ONTARIO WOMEN’S
HEALTH EQUITY REPORT

Burden of Illness
Chapter 3

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• Health and Functional Status
• Chronic Disease Risk Factors
• Chronic Conditions
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• Mortality

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Executive Summary

ISSUE

A primary objective of the POWER Study is to develop a tool that can be used to improve the health and well-being of, and reduce health inequities among, the women and men in Ontario.

In this chapter we begin by reporting on the burden of illness experienced by Ontarians and how it differs by sex, socioeconomic status, ethnicity and geographic area of residence. In doing so, we identify opportunities for improvement, present objective evidence to inform priority-setting and provide a baseline from which to measure progress. Much of the morbidity and premature mortality we report in this chapter is preventable through: public health and clinical interventions; health system redesign aimed at chronic disease prevention and management; community engagement and empowerment and social policy aimed at addressing the social determinants of health.

The burden of illness in Ontario is expected to increase as the population ages, since more people will be living with chronic disease and disability. A concerted effort to reduce illness burden among Ontarians would not only improve their quality of life but would also contribute to the sustainability of the health system by reducing demand. This could be accomplished by preventing chronic disease and its complications and thus reducing rates of preventable emergency department visits, hospitalizations and the need for long-term care. In order to succeed, it will be necessary to tackle health inequities by improving the health of all Ontarians regardless of their gender, income, education, ethnicity or where they live.

ABOUT THIS CHAPTER

The Burden of Illness chapter is divided into five sections:

A. Health and functional status
B. Chronic disease risk factors
C. Prevalence of chronic conditions
D. Sexually-transmitted infections
E. Mortality

In the first section, the health and functional status (measures of an individual’s ability to carry out their daily activities and the activities necessary to achieve their goals) of Ontario women and men is profiled. This provides an assessment of the burden of illness and disability by including women’s and men’s assessments of their health and how it impacts on their daily activities.
Information is also provided on the prevalence of fall-related hospitalizations among Ontarians aged 65 and older—the group most vulnerable to injury from falls—as this is an important and preventable cause of disability. The second section presents the prevalence of the major modifiable risk factors for chronic diseases, including health-related behaviours (being overweight or obese, physical inactivity, smoking and inadequate fruit and vegetable intake) and social determinants of health (income and education). The third section looks at selected chronic conditions—such as arthritis, heart disease and diabetes—that have a large impact on women’s health and are major contributors to the disease burden in Ontario. The fourth section reports on three sexually-transmitted infections (chlamydia, gonorrhea and human immunodeficiency virus [HIV] infection) that have a significant impact on women’s health and quality of life. The final section presents overall mortality rates for the Ontario population, as well as rates for some of the leading causes of mortality, premature mortality and life expectancy.
STUDY

The reported indicators were derived from a systematic review of the scientific literature and a rigorous selection process by a Technical Expert Panel using a modified Delphi process (see Chapter 1). At the provincial level, indicators were first stratified by sex and by age and—as allowed by sample size and data source—further stratified by socioeconomic variables (income, education, ethnicity and languages spoken). At the Local Health Integration Network (LHIN) level, indicators were stratified by sex, and then by age, income and education whenever possible. Age adjustment was done using indirect standardization. Data from several sources were used to produce this section. These include: Statistics Canada’s Canadian Community Health Survey (CCHS) Cycles 1.1, 2.1 and 3.1; Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); integrated Public Health Information System (iPHIS); Statistics Canada Mortality Database; and the 2001 Census of Canada.

KEY FINDINGS

• There were sizable and modifiable health inequities in Ontario associated with gender, income, education and ethnicity. Ontarians of lower socioeconomic position experienced much higher levels of chronic disease and disability than those who were more advantaged. They also were more likely to die prematurely (Exhibit 3E.2).

• If all Ontarians had the same health as Ontarians with higher income, an estimated 318,000 fewer people (166,000 women and 152,000 men) would be in fair or poor health, an estimated 231,000 fewer people (110,000 women and 121,000 men) would be disabled, and there would be an estimated 3,373 fewer deaths each year (947 women and 2,426 men) among Ontarians living in metropolitan areas.

• Women were more likely to report comorbidity (multiple chronic conditions) and disability than men, while men had higher rates of potentially avoidable mortality and premature death.

