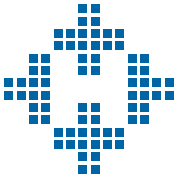
# Primary Prevention: An Examination of Data Capabilities in Manitoba

January 2005



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We thank the University of Manitoba, Faculty of Medicine, Health Research Ethics Board for their review of this project. The Manitoba Centre for Health Policy complies with all legislative acts and regulations governing the protection and use of sensitive information. We implement strict policies and procedures to protect the privacy and security of anonymized data used to produce this report and we keep the provincial Health Information Privacy Committee informed of all work undertaken for Manitoba Health.

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## Introduction

Many health problems that Manitobans face can be prevented, or their onset can be delayed. For example, choosing a healthy diet, quitting smoking, and taking part in regular physical activity can all help reduce the risk of developing heart disease. In order to determine where the opportunities for intervention exist and what types of activities contribute to improvements in health we need to collect data on a wide variety of measures that describe the health and behaviours of individuals, as well as the characteristics of the communities and societies in which they live.

The purpose of this project was to examine our ability to use Manitoba data to inform us about primary prevention. Much of the population-based data that are available in the province can be used to study patterns of health and health service use over time and across the regions of Manitoba. Can these data also be used to study activities and services that are intended to prevent health problems before they occur? What other types of data are available in the province to study primary prevention?

## Methods

This project began with a literature review to determine the types of primary prevention indicators used in other provinces and countries. A Working Group was convened to help us develop a framework for primary prevention indicators; this was used to organize the indicators from the literature review into categories, and to focus our attention on specific topic areas. Administrative health data in the Population Health Research Data Repository maintained by the Manitoba Centre for Health Policy, population-based health survey data, and public health data collected by Manitoba Regional Health Authorities (RHAs) were all reviewed for their ability to contribute to the development of primary prevention indicators.

## The Framework

The Working Group proposed a two-dimensional framework that distinguishes types of measures and level of measurement. The first dimension includes risk factors, protective factors, and health outcomes. The second dimension focusses on individuals, communities, and populations. Most of the measures that were identified from the review of literature focussed on measures of healthy eating, healthy weights, immunizations, chronic and infectious diseases, physical activity, and tobacco. Fewer numbers of indicators focussed on the broader social determinants of health such as educational attainment and environmental quality. Moreover, none of the indicators focussed on disparities or inequalities in the determinants of health. Areas for development of baseline measures were identified by the Working Group.

## Using Survey Data to Define Primary Prevention Indicators

Population-based survey data are one source of data for primary prevention indicators. Survey data are useful for obtaining information on individual risk factors like risky sexual behaviours, and protective factors like physical activity and healthy eating. Survey data have been used to examine the cross-sectional relationships between risk or protective factors and individual determinants of health such as gender, age, level of education, income level, and location of residence. Surveys can also be used to study the long-term relationships between risk factors and health outcomes. However few Canadian studies have accomplished this, in part because population-based longitudinal survey data are expensive to collect and it is difficult to follow individuals over long periods of time.

Canadian Community Health Survey (CCHS) data for 2000-2001 were used to compile cross-sectional baseline data in the following areas:

- Body mass index
- Smoking
- Physical activity
- Diet
- Unmet health care needs

These data are reported for nine Manitoba health regions corresponding to individual RHAs, with the exception of one region which combines Nor-Man, Burntwood, and Churchill RHAs (i.e., Northern RHAs). The data are also reported for income adequacy quintiles (i.e., lowest income, lower middle, middle, upper middle, and highest income quintiles) that were based on total household income and the number of individuals residing in the household. While CCHS data provide important population-based information for Manitoba, some limitations of these data should be noted. Specifically, individuals living in First Nations communities and children under the age of 12 are excluded.

Selected highlights of the CCHS analyses are as follows:

- More than one-quarter of Manitobans were identified as being overweight (i.e., with a body mass index [BMI] of 25 or greater). For Interlake and Northern RHAs, the percentage of the population that is overweight was significantly higher than the overall Manitoba figure. There were no significant differences in the percentage of overweight individuals across income quintiles.
- One-fifth of Manitobans report smoking on a daily basis. Only in the Northern RHAs was the proportion of the population that was daily smokers higher than the Manitoba proportion.
- Seventeen per cent of Manitobans report being physically active on a regular basis. Individuals in the Northern RHAs were less likely to be physically inactive, while those in the middle and low middle income quintiles were more likely to be physically inactive.

## Using Administrative Health Data to Define Primary Prevention Indicators

Administrative data are primarily generated when health services are provided to individuals. They are a valuable source of information about illness and disease in a population, and as such, are useful for identifying populations that may benefit from primary prevention interventions. In addition to providing measures of the prevalence of chronic diseases in the population, administrative data can also provide information about primary prevention programs operating in the province. For example, the Manitoba Immunization Management System provides reliable information on childhood immunizations, and medical claims include data on breast and cervical cancer screening. Administrative data can also provide population-based information on breastfeeding practices, teenage pregnancy, and low and high birth weight babies.

MCHP recently published data on several indicators that are relevant to primary prevention in the report *The Manitoba RHA Indicators Atlas: Population-Based Comparisons of Health and Health Care Use* (Martens et al., 2003). MCHP researchers are presently engaged in a project to define measures of prevalence for a selected number of chronic diseases, like arthritis, hypertension, and ischemic heart disease. These measures will be based on diagnosis and service codes in hospital and physician files, as well as drug codes in pharmaceutical records.

## Using Public Health Statistics to Define Primary Prevention Indicators

The Provincial Public Health Statistic System (PPHSS) is a unique population-based resource that has not been previously examined for its capability to provide data on primary prevention activities in the province. PPHSS data consist of reports of contacts with individuals, families, groups, and community organizations by selected public health service providers and health promotion professionals. Most of the contacts with individuals are for family health issues, such as child/adolescent health, newborn health, and postnatal maternal health. Public health service providers offer a range of interventions to clients, including health counselling, providing information, and assessing client health. Most contacts are made in person.

Some clients can be uniquely identified from PPHSS via an anonymized Personal Health Identification Number (PHIN). However, RHA staff do not consistently capture PHIN for each client contact. Failing to record PHIN hinders the capability to use PPHSS to understand the services that are provided to individuals. As well, our evaluation of the PPHSS data show that rates of service contact vary substantially by year, RHA, and service provider, suggesting that the data may not be of uniform quality across time and regions of the province.

The potential exists to use PPHSS data to develop comparative indicators of primary prevention service use and delivery in Manitoba RHAs across time. However, these capabilities are hindered by the lack of standards for data capture, variations in data recording practices, and failure to capture a unique client identification number for each contact.

## Conclusions and Recommendations

This report demonstrates that population-based data available in Manitoba can be used to monitor primary prevention in a number of key areas, but not in others. Through the use of survey data, administrative data and the Provincial Public Health Statistic System it is possible to examine a number of indicators of health outcomes, risk factors, and protective factors at the individual, community and population level. Community and population level indicators are currently limited, and present the greatest opportunity for future development.

To enhance our ability to measure the impact of primary prevention activities in Manitoba we recommend:

1. Improving existing data collection mechanisms.
2. Creating new data collection mechanisms.
3. Improving skills in managing and analyzing data.
4. Developing and refining indicators.
5. Improving data dissemination strategies.

Improving existing data collection mechanisms means building upon existing administrative and program management databases. There are a variety of actions that could be taken, like collecting information on individual behaviours and health status in physician claims, or collecting data about breastfeeding duration at the time of childhood immunization. Finally, the Provincial Public Health Statistic System has the potential to link primary prevention interventions with outcomes, if the Personal Health Information Number is captured for every contact.

The need for more complete primary prevention indicators at the community level drives our recommendation to create new data collection mechanisms. At the very least, an effort must be made to develop an inventory of data on community level determinants of health. We recognize, however, that this is a difficult task as many sources of data are outside the realm of the health system. Collaboration among Regional Health Authorities, Manitoba Health, other government departments, and non-governmental organizations must be used to enhance data collection within the province.

Our experiences in developing the indicators in this report have shown how complex a process it can be to manage and analyze indicator data. In order to have access to indicators on a regular basis it is important that data users have appropriate skills and resources, including training in the use of survey or administrative data to capture measures of health outcomes, and risk and protective factors, and access to appropriate tech-

nology. Alternatively, external consultants may be used to ensure that the data are available and accessible for decision making at provincial and regional levels.

There are many additional indicators that could be used in assessing primary prevention, but the exercise of selecting measures could quickly become overwhelming unless well-defined criteria are used to develop and refine indicators in specific areas. Questions like: Can an operational definition be developed for the indicator? and Can the indicator be reliably measured over time and across geographic areas and socioeconomic groups? should be answered before measures are adopted.

Finally, the goal of monitoring primary prevention is to help understand what is working and what is not working. Providing information to service providers regarding the impacts of their initiatives, as well as potential needs for primary prevention, can only enhance the success of their activities. Some data dissemination is currently in place, but a comprehensive reporting strategy would greatly enhance the program planning and implementation process.

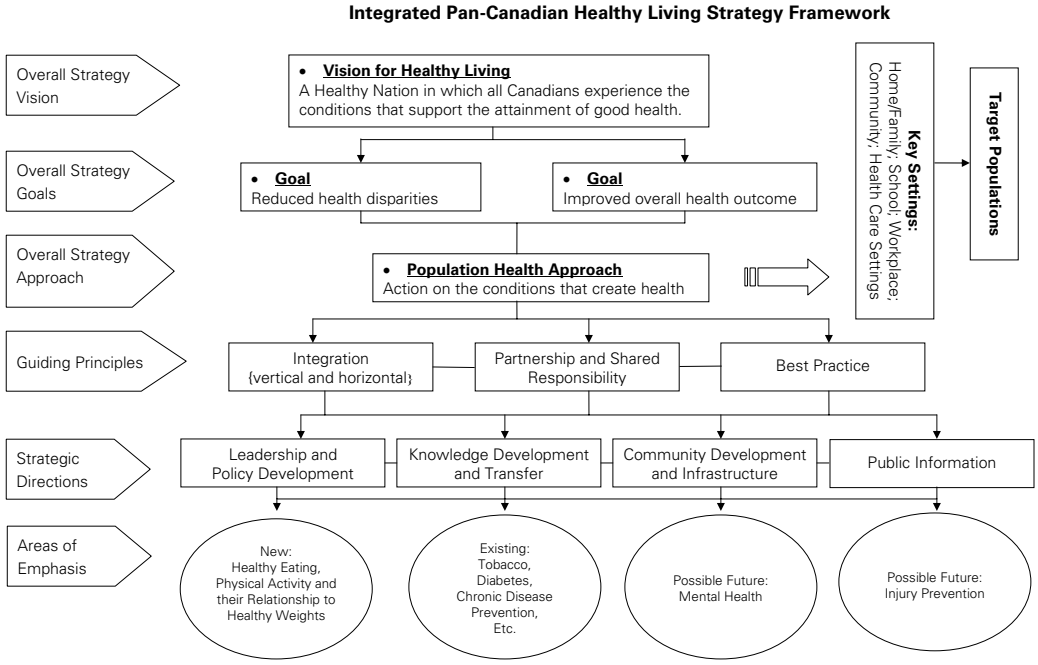
In addition to these global recommendations, we feel that the Provincial Public Health Statistic System has an important place in monitoring primary prevention, and recommend that data collection and reporting with this system be enhanced. This can be accomplished by standardizing the methods for recording data and including PHIN on all of the contacts. In the future, this system could play a significant role in monitoring the effectiveness of targeted programs.

This project has identified and reported on a number of useful indicators for primary prevention in Manitoba, and has established areas where further work is needed. Given the importance of primary prevention to the health of Manitobans this has been an important first step, and one upon which the province can build in future studies.

# CHAPTER 1: INTRODUCTION

Preventing health problems before they start is not a new idea, but initiatives at both the federal and provincial level have brought this issue to the forefront in recent years. In September 2002 Canada's federal, provincial and territorial Health Ministers announced a Pan-Canadian Healthy Living Strategy (Figure 1) which focuses on key aspects of healthy living including nutrition and physical activity and their relation to healthy weights, as well as tobacco, diabetes, and chronic disease. A second initiative is the Chronic Disease Prevention Alliance of Canada, a national coalition of organizations and individuals with a common vision for an integrated system of chronic disease prevention, focussing on the three leading chronic diseases in Canada: cancer, cardiovascular disease, and diabetes. Within the province, Manitoba Healthy Living, a ministry that was established to create conditions and supporting behaviours that promote the best possible health choices for everyone, provides evidence of the government's commitment to primary prevention activities.

**Figure 1: Pan-Canadian Healthy Living Strategy**




*With an increased emphasis on actions to improve health through primary prevention comes the need to measure the effectiveness of prevention activities and initiatives. "How do we know if primary prevention strategies are working?"*

With this emphasis on actions to improve health through primary prevention comes the need to measure the effectiveness of prevention activities and initiatives. Manitoba Health asked the Manitoba Centre for Health Policy (MCHP) to identify population-based data sources and indicators that could be used to address the question "How do we know if primary prevention strategies are working?" This is a formidable task, in part because pri-

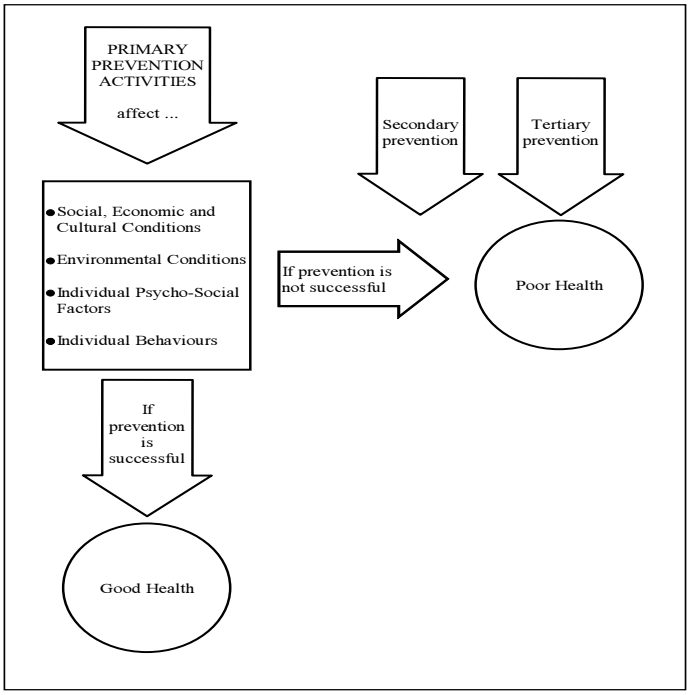
*No single indicator can provide an indication of the effectiveness of primary prevention activities.*

mary prevention includes such a wide variety of actions that are taken to prevent undesirable outcomes—from traditional public health interventions such as immunizations or inspections of restaurants to prevent the spread of infectious diseases, to community development activities designed to improve housing, education and social conditions. As well, the data to monitor primary prevention activities are not located in any one source nor are they governed by any single jurisdiction—they are scattered across national and local health surveys, national and provincial administrative databases, chronic disease surveillance systems, and community health assessment profiles. Further, no single indicator can provide an indication of the effectiveness of primary prevention activities—the relevant indicators include a broad array of measures which describe the health of individuals, communities, and populations as well as the broader social determinants of health. The impact of primary prevention activities is not immediate, and can take considerable time (i.e., many years) to produce a measurable result. Moreover, while it is possible to reduce risk, it is impossible to say with certainty that an individual would or would not develop a condition or disease if an intervention was provided.

*Individual or collective actions are taken to intervene before a problem occurs in primary prevention.*

With primary prevention, individual or collective actions are taken to intervene before a problem occurs. Secondary prevention, however, involves identifying and treating people who have already developed risk factors or early indications of a disease or condition, but in whom the condition is not clinically apparent. In contrast, tertiary prevention actions are taken to prevent or minimize any complications of, and/or disability from, an established condition. Figure 2 illustrates the relationships among these three forms of prevention. It is typically more difficult to measure the effectiveness of primary prevention than of secondary or tertiary prevention. This is because primary prevention activities are typically directed at populations or groups rather than at individuals, so the causal connection between activities and outcomes can not always be clearly established. Time is a critical element—there is often a significant length of time between implementation of a program or activity and some outcome in the population, so it may be hard to attribute a change in health status to a specific program or service. It is often difficult to directly measure some aspects of health status; for example in chronic disease surveillance, mortality data are often used to monitor trends in specific diseases despite the problems associated with cause-of-death coding and the lag time between changes in population health and detection of these changes in cause-specific mortality rates.

**Figure 2: Types of Prevention Activities**




Kumanyika (2001), in her review of the population health threat posed by obesity, highlights many of the aforementioned issues. Early research did not consistently support the notion that obesity was an independent risk factor for cardiovascular disease, beyond the more proximate risk factors of high blood pressure, high blood cholesterol, or diabetes. Kumanyika goes on to identify the complex mix of influences on the prevalence of obesity in the population, from international factors such as globalization to community factors such as the availability of garden markets. Given this complex "web of societal influences" on obesity, it is difficult to know what to measure and how to measure it.

*Despite the challenges of developing primary prevention indicators, it is important to periodically assess what we can and cannot measure well.*

Despite these challenges to measuring primary prevention activities, it is important to periodically "take inventory"; to know what we can measure, where we can get the data for these measures, and where we need to build capacity. The overall purpose of this project was to identify the data sources that exist to monitor primary prevention, the indicators can be developed from these sources, and gaps in this system. The specific objectives were:

1) To develop, in consultation with a working group and through a review of the literature, a set of primary prevention indicators that is relevant for Manitoba.
2) To examine data capabilities to track these indicators.
3) To identify information needs and gaps in monitoring primary prevention.
4) To recommend strategies for enhancing data that can be used to monitor primary prevention.

The outline of this report is as follows:

- We begin by highlighting indicator development initiatives at international, national, and provincial levels, and explore the types of measures that have been the focus of this work, as well as areas where indicator development work is still needed. We also examine some of the key technical issues involved in developing primary prevention indicators.

- Then we describe three different population-based sources that could be used to provide data for primary prevention indicators in Manitoba. For two of these sources we report on a series of baseline measures. For the third source, which had not been previously assessed for its utility in deriving population-based measures for Manitoba, we conduct a systematic evaluation of its current content and future capabilities.

- Finally, we describe some of the information gaps that we believe exist in the province and provide recommendations on improving the ability of the province to collect and analyze primary prevention indicator data.

# CHAPTER 2: BACKGROUND

## 2.1 A Review of Indicator Development Initiatives

A number of initiatives have involved developing and reporting on indicators or targeting areas for indicator development, both nationally and provincially. For example in 1999 the Canadian Institute for Health Information (CIHI) and Statistics Canada began publishing on an annual basis, a wide variety of health indicators for the larger health regions across the country (Canadian Institute for Health Information, 2004). These indicators include measures of health status, determinants of health, community and health system characteristics, and health system performance. Recently, Manitoba's second Comparable Health Indicators Report was released; it provides up-to-date comparative data on a variety of health indicators for the province (Manitoba Health, 2004). In 2005, data will be available from the Canadian Community Health Survey Nutrition component, which will be used to develop measures for food and nutrition standards and dietary guidelines.

We began this project by conducting a survey of indicator development initiatives provincially, nationally and internationally. This survey was not designed to be exhaustive—rather it is intended to give the reader an idea of the types of measures that have been used or developed in other jurisdictions. The results of our assessment of the literature, which are summarized in Table 1, were drawn from the following reports (short titles are provided in parentheses):

- Canadian Institute for Health Information, *Future Health Indicators*, 2004. (CIHI/StatsCan)
- *Manitoba's Health Indicators Report*, 2002. (MB Health Ind)
- *Manitoba Community Health Assessment Baseline Indicators*, 2003. (MB CHA)
- *Saskatchewan Comparable Health Indicators Report*, 2002. (SK)
- *The Alberta Healthy Living Framework: An Integrated Approach*, 2003. (AB)
- *Measurement in Health Care: How, What, Why? Core Indicators for Public Health in Ontario: An Interactive Workshop*, 2003. (ON)
- *PEI Strategy for Healthy Living, 2001 and Prince Edward Island Health Indicators: Provincial and Regional Report*, 2003. (PEI)
- *Saving Lives: Our Healthier Nation White Paper*, 1999. (UK White Paper)
- *North East Public Health Observatory*, United Kingdom, 2003. (UK Obs)
- *Australia National Cancer Prevention Policy 2001-03*, 2001 (AUS)

- *European Health Risk Monitoring (EHRM) Project: Recommendation for Indicators, International Collaboration, Protocol and Manual of Operations for Chronic Disease Risk Factor Surveys*, 2002. (Europe)
- *Healthy People 2010*, 2000. (US)

Table 1 is organized according to concept areas, rather than specific indicators. This is because the concept "tobacco" may be measured in several different ways, including the smoking rate, the smoking initiation rate, the smoking quit rate or the tobacco use rate (to include the use of chewing tobacco and snuff). Some jurisdictions might even include tobacco use in a "substance abuse" measure, along with drug and alcohol abuse. Consequently, it would be difficult to report on every single indicator included in the eleven reports that we considered. Table 1 is intended to provide an overview of the types of measures that have been used in different jurisdictions—further information about individual indicators can be found either in Appendix Table A.1, or in the individual sources that are referenced in this appendix. The indicators listed here are also not the complete list of indicators included in these reports, rather they are those that could be used to measure the impact of primary prevention activities. Appendix B includes an annotated bibliography of other health indicators and frameworks that provide a more general discussion of population health and disease prevention.

**Table 1: Summary of primary prevention indicator concepts**

| Indicator/Concept | CIHI/ Stats Can | MB Health Ind | MB CHA | SK | AB | ON | PEI | UK White Paper | UK Obs | AUS | Europe | US |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Access to health care | ✓ | | ✓ | | | ✓ | ✓ | | | | | ✓ |
| Alcohol use | ✓ | | ✓ | | | ✓ | ✓ | | | ✓ | | |
| Birthweight – high | | | ✓ | | | ✓ | | | | | | |
| Birthweight – low | ✓ | ✓ | ✓ | | | ✓ | ✓ | | | | | |
| Blood pressure | ✓ | | ✓ | | | | ✓ | | | | ✓ | |
| Breastfeeding | ✓ | | ✓ | | | ✓ | ✓ | | | | | |
| Communicable diseases | | | ✓ | ✓ | | ✓ | ✓ | | | | | |
| Diabetes | ✓ | ✓ | ✓ | | | | | | ✓ | | ✓ | |
| Disability-free life expectancy | ✓ | ✓ | | | | | | | | | | |
| Disease screening | ✓ | | | | | ✓ | ✓ | | | ✓ | | |
| Education attainment | ✓ | | ✓ | | | ✓ | ✓ | | ✓ | | | |
| Environmental quality | ✓ | | ✓ | | | ✓ | ✓ | | | | | ✓ |
| Healthy eating | ✓ | | ✓ | | ✓ | ✓ | ✓ | | | ✓ | | |
| Healthy weights | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ |
| Immunizations | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | | | | ✓ |
| Infant mortality | ✓ | ✓ | ✓ | | | ✓ | | | ✓ | | | |
| Injury prevention | | | | | | ✓ | | ✓ | | | | ✓ |
| Life expectancy | ✓ | ✓ | ✓ | | | ✓ | ✓ | | | | | |
| Lipids | | | | | | | | | | | ✓ | |
| Medication use | | | | | | | | | | | ✓ | |
| Mental health | ✓ | | | | | ✓ | ✓ | ✓ | | | | ✓ |
| Morbidity | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | | ✓ | | |
| Mortality | ✓ | ✓ | ✓ | | | ✓ | | | ✓ | | | |
| Physical activity | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ |
| Premature mortality | | | ✓ | | | | | | | | | |
| Potential years of life lost | ✓ | | ✓ | | | ✓ | | | | | | |
| Self-reported health | ✓ | ✓ | ✓ | | | ✓ | ✓ | | | | | |
| Sexual behaviour | | | | | | ✓ | ✓ | | | | | ✓ |
| Substance abuse | | | | | | ✓ | | | | | | ✓ |
| Teen pregnancy | | | ✓ | | | ✓ | | | ✓ | | | |
| Tobacco | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ |

It is evident from this table that a wide variety of primary prevention concepts have been examined in health indicator reports. Indicators for healthy eating, healthy weights, immunizations, morbidity, physical activity, and tobacco were most common, and were included in more than half of the eleven reports included in this literature survey. This suggests that these types of indicators are regarded as being critical for evaluating primary prevention activities across many jurisdictions. However, there are only a few indicators that focus on the broader social determinants of health, like educational attainment and environmental quality, which are increasingly being recognized as influencing health. The next section examines the types of social determinant indicators that might be included in a set of primary prevention indicators.

## 2.2 Indicators of Social Determinants of Health

Consider the following scenario:

> ***"Why is Jason in the hospital?***
> ***Because he has a bad infection in his leg.***
> ***But why does he have an infection?***
> ***Because he has a cut on his leg and it got infected.***
> ***But why does he have a cut on his leg?***
> ***Because he was playing in the junk yard next to his apartment building and there was some sharp, jagged steel there that he fell on.***
> ***But why was he playing in a junk yard?***
> ***Because his neighbourhood is kind of run down. A lot of kids play there and there is no one to supervise them.***
> ***But why does he live in that neighbourhood?***
> ***Because his parents can't afford a nicer place to live.***
> ***But why can't his parents afford a nicer place to live?***
> ***Because his Dad is unemployed and his Mom is sick.***
> ***But why is his Dad unemployed?***
> ***Because he doesn't have much education and he can't find a job.***
> ***But why ...?"***

*Toward a Healthy Future: Second Report on the Health of Canadians*. Health Canada (Federal, Provincial and Territorial Advisory Committee on Population Health), 1999, p. 174.

This scenario demonstrates that social context is an important influence on the health of an individual, community or population. It is common to identify only the proximal "causes" of poor health and label these as risk factors. In this scenario, the proximal cause of Jason's infection is a cut that occurred while he was playing in a junkyard. Putting a fence around the

junkyard might be one response to reduce the risk of injury among other children in the neighbourhood. However, the causal pathway that is explored through the series of questions shows that the root cause of the infection is a socially created situation.

*The greatest area of weakness in developing primary prevention indicators is that of measuring social determinants of health.*

Over the past 30 years, increasing emphasis has been placed on social factors in models related to health. For example, the framework developed by Andersen and Newman (1973), although focussed on health services utilization rather than primary prevention, includes a dimension of "societal determinants." The authors note that "the postulated causal links between the societal factors and resulting utilization behaviour . . . can only be inferred since the nature of our data and the state of our methods and theory generally preclude direct testing at this time" (p. 100). This early model included social features such as education, race, family size and location of residence. Subsequent models (Aday and Andersen, 1974; Aday and Andersen, 1981; Andersen, 1995) all include societal elements. Likewise, the Evans and Stoddart (1990) model of the relationship between social and individual factors and health includes a "social environment" component. A common feature of each of these models is the poor development of approaches to measuring social determinants, especially when compared to other dimensions such as health system characteristics, health status, or physical function. While the authors are able to conceptualize the contribution of social features to health they have not been able to operationalize them, that is, to measure them. Although our ability to measure social determinants of health is improving, it is perhaps the area of greatest weakness in developing primary prevention indicators.

