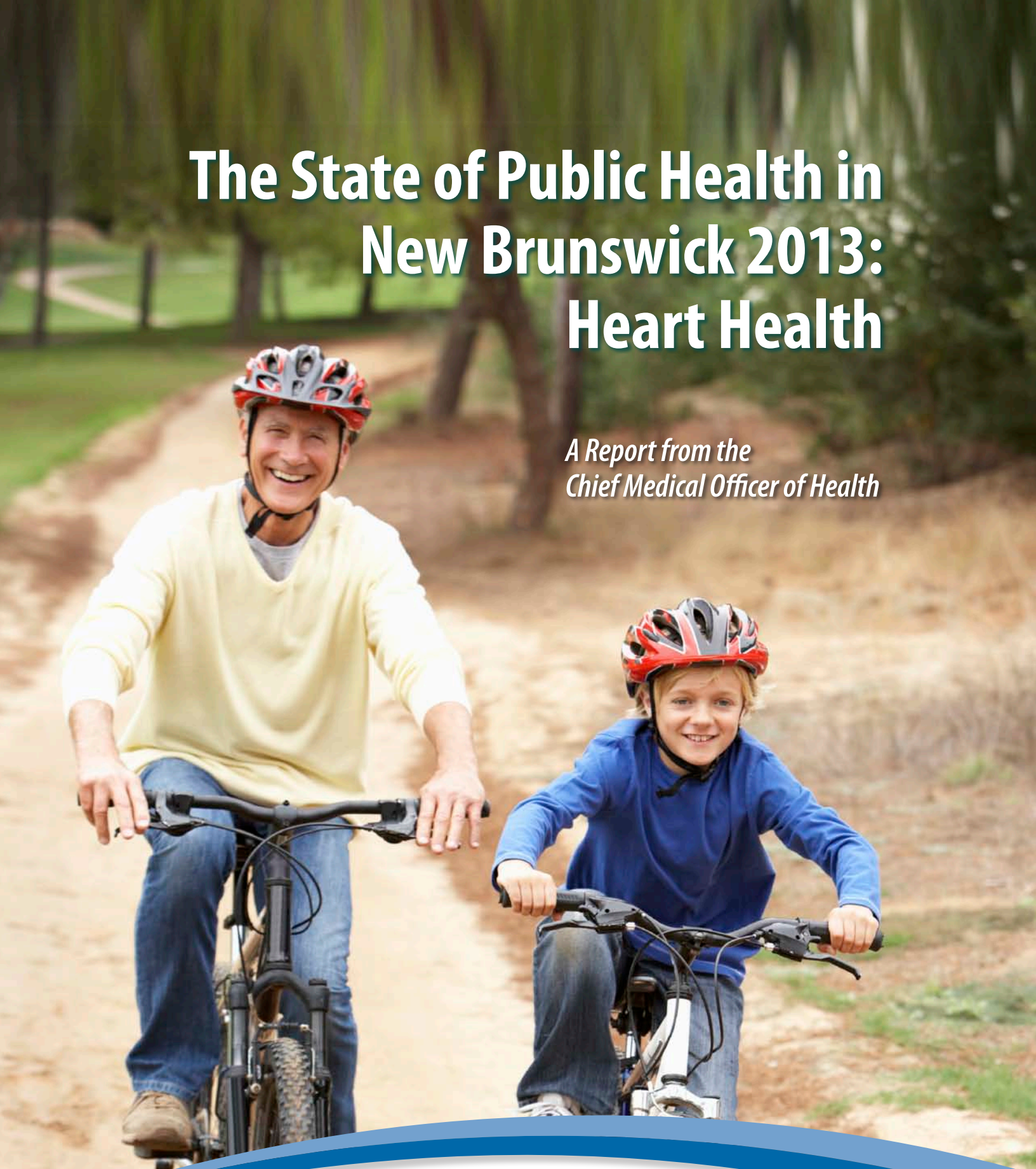
The State of Public Health in New Brunswick 2013: Heart Health

A Report from the Chief Medical Officer of Health



New Nouveau Brunswick

The State of Public Health in New Brunswick 2013: Heart Health

A Report from the Chief Medical Officer of Health

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Message from the Chief Medical Officer of Health

Although we have long-known the risk factors for heart disease, and know that it is largely preventable, it continues to be one of the leading causes of hospitalization and death among New Brunswickers. Not only does it cause pain, distress, and decreased quality and quantity of life for a significant number of people, it also is a major contributor to health-care costs in this province. To date, much of the focus has been on the clinical management of the disease and not on its prevention. If we want to make substantive and long term gains both on reducing the burden of heart related disease and lessening the cost of its management, we need to shift away from the preoccupation with diagnosis and treatment and towards a more comprehensive understanding and resolution of the underlying factors in order to deal with the risks before adverse health events occur.

While the major risk factors associated with heart disease in themselves are straightforward and not new - smoking, mental and life stress, a sedentary life style, poor nutrition, health inequities - we struggle to identify strategic and systematic ways of addressing them. Because the solutions lie with many different partners, it is not always clear who should be doing what. This leads to policy gaps and lack of visibility. Prevention is sometimes seen as something that we can wait to address "when we can afford it." I would argue that in other areas of medical practice, failing to act to prevent harm is deemed negligent. This is not to say that good work is not happening in these areas, it certainly is. However, compared with the support and funding for diagnosis and treatment (after the damage has already occurred), preventive measures receive a disproportionately low level of resources.

Just as we need to shift the balance from treatment toward prevention, so too do we need to make a shift in the way current prevention efforts are designed. The concept of Inverse Care Law in Medicine states that "the availability of good medical care tends to vary inversely with the need for it in the population served." In other words, those who need health care least use the services more, and more effectively, than those with the greatest need. This can be seen too in health promotion through our current approach of focusing preventive efforts on education aimed at changing individual behavior. Significant change will come about when we can shift the population norm as opposed to just influencing the motivated few. When identifying our strategies to lower the number of cases of heart disease in our province, we need to remember that the most successful interventions are those that reach broader sections of society and which require less individual effort. While education and awareness activities do certainly have a role, they should not remain the default or, as in some cases, the only option. What we need are approaches that make the healthy options the easy options and enable all to equitably achieve better health. Our report identifies that social disparities put some of our people at great risk and this needs to be addressed.

To maintain and improve the health of the population, Public Health examines the characteristics and needs of the population as a whole with an aim to reduce the burden of disease and improve the health of the people in this province. Understanding the extent of a problem, the trends and the risk factors are essential to plan effective and comprehensive ways to address them. I hope that this report will be useful, and used in that regard.

Progress has been made over the years. Access to certain interventions such as coronary artery bypass graft surgery and percutaneous coronary interventions is significantly higher than in the rest of Canada. New Brunswickers are living longer than ever before and are ranked fifth in life expectancy as compared with other provinces in Canada. Numbers of new cases of heart disease are declining, however because people are living longer, the demands on the health system remain high. As adult obesity rates rise it is unclear whether the downward trend in new cases will continue so we need to ensure that we build on our gains by increasing the support and funding for preventive approaches to a more appropriate level and by implementing more useful strategies and interventions to reach the population most at risk. This will result in fewer hospitalizations and deaths and an improved quality of life for many while significantly reducing our health-care costs.

Dr. Eilish Cleary
Chief Medical Officer of Health
Province of New Brunswick

Summary

What do we know about heart disease

- Heart disease is one of the leading causes of death in Canada and New Brunswick. Ischemic heart disease and heart failure are the most common forms.
- Heart disease is among the most costly of all health problems in New Brunswick and is largely preventable by acting on the main behavioural risk factors, including tobacco smoking, physical inactivity and unhealthy diets.
- Heart health is associated with a range of individual, social, economic and environmental factors.
- Actions to reduce heart disease may have a positive impact on other health conditions.

What are the key findings of this report

- An estimated 2,670 New Brunswickers were diagnosed with ischemic heart disease in 2009-10. Some 21,800 men and 13,400 women are living with the disease.
- 1,740 New Brunswickers were hospitalized for the first time with heart failure in 2009-10.
- The incidence rates of ischemic heart disease and heart failure in New Brunswick have been steadily decreasing over the past decade.
- Prevalence rates have somewhat increased over the past decade, as people with heart disease are living longer.

What we still don't know

- Will the declining trends in heart disease incidence and mortality continue in the future, given the ageing of the population and rising rates of adult obesity and diabetes.
- How some cost drivers, such as new medical technologies, may affect future health-care spending.
- How innovative public health models to address the root causes of poor heart health will affect outcomes.
- What resources will be needed to meet population health needs.

What is being done to promote heart health in New Brunswick

- The Office of the Chief Medical Officer of Health (OCMOH) is working with the regional health authorities and other partners in New Brunswick as well as health agencies across Canada to develop and inform public health policies and programs that will promote heart health and prevent disease, including acting on the underlying determinants.

Want to know more?

- Information on healthy people, communities and environments can be found on the OCMOH's website at www.gnb.ca/publichealth; including:

    - Public Health Nutrition Framework for Action 2012-2016
    - New Brunswick Health Indicators
    - New Brunswick Disease Watch Bulletin.

Contents

1. Introduction

Heart disease – a group of diseases affecting the heart and blood vessels supplying the heart – causes more deaths in New Brunswick than any other health condition except cancer. It accounts for 20 per cent of all deaths in the province, or some 1300 lives lost each year [1]. Thousands more require medical treatment for the disease. It is among the most common, costly and preventable of all health problems in Canada and New Brunswick.

One out of five deaths among New Brunswickers each year are from heart disease.

Heart disease has impacts on individuals, families, the health-care system and society as a whole. The economic burden of ischemic heart disease in Canada has been assessed at $11 billion per year, or approximately $340 for every Canadian resident [2]. The cost of hypertensive heart disease was estimated at $4 billion per year nationally or $125 per resident. These include direct health care costs (encompassing hospital, ambulatory and pharmaceutical costs) as well as indirect costs associated with reduced productivity from hospitalization, disability and premature death.

The economic burden of ischemic heart disease and hypertensive heart disease has been estimated at $465 annually for every resident.

Development of heart disease is progressive, the result of complex interactions between genetic predisposition, lifestyle, mental health, pre-existing medical conditions, socioeconomic conditions and the environment. Nationally, hospitalization and death rates due to heart disease increase dramatically at age 45 for men and at age 55 for women [3]. In Atlantic Canada, mortality rates for heart disease and other cardiovascular diseases have been higher compared to other provinces, partly due to disparities in social and economic conditions [4].

Heart disease is largely preventable. Evidence-based approaches to prevention support acting on the main behavioural risk factors for heart disease: reducing tobacco use, increasing physical activity and adopting healthier diets. Both population-wide measures and improved clinical care can result in a major reduction in the health care and socioeconomic burden caused by this disease. Many of the risk factors are shared by other major non-communicable diseases such as diabetes, cancer and chronic obstructive pulmonary disease.

