy rates among adolescents.	Evidence for outcomes. Dissemination recommended given corollary benefits.
Mastery learning methods and Good Behavior Game.	Evidence for outcomes.
Ecological approaches that promote school connectedness through classroom, whole school and school/community strategies.	Evidence for dissemination.
Multi-component approaches to influence social environments to prevent bullying.	Evidence for implementation.
School-based cognitive behavioural programs to prevent anxiety.	Evidence for dissemination. The Ministry of Children and Family Development and the school system have scaled up the FRIENDS program for grade 4 and 5 children in BC schools.
School-based social influence and harm reduction skills training interventions to reduce and prevent early drug use.	Evidence for dissemination.
Multi-setting school- and community-based social influence interventions to reduce and prevent early drug use.	Evidence for dissemination.
Child and youth programs with a significant family focused component to prevent and reduce early drug use.	Evidence for implementation. Research ongoing in various jurisdictions.
Holistic school-based suicide prevention approaches.	Evidence for outcomes.
Selected	
Multi-component home and preschool programs for children of low income, low birth weight or low education backgrounds.	Evidence for dissemination.
School-based cognitive behavioural coping skills programs for children of divorced parents.	Evidence for implementation. Requires further replication and evaluation in diverse settings.
Preventing mood disorders through cognitive behavioural therapy for at-risk school-aged children.	Evidence for dissemination.
Cognitive behavioural anxiety prevention program for at-risk school-aged children.	Evidence for dissemination.
Programs targeting adolescents screened for suicide predictors.	Evidence for outcomes.
Improving secondary school graduation rates – school system efforts to reach and retain in formal educational programs those at risk for school leaving.	Evidence for implementation. Dissemination recommended given corollary benefits.
School feeding programs targeting disadvantaged elementary school children.	Evidence for implementation. Dissemination recommended given corollary benefits.
Extra efforts to improve literacy of those who are falling behind academically	Recommended given corollary benefits.
Improving literacy and numeracy for school leavers and low literacy adults.	Dissemination recommended given corollary benefits.
Indicated	
Multi-component intervention for children identified as having conduct problems in kindergarten.	Evidence for dissemination.
School-based social skills training for disruptive 7-year-old boys, and home-based training for their parents.	Evidence for implementation.
Cognitive behavioural program for school-aged children with anxiety symptoms.	Evidence for implementation.

Intervention	Status
Cognitive therapy for adolescent children of parents with psychiatric problems and subclinical depressive symptoms, or a past episode of major depression.	Evidence for dissemination.
Anxiety prevention programs for indicated children and adolescents as an indirect strategy for reducing the risk of depression.	Evidence for outcomes.
Universal, with Selected Components	
Multi-level family intervention, with self-help materials, positive parent training, intensive training and support for high-risk families.	Evidence for outcomes.

Table 19: Interventions that Require Health System Collaboration with Additional Sectors

Intervention	Status
Universal	
Prevention of craniocerebral traumas earlier in life to prevent or delay onset of dementia.	Evidence for outcomes. Recommended given corollary benefits.
Minimize exposure to workplace hazards, violence.	Recommended given corollary benefits.
Prevention of suicide by controlling the environment to reduce access to means.	Evidence for dissemination.
Interventions that function simultaneously at multiple levels to strengthen community networks	Evidence for dissemination.
Pricing mechanisms to maintain or increase the price of legal substances.	Evidence for dissemination.
Regulation of the physical availability of alcohol.	Evidence for dissemination.
Iodized salt to address iodine deficiency disorder.	Evidence for dissemination.
Selected	
Exercise Programs for seniors.	Evidence for implementation. Warrants further research, merits support given established physical health benefits.
Jobs skills programs that incorporate social support, job search skills motivation and coping skills for those who lose their employment.	Recommended given corollary benefits.
Befriending programs for older women.	Evidence for implementation.
Housing improvement programs involving safety, repairs, quality, location and suitability.	Evidence for implementation. Dissemination recommended given corollary benefits.
Multi-component support – telephone hotline and home visiting for seniors to prevent suicide.	Evidence for implementation. Warrants further research. Requires replication in North America.
Identify patterns of mental health inequalities across the province, and focus preventive efforts on reaching and engaging vulnerable population groups.	Evidence for dissemination.

11.0 CONCLUSION, AND INTERVENTIONS RECOMMENDED FOR DISSEMINATION AND HEALTH SYSTEM SUPPORT IN BRITISH COLUMBIA

The burden of illness and disability associated with mental disorders is large, and presents significant health and fiscal costs to individuals, communities and society. The only sustainable approach to addressing this burden involves expanding the continuum of response to mental disorders to incorporate evidence-based prevention and mental health promotion. This report presents an array of individual, family, community and societal interventions that influence risk factors, protective factors and developmental pathways, and ultimately contribute to the prevention of some mental disorders.

Effective prevention across the continuum of mental disorders and in whole populations requires more research to expand the spectrum of interventions. Nevertheless, current evidence provides many options to program planners and policy-makers. Some interventions are "stand-alone," and fall within the scope and mandate of health authorities, while others require partnership and collaboration across sectors. Whether delivered directly by health authorities, or in partnership with other sectors, sustainable implementation is enhanced by selecting programs that build on existing infrastructures and resources. Wherever possible, mental disorder prevention efforts should be structurally integrated with existing health programs and social policies in schools, workplaces and communities.

Policy-makers and program planners must invest the limited resources dedicated to prevention efforts in programs and interventions for which there is good evidence to support their dissemination. Evidence for dissemination means these interventions have been shown to be effective in both research settings and "real world" applications, and follow-up has demonstrated sustained effects over time.

Policy-makers and program planners must also consider multi-outcome interventions that increase the cost-effectiveness of prevention approaches. A historically compartmentalized view of mental, social, educational, behavioural and legal problems means the evidence base to support efforts that simultaneously address common risk factors or related problems is not well developed. Yet it is the accumulation of outcomes across health and social domains that offer the most convincing arguments for investment in prevention (WHO, 2004a). By addressing multiple outcomes, interventions can reduce the risk of mental disorders, improve mental and physical health, and generate broader social and economic benefits.

Table 20 lists strategies and interventions where evidence for primary mental disorder prevention outcomes supports their dissemination in British Columbia through the health system, or in partnership with allied sectors. Table 21 lists strategies or interventions—some of which are current standards of care—with primary outcomes in the physical health and social domains. These interventions simultaneously address evidence-based risk and protective factors for mental disorders and also merit health system advocacy and support. These interventions should provide the foundation for a prevention response to mental disorders in British Columbia.

Table 20: Evidence for Dissemination – Mental Disorder Prevention Effects as a Primary Outcome

Application	Intervention
Universal	• Ecological approaches that promote school connectedness through classroom, whole school and school/community strategies. • School-based cognitive behavioural programs to prevent anxiety. • School-based social influence and harm reduction skills training interventions to reduce and prevent early drug use. • Prevention of suicide by controlling the environment to reduce access to means. • Interventions that functions simultaneously at multiple levels to strengthen community networks. • Pricing mechanisms to maintain or increase the price of legal substances. • Regulation of the physical availability of alcohol. • Iodized salt to address iodine deficiency disorder.
Selected	• Multi-component home and preschool programs for children of low income, low birth weight or low education backgrounds. • Individual parent training given by nurses in homes. • Preventing mood disorders through cognitive behavioural therapy for at-risk school-aged children. • Identify patterns of mental health inequalities across the province, and focus preventive efforts on reaching and engaging vulnerable population groups.
Indicated	• Brief interventions in primary care to reduce risky alcohol use. • Cognitive behavioural therapy for survivors of trauma. • Multimedia campaigns and mental health literacy to reduce delays in the early detection of psychosis. • Education of physicians to recognize and treat depression through continuous education and ongoing booster sessions, in order to prevent suicide. • Multi-component intervention for children identified as having conduct problems in kindergarten. • Cognitive therapy for adolescent children of parents with psychiatric problems and subclinical depressive symptoms, or past episode of major depression.

Table 21: Recommended Given Corollary Benefits – Mental Disorder Prevention Effects as a Secondary Outcome

Application	Intervention
Current Standard of Care	• Availability of safe and legal services for the termination of unwanted pregnancies in a health care setting. • Optimal prenatal care to reduce likelihood of low birth weight. • Behavioural interventions to encourage women to reduce or stop substance use during pregnancy. • Immunization to prevent vaccine-preventable, disease-linked neurodevelopmental problems, and behavioural and psychological problems. • Treatment of vascular disease to prevent or delay the onset of dementia.
Delivered with, or by, Allied Sector – Merits Health System Advocacy/Support	• Prevention of craniocerebral traumas earlier in life to prevent or delay onset of dementia. • Jobs skills programs that incorporate social support, job search skills motivation and coping skills for those who lose their employment. • Housing improvement programs involving safety, repairs, quality, location and suitability. • Literacy and numeracy programs for school leavers and low literacy adults. • School system efforts to reach and retain in formal educational programs those at risk for school leaving. • School feeding programs targeting disadvantaged elementary school children. • Exercise programs for children. • Exercise programs for seniors. • Minimize exposure to workplace hazards, violence. • Multi-component youth development programs to reduce pregnancy rates among adolescents.

REFERENCES

Adlaf, E.M. & Paglia, A. (2002). The mental health and well-being of Ontario students: Findings from the OSDUS 1991-2001. *Centre for Addiction and Mental Health Research Document Series No. 11*. Toronto: Centre for Addiction and Mental Health.