### 2.2.1 Indicators of Social Determinants of Health at the Individual Level

*Individual level social determinants of health include children/child development, education, employment, gender, food, income, individual contributions to social capital, well-being and social conditions.*

Individual level social determinants of health include children/child development, education, employment, gender, food, income, individual contributions to social capital, well-being, and social conditions. Child development relates both to having a good home environment in which to grow (e.g., appropriate child care, preparation for beginning school) (Edwards, 2002; Health Canada, 1999; Wilkinson and Marmot, 2003; CIHI, 2004a; CIHI, 2004b), as well as having social conditions that support growth (e.g., lack of poverty and violence) (Human Resources Development Canada, 1997). Education is known to be an important predictor of health status, beginning with early childhood schooling and continuing through until a person joins the workforce (Edwards, 2002; Health Canada, 1999; Queensland Health, 2003). Employment not only provides income but also provides an opportunity to contribute to society (Edwards, 2002; Queensland Health 2003). Food, both in terms of quality and quantity, can be affected by several of the other themes. A family that does not have adequate income may find it dif-

ficult to obtain sufficient food or to make appropriate food choices. If a person does not have sufficient education to recognize differences in the nutritional values of food, a poor diet may be consumed (Edwards, 2002). Income and/or assets are well known factors that affect health. The concept of income disparities is relatively new, and is discussed later (Human Resources Development Canada, 1997; Queensland Health, 2003). Social capital, well-being and social conditions include a variety of interrelated items: the feeling that an individual is contributing to their community, their social supports and networks, and their experience in living in their community (e.g., housing quality) (CIHI, 2004a; Edwards, 2002; Shookner, 2000; Human Resources Development Canada, 1997). Of the themes listed here, social capital and social conditions may also be considered community-level indicators. Appendix C contains a list of indicators for the concepts that have been discussed in this section. These indicators were identified through an internet search of government reports where social determinants of health were included.

### 2.2.2 Indicators of Social Determinants of Health at the Community Level

*Community level social determinants of health include both the physical and social environment.*

Community level social determinants of health include both the physical and social environment. For example, the physical environment includes measures of housing, such as the availability of good quality housing, adequate water, and waste management (Edwards, 2002; Dunn et al., 2003) and geographic isolation (Australia Institute of Health and Welfare, 2003). Social capital, which focusses on the social environment, can be broadly defined to include features of a community that contribute to it being a good place to live and to enhancing health. Measures of social capital include both the human features (e.g., civic involvement) (Colman, 1998) and physical features (e.g., availability of green space and libraries) (Roos, 2004). The physical environment includes air, water and soil quality, as well as potential exposure to other environmental contaminants (Shookner, 2000; Human Resources Development Canada, 1997). Appendix C contains a list of indicators for the concepts that have been discussed in this section.

### 2.2.3 Indicators of Disparities in Social Determinants of Health

In recent years, relative, rather than just absolute, measures of the social determinants of health have been emphasized (Raphael, 1998). Various terms are used to describe these differences between populations—disparities, inequities, equities and gradients. Differences in health status may result from relative differences between individuals and groups rather than simply the characteristics of the individual or group. For example, there is evidence that when there is a greater range between rich and poor, the poor will experience a lower health status than when the gap is not as great (Braveman and

Tarimo, 2002). Similarly, where the level of education is substantially different within a population, differences in health status that cannot be explained by just considering education has been found (Mustard et al., 1997). Researchers are exploring the effects of disparities or inequalities in social determinants on the health of populations and developing appropriate indicators of these disparities.

## 2.3 Measuring Primary Prevention

The previous sections have focussed on primary prevention concepts or constructs. In this next section we focus on some of the technical issues involved in measuring primary prevention activities.

### 2.3.1 Direct or Indirect Measurement

Ideally, we would like to obtain direct measures of the characteristics or features of an individual, community, or population to understand the effectiveness of primary prevention initiatives. For example, counting the number of cigarettes a person consumes in a day is a direct, or proximal, measure of a risk-taking behaviour, and could be used to examine the impact of smoking cessation programs or tobacco legislation. However it is often difficult or inappropriate to measure a characteristic or feature directly. In such instances, indirect, or surrogate, measures must be used. For example, high blood pressure (hypertension) may be a surrogate for behaviours such as poor diet, excessive alcohol consumption, or a sedentary lifestyle. A measure of blood pressure indirectly indicates the impact of primary prevention activities. Sometimes a measure can be considered either as a direct or an indirect measure of primary prevention. For example, obesity is a known risk factor for a number of poor health outcomes. Measuring an individual's body mass index provides a direct indication of their risk of developing one or more of these conditions. A population-based indicator of primary prevention of obesity would involve determining the proportion of people who are obese (or conversely, who are not obese). On the other hand, obesity could be considered an indirect indicator of health problems. It is recognized that social conditions contribute to obesity. Poor education, lack of social support and lack of access to good quality food can all contribute to the prevalence of obesity in a population. Therefore, the same measure can be used as a direct or indirect measure, depending on the context.

### 2.3.2 Unit of Measurement

The effectiveness of primary prevention activities can be measured for individuals, communities or populations. Indicators of primary prevention at the individual level include behavioural measures (e.g., frequency of physical activity, number of cigarettes smoked, whether or not a child is breastfed), as well as individual social conditions known to contribute to health status such as income, level of education and employment status. Community level indicators are typically developed for communities defined by geogra-

phy, but communities may also be defined on the basis of culture or social group membership. Some examples of community level indicators are quality of drinking water, crime rates, and availability of community resources such as playgrounds and green space. Population level indicators can either be aggregates of measures obtained at the level of the individual, such as percentage of the population that smokes, measures that describe global characteristics of a population, such as the Gross Domestic Product (GDP) or amount of the national debt per capita, or measures that describe the impact of legislation or policy on a population, such as the number of smoke-free establishments following implementation of legislation around smoke-free environments.

### 2.3.3 Types of Indicators

In this report we consider indicators of risk factors, protective factors, and health outcomes. Risk factors are those behaviours or conditions that can lead to poor health. For example, a sedentary lifestyle is a risk factor for heart disease. Behaviours or conditions that reduce the likelihood of poor health outcomes are protective factors. Immunizations, health screening and improved education are protective factors. Some concepts can be measured as both risk and protective factors. For example, the percentage of the population that is physically inactive is a risk factor, while the percentage of the population that engages in physical activity three or more times a week may be a protective factor. Outcomes reflect the measurable impact of programs and services, environmental changes, and policies on the health of a population, including self-perceived health status, physical and mental function, and health-related quality of life.

It is equally important to consider the context in which primary prevention occurs, for example the structure of the system in which health promotion activities are delivered to individuals and communities or the process by which communities engage to create or improve primary prevention opportunities. These types of context measures are not the focus of this report, although we do discuss them in later chapters.

### 2.3.4 Measuring Health

*"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1946)*

While most people would agree that primary prevention interventions are intended to improve the health of the population, there is no single way to operationalize the concept of health. According to the World Health Organization (WHO, 1946), "health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (page 100). The constructs of physical, mental and social well-being are multi-dimensional. Therefore, we focus on outcomes considered to be components of health (e.g., healthy lifestyles, lack of disease). That is, although "good health" is the desired outcome, there is no accepted indicator of good health. However, much is known about the attributes of good health, and these are the focus of the current project.

# CHAPTER 3: SELECTING INDICATORS FOR MONITORING PRIMARY PREVENTION IN MANITOBA

## 3.1 Introduction

The Working Group for this study, in collaboration with the research team, was tasked with developing an organizing framework for primary prevention indicators in Manitoba. In doing so, members of the Working Group reviewed the literature on previous indicator development initiatives and the frameworks used in other jurisdiction, as well as the types of indicators that had been considered in these reports. In developing a framework and selecting indicators for it, the Working Group recognized the importance of:

- Taking a population-based approach rather than a disease-specific focus.
- Building upon the work found in existing initiatives.
- Involving structures and systems outside the traditional domain of the health care sector.

## 3.2 A Framework of Primary Prevention Indicators

A two dimensional framework for primary prevention indicators in Manitoba was established by the Working Group. It identifies the types of measures that are critical to monitoring primary prevention:

- Risk factors
- Protective factors
- Health outcomes

It also identifies the levels at which measurement can occur:

- Individual
- Community
- Population

Table 2 defines the framework for indicators that was proposed by the Working Group.

**Table 2: Framework for indicator selection proposed by the Working Group**

| | **Type of Measure** | | |
|---|---|---|---|
| **Level of Measurement** | Risk Factors | Protective Factors | Health Outcomes |
| Individual | | | |
| Community | | | |
| Population | | | |

The indicators identified through the literature search that formed the background for the Working Group meetings (see Appendix A) were classified into one or more cells of this two-dimensional framework. For example, the

types of measures or concepts that could be used to monitor primary prevention with individual-level data are provided in Table 3.

**Table 3: Examples of individual-level indicators identified by the Working Group**

| Risk Factors | Protective Factors | Health Outcomes |
|---|---|---|
| - smoking<br>- obesity<br>- substance abuse (e.g., alcohol)<br>- exposure to ultraviolet radiation | - responsible sexual behaviour<br>- quitting smoking<br>- education<br>- diet<br>- physical activity /leisure physical activity<br>- breastfeeding<br>- immunization | - mortality<br>- morbidity<br>- teen pregnancy<br>- self-reported health status |

## 3.3 Indicators for Data Development

From the list of indicators posed to Working Group members, 22 items for which data are currently available were identified for data development. Items were selected by the Working Group on the basis of their relevance to Manitoba and their utility for planning and/or evaluating primary prevention activities. These items are:

- Standard weight/healthy body weight
- Diabetes status
- Smoking status
- Smoking cessation
- Binge drinking
- Physical activity level/index
- Frequency of physical activity
- Leisure physical activity
- Condom use
- Level of education
- Diet/Nutrient adequacy
- Breastfeeding
- Influenza immunization
- Heart disease status
- Cancer status
- Self-perceived unmet health care need
- Income adequacy
- Childhood immunization
- Diabetes treatment
- Breast cancer screening
- Low birthweight
- High birthweight

The Working Group acknowledged that this inventory of primary prevention indicators has some gaps. Community-level indicators are noticeably

absent. There are only a limited number of measures of the social determinants of health, and those focus primarily on absolute, rather than relative, measures of wealth or capital. There are few measures that capture the social context of health public policy. The Working Group tasked the research team with exploring these types of measures in further detail.

In the next chapters, we examine data sources that could be used to report baseline data for this set of measures:

- Canadian Community Health Survey (CCHS).
- Administrative health data maintained in the Population Health Research Data Repository by MCHP.
- Provincial Public Health Statistical System (PPHSS), which includes data recorded by public health staff in the course of providing services to clients.

# CHAPTER 4: USING SURVEY DATA TO DEFINE PRIMARY PREVENTION INDICATORS

## 4.1 Introduction

Population-based surveys, including the National Population Health Survey (NPHS) and the Canadian Community Health Survey (CCHS) are one source of data for developing primary prevention indicators. One advantage of survey data is that they can be used to develop measures of risk and protective factors for individuals. These types of measures are not common in administrative data files. Another advantage is that survey data are person specific as opposed to event specific, which facilitates the analysis of the relationship between prevalence of risk or protective factors and individual characteristics such as age, level of education, and income level. However, there are limitations associated with using survey data to develop primary prevention indicators. One disadvantage is that the longitudinal relationship between risk factors and health outcomes can only be assessed if surveys are conducted of the same individuals over long periods of time, or if the survey data are linked to administrative files. There are few population-based surveys which permit these types of analyses. A second disadvantage is that it is often difficult to validate self-reports of risk factors or other measures of health status against another data source, to check on the accuracy of the results. As well, these surveys do not include data for people living in First Nations communities, NPHS does not include sufficient sample size to develop RHA-specific indicators, CCHS requires aggregation of some RHAs due to sample size and the sample size is not sufficient to do smaller subsections of RHAs such as districts within the RHAs. Finally, the national surveys such as CCHS can only be linked to administrative claims data under the auspices of a Manitoba Health planning purpose.

*The CCHS is a national population-based survey that provides cross-sectional data on health determinants, health status, and health system use for regions of groupings of regions within each province.*

In this section, we focus on the CCHS, a national population-based survey that provides cross-sectional data on health determinants, health status, and health system use for regions or groupings of regions within each province. Data collection began in September 2000, and occurs in two-year cycles. The survey population includes household residents in all provinces and territories; however, an important limitation of CCHS (and NPHS) as noted above is that individuals living in First Nations Communities or Crown lands, residents of institutions, full-time members of the Canadian Armed Forces, and residents of some remote areas of the country are excluded. Also excluded from CCHS are children under 12 years of age.

Data from CCHS cycle 1.1, the focus of this report, were collected between September 2000 and November 2001 for 136 regions in Canada, including 11 Manitoba health regions. Survey respondents were 12 years of age and older; the sampling methodology was designed to ensure over-representation of youth under 19 years of age, and seniors 65 years of age and older.

## 4.2 Canadian Community Health Survey (CCHS) Content Areas

Appendix Table E.1 contains a list of the common and optional content areas used in the first wave of data collection. Each survey respondent completed questions found in the common content areas. The questions in the optional content areas were designed to meet the needs of individual health regions. Regions could "buy in" to have these optional questions included in the survey of their residents. Manitoba RHAs worked collaboratively to select common option content to ensure data comparability.

Appendix Table E.2 provides a list of CCHS questions/content areas that were initially considered for this report, based on the framework developed by the Working Group. Some of these questions/content areas could not be analyzed, either because they were optional content questions that none of the health regions in Manitoba had bought into, or because there were insufficient data available to permit comparative analyses across Manitoba. An example is breastfeeding. CCHS questions address both breastfeeding initiation and duration. However, there were too few respondents who were breastfeeding at the time of the survey to permit regional analyses of these data.

## 4.3 Method of Analysis

CCHS data can be examined in a variety of ways: by age group, sex, region of residence, income adequacy, and level of education. We present results here by region of residence and income adequacy. Region of residence is of interest to health planners. Moreover, MCHP often presents data stratified by income quintile because of the important association between income and health (McLeod et al., 2003). Income adequacy is available in CCHS at the individual level. Income adequacy was a variable developed by CCHS methodologists. Each survey respondent was assigned to a quintile using an algorithm based on total household income and number of persons living in the household:

- Lowest income quintile
- Lower middle income quintile
- Middle income quintile
- Upper middle income quintile
- Highest income quintile

In other words, individuals living in households with the same income but different numbers of household residents could be assigned to different income adequacy groupings.

All of the analyses in this section of the report were conducted using sampling weights, to ensure that derived estimates were meaningful or represen-

tative of the entire Manitoba population. As well, the data were age and sex adjusted (i.e., standardized) to permit fair comparisons between the regions or income adequacy quintiles. The Manitoba population on December 31, 2001 was used as the standard. While standardization does not necessarily tell you how many individuals in each health region have a particular risk or protective factor or health outcome, it does enable relative comparisons between regions that have very different population distributions.

On some graphs reported in the next section you will see the notes "Interpret with caution" or "Interpret with extreme caution". The coefficient of variation (CV), a measure of the quality of an estimate, was used to assign these annotations to the survey results. Data with a coefficient of variation (CV) between 16.6% and 33.3% should be interpreted with caution, while those with a CV greater than 33.3% should be interpreted with extreme caution. The CV is obtained using a bootstrap re-sampling method. This involves the selection of simple random samples known as replicates, and the calculation of the variation in the estimates from replicate to replicate. In each stratum, a simple random sample of (n-1) of the n clusters is selected with replacement to form a replicate. Note that since the selection is with replacement, a cluster may be chosen more than once. In each replicate, the survey weight for each record in the (n-1) selected clusters is recalculated. These weights are then post-stratified according to demographic information in the same way as the sampling design weights in order to obtain the final bootstrap weights.

The entire process (selecting simple random samples, recalculating and post-stratifying weights for each stratum) is repeated B times, where B is a large number. The CCHS typically uses B=500, to produce 500 bootstrap weights. To obtain the bootstrap variance estimator, the point estimate for each of the B samples must be calculated. The standard deviation of these estimates is the bootstrap variance estimator. Statistics Canada has developed a program that can perform all of these calculations for the user; it is called the Bootvar program (see http://www.statcan.ca/english/rdc/cchs_cycle1.htm for further information).

Tests of statistical significance were conducted, comparing each health region or income adequacy quintile to the overall Manitoba result for a selected number of the analyses These tests were performed by computing a z-score for each comparison, based on health region/income group estimate and the standard deviation of the estimate. Statistical significance for each indicator was set at $\alpha = .05$. A Bonferroni correction was adopted because multiple significant tests were performed for each indicator. For the RHA analyses, each comparison was conducted at the .05/9 = .0056 level of significance, while for the income adequacy quintile analyses, each comparison was conducted at the .05/5 = .01 level of significance.

## 4.4 Results

The areas that we focus on in this chapter are:

- Standard weight (i.e., Body mass index)
- Type of smoker
- Frequency of all physical activity
- Physical activity index
- Participation in leisure physical activity
- Fruit and vegetable consumption
- Self-perceived unmet health care needs

This list, which includes both risk and protective factors, does not include all possible measures that were of interest to the Working Group. For example, some data were not available because they represented optional content not available for Manitoba Health regions.

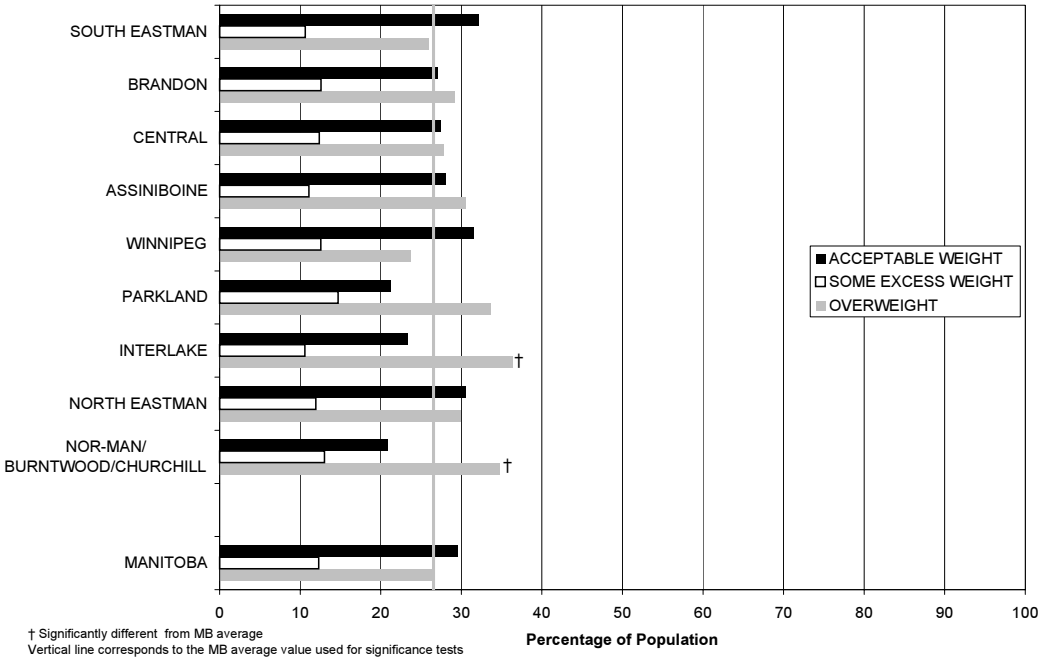
Descriptive data are presented for nine health regions corresponding to individual RHAs, with the exception of one region which combines Nor-Man, Burntwood, and Churchill RHAs. These three RHAs were aggregated because of their small populations, which results in several uninterpretable numbers across the selected indicators. In the following figures, RHAs are presented in rank order on the basis of health status; the RHA with the population having the best health status (as measured by the premature mortality rate) is at the top of the figure, and the RHA with the poorest health status is at the bottom. The data are also presented for income adequacy quintiles, which are arranged from highest to lowest quintile, from the top to the bottom of the figure.

Significance tests were performed for the following indicators:

- Percentage of population who are overweight
- Percentage of population who are daily smokers
- Percentage of population with infrequent physical activity
- Percentage of population who are inactive
- Percentage of population who participate in leisure physical activity
- Percentage of population consuming 5-10 servings of fruit and vegetables
- Percentage of population with unmet health care needs

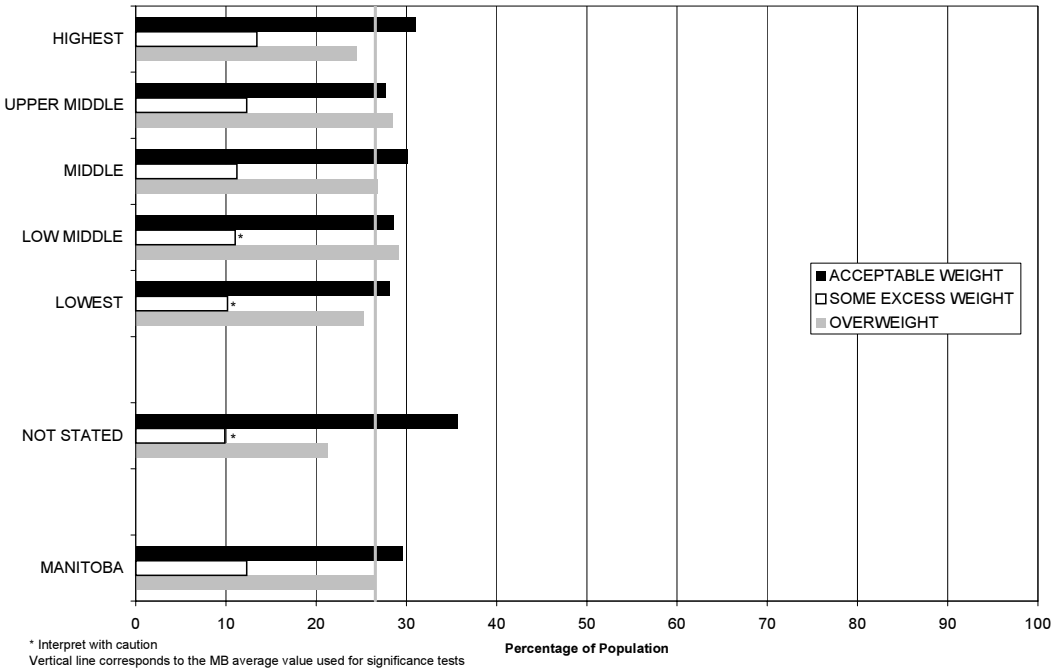
The vertical line in each chart corresponds to the indicator value obtained for all Manitoba CCHS respondents. For example, in Figure 3, the vertical line corresponds to a numeric value of 26.6%, the (weighted) percentage of Manitoba respondents who indicated that they were overweight. Health regions or income adequacy quintiles with numeric values which are significantly different from the Manitoba value are annotated in each chart. Information on the response categories for each of the measures are provided in the Glossary.

**Figure 3: Standard Weight (Body Mass Index) by Health Region**



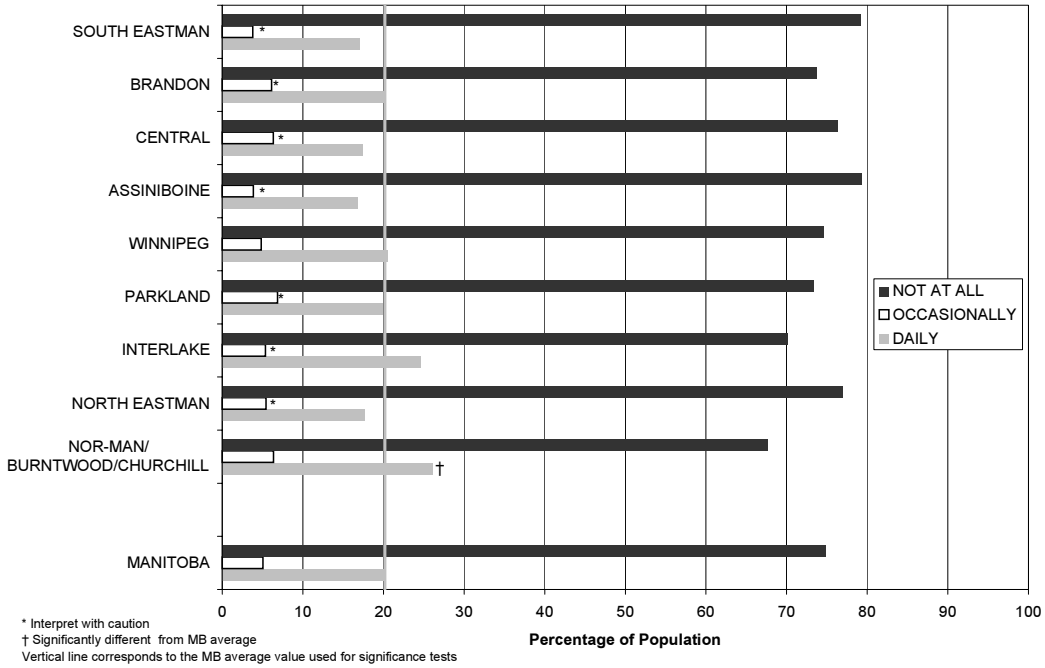

† Significantly different from MB average
Vertical line corresponds to the MB average value used for significance tests

**Figure 4: Standard Weight (Body Mass Index) by Income Adequacy Quintile**



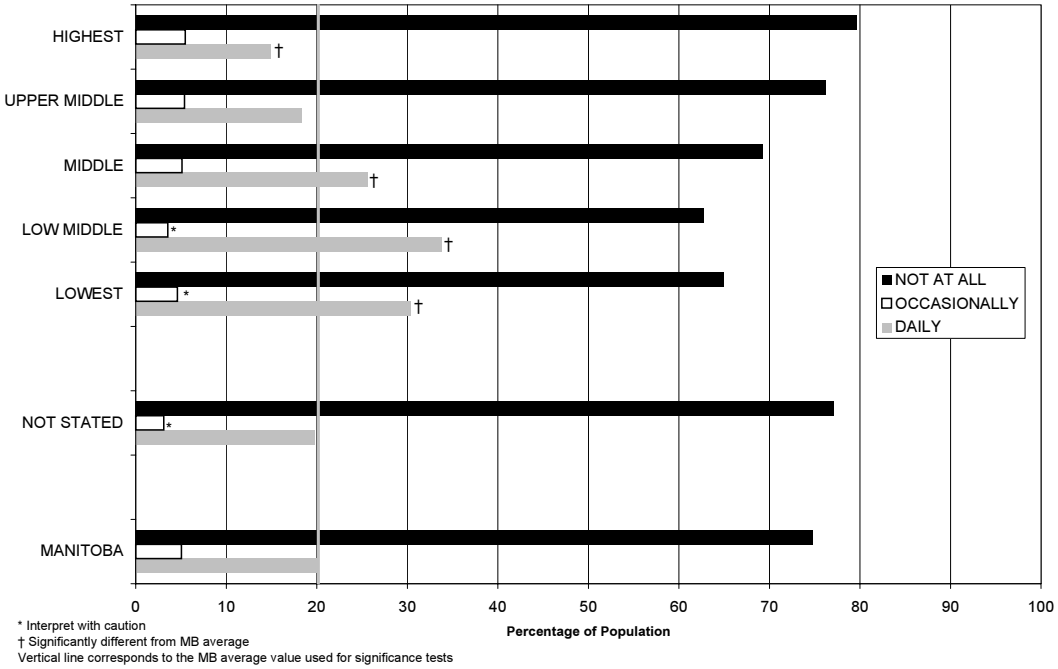

* Interpret with caution
Vertical line corresponds to the MB average value used for significance tests

