

Chronic Disease Prevention Initiative: Paper #1

**A Framework for a Provincial
Chronic Disease Prevention
Initiative**

October, 2003

Population Health and Wellness

Ministry of Health Planning

Victoria, B.C.

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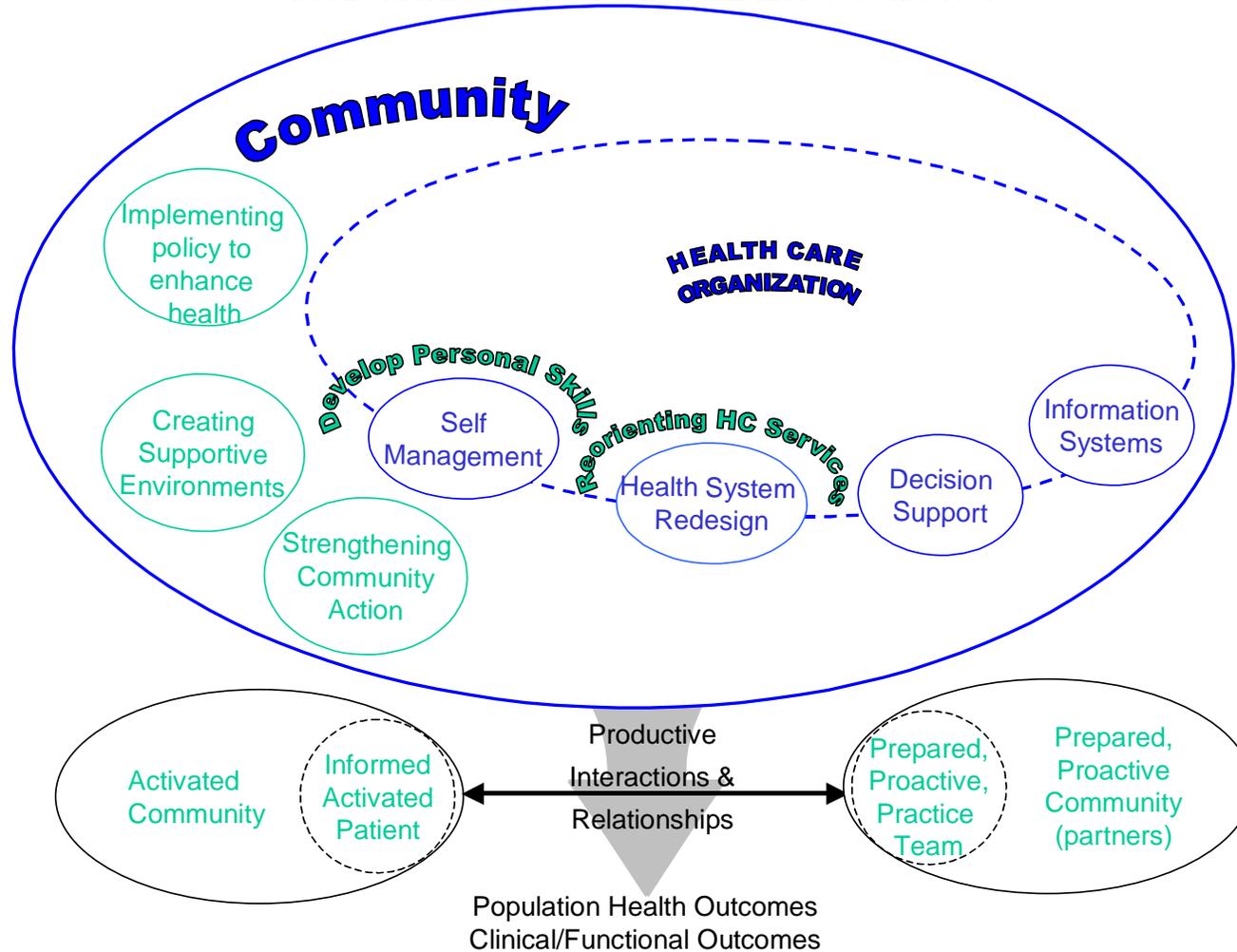
As is the case in other provinces, at the national level and internationally, the Ministries of Health are committed to addressing the massive burden of chronic disease in B.C. There are two main elements to this approach – managing better (more effectively and more efficiently) the existing burden of chronic disease so as to reduce suffering and premature death, and preventing the development of chronic diseases in the future. The chronic disease management program of the Ministry of Health Services has adopted the chronic care model used by a United States national program called "Improving Chronic Illness Care" (ICIC) based at the Group Health Cooperative of Puget Sound in Seattle, Washington. The prevention and management approaches are brought together in the "Expanded Chronic Care Model", which was developed by a group at the Vancouver Island Health Authority to incorporate the preventive components largely absent in the original model (Figure 1). This expanded model contains the key strategies from the Ottawa Charter for Health Promotion (WHO, 1986) of building health public policy, creating supportive environments and strengthening community action (the remaining two strategies – developing personal skills and re-orienting health services – are inherent in the original model), expands the notion of the activated patient to include the activated community, and expands the practice team to include community partners.

Chronic disease is usually understood to include non-communicable diseases that are chronic in nature. In the US, the Center for Disease Control and Prevention considers the following to be chronic diseases: cardiovascular disease, diabetes, arthritis and other musculo-skeletal diseases, cancers, chronic lung diseases, and chronic neurological disorders.

This report outlines the approach being developed in the Ministry of Health Planning to prevent the development of chronic disease in the first place – what is known as primary prevention – and to detect such diseases early in their development, which is an aspect of secondary prevention. By preventing chronic disease we can reduce large numbers of premature deaths in the population, avoid much unnecessary pain, suffering and disability, and improve overall health and well-being.

The report begins by placing this initiative in the context of the Government's goals and the Ministry of Health Planning's service plan and population health and wellness initiatives. Next comes a discussion of what is meant by a "provincial chronic disease prevention initiative". This is followed by the presentation of a model that will guide the provincial chronic disease prevention initiative, one that identifies both the principal risk factors and conditions that have to be addressed in a comprehensive initiative, the range of strategies that such an initiative needs to employ, and the 'life course' perspective that permeates the model. A brief overview is provided of a key issue in chronic disease prevention, namely the inequality in the burden of chronic disease that is borne by some segments of the population, an inequality that must be addressed and reduced in any provincial initiative. Finally, the implications of this framework for the development of this initiative are discussed, together with a brief overview of some of the Ministry's current activities.

**THE EXPANDED CHRONIC CARE MODEL* -
INTEGRATING POPULATION HEALTH PROMOTION**



Created by: Victoria Barr, Anita Dotts, Brenda Marin-Link, Darlene Ravensdale, Sylvia Robinson, Lisa Underhill (2002)

*Adapted from the Chronic Care Model: Glasgow, R., Orleans, C., Wagner, E., Curry, S., Solberg, L. Does the Chronic Care Model Serve Also as a Template for Improving Prevention? The Milbank Quarterly, 79(4), 2001. Also the World Health Organization, Health and Welfare Canada, Canadian Public Health Association. Ottawa Charter of Health Promotion. WHO, Copenhagen. 1986

1. The context

The development of a provincial chronic disease prevention initiative needs to be understood in the context of the Government of British Columbia's commitments to improved population health. The overarching governmental context for this work is the government's three-year strategic plan,¹ which articulates the government's vision:

"British Columbia is a prosperous and just province, where citizens achieve their potential and have confidence in the future."

Clearly, an important part of enabling citizens to achieve their potential is to help them avoid chronic diseases that may result in pain, suffering, disability and premature death.

The strategic plan also establishes three strategic goals that are key to achieving this overall vision:

- A strong and vibrant provincial economy
- A supportive social infrastructure
- Safe, healthy communities and a sustainable environment.

The Ministry of Health Planning's Population Health and Wellness section and the province's public health system contribute to the achievement of these three goals by helping to create healthy and safe communities; by being part of the supportive social infrastructure; and by preventing disease, prolonging life and improving the overall level of health, thus helping to reduce both the direct costs of health care and the indirect costs to society from disability, lost productivity, and lost lives..

Another important context is provided by the mission and service plans of the Ministries of Health Planning and Health Services. Their joint mission is:

"to guide and enhance the province's health services in order to ensure British Columbians are supported in their efforts to maintain and improve their health."

The goals of the Ministries of Health, especially the second goal, "improved health and wellness for British Columbians", and the third goal, "a sustainable and affordable health care system", are key here. Population Health and Wellness and the public health system clearly contribute to the second goal very directly, while reductions in preventable disease, disability and injury hold out the prospect of reducing the cost of health care, both in the short term and in the long term.

Also of relevance is the role of the newly created Ministry of Health Planning to:

"give health promotion and prevention activities a higher priority both as a means of improving the health and wellness of British Columbians, and as the means of creating a more sustainable system for the future."