Progress has been made in Canada over the last 30 years. The Public Health Agency of Canada reports a decrease in death rates from heart disease [3]. Canadians have reduced their risk by smoking less, eating better and becoming more active during leisure-time. However, considerable room for improvement remains. Global studies estimate that almost 80 per cent of first heart attacks could be prevented if everyone in the population engaged in regular physical activity, ate sufficient vegetables and fruit each day, and did not smoke [3]. Given increasing rates of obesity in Canada and New Brunswick, it is uncertain whether the downward trend in the death rate from heart disease will continue. Moreover, evidence shows not all population groups are benefiting from the progress made to date. For example, individuals with less education are more likely to have risk factors for heart disease than those with higher education [3].

Across Canada, First Nations peoples are more likely to be hospitalized for a heart attack, often at younger ages and presenting other conditions (notably diabetes), a pattern attributed to their socioeconomic disadvantage compared to the rest of the population [5].

Improving heart health in the population and reducing health inequalities is an important public health challenge. The burden of heart disease is felt provincially, nationally and globally. The World Health Organization advocates for enhanced management, prevention and monitoring of heart disease by:

- developing cost effective and equitable health-care innovations for disease management;
- effectively reducing risk factors and their underlying determinants;
- monitoring trends of heart disease and associated risk factors [6].

Management of heart disease is a costly and lengthy (even life-long) process. Public health approaches focus on population-based strategies to reduce modifiable risk factors and behaviours (e.g. smoking, physical inactivity, unhealthy diets) before disease manifestation, also known as primary prevention; and to inhibit emergence and establishment of the underlying social, economic, environmental and behavioural determinants (e.g. poverty, education) that influence occurrence of risk factors and behaviours, known as primordial prevention. At the same time, primary and primordial prevention interventions tend to receive less attention and public financing compared to clinical treatment of disease. This may be partly due to limited evidence of immediate impacts of collective strategies on heart disease outcomes at the population level, compared to medical treatment of individuals. The most effective approaches take advantage of opportunities for intervention at all stages of the life course, to promote heart health in both the short term and the long term.

Effective approaches to heart disease control take advantage of prevention opportunities across the life span and in different environments.

This report presents a comprehensive portrait of heart health and its determinants in New Brunswick to support evidence-informed policies, programs and practices leading to reduced burden of heart disease. The findings are expected to stimulate new questions and innovative actions to enhance disease prevention efforts across the province among a broad range of stakeholders both within and outside the health sector.

The report is divided into five sections. Following this introduction, we present a global overview of heart disease and related health conditions. In the third section, we present findings from surveillance on the current situation and recent trends related to heart disease in New Brunswick, analysed within our province's socio-demographic context. The fourth section discusses prevention, and assesses levels and trends in the main factors associated with heart disease at the population level, including the medical and non-medical determinants of health. Lastly, we highlight public health priorities and actions to address the root causes of heart disease and to enhance surveillance, as a starting point for discussion on evidence-based health promotion and disease prevention programming to improve the health of the population and reduce health inequalities.

2. An overview of heart disease

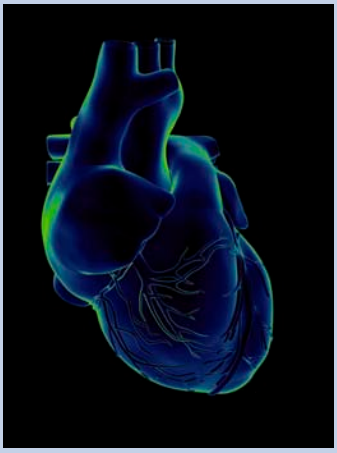
In recognition that "heart health" is more than just an absence of cardiovascular disease, the Canadian Heart Health Strategy emphasizes reducing rates of heart disease, and also promoting actions that have a positive impact on other related health conditions [7]. Acting on heart health offers a tremendous public health opportunity because up to 80 per cent of premature occurrences of cardiovascular disease are preventable. Moreover, we already have much of the knowledge required to prevent heart disease. A comprehensive approach to heart health means using what we know to address risk factors and risk behaviours, and also creating environments that are supportive of healthy lifestyles.

Heart health is more than just an absence of disease.

2.1 Heart disease

Heart disease represents a group of conditions affecting the structure and functions of the heart (Box 1). The most common forms of heart disease in Canada and much of the developed world are ischemic heart disease, including acute myocardial infarction (or heart attack), and congestive heart failure [3]. Other forms include, for example, hypertensive heart disease (complications of high blood pressure that affect the heart), carditis (inflammation of the heart or its linings) and valvular heart disease (disease process involving one or more of the heart valves). There are several definitions of heart disease in the medical literature; the term is most widely used in the context of the International Statistical Classification of Diseases and Related Health Problems (ICD), the standard used as basis for reporting morbidity and mortality statistics in Canada and New Brunswick [8].

Box 1: The human heart



The heart is a hollow muscle that pumps blood throughout the blood vessels by repeated, rhythmic contractions. It has four chambers; heart valves lie at the exit of each chamber and allow one-way blood flow to make its way through the heart. The pumping action is caused by a flow of electricity through the heart that repeats itself in a cycle. A complete cardiac cycle is the time from onset of one contraction, or heart beat, to the onset of the next.

Ischemic heart disease

Ischemic heart disease refers to a condition in which the heart works inefficiently because of reduced or absence of blood supply to part of the heart muscle, usually due to atherosclerosis (hardening of the coronary arteries). It can lead to a heart attack. Most but not all people experience symptoms, such as chest pain, prior to a heart attack. Important efforts within the health-care system to improve early detection and management of heart disease aim to reduce the number of individuals unaware of their condition.

Some risk factors for heart disease are non-modifiable, notably age, sex and family history. Others can be changed.

The risk of ischemic heart disease increases with age and among those with a family history of heart disease. Hospitalizations and death from the disease occur more often among men than women [3]. Prevention and management include acting on the underlying risk factors such as smoking, high blood pressure, high cholesterol, diabetes, heavy drinking, physical inactivity, life stress and obesity. Clinical treatment may be with medication, percutaneous coronary intervention (angioplasty) or coronary artery bypass surgery.

Congestive heart failure

Congestive heart failure, also called heart failure, is a condition where the heart is unable to provide adequate pump action to distribute blood to meet the needs of the body, causing a build-up of fluid, particularly in the lungs or legs. Heart failure can occur suddenly (e.g. following a heart attack) or it can develop over a period of time (e.g. effects of long-term high blood pressure), and can lead to death.

The risk of heart failure increases with age, generally after age 65 years. Gender differences in hospitalization and mortality rates for this condition are much less than for other cardiovascular conditions [3]. Prevention and management often consist of lifestyle measures such as restricting salt intake and not smoking. Treatment may include restricting fluid intake, medication, bypass surgery, implantation of a pacemaker or ventricular assist device, valve replacement or heart transplant.

2.2 Related conditions

Stroke

Heart disease increases the risk of stroke. In New Brunswick, stroke is the fourth leading cause of death, accounting for six per cent of all deaths [1]. Stroke is a sudden loss of brain function and occurs when a blood vessel that carries oxygen and nutrients to the brain either bleeds (hemorrhagic stroke) or is blocked by a blood clot (ischemic stroke). Depending on the location and extent of brain damage, stroke can impact any number of areas including the ability to move, see and communicate. It is a leading cause of long-term disability in Canadian adults.

Heart disease and stroke share many risk factors.

Both heart disease and stroke share many risk factors such as age, high blood pressure, atherosclerosis, smoking and obesity. Hospitalizations for this condition are more common in women, in part because they live longer than men, and stroke risks are highest at older ages [3]. The risk of death from stroke is slowly falling, partly due to improvements in clinical care and prevention of risk factors such as high blood pressure and smoking [3].

Diabetes

Persons with diabetes are more likely to develop heart disease at an earlier age than others. Diabetes is a metabolic disorder in which the body's blood sugar level, called glucose, is too high; it is a prime risk factor for heart disease and related complications [9]. It has been estimated that if diabetes was eliminated from the global population, the rate of heart attacks could decrease by 19 per cent among women and by 10 per cent among men worldwide [3]. In New Brunswick, the prevalence of diagnosed diabetes increased steadily between 1998 and 2007, such that by 2007 one in 13 New Brunswickers was living with the disease [10]. The proportion was projected to increase to one in 10 over the next five years. Compared to the general population, individuals with diabetes are about three times more likely to be hospitalized with cardiovascular disease [10].

Persons with diabetes are more likely to be hospitalized with heart disease.

Mental health

There is strong evidence that mental health is important in coping with stressors and maintaining heart health [3,4]. Poor mental health, including depression, can lead to increased risk of heart disease through adopting unhealthy behaviours such as smoking, unhealthy diet and misuse of alcohol and drugs. Unmanaged stress and anxiety can lead to high blood pressure or a heart attack. A global study identified that depression, stress and other psychosocial factors contributed to 33 per cent of the risk of a first heart attack in the population worldwide [3].

Stress and other mental health problems contribute to about one-third of the risk of a first heart attack.

Infectious diseases

Albeit less common, various infectious agents are associated with heart disease. For example, Lyme disease, an emerging infectious disease in New Brunswick, can lead to carditis and heart failure [11]. There is also evidence linking the risk of cardiovascular disease with rheumatic fever, syphilis, Hepatitis C, periodontal disease and other infections [12-16].

3. Heart health in New Brunswick

Canadians and New Brunswickers are living longer than ever. Part of the progress may be credited to advances in medicine and technology leading to improved rates of survival for disease and injury. Most – as much as 80 per cent – of the gains in the average lifespan over the past century have been attributed to public health achievements, notably reduced tobacco use, changes in diet, healthier mothers and babies, vaccination, control of infectious diseases, reduced air and water pollution, safer physical environments, and healthy social policies and programs including those addressing the broad determinants of health [17].

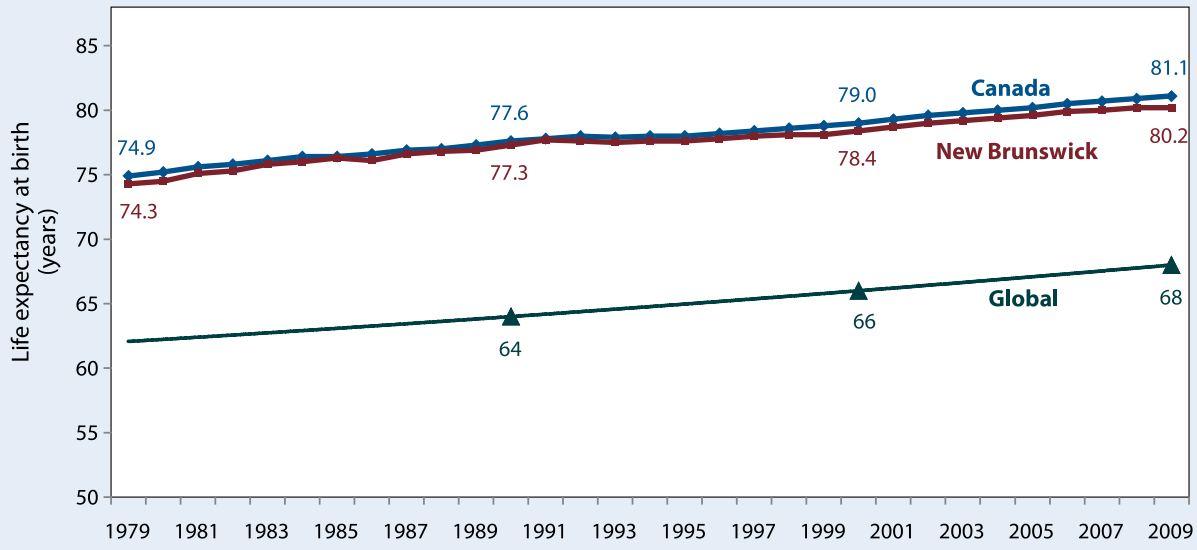
Most of the gains in the average lifespan over the past century have been attributed to public health achievements, such as reduced tobacco use and addressing the social determinants of health.