**Figure 5: Type of Smoker by Health Region**




* Interpret with caution
† Significantly different from MB average
Vertical line corresponds to the MB average value used for significance tests

**Figure 6: Type of Smoker by Income Adequacy Quintile**




* Interpret with caution
† Significantly different from MB average
Vertical line corresponds to the MB average value used for significance tests

**Figure 7: Frequency of All Physical Activity by Health Region**

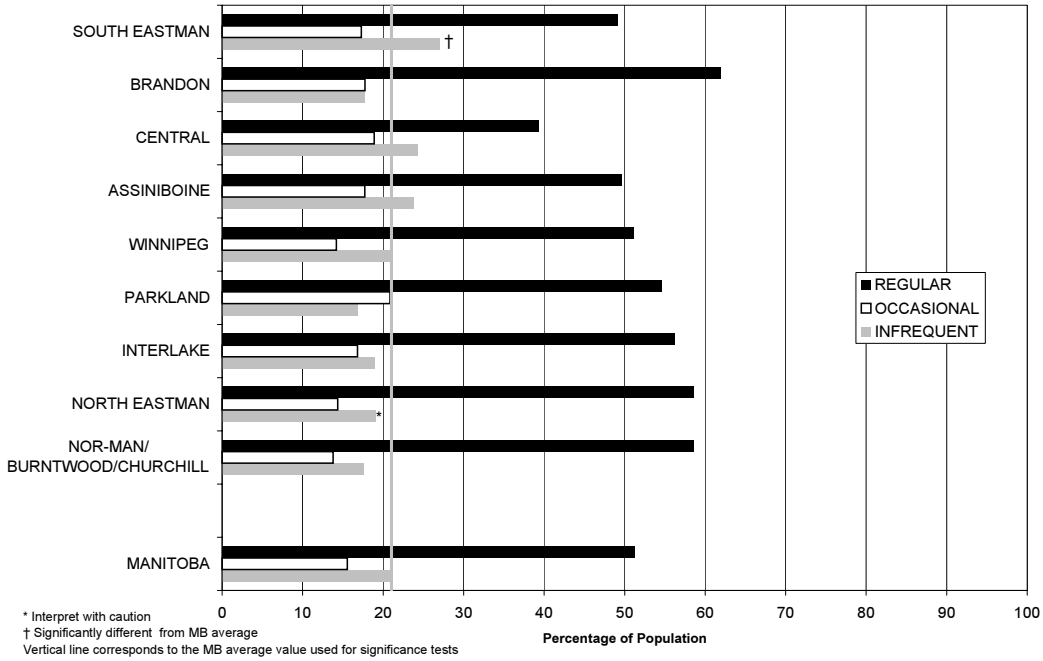



**Figure 8: Frequency of All Physical Activity by Income Adequacy Quintile**

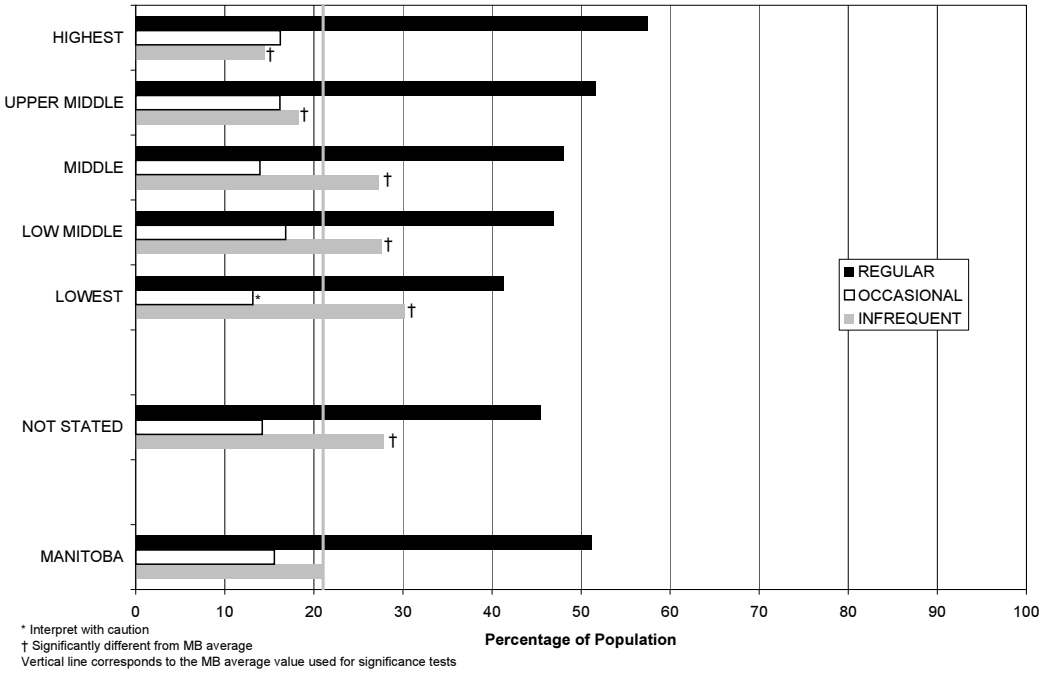
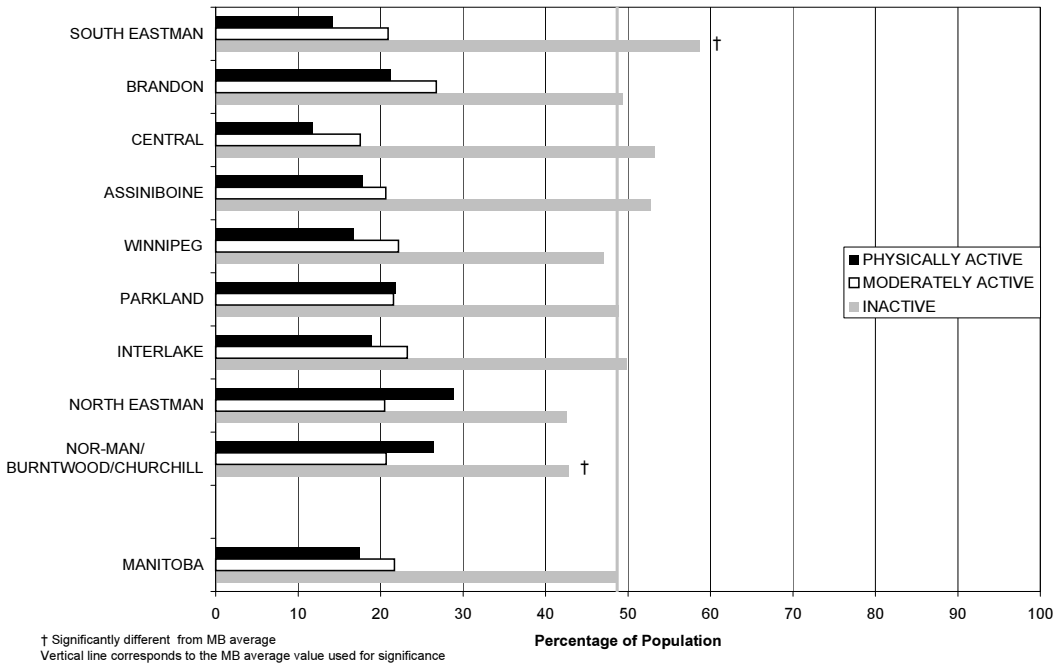
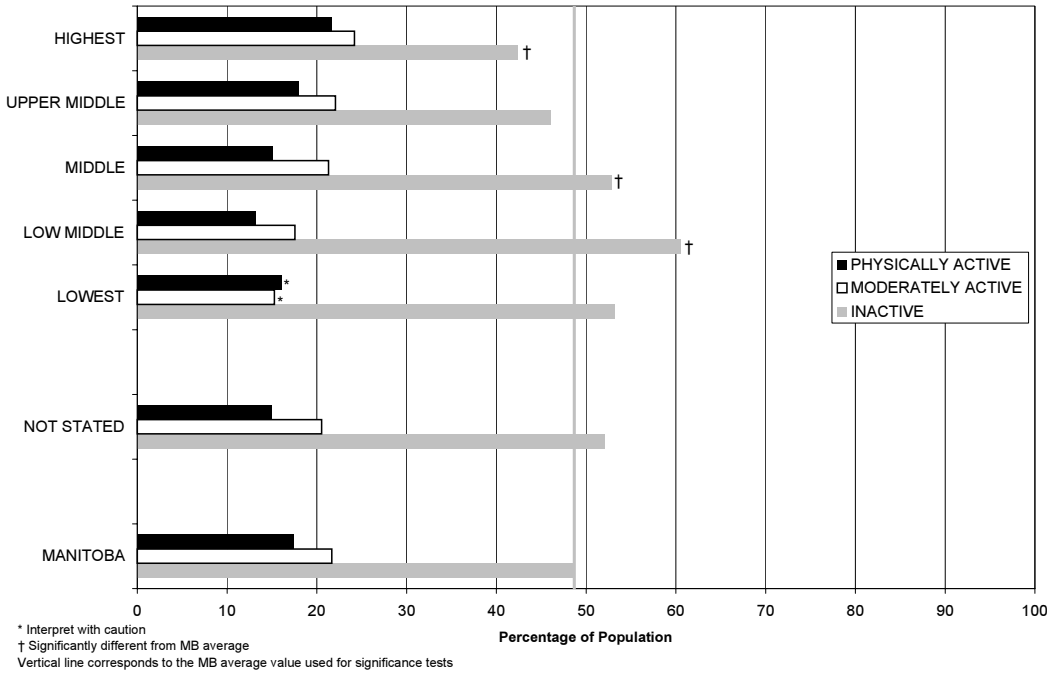


**Figure 9: Physical Activity Index by Health Region**




† Significantly different from MB average
Vertical line corresponds to the MB average value used for significance

**Figure 10: Physical Activity Index by Income Adequacy Quintile**




* Interpret with caution
† Significantly different from MB average
Vertical line corresponds to the MB average value used for significance tests

**Figure 11: Percentage of Population Participating in Leisure Physical Activity by Health Region**

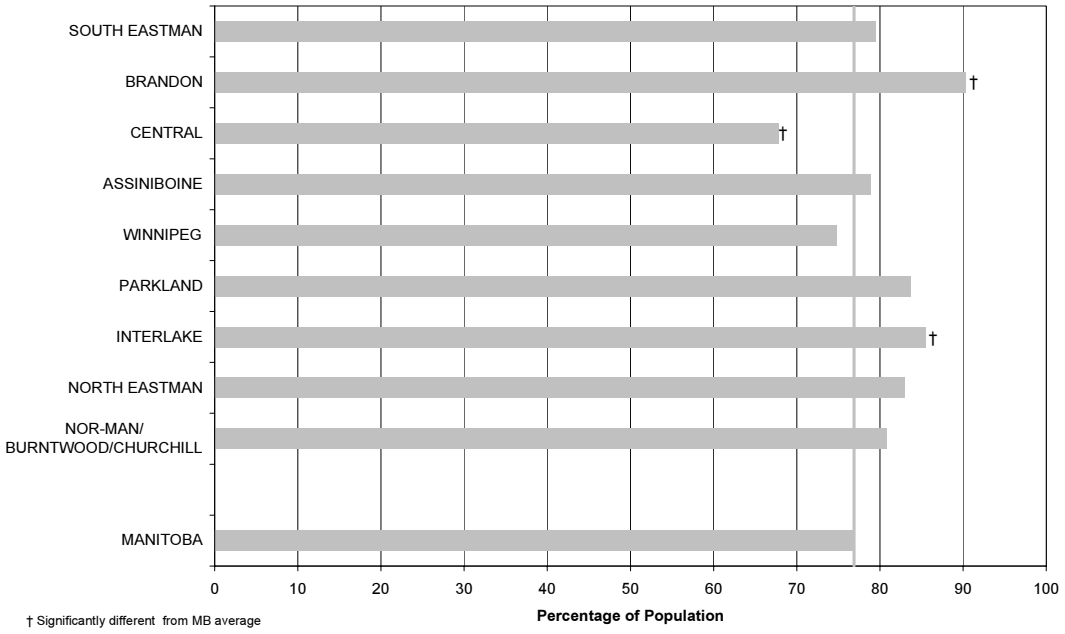



**Figure 12: Percentage of Population Participating in Leisure Physical Activity by Income Adequacy Quintile**

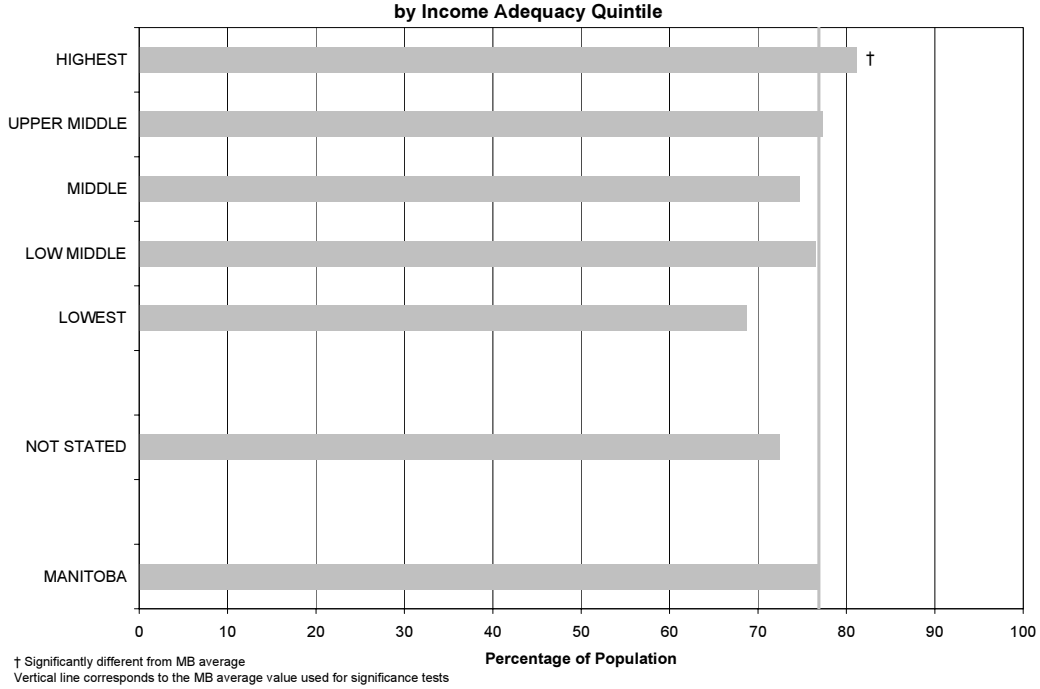
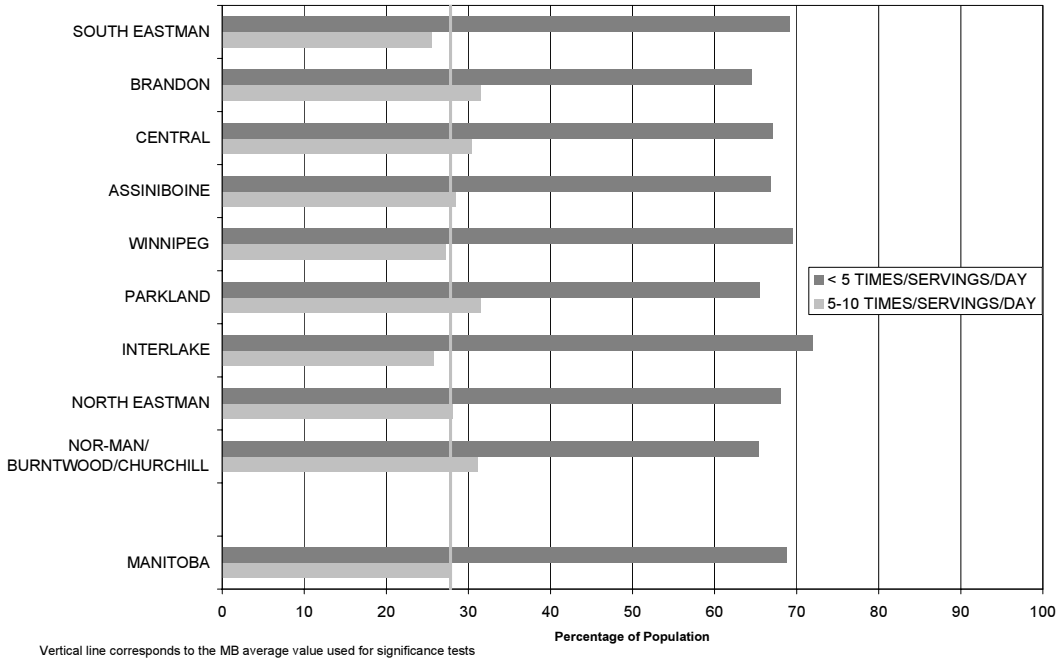
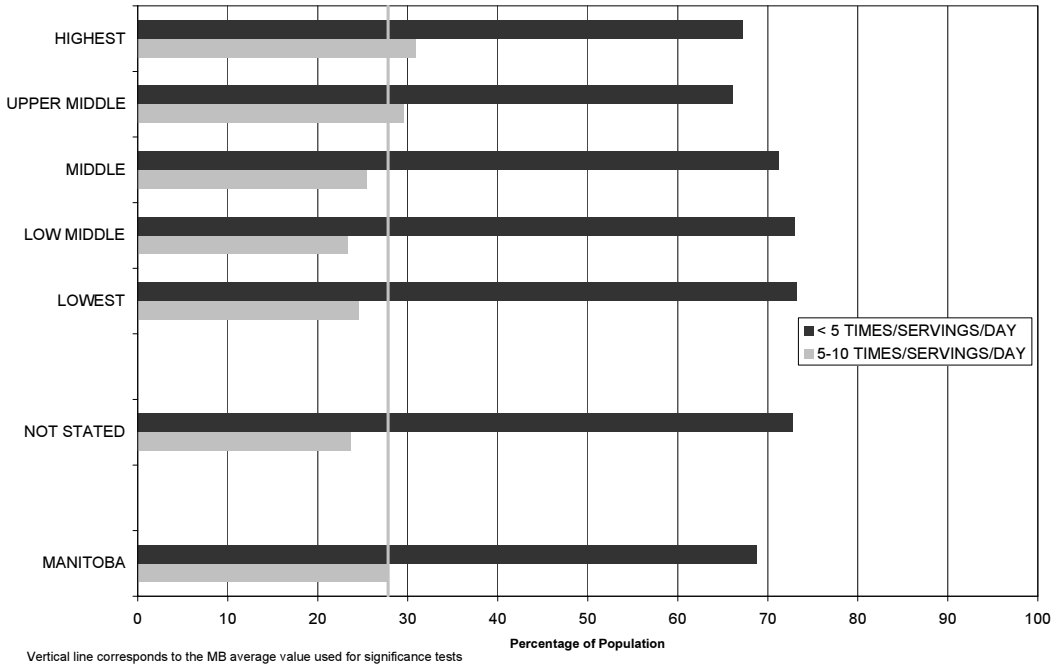


**Figure 13: Fruit and Vegetable Consumption by Health Region**




Vertical line corresponds to the MB average value used for significance tests

**Figure 14: Fruit and Vegetable Consumption by Income Adequacy Quintile**




Vertical line corresponds to the MB average value used for significance tests

**Figure 15: Unmet Health Care Needs by Health Region**

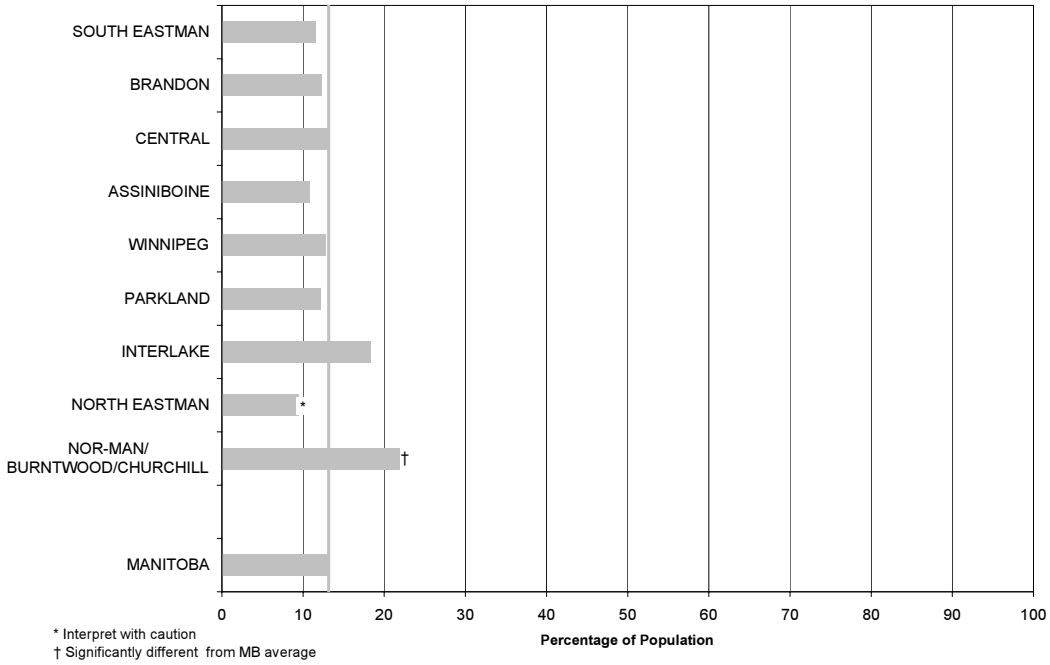
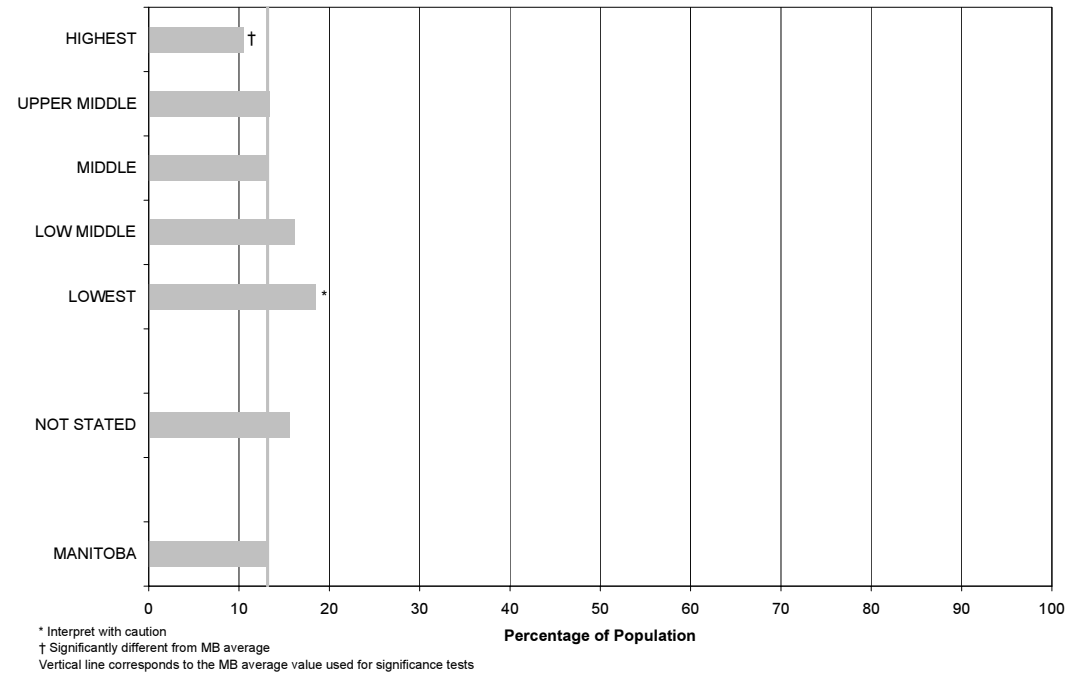



**Figure 16: Unmet Health Care Needs by Income Adequacy Quintile**



## 4.5 Summary

Some of the highlights of the analyses of risk factors and protective factors for Manitoba regions and income groups are:

- Overall, only 29.6% of Manitobans have an acceptable standard weight, according to BMI calculated from self-reported height and weight information. More than one-quarter (26.6%) of individuals are overweight. Interlake RHA and the Northern RHAs have a higher percentage of overweight individuals than the provincial average. There were no significant differences in the percentage of overweight individuals across income adequacy quintiles.
- Almost three-quarters of Manitobans do not smoke. There is a higher percentage of daily smokers in the Northern RHAs than in the Manitoba population. There was a lower percentage of daily smokers in the highest income quintile, and a higher percentage of daily smokers in the middle, low middle, and lowest income quintiles than in the entire Manitoba population.
- More than half (51.1%) of Manitobans report engaging in regular physical activity of at least 15 minutes duration. Individuals in the upper and upper middle income quintiles were less likely to report infrequent physical activity, while those in the middle, low middle, and lowest income quintiles were more likely to report infrequent physical activity.
- Close to half (48.7%) of Manitobans are physically inactive. Individuals in the Northern RHAs were less likely to be physically inactive, while those in the middle and low middle income quintiles were more likely to be inactive.
- More than three-quarters (76.9%) of Manitobans report engaging in leisure physical activity. Residents of both Brandon RHA and Interlake RHA were more likely to engage in leisure physical activity than the rest of Manitobans. As well, individuals in the highest income quintile were more likely to participate in leisure physical activity.
- Only slightly more than one-quarter (27.8%) of Manitobans report having the recommended five to ten servings of fruits and vegetables on a daily basis. There were no significant differences across the regions or income quintile groups. However, there was a gradient in this indicator across income groups.
- Overall, 13.1% of Manitobans report having unmet healthcare needs. Individuals in the Northern RHAs were more likely to report unmet needs than the rest of the population. Individuals in the highest income quintile were less likely to report unmet needs.

Once again it is important to note that the data reported here do not include individuals living in First Nations communities.

# CHAPTER 5: USING ADMINISTRATIVE DATA TO DEFINE PRIMARY PREVENTION INDICATORS

## 5.1 Introduction

Administrative data are primarily generated when health services are provided to individuals. Manitoba Health collects a variety of health service utilization data, and after removing all personal identifiers so the data are anonymous, provides these data to MCHP. MCHP has developed the Population Health Research Data Repository to permit the investigation of questions relevant to the health of Manitobans. The Data Repository includes the following databases that can be used to develop primary prevention indicators:

- Physician services claims
- Hospital discharges
- Prescription drugs
- Manitoba Immunization Management System
- Vital Statistics

All of these databases are linked through a population registry to permit the development of profiles of individuals, communities and populations. Data are linked using anonymized identifiers.