• Across all age groups, women were more likely to live in lower-income households than men, with gender differences in income greatest among those aged 65 and older. The differences in health among women and men associated with socioeconomic position were greater than those between women and men overall, and there were gender differences in the impact of socioeconomic factors on health. The burden of chronic illness and disability was highest among low-income and Aboriginal women, whereas low-income men had the highest rates of potentially avoidable mortality and premature death.

• Overall, one in two Ontarians reported being physically inactive, having inadequate fruit and vegetable intake, or being overweight or obese, and one in five reported currently smoking. Lower levels of education and income were associated with a higher prevalence of these risk factors known to increase the risk of chronic diseases.

• There were also important differences between Ontario’s Local Health Integration Networks (LHINs) in the health and functional status of their residents, as well as the distribution of risk factors for chronic disease, including smoking, obesity and sedentary lifestyles.
KEY MESSAGES

There are enormous opportunities to improve overall population health while reducing health inequities in Ontario. It is not surprising that we found health inequities, as these exist in all societies and are well-documented in Canada. However, the large size of the identified inequities is surprising and of concern. The use of these indicators and findings to inform and drive improvement can play an important role in achieving the objectives of improving population health and reducing health inequities.

There is growing evidence for interventions that can reduce overall population risk for disease and disability and close health gaps between the less advantaged and more advantaged members of society. In addition, there are many innovative models to draw upon in Ontario, across Canada and internationally by communities, health care providers, health systems and public health systems and organizations to effect improvement (See Reducing Burden of Illness: Different Approaches).

Ontario has achieved success in reducing population risk through its Smoke-Free Ontario Strategy; nevertheless, we found that 40 percent of men and 28 percent of women with less than a secondary school education, as well as 39 percent of Aboriginal women and 43 percent of Aboriginal men, currently smoke. Thus, to be most effective, prevention and improvement efforts must also target vulnerable population subgroups.

The following four key actions can accelerate progress in improving the health of and reducing inequities among all Ontarians:

Prioritize Chronic Disease Prevention and Management

- Because chronic diseases and their risk factors contribute greatly to health inequities, the implementation of a comprehensive and coordinated chronic disease prevention and management strategy—one that addresses the need of at-risk populations—is the key to improving population health and achieving health equity.

- It is especially important to identify specific opportunities to improve quality of life and functional status through both community-based and health care interventions. For example, improved pain management and falls prevention interventions can reduce illness burden and contribute to the goal of helping older Ontarians remain active and independent.

Coordinate Population Health, Community and Clinical Responses

- There are many important ongoing activities aimed at improving health in the province including: targeting population-based health promotion, enhancing the quality and capacity of community-based services, and improving the quality of care delivered in clinical settings. Efforts to integrate and coordinate these activities could produce synergies to accelerate progress in improving health and reducing health inequities among Ontarians.

Address the Broader Social Determinants of Health

- There is a need to address the broader social determinants of health (i.e., income, education, food security, housing and environment) and to integrate these efforts with health policy. Cross-sectoral partnerships are needed to accomplish this.

- To guide these efforts, tools such as Health Impact Assessments (HIAs) are available to assess the health impact of policy—including those in non-health sectors such as education, housing and environment—on both population health and health inequities. Conducting HIAs in key priority areas in Ontario could support efforts to achieve health equity.

 Routinely Include Gender and Equity Analysis in Health Indicator Monitoring

- Attention to gender issues is required to improve population health because women and men have different health needs and different social contexts that
influence their health. A gender and equity focus should be routinely incorporated into health indicator reporting and monitoring. This provides the needed information to effectively target gender, socioeconomic and ethnic inequities in health. Monitoring these indicators over time will allow us to assess progress in improving health and reducing inequities.

- Improvements in data quality, availability and timeliness are needed to support monitoring and reporting strategies. There is especially a need for data on ethnicity, knowledge of official languages and length of residence in Canada to improve the capacity to measure, monitor and improve health for Ontario’s diverse communities.

**KEY FINDINGS BY SECTION**

**SECTION A | Health and Functional Status**

- Low-income women and men were more than three times as likely to report that their health was fair or poor compared to those in the highest income group (Exhibit 3A.1). They were also more likely to report having two or more chronic conditions and that their activities were limited by a chronic health condition (Exhibit 3A.8).

- Aboriginal women and men were more likely to report fair or poor health, multiple chronic conditions and activity limitations than women and men in other ethnic groups. Forty-five percent of women who self-identified as Aboriginal reported that their activities were limited by a chronic health condition (Exhibit 3A.10).