Chronic disease prevention has been singled out by the Ministry of Health Planning as one of its priority issues, just as management of chronic disease has been identified as a priority by the Ministry of Health Services. The prevention and management of chronic disease is thus a shared priority of the Ministries of Health Planning, which are working to integrate these activities.

The three objectives of the Ministry of Health Planning with respect to goal two provide direction for chronic disease prevention. These objectives are to:

- identify preventable health conditions and high-risk health behaviours,
- identify health status inequalities, and
- identify effective strategies to reduce occurrence of preventable illness, injuries and health risk.

This paper addresses the first two objectives; the second paper in this series will address the third objective.

¹ British Columbia Government Strategic Plan 2002/3 - 2004/5

2. Population Health and Wellness Initiatives

The Population Health and Wellness section of the Ministry of Health Planning has a mandate to contribute to improving the health of the population of B.C. and reducing the burden of disease. This is being addressed in part through the development of a new Public Health Act, which will incorporate core programs in public health, and in part through the development of a set of province-wide population health improvement and disease and injury prevention initiatives (Figure 2). Since the Ministry does not deliver services, but instead provides planning and ‘stewardship’, the provincial role is to provide direction and support to health authorities and to work with non-governmental partners to ensure that evidence-based action is taken across B.C. in these and other priority issues that have been identified as the subjects of province-wide initiatives.

While some of these initiatives address communicable diseases such as HIV/AIDS and vaccine-preventable diseases, and others address environmental health issues or the needs of specific population groups, three of the principal initiatives focus on the priority non-communicable conditions which between them account for almost three-quarters of the burden of disease in British Columbia and in Canada (see Tables 1 and 2).

These conditions are:

- Selected chronic conditions (heart disease, cancer, chronic respiratory disease, and diabetes) that share three principal common risk factors (smoking, unhealthy eating patterns, physical inactivity)
- Injuries, both unintentional and intentional
- Mental health problems and addictions disorders.

Figure 2

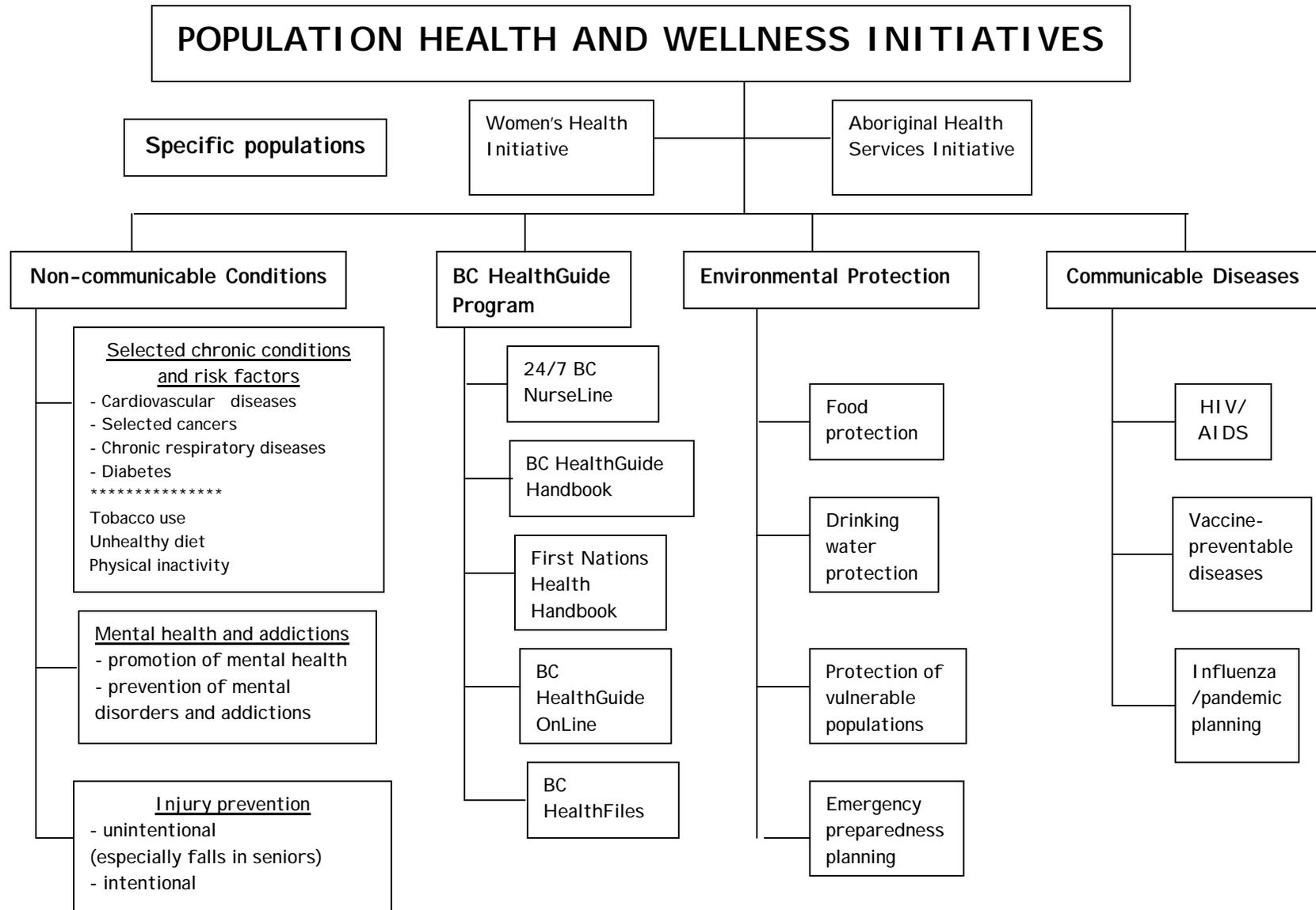


Table 1: The Burden of Disease in British Columbia, 1998

(Source: B.C. Ministry of Health, 2001)

Cancer	20.7% of DALYs ²
Cardiovascular disease	18.3%
Injuries	12.2% (9% unintentional, 3.2% intentional)
Mental disorders	11.0%
Neurological & sensory disorders	8.7%
Chronic respiratory disease	6.5%
Musculo-skeletal diseases	3.4%
Digestive disorders	3.2%
Diabetes mellitus	<u>3.1%</u>
TOTAL =	87.1%

² Disability-adjusted life years, which combines years of life lost due to 'premature' death with years of life lived with a disability, weighted according to an assessment of the severity of the disability.

Table 2: Economic Burden of Illness in British Columbia, 1998
(Diagnostic categories contributing 1% or greater to total costs)¹

<u>Diagnostic category</u>	<u>% of total (and rank)</u>		
	<u>Total Costs</u> (\$22.03 billion)	<u>Direct costs</u> (\$10.95 billion)	<u>Indirect Costs</u> (\$11.09 billion)
Musculoskeletal diseases	12.3 (1)	3.4 (7)	21.0 (1)
Cardiovascular disease	10.0 (2)	7.5 (1)	12.4 (4)
Injuries	9.1 (3)	4.1 (3)	14.0 (2)
Cancer	7.9 (4)	2.7 (9)	13.0 (3)
Nervous system/sensory diseases	5.5 (5)	3.4 (6)	7.5 (5)
Respiratory diseases	5.4 (6)	3.8 (5)	7.0 (6)
Mental disorders	5.3 (7)	5.1 (2)	5.4 (7)
Digestive diseases	3.2 (8)	4.0 (4)	2.4 (8)
Genitourinary diseases	2.0 (9)	3.1 (8)	1.0 (11)
Endocrine and related diseases	1.5 (10)	1.7 (10)	1.4 (10)
Infectious/parasitic diseases	1.4 (11)	1.0 (13)	1.9 (9)
Pregnancy	1.1 (12)	1.6 (12)	0.6 (12)
Skin and related disorders	1.0 (13)	1.7 (11)	0.2 (15)
TOTAL	65.7%	43.1%	87.8%
(% of costs excluding unattributable, etc - see footnote)	(98.8%)	(98.2%)	(98.9%)

¹ Excludes "unattributable", ranked #1 overall, (22.4% of total costs, 45.0% of direct costs, 0.1% of indirect costs); "ill-defined conditions", ranked 6th overall (5.6% of total costs, 3.1% of direct costs, 8.0% of indirect costs); "others", ranked 11th overall (3.1% of total costs, 5.6% of direct costs, 0.7% of indirect costs); and "well-patient care", ranked 12th overall (2.4% of total costs, 2.4% of direct costs, 2.4% of indirect costs). Combined, these categories accounted for 33.5% of total costs, 56.1% of direct costs, and 11.2% of indirect costs