*Most indicators from administrative data are not considered direct measures of primary prevention. The goal of primary prevention is to reduce the need for health care. In many cases, administrative data indicate a failure of primary prevention.*

Administrative data can be used to develop a variety of health outcome measures, including prevalence and incidence of chronic and infectious diseases or conditions. Administrative data can also provide information on the use of preventive health services such as immunizations. They can also be used to look at determinants of health, including breastfeeding and teenage pregnancy. These data are generally available over time and for all regions of the province, so that comparative measures can be produced.

However, it is important to note that most indicators developed from administrative data are not considered direct measures of primary prevention—in fact, as described earlier, the goal of primary prevention is to reduce the need for health care. A healthy population will need fewer health services aimed at secondary or tertiary prevention. In many cases, administrative data indicate a failure of primary prevention. For example, high rates of diabetes in a population indicate a need for additional prevention activities. On the other hand, when viewed over time, administrative data can be useful for identifying trends—if the incidence of diabetes is reduced over a period of years, this may indicate that primary prevention strategies that are in place have been effective. Administrative data can also be useful in determining where the need for resources for primary prevention is greatest.

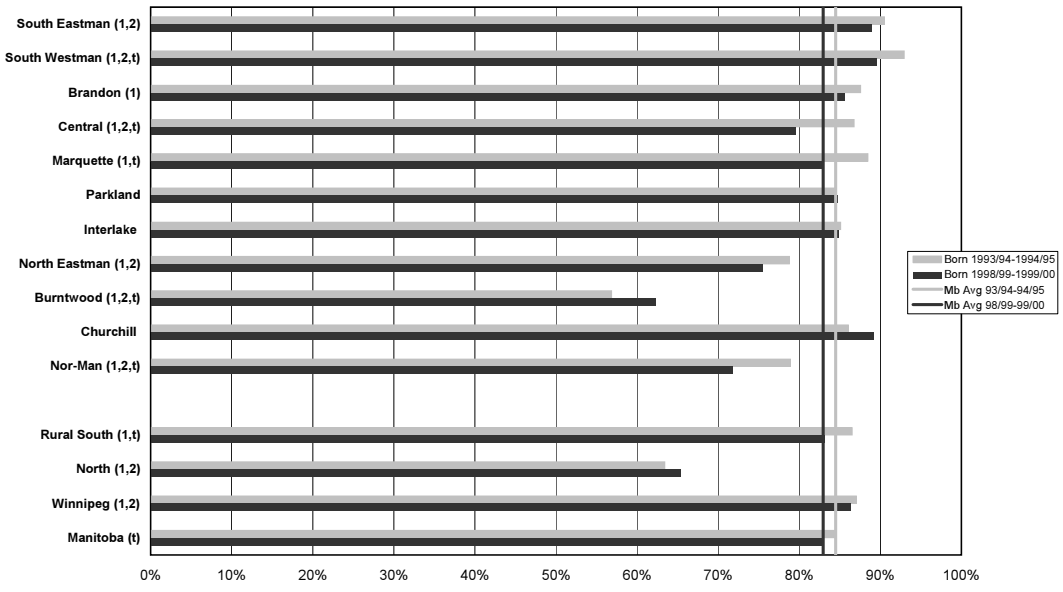
In the following sections, those primary prevention indicators that can be drawn from administrative data are identified, and several examples of these

indicators are provided. All figures presented here are taken from MCHP report *The Manitoba RHA Indicators Atlas: Population-Based Comparisons of Health and Health Care Use* (Martens et al., 2003). All figures present RHAs in rank order on the basis of health status, with the RHA with the population having the highest health status (as measured by the premature mortality rate) at the top and the RHA with the poorest health status at the bottom of each figure.

## 5.2 Manitoba Immunization Management System (MIMS)

This administrative database contains records of all children who receive immunizations. When linked to the population registry, a population-based measure of the proportion of children who receive the full series of immunizations can be developed; this measure can be used to identify geographic areas where the immunization rate is low, or where children are not receiving the complete series of immunizations; these data can be provided for series completion at one, two, and seven years of age. Figure 17 shows the one-year immunization rate for children by RHA. Note that MIMS data from First Nations communities may be underestimating the percentage of children immunized, due to missing data.

**Figure 17: One-Year Immunization Rates by RHA**
Percentage of children with complete immunization schedules at age one year



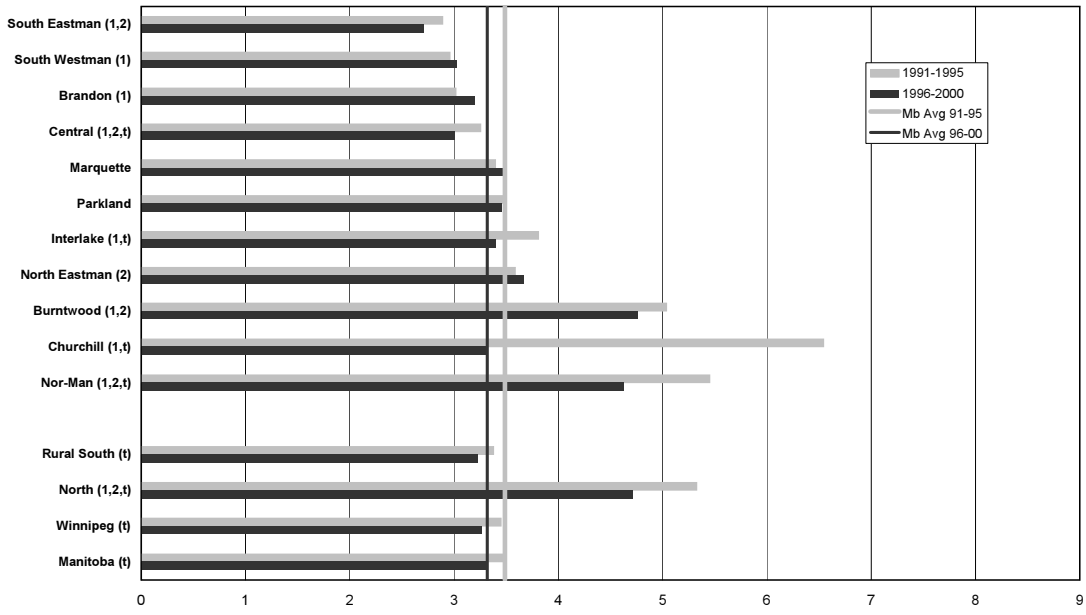

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
Data Source: Manitoba Immunization Monitoring System (MIMS)
Source: Martens et al., 2003

## 5.3 Vital Statistics

Vital Statistics data include information on births and deaths. In the context of primary prevention, these data are used to develop measures of population health status. Examples include premature mortality (death before the age of 75), life expectancy, and potential years of life lost (PYLL). Figure 18 provides comparative regional data for the premature mortality rate (PMR) a well-established measure of a population's need for health care (Carstairs and Morris, 1991, Eyles et al., 1991, US General Accounting Office, 1996). PMR and other measures from Vital Statistics data are particularly useful in identifying geographic areas where populations exhibit poor health status and, accordingly, may have a greater need for primary prevention interventions. These measures are also useful for examining trends in health status, to determine whether disparities in population health are increasing or decreasing over time (Brownell et al., 2003).

**Figure 18: Premature Mortality Rates by RHA**

Age- & sex-adjusted rate of deaths per 1000 aged 0-74




'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
Source: Martens et al., 2003

## 5.4 Health Services Utilization Data

In the context of monitoring primary prevention, health service utilization data are most useful for describing the incidence and prevalence of disease. Preventing the onset of chronic illness is a priority for governments in Canada, as well as in many other developed countries. Examples of chronic disease algorithms (i.e., definitions) developed by MCHP are provided in Appendix F; these include diabetes, heart disease and cancer.

MCHP researchers are currently undertaking a project for Manitoba Health that will identify different algorithms for a select number of chronic dis-

eases, and then systematically compare the cases identified from these algorithms to those identified via self-report data available in population-based surveys or to existing chronic disease registries. The diseases that have been prioritized by the Working Group include:

- Arthritis (with separate definitions for osteoarthritis and rheumatoid arthritis)
- Asthma
- Diabetes
- Hypertension
- Ischemic heart disease
- Renal disease
- Stroke
- Congestive heart failure

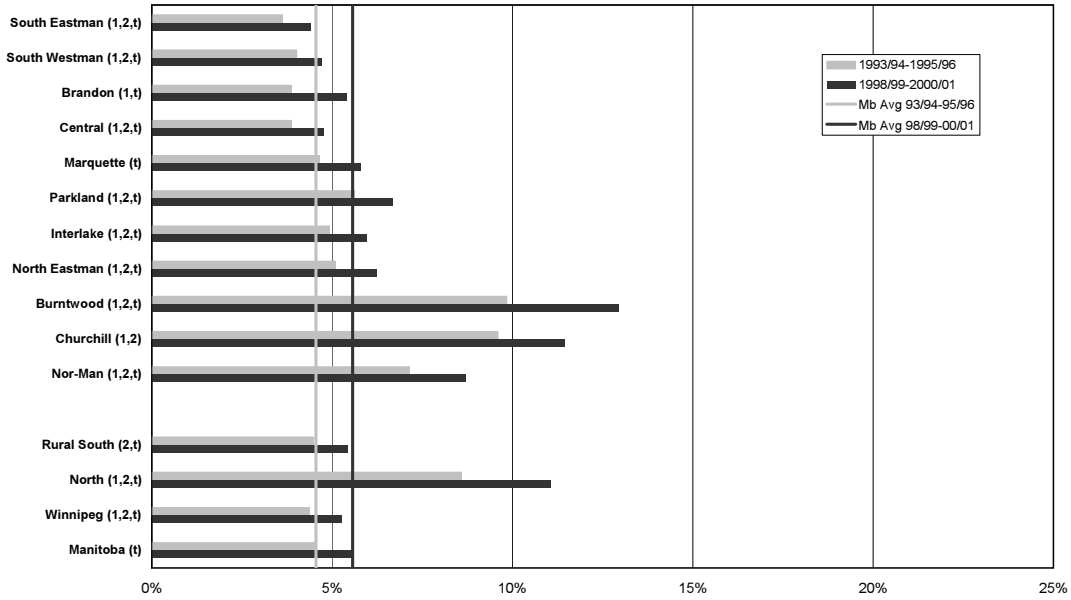
Population-based rates of chronic diseases can be established using diagnosis or service codes in physician and hospital data, as well as prescription drug codes. Diagnosis codes are currently based on the International Classification of Diseases, 9th revision, Clinical Modification (i.e., ICD-9-CM). The 10th revision of this classification system has been adopted for reporting in hospital separation abstracts, and will provide enhanced capabilities to monitor diseases and conditions.

One chronic condition that has been the focus of significant work by MCHP and other Manitoba researchers is diabetes (see e.g., Blanchard et al., 1996). Figure 19 provides comparative regional data on the diabetes treatment prevalence rate for the RHAs using an algorithm validated by Martens et al. (2003). It is important to note that the treatment prevalence rates may not coincide with the actual disease rate because individuals who have diabetes but do not have contact with the health care system for treatment are not captured in administrative data.

In addition to chronic conditions, administrative data may be used to describe population-based rates of procedures, interventions and morbidity. Although screening programs are often considered to represent secondary prevention, they are an additional tool for monitoring protective factors in the population. Breast cancer screening (Figure 20) and cervical cancer screening are commonly reported indicators.

**Figure 19: Diabetes Treatment Prevalence by RHA**

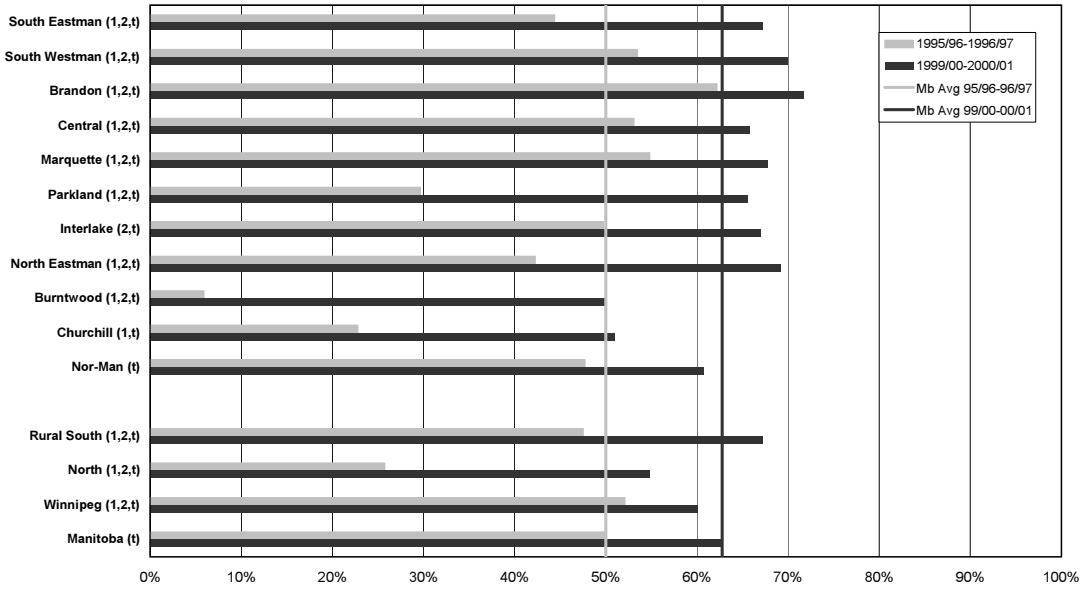
Age- & sex-adjusted percentage of population aged 20-79 treated for diabetes




'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
Source: Martens et al., 2003

**Figure 20: Breast Cancer Screening Rates by RHA**

Age-adjusted percentage of women age 50-69 receiving at least one mammogram in two years



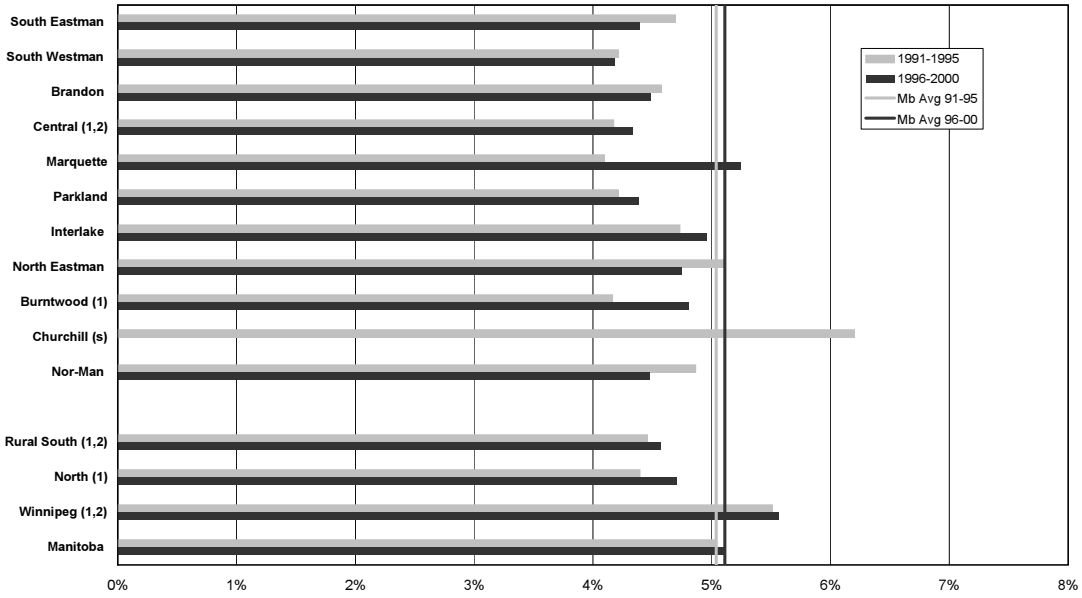

'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers
Source: Martens et al., 2003

Encounters with the health care system provide opportunities that could be used to collect additional data that would be useful in assessing primary prevention. For example, billing claims or records submitted for payment could also include such important measures as height, weight, smoking status, alcohol consumption, self-reported health, and the physician's subjective assessment of the individual's health status; and when children receive immunizations, it would be possible to record whether or not they are breastfeeding, to provide an indicator of breastfeeding duration.

Low and high birth weight rates are also important prevention-related indicators included in the administrative data because they are both risk factors and outcomes. Figures 21 and 22 show these measures for Manitoba RHAs. There is increasing evidence that high or low birth weight can affect a person's health throughout their life (Caulfield et al., 1998; Saigal et al., 2001; Law, 2002).

**Figure 21: Low Birth Weight Births by RHA**

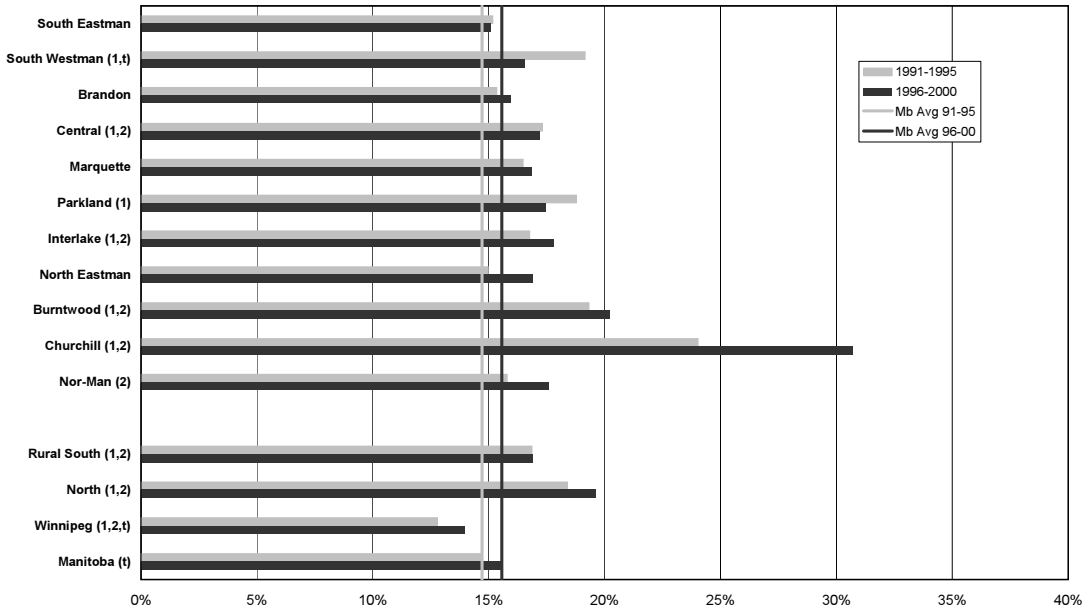
Percentage of babies born with low birth weights (less than 2500 grams)




'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
's' indicates data suppressed due to small numbers
Source: Martens et al., 2003

**Figure 22: High Birth Weight Births by RHA**

Percentage of babies born with high birth weights (greater than 4000 grams)

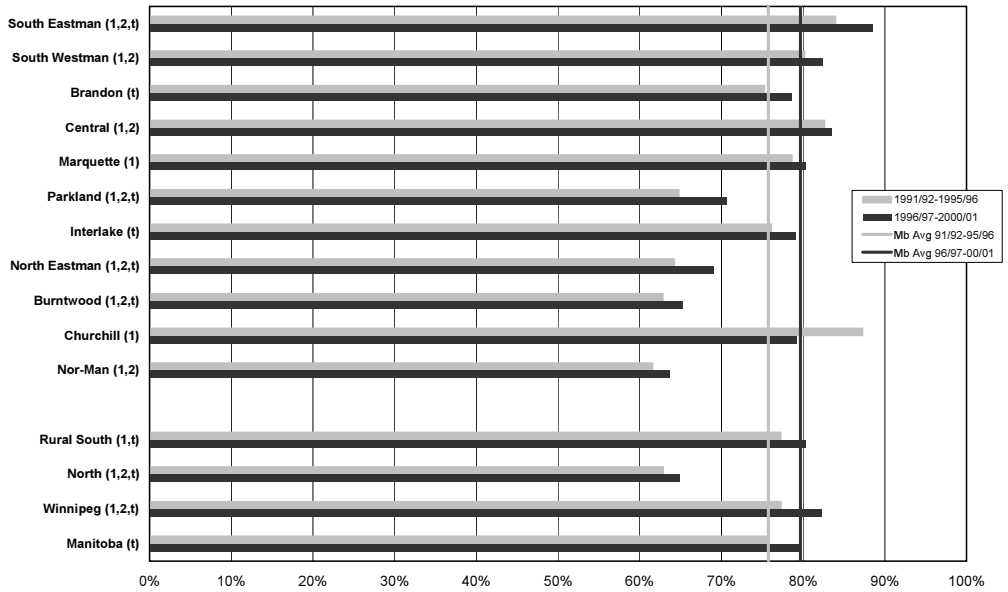



'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
Source: Martens et al., 2003

Breastfeeding initiation data are available from hospital discharge records. Figure 23 provides regional comparisons. Breastfeeding duration is not available in the administrative data. Hence current data are limited in only providing information about breastfeeding at the point of discharge from hospital.

**Figure 23: Breastfeeding Initiation Rates by RHA**

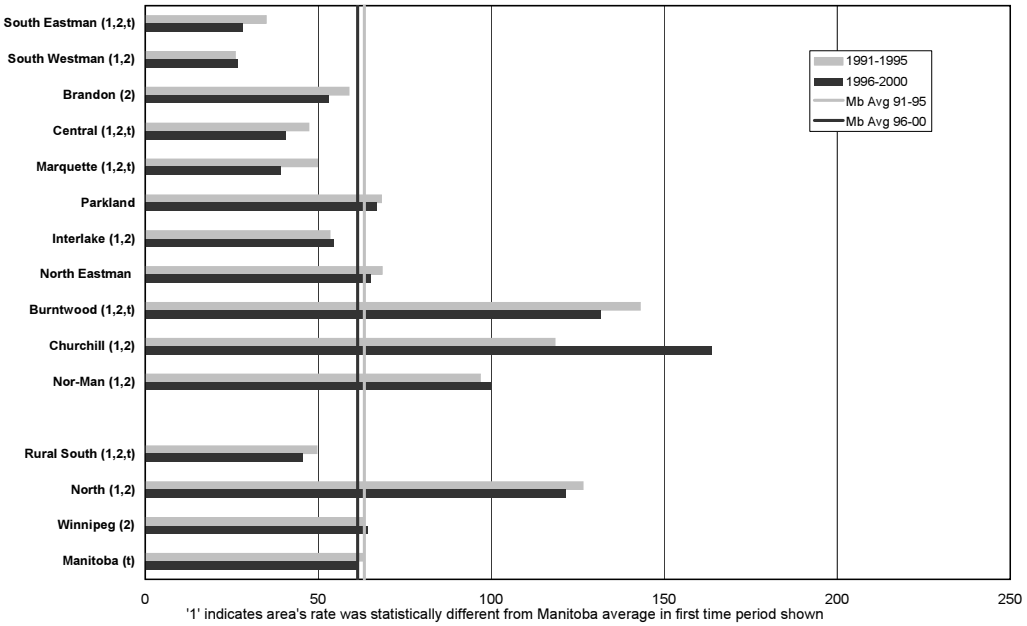
Per cent of newborns breastfeeding at hospital discharge




'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
Source: Martens et al., 2003

Another important indicator for which administrative data are available is teen pregnancy, which focusses on mothers between the age of 15 and 19 years. This information for Manitoba RHAs is presented in Figure 24.

**Figure 24: Teen Pregnancy Rates by RHA**
Rate of teen pregnancies per 1000 females aged 15-19 years




'1' indicates area's rate was statistically different from Manitoba average in first time period shown
'2' indicates area's rate was statistically different from Manitoba average in second time period shown
't' indicates change over time was statistically significant
Source: Martens et al., 2003

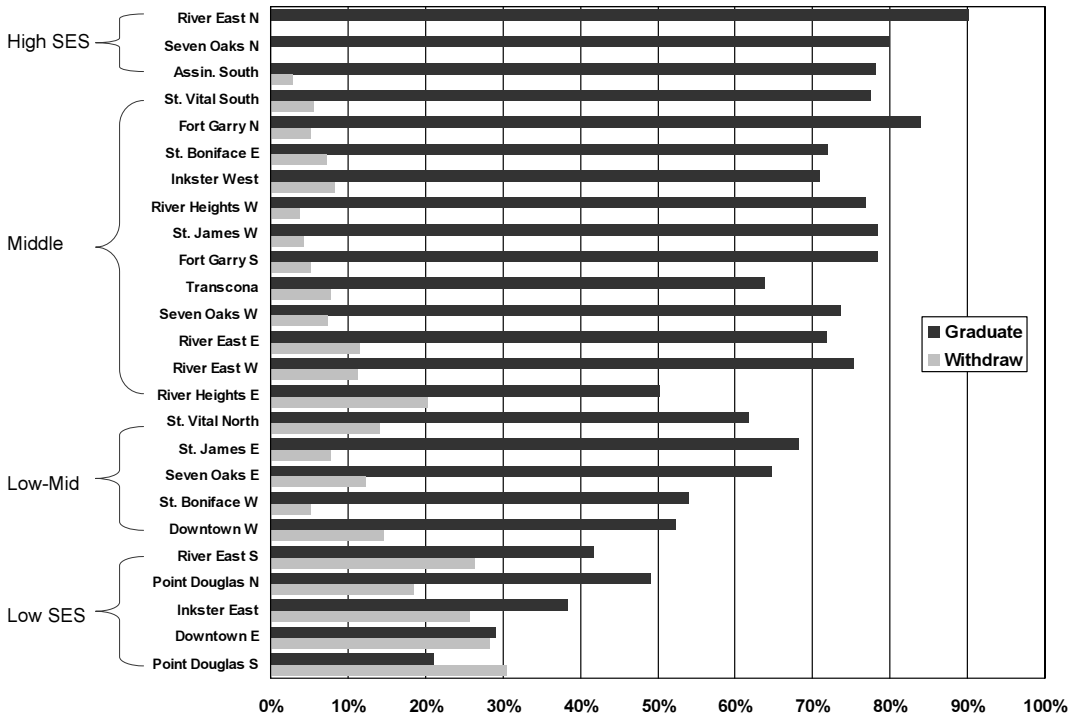
These examples provide an indication of the important role that administrative health data can play when considering primary prevention. As indicated above, there are opportunities to further enhance the utility of administrative data through the collection of additional data at the time of an individual's encounter with the health care system.

## 5.5 Other Data Sources in the Repository

In addition to the health administrative data included in the Data Repository, there are other databases that are potentially relevant to primary prevention. For example, data available through data sharing agreements with Manitoba Education and Manitoba Family Services and Housing include information that may be useful in considering the social determinants of health. The Repository also includes clinical databases, survey data and community resource data. For example, the bone mineral densitometry clinical database includes data on individuals who are at risk of fracture due to osteoporosis—these data could be useful in identifying populations at risk of falls (indicating a target for primary prevention), or in assessing the success of programs designed to prevent osteoporosis. Survey data that may be linked to administrative data include the National Population Health

Survey, the Aging in Manitoba Longitudinal Study, the Heart Health Study and the Alcohol Panel Surveys. Each of these surveys contains individual level data on a variety of issues, including items that may be important for primary prevention. Community (neighbourhood) level data for Winnipeg include crime statistics, housing value, and community programs. These data are also relevant as measures of the social determinants of health.