- Ontarians who spoke French only or who did not speak French or English were more likely to report that their health was fair or poor than those who spoke English only or who were bilingual in French and English (Exhibit 3A.5).

- Low-income Ontarians were much more likely to report that at least some of their activities were prevented due to pain or discomfort than those with higher incomes. (Exhibit 3A.16). One-quarter of low-income women and men in Ontario reported that their activities were limited by pain or discomfort. Older women were the most likely to report that their activities were limited due to pain or discomfort, with 35 percent of low-income women aged 65 and older reporting activity limitations (Exhibit 3A.17).

**SECTION B | Chronic Disease Risk Factors**

- The number of fall-related hospitalizations increased with age, for both women and men, with highest rates observed among individuals aged 80 and older (Exhibit 3A.18). Overall, 1,483 per 100,000 adults aged 65 and older in Ontario were hospitalized due to fall-related injuries in 2005/06. A total of 1,837 per 100,000 women and 1,026 per 100,000 men in Ontario were hospitalized due to fall-related injuries over the course of that year.

- Across all age groups, women were more likely to live in lower-income households than men, with gender differences in income greatest among those aged 65 and older. Forty-four percent of women aged 65-79 and 52 percent of those aged 80 and older reported living in a lower-income household compared to 33 percent and 35 percent of men in these age groups, respectively (Exhibit 3B.1).

- Recent immigrants, members of racial and ethnic minority groups, and Francophones who spoke French only were also more likely to live in lower-income households than the overall Ontario population (Exhibit 3B.1).

- The proportion of Ontarians who reported four major risk factors that increase the risk for chronic diseases and their associated morbidity and premature mortality (physical inactivity, inadequate fruit and vegetable intake, being overweight or obese, and smoking) was high across all levels of education and income (Exhibit 3B.5).

- Lower levels of education and income were associated with a higher prevalence of these risk factors. For
example, women and men with lower levels of education were more likely to smoke; 28 percent of women and 40 percent of men with less than a secondary school education compared to eight percent of women and 13 percent of men who had a Bachelor’s degree or higher (Exhibit 3B.5).

- Women were more likely to report that they were physically inactive but less likely to report inadequate fruit and vegetable intake, being overweight or obese, and smoking than men.

- While five percent of Ontarians overall reported food insecurity, one in four low-income women and men reported that they did not have enough to eat, worried about there not being enough to eat or did not eat the quality or variety of foods desired due to a lack of money (Exhibit 3B.4).

**SECTION C | Chronic Conditions**

- The majority of women and men in Ontario were living with at least one chronic condition. Nearly one in three women and one in four men reported having two or more chronic conditions (Exhibit 3C.7).

- There was an income gradient in the prevalence of common chronic diseases among both women and men and a similar pattern was seen for education. Lower-income and less educated women and men were most likely to report having common chronic conditions (hypertension, arthritis, obstructive lung disease, diabetes, heart disease or stroke and depression) as well as having multiple chronic conditions (comorbidity) (Exhibit 3C.1).

- The prevalence of comorbidity also varied by ethnicity. Nearly half (48 percent) of Aboriginal women reported having two or more chronic conditions compared to 16 percent of East and Southeast Asian women (Exhibit 3C.10).

- Women were more likely to report having arthritis, depression, and multiple chronic conditions than men.

- Among low-income women aged 65 and older, two in three reported having hypertension or arthritis, one in five reported having diabetes, and one in four reported having heart disease or stroke (Exhibit 3C.2).

**SECTION D | Sexually-transmitted Infections**

- Chlamydia infection and its consequences primarily affects adolescent and young adult women (aged 15–24) (Exhibit 3D.1).

- Reported incidence rates of gonorrhea infection among women aged 15–19 were more than twice as high as rates reported for adolescent men. For those aged 20 and older, rates were higher among men than women; however, this difference was small among those aged 20–24 (Exhibit 3D.2).

- While men were more likely than women to be infected with HIV, one quarter of new HIV infections occurred in women. Risk factors for HIV infection differed greatly for women and men. Among women in Ontario most infections were due to heterosexual transmission, whereas homosexual transmission was more common for men (Exhibit 3D.4).

**SECTION E | Mortality**

- Low-income women and men had higher mortality rates both overall (Exhibit 3E.1) and for specific causes of death—including chronic disease, infections, and injuries (with the exception of motor vehicle accidents). They also had a higher probability of premature mortality, shorter life expectancies and shorter disability-free life expectancies than those with higher incomes.