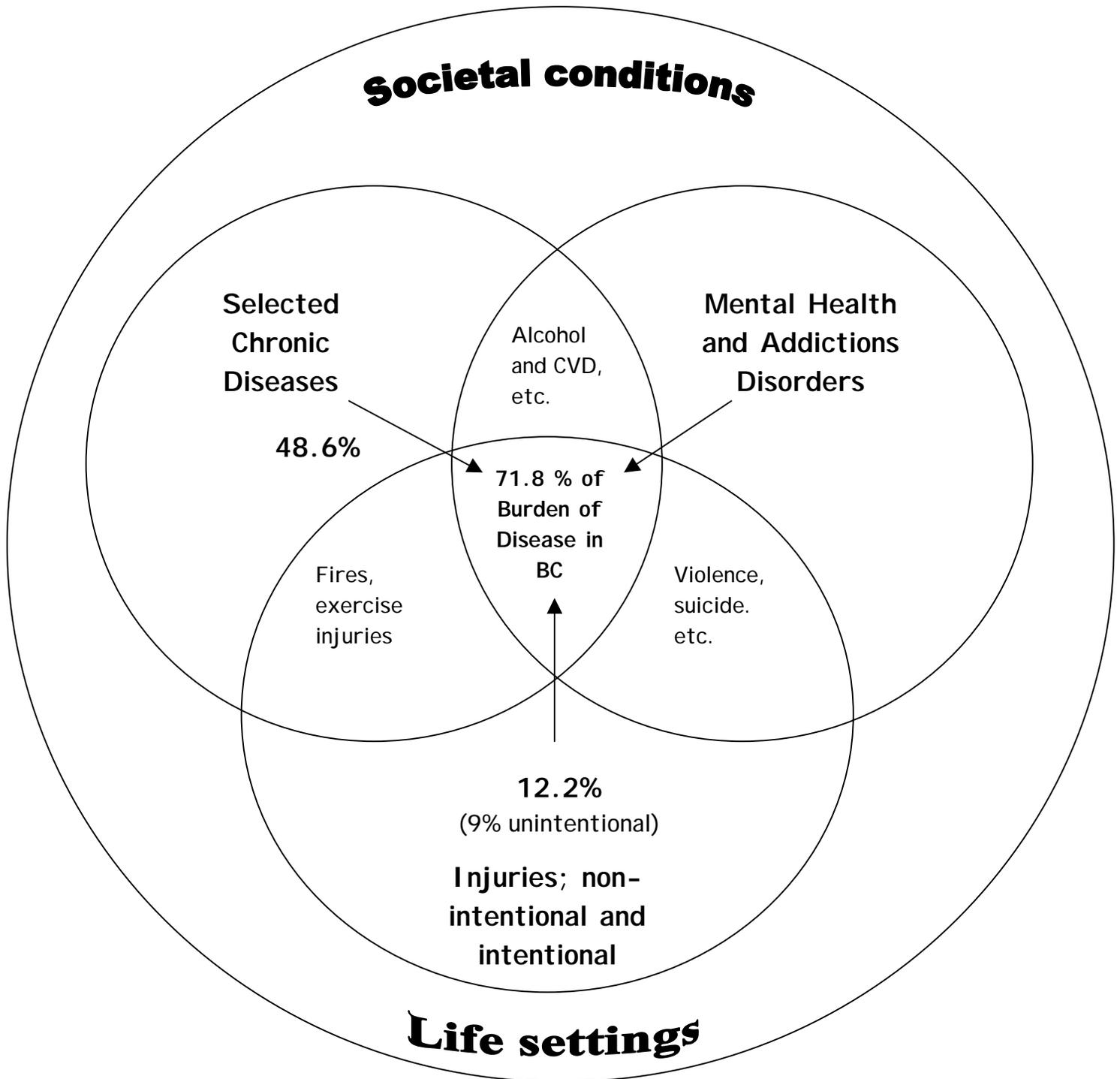
While for convenience these conditions are addressed by different initiatives, in reality they are inter-related, and exist within a set of common health determinants operating at the societal level and in the homes, schools, workplaces and communities in which people lead their lives (Figure 3). Some examples of the interactions are:

- Mental health problems and addictions disorders, which are themselves rooted in a combination of social circumstance and biological conditions, may contribute to both intentional injuries (such as self-inflicted injury or violence against others) and to a mental health state that makes it difficult to change patterns of behaviour (such as poor nutrition or physical inactivity) that contribute to the selected chronic conditions.
- Mental health status, including learned helplessness and associated depression, may be factors contributing to the physiological changes that lead to heart disease and other chronic conditions, while conversely resilience, self-efficacy, and other factors that determine mental health are also factors that may be protective with respect to these same conditions.
- While alcohol abuse and addiction contribute significantly to the burden of both physical and mental health problems, regular low-level consumption of alcohol may significantly reduce the burden of cardiovascular disease.
- Fires caused by smoking are an important contributor to deaths and injuries, while exercise contributes to the burden of sports-related injuries.
- Exercise may help prevent or overcome depression and other mental health problems.

Moreover, inequalities in health are found within all these categories of health conditions. These inequalities are rooted in socio-economic conditions, educational attainment, working conditions, gender, and the social and cultural conditions experienced by First Nations peoples. Improving these broad societal conditions and reducing inequalities in access to such determinants of health is likely to have a beneficial impact on these and other health problems, both chronic and acute.

This paper provides the framework for an initiative that focuses on the first of the three sets of conditions noted above, namely a selected set of chronic conditions (heart disease, cancer, chronic respiratory disease, and diabetes) that share three principal common risk factors (smoking, unhealthy eating patterns, and physical inactivity). The selection of this limited set of chronic conditions is consistent with the approach taken by the World Health Organization (2002), the US Center for Disease Control and Prevention (CDCP), the National Public Health Partnership (NPHP) in Australia, and the Chronic Disease Prevention Alliance of Canada (CDPAC), among others. The NPHP (2001) includes mental health in its definition of chronic disease, but has developed a separate mental health strategy, while both CDCP and CDPAC exclude mental health from their definition of chronic disease.

Figure 3: Relationship of 3 key non-communicable disease and injury prevention initiatives



The approach taken here is to include mental health – but not injuries³ – in the model, to recognize the common risk factors and conditions that often link the principal chronic physical diseases with mental disorders and addictions, and to recognize the common settings within which shared interventions need to be applied.

But at the same time, it is important to recognize that for the practical purposes of coalition-building, many of the key stakeholders involved in the prevention of the chronic physical diseases of concern (e.g. the Heart and Stroke Foundation, the Cancer Society, the Lung Association, the Diabetes Association, anti-smoking coalitions, physical activity coalitions, healthy eating coalitions, etc.) have a different focus from those involved in the promotion of mental health and the prevention of mental disorders and addictions, or those working to prevent both unintentional and intentional injuries – with the latter in fact sharing a number of concerns with those involved in the prevention of mental disorders and addictions.⁴

This paper provides a framework for the prevention of chronic physical and mental health problems in general, and the selected chronic diseases as noted above in particular. This framework provides the basis for identifying both broad and generic strategies for addressing chronic physical and mental health problems, and more specific strategies that can reduce the incidence of the selected chronic diseases of concern. A second paper, to be ready by April 2003, will provide the evidence base for the strategies that will be pursued.

1. A provincial chronic disease prevention initiative for B.C.

It is important to begin with a clear understanding of what is meant by the term “provincial chronic disease prevention initiative”. Each of these key concepts is described below.