Contributing to further improvements needs to take into consideration epidemiological and demographic trends and how they could impact on population health. The true incidence of heart disease (number of new cases), prevalence (total number of cases widespread in the population) and impacts (on individuals, families, communities, the health-care system and society as a whole) are uncertain. The concept of good heart health may be simple, but its measurement is complex. Data on heart disease, related conditions, different types of care received, and the risks and impacts can be obtained from multiple sources, such as clinical care records and population-based surveys. These data sources can be used to better understand heart health in New Brunswick (Box 2).

3.1. Adding years to life

A child born in New Brunswick today can expect to live, on average, for 80.2 years (females: 82.8; males: 77.5) [18] and to be healthy for most of that time. In fact, New Brunswickers are living, on average, six years longer than they did three decades ago (Figure 3.1) [18,19]. Rising life expectancy in the province generally reflects the national trend. In 2009, among the 10 provinces, New Brunswick

Figure 3.1: Trends in life expectancy, New Brunswick and Canada, 1979 to 2009



Source: Statistics Canada; World Health Organization.

Box 2: Measuring heart health

Various data sources can be used to generate information and evidence on population health. Some key sources that are being used to support ongoing surveillance and expand our understanding of heart disease and associated factors in New Brunswick include:

- **Hospital Discharge Abstract Database:** data files on discharges, transfers and deaths of in-patients and day surgery patients from acute-care hospitals in New Brunswick. Information on clinical diagnoses allows measures of hospital services utilization for heart disease. Provincial data are also shared with the Canadian Institute of Health information, enabling comparisons across jurisdictions.
- **Vital Statistics:** data files on births, deaths and other vital events. Information on causes of death, which is categorized by Statistics Canada according to the International Classification of Diseases, allows measures of the mortality burden due to heart disease.
- **Chronic Disease Surveillance System:** a collaborative network supported by the Public Health Agency of Canada that uses provincial and territorial administrative databases (including hospitalization, physician billing, health insurance registry and vital statistics deaths databases) to track the progression of selected chronic conditions. In 2012, the system began to track information on diagnosed heart disease (notably, ischemic heart disease and heart failure) according to standardized case criteria. The Office of the Chief Medical Officer of Health is New Brunswick's official representative to this network.
- **Canadian Community Health Survey:** a series of cross-sectional surveys conducted periodically by Statistics Canada that collects information related to health status, health care utilization and health determinants. It targets all Canadians aged 12 and older and is designed to provide reliable estimates for key indicators at the health region level.
- **Census of Canada:** an enumeration of the population conducted in five-year intervals by Statistics Canada. Each year, Statistics Canada also calculates population estimates at the subprovincial level based on census counts, adjusted for census coverage levels and postcensal demographic growth.

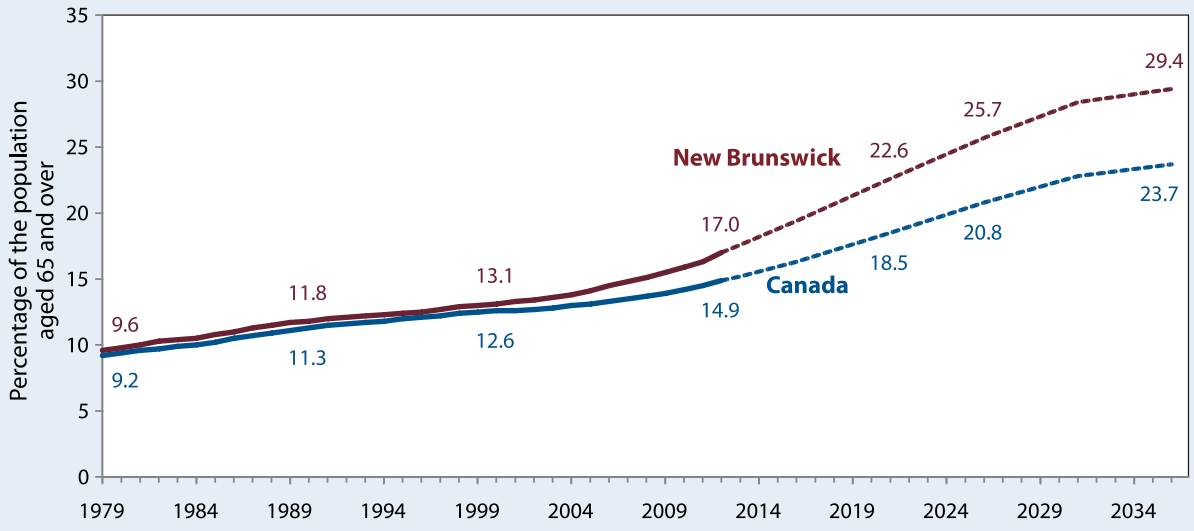
Each source has strengths and limitations for population health assessment. All data presented in this report are protected by the confidentiality provisions of the *Personal Health Information Privacy and Access Act* and other privacy legislation in force in the province of New Brunswick. In some cases, data based on small numbers have been grouped to ensure minimum standards for statistical validity, privacy and confidentiality.

ranked fifth in average lifespan [18]. New Brunswickers and Canadians are living longer than ever and have among the highest life expectancies in the world.

As a result of longer life expectancy, as well as declining fertility rates and ageing of baby boomers, the proportion of people aged 65 years and over is growing faster than any other age group. The proportion of seniors among New Brunswick's population is growing faster than the national average (Figure 3.2) [20,21]. In 2012, this province had the second highest proportion of seniors (17.0 per cent) among the 13 Canadian provinces and territories, after Nova Scotia (17.2 per cent) [20]. The median age among New Brunswickers (43.4 years) was the same as for Nova Scotia, and second only to Newfoundland and Labrador (44.2 years) as oldest in the country [20].

Within New Brunswick, the proportion of the population aged 65 and over was below the provincial average in health regions 1 (Moncton area), 2 (Saint John area) and 3 (Fredericton area) (Figure 3.3) [22]. It was above the provincial average in the four northern health regions: 4

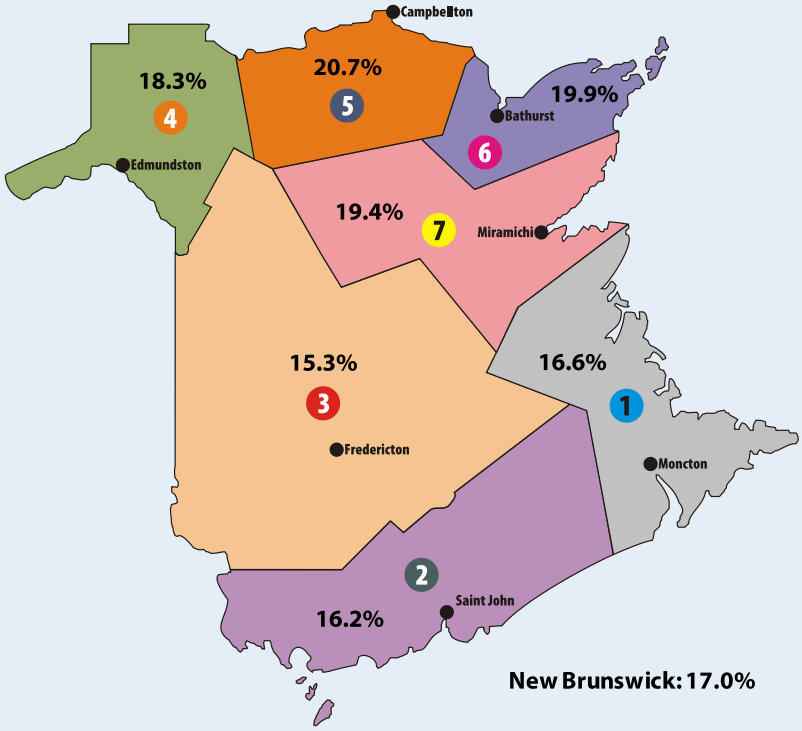
Figure 3.2: Trends and projections in population ageing, New Brunswick and Canada, 1979 to 2036



Note: Data for 1979-2012 based on census counts adjusted for census net undercoverage and estimated intercensal population growth. Projections for 2013-2036 based on historical demographic trends and medium-growth scenario.

Source: Statistics Canada.

Figure 3.3: Percentage of the population aged 65 and over, by health region, New Brunswick, 2012



Source: Statistics Canada

(Edmundston area), 5 (Campbellton area), 6 (Bathurst area) and 7 (Miramichi area).

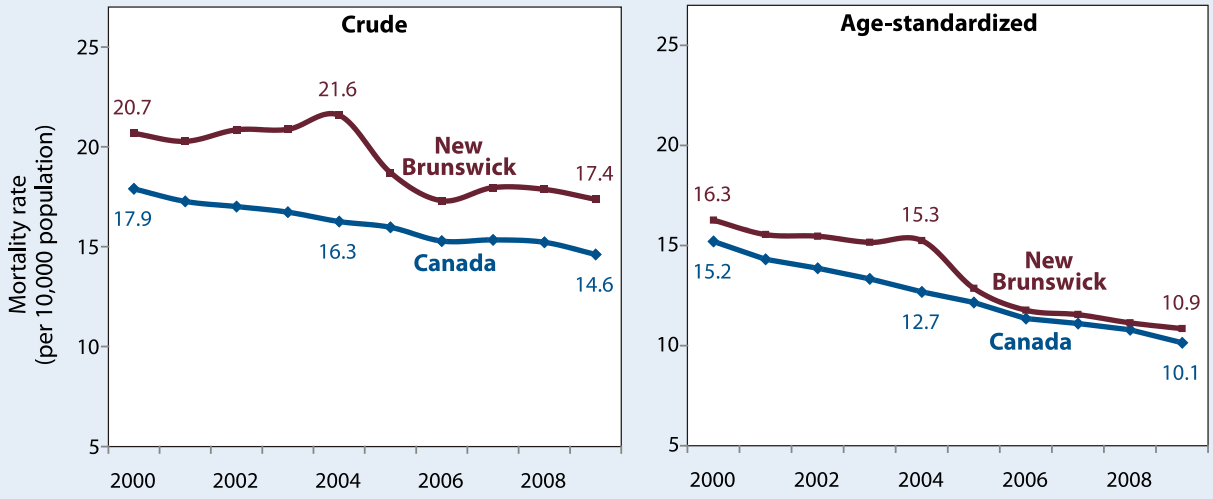
A pattern of finding the country's oldest populations in the Atlantic provinces has remained steady for years, the result of differences in demographic behaviours including lower fertility and interprovincial movements [21]. Statistics Canada projects that, should historical trends continue, by the year 2036, nearly one in three New Brunswickers (29.4 per cent) will be aged 65 or over – a considerably higher proportion than projected nationally (23.7 per cent) [21]. Older people are a valuable resource for their families and communities, but population ageing can also be seen as a challenge to which clinical care systems and society as a whole must adapt in order to maximize the

health, functional capacity and social participation of older women and men.