Advisory Committee on Population Health and Health Security. (2004). *Reducing health disparities—Roles of the health sector*. Ottawa, ON: Health Disparities Task Group, Advisory Committee on Population Health and Health Security.

Amato, L., Minozzi, S., Pani, P.P., & Davoli, M. (2007). Antipsychotic medications for cocaine dependence. *Cochrane Database of Systematic Reviews, 1*.

American Psychiatric Association. (1999). *Practice guideline for the treatment of patients with delirium.* Washington, DC: Author.

Anderson, A.R., Christenson, S.L., Sinclair, M.F., & Lehr, C.A. (2004). Check & connect: The importance of relationships for promoting engagement with school. *Journal of School Psychology, 42*, 95–113.

Anderson, P., Biglan, A., & Holder H. (2005). Preventing the harm done by substances. In C. Hosman, E. Jané-Llopis, & S. Saxena, (Eds.), *Prevention of mental disorders: Effective interventions and policy options*. Oxford: Oxford University Press.

Andersson, M., Takkouche, B., Egli, I., Allen, H.E., & de Benoist, B. (2005). Current global iodine status and progress over the last decade towards the elimination of iodine deficiency. *Bulletin of the World Health Organization, 83*(7), 518–525.

Aronen, E., & Kurkela, S. (1996). Long-term effects of an early home-based intervention. *Journal of the American Academy of Child and Adolescent Psychiatry, 1996, 35*, 1665–1672.

Astbury, J. (2006). *Gender and mental health. Global Health Equity Initiative/Gender and Health Equity Project*. Cambridge, MA: Harvard Center for Population and Development Studies. Retrieved February 25, 2007, from http://www.grhf.harvard.edu/HUpapers/gender/astbury.pdf.

Babor, T., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Hill, L., et al. (2003). *Alcohol: No ordinary commodity – research and public policy.* Oxford: Oxford University Press.

Bachar, E., Canetti, L., Kaplan De-Nour, A., Galili-Weisstub, E., & Shalev, A.Y. (1997). Parental bonding and mental health in adolescence. *Adolescence, 32*(126), 381–395.

Barlow, J. & Coren, E. (2000). Parenting programs for improving maternal psychosocial health. *Cochrane Database of Systematic Reviews, 3*.

Barrera, M., Biglan, A., Taylor, T.K., Gunn, B.K., Smolkowski, K., Black, C., et al. (2002). Early elementary school intervention to reduce conduct problems: A randomized trial with Hispanic and non-Hispanic children. *Prevention Science, 3*, 83–94.

Barrett, P.M., Farrell, L.J., Ollendick, T.H., & Dadds, M. (2006). Long-term outcomes of an Australian universal prevention trial of anxiety and depression symptoms in children and youth: An evaluation of the Friends Program. *Journal of Clinical Child & Adolescent Psychology, 35*(3), 403–411.

Beardslee, W., Solantaus, T., & van Doesum, K. (2005). Coping with parental mental illness. In C. Hosman, E. Jané-Llopis, & S. Saxena (Eds.), *Prevention of mental disorders: Effective interventions and policy options*. Oxford, Oxford University Press.

Beardslee, W.R., Keller, M.B., Lavori, P.W., Klerman, G.K., Dorer, D.J., & Samuelson, H. (1988). Psychiatric disorder in adolescent offspring of parents with affective disorder in a non-referred sample. *Journal of Affective Disorders, 15,* 313–319.

Beck, C. (1996). A meta-analysis of predictions of postpartum depression. *Nursing Research 45,* 297–303.

Beck, C. (2001). Predictors of postpartum depression: An update. *Nursing Research, 50,* 275–285.

Beer, M. (1995). Psychosis: From mental disorder to disease concept. *History of Psychiatry, 6*(22, part 2), 177–200.

Beiser, M., Hou, F., Hyman, I., & Tousignant, M. (1998). *Growing up Canadian—A study of new immigrant children* [Working Paper Series SP-378-02-01E W-98-24E]. Ottawa, ON: Applied Research Branch, Strategic Policy, Human Resources Development Canada. Retrieved October 2008, from http://www.hrsdc.gc.ca/en/cs/sp/sdc/pkrf/publications/research/1998-000142/page01.shtml.

Bell, R. (1992). Multiple risk cohorts and segmenting risk as solutions for the problems of false positives in risk for the major psychoses. *Psychiatry, 55,* 370–381.

Berrueta-Clement, J.R., Schweinhart, L.J., Bamett, W.S., Epstein, A.S., & Weikart, D.P. (1984). *Changed lives: the effects of the Perry preschool program on youths through age 19*. Ypsilanti, MI: High/Scope Press.

Bond, L., Butler, H., Thomas, L., Carlin, J.B., Glover, S., Bowes, G. et al. (2007). Social and school connectedness in early secondary school as predictors of late teenage substance use, mental health and academic outcomes. *Journal of Adolescent Health 40*(4), 357e9–357e18.

Boulton-Jones, C., & McInneny, K. (1995). Teenage pregnancy and deprivation. *British Medical Journal, 310,* 398–399.

Boyle, M.H., Cunningham, C.E., Heale, J., Hundert, J., McDonald, J., Offord, D.R., et al. (1999). Helping children adjust – A Tri-Ministry study: Evaluation methodology. *Journal of Child Psychology and Psychiatry, 4,* 1051–1060.

Bridge, C., Flatau, P., Whelan, S., Wood, G., & Yates, J. (2007). How does housing assistance affect employment, health and social cohesion? A systematic review. *Australian Housing and Urban Research Institute Research & Policy Bulletin, 87*. Melbourne: Australian Housing and Urban Research Institute.

British Columbia Coroners Service. (2005). *Suicide statistics*. Burnaby, BC: Author. Retrieved February 3, 2007, from http://www.pssg.gov.bc.ca/coroners/statistics/pdfs/SUICIDE_IN_BC.pdf.

Brown, H. & Sturgeon, S. (2005). Promoting a healthy start of life and reducing early risks. In C. Hosman, E. Jané-Llopis, & S. Saxena (Eds.), *Prevention of mental disorders: Effective interventions and policy options*. Oxford, Oxford University Press.

Brown, R., Perlesz, A., & Proctor, K. (2002). Mental health issues for GLBTI Victorians. In W. Leonard (Ed.), *What's the difference? Health issues of major concern to gay, lesbian, bisexual, transgender and intersex Victorians: A research paper.* Melbourne: Rural and Regional Health and Aged Care Services Division, Victorian Government Department of Human Services.

Bryant, R.A., Harvey, A.G., Dang, S.T., Sackville, T., & Basten, C. (1998). Treatment of acute stress disorder: A comparison of cognitive-behavioral therapy and supportive counseling. *Journal of Consulting and Clinical Psychology, 66*, 862–866.

Bryant, R.A., Sackville, T., Dang, S.T., Moulds, M., & Guthrie, R. (1999). Treating acute stress disorder: An evaluation of cognitive behavior therapy and counseling techniques. *American Journal of Psychiatry, 156*, 1780–1786.

Burgess, S., Geddes, J., Hawton, K., Townsend, E., Jamison, K., & Goodwin, G. (2001). Lithium for maintenance treatment of mood disorders. *Cochrane Database of Systematic Reviews, 3*.

Carnethon, M., Biggs, M., Barzelay, J., Smith, M., Vaccarino, B., Bertoni, A., et al. (2007). Longitudinal association between depressive symptoms and incident type 2 diabetes mellitus in older adults. *Archives of Internal Medicine, 167*(8), 802–807.

Centers for Disease Control and Prevention & Massachusetts Department of Education. (1997). *1997 Massachusetts Youth Risk Behavior Survey Results.* Malden, MA. & Atlanta GA: Authors.

Centers for Disease Control and Prevention. (1986). Rubella and congenital rubella syndrome—New York City. *Morbidity and Mortality Weekly Report, 35*(50), 770–774, 779.

Centers for Disease Control and Prevention. (1989). Measles prevention: Recommendations of the Immunization Practices Advisory Committee. *Morbidity and Mortality Weekly Report, 38*(S–9), 1–18.

Centers for Disease Control and Prevention. (1991). Diptheria, tetanus and pertussis: Recommendations for vaccine use and other preventive measures—recommendations of

the Immunization Practices Advisory Committee. *Morbidity and Mortality Weekly Report, 40*, RR–10.

Centers for Disease Control and Prevention. (1998). Health-related quality of life and activity limitation—Eight states, 1995. *Morbidity and Mortality Weekly Report, 47*, 134–140.

Chikritzhs, T. & Stockwell, T.R. (2002). The impact of later trading hours for Australian public houses (hotels) on levels of violence. *Journal of Studies on Alcohol, 63*(5), 591–599.

Child and Youth Officer for British Columbia. (2006). *Special report: Sayt K'üülm Goot – Of one heart: Preventing Aboriginal youth suicide through youth and community engagement*. Victoria, BC. Author. Retrieved September 11, 2008, from http://www.rcybc.ca/Groups/Archived%20Reports/cyo_of_one_heart_web.pdf.

Chronis, A.M., Chacko, A., Fabiano, G.A., Wymbs, B., & Pelham, W.E. (2004). Enhancements to the behavioural parent training paradigm for families of children with ADHD: Review and future directions. *Clinical Child and Family Psychology Review, 7*(1), 2–27.