3.1 What is meant by ‘provincial’?

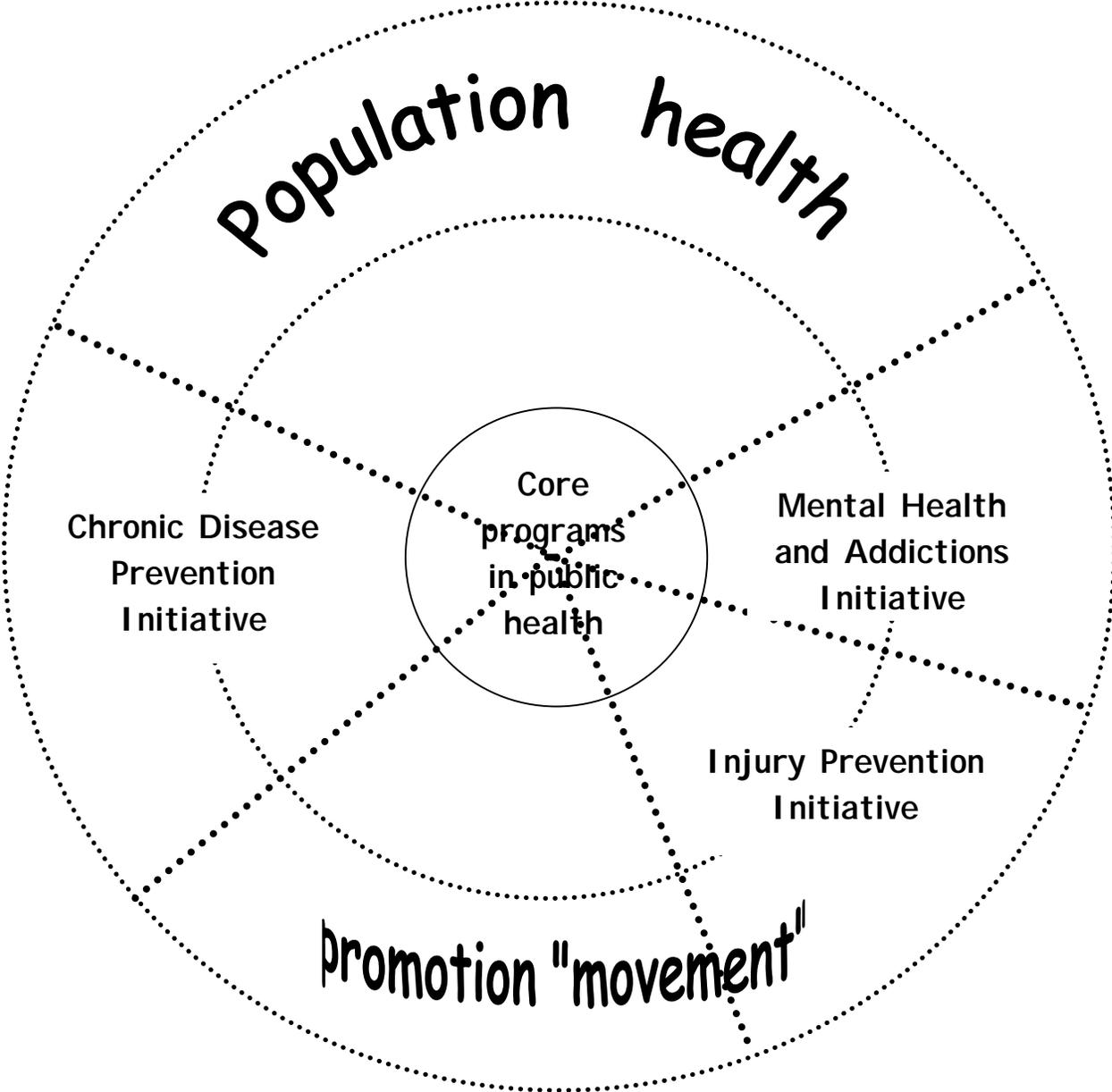
Since the Ministry of Health Planning does not deliver services, but instead provides planning and ‘stewardship’, the provincial role is to provide direction and support to health authorities and to work with non-governmental partners to ensure that evidence-based action is taken across B.C. in this and other priority issues that have been identified as the subjects of province-wide initiatives. Direction and support to health authorities will be provided within the emerging context of core programs in public health. These are currently under development and will be included in a new Public Health Act to be introduced in 2004/5. They will be complemented by a province-wide initiative that includes the development of a B.C. chronic disease prevention alliance.

These initiatives are perhaps better described as “province-wide” rather than “provincial” because they extend well beyond the health care system, the Ministry of Health and the provincial government, to forge partnerships with provincial voluntary organizations, local municipalities, community organizations, and key private sector companies that comprise what might be termed the ‘population health-promotion movement’ (Figure 4). These initiatives play an important role in improving health, preventing disease, disability and injury, and protecting people from environmental hazards in the built and natural environments.

³ Although injuries may be chronic conditions and are significant contributors to the burden of disease internationally and in Canada, they are usually considered as separate, but related issues; both CDCP and the NPHP specifically exclude injuries from their definition of chronic non-communicable diseases.

⁴ Examples include the relationship between substance abuse and motor vehicle accidents, the relationship between mental health problems or substance abuse and violence, and so on.

Figure 4: Province-wide population health and wellness initiatives for priority non-communicable conditions



3.2 What is meant by ‘chronic disease’?

In the health sector, the term “chronic” refers to a health-related state that lasts a long time: the US National Center for Health Statistics defines a “chronic” condition as one of three months duration or longer. The term also refers to “exposure, prolonged or long-term, often with specific reference to low intensity” (Last, 2001).

In a recent report on a Strategic Framework for Chronic Disease Prevention in Australia (National Public Health Partnership, 2001) it is suggested that chronic diseases

“are usually characterized by complex causality, multiple risk factors, a long latency period, a prolonged course of illness, functional impairment or disability, and in most cases, the unlikelihood of cure”.

Chronic disease is usually understood to mean non-communicable diseases that are chronic in nature, although the WHO considers “chronic conditions” to include certain communicable diseases such as HIV/AIDS as well as non-communicable diseases and long-term mental disorders (WHO, 2001).

In the US, the Center for Disease Control and Prevention considers the following to be chronic diseases: cardiovascular disease, diabetes, arthritis and other musculo-skeletal diseases, cancers, chronic lung diseases, and chronic neurological disorders; the Australian report includes mental health problems in the definition. However, neither includes injuries, even though they may result in long-term or indeed lifetime impairment and disability,⁵ nor do they include communicable diseases, including those which may indeed be chronic in the sense of long-lasting (e.g. HIV/AIDS, TB, hepatitis C), or dental caries and periodontal disease, which is in fact one of the most widespread chronic diseases and one which exacts a high economic cost.

This report adopts the Australian approach to defining chronic disease⁶. Based on an analysis of the burden of disease in British Columbia in 1998, the priority conditions for chronic disease prevention in general are as follows:

	<u>% of total DALYs</u>
Cancer	20.7%
Cardiovascular disease	18.3%
Mental disorders	11.0%
Neurological & sensory disorders	8.7%
Chronic respiratory disease	6.5%
Musculo-skeletal diseases	3.4%
Digestive disorders	3.2%
Diabetes mellitus	3.1%
<u>TOTAL</u>	<u>74.9%</u>

Between them, these diseases account for three-quarters of the burden of disease.⁷

⁵ While injuries are a significant component of the burden of disease and may contribute to chronic or indeed life-long impairment and disability, they are not included in the definition used by the Australians or here, on the grounds that many of the interventions and risk factors are very different than for the major chronic diseases - although there is some overlap. A separate injury prevention initiative is under development.

⁶ The direct cost of dental services in Canada is \$6.4 billion (Health Canada 2002 - Table 2, footnote #4), making them 2nd (7.6%) in rank for direct costs (no data were provided for indirect costs, and BC data are not available from this report). The report notes that it is hard to determine the proportion of dental costs linked to digestive diseases. For the same reason, dental disease does not appear to be included in the estimation of the burden of disease in BC.

⁷ One of our next steps must be to dig down deeper and define the diseases that explain 80% or so of the DALYs within each category, so we can begin to review the literature for effective primary prevention interventions that are disease-specific, as well as those that are more generic

However, as a first step the chronic disease prevention initiative will focus on certain of these disease categories (cardiovascular disease, several forms of cancer, chronic respiratory disease and diabetes) that together contribute almost half the estimated burden of disease in B.C. and share a set of common risk factors, namely smoking, unhealthy eating and physical inactivity.⁸

3.3 What is meant by 'prevention'?

Prevention has been defined as "actions aimed at eradicating, eliminating, or minimizing the impact of disease and disability, or if none of these is feasible, retarding the progress of disease and disability" (Last, 2001).

There are four levels of prevention:⁹

- Primordial prevention – "Actions and measures that inhibit the emergence and establishment of environmental, economic, social and behavioural conditions, cultural patterns of living, etc., known to increase the risk of disease" (e.g., improving housing availability, reducing child poverty).
- Primary prevention – "Protection of health by personal and communal efforts, such as enhancing nutritional status, immunizing against communicable diseases, and eliminating environmental risks, such as contaminated drinking water supplies".
- Secondary prevention – "A set of measures available to individuals and communities for the early detection and prompt intervention to control disease and minimize disability, e.g., by the use of screening programs".
- Tertiary prevention – "Measures aimed at softening the impact of long-term disease and disability by eliminating or reducing impairment, disability, and handicap; minimizing suffering; and maximizing potential years of useful life" (Last, 2001).

Last (2001) suggests that these are, respectively, the task of public health policy and health promotion, public health services, preventive medicine, and rehabilitation. While this task definition should not be considered to be rigid, it does serve to make the point that prevention involves more than public health, extending on the one hand to wider segments of society and its governments, and on the other hand to primary care and other health care staff working in the health care system.