It is projected that, by the year 2036, nearly one in three New Brunswickers will be aged 65 or over.

In parallel with greater overall longevity, death rates from heart disease have been declining in New Brunswick and across Canada over the past decade (Figure 3.4) [23]. Downward trends in mortality due to ischemic heart disease have been observed previously since at least the mid-1980's [24]. While numbers of deaths (and other health events) rise and fall over time in all populations, fluctuations can be more erratic in smaller populations. New Brunswick's crude death rate due to heart disease has experienced greater fluctuations compared to the national average, as expected given its relatively small population, but the declining pattern has generally held: from 20.7 to 17.4 deaths per 10,000 population between 2000 and 2009 [23]. The pace of decline was similar to the national average, a ten-year drop of approximately 20 per cent, albeit at a higher level. Given the province's older population, and the fact that the health impacts of heart disease increase with age, New Brunswick's crude death rate is expected to be higher than the national average. To control for differences in population age structure, comparisons are made using age-standardized mortality rates, which are calculated by weighting the number of deaths occurring at different ages against a standard population. Once adjusting for population ageing, the declining pattern in the burden of heart disease in New Brunswick continued to hold: a ten-year drop of 33 per cent in the age-standardized mortality rate, and a reduced gap in the rate against the national average.

Figure 3.4: Trends in mortality rates due to heart disease, New Brunswick and Canada, 2000 to 2009



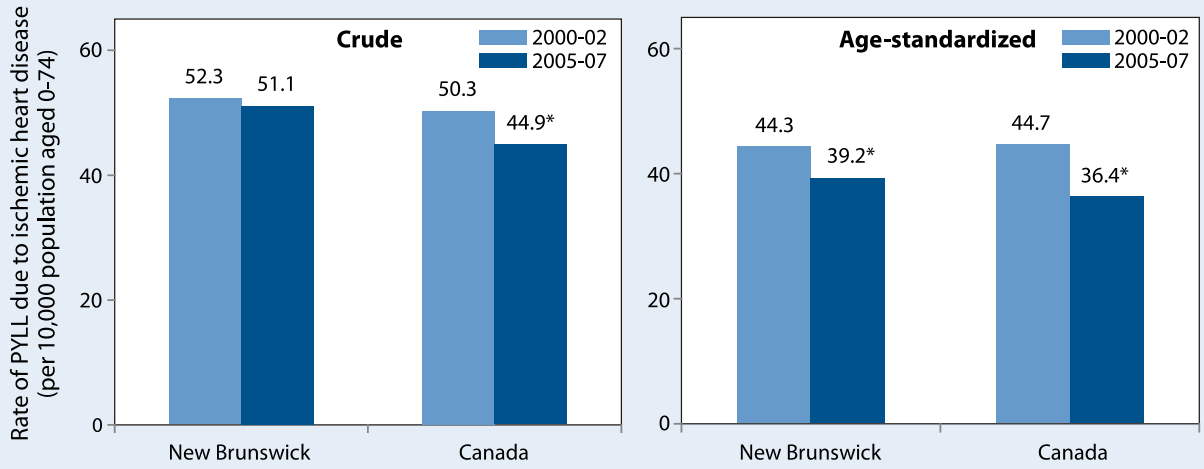
Note: Data based on the underlying cause of death, and categorized according to the International Classification of Diseases [ICD-10 codes I00-I09, I11, I13, I20-I51]. Age-standardized rates weighted to the 1991 Canadian census population structure.

Source: Statistics Canada.

Another way to look at the burden of heart disease is through measures of premature mortality, notably the potential years of life lost (PYLL), which is an estimate of the average number of years a person would have lived if he or she had not died prematurely of heart disease (set here as death before age 75). In New Brunswick, the PYLL due to ischemic heart disease account for 9.5 per cent of the total PYLL for all causes of premature death [25]. The province's crude rate of PYLL due to ischemic heart disease remained relatively stable between 2000-02 and 2005-07 (Figure 3.5) [25]. Controlling for population ageing, the rate decreased significantly over the same period (from 44.3 to 39.2 per 10,000 population aged 0-74). The provincial rate was statistically similar to the national average. The rate of PYLL due to ischemic heart disease remained considerably higher among male New Brunswickers than females (63.9 versus 15.2 per 10,000 population in 2005-07) [25], reflecting some combination of a greater number of premature deaths or younger ages at death among males. Decreasing mortality

Deaths from heart disease, including premature deaths, are declining.

Figure 3.5: Potential years of life lost due to ischemic heart disease, New Brunswick and Canada, 2000-2002 and 2005-2007



Note: * = significantly lower than the previous reference period ($p<0.05$). Rates for New Brunswick not statistically different from the age-standardized Canada rates. Potential years of life lost calculated using the population aged 0-74, and age-standardized using the 1991 Canadian census population structure. Rates based on three consecutive years of data on underlying cause of death: ischemic heart diseases [ICD-10 codes I20-I25].

Source: Statistics Canada.

trends across Canada for this disease have been attributed almost equally to primary prevention, i.e. reductions in risk factors and changes in lifestyle, and better treatment [26].

With the expected rapid increase in the proportion of seniors in New Brunswick in the coming years, and the increase in rates of diabetes and adult obesity, the evidence is inconclusive as to whether the declining trends in heart disease-related mortality will continue in the future.

It is uncertain whether the number of deaths from heart disease will continue to drop in the future.

3.2. Adding life to years

New Brunswickers are living longer than ever. Not all of the gains in longevity are spent in good health, especially at older ages.

Not all gains in longevity are lived in good health. Health-adjusted life expectancy (HALE), a summary measure of both quantity and quality of life, reflects many chronic diseases that tend to develop only once a person is older. National data on the loss of HALE for those with diabetes and hypertension (both important risk factors for heart disease) suggest that although women have a higher life expectancy than men, they are expected to spend a smaller proportion of their life in good health, notably at older ages [27].

New findings from the Chronic Disease Surveillance System, which collates and summarizes information from multiple data sources, offer estimates of the incidence and prevalence of diagnosed ischemic heart disease and heart failure among adult men and women in New Brunswick. The surveillance system does not capture conditions that have not yet been diagnosed by a physician, and therefore might underestimate the true levels and health impacts of heart disease in the province. However the numbers of undiagnosed cases are likely declining over time as a result of health system efforts to improve disease detection and management.

Each year about 2,670 New Brunswickers are diagnosed with ischemic heart disease. The number has gone down considerably over the past decade.

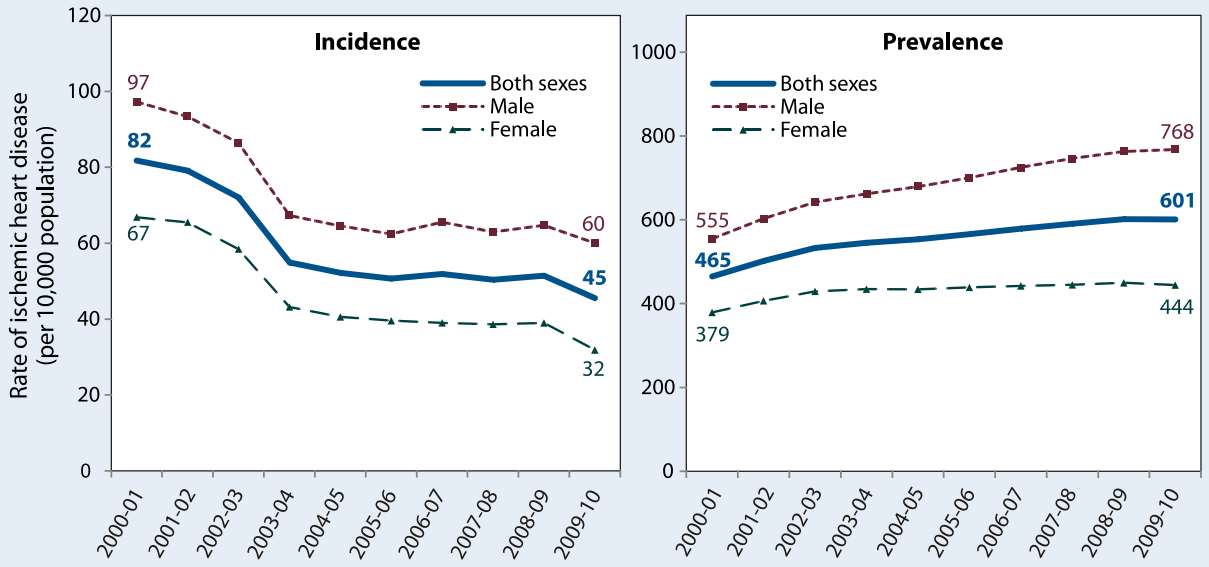
An estimated 2,670 adult New Brunswickers (970 women and 1,700 men) were newly diagnosed with ischemic heart disease in 2009-10. This is down from over 4,500 new diagnoses in 2000-01. The incidence rate dropped nearly in half over the decade, from 82 per 10,000 population aged 20 and over in 2000-01 to 45 in 2009-10 (Figure 3.6). While the exact reason for this decrease is not known, it is likely the result of a combination of factors, including a reduction in the risk factors for developing heart disease, notably lower rates of smoking, and also better clinical management of individuals with the disease resulting in longer survival [3]. Improved survival means the number of persons living with the disease continues to increase over time. According to the latest surveillance data, some 35,200 New Brunswickers (13,400 women and 21,800 men) were living with diagnosed ischemic heart disease in 2009-10.

Within the province, once taking into account differences in population age structure, the number of new diagnoses of ischemic heart disease was highest among residents of health region 3 (Fredericton area) and lowest among residents of region 4 (Edmundston area) (Figure 3.7). Disease prevalence, which represents the cumulative sum of past years incidence rates, was significantly higher than the provincial average among residents of regions 3 (Fredericton area), 5 (Campbellton area), 6 (Bathurst area) and 7 (Miramichi area). Conversely, significantly lower prevalence was recorded for regions 1 (Moncton area) and 2 (Saint John area).

Improved survival means the number of New Brunswickers with ischemic heart disease is increasing over time.