**Figure 25: High School Completion Rates, by Winnipeg Neighbourhood**
**Grade 9 (S1) students in 1997/98: What happens in next 5 years?**




Source: Brownell et al., 2004

It would be possible to present many examples of how other data sources in the Repository could be used. However, our task in this report is not to provide exhaustive benchmarking, but rather to indicate possible sources for further analysis. In the report "How do Educational Outcomes Vary with Socioeconomic Status?" Brownell and colleagues (2004) reported high school completion rates by Winnipeg neighbourhoods (see Figure 25). Education is recognized as an important determinant of health. This figure shows how the number of students who graduate five years after enrolment in grade 9 varies as a function of the socioeconomic status of the community in which they live. The gradient of decreasing graduation rates and increasing withdrawal rates is evident as one moves from high to low socioeconomic communities. This is an important observation that has implications for primary prevention.

## 5.6 Summary

*Administrative data are not considered good sources for developing indicators of primary prevention, because they describe morbidity rather than prevention activities. They are, however, very useful for describing health status and health service utilization.*

Administrative data are not typically considered good sources for developing indicators of primary prevention because they best describe morbidity rather than prevention activities. Indeed, administrative data are most readily used to describe tertiary prevention, where an intervention is required to mediate further morbidity, such as the diagnosis of osteoporosis through bone mineral densitometry or amputations resulting from diabetes. They are, however, very useful for describing patterns of health status and health services utilization, particularly when considering population health status on a geographic or longitudinal basis. The greatest strengths of the data are that they are population-based measures, and the data are readily accessible. However, in addition to being distal and indirect indicators of primary prevention activities they also require that appropriate methods be used to define chronic conditions. Developing algorithms to define the prevalence of chronic diseases is a project that is currently underway at MCHP.

# CHAPTER 6: USING PUBLIC HEALTH STATISTICS TO DEFINE PRIMARY PREVENTION INDICATORS

## 6.1 Introduction

The Provincial Public Health Statistic System (PPHSS) is an administrative data system used by selected public health service providers in the RHAs to capture information on their substantive contacts with clients. A substantive contact is an encounter in which issues of the client are identified, interventions/services are provided, and the issues are resolved or followed with additional contacts. The types of service providers that report to PPHSS vary across regions of the province, but generally include public health nurses, community health workers, community health nurses, health educators, and home economists or nutritionists. The data are manually recorded by service providers in a hard copy format, and then entered into an electronic file. The RHAs submit their data files to Manitoba Health for compilation and summary reports are generated.

*PPHSS, because it provides data on the delivery of public health activities in the province; it should therefore have value for developing primary prevention indicators. However, there was concern that the quality of the data may vary across the province and across time, which may affect its utility for indicator development.*

PPHSS is a unique resource in Manitoba that has not been previously explored for its potential to add to our knowledge of primary prevention in the province. Because it provides data on the delivery of public health activities in the province it should have value for developing primary prevention indicators. However, at the outset it was recognized that the quality of the data may vary across the province and across time, which may affect its utility for indicator development. As well, because entries in the system pertain to contacts with public health service providers rather than the individuals who obtain these services, it may be difficult to use PPHSS data to monitor individual, community, or population risk factors, protective factors, and/or health outcomes.

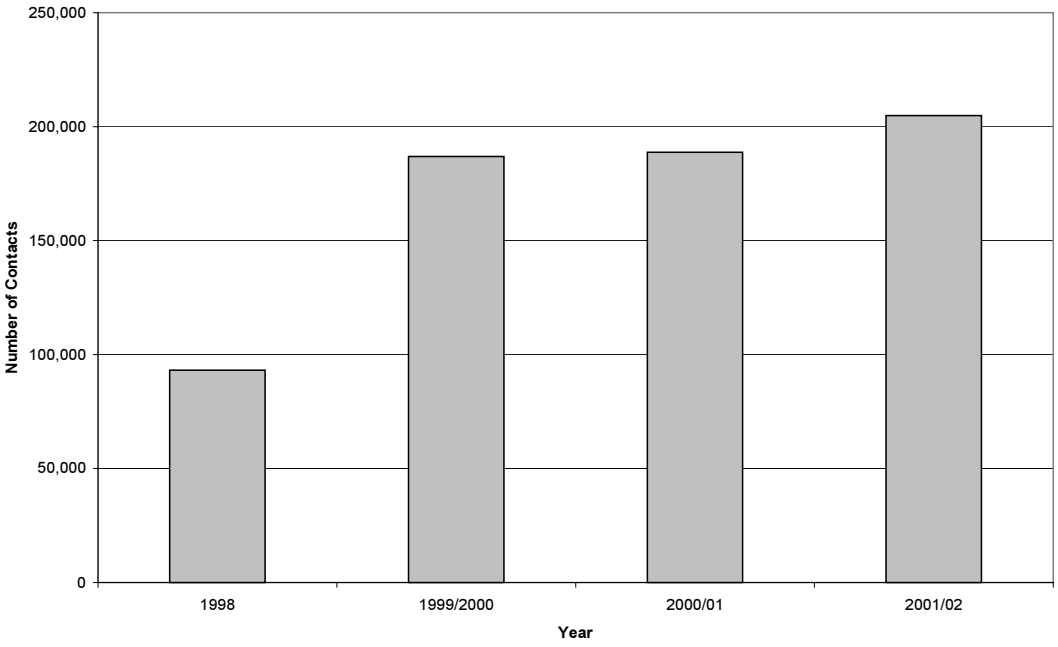
We undertook a systematic descriptive analysis of PPHSS data for a single fiscal year, 2001/02, to evaluate its potential for indicator development. This section of the report describes the characteristics of the data, which includes the types of clients, services, and service providers that are represented in the contacts. Variations in PPHSS contacts across the RHAs are analyzed. An assessment of the capabilities to link PPHSS data to other administrative health data using an individual's personal health identification number (PHIN) is presented; this component of the analysis is critical for evaluating the extent to which PPHSS clients can be described in terms of their demographic characteristics and use of other components of the health system.

For this report, MCHP acquired PPHSS data from Manitoba Health for the following time periods (see Figure 26):

- Calendar years: 1997, 1998
- Fiscal years: 1999/2000, 2000/01, 2001/02

Data are not available for the three month period 01/01/99-– 03/31/99. All RHAs collected data in 1997. Central RHA discontinued data collection in 1998. As well, data from Interlake and Nor-Man RHAs are missing from the 1998 files.

**Figure 26: Number of PPHSS Contacts by Year**




## 6.2 Client Contacts

PPHSS data contains information on public health contacts with individuals, families, groups, and community organizations. Sex and age category are reported for individual clients, and the age range of participants is reported for group and community contacts.

In 2001/02, the majority of contacts (79.9%) were for individual clients. Families comprised 13.4% of contacts, and groups or communities were responsible for another 6.6% of contacts. Almost half of the group contacts (48.7%) were for individuals of mixed ages.

Gender was recorded on virtually all (94.7%) of the contacts for individuals. More than two-thirds (66.5%) of individual contacts were with females. Newborns under one year of age were responsible for almost one-quarter (22.0%) of individual contacts. Children between one and four years of age were responsible for 11.3% of individual contacts, and youth between 15 and 19 years of age for an additional 12.2% of these contacts.

## 6.3 Client Issues

Up to two issues may be recorded for each contact. Issues are the factors or concerns identified by the client or service provider at the time of the contact, that impact the physical, emotional, social, spiritual, or economic well-being of the client. Issues are grouped into broad categories, such as family health, addictions and substance use, and psychosocial well-being.

A single issue (i.e., the primary issue) was recorded on three-quarters of the contacts in 2001/02; the remaining contacts had two issues. A frequency distribution of the primary issue categories is given in Table 4. The three most frequent categories were family health (64.4%), communicable conditions (21.4%), and acute conditions (5.8%).

**Table 4: Frequency of contacts by type of issue, 2001/02**

| Primary Issue | Frequency | Per cent |
|---|---|---|
| Family Health | 131,891 | 64.4 |
| Communicable Conditions | 43,818 | 21.4 |
| Acute Conditions | 11,794 | 5.8 |
| Chronic Conditions | 7,786 | 3.8 |
| Community Health | 5,260 | 2.6 |
| Psychosocial Well Being | 2,644 | 1.3 |
| Addictions & Substance/Medication Use | 587 | 0.3 |
| Hearing/Speech | 549 | 0.3 |
| Missing/Miscoded | 545 | 0.3 |
| **Total** | **204,874** | **100** |

Within the family health category, the most frequent primary issues were child/adolescent health (21.7%), healthy newborn (16.6%), and healthy postnatal mother (14.1%). Within the communicable condition category, the most frequent issues were reportable communicable diseases (47.3%), travel health (18.6%), and STDs/HIV/AIDs (14.8%). Finally, within the acute conditions category, the most frequent primary issues were obstetrics/gynaecological issues (23.7%), integument (16.7%), and ears/nose/throat (16.2%).

## 6.4 Interventions

Up to three interventions may be recorded for each issue; therefore as many as six interventions may be captured for each contact. Interventions are the activities or services provided by the service provider to the client.

Overall, one-third of the contacts had two interventions, and another 29.1% had three interventions. Only 10.0% of contacts had either five or six interventions. For the primary issue, two interventions were most commonly recorded (40.4%).

We analyzed these primary and secondary interventions. The most frequent primary interventions (see Table 5) were health counselling (30.9%), providing information (24.3%), and health assessment without a physical examination (16.2%). The most frequent secondary interventions were health counselling (33.4%), health assessment without a physical examination (13.2%), and educating (11.0%).

**Table 5: Frequency of primary interventions for primary issue, 2001/02**

| Primary Intervention | Frequency | Per cent |
|---|---|---|
| Health Counseling | 63,234 | 30.9 |
| Providing Information | 49,741 | 24.3 |
| Health Assessment without Physical | 33,238 | 16.2 |
| Health Assessment with Physical | 23,781 | 11.6 |
| Educating | 6,968 | 3.4 |
| Coordinating Services and Resources | 5,004 | 2.4 |
| Assessment/Clinical Treatment | 4,912 | 2.4 |
| Immunizing | 4,325 | 2.1 |
| Consulting | 3,046 | 1.5 |
| Skill Development | 2,047 | 1.0 |
| Providing Medication/Supplies | 1,635 | 0.8 |
| Screening | 1,408 | 0.7 |
| Facilitating | 1,127 | 0.6 |
| Referring to Physician | 656 | 0.3 |
| Performing Lab Tests | 643 | 0.3 |
| Contact Interview | 623 | 0.3 |
| Community Development | 349 | 0.1 |
| Referring to Health Services | 279 | 0.1 |
| Referring to Community Support | 237 | 0.1 |
| Advocacy | 236 | 0.1 |
| Outbreak/Investigation | 154 | 0.1 |
| Community Research and Evaluation | 140 | 0.1 |
| Social Marketing | 136 | 0.1 |
| Prophylactic Treatment | 117 | 0.1 |
| Referring to Social Services | 110 | 0.1 |
| Policy Formation | 65 | 0.0 |
| Missing/Miscoded | 636 | 0.3 |
| **Total** | **204,874** | **100** |

## 6.5 Disposition of Contacts

Up to two dispositions may be recorded for each contact, one for the primary issue and one for the secondary issue. The disposition may occur at the time of the contact, or shortly thereafter as a result of the intervention(s).

Three-quarters of the contacts had a single disposition, and one-quarter had two dispositions. The most common dispositions for the primary issue were further contact planned (54.5%) and issue resolved (43.4%).

For primary issues in the family health category, further contact planned was the recorded disposition for almost two-thirds (61.5%) of contacts. For contacts where a communicable condition was the primary issue, 61.0% of contacts were resolved.

## 6.6 Initiating a Contact

Overall, 40.8% of contacts were initiated by the service provider, and another 35.5% by the client. Ten per cent were initiated by a hospital, followed by family or community (7.1%), an agency official (3.9%), or physician (2.1%).

Almost two-thirds (60.8%) of contacts occurred in the client's home, and another 26.8% occurred in the service provider's office, clinic, or health centre. Smaller numbers of contacts were in schools (5.7%), community settings (4.1%), and workplaces (1.6%).

## 6.7 RHA Variations in Contacts

Both the per cent distribution and rate of contacts was analyzed for the RHAs. It is important to remember that in these data, RHA corresponds to the RHA that provided the service, not the RHA where the client lived. Services provided by Brandon RHA, for example, might be used by residents of neighbouring RHAs. The RHA in which the client lived is not recorded in the PPHSS system. However, the six-digit postal code of the client's place of residence is captured and could be used to assign clients to RHAs. To do this would require further assessment of the accuracy and completeness of postal code data, which was beyond the scope of the current analysis.

Table 6 contains data on the frequency distribution of contacts for the RHAs. Overall, Winnipeg RHA recorded the greatest number of PPHSS contacts in 2001/02, followed by Interlake and South Eastman RHAs.

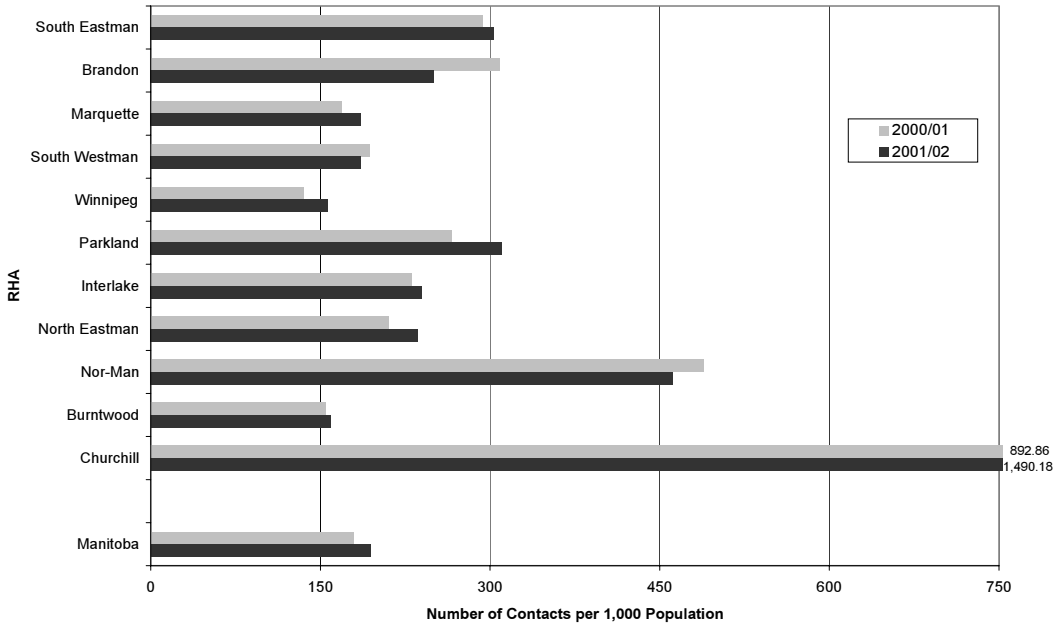
Figure 27 shows the rate of PPHSS contacts for each of the RHAs for the two most current years of data that were available at the time of analysis. In this figure, rates are provided separately for Marquette and South Westman

**Table 6: Frequency of PPHSS contacts by RHA, 2001/02**

| RHA of Contact | Frequency | Per cent |
|---|---|---|
| South Eastman | 16,771 | 8.2 |
| Brandon | 11,886 | 5.8 |
| Marquette | 6,901 | 3.4 |
| South Westman | 6,233 | 3.0 |
| Winnipeg | 102,060 | 49.8 |
| Parkland | 13,150 | 6.4 |
| Interlake | 17,982 | 8.8 |
| North Eastman | 9,309 | 4.5 |
| Nor-Man | 11,561 | 5.6 |
| Burntwood | 7,187 | 3.5 |
| Churchill | 1,517 | 0.7 |
| Missing | 317 | 0.2 |
| **Total** | **204,874** | **100** |

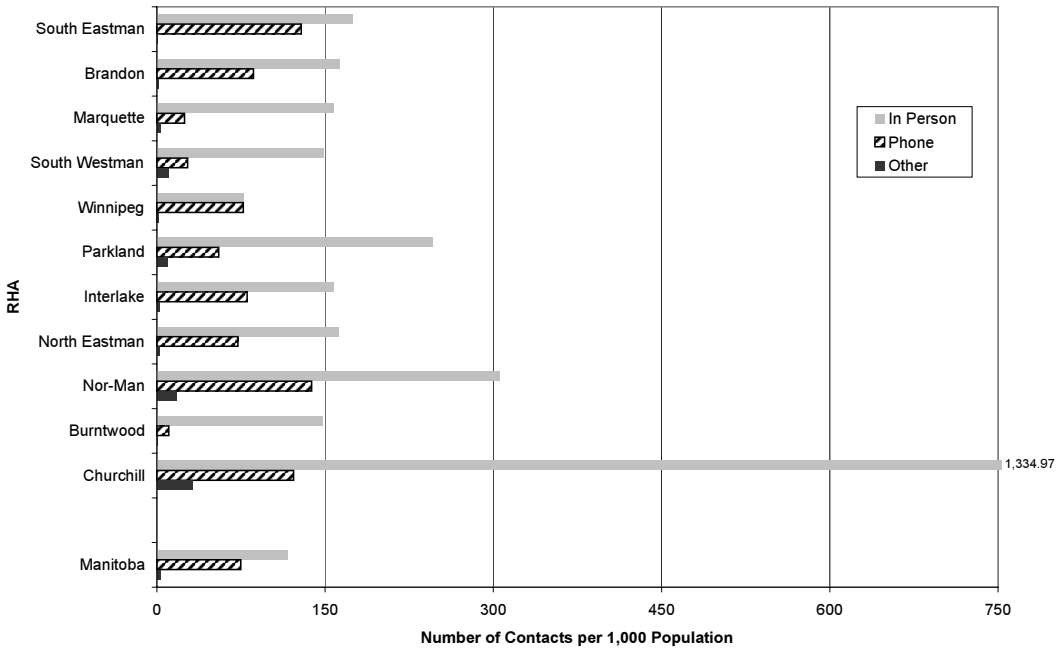
RHAs, because they did not amalgamate until July 2002. Hence, the RHA-specific results are reported using the administrative boundaries that were in place at the time of data collection. Figure 27 shows that for 2001/02, the highest rate was for Churchill RHA, at 1,490.2 contacts per 1,000 people. The lowest rate was for Winnipeg RHA, at 156.0 contacts per 1,000 people. Between 2000/01 and 2001/02, rates decreased slightly for Brandon, South Westman, Interlake, and Nor-Man RHAs. They increased or remained about the same in all other RHAs.

**Figure 27: Rate of PPHSS Contacts by RHA, 2000/01-2001/02**




In non-Winnipeg RHAs, most client contacts occurred in person (see Figure 28). For Winnipeg RHA however, in-person and telephone contacts were equally common. For all RHAs, rates for other methods of client contact, which include email, fax, and mail, were very low.

**Figure 28: Rate of PPHSS Contacts by RHA and Mode of Contact**




There were also differences between Winnipeg and non-Winnipeg RHAs in the source of the contact (Table 7). In Winnipeg RHA, clients were less likely to initiate a public health contact than in non-Winnipeg RHAs. However, hospitals were more likely to initiate contacts in Winnipeg RHA than in non-Winnipeg RHAs.

**Table 7: Frequency of PPHSS contacts by type of contact initiator**

| Contact Initiator | Winnipeg RHA | | Non-Winnipeg RHAs | |
|---|---|---|---|---|
| | N | % | N | % |
| Service Provider | 49,105 | 48.1 | 34,575 | 33.6 |
| Self (Client-Initiated) | 28,008 | 27.4 | 44,707 | 43.5 |
| Hospital | 16,495 | 16.2 | 5,004 | 4.9 |
| Family/Community | 3,692 | 3.6 | 10,887 | 10.6 |
| Agency | 4,109 | 4.0 | 3,829 | 3.7 |
| Physician | 632 | 0.6 | 3,743 | 3.6 |
| Missing | 19 | 0.0 | 69 | 0.1 |
| **Total** | **102,060** | **100** | **102,814** | **100** |

## 6.8 Public Health Service Providers

A total of 440 service providers were identified by the employee identification number recorded in the PPHSS system. This number includes 298 public health nurses (67.7%), 54 community health workers (12.3%), and 19 home economists/nutritionists (4.3%), along with smaller numbers of community health nurses, health educators, and other staff.

Table 8 shows the number of service providers and the rate of contacts per provider by RHA. We caution that the rates cannot be used to determine whether RHAs have sufficient resources to respond to public health issues, because: (a) the number of full-time equivalent staff is not known, and (b) there is no established benchmark for the number of contacts per provider. However, the rates do provide an indication of the relative distribution of contacts across the public health service providers of an RHA. These data show that Interlake had the greatest number of contacts per provider, followed by South Eastman, and Brandon. Burntwood, Churchill, and Parkland had the fewer contacts per provider.

**Table 8: Frequency of PPHSS service providers by RHA, 2001/02**

| RHA of Contact | Service Providers | Number of Contacts/Provider |
|---|---|---|
| South Eastman | 25 | 670.8 |
| Brandon | 20 | 594.3 |
| Marquette | 20 | 345.1 |
| South Westman | 15 | 415.5 |
| Winnipeg | 190 | 537.2 |
| Parkland | 54 | 243.5 |
| Interlake | 25 | 719.3 |
| North Eastman | 16 | 581.8 |
| Nor-Man | 23 | 502.7 |
| Burntwood | 35 | 205.3 |
| Churchill | 6 | 252.8 |

## 6.9 Using PHIN to Identify PPHSS Clients

The PPHSS reference manual for RHA staff notes that PHIN should be obtained "if it can be readily determined". In the 2001/02 data there were 85,181 contacts for which a PHIN was recorded. This represents 41.6% of all individual contacts. Our analysis showed that this corresponds to approximately 34,000 individuals, and an average of about three contacts per person. The PHIN is anonymized by Manitoba Health prior to it becoming part of the Repository, to ensure individual persons cannot be identified in the data.

The number of contacts with a PHIN was analyzed by RHA, mode of contact, and type of issue. PHIN was recorded on the greatest percentage of Brandon RHA contacts, followed by Burntwood and Parkland RHAs (see Table 9). For Winnipeg RHA, PHIN was captured on about one-third of the contacts. Almost half (47.2%) of all in-person contacts had a PHIN, while only one-third (33.3%) of telephone contacts had a PHIN. For other methods of contact (i.e., mail, fax, email), only 30.1% of contacts had a PHIN. Less than half (41.0%) of contacts with a family health primary issue had a PHIN recorded, compared with more than two-thirds of acute condition contacts and 59.0% of chronic condition contacts (Table 10).

**Table 9: Linkable PPHSS contacts by RHA, 2001/02**

| RHA of Contact | # of Contacts with PHIN | Total Contacts | % Contacts with PHIN |
|---|---|---|---|
| Brandon | 10,625 | 11,886 | 89.4 |
| Burntwood | 5,041 | 7,187 | 70.1 |
| Parkland | 9,125 | 13,150 | 69.4 |
| South Westman | 4,251 | 6,233 | 68.2 |
| Marquette | 4,602 | 6,901 | 66.7 |
| Nor-Man | 7,241 | 11,561 | 62.6 |
| South Eastman | 7,941 | 16,771 | 47.3 |
| Churchill | 696 | 1,517 | 45.9 |
| Winnipeg | 32,397 | 102,060 | 31.7 |
| Interlake | 4,584 | 17,982 | 25.5 |
| North Eastman | 2,343 | 9,309 | 25.2 |

**Table 10: Linkable PPHSS contacts by primary issue, 2001/02**

| Primary Issue | # of Contacts with PHIN | Total Contacts | % Contacts with PHIN |
|---|---|---|---|
| Family Health | 54,103 | 131,891 | 41.0 |
| Communicable Conditions | 16,493 | 43,818 | 37.6 |
| Acute Conditions | 8,065 | 11,794 | 68.4 |
| Chronic Conditions | 4,593 | 7,786 | 59.0 |
| Community Health | 683 | 5,260 | 13.0 |
| Psychosocial Well Being | 793 | 2,644 | 30.0 |
| Addictions & Substance/Medication Use | 109 | 587 | 18.6 |
| Hearing/Speech | 255 | 549 | 46.4 |
| Missing/Miscoded | 87 | 545 | 16.0 |

## 6.10 Using PPHSS Linked Records to Develop Primary Prevention Indicators

PPHSS contacts with PHIN can be linked to other administrative data sources, including the population registry, and hospital, physician, and prescription drug files. The linked files have the potential to be used by RHAs and Manitoba Health to examine the relationship between use of public health services and population health status, health service utilization, and/or health outcomes for individuals. This section of the report examines the ways that PPHSS linked data could be used.

We have selected two demonstrations to highlight the potential capabilities for using PPHSS linked data. The first demonstration focusses on individuals who contact public health service providers for diabetes issues. The second demonstration examines BabyFirst program contacts.

### 6.10.1 Diabetes Contacts

The overall purpose of this demonstration is to describe the characteristics of individuals who had at least one diabetes contact in PPHSS in 2001/02 and could be identified via their PHIN through PPHSS. Specific objectives are to:

- Determine whether these PPHSS diabetes clients had a recent diabetes diagnosis.

- Describe the PPHSS, hospital, physician, and prescription drug use of diabetes clients.

In 2001/02, there were close to 8,000 contacts in PPHSS for which the primary issue was a chronic condition. One-quarter of these chronic condition contacts (*n* = 1,967) were for diabetes. Almost half of the diabetes contacts (48.9%) were recorded for North Eastman RHA. A very small number (1.8%) were recorded for Winnipeg RHA.

Using PHIN as identified from the PPHSS contact record and the Manitoba Health registry we identified 491 clients who had at least one PPHSS contact with a diabetes primary issue in 2001/02. More than one-quarter of these clients (25.5%) were 70+ years of age and 15.3% were under 40 years of age. There were more females (60.5%) than males among these service recipients. The majority (95.7%) were non-Winnipeg residents.