Citizenship and Immigration Canada, Research and Evaluation Branch. (2006). *Facts and figures: Immigration overview - permanent and temporary residents, 2005*. Ottawa, ON: Author. Retrieved July 15, 2008, from http://www.cic.gc.ca/ENGLISH/resources/statistics/facts2005/index.asp.

Clarke, G., Hawkins, W., Murphy, M., Sheeber, L., Lewinsohn, P. & Seeley, J. (1995). Targeted prevention of unipolar depressive disorder in an at-risk sample of high school adolescents: A randomized trial of group cognitive intervention. *Journal of the American Academy of Child and Adolescent Psychiatry, 34*, 312–321.

Clarke, G., Hornbrook, M., Lynch, F., Polen, M., Gale, J., Beardslee, W., et al. (2001). A randomized trial of a groupcognitive intervention for preventing depression in adolescent offspring of depressed parents. *Archives of General Psychiatry, 58*, 1127–1134.

Cochran, S., Mays, V., Bowen, D., Gage, S., Bybee, D., Roberts, S., et al. (2001). Cancer related risk behaviors and preventive screening behaviors among lesbians and bisexual women. *American Journal of Public Health, 91,* 591–597.

Cochran, S.D. & Mays, V. (2000) Lifetime prevalence of suicidal symptoms and affective disorders among men reporting same sex sexual partners: Results from NHANES III. *American Journal of Public Health, 90*, 573–578.

Coie, J.D., Watt, N.F., West, S.G, Hawkins, J.D., Asarnow, J.R., Markman, H.J., et al. (1993). The science of prevention: A conceptual framework and some directions for a national research program. *American Psychologist, 48*, 1013–1022.

Committee of Supply. (2004). *British Columbia debates of the Legislative Assembly, 22*(1), 9411, sec.1055.

Conduct Problems Prevention Research Group (2002). Evaluation of the first three years of the Fast Track Prevention Trial with children at high risk for adolescent conduct problems. *Journal of Abnormal Child Psychology, 30*, 19–35.

Cooper, B. (2002). Thinking preventively about dementia. *International Journal of Geriatric Psychiatry, 17*, 895–906.

Coren, E. & Barlow, J. (2002). Individual and group-based parenting programs for improving psychosocial outcomes for teenage parents and their children. *The Campbell Database for Systematic Reviews, C2-RIPE. Social welfare domain.*

Cunningham, C., Bremner, R., & Boyle M. (1995). Large group community-based parenting programs for families of pre-schoolers at risk for disruptive behavior disorders: Utilization, cost effectiveness and outcome. *Journal of Child Psychology and Psychiatry, 36*, 1141–1159.

Dadds, M.R., Spence, S.H., Hollands, D.E., Barrett, P.M., & Laurens, K. (1997). Prevention and early intervention for anxiety disorders: A controlled trial. *Journal of Consulting and Clinical Psychology, 65*(4), 627–635.

Dallastown Area School District. (2006). *Communities that care. Overview of programs*. Retrieved May 21, 2007, at http://www.dallastown.net/2905809895658/blank/browse.asp?A=383&BMDRN=2000&BCOB=0&C=47383.

Degenhardt, L., Hall, W., & Lynskey, M. (2001). Comorbidity between cannabis use and psychosis: Modeling some possible relationships. *NDARC Technical Report No. 121*. Sydney, Australia: National Drug and Alcohol Research Centre.

DeLeo, D., Dello Buono, M., & Dwyer, J. (2002). Suicide among the elderly: The long-term impact of a telephone support and assessment intervention in northern Italy. *British Journal of Psychiatry, 181*, 226–229.

Dennis, C-L & Creedy, D. (2004). Psychosocial and psychological interventions for preventing postpartum depression. *Cochrane Database of Systematic Reviews, 4.*

Detels, R., McEwan J., & Beaglehole, J. (Eds.). (2002). *Oxford Textbook of Public Health* (4th ed). Oxford: Oxford University Press.

Dhopesh, V.P., Cristancho, P., & Caroff, S. (2007, April). Magnan-Suary's sign revisited: Case report. *Resident and Staff Physician, 53*, 4. Retrieved September 11, 2008, from http://www.residentandstaff.com/issues/articles/2007-04_04.asp.

Dishion, T. & Andrews, D. (1995). Preventing escalation in problem behaviors with high-risk adolescents: Immediate and one-year outcomes. *Journal of Consulting and Clinical Psychology, 63*, 538–548.

Domitrovich, C., Weare, K., Elias, M., Greenberg, M., & Weissberg, R. (2005). Enhancing resilience and reducing risk behaviour in schools. In C. Hosman, E. Jané-Llopis, & S. Saxena, (Eds.), *Prevention of mental disorders: Effective interventions and policy options*. Oxford: Oxford University Press.

Dynarski, M. & Gleason, P. (1998). *How can we help? What we have learned from evaluations of federal dropout-prevention programs*. Princeton, NJ: Mathematica Policy Research, Inc.

Echeburua, E., deCorral, P., Sarasua, B., & Zubizarreta, I. (1996). Treatment of acute post traumatic stress disorder in rape victims: An experimental study. *Journal of Anxiety Disorders, 10,* 185–199.

Eckenrode, J., Zielinski, D., Smith, E., Marcynyszyn, L.A., Henderson, C.R., Kitzman, H., et al. (2001). Child maltreatment and the early onset of problem behaviors: Can a program of nurse home visitation break the link? *Development and Psychopathology, 13*, 873–890.

Eddy, J.M. (2005). Prevention of conduct disorders, violence and aggression. In C. Hosman, E. Jané-Llopis, & S. Saxena, (Eds.), *Prevention of mental disorders: Effective interventions and policy options*. Oxford: Oxford University Press.

Eggert, L., Thompson, E., Randell, B., & Pike, K. (2002). Preliminary effects of brief school-based prevention approaches for reducing youth suicide – Risk behaviours, depression, and drug involvement. *Journal of Child and Adolescent Psychiatric Nursing, 15*, 48–64.

Eisenberg, M. & Resnick, M. (2006). Suicidality among gay, lesbian and bisexual youth: The role of protective factors. *Journal of Adolescent Health, 39*(5), 662–668.

Ekeland, E., Heian, F., Hagen, K.B., Abbott, J., & Nordheim, L. (2004). Exercise to improve self-esteem in children and young people. *The Campbell Database for Systematic Reviews, C2-RIPE. Social welfare domain.*

Elliott, D.S., Huizinga, D., & Menard, S. (1989). *Multiple problem youth: Delinquency, substance use and mental health problems.* New York: Springer-Verlag.

Evans, G.W. (2003). The built environment and mental health. *Journal of Urban Health: Bulletin of the New York Academy of Medicine, 80*(4), 536–555.

Faggiano, F., Vigna-Taglianti, F.D., Versino, E., Zambon, A., Borraccino, A., & Lemma, P. (2005). School-based prevention for illegal drugs use. *Cochrane Database of Systematic Reviews, 2*.

Farrell, L.J. & Barrett, P.M. (2007). Prevention of childhood emotional disorders: Reducing the burden of suffering associated with anxiety and depression. *Child and Adolescent Mental Health, 12*(2), 58–65.

Feldman, M. & Meyer, I. (2007). Eating disorders in diverse lesbian, gay and bisexual populations. *International Journal of Eating Disorders, 40*(3), 218–226.

Ford, C. (2004). *Guidance for working with cocaine and crack users in primary care*. London, UK: Royal College of General Practitioners.

Forette, F., Seux, M.L., Staessen, J.A., Thijs, L., Babarskiene, M., Babeanu, S., et al. (2002). The prevention of dementia with antihypertensive treatment: New evidence from the Systolic Hypertension in Europe (Syst-Eur) study. *Archives of Internal Medicine, 162*(18), 2046–2052.

Forette, F., Seux, M.L., Staessen, J.A., Thijs, L., Birkenhager, W.H., Babarskiene, M.R., et al. (1998). Prevention of dementia in randomized double-blind placebo-controlled Systolic Hypertension in Europe (Syst-Eur) trial. *Lancet, 352*(9137), 1347–1351.

Foxcroft, D.R., Ireland, D., Lowe, G., & Breen, R. (2002). Primary prevention for alcohol misuse in young people. *Cochrane Database of Systematic Reviews, 3*.

Gardenswartz, C.A. & Craske, M.G. (2001). Prevention of panic disorder. *Behavior Therapy, 32*(4), 725–737.

Garofalo, R., Wolf, R.C., Wissow, L.S., Woods, E.R., & Goodman E. (1999). Sexual orientation and risk of suicide attempts among a representative sample of youth. *Archives of Pediatric Adolescent Medicine, 135*(5), 487–493.

Gibbons, R.D., Brown, C.H., Kwan, H., Marcus, S., Bhaumik, D.K. & Mann, J.J. (2007). Relationship between antidepressants and suicide attempts: An analysis of the veterans health administration data sets. *American Journal of Psychiatry, 164,* 1044–1049.

Gidron, Y., Gal, R., Freedman, S.A., Twiser, I., Lauden, A., Snir, Y., et al. (2001). Translating research findings to PTSD prevention: Results of a randomized-controlled pilot study. *Journal of Traumatic Stress, 14*(4), 773–780.

Gilman, S.E., Cochran, S.D., Mays, V. M., Hughes, M., Ostrow, D., & Kessler, R.C. (2001). Prevalence of DSM-III-r disorders among individuals reporting same-gender sexual partners in the National Co-morbidity Survey. *American Journal of Public Health, 91*(6), 933–939.