Rates for certain medical and surgical interventions for ischemic heart disease, notably percutaneous coronary intervention and coronary artery bypass graft surgery, were higher in New Brunswick in 2011-12 compared to the national average (Figure 3.8) [28]. Hospitalization rates for percutaneous coronary intervention were higher among residents of health regions 2 and 3. Some other regional differences were observed, but they were not statistically significant, meaning this was likely an effect driven by higher variability or chance given the small population sizes, rather than a true pattern.

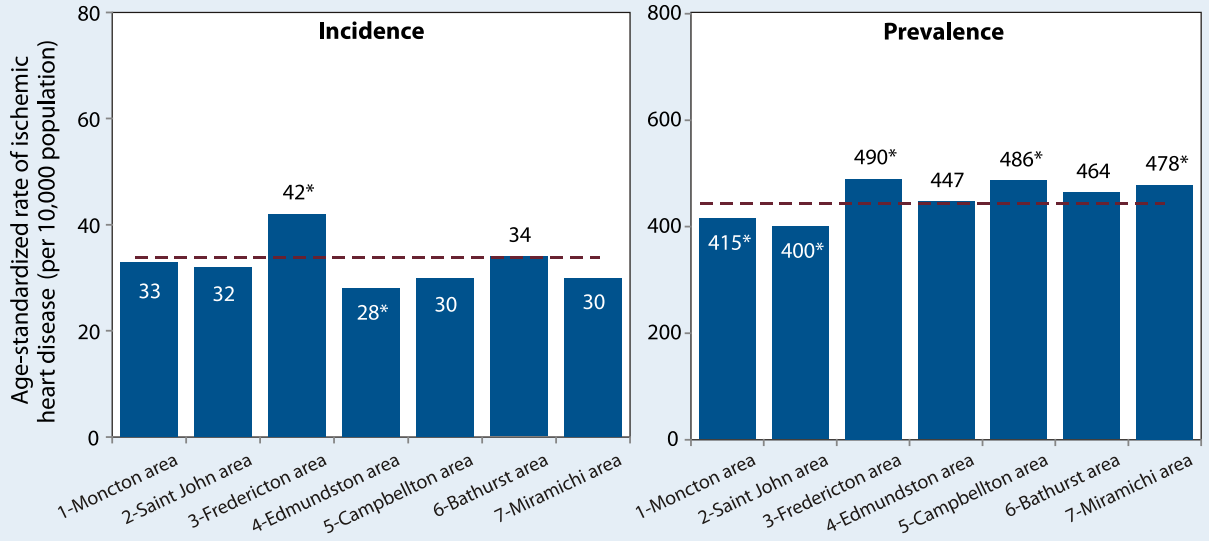
Figure 3.6: Trends in rates of diagnosed ischemic heart disease, New Brunswick, 2000-2001 to 2009-2010



Note: Data based on health administrative records analysed to meet case criteria for medical diagnosis of ischemic heart disease: at least two physician claims or one inpatient hospitalization within one year listing the disease as a diagnosis, classified according to the International Classification of Diseases [ICD-10 codes I25-30; ICD-9 codes 410-414], or identifying a related procedure (e.g. angioplasty). Incidence refers to new diagnoses recorded among the population aged 20 and older. Prevalence includes all persons ever diagnosed with the disease since the beginning of surveillance data capture (1995) and still alive during the reference year. Rates are per 10,000 population aged 20 and older, by fiscal year.

Source: Office of the Chief Medical Officer of Health, using data from the Chronic Disease Surveillance System.

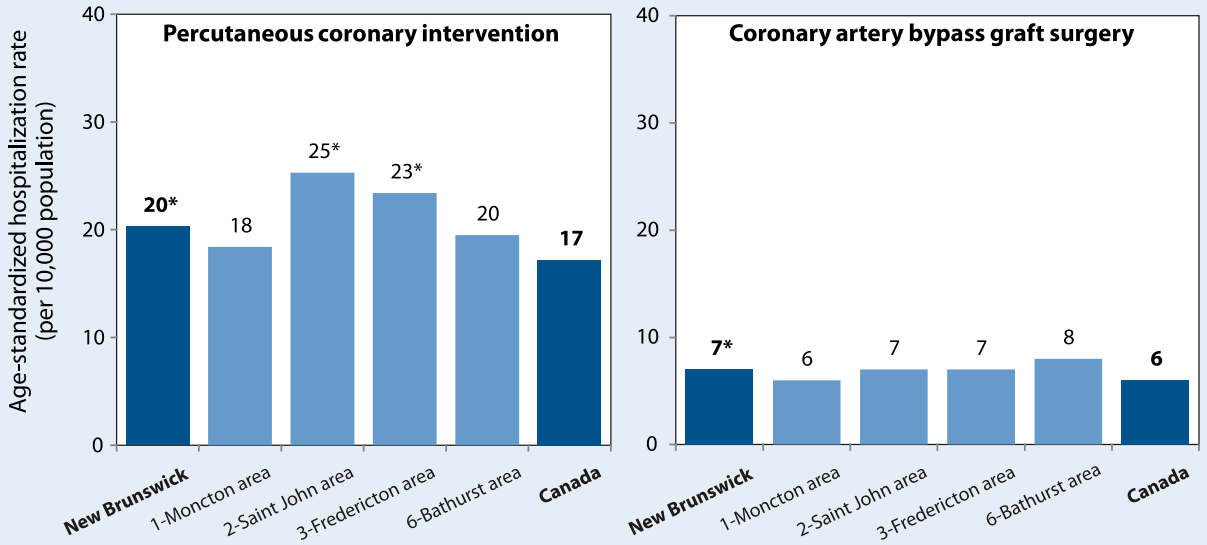
Figure 3.7: Rates of diagnosed ischemic heart disease by health region, 2009-2010



Note: * = statistically different from the age-standardized provincial rate (incidence: 34 per 10,000; prevalence: 446 per 10,000).

Source: Office of the Chief Medical Officer of Health, using data from the Chronic Disease Surveillance System.

Figure 3.8: Hospitalization rates for selected medical treatments for heart disease, by health region, New Brunswick and Canada, 2011-2012



Note: * = statistically higher than the national rate. Data for acute-care hospitalizations for selected medical and surgical interventions, by fiscal year and based on patients' place of residence (intervention may have been received outside the region). Data for regions with small populations (fewer than 50,000 inhabitants) not reported to ensure stability in rates and reduce the risk of suppression stemming from privacy and confidentiality issues.

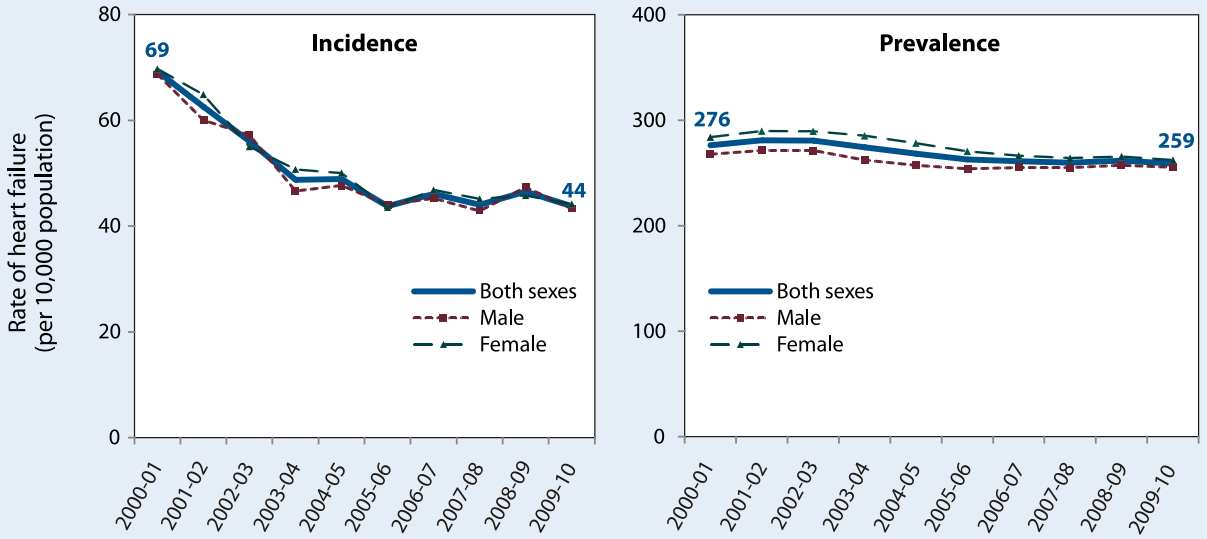
Source: Canadian Institute for Health Information, Statistics Canada.

According to the latest surveillance data, 1,740 adult New Brunswickers (44 per 10,000 population aged 40 and over) were hospitalized for new onset heart failure in 2009-10 (Figure 3.9). This was down by more than one-quarter from the estimated 2,360 first time hospitalizations (69 per 10,000 population) in 2000-01. Prevalence of hospitalized heart failure dropped more slowly over the past decade, and became increasingly similar for both sexes. By 2009-10, some 10,340 New Brunswickers (259 per 10,000 population) had received hospital care for heart failure, with the rate down about five per cent from that recorded ten years earlier (276 per 10,000 population).

Within the province, the age-adjusted incidence rates of hospitalized heart failure were significantly lower than the provincial rate among residents of health regions 1 (Moncton area), 6 (Bathurst area) and 7 (Miramichi area), with prevalence also significantly lower for regions 1 and 6 (Figure 3.10). Conversely, incidence rates were significantly higher among residents of health region 2 (Saint John area), and somewhat higher for regions 3 (Fredericton area) and 5 (Campbellton area). Prevalence was significantly higher in all three of these regions.

Not all heart conditions result in hospitalization. Hospitalization rates depend on numerous factors, including severity of disease, physician practice patterns, availability of services, referral patterns and differences in population health and socio-demographics.