The proposed Chronic Disease Prevention Initiative focuses mainly on primordial and primary prevention – the prevention of onset of disease in the first place – but also includes early detection, which is part of secondary prevention. Moreover, it could be argued that some forms of secondary and even tertiary prevention in one chronic condition are primary prevention for another. For example, early detection and appropriate treatment of hypertension (high blood pressure) is an effective means of delaying or even preventing the onset of cardiovascular and renal disease and stroke, while effective rehabilitation from stroke may reduce both the burden of the residual disability (and thus the burden of disease) as well as the likelihood of resultant depression.

⁸ The prevention of mental disorders is addressed in a separate strategy under development by the Adult Mental Health Division of the Ministry of Health Services. However, given the clear overlap with respect to a number of key risk factors and conditions, close collaboration will be beneficial for both sets of conditions.

⁹ A fifth level, quaternary prevention, has been proposed (Jamouille, 1986). It is defined in the WONCA Dictionary (Bentzen, 2000) as "Action taken to identify patients at risk of over-medicalization (and) protect them from new medical invasion . . ." or as "measures that relieve without curing the symptoms of terminal disease" (National Specialty Program in Public Health and Community Nutrition, Australia, undated). It is thus concerned with unnecessary and inappropriate diagnostic and therapeutic interventions and excessive and intrusive end-of-life treatment; it can also be thought of as the prevention of an unhealthy death. It is relevant in particular to chronic diseases and conditions.

3.4 What is meant by ‘initiative’?

A Provincial Initiative constitutes a coordinated set of programs and activities at the provincial and local level that are focused on an issue of public health importance – in this case, the burden of selected chronic diseases. Initiatives are usually developed together with the Health Authorities and other partners within the health care system, with NGOs, with local municipalities and community organizations, and with the private sector. An important first step, currently underway, is the establishment of a provincial chronic disease prevention alliance involving key provincial organizations, the Provincial Health Officer and the Ministry of Health Planning. This alliance, which will relate to the recently established Chronic Disease Prevention Alliance of Canada, will help to ensure a more integrated and effective province-wide approach to the prevention of chronic diseases. Like its national partner, the B.C. alliance will be focusing on the same set of diseases and the same common risk factors and conditions that are discussed here.

Core programs in public health are currently being defined in the context of the new Public Health Act. These will include both health improvement and disease prevention programs that will be central to the prevention of chronic diseases in B.C. As shown in Figure 4, an initiative may be rooted in core programs in public health, but transcends public health – indeed, it transcends both health services and government actions, encompassing what may be thought of as a broader ‘population health-promotion movement’. At the same time, Figure 4 also illustrates that core programs in public health, and indeed the work of the health care system and the broader ‘population health-promotion movement’, encompass much more than just chronic disease.

Thus this report proposes a province-wide effort to coordinate the efforts of governmental and non-governmental health organizations and other key players in an integrated set of policies, programs and activities focused on preventing the onset of cardiovascular disease, many forms of cancer, chronic respiratory disease and diabetes by addressing the common risk factors and conditions that contribute to these diseases.

3.5 An integrated approach

A recent report adopted by Canada’s Minister of Health suggests that an integrated approach to chronic disease prevention must be taken. Such an approach has four key elements:

- Addressing the set of common risk factors – Integrated strategies will target the set of common risk factors for major chronic diseases simultaneously through approaches that promote and support healthy living.
- Recognizing and addressing the relationship between lifestyle choices and social conditions – The most promising avenues for effective prevention focus on supporting healthy living in healthy conditions, based on an understanding of lifestyle choices within the possibilities and constraints of people’s social conditions.
- Consolidating prevention efforts within life settings – Focusing on life settings such as work, school or community is increasingly recognized as an effective way to reach target populations with integrated prevention action on multiple risk factors and across life cycles.
- Engaging partners within and across the systems that impact health – To optimize health gains coordinated intersectoral and interjurisdictional intervention is required, as well as horizontal linkages with other sectors (such as environment, housing and justice) that have a role in addressing underlying determinants of health.

Consistent with this approach, and with the proposed core programs in public health, a provincial chronic disease prevention initiative will need to have two main components:

- Health improvement programs that have generalized and non-specific preventive effects on a wide range of diseases and conditions (including injuries, mental disorders, communicable diseases, adverse birth outcomes, etc.). These include healthy infant and child development; healthy living (non-smoking, active living, healthy eating, moderate alcohol use) in the context of healthy living conditions; and mental health promotion.
- Chronic disease prevention programs that target specific diseases. The target diseases are chosen based on the burden of disease, as noted earlier.

In both cases, the initiative needs to both enhance protective factors and to reduce risk factors.

It should be clear that neither the Ministries of Health nor the Health Authorities can provide all the services and resources that are required for chronic disease prevention; hence the need for a province-wide effort. Active living, for example, requires the collaboration of school boards, urban planners, recreational professionals and many others; healthy eating requires the participation of food stores and restaurants, the agri-food industry, workplaces, school boards and many others; while mental health promotion needs to involve day cares, schools, workplaces, and other key life settings. A chronic disease prevention initiative needs to bring together a coalition – or a number of coalitions – in order to marshal and organize the necessary resources.

In this context, the role of the Ministry of Health Planning is to:

- provide the evidence on effective chronic disease prevention programs and activities
- help to create the necessary coalitions and infrastructure
- assist with the planning and implementation of the key elements of a chronic disease prevention initiative and specific chronic disease prevention programs, and
- work to develop provincial legislation, policies and programs that are important for reducing the burden of chronic disease in B.C.

4 A chronic disease prevention model

Based on a review of the evidence concerning the wide range of factors and conditions that play an important role in the development or avoidance of chronic disease, a model has been developed¹⁰ showing the relationship of these factors and conditions to each other and to the outcomes, namely biological changes and disease itself (Figure 5). This model has been developed in the context of an understanding of ‘chronic disease’ as encompassing a selected set of physical diseases (cardiovascular disease, some of the principal cancers, chronic respiratory disease and diabetes) that share a common set of risk factors (smoking, unhealthy eating patterns, physical inactivity), as well as mental health disorders and addictions that share with these diseases a common set of social, economic, environmental and cultural circumstances and living and working conditions. Genetic, psychological and other biological factors that can contribute to or protect against risk are also included in the model. Where possible, the proportionate contribution of these different factors to the burden of disease is indicated.

In addition to the determinants, which are the ‘boxes’ in the model, the model also integrates the various strategies that need to be used to change these determinants.

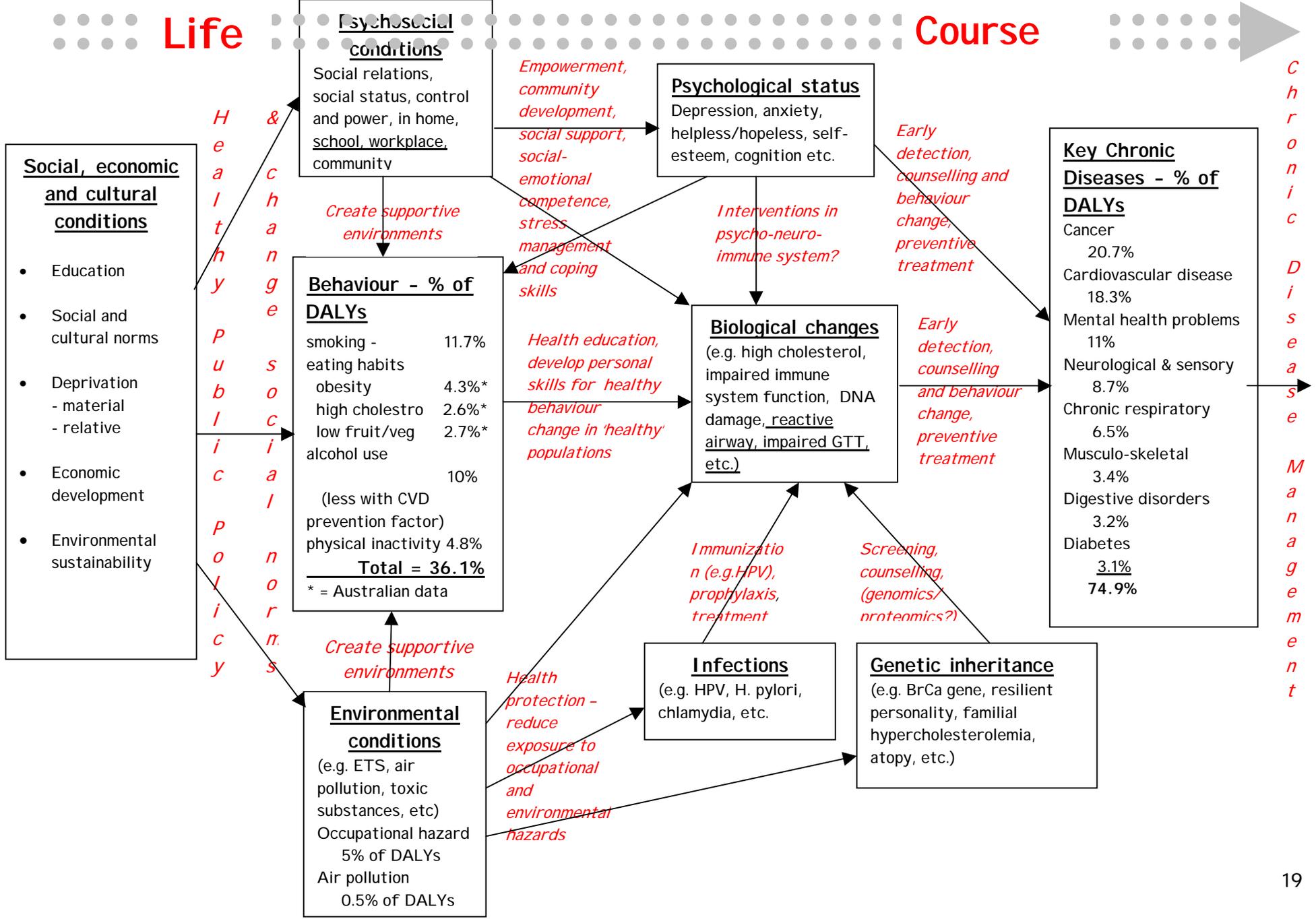
¹⁰ It is worth recalling the sage advice of the distinguished statistician George Box that “All models are wrong – but some models are useful.” This model is no exception; for the sake of clarity in what is already a complex model, not every relationship is shown, although some additional aspects of those relationships are discussed in the text.