Hospital separations and physician claims were used to determine whether these PPHSS clients had a diabetes treatment diagnosis. A diabetes treatment diagnosis was assigned to any client who has had at least one hospital separation or two physician visits with an ICD-9 diagnosis of diabetes (i.e., ICD-9 250) in a three-year period. This definition has been used previously at MCHP to identify new cases of diabetes treatment. Overall, 360 clients (73.3%) had a recent treatment diagnosis, which was defined as a treatment diagnosis in either of the two three-year periods that spans the period from 1998/99-2001/02 (i.e., 1998/99-2000/01 or 1999/2000-2001/02). Table 11 shows the characteristics of PPHSS clients with and without a recent diabetes treatment diagnosis. Those without a recent diagnosis were more likely to be less than 40 years of age, less likely to be 60-69 years of age, and more likely to be female, than individuals with a diabetes treatment diagnosis. PPHSS diabetes clients accounted for a total of 2,023 contacts in PPHSS in 2001/02, an average of four contacts per person. While more than half of the contacts (57.1%) had diabetes recorded as the primary issue, others were

**Table 11: Demographic characteristics of PPHSS diabetes clients, 2001/02**

| Characteristics | Clients with a Recent Diabetes Treatment Diagnosis (*n* = 360) | | Clients without a Recent Diabetes Diagnosis (*n* = 131) | |
|---|---|---|---|---|
| | Frequency | Per cent | Frequency | Per cent |
| Under 40 years | 38 | 10.6 | 37 | 28.2 |
| 40-59 years | 147 | 40.8 | 44 | 33.6 |
| 60-69 years | 84 | 23.3 | 16 | 12.2 |
| 70+ years | 91 | 25.3 | 34 | 26.0 |
| | | | | |
| Male | 151 | 41.9 | 43 | 32.8 |
| Female | 209 | 58.1 | 88 | 67.2 |
| | | | | |
| Non-Winnipeg resident | 347 | 96.4 | 123 | 93.9 |
| Winnipeg resident | 13 | 3.6 | 8 | 6.1 |

for acute conditions (15.8%), or family health issues (5.5%). Half of the PPHSS contacts were initiated by the individual, and another 22.8% were initiated by the service provider. The most common interventions were health counselling (30.6%), providing information (19.6%), and assessment/clinical treatment (12.5%). Further contact was planned for 58.3% of the contacts. More than one-third of the contacts (36.3%) were resolved.

Clients with a recent diabetes treatment diagnosis had an average of 2.6 PPHSS contacts with a diabetes primary issue (SD = 2.7), while clients without a recent diabetes diagnosis had an average of 1.7 contacts for diabetes (SD = 1.0) in 2001/02. Table 12 shows the mean number of hospital separations, physician visits, and prescriptions for both groups of clients in 2001/02. These data suggest that on average, individuals with a recent diabetes diagnosis had greater health care utilization than individuals without a recent diagnosis.

**Table 12: Health care utilization for PPHSS diabetes clients, 2001/02**

| | Clients with a Recent Diabetes Treatment Diagnosis (*n* = 360) | | | | | Clients without a Recent Diabetes Diagnosis (*n* = 131) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Median** | **Min** | **Max** | **Mean** | **SD** | **Median** | **Min** | **Max** |
| Hospital Separations | 0.5 | 1.2 | 0 | 0 | 9 | 0.5 | 1.0 | 0.0 | 0 | 6 |
| Physician Visits | 14.7 | 10.8 | 12 | 0 | 74 | 10.1 | 7.5 | 9.0 | 0 | 42 |
| Prescriptions | 43.2 | 55.9 | 31 | 0 | 200+ | 23.6 | 31.4 | 14.0 | 0 | 200+ |

In summary, diabetes contacts in PPHSS do not appear to be distributed across the province in proportion to the prevalence of diabetes cases. This may be because some RHAs focus relatively more of their public health service provision and data collection efforts (as captured by PPHSS) on diabetes counselling and education than other RHAs. A significant proportion of the individuals who contact public health staff because of a concern about diabetes also have a recent diabetes treatment diagnosis. Public health staff may therefore be providing tertiary care to their clients rather than preventive services. Diabetes clients may also seek services for public health staff for reasons other than diabetes. Individuals with a recent treatment diagnosis may have greater use of physicians and prescription drugs than individuals without a treatment diagnosis.

### 6.10.2 A Regional Study of the BabyFirst Program

The PPHSS record contains fields that are used to identify public health contacts with individuals registered in the BabyFirst and Healthy Baby programs. BabyFirst is a community based home-visiting program offering information and support to parents facing the challenges of caring for a baby. Healthy Baby is a two-part program of financial assistance for nutri-

tion during pregnancy and community programs that offer nutritional and health information to expectant and new families.

In 2001/02 there were close to 38,000 BabyFirst program contacts and more than 11,000 Healthy Baby program contacts captured in the PPHSS data. These programs respectively accounted for 18.5% and 5.5% of all PPHSS contacts in that fiscal year. More than two-thirds of the Healthy Baby contacts and 88% of the BabyFirst contacts were recorded by Winnipeg RHA. For BabyFirst, Interlake RHA was next (9.1%), followed by South Eastman RHA (5.7%), and Brandon RHA (4.4%). For the Healthy Baby program, Interlake RHA was next (4.4%), followed by Parkland (3.8%), and North Eastman (1.1%).

Although there were few BabyFirst contacts in Brandon, because that RHA had a high rate of recording of PHIN on PPHSS contacts, the Brandon RHA BabyFirst program PPHSS data were selected for this next demonstration. The purpose of this demonstration is to describe the demographic and health care use by infants or small children identified as BabyFirst program recipients through PPHSS data, and compare health care use to a matched cohort.

Overall, 13.8% of the PPHSS contacts for Brandon RHA were for the BabyFirst program. All but nine of these contacts (0.5%) had a family health primary issue.

Using the PHIN as identified from the PPHSS contact record and the Manitoba Health registry we initially identified 184 clients with at least one BabyFirst PPHSS contact in Brandon RHA in 2001/02. We found that a substantial portion of the BabyFirst contacts in PPHSS were for adults; we assumed that many of them were parents of small children, and that it would be possible to use the Manitoba Health family registration number of the adult to identify a child three years of age or younger who was the recipient of the BabyFirst program. Using the adult's registration number, we searched the registry for individuals with a birth date between April 1, 1998 and March 31, 2002. We also identified that a number of the PHINs appeared to be coded in error, as they did not link to a young child or to the parent of a child in the registry. In total, there were only 95 children three years of age or younger who could be identified from a combination of the registry and PPHSS. Of these, 43.2% were male and the rest were female. Most of these children (83.4%) were two years of age or older as of March 31, 2002.

A cohort of children from Brandon RHA was matched to the PPHSS BabyFirst client cohort using month of birth and sex as matching variables. Then, hospital, physician, and prescription drug use was compiled for both

the PPHSS client cohort and the matched cohort, using data from 2001/02. The results of this analysis are provided in Table 13. Close to 40% of the BabyFirst cohort (27.3%) was hospitalized at least once in 2001/02; this percentage was similar in the matched cohort. However, there were differences between the two cohorts in terms of both physician visits and prescriptions. Overall, members of the BabyFirst cohort went to a physician an average of 10 times in 2001/02; the average for the matched cohort was only 8.4 visits. In fact, close to half (44.3%) of the BabyFirst cohort saw a physician 10 or more times in one year, compared to only 36.8% of the matched cohort. As well, the BabyFirst cohort had a higher average number of prescriptions filled in 2001/02 than the matched cohort. A total of 12.6% of the BabyFirst cohort and 4.2% of the matched cohort had 10 or more prescriptions in a single year.

**Table 13: Health care utilization for PPHSS BabyFirst clients and a matched cohort in Brandon RHA, 2001/02**

| | BabyFirst Clients ($n$ = 95) | | | | | Matched Cohort ($n$ = 95) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Median | Min | Max | Mean | SD | Median | Min | Max |
| Hospital Separations | 0.4 | 0.6 | 0 | 0 | 4 | 0.5 | 0.6 | 0 | 0 | 3 |
| Physician Visits | 9.9 | 6.0 | 9 | 0 | 38 | 8.4 | 6.3 | 7 | 0 | 30 |
| Prescriptions | 3.5 | 4.6 | 2 | 0 | 97 | 2.5 | 3.6 | 1 | 0 | 23 |

*The BabyFirst and Health Baby programs together account for almost one-quarter of PPHSS contacts in 2001/02, with most of these contacts recorded by the Winnipeg RHA.*

In summary, our analysis has shown that the BabyFirst and Healthy Baby programs together accounted for almost one-quarter of PPHSS contacts in 2001/02, with most of these contacts recorded by the Winnipeg RHA. For the BabyFirst program, we found that the personal health identification number of both adults and children was recorded in the PPHSS system in Brandon RHA. We were able to identify a group of children who received services through PPHSS and were identified as BabyFirst program recipients. These children had a higher number of physician visits and prescriptions than a matched cohort of children from the same RHA. We identified that there were a number of problems in linking Manitoba Health registry data and health service utilization data to PPHSS client information because the child's PHIN was not consistently captured, and there were a number of apparent data entry errors.

## 6.11 Summary

PPHSS is one source of data with the potential for developing provincial indicators. Its strengths are:

- An infrastructure is in place across the province to potentially record, on a systematic basis, data on public health services for the entire population.
- PPHSS data can be used to develop structure and process indicators, which include measures of health system resources and processes for

delivering preventive health care. For example, when systematically implemented, we can count the number of service providers, or the number of different kinds of providers who deliver public health services in a region. We could also examine the frequency of different types of service contacts with individuals and groups. Most other administrative data sources are better suited to the development of outcome indicators, such as measures of individual or population health status.

- The client's Personal Health Identification Number (PHIN) is recorded on some PPHSS records. This means that clients can be uniquely identified and that a client's public health contact data can be linked to the population registry as well as to hospital, physician, and prescription drug files. These linkages facilitate the development of demographic and health service use profiles of public health clients.
- Data are available over time, so that retrospective analyses can be undertaken.

At the same time, there are a number of limitations associated with using PPHSS data to develop provincial primary prevention indicators:

- The PPHSS system does not capture all public health activities within the province. For example, medical officers of health and public health inspectors do not report through this system.
- Changes in the annual number of contacts may be due to changes in data recording and data entry policies within the RHAs rather than actual changes in the delivery of services.
- PHIN is not currently captured for all PPHSS clients. Accordingly the data cannot be used to identify individuals or groups who are not receiving public health services.
- There may be systematic differences between public health clients for whom PHIN is captured and clients for whom PHIN is not captured. The demographic and health care use of public health clients with PHIN can not be generalized to all public health clients.

# CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

## 7.1 Conclusions

This report has examined three data sources that can be used to develop primary prevention indicators. These sources include survey data from the Canadian Community Health Survey, administrative data from the Population Health Research Data Repository maintained by MCHP, and the Provincial Public Health Statistic System. The CCHS provided data on risk-taking and preventive behaviours of individuals. Administrative data from the Repository were used to develop measures of health outcomes and use of preventive health services for individuals as well as populations. PPHSS administrative data have the potential to be used for developing measures of preventive health services, as well as context measures which describe the delivery of public health services in Manitoba.

There are several primary prevention indicators that are missing from our assessment because of the lack of available data. For example, some content on CCHS is optional (e.g., smoking cessation and responsible sexual behaviour), and therefore may not be systematically collected for all RHAs. Where there is perhaps the greatest lack of data is for measuring the social determinants of health at the community and population levels. In this report we have discussed the kinds of social determinant indicators that might be developed within the province. Some work in this area has been undertaken for Winnipeg neighbourhoods, and indicator data are contained within the Population Health Research Data Repository such as community measures as crime, green space, and social and recreation programs.

Tables 14 and 15 present indicators that were prioritized by the Working Group. The first table shows those individual, community and population indicators that are currently available, and data sources from which they may be obtained. The second table shows those indicators that cannot currently be presented because of a lack of available data.

Individual level indicators are clearly the most readily available, and individual level data may often be aggregated to provide population-level measures. Administrative data provide comprehensive information but these data primarily report outcomes that are distal and/or indirect measures of primary prevention. Selected community-level indicators are currently available only for Winnipeg neighbourhoods.

**Table 14: Data currently available for measuring primary prevention**

| Level of Measurement | Indicator/Concept | Source |
|---|---|---|
| **Individual** | Obesity/Standard weight | CCHS |
| | Morbidity (especially chronic disease)[1] (e.g., diabetes, heart disease, cancer) | Administrative data/CCHS |
| | Smoking status/Cessation | CCHS |
| | Alcohol abuse[2] /Binge drinking | Administrative data/CCHS |
| | Physical activity level/frequency | CCHS |
| | Leisure-time physical activity | CCHS |
| | Responsible sexual behaviour/Condom use | CCHS |
| | Education level[3] | MB Education/CCHS |
| | Diet/Nutrition | CCHS |
| | Breastfeeding | Administrative data/CCHS |
| | Immunizations - other/Influenza | Administrative data/CCHS |
| | Self-perceived unmet health care need | CCHS |
| | Income adequacy | CCHS |
| | Immunizations - childhood | Administrative data |
| | Breast cancer screening | Administrative data/CCHS |
| | Birth weight - low and high | Administrative data |
| | Mortality | Vital Statistics |
| | Teen pregnancy | Administrative data |
| | Self-reported health | CCHS |
| **Community**[4] | Green space | Canadian Population Health Initiative Project (L. Roos) |
| | Recreation/community centers | |
| | Social capital | |
| **Population**[5] | | |

[1] Administrative data definitions are not currently available for all chronic diseases.
[2] Administrative data will provide an incomplete measure.
[3] Administrative data for a limited number of years are available, and post-secondary education administrative data are not available.
[4] These indicators are available for Winnipeg only.
[5] Many individual level indicators may be expressed as population level measures, for example the mortality rate and life expectancy are population indicators that are measured at the individual level.

**Table 15: Indicators considered important for assessing the impact of primary prevention activities, but not currently available**

| Level of Measurement | Indicator/Concept | Potential sources |
|---|---|---|
| **Individual** | | |
| **Community** | Social capital<br>Physical structure<br>Environmental quality | Community surveys |
| **Population** | Social determinants of health, including disparities in social determinants (for example, disparities in income, education or employment) and societal economic measures | Survey data |

Several indicators that were considered important by the Working Group are not currently available. In particular, these indicators relate to the broad construct of social determinants of health, at the individual, community and population level. These data are collected through surveys of individuals (such as the Canadian Community Health Survey) and through community surveys (such as has been completed for Winnipeg). Population level information may be derived from analysis of existing survey data (e.g., to determine disparities within a population). Province-wide community profile information including such features as environmental quality and social capital (among others) would contribute substantially to recognizing communities that are at-risk.

## 7.2 Overall Recommendations

In the process of completing this project, five approaches to improving our ability to measure primary prevention emerged. These are: (1) improving existing data collection mechanisms, (2) creating new data collection mechanisms, (3) improving skills in managing and analyzing data, (4) developing and refining indicators, and (5) improving data dissemination to service providers. We discuss each of these approaches in turn. Following that, we provide some specific recommendations regarding the use of PPHSS data to monitor primary prevention.

### 7.2.1 Improving Existing Data Collection Mechanisms

One way to create new primary prevention indicators is to add data elements to existing data sources. For example, we presently lack the ability to monitor individual-level risk factors and protective factors over time, and to examine their cumulative effects on personal health outcomes. A small number of Manitobans are followed over time in the NPHS and provide data on smoking status, self-reported health, and physical activity levels, that can be linked to health outcome data. However, the results of this survey cannot be generalized to populations in all regions of Manitoba because it excludes individuals living in First Nations communities. Administrative data are a potential alternate source for the collection of data on risk and protective factors:

- Physician billing claims could be used to capture the following data elements for general physical exams: height, weight, smoking status, alcohol consumption, self-reported health, and the physician's subjective assessment of the individual's health status. This would facilitate the development of primary prevention indicators at the individual level and assessment of longitudinal trends for individuals.
- Information on duration of breastfeeding could be collected at the time of child immunization.

In addition, the utility of PPHSS data would be enhanced through:

- Including the PHIN for each individual contact. This would facilitate database linkage, and research on the relationship between use of public health services and both acute care and primary care.
- Collecting data on specific programs and services. At present, many of these data are captured in broad categories that do not allow for sub-analysis. For example, the category "tobacco" encompasses a wide range of activities, including smoking cessation programs, health promotion, and community mobilization around smoking issues. Indicators such as "per cent of population receiving smoking cessation programs or information from public health service providers" could be developed from PPHSS with appropriate refinement of the issue categories.

### 7.2.2 Creating New Data Collection Mechanisms

Pluto et al. (2004) conducted an analysis of the availability of data for monitoring policy and environmental indicators for heart disease and stroke prevention in South Carolina and Alabama. Overall, the authors found that only about one-third of the indicators for community, school, workplace, and health care settings had readily available data sources. Moreover, even where data did exist, it was not always available on a consistent basis over time or across different jurisdictions.

*The priority for new data collection mechanisms must be placed on community level measures of risk factors and protective factors.*

From our consultations with Working Group members and assessments of the literature, it is apparent that we lack data to effectively measure many primary prevention behaviours and strategies at the level of the individual, community, and population. The priority for new data collection mechanisms must be placed on community level measures of risk factors and protective factors.

Identifying data sets that can be used to develop additional primary prevention indicators requires some creativity. This process may be facilitated by dedicating financial or human resources to develop data repositories within RHAs or research organizations, by networking with individuals and agencies that have common interests in primary prevention, and by learning from the experiences of others jurisdictions. In Manitoba, an organization like the Alliance for the Prevention of Chronic Disease, that organizes workshops and meetings on chronic disease prevention strategies, may be well-suited to facilitate the sharing of information and ways to capture data on primary prevention activities. The Regionalization Support Unit within Manitoba Health, which is responsible for the Community Health Assessment, is also an important venue for the sharing of ideas and information about new data sources.

### 7.2.3 Improving Skills in Managing and Analyzing Data Sets

In this report, we have emphasized three data sources that can be used to develop primary prevention indicators. Extracting and analyzing the data from these sources was not an easy process! Using data from the CCHS to compare risk-taking and protective behaviours across the RHAs required age-sex standardization of the data and the computation of bootstrap standard errors for significance tests. Within the RHAs, individuals who wish to undertake their own comparative analyses require the necessary analytic skills and software.

*RHA staff need to have access to methodological expertise or training opportunities in order to encourage adoption of primary prevention indicators.*

One step in the process of encouraging adoption of primary prevention indicators for program evaluation is to ensure that RHA staff have access to methodological expertise or training opportunities. For example, Manitoba Health staff may share their skills with regional staff members, and support should be available to enable staff to attend workshop training sessions or to contract with independent consultants who can complete the require analyses. Statistics Canada offers both regional workshops such as "Making Sense of Survey Data and Processing" and "Interpreting Survey Data" (see http://www.statcan.ca/cgi-bin/workshop/wst.cgi), as well as "Statistical Analysis of Survey Data" through its Statistical Training Program.

One opportunity for further analysis comes from the linkage of the Canadian Community Health Survey and the National Population Health Survey to administrative health data maintained by Manitoba Health. The linked data sets provide the opportunity for further research into the interaction between behaviours and environments (as reported in the survey data), and utilization of health services (as reported in the administrative data). However, CCHS and NPHS data may only be linked to administrative data under the auspices of a planning process for Manitoba Health.

### 7.2.4 Developing and Refining Indicators

There are a large number of indicators that could be examined by regional and provincial authorities in Manitoba to assess the effectiveness and availability of preventive services, and to assess disparities among communities relating to social determinants of health. In order to select appropriate indicators for monitoring primary prevention, it is important to consider the following types of issues:

- Can an operational definition be developed for the indicator?
- Can the indicator be reliably measured over time and across geographic areas and socioeconomic groups?
- Does the indicator measure a goal of primary prevention programs or activities?
- Is there a benchmark or gold standard against which to evaluate performance?

- Is the indicator sensitive to changes in individual, community, or population health behaviours or outcomes?

A subsequent step for groups or organizations that compile and report on indicators is to set priorities for action. Criteria such as the number of people affected, the seriousness of the condition, community willingness to act on an indicator result, or ability to affect an outcome may all be useful in establishing priorities. These priorities for action may in turn be used to refine data collection initiatives.

### 7.2.5 Improving Data Dissemination

*Development of a comprehensive strategy for communicating information regarding primary prevention activities to service providers would be an important step in maximizing the effectiveness of initiatives.*

This report has described a number of indicators and sources of indicators for primary prevention. The goal of monitoring primary prevention is to know what is working and what is not working. In order to improve the effectiveness of primary prevention efforts it is important to provide feedback to service providers about the results of indicator anaylses. A variety of reports, such as the Comparable Health Indicators Report (Manitoba Health, 2004), The Manitoba RHA Indicators Atlas (Martens et al., 2003) and the annual Community Health Assessment reports conducted by RHAs provide summary data, but there are gaps in the data that are available to service providers. In particular, data recorded in PPHSS provide valuable information on services that are being provided and who is receiving them. When linked with other administrative databases, PPHSS has the potential to provide data about individuals or populations who are not receiving public health services. If, as has been recommended here, PPHSS was enhanced through improved collection of PHIN and collection of program specific data, the information that could be generated would increase providers' knowledge of strengths and opportunities for improvement. We have also described the relative lack of data on social determinants of health. Enabling service providers to have information regarding at-risk populations could greatly enhance the targeting of primary prevention. We have identified that there may be other sources of data that could be generated through networks of organizations in Manitoba. Improving the opportunities for information sharing could greatly enhance not only the provision of services but also the common understanding of the effectiveness of different interventions.

Development of a comprehensive strategy for communicating information regarding primary prevention activities to service providers would be an important step in maximizing the effectiveness of initiatives.

## 7.3 Specific Recommendations for the Provincial Public Health Statistic System

PPHSS represents one promising source of data on comparative provincial indicators for primary prevention activities within the province. If provincial authorities want to use PPHSS for this purpose then:

- Standards for data recording need to be systematically applied in all regions of the province and across time.
- Variations in data recording practices must be systematically documented by both provincial and RHA staff.
- A measurement of full-time equivalency should be recorded along with each employee identification number. This information could be used to compute relative measures of service provision intensity in the RHAs.
- The classification of client's issues might be modified. At present, the family health category accounts for almost two-thirds of the contacts, but within this category it is difficult to distinguish those that might be directed toward preventive services.

If provincial authorities want to use the PPHSS system to study specific segments of the population to identify needs for preventive programs then:

- The personal health identification number should be recorded for all individual contacts.
- Targeted prevention programs (e.g., BabyFirst and Healthy Baby) should continue to be flagged in the PPHSS record, so that program recipients can be systematically identified. Other types of preventive programs, such as those aimed at smoking cessation or chronic disease prevention might also be identified.

Completion of this report has provided an opportunity to "take inventory" of the present capacity to measure the impact of primary prevention activities in Manitoba. Risk factors, protective factors and outcomes that may be measured at the individual, community, and regional health authority, and provincial levels have been identified. While it is possible to use a variety of currently available data sources to look at primary prevention, there are important limitations to these sources that have been described. The recommendations we make address these limitations, and if implemented, will further enhance our understanding of the impact of primary prevention on the health status of Manitobans.

# GLOSSARY

**Body Mass Index (BMI).** BMI is a measure of body fat based on height and weight that applies to both adult men and women. BMI is calculated as follows: weight in kilograms divided by height in metres squared. The index of BMI that is used in CCHS is: underweight (under 20.0), acceptable weight (20.0-24.9), some excess weight (25.0-27.0), and overweight (greater than 27.0). The index is calculated for survey respondents aged 20 to 64 years, excluding pregnant women.

**Canadian Community Health Survey (CCHS).** This population health survey is conducted by Statistics Canada to provide regular and timely cross-sectional estimates of health determinants, health status and health system utilization for 133 health regions across Canada, plus the territories.

**Chronic Disease Prevention Alliance of Canada (CDPAC).** A national coalition of organizations and individuals with a common vision for an integrated system of chronic disease prevention, focussing on the three leading chronic diseases in Canada: cancer, cardiovascular disease, and diabetes.

**Frequency of Physical Activity.** Classifies Canadian Community Health Survey respondents based on their average monthly frequency of physical activities lasting more than 15 minutes over a three-month period. The categories are regularly (>=12 times), occasionally (>= 4 and < 12), and infrequently (< 4).

**Fruit and Vegetable Consumption.** Measures the number of times fruits and vegetables are consumed, or frequency, without any regard to amount or "serving size".

**Income Adequacy Quintiles.** Respondents to the Canadian Community Health Survey are assigned to one of five income categories on the basis of self-reported household income and number of persons living in the household.

**Pan-Canadian Healthy Living Strategy.** In September 2002, the Federal/Provincial/Territorial (F/P/T) Ministers of Health announced that they agreed to work together on an Integrated Pan-Canadian Healthy Living Strategy. The initial areas of emphasis for the Strategy are physical activity, healthy eating and their relationship to healthy weights. The Healthy Living Strategy is an initiative aimed at reducing non-communicable diseases by addressing their common risk factors and the underlying conditions in society that contribute to them.

**Participation in Leisure Physical Activity.** Classifies Canadian Community Health Survey respondents into two categories based on whether they participated in any physically active leisure activities in the three months prior to the survey.

**Physical Activity Index.** Canadian Community Health Survey respondents are classified as active, moderately active or inactive based on an index of average daily physical activity over the past 3 months. For each physical activity engaged in by the respondent, an average daily energy expenditure is calculated by multiplying the number of times the activity was performed by the average duration of the activity by the energy cost (kilocalories per kilogram of body weight per hour) of the activity. The index is calculated as the sum of the average daily energy expenditures of all activities. Respondents are classified as follows: 3.0 kcal/kg/day or more = physically active; 1.5 - 2.9 kcal/kg/day = moderately active; less than 1.5 kcal per day = inactive.

**Primary Prevention.** Prevention of disease or mental disorders in susceptible individuals or populations through promotion of health, and specific protection, as in immunization, as distinguished from the prevention of complications or after-effects of existing disease. Preventive health measures including health promotion and specific protection.

**Protective Factors.** Protective factors are those things that help individuals contend more effectively with risk factors and unhealthy health events. They enhance the current and future resiliency of an individual, and are important to healthy development.

**Provincial Public Health Statistic System (PPHSS).** A data collection system used by public health service providers in Manitoba Regional Health Authorities. Information on substantive contacts of a service provider with clients are recorded. A substantive contact is an encounter in which issues of the client are identified, interventions/services are provided, and a disposition is determined.

**Risk Factors.** This term is given to a range of health-related behaviours, and social and environmental conditions that can have a negative impact on the health of an individual, by increasing the risk of ill-health. Data about risk factors can assist in explaining trends in the health status of a population and can provide insight into why some people or groups have better or worse health than others. These data can also be used to monitor the success of health related campaigns or to initiate health promotion interventions.

**Secondary Prevention.** Encompasses the identification and modification of risk factors, in order to reduce the likelihood of recurrence.

**Self-Perceived Unmet Healthcare Needs.** Canadian Community Health Survey respondents were asked "During the past 12 months, have you felt that health care was needed but not received?" The response categories were "yes" and "no".

**Social Capital.** Whereas physical capital refers to physical objects and human capital refers to the properties of individuals, social capital refers to connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them. In that sense social capital is closely related to what some have called "civic virtue." The difference is that "social capital" calls attention to the fact that civic virtue is most powerful when embedded in a sense network of reciprocal social relations. A society of many virtuous but isolated individuals is not necessarily rich in social capital. (Putnam, 2000, p. 19)

**Social Determinants of Health.** People's social and economic circumstances, which can strongly affect their health throughout life.

**Tertiary Prevention.** The aim of tertiary prevention is to identify and alleviate established disease, in order to improve or maintain functional status. The rationale depends on the ability to prevent disability and handicap, but not necessarily the impairment itself, which may not be amenable to a specific treatment.