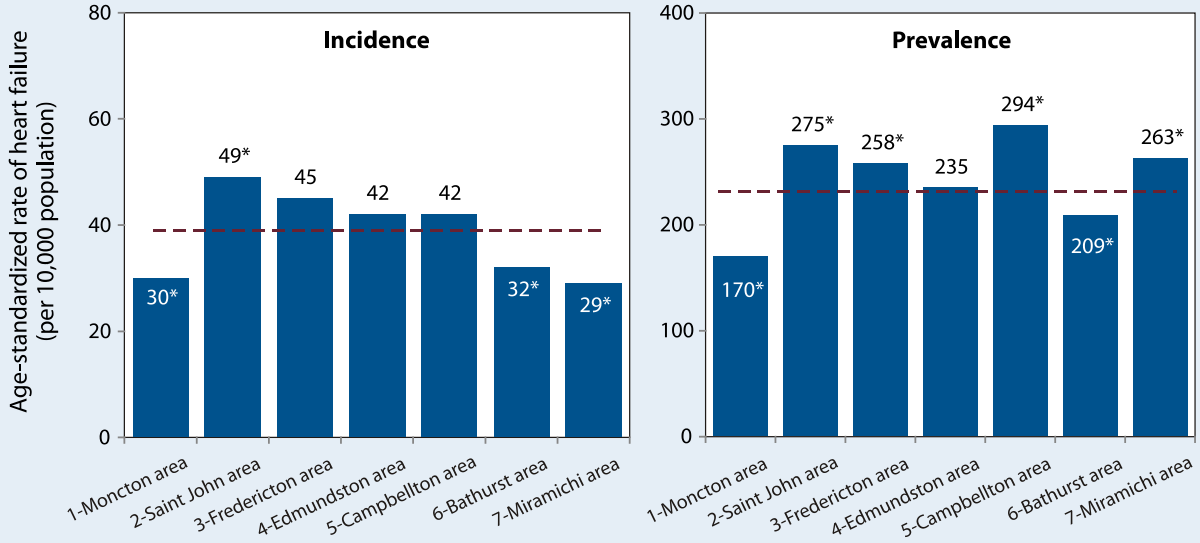
Figure 3.9: Trends in the number of adults hospitalized with heart failure per 10,000 population, New Brunswick, 2000-2001 to 2009-2010



Note: Data based on health administrative records analysed to meet case criteria for medical diagnosis of heart failure: one or more inpatient hospitalizations listing the disease as a diagnosis, classified according to the International Classification of Diseases [ICD-10 code I50; ICD-9 code 428]. Incidence refers to first time heart failure among the population aged 40 and older. Prevalence refers to any hospitalized heart failure since the beginning of surveillance data capture (1995), with the person still alive during the reference year. Rates are per 10,000 population aged 40 and older, and by fiscal year.

Source: Office of the Chief Medical Officer of Health, using data from the Chronic Disease Surveillance System.

Figure 3.10: Number of adults hospitalized with heart failure per 10,000 population, by health region, 2009-2010



Note: * = statistically different from the age-standardized provincial rate (incidence: 39 per 10,000; prevalence: 235 per 10,000).

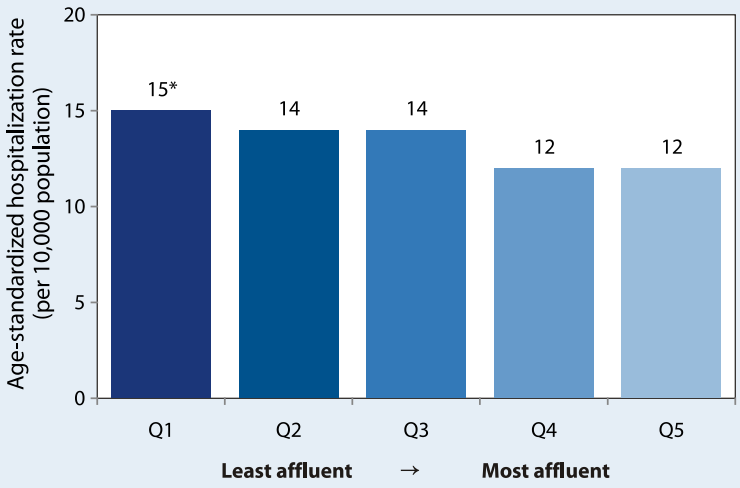
Source: Office of the Chief Medical Officer of Health, using data from the Chronic Disease Surveillance System.

3.3. Some New Brunswickers at greater risk

Fewer New Brunswickers could be hospitalized for stroke if social disparities were reduced.

While New Brunswickers are living longer than ever, and with better outcomes for many heart health-related diseases, not everyone has benefitted equally from the progress that has been made. For example, evidence indicates a significant disparity in the rate of hospitalizations due to stroke for New Brunswickers living in lower income neighbourhoods, compared to the rate for those in higher income neighbourhoods (Figure 3.11) [28]. If all New Brunswickers experienced the rate of the most affluent group, the province could expect a 10 per cent drop in the overall rate of stroke hospitalizations. Significant potentials for hospitalization rate reductions have also been assessed for injury and for ambulatory care sensitive conditions, such as heart failure, diabetes and other chronic conditions best prevented and managed through community- and home-based services [28]. Similarly high potentials for hospitalization rate reductions related to disparities in health and health care do not necessarily hold for all forms of heart disease and associated conditions. Measuring outcomes by neighbourhood income group is one approach to evaluating health inequalities; it should be complemented with other indicators of socioeconomic status and health system performance to better target policies, programs and services where important gains could be realized.

Figure 3.11: Hospitalization rates for stroke by neighbourhood income quintile, New Brunswick, 2011-2012



Note: * = statistically significant disparity ratio between Q1 and Q5 rates ($p<0.05$). Quintile 1 (Q1) refers to the least affluent neighbourhoods, while quintile 5 (Q5) refers to the most affluent. The quintiles were constructed according to methods developed by Statistics Canada.

Source: Canadian Institute for Health Information, Statistics Canada.

4. Closing health gaps: the population health approach

We have long known that health care is only one of the many factors that influence the health of the population [29]. A wide range of social, economic, lifestyle and environmental factors also influence health. Most heart health problems are not the result of a single factor, but rather the result of the interaction of multiple factors, many of which can be modified. Numerous opportunities exist to prevent a heart condition from occurring or to reduce the harm done. Comprehensive prevention approaches span a number of different levels:

- **Primordial prevention:** the most foundational level, focuses on actions that will prevent the emergence and establishment of factors that are known to increase the risk of disease. Primordial prevention encompasses a range of strategies including legislation, healthy public policies, community development initiatives, public education, and health promotion and awareness campaigns. Emphasis is placed on creating supportive social, physical, economic and cultural environments where the healthy choice becomes the easy choice for most people. Specific examples may include legislation to create smoke-free places; developing public policies to address issues such as poverty, housing conditions or environmental concerns; and efforts to "de-normalize" tobacco use and reduce the amount of salt and trans-fats in the food supply.
- **Primary prevention:** refers to the efforts to modify risk factors or prevent their development with the aim of preventing or delaying the onset of disease. Actions may be personal or communal, and include such initiatives as those aimed to improve the nutritional status and fitness levels of not only individuals but of whole populations.
- **Secondary and tertiary prevention:** seek to arrest or retard existing disease and its effects through early detection and treatment (e.g. blood pressure testing, pharmacotherapy, counseling); or to reduce the occurrence of relapses and the establishment of chronic conditions through, for example, effective rehabilitation.

Public health systems focus mainly on interventions before occurrence of disease or injury, i.e. primordial and primary prevention, through population-based strategies. The public health perspective looks "upstream" to consider the root causes of heart health problems, questions how to prevent further manifestations, and proposes strategies for prevention. In contrast, many health-care interventions constitute secondary and tertiary prevention, or the "high-risk approach," namely the clinical identification of individuals in that portion of the population at highest risk and their intensive treatment. It is increasingly recognized that primordial and primary prevention activities can facilitate the uptake and success of clinical interventions. The evidence is strong that population-wide prevention and individual health-care intervention strategies have both contributed to declining heart-related mortality trends around the world. With the ageing of the population, and widespread prevalence of certain unhealthy behaviours, we cannot lapse into complacency or else we may face even more strain on the health-care system.

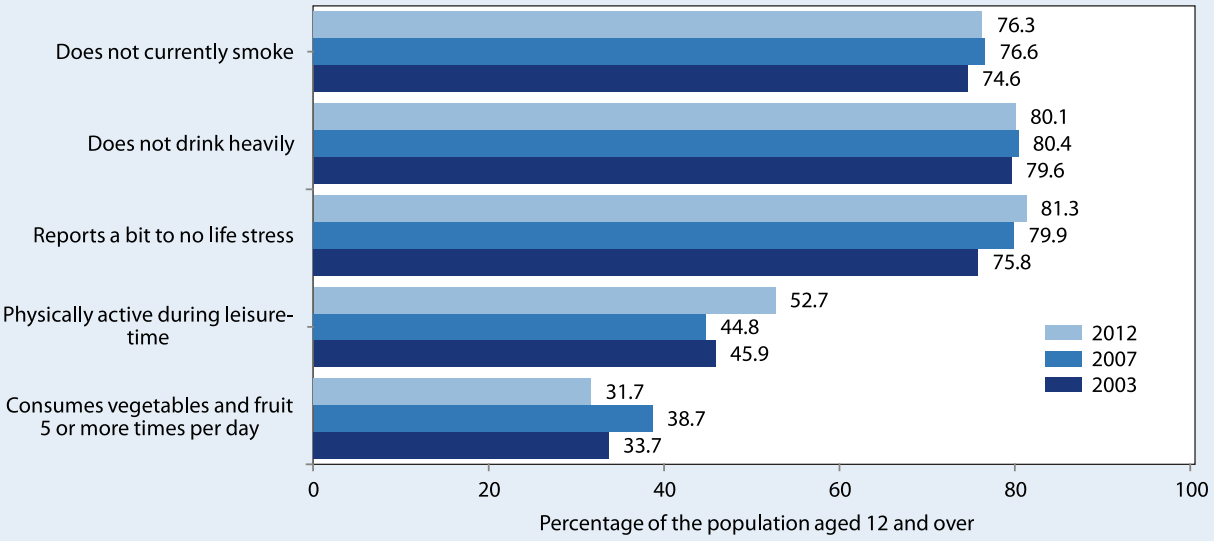
Greater benefits for heart health in New Brunswick could be achieved through population health approaches.

Progress is being made in understanding the genetic susceptibility to heart disease, but numerous lifestyle factors also influence morbidity and mortality outcomes related to heart health [3]. While there are many root causes of heart disease, tobacco smoking, physical inactivity and unhealthy diets are the main behavioural risk factors.

Unhealthy behaviours and unhealthy environments increase the risk of heart disease.

As shown in Figure 4.1, a majority of New Brunswickers adopt some aspects of a healthy lifestyle, although there remains considerable room for improvement. On the positive side, 76.3 per cent are non-smokers and 80.1 per cent do not engage in heavy alcohol use, according to data from the 2012 Canadian Community Health Survey [30]. Smoking rates have decreased significantly over the past decade, among both adults and youth (Box 3) [30, 31]. Stress, another risk factor for heart disease, is less and less often reported as considerably problematic in the lives of New Brunswickers. The proportion who reported quite a lot of life stress in 2012 was significantly lower than the national average (18.7 versus 22.7 per cent) [30].

Figure 4.1: Trends in selected personal health behaviours and characteristics, New Brunswick, 2003 to 2012



Note: Data based on self-reported health behaviours and characteristics. Current smoking refers to smoking cigarettes on a daily or occasional basis. Heavy drinking refers to having 5 or more drinks on one occasion, at least once a month in the past year. Life stress refers to the amount of stress perceived most days in life.

Source: Statistics Canada, Canadian Community Health Survey (CCHS).

Areas that require considerable improvement include increasing levels of physical activity and the consumption of vegetables and fruit. Only half of New Brunswickers aged 12 and over report being at least moderately physically active, and about a third report eating at least five services of vegetables and fruit a day, as recommended by the World Health Organization to promote heart health.