Thus on the left part of the model is a set of 'primordial' prevention strategies drawn from the Ottawa Charter for Health Promotion, while on the right side are the more clinical primary prevention strategies from the Canadian Task Force on Preventive Health Care. Once the disease is present, the clinical components of the chronic disease care model come in to play, so at the right-hand edge the model links up to chronic disease management.

The reference to life course (which should not be understood literally as running in a linear fashion across the model) indicates that many of the determinants of chronic disease exert their influence from before birth – indeed from before conception – throughout life, and into old age. Thus interventions, although often appropriately focused early in life, may need to be made throughout life, and indeed over several generations, in order to be effective.

The components of the model are briefly reviewed below.

CHRONIC DISEASE PREVENTION MODEL



4.1 Determinants

1. Social, economic and cultural conditions influence behaviour, psychosocial conditions and physical environments. Interventions involve the development of healthy public policy and the changing of social norms, which requires health impact assessment and advocacy for health in a wide range of “non-health” sectors.
2. Psychosocial conditions (social relations, social status, and power and control) in homes, schools, workplaces and communities influence psychological status and behaviour, and also influence biological factors through the psycho-neuro-immune system. Interventions include the creation of supportive psychosocial environments, community development and empowerment in the settings in which people lead their lives, the development of social-emotional competence, and stress management and other potential interventions in the psycho-neuro-immune system.
3. Environmental conditions in the built environment (homes, schools, workplaces, communities) and in the natural environment influence psychological status and behaviour, and produce biological change both directly and via infections and genetic change. Interventions include the creation of supportive physical environments (especially built environments) and protecting people from exposure to environmental hazards such as toxins or micro-organisms in air, water and food that are associated with chronic disease.
4. Psychological status is shaped from infancy and throughout life by broad social, economic and cultural conditions and by more immediate psychosocial and environmental conditions. Psychological status in turn shapes behaviour, and may directly cause biological change through the psycho-neuro-immune system. Interventions include efforts to create positive psychological characteristics through modifying the social relationships and the psychosocial environment in homes, schools and workplaces, helping young people to improve their social-emotional competence, and helping people to learn effective stress management and coping skills.
5. Behaviour is shaped by social, economic, cultural, psychosocial and physical environment conditions, as well as by psychological status. Interventions (other than those already discussed aimed at the determinants of behaviour) include health education to change knowledge and attitudes and to assist people in developing self-health care skills that enable them to look after their own and their families’ health and well-being; these interventions are intended mainly for currently healthy populations.
6. Infections are of growing interest as potential contributors to the development of chronic disease. This suggests potential interventions including immunization, prophylaxis and treatment.
7. Genetic inheritance interacts with the other determinants, which help to determine the extent to which genetic predisposition is expressed. There are few direct interventions at present that will modify genetic inheritance, although over time it may be possible to intervene with genomics. In the meantime, screening and counselling for those at high risk of transmitting genetic predisposition for chronic diseases is the principal intervention.
8. Biological change is the final stage in the process prior to the onset of symptomatic and clinically apparent disease. Interventions here are essentially secondary prevention, since the disease process has already been initiated. Interventions include early detection, behavioural modification (but now targeted to those at high risk and with early changes) and treatment of precursor conditions to reverse the change prior to the onset of frank morbidity.

The next report on chronic disease management, to be completed by April 2003, will provide brief reviews that identify our current state of knowledge with respect to these components as determinants of chronic disease, both in general and for specific chronic diseases: cardiovascular disease, cancer, respiratory disease, and diabetes – see Appendix 1 for a draft outline of the table of contents of this report).

4.2 Interventions

Interventions to prevent chronic disease fall into two broad categories: One set of interventions is based on the Ottawa Charter for Health Promotion, and as such primarily addresses the broader determinants of health through interventions that are political, environmental, and social in nature. The second set of interventions is more focused on individuals, and ranges from psychosocial interventions to clinical interventions. There is a degree of overlap between these two categories of intervention.

1. Developing healthy public policy: Healthy public policy refers to the development of public policy that is good for health – and for that matter, private sector policy where it has an effect on the health of the population – in non-health sectors. Given the importance of these non-health sectors as determinants of population health, the development of healthy public (and private) policies may be more important for the prevention of chronic disease than anything that occurs within the health policy field. For example, urban design and transportation policies have an influence on physical activity, while the policies and practices of the fast-food industry have important implications for obesity and fat consumption. Policies that affect social inequality, a condition which is known to be related to differential rates of chronic disease, are also important.

2. Changing social norms: One of the most effective strategies to prevent chronic disease in recent years has been the emergence of the non-smokers' rights movement, which has changed the norm regarding the social acceptability of smoking. This in turn has led to measures such as legislation to protect non-smokers and even the prosecution of the tobacco industry. Further progress in preventing chronic diseases will require changes in the social norms with respect to issues such as portion size in restaurants and at home, the social acceptability of active living, what constitutes a pleasing diet and so on. These norms cannot be imposed, but they can be modified through a broad societal effort, as the example of tobacco shows.

3. Creating supportive environments: Individual behaviours, community lifestyles and social norms are influenced by our social and physical environments. If we create environments that support or reinforce unhealthy ways of life, we should not be surprised if people and communities make unhealthy choices. We have to make the healthy choice the easy one, by creating social and physical environments that support those choices in our homes, schools, workplaces, care facilities and communities.

4. Protecting people from hazards: People may be unwittingly and unwillingly exposed in their homes, schools, workplaces and communities to chemical or biological factors that contribute to chronic diseases. Examples include urban air pollution, persistent organic pollutants in food, carcinogens in the workplace or infectious agents in the blood supply. Protecting people from these hazards is an important role for governments and industry.

5. Empowerment, community development and social support: Enabling individuals and communities to exert greater control over the factors that determine chronic disease has both direct and indirect impact on their health. The direct impact stems from the well-established role of social support in determining health status and longevity, mediated no doubt through the psycho-neuro-immune system. The indirect impact results from the ability of empowered individuals and communities to create supportive environments, push for healthier public policies, and in other ways alter the determinants of chronic disease.

6. Enhance social-emotional competence: At the individual level, enhancing the competence and effective functioning of the individual, in the context of supportive social environments, strengthens their ability to make positive choices that will result in lower levels of risk and of chronic disease for themselves and their families.

7. Stress management and coping skills: In light of the evidence about the importance of stress in altering physiological functioning in ways that may contribute to a wide variety of chronic diseases, it is important to help individuals to better cope with adverse conditions and to manage stress more effectively. However, this needs to occur within the context of the creation of social and physical environments that reduce the stress to which people are subjected.

8. Prevention of infections linked to chronic diseases: Given the growing evidence of the role of some infectious organisms in the development of some chronic diseases, interventions to prevent and/or treat such infections before the onset of the chronic disease is likely to assume increasing importance. This may be accomplished through immunization, prophylactic treatment, or reducing or eliminating the organism in the environment.

9. Genetic screening and counselling: As research continues to identify genes that increase the probability of developing specific chronic diseases, the importance of genetic screening will increase. However, as with all screening, it is essential that an effective intervention and/or counselling be available for those in whom a genetic marker or abnormality is detected.