Gilman, S.E., Kawachi, I., Fitzmaurice, G.M., & Buka, S.L. (2002). Socio-economic status in childhood and the lifetime risk of major depression. *International Journal of Epidemiology, 3,* 359–367.

Global Business and Economic Roundtable on Addiction and Mental Health. (2006). *2006 business and economic plan for mental health and productivity—an agenda for progress: reducing the social and economic burden of mental disabilities in the workplace.* Toronto: Author.

Goepfert, M., Webster, J., & Seeman, M. (Eds.). (1996). *Parental psychiatric disorder—distressed parents and their families.* Cambridge: Cambridge University Press.

Good, K.P., Kiss, I., Buiteman, C., Woodley, H., Rui, Q., Whitehorn, D., et al. (2002). Improvement in cognitive functioning in patients with first-episode psychosis during treatment with quetiapine: An interim analysis. *British Journal of Psychiatry, 181*(Suppl. 43), s45–s49.

Green, L.W. & Kreuter, M.W. (1999). *Health promotion planning: An educational and ecological approach* (3rd ed.). Mountain View: Mayfield Publishing.

Grierson, J., Bartos, M., de Visser, R., & McDonald, K. (2000). *HIV Futures 11: The health and well-being of people living with HIV/AIDS in Australia.* Melbourne: The Living with HIV Program at The Australian Research Centre in Sex, Health and Society, Latrobe University.

Grossman, D.C., Neckerman, H.J., Koepsell, T.D., Liu, P.Y., Asher, K.N., Beland, K., et al. (1997). Effectiveness of a violence prevention curriculum among children in elementary school: A randomized controlled trial. *Journal of the American Medical Association, 277,* 1605–1611.

Gross-Tsur, V., Joseph, A,, & Shalev, R.S. (2004). Hallucinations during methylphenidate therapy. *Neurology, 63,* 753–754.

Guck, T., Kavan, M., Elsasser, G., & Barone, E. (2001, August 15). Assessment and treatment of depression following myocardial infarction. *American Family Physician, 64*(4).

Haight, B., Michel, Y., & Hendrix S. (1998). Life review: Preventing despair in newly relocated nursing home residents: Short-and long-term effects. *International Journal of Aging and Human Development, 47,* 119–142.

Hallberg, I. (1999). Impact of delirium on professionals. *Dementia and Geriatric Cognitive Disorders, 10,* 420–425.

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

Hawkins, J.D., Catalano, R.F., & Arthur, M.W. (2002). Promoting science-based prevention in communities. *Addictictive Behavior, 27,* 951–976.

Health Canada. (2003). *Acting on what we know: Preventing suicide in First Nations youth.* A report of the Suicide Prevention Advisory Group. Ottawa, ON: Author.

Health Evidence Network. (2005). *What are the most effective diagnostic and therapeutic strategies for the management of depression in specialist care?* Copenhagen: World Health Organization.

Heather, N. (2004). Brief interventions. In N. Heather & T. Stockwell (Eds.), *The essential handbook of treatment and prevention of alcohol problems* (pp. 117–138). John Wiley and Sons.

Henquet, C., Murray, R., Linszen, D., & van Os, J. (2005). The environment and schizophrenia: The role of cannabis use. *Schizophrenia Bulletin, 31*(3), 608–612.

Hickson, F., Weatherburn, P., Reid, D., Jessop, K., & Hammond, G. (2007). *Consuming passions: Findings from the 2005 Gay Men's Sex Survey.* London: Sigma Research & Terrence Higgins Trust.

Hoek, H., Brown, A., Susser, E. (1998). The Dutch famine and schizophrenia spectrum disorders. *Social Psychiatry and Psychiatric Epidemiology*, *33*(8), 373–379.

Hoerr, S.L., Bokram, L., Lugo, B., Bivins, T., & Keast, D.R. (2002). Risk for disordered eating relates to both gender and ethnicity for college students. *Journal of the American College of Nutritionists, 21*, 307–314.

Holder, H.D., Treno, A., & Levy, D. (2005). Community systems and ecologies of drug and alcohol problems. In T. Stockwell, P. Gruenewald, J. Toumbourou, & W. Loxley (Eds), *Preventing harmful substance use: The evidence base for policy and practice* (pp. 149–162). John Wiley and Sons.

Homel, R., McIlwain, G., & Carvolth, R. (2001). Creating safer drinking environments. In N. Heather, T.J. Peters, & T. Stockwell, T. (Eds), *International handbook of alcohol dependence and problems* (pp. 721–740). John Wiley and Sons.

Hosman, C. (2005). Prevention of eating disorders. In: C. Hosman, E. Jané-Llopis, & S., Saxena (Eds.), *Prevention of mental disorders: Effective interventions and policy options*. Oxford: Oxford University Press.

Hosman, C., Dadds, M., & Raphael, B. (2005). Prevention of anxiety disorders. . In C. Hosman, E. Jané-Llopis, & S. Saxena, (Eds.), *Prevention of mental disorders: Effective interventions and policy options*. Oxford: Oxford University Press.

Hosman, C., Jané-Llopis, E, & Saxena, S. (in press). *Prevention of mental disorders: Effective interventions and policy options*. Geneva: World Health Organization.

Hosman, C., Wasserman, D., & Bertolote, J. (2005). Suicide prevention. In C. Hosman, E. Jané-Llopis, & S. Saxena, (Eds.), *Prevention of mental disorders: Effective interventions and policy options*. Oxford: Oxford University Press.

Howard, L.M., Hoffbrand, S., Henshaw, C., Boath, L., & Bradley, E. (2005). Antidepressant prevention of postnatal depression. *Cochrane Database of Systematic Reviews, 2*.

Hundert, J., Boyle, M.H., Cunningham, C.E., Duku, E., Heale, J., McDonald, J., et al. (1999). Helping children adjust – A Tri-Ministry study: II. Program effects. *Journal of Child Psychology and Psychiatry, 40,* 1061–1073.

Hutchings, J., Gardner, F., Bywater, T., Daley, D., Witaker, C., Jones, K., et al. (2007). Parenting intervention in Sure Start services for children at risk of developing conduct disorder: Pragmatic randomized control trial. *British Medical Journal, 334*, 678.

Ialongo, N., Poduska, J., Werthamer, L., & Kellam, S. (2001). The distal impact of two first-grade preventive interventions on conduct problems and disorder in early adolescence. *Journal of Emotional & Behavioural Disorders, 9,* 146–160.

Ialongo, N.S., Werthamer, L., Kellam, S.G., Brown,C.H., Wang, S., & Lin, Y. (1999). Proximal impact of two first-grade preventive interventions on the early risk behaviors for late substance abuse, depression, and antisocial behavior. *American Journal of Community Psychology, 27,* 599–641.

Immigration and Refugee Protection Act, R.S.C., 2001, C. 27, Part 2 (1, 2).

Institute of Medicine of the National Academies. (1985). *Preventing low birthweight*. Washington, DC: National Academy Press.

Institute of Medicine of the National Academies. (1994). *Reducing risks for mental disorders: Frontiers for preventive intervention research*. Washington, DC: National Academy Press.

Ireland, J.L., Sanders, M.R., & Markie-Dadds, C. (2003). The impact of parent training on marital functioning: A comparison of two group versions of the Triple P-Positive Parenting Program for parents of children with early-onset conduct problems. *Behavioral and Cognitive Psychotherapy, 31*, 127–142.

Isaacs, S., Keogh, S., Menard, C., & Hockin, J. (2000). Suicide in the Northwest Territories: A descriptive review. *Chronic Diseases in Canada, 19*(4). Retrieved May 17, 2007, from http://www.phac-aspc.gc.ca/publicat/cdic-mcc/19-4/index.html.

Jablensky, A. & Kalaydjieva, L. (2003). Genetic epidemiology of schizophrenia: Phenotypes, risk factors, and reproductive behavior. *American Journal of Psychiatry 160*(3), 425–429.

Jablensky, A., McGrath, J., Herrman, H., Castle, D., Gureje, O., Evans, M., et al. (2000). Psychotic disorders in urban areas: an overview of the study on low prevalence disorders. *Australian and New Zealand Journal of Psychiatry, 34*, 221–236.

Jané-Llopis, E., Hosman C., Jenkins, R., & Anderson, A. (2003). Predictors of efficacy in depression prevention programs: meta-analysis. *British Journal of Psychiatry, 183*, 384–397.

Jané-Llopis, E., Katschnig, H., McDaid, D. et al. (2006). *Evidence base of interventions for mental health promotion and mental disorder prevention. A report of the EC Mental Health Working Party, Taskforce on Evidence*. Luxembourg: European Communities.

Jané-Llopis, E., Muñoz, R., & Patel, V. (2005). In C. Hosman, E. Jané-Llopis, & S. Saxena, (Eds.), *Prevention of mental disorders: Effective interventions and policy options*. Oxford: Oxford University Press.

Johannessen, J.O., McGlashan, T.H., Larsen, T.K, Horneland, M., Joa, I., Kvebækk, R. (2001). Early detection strategies for untreated first-episode psychosis. *Schizophrenia Research, 51*, 39–46.

Kaner, E.F.S., Beyer, F., Dickinson, H.O., Pienaar, E., Campbell F., Schlesinger, C., et al. (2007). Effectiveness of brief alcohol interventions in primary care populations. *The Cochrane Database of Systematic Reviews, 2.*

Kaplan, H.I., Sadock, B.J., & Grebb, J.A. (Eds.). (1994). *Kaplan and Sadock's synopsis of psychiatry: behavioral sciences, clinical psychiatry* (7th ed.). Baltimore, MD: Williams and Wilkins.