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# APPENDIX A: SURVEY OF PRIMARY PREVENTION INDICATORS

**Appendix Table A.1: National, provincial, and international primary prevention indicators**

| CANADA - National |
|---|
| **CIHI - Health Indicators Project** |
| **Rationale/Background:** This project is a joint response of CIHI and Statistics Canada to a 1998 meeting of health administrators, researchers, caregivers, government officials, health advocacy groups, and consumers who were brought together to identify health information needs. One of their priorities was comparable quality data on key health indicators for health and health services.<br><br>**Strategy Goal(s) or Priorities:** The primary goal of this project is to support health regions in monitoring progress in improving and maintaining the health of the population and the functioning of the health system for which they are responsible through the provision of quality, comparative information on the overall health of the population served, how it compares with other regions in the province and country, and how it is changing over time; the major non-medical determinants of health in the region; the health services received by the region's residents; and characteristics of the community or the health system.<br><br>**Indicators** (Health behaviours only)**:**<br>1. **Smoking** – i) Status (Population aged 12 and over who reported being either a smoker (daily or occasional) or a non-smoker (former or never smoked); ii) Smoking initiation (Population (12+ yrs) reported being either a current or former smoker and who reported the age when they smoked their first cigarette; iii) Changes over time in smoking behaviour (Changes over time in the smoking behaviour of the 1994/95 household population (12+ yrs) every two years. Smokers are those who smoke on either a daily or an occasional basis)<br>2. **Frequency of heavy drinking** – Population 12+ yrs who are current drinkers and who reported drinking 5 or more drinks on at least one occasion in the past 12 months<br>3. **Leisure-time physical activity** - Population 12+ yrs reported level of physical activity (frequency, duration and intensity)<br>4. **Breastfeeding practices** - Recently-born (w/in 3 yrs prior to survey) children of mothers aged 15 to 49 who were breastfed, and the duration of breastfeeding.<br>5. **Dietary practices** - Population 12+ yrs, by the average number of times per day that they consume fruits and vegetables.<br><br>**Source**: http://secure.cihi.ca/indicators/en/hlthind.shtml |
| **CANADA - Provincial** |
| **Manitoba's Health Indicators Report; 2002** |
| **Rationale/Background:** This report resulted from an agreement by First Ministers in September 2000 that all provinces and territories would provide comprehensive and regular public reporting. The 56 indicators described in this report provide measures of health status, health outcomes, and quality of service.<br><br>**Strategy Goal(s) or Priorities:** Improved reporting on health system performance.<br><br>**Indicators: (**only indicators relevant to primary prevention are listed)<br>**A. Health Status**<br>1. life expectancy & disability-free life expectancy<br>2. infant mortality<br>3. low birth weight<br>4. self-reported health |

Appendix Table A.1 continued

**B. Health Outcomes**

1. Changes in life expectancy
   - i. Mortality rates for lung, prostate, breast, and colorectal cancer, AMI & stroke
   - ii. Survival rates for: lung, prostate, breast, colorectal cancer
   - iii. Inpatient mortality for AMI and stroke
   - iv. Net survival rates for AMI (365-day) and stroke (180 days)
2. Reduced burden of disease, illness, and injury
   - i. incidence rates for all cancers, lung, prostate, breast, and colorectal cancer
   - ii. Potential years of life lost due to lung, prostate, breast, & colorectal cancer, AMI, stroke, suicide, & unintentional injuries
   - iii. Incidence of vaccine-preventable diseases: invasive meningococcal disease, measles, & haemophilus influenza b
   - iv. Prevalence of diabetes

**C. Health Promotion and Disease Prevention** (no definitions provided)

1. Smoking
2. Physical activity
3. Obesity (BMI)
4. Flu immunization (65+ yrs)

**Source**: http://www.gov.mb.ca/health/pirc/hlthpirc.pdf

**Manitoba Community Health Assessment Baseline Indicators; 2003**

**Rationale/Background:** Indicators were developed using the Manitoba Population Health Assessment Template, which organized data according to (1) determinants of health, and (2) health outcomes and health status.

**Strategy Goal(s) or Priorities:** To recommend a core set of indicators for which data are currently available that would form the basis for the community health assessment process from 2001 to 2005.

**Indicators:**

**A. Health Status**

1. Mortality rate
2. Life expectancy
3. Potential years of life lost – all deaths, by cause
4. Premature mortality
5. Birth weight
6. Incidence/prevalence of cancer, arthritis/rheumatism, diabetes, asthma, respiratory morbidity, hypertension
7. Self-rated – health, functional health, activity limitation

**B. Determinants of Health**

1. BMI
2. Dietary practices – daily consumption of fruit & vegetables by 12+ yrs
3. Hepatitis B immunization – 9 yr olds
4. Heavy drinking – proportion of current drinkers (12+ yrs) who report drinking 5+ on at least one occasion
5. Medication use rates - # prescriptions, # different drugs, # antibiotics, % population on anti-depressants
6. Physical activity (leisure time) – 12+ yrs reported level of physical activity (frequency, duration, intensity)
7. Smoking –12+ yrs

## Appendix Table A.1 continued

**C. Healthy Child Development**
1. Childhood immunization rates – at 1, 2, & 7 years

**Source:** Lorraine Dacombe Dewar, A/Director, Community Health Assessment Unit and Chair of Health Indicator Working Group

**Saskatchewan Comparable Health Indicators Report; 2002**

**Rationale/Background:** This report resulted from an agreement by First Ministers in September 2000 that all provinces and territories would provide comprehensive and regular public reporting.

**Strategy Goal(s) or Priorities:** Improved reporting on health system performance.

**Indicators:** (only those relevant to this project)

**A. Healthy Lifestyles**
1. **Physical activity** – a) % population aged 12 and over that was moderately or physically active during leisure-time, b) % population aged 12 and over that was physically inactive during leisure time.
2. **Youth smoking** - proportion of youth between the 12 to 19 years of age who smoke on an occasional or daily basis (current smokers).
3. **Exposure to environmental tobacco smoke** - proportion of non-smoking population regularly exposed to environmental smoke in public spaces and work places.
4. **Body weight** - proportion of the population aged 20 to 64 years, (excluding pregnant women), who had a body mass index greater than 25

**B. Vaccine-Preventable Diseases**
1. **Measles** – the rate of new cases of measles reported by year
2. **Haemophilus Influenzae b (Hib)** – number of new Hib cases reported by year in children under 5
3. **Invasive meningococcal disease (IMD)** - the rate of new IMD cases reported by year, age and serogroup.

**C. Public Surveillance and Protection**
1. **Tuberculosis** – rate of cases of infectious pulmonary tuberculosis reported by calendar year.
2. **Influenza immunization (65+)** - % seniors who received influenza immunization
3. ***E.coli*** – rate of *e.coli* cases reported by year.

**Source:** http://www.health.gov.sk.ca/info_center_comparable_health_indicators_report.html

**The Alberta Healthy Living Framework: An Integrated Approach**

**Rationale/Background:** Resulted from a provincial forum (March 2002) on the prevention of chronic disease. Participants agreed to the creation of a provincial organization and the development of a health promotion and chronic disease prevention framework.

**Strategy Goal(s) or Priorities:** This framework addresses health promotion and chronic disease prevention using an integrated and collaborative approach. Its initial focus is on three common risk factors— unhealthy eating practices, tobacco use and physical inactivity—and their underlying determinants of health.

**Indicators:**
1. Tobacco use - % Albertans (12+ yrs) who smoke; % Alberta women (12+) who smoked during last pregnancy

Appendix Table A.1 continued

2. Physical inactivity - % Albertans (12+ yrs) who are physically inactive
3. Unhealthy eating practices - % Albertans (12+ yrs) who don't eat at least 5-10 servings of fruits & vegetables each day
4. Overweight - % Albertan (20-64 yrs) with a BMI over 25

**Source:** http://www.health-in-action.org/ahln/assets/AHLNFramework.pdf

**PEI Strategy for Healthy Living, 2001**

**Rationale/Background:** "Chronic disease is the major cause of death in PEI, as well as a contributor to hospitalization and reduction in quality and length of life. The best chance to improve health status is in reducing the risk factors for chronic disease specifically, tobacco use, unhealthy diet and physical inactivity."

**Strategy Goal(s) or Priorities:** to "encourage and support Islanders to take measures to address the common risk factors that contribute to chronic disease."

**Indicators:** Indicators relate to five key areas:

1. Chronic disease (type 2 diabetes, diet, smoking-related cancer, and CVD), Obesity (BMI)
2. Smoking; exposure to second-hand smoke
3. Physical activity during leisure time
4. Healthy eating habits; availability of healthy food
5. Health system-based health promotion and chronic disease prevention programs

**Source:** http://www.gov.pe.ca/photos/original/hss_hl_strategy.pdf

**Prince Edward Island Health Indicators: Provincial And Regional Report; 2003**

**Rationale/Background:** "Health is the complete state of physical, mental, social, and emotional well-being and not mere absence of disease. Population health is influenced by various determinants: personal health practices, social, economic and physical environments, human biology, as well as the health system."

**Strategy Goal(s) or Priorities:** In keeping with the definition of health, the identified indicators "will be used to monitor progress in improving and maintaining the health of the population and the functioning of the health system, by providing comparisons over time, and between regions."

**Indicators:** The indicators are organized in a framework to represent health status, non-medical determinants of health, health system performance, and community and health system characteristics.

This framework was developed by Statistics Canada and the Canadian Institute for Health Information, in collaboration with health administrators, researchers, caregivers, government officials, health advocacy groups, and consumers.

**Source:** http://www.gov.pe.ca/photos/original/hss_healthind02.pdf

**Measurement In Health Care: How, What, Why? Core Indicators For Public Health In Ontario: An Interactive Workshop; 2003**

**Rationale/Background:** The Provincial Health Indicators Work Group (PHIWG) was established as a response to the need (expressed by public health epidemiologists) for consistent set of health indicator definitions in Ontario. It uses, as a framework, an elaboration of the Ontario

## Appendix Table A.1 continued

Mandatory Programs and Services Guidelines.
**Strategy Goal(s) or Priorities:** to produce the document Core Indicators for Public Health in Ontario. PHIWG promotes use of the indicators and encourages public health units, district health councils, health intelligence units and others to adopt the indicators as defined and to generate the indicators for their areas.

**Indicators:** Indicators are grouped according to the following categories:
A. Population
B. Environment and Health - Social & physical environments
C. Mortality, Morbidity and Health-Related Quality of Life
D. Chronic Diseases and Injuries – Cancer incidence and early detection; prevention of injury and substance abuse
E. Behaviour and Health – Smoking, alcohol, physical activity, nutrition, sun safety
F. Family Health – sexual and reproductive health; child and adolescent health
G. Mental Health
H. Infectious Diseases
I. Use of Health Services

**Sources:**
- http://www.healthinformation.on.ca/symp2003/presentations/Mary-Anne%20Symposium%20Handouts.doc
- http://www.cehip.org/apheo2/indicators/index.html

**INTERNATIONAL**

**Saving Lives: Our Healthier Nation White Paper (UK); 1999**

**Rationale/Background:** To tackle the complex causes of ill-health and reduce health inequalities

**Strategy Goal(s) or Priorities:** "to encourage and support action being taken to address a wide range of influences (or determinants) on health." Its aim is to prevent up to 300,000 untimely and unnecessary deaths by the year 2010.

**Indicators**
1. **Cancer:** death rate in people under 75 years
2. **CHD & Stroke**: death rate from CHD, stroke, & related diseases in people under 75 years
3. **Accidents**: death rates from accidents and the rate of serious injury from accidents
4. **Mental Health**: death rate from suicide and undetermined injury

**Source:** http://www.ohn.gov.uk/ohn/ohn.htm

**North East Public Health Observatory (UK); 2003**

**Rationale/Background:** (an example of one) Regional response to NHS Strategy outlined in the OHN paper (see above)

**Strategy Goal(s) or Priorities:** Indicators fit the following criteria:
1. Related to national targets, and where possible to national targets for sustainable development as well as for the NHS or local authorities.
2. Robust and accessible data, regularly updated
3. Regionally adjusted and relevant for our population
4. Meaningful at a sub-regional, and if possible local level
5. Major impact on health improvement and inequalities in health
6. Evidence is available for effective interventions.

Appendix Table A.1 continued

**Indicators**

1. Smoking quit rates
2. Teenage pregnancy
3. Mortality from CHD
4. Educational attainment
5. Infant mortality
6. Life expectancy at birth
7. Mortality from lung cancer
8. Mortality from respiratory disease

**Source:** http://www.hda-online.org.uk/downloads/word/regional/north_east/health_indicators_jun03.doc

**National Cancer Prevention Policy 2001-03 (Australia)**

**Rationale/Background:**

**Strategy Goal(s) or Priorities:** Reducing Australians' level of risk for each of the key and modifiable risk factors: Smoking, sun exposure, poor diet, alcohol consumption and physical inactivity

**Indicators**:

A. Smoking - population rates of smoking (overall and among specific population groups), numbers of cigarettes smoked and levels of exposure to environmental tobacco smoke
B. Ultraviolet radiation - incidence and deaths from melanoma and non-melanocytic skin cancer
C. Diet - proportion of population meeting or exceeding desirable levels of diet related risk factors (consumption of nutritionally adequate and varied diets based primarily on foods of plant origin such as vegetables, fruit, pulses and wholegrain cereals, as well as lean meats, fish and low fat dairy products). Intake of vegetables, fruit, cereal food, sodium, fat, & saturated fat; Overweight or obesity (BMI)
D. Physical activity – energy expenditure, measured according to three indices: intensity, duration and frequency.
E. Alcohol – detection of new cases of alcohol related cancers, cancer deaths were attributable to any alcohol consumption. Proportion of population who drink regularly or occasionally; amount of alcohol consumed
F. Cancer Screening – breast, cervical, colorectal, melanoma, prostate

**Source:**
http://www.cancer.org.au/documents/National%20Cancer%20Prevention%20Policy.PDF

**EHRM Project: Recommendation For Indicators, International Collaboration, Protocol And Manual Of Operations For Chronic Disease Risk Factor Surveys; 2002 (EUROPE)**

**Rationale/Background:** The European Union launched a Program of Community Action on Health Monitoring. Its objective was to contribute to the establishment of a Community health monitoring system which makes it possible to:

- measure health status, trends and determinants throughout the Community;
- facilitate the planning, monitoring and evaluation of Community programmes and action; and
- provide Member States with appropriate health information to make comparisons and support their national health policies.

**Strategy Goal(s) or Priorities:** The European Health Risk Monitoring (EHRM) Project was established to contribute to the Programme of Community Action on Health Monitoring by planning indicators and measures for co-ordinated standardized national population risk factor surveys. Such surveys would gather information on major chronic disease risk factors, related behaviours and determinants, in order to serve and evaluate disease prevention and health

Appendix Table A.1 continued

promotion efforts in the countries and at European level.
**Indicators:** (only indicators relevant to primary prevention are listed)

1. Blood pressure
2. Lipids
3. Obesity
4. Smoking
5. Use of antiplatelet drugs
6. Glucose

**Source:** http://www.ktl.fi/ehrm/

**U.S.**

**Healthy People 2010 (US); 2000**

**Rationale/Background:** This strategy builds on initiatives pursued over the past two decades and identifies the most significant preventable threats to health and focuses public and private sector efforts to address those threats

**Strategy Goal(s) or Priorities: 1)** Increase quality and years of healthy life; **2)** eliminate health disparities among segments of the population, including differences that occur by gender, race or ethnicity, education or income, disability, geographic location, or sexual orientation

**Indicators:**

1. Physical Activity
2. Overweight and Obesity
3. Tobacco Use
4. Substance Abuse
5. Responsible Sexual Behavior
6. Mental Health
7. Injury and Violence
8. Environmental Quality
9. Immunization
10. Access to Health Care

**Source:**

- http://www.healthypeople.gov/LHI/
- http://www.healthypeople.gov/Document/HTML/uih/uih_4.htm

## APPENDIX B: ANNOTATED BIBLIOGRAPHY OF OTHER SOURCES ON PRIMARY PREVENTION OR HEALTH INDICATORS

In addition to the indicator initiatives outlined in the Appendix Table A.1, other health indicator initiatives and frameworks were consulted. The ones identified below targeted population health and disease prevention but did not develop clear, measurable indicators.

### International (Ireland)

#### 1. Quality and Fairness: A Health System for You

http://www.doh.ie/hstrat/index.html (accessed Dec 2/03)

**Summary:** This strategy complements Ireland's National Health Information Strategy. It emphasizes a more people centred/consumer oriented system, an analysis of cross-sectoral issues affecting health status and the development of integrated sets of quality services, accessed on the basis of need. There is also a strong focus on equity. The key themes of the new Strategy are expected to include health futures, health promotion/population health, quality, information systems and e-health, delivery systems including human resource issues, funding and eligibility. One of the key objectives involves the promotion of health and well-being, with an emphasis on smoking, alcohol, and diet and exercise; other activities are directed at breastfeeding, healthy lifestyles in children, injury prevention, cancer screening, sexual health, and food safety.

### Canada

#### 1. Taking Action on Healthy Living: Background Information on the Integrated Pan-Canadian Healthy Living Strategy

http://www.hc-sc.gc.ca/english/lifestyles/healthyliving/pdf/hl_backgrounder.pdf (accessed Dec 4/03)

**Summary**: This document provides background information on the Integrated Pan-Canadian Healthy Living Strategy. This Strategy is founded on a population health approach, which recognizes that healthy behaviours are strongly influenced by the social, economic and physical environments where Canadians live, work, learn and play. Phase I of the Strategy will focus on the issues of healthy eating, physical activity and their relationship to healthy weights. Two over-arching goals have been identified for the strategy: 1) To improve health outcomes. This goal places a focus on improving the health of all Canadians. 2) To reduce health disparities. All Canadians do not enjoy the same level of health, nor do they share the same risk of ill health. This goal places a focus on improving the health of Canadians who may be at greatest risk for illness or disability. See Appendix 6 of the report Key Elements of the Healthy Living Strategy.

**2. The Ontario Public Health Association (March 2002) Primary Prevention of Type 2 Diabetes in Ontario: Policies, Research and Community Capacity.**
http://www.opha.on.ca/resources/diabetes.pdf (accessed Nov 26/03)

**Summary:** This document illustrates "the similarities between provincial, and, where relevant, federal policy documents with respect to diabetes primary prevention efforts and the other chronic diseases. Stated guidelines are used in order to provide a platform for open discussion and for the collaborative planning of chronic disease prevention efforts… The information presented in this report is intended to serve as a starting point for collaborative discussion and effort." Other chronic disease strategies discussed relate to asthma, cancer, heart health, stroke, and osteoporosis. Finally, it also suggests a framework for the collaborative planning and evaluation of strategies for chronic disease prevention in Ontario.

**3. KPMG Consulting (2002) Health Promotion & Chronic Disease Prevention Collaborative Initiatives – An Environmental Scan Report (prepared for Canadian Diabetes Association)**
http://www.diabetes.ca/Files/FinalCDPReport.pdf (accessed Nov 28/03)

**Summary:** This report resulted from a provincial forum held in Alberta (March 2002) on the prevention of chronic disease. To support the objectives of the forum an environmental scan was conducted to learn about integrated chronic disease prevention and health promotion initiatives at provincial, national and international levels. The focus of the environmental scan was an Internet search and review of relevant literature to collect any available information regarding other integrated approaches. Specifically, their rationale, functions and activities, organizations involved, developmental milestones, and the specific steps undertaken to form the integrated initiatives. The report contains information on the emerging trends in developing integrated health promotion and chronic disease prevention models, highlights the research undertaken, and summarizes the key features contributing to the success of the integrated models that we reviewed. It also briefly summarizes a sample of the initiatives that we reviewed for the environmental scan.

**4. Chronic Disease Prevention Alliance of Canada (CDPAC) (2002) Chronic Disease Prevention Initiatives (prepared for CDPAC Consultation Workshop Nov 2002).**
http://www.hpclearinghouse.ca/downloads/Chronic_Disease_Prevention_Initiatives.pdf (accessed Nov 28/03)

**Summary:** This document provides a snapshot of some of the different types of chronic disease prevention initiatives—provincial/territorial and national—in progress or planned across Canada. Strategies address topics such as tobacco use, diabetes, heart, cancer, physical activity

### 5. BC Health Planning (2002) The Picture of Health

http://www.healthplanning.gov.bc.ca/cpa/publications/picture_of_health.pdf (accessed Nov 28/03)

**Summary:** This report describes the vision of renewal in BC's health care system and the actions that have been, and will be taken to achieve a stronger system. It addresses the following areas: chronic disease management, primary health care, preventive health, home and community care, Pharmacare, meeting human resource needs, information technology, mental health and addictions care, and Aboriginal health. In terms of preventive health, the report notes the development of a chronic disease and injury prevention strategy by the Ministry of Health Planning in collaboration with the health authorities. This strategy (to be in place by March 2003) focusses on physical activity, eating habits, tobacco use, prevention of mental illness, alcohol and drug misuse, and injuries, especially falls among seniors.

### 6. Northwest Territories Health Promotion Strategy

http://www.hlthss.gov.nt.ca/Features/Initiatives/initiatives.htm (accessed Nov 28/03)

**Summary:** This strategy provides a framework for increased investment in promotion and prevention activities at the territorial, regional, local and individual levels. The Department is currently focussing on the following priority areas: Active Living; Healthy Pregnancies; Injury Prevention; and Tobacco-harm Reduction and Cessation.

### 7. Healthier Together: A Strategic Health plan for Newfoundland and Labrador

http://www.gov.nl.ca/health/strategichealthplan/pdf/HealthyTogetherdocument.pdf (accessed Dec 1/03)

**Summary:** This report describes the challenges currently faced by the health and community services system in Newfoundland and Labrador and sets out new directions for the system over the next five years. The three goals focus on improving the health status of the population, community-based support of health and well-being, and the quality, accessibility, and sustainability of health and community services. Target health behaviours and outcomes include adults smoking rates, adult physical

inactivity, overweight, prevalence of diabetes, Pap smear rates, mammography rates, and mortality rates for heart disease, heart attack and stroke. The indicators used in this strategy follow the national indicators identified by the Performance Indicators Reporting Committee.

### 8. HEALTH Performance Indicators: A Report to New Brunswickers on Comparable Health and Health System Indicators (2002)

http://www.gnb.ca/0391/pdf/HEALTHPerformanceIndicators2002-e.pdf (accessed Dec 2/03)

**Summary:** This report is based on recommendations for comparable performance indicator reporting outlined in the First Minister's Communiqué on Health of September 11, 2000 and the Plan for Federal/Provincial Territorial Reporting on 14 Indicators Areas accepted by the Conference of Deputy Ministers of Health in June 2002, and subsequently modified by authorization of the Chair of the Performance Indicator Reporting Committee up to and including August 30, 2002. The relevant topics covered by the indicators are health status, health outcomes, and health promotion and disease prevention.

# APPENDIX C: SOCIAL DETERMINANTS OF HEALTH AT THE INDIVIDUAL LEVEL

Appendix Table C.1 presents general themes and specific indicators that have been used in describing individual level social determinants of health. They have been grouped into broad categories to show the diversity of indicators that have been use.