10. Early detection/screening: The detection of pre-symptomatic, sub-clinical or early clinical changes that mark the early development of chronic diseases, while not primary prevention in nature, remains an important means of preventing the full clinical condition from emerging. In some cases, early detection can lead to fully effective treatment (surgical excision of cervical carcinoma-in-situ, for example).

11. Counselling, behavioural change and preventive treatment: These forms of intervention in those who already exhibit biological change or clinical disease are secondary prevention, in that they do not prevent the onset of the disease, but they do prevent, delay or slow down progression. Counselling and behavioural change services help people acquire the self-health-care skills that enable them to change their risk behaviours and slow or even reverse the risk factors they exhibit, while self-medical-care skills may include self-management of chronic diseases. Moreover, in some cases the treatment of one condition (e.g., hypertension) can prevent the onset of a second condition (e.g., stroke). As such, these interventions may straddle the boundary between chronic disease prevention and chronic disease management.

The next report, to be completed by April 2003, will provide brief reviews that identify our current state of knowledge with respect to these strategies in terms of their effectiveness in preventing chronic diseases, both in general and for the specific chronic diseases of concern: cardiovascular disease, cancer, respiratory disease, and diabetes.

4.3 A life course perspective

"The life course may be regarded as combining biological and social elements which interact with each other. Individual biological development takes place within a social context, which structures life changes so that advantages and disadvantages tend to cluster cross-sectionally and accumulate longitudinally. Exposure to one environmental hazard is likely to be combined with exposure to other hazards and these exposures are likely to accumulate over the course of life." (Blane, 1999)

The various societal conditions that affect the development of chronic disease appear to exert their influence on health through two main pathways: either their effects contribute to or result from differential access to the determinants of health, a process that has been referred to as social programming, or their effect on the psyche and on the body directly alters biochemistry, physiology and cellular and organ functioning – biological programming. In both cases, these changes interact with the genetic and acquired biological programming of the individual and their impact, whether positive or negative, accumulates over the course of an individual's life, affecting their psychological and physiological resilience to challenges to their health, a process that Canadian health philosopher Sholom Glouberman has termed the “biological embedding of life experience”.

These factors also affect the development of the social-emotional competence of individuals, which not only affects their internalized sense of self, and thus their resilience in the face of challenge, but also affects their ability to develop skills that enable them to avoid or successfully manage the challenges – physical or psychosocial – that are inherent in life.

According to Brunner and Marmot (1999) the process of biological programming begins with biological stressors occurring before birth such as malnutrition, maternal smoking or infection, and continues through infancy, in particular malnutrition and infection. These early changes have life-long impact because "The in-utero environment programs organ systems of the developing fetus . . . (and changes) the person's likelihood of developing chronic disease later in life." (Marmot, 1999)

An important Canadian review of early child development (Guy, 1997) examined recent research that showed that "the first few years of life can have a lifelong impact on health, mental ability and coping skills." Among the most important factors are early stimulation as a result of good parenting, good early childhood education and child care, all of which stimulate brain development, with important implications for intellectual, emotional and social development; caring and supportive relationships with parents and other close family members; a supportive community that protects children from harm and neglect and provides them with opportunity and hope. The converse of these conditions constitutes risk factors and risk conditions that may adversely affect both child development and health and subsequent adult health.

" . . . recent research in child health shows that early life health is, for each child, the basis of health in adult life. Therefore investment in health in early life has beneficial effects, specifically on the future health of a nation as well as on the future functioning of its citizens." (Wadsworth, 1999)

5 Inequalities in the burden of chronic disease

The burden of chronic disease is not distributed evenly across the population. Rather, there are inequalities in health which in turn are rooted in inequalities in the distribution of the determinants of health, some of which are inherent in our biological makeup and some of which are acquired during our passage through life.¹¹ Some of the inherent biological determinants are sex; genetic abnormalities resulting in inborn errors of metabolism and genetic defects; and inequalities inherent in the normal biological variation across the population in physiological and biochemical function and in response to stress, infection and other challenges to health.

¹¹ Whitehead (1990) proposes seven categories of health inequalities that range from those that are essentially fixed and perhaps relatively unchangeable, such as inequalities in health associated with gender, aging and inherited genetic disorders (although some of these latter inequalities might be reduced with advances in genetic engineering!) to those at the other end of the spectrum – inequalities in health that are modifiable, if not completely eradicable. These latter are for the most part rooted in economic, social and other inequities (unfair or unjust or unacceptable inequalities) that result from the way we structure and operate our societies.

Other inequalities in health are acquired so early in life (in utero or during birth) and have such a lifelong (chronic) impact (e.g., cerebral palsy, intra-uterine growth retardation, etc.) that they are to all intents and purposes inherent. Some result from the differences in circumstances, parenting styles and skills, and other factors that affect development, including brain development, in infancy and early childhood. Others are a result of behaviours that are acquired from family, community, societal or cultural lifestyles. Some "sex-related" inequalities are in reality gender-based¹² in that they arise out of the different roles of, and attitudes towards, males and females in society (e.g., the less-aggressive treatment given to women for heart attack, or the greater likelihood they will be prescribed tranquilizers). Yet others are the result of structural economic and social inequalities and differences in living and working conditions that arise from the way society is organized. Inequity is a term used when such inequalities are deemed to be unjust, unfair and socially unacceptable. As D'Arcy (1988) has remarked, "while inequalities may be noted, inequities demand action". In practice, many inequalities in health and in the burden of chronic disease are a combination of both nature and nurture, genes and environment; some inequalities can be modified, some are essentially un-modifiable. Three key inequalities that will need to be addressed in a provincial chronic disease prevention initiative are briefly described here: the situation with respect to Aboriginal people; sex and gender-based inequalities; and socio-economic inequalities.

5.1 The burden of chronic disease among Aboriginal people

The burden of chronic disease among British Columbia's Aboriginal people has recently been assessed as part of the Provincial Health Officer's report on the health and well-being of Aboriginal People in BC (Provincial Health Officer, 2002). The report found some promising signs, in that the gap in all-cause mortality rates between Status Indians¹³ and other British Columbians is narrowing, and the trend in mortality rates among Status Indians are improving for most forms of cancer (except lung cancer), circulatory system diseases, respiratory system diseases and digestive system diseases (but showing little change for diabetes). However, "Aboriginal people have a level of health that is below that of the general population." For example, life expectancy for Status Indians, at 72.25 years, is 7.5 years below other British Columbians.

National surveys have shown that chronic conditions such as heart disease, diabetes and arthritis are more common among Aboriginal people – diabetes is more than three times as prevalent, smoking rates are twice as high, and use of screening tests such as mammography and the Pap smear among Aboriginal people is at roughly two-thirds the rate of other British Columbians. Clearly, there are major inequalities here that need to be addressed in any provincial chronic disease prevention initiative.

5.2 Sex and gender-based inequalities in the burden of chronic disease

While much attention has been paid to the inequalities in health experienced by women, it is worth recalling, as Acheson (1999) points out, that "at all stages of life from the fetus to old age, the mortality of males is higher than that of females," and that, even more dramatically, at least in the UK, "women living in the least favourable circumstances have a substantially better mortality experience than men living in the most favourable conditions".

¹² The term "sex" is used to connote biological sex: the term "gender" will be used to describe differences between males and females that are inherently socio-cultural. Thus the terms male and female are generally used in this report to refer to sex-related diseases, while the terms men and women are generally used to refer to gender-related conditions. Obviously, the two concepts are closely inter-linked and may well overlap.

¹³ Data is only available for Status Indians, not for the roughly one third of Aboriginal people who are non-status First Nations, Metis or Inuit.

The authors of the UK's Report of the Independent Inquiry into Inequalities in Health (1998) suggest there are three routes to gender inequalities in health. The first is related to the different biology of the male and female sexes, including diseases of the reproductive organs and those associated with child bearing. A second set of gender differences is related to "social and cultural influences which have a differential impact on men and women", such as the higher rates of accidental death in young male adults. The third basis for gender inequalities in health relate to different male and female cultural roles, with impacts on mental and social health. Examples include food poverty among single mothers, who tend to go without food in order to feed their children, a possibly greater impact on the mental health of men who become unemployed and so on.¹⁴

Life expectancy at birth for women in B.C. in 1999 was 82.6 years, and for men 77.2 years, a difference of 5.4 years. Since the early 1980s, the gap in life expectancy between men and women has been narrowing. This is because men's life expectancy has been increasing more rapidly than women's. Between the periods 1987-1991 and 1995-1999, men's average life expectancy increased 1.5 years, while in the same time period, women's gains were more modest – 0.9 years overall (Provincial Health Officer, 2000).