Keel, P.K., Leon, G.R., & Fulkerson, J.A. (2001). Vulnerability to eating disorders in childhood and adolescence. In R.E. Ingram, & J.M. Price (Eds.), *Vulnerability to psychopathology: Risks across the life span* (pp. 390–411). New York: Guilford Press.

Kellam, S.G. & Rebok, G.W. (1992). Building developmental and etiological theory through epidemiologically based preventive intervention trials. In J. McCord & R. E. Tremblay (Eds.), *Preventing antisocial behavior: Interventions from birth through adolescence*. (pp. 162–195). New York: Guilford Press.

Kellam, S.G., Rebok, G.W., Ialongo, N., & Mayer, L.S. (1994). The course and malleability of aggressive behavior from early first grade into middle school: results of a developmental epidemiologically based preventive trial. *Journal of Child Psychology and Psychiatry, 35*, 259–281.

Kessler, R.C., Turner, J.B., & House, J.S. (1988). Effects of unemployment on health in a community survey: Main, modifying, and mediating effects. *Journal of Social Issues, 44*, 69–85.

Killackey, E., McGorry, P., Wright, A., Harris, M., & Juriansz, D. (2005). Early prevention in psychosis. In C. Hosman, E. Jané-Llopis, & S. Saxena, (Eds.), *Prevention of mental disorders: Effective interventions and policy options*. Oxford: Oxford University Press.

King, M., McKeown, E., Warner, J., Ramsay, A., Johnson, K., Cort, C., et al. (2003). *Mental health and social wellbeing of gay men, lesbians and bisexuals in England and Wales: A summary of findings*. London: National Association for Mental Health.

Kleinman R., Murphy J.M., Little, M., Pagano, M., Wehler, C.A., Regal, K., et al. (1998). Hunger in children in the United States: Potential behavioral and emotional correlates. *Pediatrics, 101*(1), E3.

Kopp, M.S., Skrabski, A., & Szedmark, S. (2000). Psychosocial risk factors, inequality and self-rated morbidity in a changing society. *Social Science and Medicine, 51*, 1351–1361.

Kristjansson, E.A., Robinson, V., Petticrew, M., MacDonald, B., Krasevec, J., Janzen, L., et al. (2007). School feeding for improving the physical and psychosocial health of disadvantaged elementary school children. *The Campbell Database of Systematic Reviews, C2-RIPE. Social welfare domain.*

Kupfer, D., Frank, E., and Perel, J.M. (1989). The advantage of early treatment intervention in recurrent depression. *Archives of General Psychiatry, 46,* 771–775.

Kurth, C.L., Krahn, D.D., Nairn, K., & Drewnowski, A. (1995). The severity of dieting and bingeing behaviours in college women: Interview validation of survey data. *Journal of Psychiatric Research, 29*(3), 211–225.

Lampinen, T., Bonner, S., Rusch, M., & Hogg, R. (2006). High prevalence of smoking among urban dwelling Canadian men who have sex with men. *Journal of Urban Health. New York Academy of Medicine, 38*(6), 1143–1150.

Larsen, T.K., Johannessen, J.O., McGlashan, T.H., Friis, S., Guldberg, C., Haahr, U., et al. (2001). Shortened duration of untreated first episode of psychosis: changes in patient characteristics at treatment. *American Journal of Psychiatry, 158*, 1917–1919.

Larson, M. (2006). Amphetamine-related psychiatric disorders. *E-Medicine World Medical Library*. Retrieved September 11, 2008, from http://www.emedicine.com/med/topic3114.htm.

Larun, L., Nordheim, L.V., Ekeland, E., Hagen, K.B., & Heian, F. (2006). Exercise in prevention and treatment of anxiety and depression among children and young people. *Cochrane Database of Systematic Reviews, 3*.

Leenars, A. (2001). Controlling the environment to prevent suicide. In D. Wasserman (Ed.), *Suicide, an unnecessary death* (pp. 259–264). London: Martin Dunitz.

Leff, J., Wig, N.N., Ghosh, A., Bedi, A., Menon, D.K., Kuipers, L., et al. (1987). Expressed emotion and schizophrenia in north India. III: Influences of relatives' expressed emotion on the course of schizophrenia in Chandigarh. *British Journal of Psychiatry, 151*, 166–173.

Lewis, S. (2002). The European First-Episode Schizophrenia Network. *British Journal of Psychiatry, 181*, s1–s2.

Li, F., Duncan, T., Duncan, S., McAuly, E., Chaumeton, N., & Harmer, P. (2001). Enhancing the psychological well-being of elderly individuals through Tai Chi exercise: A latent growth curve analysis. *Structural Equation Modelling, 8*(1), 53–83.

Linzer, M., Spitzer, R., Kroenke, K., Williams, J.B., Hahn, S., Brody, D., et al. (1996). Gender, quality of life, and mental disorders in primary care: Results from the PRIME-MD 1000 study. *American Journal of Medicine, 101*, 526–533.

Littlewood, R. (1995). Psychopathology and personal agency: Modernity, cultural change and eating disorders in south Asian societies. *British Journal of Medical Psychology, 68*, 45–63.

Loebel, A.D., Lieberman, J.A., & Alvir, J. (1992). Duration of psychosis and outcome in first-episode schizophrenia. *American Journal of Psychiatry, 149*, 1183–1188.

Lowry-Webster, H., Barrett, P., & Lock, S. (2003). A universal prevention trial of anxiety symptomatology during childhood: Results at one-year follow-up. *Behaviour Change, 20*(1), 25–43.

Lowry-Webster, H.M., Barrett P., & Dadds, M.R. (2001). A universal prevention trial of anxiety and depressive symptomatology in childhood: Preliminary data from an Australian study. *Behavior Change, 18*(1), 36–50.

Loxley, W., Toumbourou, J., & Stockwell, T. (2004). *The prevention of substance use, risk and harm in Australia: A Review of the Evidence*. Canberra: Australian Government Department of Health and Ageing.

Magnan V, & Saury, M. (1889). Trois cas de cocainisme chronique. *Comptes Rendus des Séances et Mémoires de la Société de Biologie, 41*, 60–63.

Manitoba Healthy Child Committee of Cabinet. (2005). *World renowned program offers new supports to parents with young children in Manitoba, March 21, 2005* [News Release]. Winnipeg, MB: News Media Services. Retrieved September 11, 2008, from http://www.gov.mb.ca/chc/press/top/2005/03/2005-03-21-03.html.

Mann, J.J., Apter, A., Bertolote, J., Beautrais, A., Currier, D., Haas, A., et al. (2005). Suicide prevention strategies—A systematic review. *Journal of the American Medical Association, 294*, 2064–2074.

Mathers, C., Lopez, A., & Murray, C. (2006). The burden of disease and mortality by condition: Data, methods, and results for 2001. In A.D. Lopez, C.D. Mathers, M. Ezzati, D.T. Jamison, & C.J.L. Murray (Eds.), *Global burden of disease and risk factors* (pp. 45–93). New York: Oxford University Press.

McBride, N. (2003). A systematic review of school drug education. *Health Education Research Theory and Practice, 18*(6), 729–742.

McBride, N. (2005). The evidence base for school-based interventions. In: T. Stockwell, P. Gruenewald, J. Toumbourou, & W. Loxley (Eds.), *Preventing harmful substance use: The evidence base for policy and practice.* Chichester: John Wiley & Sons.

McClellan, J., Susser, E., & King, M.C. (2006). Maternal famine, de novo mutations, and schizophrenia. *Journal of the American Medical Association, 296*, 582–584.

McCord, J., Tremblay, R.E., Vitaro, F., & Desmarais-Gervais, L. (1994). Boys' disruptive behavior, school adjustment, and delinquency: The Montreal prevention experiment. *International Journal of Behavioral Development, 17*, 739–752.

McEwan, K., Waddell, C., & Barker, J. (2007). Bringing children's mental health 'out of the shadows'. *Canadian Medical Association Journal, 176*, 4.

McGorry, P.D., Yung, A.R., Phillips, L.I., Yuen, H.P., Francey, S., Cosgrave, E., et al. (2002). Randomized controlled trial of interventions designed to reduce the risk of progression to first-episode psychosis in a clinical sample with subthreshold symptoms. *Archives of General Psychiatry, 59*, 921–928.

McQueen, D.V. & Anderson, L.M. (2001).What counts as evidence: Issues and debates. In I. Rootman, M. Goodstadt, B. Hyndman, D.W. McQueen, L. Potvin, J. Springett, et al. (Eds.). *Evaluation in health promotion: Principles and perspectives* (pp. 63–82). Copenhagen: World Health Organization.

Merry, S., McDowell, H., Hetrick, S., Bir, J., & Mullerm, N. (2004). Psychological and/or educational interventions for the prevention of depression in children and adolescents. *Cochrane Database of Systematic Reviews, 2*.

Ministry of Children and Family Development. (2003). *Child and youth mental health plan for British Columbia.* Victoria, BC: Author. Retrieved September 11, 2008, from http://www.mcf.gov.bc.ca/mental_health/mh_publications/cymh_plan.htm.

Ministry of Health Services. (2004). *British Columbia nutrition survey*. Victoria, BC: Author. Retrieved May 4, 2006, from http://www.health.gov.bc.ca/prevent/nutrition/pdf/nutrientsreport.pdf.