Perhaps more disconcertingly, 60.8 per cent of adult New Brunswickers were overweight or obese in 2012, with the proportion consistently and significantly higher than the national average since 2003 (Figure 4.2) [30,32].

Many New Brunswickers adopt some aspects of a healthy lifestyle. For one, smoking rates are going down. However, in parallel with high levels of physical inactivity and unhealthy diets, three out of five adults are overweight or obese.

Box 3: Tobacco: significant achievements, emerging challenges, continued burden

Tobacco use is strongly associated with adverse health outcomes, including increased risk of coronary heart disease, respiratory infections and various forms of cancer. The World Health Organization estimates that tobacco kills up to half of its users, making it one of the world's greatest public health threats. In 2012, 23.7 per cent of New Brunswickers aged 12 and over were smokers; the rate was down significantly since 2003 (25.4 per cent) but somewhat higher than the national average (20.3 per cent) [30]. One in ten of New Brunswick's youth aged 12-19 smoked in 2012, a proportion similar to the national average and down significantly from a decade earlier [30]. Average daily cigarette consumption among New Brunswick smokers was not significantly different from the national average or compared to other provinces (about 13 to 16 cigarettes per day by province, according to the Canadian Tobacco Use Monitoring Survey) [31].

Risks to health from tobacco result not only from direct consumption, but also from exposure to second-hand smoke. Among non-smokers, the provincial rates of exposure to second-hand smoke decreased significantly over the period 2003-2012, and were similar to the national average in 2012 in terms of exposure in vehicles and public places (16 per cent) or at home (about 5 per cent) [30].

Despite smoke-free place legislation and the declines in tobacco prevalence achieved to date, tobacco is still the leading cause of preventable death. The downward trend in smoking rates has stalled in more recent years. In New Brunswick, 150,000 people – including some 7,000 youth 12-19 years – continue to smoke [30]. Moreover, smokeless tobacco products are gaining in popularity among youth, and tobacco industry marketing is increasingly blurring the lines between cessation aids and facilitating continued dependence.

Against a backdrop of competing public health and clinical priorities, renewed efforts are needed to address both physical dependence and social contexts of tobacco use. In New Brunswick, comprehensive public health tobacco control strategies address multiple facets:

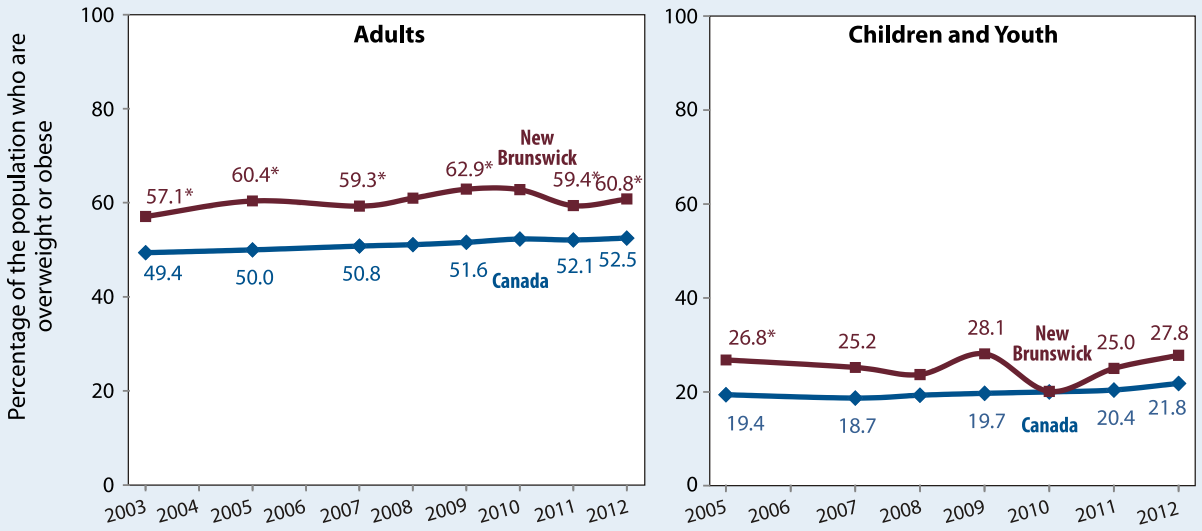
- prevention: keep non-users from starting;
- protection: protect the public from harmful effects and influences of industry;
- cessation: help smokers quit and prevent relapse.

Rates of overweight and obesity among New Brunswick's children and youth, at about one-quarter of the population aged 12-17, have shown neither significant progress nor regression in recent years; they have remained similar to the national average since 2007 (Figure 4.2) [30].

Within the province, Canadian Community Health Survey data highlight the generalized nature of the obesity pandemic. Rates of overweight and obesity among adults are high across all of New Brunswick's health regions – ranging between 56 per cent (region 1) and 71 per cent (region 7) (Figure 4.3) [33]. Among children and youth, little differences in the rates are discernible compared to the provincial or national averages.

Rates of overweight and obesity among New Brunswick's children and youth are similar to the national average, and remain stubbornly high. Obesity is largely preventable.

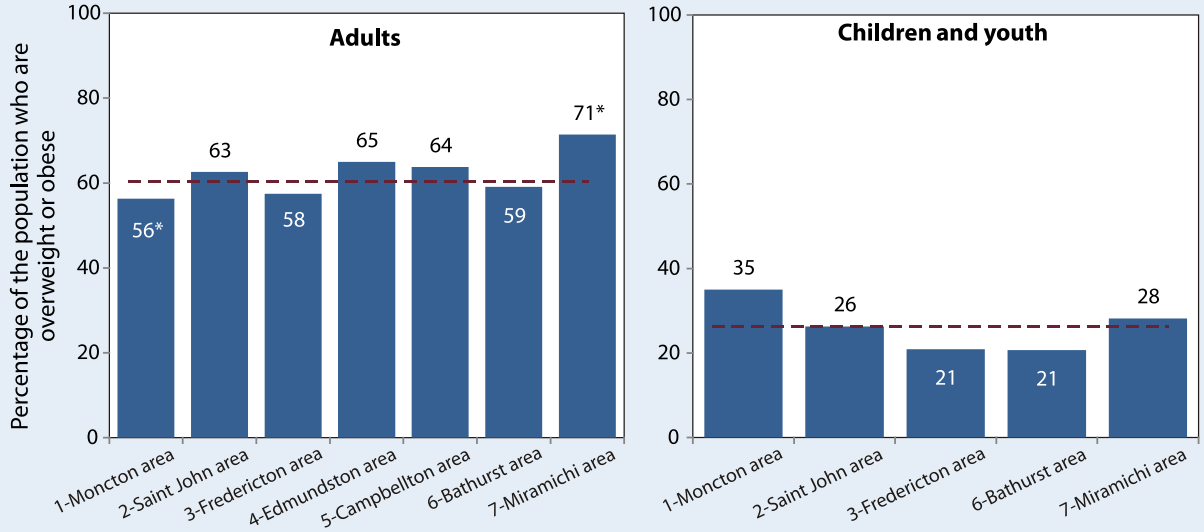
Figure 4.2: Trends in rates of overweight and obesity among adults (18 years and over) and children and youth (12-17 years), New Brunswick and Canada, 2003 to 2012



Note: * = statistically higher than the Canadian crude rate ($p<0.05$). Age-standardized rates of overweight and obese adults also statistically higher than the Canadian rates ($p<0.05$; not shown). Data based on self-reported height and weight, and categorized by Body Mass Index (BMI) according to health risk. Overweight and obese classification for adults based on standards developed by the World Health Organization; for children and youth based on BMI cut-offs established since 2005 by the International Obesity Task Force.

Source: Statistics Canada, Canadian Community Health Survey.

Figure 4.3: Rates of overweight and obesity by health region, 2011-2012



Note: * = statistically different from the provincial average (adults aged 18 and older: 60 per cent; children and youth aged 12-17: 26 per cent). Rates for children and youth for regions 3 and 6 based on 2009-2010 data, as the sampling variability associated with the 2011-2012 data was considered too extreme to enable reliable estimates; no significant difference was observed in the provincial average between 2009-2010 and 2011-2012. Rates for children and youth for regions 4 and 5 too unreliable to be published.

Source: Statistics Canada, Canadian Community Health Survey (two-year estimates).

While the fundamental cause of obesity and overweight is an energy imbalance between calories consumed and calories expended, physical activity levels remain insufficient and there has been an increased intake of foods that are high energy-dense but nutrient-poor, often high in fat, sugar and salt (Box 4) [34-36]. These changes are associated with wider societal and environmental changes: the global food system is producing more processed, affordable and effectively marketed foods; and lifestyles are becoming increasingly sedentary due to the nature of many forms of work, changing modes of transportation and increasing urbanization [37,38].

Obesity is largely preventable. Given the tendency for obese children to remain obese as adults, it is increasingly recognized that effectively combating the obesity pandemic requires actions widely aimed at preventing or reducing childhood obesity, including those based on embedding support for the benefit of all children in being physically active in everyday practice and in eating healthier foods, starting with the contribution of breastfeeding to optimal physical growth (Box 5) [39-47].

Box 4: Sodium reduction and heart health

As part of daily food and nutrient intake, some sodium (the major ingredient in edible salt) is needed to control blood volume and help cells function properly, but too much is associated with high blood pressure. The World Health Organization advocates limiting salt intake to less than one teaspoon a day to promote heart health. This includes salt from all sources: processed foods (including restaurant and fast foods), salt found naturally in foods, salt added during cooking and salt added at the table.

A national nutrition survey revealed that most Canadians, even young children, consume too much sodium [34]. While encouraging New Brunswickers to adopt healthier behaviours is one apparent strategy for improving population health and heart health outcomes, individual lifestyles are not merely a matter of personal choices; they are also influenced by the context in which people live. In particular, the survey results suggested that while adults generally seem to be aware they should control their salt consumption, adding salt to food at the table accounted for only a small amount (five per cent) of daily sodium intake [34]. Most sodium intake was less obvious because it was already in the food. Average daily sodium intake was similar in New Brunswick to the national average.

It has been estimated that the incidence of hypertension in Canada could be reduced by 30 per cent and 23,500 cardiovascular events could be prevented each year if the population average sodium intake decreased roughly in half, to about the recommended levels (from 3400 mg to 1800 mg per day) [35]. Such outcomes could contribute to $949 million annually in direct cost savings due to fewer physician visits, laboratory tests and pharmaceuticals use. Canada's Premiers have endorsed sodium reduction as an important measure to improve the health of the population [36].

In order to decrease sodium intakes in the population, complementary actions should focus on lowering sodium in the food supply; awareness and education; and research, monitoring and evaluation. Examples of public health actions that can contribute to decreases of sodium intakes include:

- Collaborating with the restaurant and foodservice industry to seek commitment toward reduced sodium content of their prepared and processed foods;
- Developing sodium reduction messages that could be used with health and education organizations and incorporated into public materials;
- Developing guidelines for the procurement of foods and beverages that can be sold or served in publicly funded places such as schools, daycares, hospitals and recreational facilities;
- Engaging with federal, provincial and territorial colleagues, industry and other stakeholders to develop evidence-based nutrition standards for processed foods, and monitor progress towards sodium reduction, through voluntary or mandatory approaches.