In terms of the burden of disease in B.C., males accounted for 53.8% of the DALYs, while women accounted for the remaining 46.2%. The most notable difference was that for women, cancer, mental disorders, neurological and sensory disorders, and musculo-skeletal disorders contributed a larger proportion, and injuries and cardiovascular disease a smaller proportion of total burden of disease than was the case for men (B.C. Ministry of Health, 2001). Health Canada (1999, cited in Reid, 2002) has reported that women suffer more than men from migraines, allergies, arthritis and rheumatism, and have higher levels of depression, low self-image and psychiatric hospitalization.

With respect to the specific chronic diseases and risk factors of concern here:

- The age-standardized mortality rate for cardiovascular disease has declined dramatically for both men and women between 1950 and 1997. The rate for women is roughly two-thirds the rate for men.
- Lung cancer has been decreasing among men, reflecting the decline in smoking rates that began in the 1960s. Among women, lung cancer rates are continuing to increase, because tobacco industry marketing targeted women in mid-century, they took up smoking in large numbers and their smoking rates started to decline later and more slowly than men's.
- The proportion of women age 15 and over who were regular smokers in 1999 remained slightly below that of men, and was decreasing.
- Women in general, as well as people in the older age groups and those with low income, are less likely to be physically active than men, youth, and those with higher incomes respectively.
- Men were more likely to be overweight than women, while underweight is more common among women (12 per cent), and women are more likely to struggle with body image, food, and weight problems.
- Chronic pain tends to be associated with conditions such as arthritis, and thus generally increases with age. At all ages, pain is more common among women than men, and overall, women are almost twice as likely to report chronic pain (Provincial Health Officer, 2000).

But while men live shorter lives and have a lower disability-free life expectancy, women suffer from a variety of health problems that are unique to their sex (disease of the breast, ovaries, uterus and cervix) and as well a wide range of diseases that are in part or in whole the result of – or are worsened by – gender bias in society. This includes higher levels of stress resulting from the double or triple burden of work they may carry; a greater likelihood to be victims of family violence; different treatment in the health care system, and other factors. As a result, women have a higher rate of morbidity than men, and while they have longer lives, they experience more disability.

¹⁴ A fourth factor may be at work; the well-documented differences in treatment provided to women and men for heart attack, depression and other conditions.

The result is that in Canada, while females live longer lives and, overall, can expect a greater number of years of life free of activity limitation, they actually spend a somewhat greater proportion of their lives with activity limitation; 12.5 years, or 15 percent of life expectancy, compared to 9.9 years, or 13 percent of life expectancy for males (Statistics Canada, 2001).

Clearly, a chronic disease prevention initiative needs to address differences in the burden of disease between men and women. The actions needed to address the differences in health status between men and women depends in part on whether the differences are rooted in biological differences or social inequity.

5.3 Socio-economic inequalities in the burden of chronic disease

As noted in the report of the Provincial Health Officer (2000),

“There is a close relationship between income and health. An adequate income is important for health and, conversely, low income is associated with poor health status. Certainly, not all people with low incomes have poor health, just as not all people in well-off families have excellent health. But studies in Canada and elsewhere consistently show that, on average, people at each step on the income scale are healthier than those on the step below.”

His report also notes that:

- Within the province, dying prematurely is related to social and economic conditions in the community. In general, the better the ranking on indicators such as education, employment, and income, the lower the rate of premature death.
- Many British Columbians lack sufficient income to purchase enough nutritious food, as evidenced by the numbers below the low-income line and of those who rely on food banks.

Data on potential years of life lost in Canada prior to age 75 are particularly revealing when expressed in terms of the "excess" PYLL experienced in the poorest compared to the wealthiest income quintile, since:

"Excess PYLL is a crude measure of population-attributable risk, which in this case quantifies the public health impact of income-related differences in premature mortality" (Wilkins, Ng and Berthelot, 2001).

These researchers found that in Canada, in 1996, potential years of life lost for major causes of death and for "excess" PYLL attributable to income-related differences across all quintiles were as follows:

- neoplasms – 31 percent
- income-related differences – 23 percent
- injuries (intentional and unintentional) – 20 percent
- circulatory diseases – 20 percent (emphasis added).

In other words, income-related differences were a greater contributor to PYLL than either injuries or circulatory diseases. The authors also note that the major causes of death that contributed to this income-related excess PYLL were, in order of importance, circulatory diseases, injuries, neoplasms, and infectious diseases (Wilkins, Ng and Berthelot, 2001).

5.4 Conclusion

An examination of inequalities in health and the burden of disease in B.C. and in Canada is revealing. It suggests that a substantial portion of the total burden of disease is attributable to inequalities in health that are rooted in cultural inequities (Aboriginal people, women, men); in socio-economic inequality (Aboriginal people, low-income groups, women); and in biological differences (males and females). Efforts to reduce the burden of chronic disease must include a significant focus on such cultural inequities and socio-economic inequalities, while recognizing biological differences.

6. Implications and overview of key activities

While much of the work that needs to be done to reduce the incidence of selected chronic diseases (cardiovascular disease, many forms of cancer, chronic respiratory disease, diabetes) requires the active participation of a range of partners from the health authorities, the health professions, voluntary organizations, local municipalities, community groups and the private sector, the Ministry of Health Planning has an important role to play in:

- setting direction, in consultation with these partners,
- ensuring that chronic disease prevention activities are available throughout the province,
- working to strengthen the capacity of the health care system, especially public health, to undertake chronic disease prevention activities,
- ensuring that surveillance and monitoring systems are in place, both to monitor the status of these selected chronic diseases and of the determinants of these diseases, and to monitor the effectiveness of our interventions, and
- advocating within government for public policies in non-health sectors that will contribute to the prevention of chronic diseases.

The development of the capacity to undertake these tasks must be a priority for the Ministry of Health Planning if it is to play its role in addressing and reducing the massive burden of chronic disease in British Columbia.

Work is already underway in a number of areas:

- A B.C. Chronic Disease Prevention Alliance has recently been established, with membership from a number of major voluntary and professional organizations (Heart and Stroke Foundation of BC and Yukon, Canadian Cancer Society – BC Yukon Division, British Columbia Lung Association, Canadian Diabetes Association – Pacific Area, Dietitians of Canada – BC Region, British Columbia Recreation and Parks Association, and Public Health Association of BC) and the Provincial Health Officer. The Population Health and Wellness Division of the Ministry of Health Planning will provide secretariat support in the early stages of the development of the Alliance, which is also linked to the Chronic Disease Prevention Alliance of Canada (CDPAC).

Initially, in common with the national approach, the Alliance will focus on four major chronic disease categories – cardiovascular, cancer, respiratory and diabetes – as well as their common underlying risk factors (tobacco use, physical inactivity, poor dietary habits, obesity) and the underlying determinants that contribute significantly to these conditions. However, the Alliance recognizes that there is a wide range of chronic diseases, and over time expects to expand its scope. The Alliance will be posting updates of its activities on the CDPAC website:

www.cdpac.ca

- A new Public Health Act is being planned for 2004/5, and this will include core programs (or functions) in public health that every health authority would be expected to provide. A second draft of a working paper on these core programs has recently been distributed, and consultation with public health professionals and health authorities is ongoing. The draft list of core programs (or core functions) includes several program or service areas directly relevant to chronic disease prevention, including healthy living, healthy living conditions, and specific chronic disease prevention activities.

- The Ministry of Health Services has been developing a chronic disease management approach, focusing on a set of diseases identified by B.C. doctors in a survey conducted in 2001 as priorities for chronic disease management: diabetes, hypertension, congestive heart failure, asthma, chronic lung disease, depression, renal failure, liver disease, and arthritis/osteoarthritis. The Population Health and Wellness Division is working with this program to ensure that there is an integration of both the prevention and management approaches.
- Primary care providers play an important role in the prevention and early detection of many chronic diseases. Primary health care renewal is underway in B.C., and the Population Health and Wellness Division is working with the primary care renewal team to ensure that the role and capacity of primary care providers in chronic disease prevention is strengthened. The evidence paper on chronic disease prevention will contribute to this, and to the chronic disease management program described above, by identifying the evidence-based practices that primary care providers should be supported in adopting.
- The Ministries of Health are also developing an approach to reform mental health services in B.C., and the Population Health and Wellness Division is working with the Adult Mental Health Division to ensure that prevention is integrated in this reform.
- A new tobacco strategy is under development in the Population Health and Wellness Division that will strengthen B.C.'s already strong commitment to reducing the significant burden of disease caused by this major contributor to chronic and other diseases.
- The Population Health and Wellness Division has outlined a broad framework for enhancing wellness and preventing chronic disease in B.C. Within this framework, key priorities have been identified and as a result a physical activity and healthy eating initiative that identifies priorities for collaborative action is under development to address these large contributors to the burden of chronic disease. A key component within the initiative is the Action Schools Initiative, which during Phase I is being evaluated in the Lower Mainland / Vancouver Coastal Health Authority.

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