Ministry of Health, Population Health and Wellness. (2006, March). *Evidence review: Prevention of harms associated with substances*. Victoria, BC: Author.

Ministry of Health, Population Health and Wellness. (2007, May). *Evidence review: Mental health promotion*. Victoria, BC: Author.

Ministry of Health. (2001). *Evaluation of the burden of disease in British Columbia*. Victoria, BC: Strategic Policy and Research Branch, Ministry of Health.

Ministry of Health. (2006). *Following the evidence: Preventing harms from substance use in BC.* Victoria, BC: Author. Retrieved September 15, 2008, from http://www.health.gov.bc.ca/prevent/pdf/followingtheevidence.pdf.

Ministry of Health. (2007). *Immunize BC: A strategic framework for immunization in British Columbia.* Victoria, BC: Author.

Montgomery, S.A. (1997). Suicide and antidepressants. *Annals of the New York Academy of Sciences, 836*(1), 329–338.

Moon, L., Meyer, P., & Grau, J. (1999). *Australia's young people – Their health and wellbeing 1999*. Canberra: Australian Institute of Health and Welfare.

Moore, R., Mao, Y., Zhang J., & Clarke, K. (1997). *Economic burden of illness in Canada, 1993.* Ottawa: Health Canada.

Moore, T., Zammit, S., Lingford-Hughes, A., Barnes, T., Jones, P., Burke, M. et al. (2007). Cannabis use and risk of psychotic or affective mental health outcomes: A systematic review. *Lancet, 370,* 319–328.

Morriss, R.K., Faizal, M.A., Jones, A.P., Williamson, P., Bolton, C., & McCarthy, J. (2007). Interventions for helping people recognise early signs of recurrence in bipolar disorder. *Cochrane Database of Systematic Reviews, 1*.

Morton, W.A. (1999). Cocaine and psychiatric symptoms. *Primary Care Companion—Journal of Clinical Psychiatry, 1,* 109–113.

Mrazek, P.J. & Haggerty, R.J. (Eds.). (1994). *Reducing risks for mental disorders: Frontiers for preventive intervention research.* Washington, DC: National Academy Press.

Murray, C.J.L. & Lopez, A.D. (Eds.). (1996). *The global burden of disease. A comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020.* Cambridge, MA: Harvard School of Public Health.

Musisi, S., Mollica, R., & Weiss, M. (2005). Supporting refugees and victims of war. In C. Hosman, E. Jané-Llopis, & S. Saxena, (Eds.), *Prevention of mental disorders: Effective interventions and policy options*. Oxford: Oxford University Press.

Mussell, B., Cardiff, K., & White, J. (2004). *The mental health and well-being of Aboriginal children and youth: Guidance for new approaches and services.* Vancouver, BC: Sal'i'shan Institute and the Children's Mental Health Policy Research Program.

Myers, F., McCollum, A., & Woodhouse, A. (2005). *Equal minds working paper summary.* Edinburgh: Scottish Executive.

National Center for Health Statistics. (1997). *The National Health Interview Survey*. Atlanta, GA: Author.

Nutbeam, D. (1999). The challenge to provide "evidence" in health promotion. *Health Promotion International, 14*(2), 99–100.

O'Kearney, R.T., Anstey, K.J., & von Sanden, C. (2006). Behavioural and cognitive behavioural therapy for obsessive compulsive disorder in children and adolescents. *Cochrane Database of Systematic Reviews, 4*.

Olds, D. (1997). The Prenatal/Early Infancy Project: Fifteen years later. In G.W Albee & T.P. Gulotta (Eds.), *Primary prevention works* (pp. 41–67). Thousand Oaks, CA: Sage.

Olds, D. (2002). Prenatal and infancy home visiting by nurses: From randomized trials to community replication. *Prevention Science, 3*, 1153–1172.

Olds, D., Robinson, J., Song, N., Little, C., & Hill, P. (August, 1999). *Reducing risks for mental disorders during the first five years of life: A review of preventive interventions.* Rockville, MD: Center for Mental Health Services.

Olweus, D. (1991). Bully/victim problems among schoolchildren: Basic facts and effects of a school based intervention program. In D. Pepler & K. Rubin (Eds.), *The development and treatment of childhood aggression* (pp. 411–448). Hillsdale, NJ: Erlbaum.

Parker, G. & Roy, K. (2001). Adolescent depression: A review. *Australia and New Zealand Journal of Psychiatry, 35*, 572–580.

Patel, V. (2001). Poverty, inequality, and mental health in developing countries. In D. Leon, & G. Walt, (Eds.), *Poverty, inequality and health: An international perspective* (pp. 247–261). Oxford: Oxford University Press.

Patel, V., & Jané-Llopis, E. (2005). Poverty, social exclusion and disadvantaged groups. In C. Hosman, E. Jané-Llopis, & S. Saxena (Eds.), *Prevention of mental disorders: Effective interventions and policy options*. Oxford: Oxford University Press.

Patton, G. (1996). An epidemiological case for a separate adolescent psychiatry? *The Australian and New Zealand Journal of Psychiatry, 30*(5), 563–566.

Perkins, S.J., Murphy, R., Schmidt, U., & Williams, C. (2006). Self help and guided self help for eating disorders. *Cochrane Database of Systematic Reviews, 3*.

Posner, K., Oquendo, M., Gould, M., Stanley, B., & Davies, M. (2007). Columbia Classification Algorithm of Suicide Assessment (C-CASA): Classification of suicidal events in the FDA's pediatric suicidal risk analysis of antidepressants. *American Journal of Psychiatry, 164*, 1035–1043.

Pratt, B. & Woolfenden, S.R. (2002). Interventions for preventing eating disorders in children and adolescents. *Cochrane Database of Systematic Reviews, 2*.

Price, R. & Kompier, M. (2005). Work, stress and unemployment. In C. Hosman, E. Jané-Llopis, & S. Saxena, (Eds.), *Prevention of mental disorders: Effective interventions and policy options*. Oxford: Oxford University Press.

Prinz, R.J., Blechman, E.A., & Dumas, J.E. (1994). An evaluation of peer coping-skills training for childhood aggression. *Journal of Clinical Child Psychology, 23*, 193–203.

Provincial Health Officer. (2001). *Suicide rates among First Nations persons in British Columbia, 1993–2000*. Prepared by Christopher E. Lalonde. Victoria, BC: Author.

Provincial Health Officer. (2002). *The health and well-being of Aboriginal people in British Columbia. Provincial Health Officer's Annual Report 2001*. Victoria, BC: Ministry of Health Planning.

Provincial Health Services Authority & Ministry of Health. (2006). *Addressing perinatal depression: A framework for BC's health authorities*. Vancouver, BC: Authors. Retrieved July 3, 2008, from http://www.health.gov.bc.ca/library/publications/year/2006/MHA_PerinatalDepression.pdf.

Public Health Agency of Canada. (2004). *Population health approach: Key determinants, research and evidence base*. Ottawa, ON: Author. Retrieved April 22, 2207, from http://www.phac-aspc.gc.ca/ph-sp/phdd/determinants/index.html.

Remafedi, G. (1999). Sexual orientation and youth suicide. *Journal of the American Medical Association, 282*, 1291.

Riemsma, R.P., Kirwan, J.R., Taal, E., & Rasker J. (2002) Patient education for adults with rheumatoid arthritis. *Cochrane Database of Systematic Reviews, 2.*

Robins, L.N., Locke, B.Z., & Regier, D.A. (1991). An overview of psychiatric disorders in America. In L.N. Robins & D.A. Regier (Eds.), *Psychiatric disorders in America: The Epidemiologic Catchment Area Project* (pp. 328–366). New York: The Free Press.

Roche, A. (2004). Brief interventions: Good in theory but weak in practice. *Drug and Alcohol Review, 23*(1), 11–18.

Rose, S., Bisson, J., Churchill, R., & Wessely, S. (2002). Psychological debriefing for preventing post traumatic stress disorder (PTSD). *Cochrane Database of Systematic Reviews, 2*.

Rosenburg, M. & Mercy, J. (Eds.). (1991). *Violence in America: A public health approach.* New York: Oxford University Press.

Royal Children's Hospital, Melbourne. (2006). *Pioneer communities report. Communities that Care Australia*. Melbourne: Centre for Adolescent Health, Royal Children's Hospital. Retrieved April 22, 2007, from http://www.rch.org.au/cah/research/?doc_id=1011#pioneers.

Rubenstein C.S., Pigott T.A., L'Heureux F., Hill J., & Murphy D.L. (1992). A preliminary investigation of the lifetime prevalence of anorexia and bulimia nervosa in patients with obsessive compulsive disorder. *Journal of Clinical Psychiatry, 53*, 309–314.

Rutz, W., von Knorring, L., & Walinder, J. (1992). Long-term effects of an educational program for general practitioners given by the Swedish Committee for Prevention and Treatment of Depression. *Acta Psychiatrica Scandanavia, 85*, 83–88.

Saewyc, E.M., Poon, C., Wang, N., Homma, Y., Smith, A., & the McCreary Centre Society (2007). *Not yet equal: The health of lesbian, gay & bisexual youth in BC.* Vancouver, BC: McCreary Centre Society.

Sanders, M.R., Markie-Dadds, C., Tully, L., & Bor, W. (2000). The Triple P- Positive Parenting Program: A comparison of enhanced, standard, and self directed behavioral family intervention for parents of children with early onset conduct problems. *Journal of Consulting and Clinical Psychology, 68*(4), 624–640.