Box 5: Obesity and infant and child nutrition and development

Addressing the dramatic rates of overweight and obesity in Canada and New Brunswick is an important challenge; the causes are complex and the remedies often seem difficult. Developing healthy behaviour patterns at an early age plays an important role to promote healthy growth and reduce many risks associated with both immediate and long-term health problems [39].

One promising area for action, identified in the report *Curbing Childhood Obesity: a Federal, Provincial and Territorial Framework for Action to Promote Healthy Weights* [40], endorsed by all Canadian health ministers, and the *New Brunswick Public Health Nutrition Framework for Action* [41], is breastfeeding promotion. Evidence indicates that breastfeeding is a highly effective preventive measure at the earliest time to protect the health of infants, children and mothers. Exclusive breastfeeding has been associated with lower Body Mass Index, lower blood pressure and higher HDL cholesterol, which are factors that help reduce the risk of cardiovascular disease later in life [42-46].

The World Health Organization and Health Canada recommend exclusive breastfeeding for the first six months of life and continued breastfeeding with appropriate complementary foods for up to two years and beyond. But for a variety of social, economic and educational reasons, only a small portion of New Brunswick mothers meet these recommendations: 27 per cent of new mothers reported in 2012 having exclusively breastfed their last child for six months [30]. To help create an environment that protects, promotes and supports breastfeeding, the New Brunswick Department of Health has adopted the Baby-Friendly Initiative. The Baby-Friendly Initiative is the global standard through which health-care services can ensure that policies and practices are evidence-based to optimally support better health for all mothers and babies.

As children grow, New Brunswick's comprehensive school health approach supports linkages between the school community and partners to improve both health and learning outcomes that last a lifetime. A broad spectrum of health promotion activities and services address issues such as nutrition, tobacco prevention, physical activity and mental fitness. The approach focuses on actions that address:

- students' social and physical environment to ensure that it promotes healthy choices;
- students' knowledge and awareness about health issues;
- implementation of school policies that encourage and support positive behaviours; and
- access to partnership and services that can support students in making healthy choices.

Having access to nutritious safe food is also important for preventing the development of obesity and other contributing factors to heart health. The *New Brunswick Public Health Nutrition Framework for Action* [41] prioritizes food and nutrition security, as not all New Brunswickers can afford to purchase the foods for an active and healthy life, particularly children and families living in poverty. At nearly 10 per cent, the provincial rate of household food insecurity was above the national average in 2007-2008, with the highest rates among households with children [47]. Other groups vulnerable to food insecurity in Canada include single parent families, immigrants, Aboriginals and visible minorities. Addressing food security requires a multi-sectoral approach: Public Health can partner with provincial and community stakeholders to reduce the barriers to accessing nutritious foods such as poverty, transportation, education and food skills.

Traditionally, much emphasis has been placed on educating individuals to make healthier choices; however, the environments where children live, learn and play have a significant influence on eating and health behaviours. Sustainable changes start with supportive environments: those that make the healthy choice the easy choice.

The social and cultural conditions in which people are born, grow and age are also widely recognized as important determinants of health. Some communities are more vulnerable to adverse heart health outcomes. Reaching population health goals requires reducing the inequities that currently exist in New Brunswick, notably for First Nations populations (Box 6) [48-53].

Acting on heart health can be enhanced by recognizing the interrelationships across multiple domains of health and society. For instance, public health interventions in favour of increased use of active transportation (e.g. walking, cycling) to reduce problems of obesity as a risk factor for heart disease could simultaneously reduce the incidence of injuries due to motor vehicle traffic collisions. Physical environments, including the natural environment (e.g. air and food quality) and the built environment (e.g. housing, transportation, design of communities), are also key elements to an active and healthy lifestyle (Box 7) [53-56]. Ideal approaches to promote heart health take advantage of opportunities for preventing, detecting and reducing risk and mitigating impacts at all stages of the life course and in different environments.

In the context of increasingly constrained resources, the first priority should be recognition of the complexity of heart health issues and the need for multifaceted approaches. Public health strategies and clinical care mutually enhance each other; the effectiveness of one is compromised when the other is not also fully realized. Implementing interventions at each of the prevention levels can achieve the maximum possible sustained health benefit, including addressing behavioural risk factors as well as the social, physical and environmental determinants of health. In other words, policy makes the greatest impact when it optimizes the environments in which people live, work, learn and play, making healthier behaviours and healthier choices the norm.

The most effective way to improving heart health is through optimizing the environments in which New Brunswickers live, work, learn and play, making healthier behaviours and healthier choices the norm.

Box 6: First Nations and heart health

In 2011, 3.1 per cent of New Brunswick's population, or about 22,600 people, identified themselves as First Nations [48]. The First Nation population is young: the median age is 16 years younger than that of the province's non-Aboriginal population, a pattern attributable to higher fertility rates and shorter life expectancy [48].

In New Brunswick, as elsewhere across Canada, little is known about the incidence of heart disease among First Nations, or the care they receive, since information about patients' ethnicity is not consistently recorded in hospital records [5].

More is known about the underlying determinants of First Nation heart health. According to Canadian Community Health Survey data, First Nation persons in New Brunswick are significantly more likely to smoke compared to the non-Aboriginal identity population: 40 per cent versus 22 per cent [49]. At the same time, the average income of Aboriginal persons is about 30 per cent less than the provincial average [50]. Higher income determines living conditions such as safe housing and ability to buy sufficient nutritious food, which in turn can improve health status [51]. National survey results indicate that self-reported prevalence of diabetes, a condition which significantly increases the risk of heart disease, is higher among First Nations compared to the non-Aboriginal population [52].

Efforts are being made to enhance the public health of the First Nation population through collaboration and supportive relationships between New Brunswick's First Nation communities, the First Nations and Inuit Health Branch of Health Canada, and the Office of the Chief Medical Officer of Health [53]. Examples of public health actions include enhancing the province's Postnatal Benefit Program to offer income supplementation for a healthy nutritional start for First Nation mothers and babies in the first months of life; and developing culturally appropriate resources to support breastfeeding families in First Nations communities under the Baby-Friendly Initiative. Such actions aim to optimize prevention efforts and address longstanding health inequities to support better heart health outcomes throughout the province in the future.

Box 7: Heart health and the built environment

Built environments refer to our human-made surroundings, such as buildings and parks and their supporting infrastructure, and how they are designed for health and wellness. Examples of the significance of the built environment for keeping us healthy stem back over 2,000 years, with sewage systems in some European cities being planned below streets rather than buildings to avoid contaminating living areas [54]. The concept has evolved from a public health perspective and now often focuses on integration of health considerations into transportation planning, land use and building construction decisions for the prevention of chronic disease. Community design can be part of an overall plan in addressing obesity and other risk factors for heart disease.

In New Brunswick today, economic development pressures and social norms (e.g. car-dominant culture, expectations tied to home ownership and raising a family) often influence decisions related to neighbourhood design. Complex questions surrounding equity also arise, for example, adequate infrastructure to safely walk or bicycle to work and school. However, it is often perceived that not all neighbourhoods, especially in rural areas, have the density to support public transit, routes for active transportation and other traffic calming measures.

Collaborations between public health, other public agencies, community planners, engineers, non-governmental organizations and others are critical to the achievement of healthier built environments, considering a range of programs, policies and legislation related to:

- accessibility and connectivity that encourage walking and outdoor activity;
- creating a cohesive community through developing amenities and safe areas that encourage free play and outside interaction for children and adults such as parks, playgrounds, bike trails, low traffic volumes on streets (also known as social capital);
- pollution control (e.g. air, water, soil, noise, light);
- safe and efficient transportation options, including those designed to accommodate ageing populations.

The Department of Health's Office of the Chief Medical Officer of Health identifies the strategic importance of built environment design for healthier populations and preventing health hazards [53]. The Department has partnered with the Heart and Stroke Foundation on an initiative with the Healthy Canada by Design CLASP (*Coalitions Linking Action and Science for Prevention*), focusing on promoting community designs that facilitate active transportation and integration of physical activity in New Brunswickers' daily lives. The CLASP initiative supports collaborations across stakeholders from the health, planning, engineering and non-governmental sectors to identify and accelerate actions that promote healthier built environments [55]. Achievements to date include a compendium of tools and practices to support collaborative work efforts [56]. Future actions aim to evaluate and use these resources for guiding interventions that are locally-specific and context-sensitive and that, using a "learn-by-doing" model, build long-term capacity for strategic collaboration across sectors.

5. Conclusions and considerations

Heart disease is one of the leading causes of death in New Brunswick. Tobacco smoking, physical inactivity and unhealthy diets are its main behavioural risk factors. These risk factors are shared by other major non-communicable diseases such as stroke and diabetes. Heart health is also associated with a range of social, economic and environmental factors.

New findings from surveillance show the incidence rates of ischemic heart disease and hospitalization for heart failure have been steadily decreasing in New Brunswick over the past decade. Prevalence is not declining at the same pace, as people with heart disease are living longer. A comprehensive approach to heart health means using what we know to improve clinical care while also addressing risk factors and risk behaviours, and creating environments that are supportive of healthy lifestyles. Actions to reduce heart disease offer a tremendous public health opportunity, because up to 80 per cent of premature occurrences of cardiovascular disease are preventable. These actions may also have a positive impact on other health conditions.

Reducing the burden of heart disease, improving the health of the population and reducing health inequities is a collective challenge. Achieving tangible, sustainable and equitable health gains requires working with many partners both within and outside the health sector to develop and inform healthy public policies, practices and programs across multiple domains [51]. In New Brunswick, this means:

- **Increase accountability for health outcomes:** enhancing ongoing surveillance, analysis and reporting of heart disease and related conditions and risk factors in New Brunswick, in alignment with national and international statistical standards, to ensure that short- and long-term objectives for better heart health results are met.
- **Base decisions on evidence:** using best available data and evidence at all stages of policy and program development. This includes drawing on a variety of information sources, such as clinical care records and population-based surveys, to create a more complete picture of population health, with attention to vulnerable population groups.
- **Invest upstream:** focusing on the risk factors for heart disease and their root causes, balancing resource allocation to improve heart health in both the short term and long term.
- **Apply multiple strategies to act on the determinants of health:** recognizing the interactions of health determinants (e.g. healthy diets, physical activity and the built environment) and prioritizing interventions that address heart health issues in an integrated way in multiple settings over the life span.
- **Collaborate across levels and sectors:** engaging a wide range of government and non-government stakeholders (e.g. health professionals, schools, workplaces, community planners), working together to foster healthy lifestyles in healthy and safe environments.
- **Employ mechanisms to engage citizens:** partnering with local groups, including First Nation communities, to develop context-sensitive and culturally appropriate interventions towards achieving better heart health outcomes for all.

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