**Appendix Table C.1: Survey of individual level social determinants of health**

| | |
|---|---|
| **Children** | |
| **Specific Indicators** | |
| Suicide rates for ages 15–19 | Index for social health: http://www.hc-sc.gc.ca/hppb/phdd/determinants/deter_biblio.html |
| Dependent children of selected pensioners and beneficiaries as a percentage of all children aged from 0-15 years by SLA. A child, and additional children, presents a much greater impact on the standard of living of people who are not well off than for better-off households. | Queensland Health. 2003. Social indicators for addressing health inequalities. Available at: http://203.147.140.236/HealthyLiving/Social_Determinants_HP.htm |
| **General Themes** | |
| Early childhood care | The Social Determinants of Health: An Overview of the Implications for Policy and the Role of the Health Sector. Conference findings—Social determinants of health across the life-span. 2002. Available at: http://www.hc-sc.gc.ca/hppb/phdd/pdf/overview_implications/01_overview_e.pdf |
| Healthy child development | The Federal, Provincial and Territorial Advisory Committee on Population Health (ACPH): http://www.hc-sc.gc.ca/hppb/phdd/determinants/determinants2.html |
| Number of children injured as a result of assault, abuse, battering or neglect | Index for social health: http://www.hc-sc.gc.ca/hppb/phdd/determinants/deter_biblio.html |
| Early life | Wilkinson R and Marmot M (eds). The solid facts: second edition. Social determinants of health. World Health Organization 2003. |
| School readiness | Canadian Institute for Health Information. Future Health Indicators. Second Consensus Conference on Population Health Indicators. 2004 |
| **Income/Wealth** | |
| **General Themes** | |
| Income inequality | The Federal, Provincial and Territorial Advisory Committee on Population Health (ACPH): http://www.hc-sc.gc.ca/hppb/phdd/determinants/determinants2.html |
| Income and Social Status | The Federal, Provincial and Territorial Advisory Committee on Population Health (ACPH): http://www.hc-sc.gc.ca/hppb/phdd/determinants/determinants2.html |

Appendix Table C.1 continued

| | |
|---|---|
| Proportion of people receiving a pension by type of government pension/allowance (principal and auxiliary, full or part) by gender | Queensland Health. 2003. Social indicators for addressing health inequalities. Available at: http://203.147.140.236/HealthyLiving/Social_Determinants_HP.htm |
| **Education** | |
| **Specific Indicators** | |
| De-enrolment and retention rates in government and nongovernment schools. | Queensland Health. 2003. Social indicators for addressing health inequalities. Available at: http://203.147.140.236/HealthyLiving/Social_Determinants_HP.htm |
| Proportion of highest level of schooling completed (highest educational attainment) by age and gender for persons aged 15 years and over. | Queensland Health. 2003. Social indicators for addressing health inequalities. Available at: http://203.147.140.236/HealthyLiving/Social_Determinants_HP.htm |
| Percentage of year five students achieving the national reading benchmark. | Queensland Health. 2003. Social indicators for addressing health inequalities. Available at: http://203.147.140.236/HealthyLiving/Social_Determinants_HP.htm |
| Percentage of year five students achieving the national numeracy benchmark. | Queensland Health. 2003. Social indicators for addressing health inequalities. Available at: http://203.147.140.236/HealthyLiving/Social_Determinants_HP.htm |
| Dropout rate for secondary school students. | Index for social health: http://www.hc-sc.gc.ca/hppb/phdd/determinants/deter_biblio.html |
| **General Themes** | |
| Education | The Social Determinants of Health: An Overview of the Implications for Policy and the Role of the Health Sector. Conference findings—Social determinants of health across the life-span. 2002. Available at: http://www.hc-sc.gc.ca/hppb/phdd/pdf/overview_implications/01_overview_e.pdf |
| Education and Literacy | The Federal, Provincial and Territorial Advisory Committee on Population Health (ACPH): http://www.hc-sc.gc.ca/hppb/phdd/determinants/determinants2.html |
| **Employment** | |
| **Specific Indicators** | |
| Average weekly earnings | Index for social health: http://www.hc-sc.gc.ca/hppb/phdd/determinants/deter_biblio.html |
| Trends in proportion of employed persons by industry by gender and age. | Queensland Health. 2003. Social indicators for addressing health inequalities. Available at: http://203.147.140.236/HealthyLiving/Social_Determinants_HP.htm |
| Trends in unemployment rates by gender and age groups. | Queensland Health. 2003. Social indicators for addressing health inequalities. Available at: http://203.147.140.236/HealthyLiving/Social_Determinants_HP.htm |

Appendix Table C.1 continued

| | |
|---|---|
| Trends in long-term unemployment as a proportion of total unemployed. | Queensland Health. 2003. Social indicators for addressing health inequalities. Available at: http://203.147.140.236/HealthyLiving/Social_Determinants_HP.htm |
| **General Themes** | |
| Employment and job security | The Social Determinants of Health: An Overview of the Implications for Policy and the Role of the Health Sector. Conference findings—Social determinants of health across the life-span. 2002. Available at: http://www.hc-sc.gc.ca/hppb/phdd/pdf/overview_implications/01_overview_e.pdf |
| Working conditions | The Social Determinants of Health: An Overview of the Implications for Policy and the Role of the Health Sector. Conference findings—Social determinants of health across the life-span. 2002. Available at: http://www.hc-sc.gc.ca/hppb/phdd/pdf/overview_implications/01_overview_e.pdf |
| **Food** | |
| **General Theme** | |
| Food security | The Social Determinants of Health: An Overview of the Implications for Policy and the Role of the Health Sector. Conference findings—Social determinants of health across the life-span. 2002. Available at: http://www.hc-sc.gc.ca/hppb/phdd/pdf/overview_implications/01_overview_e.pdf |
| **Social Conditions/Wellbeing/Social Capital** | |
| **Specific Indicators** | |
| Number of persons 65 and over below the low-income cut-offs | Index for social health: http://www.hc-sc.gc.ca/hppb/phdd/determinants/deter_biblio.html |
| The percentage of the population over age 15 engaged in voluntary work | Module one: The economic value of civic and voluntary work in Nova Scotia. Available at: http://www.gpiatlantic.org/pdf/volunteer/volunteer.pdf |
| The annual number of volunteer hours contributed. | Module one: The economic value of civic and voluntary work in Nova Scotia. Available at: http://www.gpiatlantic.org/pdf/volunteer/volunteer.pdf |
| Proportion of sole parent pensioners as a percentage of all persons aged 15 years and over by gender. | Queensland Health. 2003. Social indicators for addressing health inequalities. Available at: http://203.147.140.236/HealthyLiving/Social_Determinants_HP.htm |
| Juvenile offenders involved in federal drug offences | Index for social health: http://www.hc-sc.gc.ca/hppb/phdd/determinants/deter_biblio.html |
| Percentage of income spent on health care expenses by persons 65 and over. | Index for social health: http://www.hc-sc.gc.ca/hppb/phdd/determinants/deter_biblio.html |

Appendix Table C.1 continued

| | |
|---|---|
| Homicides | Index for social health: http://www.hc-sc.gc.ca/hppb/phdd/determinants/deter_biblio.html |
| Child welfare admissions | Shookner, M. 2000. The Quality of Life in Ontario. Report prepared for the Ontario Social Development Council, Social Planning Network of Ontario. Available at: http://www.qli-ont.org/spring2000/qlispring2000.html |
| Public housing waiting lists | Shookner, M. 2000. The Quality of Life in Ontario. Report prepared for the Ontario Social Development Council, Social Planning Network of Ontario. Available at: http://www.qli-ont.org/spring2000/qlispring2000.html |
| Bankruptcies | Shookner, M. 2000. The Quality of Life in Ontario. Report prepared for the Ontario Social Development Council, Social Planning Network of Ontario. Available at: http://www.qli-ont.org/spring2000/qlispring2000.html |
| General Themes | |
| Community belonging | Canadian Institute for Health Information. Future Health Indicators. Second Consensus Conference on Population Health Indicators. 2004 |
| Social inclusion and exclusion | The Social Determinants of Health: An Overview of the Implications for Policy and the Role of the Health Sector. Conference findings—Social determinants of health across the life-span. 2002. Available at: http://www.hc-sc.gc.ca/hppb/phdd/pdf/overview_implications/01_overview_e.pdf |
| Social support networks | The Federal, Provincial and Territorial Advisory Committee on Population Health (ACPH): http://www.hc-sc.gc.ca/hppb/phdd/determinants/determinants2.html |

# APPENDIX D: SOCIAL DETERMINANTS OF HEALTH AT THE COMMUNITY LEVEL

This table presents indicators that have been used in describing community level social determinants of health, and the sources of the indicators.

**Appendix Table D.1: Survey of community level social determinants of health**

| Indicator/Theme | Source |
|---|---|
| Housing | The Social Determinants of Health: An Overview of the Implications for Policy and the Role of the Health Sector. Conference findings—Social determinants of health across the life-span. 2002. Available at: http://www.hc-sc.gc.ca/hppb/phdd/pdf/overview_implications/01_overview_e.pdf Dunn, J. R., Hayes, M., Hulchanski, D., Hwang, S., & Potvin, L. (2003, March). A Needs, Gaps and Opportunities Assessment for Research: Housing as a Socio-Economic Determinant of Health, a Report for the Canadian Institutes of Health Research. Available at: http://www.cme.ucalgary.ca/housingandhealth/english/index.htm |
| Green space | Roos L. Canadian Public Health Initiative Project. Personal communication. 2004. |
| Recreation/community centers | Roos L. Canadian Public Health Initiative Project. Personal communication. 2004. |
| Social capital | Roos L. Canadian Public Health Initiative Project. Personal communication. 2004. |
| Contribution of the social economy | The Social Determinants of Health: An Overview of the Implications for Policy and the Role of the Health Sector. Conference findings—Social determinants of health across the life-span. 2002. Available at: http://www.hc-sc.gc.ca/hppb/phdd/pdf/overview_implications/01_overview_e.pdf |
| Physical Environments | The Federal, Provincial and Territorial Advisory Committee on Population Health (ACPH): http://www.hc-sc.gc.ca/hppb/phdd/determinants/determinants2.html |
| Hours of moderate/poor air quality | Shookner, M. 2000. The Quality of Life in Ontario. Report prepared for the Ontario Social Development Council, Social Planning Network of Ontario. Available at: http://www.qli-ont.org/spring2000/qlispring2000.html |
| Toxic environmental spills | Shookner, M. 2000. The Quality of Life in Ontario. Report prepared for the Ontario Social Development Council, Social Planning Network of Ontario. Available at: http://www.qli-ont.org/spring2000/qlispring2000.html |
| Tonnes diverted from landfill to blue boxes. | Shookner, M. 2000. The Quality of Life in Ontario. Report prepared for the Ontario Social Development Council, Social Planning Network of Ontario. Available at: http://www.qli-ont.org/spring2000/qlispring2000.html |
| Rural/Remoteness | Australia Institute of Health and Welfare. 2003. Rural, Regional and Remote Health: A Study on Mortality. Available at: http://www.aihw.gov.au/publications/index.cfm/title/9411 |

# APPENDIX E: BACKGROUND MATERIAL TO CANADIAN COMMUNITY HEALTH SURVEY

**Appendix Table E.1: Description of common and optional content in CCHS Cycle 1.1**

| Common Content | Optional Content |
|---|---|
| • Administration<br>• Alcohol<br>• Alcohol dependence / abuse<br>• Blood pressure check<br>• Breastfeeding<br>• Chronic conditions<br>• Contacts with mental health professionals<br>• Exposure to second hand smoke<br>• Food insecurity<br>• Fruit and vegetable consumption<br>• General health<br>• Health care utilization<br>• Health Utility Index (HUI)<br>• Height / weight<br>• Household record variables<br>• Income<br>• Injuries<br>• Labour force<br>• Mammography<br>• PAP smear test<br>• Patient satisfaction<br>• Physical activities<br>• PSA test<br>• Restriction of activities<br>• Smoking<br>• Socio-demographic characteristics<br>• Tobacco alternatives<br>• Two-week disability | • Breast examinations<br>• Breast self examinations<br>• Changes made to improve health<br>• Dental visits<br>• Depression<br>• Distress<br>• Driving under influence<br>• Drug use<br>• Eye examinations<br>• Flu shots<br>• Home care<br>• Mastery<br>• Mood<br>• Physical check-up<br>• Sedentary activities<br>• Self-esteem<br>• Sexual behaviours<br>• Smoking cessation aids<br>• Social support<br>• Spirituality<br>• Suicidal thoughts and attempts<br>• Use of protective equipment<br>• Work stress |

**Appendix Table E.2: CCHS context areas and variables relevant to primary prevention indicator development**

| CCHS Concept | Variable Name | Question | Content |
|---|---|---|---|
| Age | DHHA_Age | -- | Years |
| Sex | DHHA_SEX | -- | Male<br>Female |
| RHA | GEOA_HR4 | -- | Winnipeg<br>Brandon<br>North Eastman<br>South Eastman<br>Interlake<br>Central<br>Marquette<br>South Westman<br>Parkland<br>Nor-Man<br>Burntwood+Churchill |
| Income Adequacy quintile | INCADIA5 | Derived variable | Lowest income quintile<br>Lower middle income quintile<br>Middle income quintile<br>Upper middle income quintile<br>Highest income quintile<br>Not stated |
| Education | EDUADR10 | -- | Secondary school grad. no post-sec.<br>Some post-secondary<br>Trades certificate or diploma<br>Diploma/certificate - college/cegep<br>Univ. certificate below bachelor's level<br>Bachelor's degree<br>Univ. degree or cert. above bach. level<br>Not stated |
| Standard weight | HWTADSW | Derived variable | Insufficient weight<br>Acceptable weight<br>Some excess weight<br>Overweight<br>Not applicable<br>Not stated |
| Diet | FVCAGTOT | Derived variable | Less than 5 times/servings per day<br>5-10 times/servings per day<br>More than 10 times/servings per day<br>Not stated |
| Physical activity index | PACADPAI | Derived variable | Active<br>Moderate<br>Inactive<br>Not stated |

## Appendix Table E.2 Continued

| | | | |
|---|---|---|---|
| Frequency of all physical activity | PACADFR | Derived variable | Regular<br>Occasional<br>Infrequent<br>Not stated |
| Leisure physical activity | PACAFLEI | Derived variable | Yes<br>No<br>Not stated |
| Self-perceived unmet health care needs | HCUA_06 | During the past 12 months, was there ever a time when you felt that you needed health care but you didn't receive it? | Yes<br>No<br>Don't know<br>Refusal<br>Not stated |
| Has diabetes | CCCA_101 | Do you have diabetes? | Yes<br>No<br>Don't know<br>Not stated |
| Type of smoker | SMKA_202 | At the present time do you smoke cigarettes daily, occasionally or not at all? | Daily<br>Occasionally<br>Not at all<br>Don't know<br>Refusal<br>Not stated |
| Binge drinking | ALCA_3 | How often in the past 12 months have you had 5 or more drinks on one occasion? | Never<br>Less than once a month<br>Once a month<br>2 to 3 times a month<br>Once a week<br>More than once a week<br>Not applicable<br>Don't know<br>Refusal<br>Not stated |
| Sexual activity | SXBA_7 | For that (those) relationship(s) that lasted less than a year, how often did you use a condom in the past 12 months? | Always<br>Usually<br>Occasionally<br>Never<br>Not applicable<br>Don't know<br>Refusal<br>Not stated |
| Sexual activity | SXBA_7A | Did you use a condom the last time? | Yes<br>No<br>Not applicable<br>Don't know<br>Refusal<br>Not stated |

## Appendix Table E.2 Continued

| | | | |
|---|---|---|---|
| Sexual activity | SXBA_4 | With how many different partners (have you had sexual intercourse in the past 12 months)? | 1 partner<br>2 partners<br>3 partners<br>4 or more partners<br>Not applicable<br>Don't know<br>Refusal<br>Not stated |
| Smoking quit | SCAADQUI | -- | Didn't try to quit last year<br>Tried to quit unsuccessfully/ last year<br>Successfully quit in the last year<br>Successfully quit more than 1 year ago<br>Not applicable<br>Not stated |
| Breastfeeding | BRFA_02 | (For your last baby), did you breastfeed or try to breastfeed your child even if only for a short time? | Yes<br>No<br>Not applicable<br>Don't know<br>Refusal<br>Not stated |
| Breastfeeding | BRFA_04 | How long did you breastfeed (your last child)? | Less than 1 week<br>1 to 2 weeks<br>3 to 4 weeks<br>5 to 8 weeks<br>9 to less than 12 weeks<br>3 to 6 months<br>7 to 9 months<br>10 to 12 months<br>More than 1 year<br>Not applicable<br>Don't know<br>Not stated |
| Flu | FLUA_160 | Have you ever had a flu shot? | Yes<br>No<br>Not applicable<br>Don't know<br>Refusal<br>Not stated |
| Flu | FLUA_162 | When did you have your last flu shot | Less than 1 year ago<br>1 year to less than 2 years ago<br>2 years ago or more<br>Not applicable<br>Don't know<br>Refusal<br>Not stated |

Appendix Table E.2 Continued

| | | | |
|---|---|---|---|
| Heart disease | CCCA_121 | Do you have heart disease diagnosed by a health professional? | Yes<br>No<br>Don't know<br>Refusal<br>Not stated |
| Cancer | CCCA_131 | Do you have cancer? | Yes<br>No<br>Don't know<br>Refusal<br>Not stated |

# APPENDIX F: EXAMPLES OF CHRONIC DISEASE DEFINITIONS FROM ADMINISTRATIVE DATA

The following table provides examples of the definitions that have been used in recent MCHP Reports and research papers to define the following chronic diseases: cancer, heart disease, and diabetes.

**Appendix Table F.1: MCHP reports and research papers that define measures of chronic disease**

| MCHP Reports | ICD-9-CM Codes | Notes from Glossaries or Other Methods Sections |
|---|---|---|
| **CANCER** | | |
| The Manitoba RHA Indicators Atlas: Population-Based Comparisons of Health and Health Care Use | 140-208<br>230-239<br>*excl.* 173 | Cancer rate is defined as the rate of new cases of cancer diagnosed each year, excluding non-malignant skin cancers. Data were provided by CancerCare Manitoba in five-calendar-year periods: 1991-1995 and 1996-2000. |
| Why is the Health Status of Some Manitobans Not Improving? The Widening Gap in the Health Status of Manitobans | Incidence:<br>140-208<br>*excl.* 173<br>Mortality:<br>140-208 | Incidence data were provided by CancerCare Manitoba in five-year aggregate time periods. Non-malignant skin cancers were excluded. Mortality data were provided by Vital Statistics for the calendar years 1985-1999. |
| The Health and Health Care Use of Manitoba's Seniors: Have They Changed Over Time? | Incidence:<br>140-172, 174-208<br>Mortality:<br>140.0-239.9 | Cancer incidence data are presented for three-year time periods to provide more stable results. |
| Assessing the Health of Children in Manitoba: A Population-Based Study | Mortality:<br>140-239 | |
| Tomiak et al., 1998, 2000 | 140-208 | |
| Roos & Mustard, 1997 | 153, 154, 162, 174 | Selected cancers: colon, lung, breast |
| **HEART DISEASE** | | |
| Why is the Health Status of Some Manitobans Not Improving? The Widening Gap in the Health Status of Manitobans | Mortality:<br>390-459 | Mortality data were provided by Vital Statistics for the calendar years 1985 through 1999. |
| The Health and Health Care Use of Manitoba's Seniors: Have They Changed Over Time? | Incidence:<br>410-414<br>Mortality:<br>401.0-429.9 | A person is defined as having ischemic heart disease if they had at least one hospitalization or two physician visits for ischemic heart disease in three fiscal years. |
| Roos and Mustard, 1997; Tomiak et al., 1998, 2000 | 410-414 | |
| Pilote et al., 1998 | 411, 413, 414 | |
| **DIABETES** | | |
| Using Administrative Data to Develop Indicators of Quality in Family Practice | – | No ICD-9-CM codes are used because the data for this study only included patients treated with oral medication (i.e. those with Type II diabetes). |
| Supply, Availability and Use of Family Physicians in Winnipeg | 250 | Adults aged 20 to 79 are identified as being diabetic if they had at least two physician visits or one hospital claim that contained a diabetes diagnosis in any field over a period of three years. |

## Appendix Table F.1 continued

| | | |
|---|---|---|
| The Manitoba RHA Indicators Atlas: Population-Based Comparisons of Health and Health Care Use | 250 | Diabetes is defined as the occurrence of at least two physician visits or one hospitalization with a diabetes diagnosis in a three-year period. |
| Why is the Health Status of Some Manitobans Not Improving? The Widening Gap in the Health Status of Manitobans | 250 | Diabetes treatment prevalence is defined as the number of individuals with at least one hospitalization or two ambulatory physician visits with a diabetes diagnosis within a three-year period, per thousand population. |
| The Health and Health Care Use of Manitoba's Seniors: Have They Changed Over Time? | Incidence:<br>250<br>Mortality:<br>250.0-250.9 | A person with diabetes is defined as any individual having at least one hospitalization or two physician visits for diabetes in three fiscal years. |
| The Health and Health Care Use of Registered First Nations People Living in Manitoba: A Population-Based Study | 250 | Diabetes treatment prevalence is defined as the occurrence of at least two physician visits or one hospitalization with a diabetes diagnosis in a three-year period, and expressed as a rate for people ages 20 through 79 years inclusive. |
| Assessing the Health of Children in Manitoba: A Population-Based Study | 250 | The diagnosis-based definition is at least three physician claims for a diabetes diagnosis over 2 years (1996-1998), excluding Treaty First Nations children. |
| Tomiak et al., 1998, 2000; Roos & Mustard, 1997 | 250 | Diabetes Mellitus |
| Robinson et al., 1997 | 250<br>271.4<br>648.0<br>648.8<br>790.2 | Definitions in this study were intentionally constructed to cover any possible case to which the respondent might have given a positive response, thus an individual with diabetes insipitus or gestational diabetes would answer 'yes' to the question 'Have you ever been told you have diabetes?'. Since most research would involve investigation of diabetes mellitus...these definitions may not be ideal. (J. Robinson, personal communication, Jan. 27/97) |

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Why is the Health Status of Some Manitobans Not Improving? The Widening Gap in the Health Status of Manitobans:
Brownell M, Lix L, Ekuma O, Derksen S, De Haney S, Bond R, Fransoo R, MacWilliam L, Bodnarchuk J. Why is the health status of some Manitobans not improving? The widening gap in the health status of Manitobans. Winnipeg, MB: Manitoba Centre for Health Policy, 2003.

Assessing the Health of Children in Manitoba: A Population-Based Study:
Brownell M, Martens P, Kozyrskyj A, Fergusson P, Lerfald J, Mayer T, Derksen S, Friesen D. Assessing the health of children in Manitoba: a population-based study. Winnipeg, MB: Manitoba Centre for Health Policy, 2001.

Using Administrative Data to Develop Indicators of Quality in Family Practice, 2004:
Katz A, De Coster C, Bogdanovic B, Soodeen R, Chateau D. Using administrative data to develop indicators of quality in family practice. Winnipeg, MB: Manitoba Centre for Health Policy, 2004.

## Appendix Table F.1 continued

The Health and Health Care Use of Registered First Nations People Living in Manitoba: A Population-Based Study:
Martens P, Bond R, Jebamani L, Burchill C, Roos N, Derksen S, Beaulieu M, Steinbach C, MacWilliam L, Walld R, Dik N, Sanderson D and the Health Information and Research Committee - Assembly of Manitoba Chiefs, Tanner-Spence M, Leader A, Elias B, O'Neil J. The health and health care use of registered First Nations people living in Manitoba: a population-based study. Winnipeg, MB: Manitoba Centre for Health Policy, 2002.

The Manitoba RHA Indicators Atlas: Population-Based Comparisons of Health and Health Care Use:
Martens P, Fransoo R, The Need to Know Team, Burland E, Jebamani L, Burchill C, Black C, Dik N, MacWilliam L, Derksen S, Walld R, Steinbach C, Dahl M, Bogdanovic B. The Manitoba RHA indicators atlas: population-based comparisons of health and health care use. Winnipeg, MB: Manitoba Centre for Health Policy, 2003.

The Health and Health Care Use of Manitoba's Seniors: Have They Changed Over Time?:
Menec V, MacWilliam L, Soodeen R, Mitchell L. The health and health care use of Manitoba's seniors: have they changed over time? Winnipeg, MB: Manitoba Centre for Health Policy, 2002.

Pilote L, Lavoie F, Hamilton V, Eisenberg M: "Global Analysis of Technological Change in the Treatment of Acute Myocardial Infarction: Results" (Presented at the International Conference on Technological Change and Medical Expenditure Growth, February 26-28, 1998).

Robinson JR, Young TK, Roos LL, Gelskey DE (1997): "Estimating the Burden of Disease: Comparing Administrative Data and Self-Reports". Medical Care;35, 932-47.

Roos N, Mustard C (1997):"Variation in health and health care use by socio-economic status in Winnipeg, Canada: The system works well? Yes and no." Milbank Quarterly;75(1):89-111.

Tomiak M, Berthelot J, Guimond E, Mustard C (2000): Factors associated with nursing-home entry for elders in Manitoba, Canada. Journal of Gerontology: Medical Sciences, 55A(5), M279-M287.

Tomiak M, Berthelot J, Mustard C (1998): A Profile of Health Care Utilization of the Disabled Population in Manitoba. Medical Care, 36(9): 1383-97.

Supply, Availability and Use of Family Physicians in Winnipeg:
Watson D, Bogdanovic B, Heppner P, Katz A, Reid R, Roos N. Supply, availability and use of family physicians in Winnipeg. Winnipeg, MB: Manitoba Centre for Health Policy, 2003.

# Recent MCHP Publications

## 2004

*Patterns of Regional Mental Illness Disorder Diagnoses and Service Use in Manitoba: A Population-Based Study,* by Patricia Martens, Randy Fransoo, Nancy McKeen, *The Need To Know Team* (funded through CIHR), Elaine Burland, Laurel Jebamani, Charles Burchill, Carolyn De Coster, Okechukwu Ekuma, Heather Prior, Dan Chateau, Renée Robinson, and Colleen Metge

*Diagnostic Imaging Data in Manitoba, Assessment and Applications,* by Greg Finlayson, Bill Leslie and Leonard MacWilliam

*How do Educational Outcomes Vary With Socioeconomic Status? Key Findings from the Manitoba Child Health Atlas 2004*, by Marni Brownell, Noralou Roos, Randy Fransoo, Anne Guèvremont, Leonard MacWilliam, Shelley Derksen, Natalia Dik, Bogdan Bogdanovic, and Monica Sirski

*Using Administrative Data to Develop Indicators of Quality in Family Practice*, by Alan Katz, Carolyn De Coster, Bogdan Bogdanovic, Ruth-Ann Soodeen, and Dan Chateau

*Patterns of Health Care Use and Cost at the End of Life*, by Verena Menec, Lisa Lix, Carmen Steinbach, Okechukwu Ekuma, Monica Sirski, Matt Dahl, and Ruth-Ann Soodeen

## 2003

*Pharmaceuticals: Therapeutic Interchange and Pricing*, by Steve Morgan, Anita Kozyrskyj, Colleen Metge, Noralou Roos, and Matt Dahl

*Pharmaceuticals: Focussing on Appropriate Utilization*, by Colleen Metge, Anita Kozyrskyj, Matt Dahl, Marina Yogendran, and Noralou Roos

*Supply, Availability and Use of Family Physicians in Winnipeg*, by Diane Watson, Bogdan Bogdanovic, Petra Heppner, Alan Katz, Robert Reid, and Noralou Roos

*Manitoba RHA Indicators Atlas: Population-Based Comparisons of Health and Health Care Use*, by Patricia J Martens, Randy Fransoo, *The Need to Know Team*, Elaine Burland, Laurel Jebamani, Charles Burchill, and others.

*Why is the Health Status of Some Manitobans Not Improving? The Widening Gap in the Health Status of Manitobans*, by Marni Brownell, Lisa Lix, Okechukwu Ekuma, Shelley Derksen, Suzanne De Haney, and others.

*Discharge Outcomes for Long-Stay Patients in Winnipeg Acute Care Hospitals*, by Anita Kozyrskyj, Charlyn Black, Elaine Dunn, Carmen Steinbach, and Dan Chateau

*Key Events and Dates in the Manitoba Health Care System, 1990 to 2003,* compiled by Fred Toll

## 2002

*Improving Children's Health: How Population-Based Research Can Inform Policy - The Manitoba Experience,* Canadian Journal of Public Health, Volume 93, Supplement 2, November/December 2002

*Monitoring the Acute Care Sector: Key Measures and Trends,* Healthcare Management Forum Supplement, Winter 2002

*Estimating Personal Care Home Bed Requirements*, by Norman Frohlich, Carolyn De Coster, and Natalia Dik

*The Health and Health Care Use of Manitoba's Seniors: Have They Changed Over Time?* by Verena Menec, Leonard MacWilliam, Ruth-Ann Soodeen, and Lori Mitchell

*Profile of Medical Patients Who Were Assessed as Requiring Observation-Level Services at Winnipeg Acute Care Hospitals in 1998/99*, by Sharon Bruce, Charlyn Black, and Charles Burchill

*Projecting Hospital Bed Needs for 2020*, by David Stewart, and Robert Tate, Greg Finlayson, Leonard McWilliam, and Noralou Roos

*Health and Health Care Use of Registered First Nations People Living in Manitoba: A Population-Based Study*, by Patricia J Martens, Ruth Bond, Laurel Jebamani, Charles Burchill, and others.

## 2001

*Perspectives on Home Care Data Requirements,* by Noralou Roos, Lori Mitchell, Sandra Peterson and Evelyn Shapiro

*A Comparison of Preliminary and Adjusted Cost per Weighted Case Determinations for Manitoba Hospitals: Impact for Evaluation and Report Cards,* by Greg Finlayson, Philip Jacobs, Diane Watson and Bogdan Bogdanovic

*A Look at Home Care in Manitoba,* by Noralou P Roos, Leonie Stranc, Sandra Peterson, Lori Mitchell, Bogdan Bogdanovic and Evelyn Shapiro

*Do Some Physician Groups See Sicker Patients Than Others? Implications for Primary Care Policy in Manitoba,* by Robert Reid, Bogdan Bogdanovic, Noralou P Roos, Charlyn Black, Leonard MacWilliam and Verena Menec

*Acuity of Patients Hospitalized for Medical Conditions at Winnipeg Acute Care Hospitals,* by Sharon Bruce, Carolyn De Coster, Jan Trumble Waddell, Charles Burchill and Suzanne De Haney

*Changes in Health and Health Care Use by Manitobans, 1985-1998,* by Noralou Roos, Evelyn Shapiro, Ruth Bond, Charlyn Black, Greg Finlayson, Christine Newburn-Cook and others.

*Indicators of Health Status and Health Service Usefor the Winnipeg Regional Health Authority,* by Norman Frohlich, Randy Fransoo and Noralou Roos

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