Sandfort, T., de Graaf, R., Bijl, R., & Schnabel, P. (2001). Same-sex sexual behavior and psychiatric disorders: Findings from the Netherlands Mental Health Survey and Incidence Study (NEMESIS). *Archives of General Psychiatry, 58*, 85–91.

Sandler, I., Ayers, T.S, & Dawson-McClure, S.R. (2005). Children suffering from family disruption: Separation, divorce, and bereavement. *Prevention of mental disorders: An overview on evidence-based strategies and programs*. Geneva: World Health Organization.

Savin-Williams, R.C. (1994). Verbal and physical abuse as stressors in the lives of lesbian, gay male, and bisexual youths: Associations with school problems, running away, substance abuse, prostitution, and suicide. *Journal of Consulting Clinical Psychology, 62*, 261–269.

Saxena, S., Jané-Llopis, E, & Hosman, C. (2006). Prevention of mental and behavioural disorders: Implications for policy and practice. *World Psychiatry, 51*, 5–14.

Scher, L.S., Maynard, R., & Stagner, M. (2006). Interventions intended to reduce pregnancy related outcomes among teenagers. *The Campbell Database of Systematic Reviews, C2-RIPE. Social welfare domain*.

Schore, A.N. (2001). Effects of a secure attachment relationship on right brain development, affect regulation, and infant mental health. *Infant Mental Health Journal*, *22*, 1–2, 7–66.

Schwartz, C., Harrison, E., Garland, O., & Waddell, C. (2007). *Preventing substance use disorders in children and youth*. Vancouver, BC: Children's Mental Health Policy Research Program.

Schweinhart, L.J., & Weikart, D.P. (1997). The High/Scope preschool curriculum comparison study through age 23. *Early Childhood Research Quarterly, 12,* 117–143.

Scott, A., Shaw, M., & Joughin, C. (Eds.). (2001). *'Finding the evidence' - A gateway to the literature in child and adolescent mental health* (2nd ed.). London: Gaskell.

Scott, S. (1998). Aggressive behaviour in childhood. *British Medical Journal, 316*, 202–206.

Select Standing Committee on Education. (2006). *Literacy through leadership: Outlining an adult literacy strategy for British Columbians.* Victoria, BC: Legislature of British Columbia.

Semple, D.M., McIntosh, A.M., & Lawrie, S.M. (2005). Cannabis as a risk factor for psychosis: Systematic review. *Journal of Psychopharmacology, 19*(2), 187–194.

Shisslak, C.M., Crago, M., & Estes, L.S. (1995). The spectrum of eating disturbances. *International Journal of Eating Disorders, 18,* 209–219.

Shochet, I., Dadds, M., Holland, D., Whitefield, K., Harnett, P. H., & Osgarby, S. (2001). The efficacy of a universal school-based program to prevent adolescent depression. *Journal of Clinical Child Psychology, 30*(3), 303–315.

Siddiqi, N., Stockdale, R., Britton, A.M., & Holmes, J. (2007). Interventions for preventing delirium in hospitalised patients. *Cochrane Database of Systematic Reviews, 2*.

Simon, G., & Savarino, J. (2007). Suicide attempts among patients starting depression treatment with medications or psychotherapy. *American Journal of Psychiatry, 164*, 1029–1034.

Skara, S. & Sussman, S. (2003). A review of 25 long-term adolescent tobacco and other drug prevention program evaluations. *Preventive Medicine, 37*(5), 451–474.

Smith, T. (1993). Influence of socioeconomic factors on attaining targets for reducing teenage pregnancies. *British Medical Journal, 306,* 1232–1235.

Smye, V. & Mussell, B. (2001). Aboriginal mental health: What works best? Vancouver, BC: Mental Health Evaluation and Community Consultation Unit.

Social Exclusion Unit. (1999). *Teenage pregnancy*. London: The Stationary Office.

Solantaus, T. & Toikka, S. (2006). The effective family program: Preventive services for the children of mentally ill parents in Finland. *International Journal of Mental Health Promotion, 8*(3), 37–43.

Sorensen, S., Pinquart, M., & Duberstein P. (2002). How effective are interventions with caregivers? An updated meta-analysis. *Gerontologist, 42*, 356–372.

Spoth, R.L., Redmond, C., & Shin, C. (2001). Randomized trial of brief family interventions for general populations: Adolescent substance use outcomes 4 years following baseline. *Journal of Consulting and Clinical Psychology, 69*(4), 627–642.

Statistics Canada (2007, May 3). The income of Canadians, 2005. *The Daily*. Ottawa, ON: Author. Retrieved May 28, 2007, from http://www.statcan.ca/Daily/English/070503/d070503a.htm.

Statistics Canada. (2003, September 3). Canadian Community Health Survey—mental health and well-being. *The Daily*. Ottawa, ON: Author. Retrieved March 22, 2007, from http://www.statcan.ca/Daily/English/030903/d030903a.htm.

Stephens, T. & Joubert, N. (2001). The economic burden of mental health problems in Canada. *Chronic Diseases in Canada, 2001, 22*(1), 18–23.

Stevens, N. & van Tilburg, T. (2000). Stimulating friendship in later life: A strategy for reducing loneliness among older women. *Educational Gerontology, 26*(1), 15–35.

Stockwell, T., Fishbein, D., Toumbourou, J.W., Tarter, R., & Eldreth, D. (2005). *Preventing psychoactive substance use and related harms among children and adolescents: A review of theory and global best practices to address psychosocial and neurobiological factors.* Prepared for the World Health Organization.

Stockwell, T.R. (2004). Harm reduction: The drugification of alcohol policies and the alcoholisation of drug policies. In H. Klingemann, & R. Muller (Eds.). *From science to action? 100 years later - alcohol policies revisited* (pp. 49–59). Netherlands: Kluwer Academic Publishers.

Sullivan, L. (1991). Violence as a public health issue. *Journal of the American Medical Association, 265*, 21.

Tangchararoensathien, V., Harnvoravongchai, P., Pitayarangsarit, S., & Kasemsup, V. (2000). Health aspects of rapid socio-economic changes in Thailand. *Social Science and Medicine, 51*, 789–807.

Taub, J. (2001). Evaluation of the Second Step violence prevention program at a rural elementary school. *School Psychology Review, 31*, 186–200.

Therapeutics Initiative. (2004). *Therapeutics letter: Use of benzodiazepines in BC: Is it consistent with recommendations?* Vancouver, BC: Author. Retrieved June 29, 2007, from: http://www.ti.ubc.ca/PDF/54.pdf.

Thomson, H., Petticrew, M., & Morrison, D. (2001). Health effects of housing improvement: Systematic review of intervention studies. *British Medical Journal, 323*(7306), 187–190.

Torgerson, C., Brookes, G., Porterhouse, J., Burton, M., Robinson, J., Wright, K., et al. (2004). Systematic review of randomized controlled trials. In *Adult Literacy and numeracy*

interventions and outcomes: a review of controlled trials. London: National Research and Development Centre for Adult Literacy and Numeracy.

Torgerson, C.J., Porthouse, J., & Brooks, G. (2003). A systematic review and meta-analysis of randomised controlled trials evaluating interventions in adult literacy and numeracy. *Journal of Research in Reading, 26*(3), 234–255.

Toumbourou, J., Williams, J., Waters, E., & Patton, G. (2005). What do we know about preventing drug-related harm through social developmental intervention with children and young people? In T. Stockwell, P. Gruenewald, J. Toumbourou, & W. Loxley, (Eds), *Preventing harmful substance use: The evidence base for policy and practice* (pp. 87–100). John Wiley and Sons.

Transformative Change Accord: First Nations Health Plan. Supporting the health and wellness of First Nations in British Columbia. (2005). Victoria, BC: British Columbia Assembly of First Nations, First Nations Summit, Union of British Columbia Indian Chiefs, & Province of British Columbia.

Tremblay, R.E., McCord, J., Boileau, H., Charlebois, P., Gagnon, C., Le Blanc, M., et al. (1991). Can disruptive boys be helped to become competent? *Psychiatry, 54,* 148–161.

Tremblay, R.E., Pagani-Kurtz, L., Mâsse, L.C., Vitaro, F., & Pihl, R.O. (1995). A bimodal preventive intervention for disruptive kindergarten boys: Its impact through mid-adolescence. *Journal of Consulting and Clinical Psychology, 63,* 560–568.

Tremblay, R.E., Vitaro, F., Bertrand, L., Le Blanc, M., Beauchesne, H., Boileau, H., et al. (1992). Parent and child training to prevent early onset of delinquency: The Montreal Longitudinal-Experimental Study. In J. McCord & R.E. Tremblay (Eds.) *Preventing antisocial behavior, interventions from birth through adolescence.* New York: Guilford Press.

Tugwell, P., O'Connor, A., Andersson, N., Mhatre, S., Kristjansson, E., Jaconbsen., M. et al. (2006). Reduction of inequalities in health: Assessing evidence-based tools. *International Journal for Equity in Health, 5*, 11.

UNICEF. (2007). *Child poverty in perspective: An overview of child well-being in rich countries. Innocenti Report Card* 7. Florence: UNICEF Innocenti Research Centre.

United States Department of Health and Human Services, Substance Abuse and Mental Health Services Administration (n.d.). *National registry of evidence-based programs and practices searchable database*. Retrieved May 9, 2007, from http://www.nrepp.samhsa.gov/.

United States Department of Health and Human Services. (1999). *Mental health: A report of the Surgeon General.* Rockville, MD: Author.

University of Wisconsin Population Health Institute (2005). *Evidence based practices for healthiest Wisconsin 2010*. Madison, WI: University of Wisconsin & Bureau of Health Information and Policy, Division of Public Health, Department of Health and Family

Services. Retrieved September 11, 2008, from http://dhfs.wisconsin.gov/statehealthplan/practices/.

Ustin, T.B. & Sartorius, N. (1995). *Mental illness in general health care: An international study*. New York: John Wiley.

Vachon, M.L.S., Lyall, W.A., Rogers, J., Freedman-Letofsky, K., & Freeman, S.J.J. (1980). A controlled study of self-help interventions for widows. *American Journal of Psychiatry, 137*, 1380–1384.

Vachon, M.L.S., Rogers, J., Lyall, W.A., Lancee, W.J., Sheldon, A.R., & Freeman, S.J.J. (1982). Predictors and correlates of adaptation to conjugal bereavement. *American Journal of Psychiatry, 139*, 998–1002.

Van Doesum, K.T.M., Hosman, C., & Riksen-Walraven, J.M. (2005). A model-based intervention for depressed mothers and their infants. *Infant Mental Health Journal, 26*(2), 157–176.

van Os, J., & McGuffin, P. (2003). Can the social environment cause schizophrenia? *British Journal of Psychiatry, 182*(4), 291–292.

Vancouver Coastal Health. (2006). Building on strength: Building the continuum of care for Vancouver community mental health and addiction. Vancouver, BC: Author. Retrieved September 11, 2008, from http://www.vch.ca/mental/docs/bosfulldoc_vc.pdf.

Veterans Affairs Canada. (2004). *Acute stress disorder: A national centre for post traumatic stress disorder fact sheet*. Ottawa, ON: Author. Retrieved March 27, 2007, from http://www.vac-acc.gc.ca/clients/sub.cfm?source=mhealth/factsheets/acute.

Vinokur, A.D., Schul, Y., Vuori , J., & Price, R. H. (2000). Two years after a job loss: Long-term impact of the JOBS Program on reemployment and mental health. *Journal of Occupational Health Psychology, 5*, 32–47.

Voas, R.B., Tippetts, A.S., & Fell, J.C. (2003). Assessing the effectiveness of minimum legal drinking age and zero tolerance laws in the United States. *Accident Analysis and Prevention, 35*, 579–587.

Vuori, J., Silvonen, J., Vinokur, A.D., & Price, R.H. (2002). The Työhön job search program in Finland: benefits for the unemployed with risk of depression or discouragement. *Journal of Occupational Health Psychology, 7*, 5–19.

Waddell, C., Godderis, R., Hua, J., McEwan, K., & Wong, W. (2004, June). *Preventing and treating anxiety disorders in children and youth. A research report prepared for the British Columbia Ministry of Children and Family Development*. Vancouver, BC: University of British Columbia.

Waddell, C., Godderis, R., McEwan, K., & Schwartz, C. (2005). *Preventing and treating obsessive-compulsive disorders in children and youth.* Vancouver, BC: Children's Mental Health Policy Research Program.

Waddell, C., Godderis, R., Schwartz, C., & Garland, O. (2005, July). *Preventing and treating eating disorders in children and youth. A research report prepared for the British Columbia Ministry of Children and Family Development*. Vancouver, BC: University of British Columbia.

Waddell, C., Hua, J., Godderis, R., & McEwan, K. (2004, November). *Preventing and treating depression in children and youth. A research report prepared for the British Columbia Ministry of Children and Family Development*. Vancouver, BC: University of British Columbia.

Waddell, C., McEwan, K., Shepherd, C.A., Offord, D.R.., & Hua, J.M. (2005). A public health strategy to improve the mental health of Canadian children. *Canadian Journal of Psychiatry, 50*(4), 226–233.

Waddell, C., Wong, W., Hua, J.M., & Godderis, R. (2004). *Preventing and treating conduct disorder in children and youth*. Vancouver, BC. Children's Mental Health Policy Research Program.

Ward, J., Lieberman, J.M., & Cochi, S.L. (1994). Haemophilus influenzae vaccines. In S.A. Plotkin & E.A. Mortimer, (Eds.), *Vaccines* (2nd ed.) (pp. 337–386). Philadelphia, PA: W.B. Saunders Co.

Webster-Stratton, C. (1990). Long term follow up of families with young conduct problem children: From pre-school to grade school. *Journal of Clinical Child Psychology, 19*(2), 144–149.

Webster-Stratton, C. & Reid, M.J. (2002). An integrated approach to prevention and management of aggressive behavior problems in preschool and elementary grade students – Schools and parents collaboration. In K.L. Lane, F.M. Gresham & T.E. O'Shaughnessy (Eds.), *Interventions for students with or at risk for emotional and behavioral disorders* (pp. 261–272). Boston: Allyn & Bacon.

Weiss, B.D. (2001). Health literacy: An important issue for communicating health information to patients. *Chinese Medical Journal 64*(11), 603–608.

Welch, S., Collings, S., & Howden-Chapman, P. (2000). Lesbians in New Zealand: Their mental health and satisfaction with mental health services. *Australian and New Zealand Journal of Psychiatry 34*, 256–263.

White, J. (2005, January). *Preventing suicide in youth: taking action with imperfect knowledge. A research report prepared for the British Columbia Ministry of Children and Family Development*. Vancouver, BC: University of British Columbia.

Whiteford, P. & Adema, W. (2007). What works best in reducing child poverty? *OECD Social, Migration and Employment Working Papers #51*. Paris: Directorate for Employment, Labour and Social Affairs, Organization for Economic Cooperation and Development.

Williams, D.R. & Williams-Morris, R. (2000). Racism and mental health: The African American experience. *Ethnicity and Health, 5*(3/4), 243–268.

Windsor, R.A., Lowe, J.B., Perkins, L.L., Smith-Yoder, D., Artz, L., Crawford, M., et al. (1993). Health education for pregnant smokers: Its behavioural impact and cost benefit. *American Journal of Public Health, 83*(2), 201–206.

Wolchik, S.A., Sandler, I.N., Millsap, R.E., Plummer, B., Green, S.M., Anderson, E.R., et al. (2002). Six-year follow-up of preventive interventions for children of divorce. A randomized controlled trial. *Journal of the American Medical Association, 288,* 1874–1881.

Wolchik, S.A., West. S.G., Sandler, I.N., Tein, J.Y., Coatsworth, D., Lengua, L., et al. (2000). An experimental evaluation of theory-based mother and mother-child programs for children of divorce. *Journal of Consulting Clinical Psychology, 68,* 843–856.

Wolchik, S.A., West, S.G., Westover, S., Sandler, I.N., Martin, A., Lustig, J., et al. (1993). The children of divorce parenting intervention: outcome evaluation of an empirically based program. *American Journal of Community Psychology, 21*, 293–231.

Workers Compensation Act, R.S.B.C., 1996. Part 3, Div. 2 (111).

Workers Compensation Board of British Columbia. (2000). General conditions: Workplace conduct and prohibition of improper activity or behavior. *Prevention Manual, Item R4.25-1.* Richmond, BC: Author.

World Health Organization. (1998). *Primary prevention of mental, neurological and psychosocial disorders*. Geneva: Author.

World Health Organization. (1999). Creating an environment for emotional and social well-being: an important responsibility of a health-promoting and child friendly school. *WHO's Information series on school health, Document 10.* Geneva: Department of Noncommunicable Disease Prevention and Health Promotion & Department of Mental Health and Substance Dependence, Evidence and Research.

World Health Organization. (2001a). *Mental health: New understanding, new hope. World health report 2001*. Geneva: Author.

World Health Organization. (2001b). *Assessment of iodine deficiency disorders and monitoring their elimination* (2nd ed.). Geneva: Author.

World Health Organization. (2001c). *Iron deficiency anemia: Assessment, prevention and control.* Geneva: Author.

World Health Organization. (2002a). *Gender and mental health*. Geneva: Department of Gender and Women's Health/Department of Mental Health and Substance Dependence.

World Health Organization. (2002b). *Prevention and promotion in mental health. Mental health: evidence and research.* Geneva: Department of Mental Health and Substance Dependence, World Health Organization.

World Health Organization. (2004a). *Prevention of mental disorders: effective interventions and policy options. Summary report.* Geneva: Author.

World Health Organization. (2004b). *The world health report 2004: Changing history*. Geneva: Author.

World Health Organization. (2004c). *Global status report: Alcohol policy*. Geneva: Author.

World Health Organization. (2006). *Safer access to pesticides. Community interventions*. Geneva: Author.

Younie, S., Scollo, M., Hill, D., & Borland, R. (2005). Preventing tobacco use and harm: What is evidence based policy? In: T. Stockwell, P. Gruenewald, J. Toumbourou, & W. Loxley (Eds), *Preventing harmful substance use: The evidence base for policy and practice* (pp. 337–350). John Wiley and Sons.

Zenere, F. & Lazarus, P. (1997). The decline of youth suicidal behaviour in an urban, multicultural public school system following the introduction of a suicide prevention and intervention program. *Suicide and Life Threatening Behavior, 27*, 387–403.

Zipfel, S., Löwe, B., Reas, D.L., Deter, H.C., & Herzog, W. (2000). Long-term prognosis in anorexia nervosa: Lessons from a 21-year follow-up study. *Lancet (North American Edition), 355*(9205), 721.