- For most measures of mortality, an income gradient was observed across neighbourhood income quintiles. In addition, sex differences in mortality rates tended to be greatest among low-income women and men indicating a marked survival disadvantage for low-income men.

- Forty-one percent of men and 26 percent of women in the lowest income quintile died before age 75 (premature mortality), compared to 28 percent of men and 19 percent of women in the highest income quintile (Exhibit 3E.2).
Introduction

A primary objective of the POWER Study is to develop a tool that can be used to improve the health and well-being of, and reduce health inequities among, the women and men in Ontario.

We begin by reporting in this chapter on the burden of illness experienced by Ontarians and how it differs by sex, socioeconomic status and geographical area of residence. In doing so, we identify opportunities for improvement, present objective evidence to inform priority setting, and provide a baseline from which to measure progress.

Much of the morbidity and premature mortality we report in this chapter is preventable through: public health and clinical interventions; health system redesign aimed at chronic disease prevention and management; community engagement and empowerment; and social policy aimed at addressing the social determinants of health. Given an aging population, a concerted effort to reduce the illness burden among Ontarians can contribute to the sustainability of the health system by reducing demand for health care services.1, 2 This could be accomplished by preventing chronic disease and its complications and thus reducing rates of preventable emergency department visits, hospitalizations and the need for long-term care. It can also diminish the financial burden associated with the substantial direct and indirect costs of illness and disability.3-7

In the first section, the health and functional status of Ontario women and men is profiled. This examines the burden of illness and disability through women’s and men’s assessments of their health and how it affects their daily activities. Information is also provided on the prevalence of fall-related hospitalizations among Ontarians aged 65 and older—the group most vulnerable to injury from falls—as this is an important and preventable cause of disability. The second section presents the prevalence of the major modifiable risk factors for chronic diseases, including social determinants of health (income and education) and health-related behaviours (overweight or obesity, physical inactivity, smoking and inadequate fruit and vegetable intake). The third section looks at selected chronic conditions such as arthritis, heart disease and diabetes, that have a large impact on women’s health and are major contributors to the disease burden in Ontario. The fourth section reports on three STIs (sexually-transmitted infections) (chlamydia, gonorrhea, and human immunodeficiency virus [HIV] infection) that have a significant impact on women’s reproductive health and quality of life. The final section presents overall mortality rates for the Ontario population, as well as rates for some of the leading causes of mortality, premature mortality, and life expectancy.

The indicators we report are the result of a rigorous selection process which included an extensive literature review of existing indicators as well as input and agreement from experts in the field (see Chapter 1). Some indicators included in this chapter are also used by other reporting projects in the province, such as
the Ministry of Health and Long-Term Care (MOHLTC) Health System Scorecards, the Cancer Care Ontario Cancer System Quality Index, and the Ontario Health Quality Council annual reports. Many of these indicators are from the core indicator set recommended by the Association of Public Health Epidemiologists of Ontario.

We have built on these reports by incorporating gender and equity analyses. This is important because women and men have different patterns of disease, disability and mortality. Women and men also have different social contexts and different experiences with health care which, together with differences in biology, contribute to observed gender differences in health (see Chapter 2).

Health inequities associated with gender and socioeconomic position have been well documented. Men and women with lower income and lower levels of educational attainment have worse health status, are more likely to suffer from chronic conditions, and have higher rates of mortality than those who have higher income and higher levels of educational attainment.

Thus, differences in illness burden between subgroups of women are often larger than overall differences between women and men.

Health inequalities resulting from social conditions are manifested through preventable or treatable chronic conditions, such as heart disease, diabetes or asthma, which are therefore more prevalent among disadvantaged and marginalized groups. As a result, when socioeconomically disadvantaged women and men experience barriers to accessing care or receive health care of lower quality, they experience suboptimal health outcomes. Access to quality health care can potentially improve the health of population groups of lower socioeconomic status, whereas poor access and quality of care can compound these inequalities.

There is evidence that access to effective primary care can contribute to reducing health inequities.

In this chapter we assessed the magnitude of health inequities in Ontario associated with gender, socioeconomic position, ethnicity, immigration status, knowledge of official languages and geography. As Ontario grows more diverse, it becomes increasingly important to understand and improve the health and well-being of the many different ethnic groups in the province. So, when possible, we analyzed survey data from Ontarians who self-identified as being from different ethnic groups (e.g., Aboriginal people, including North American Indian, Métis, or Inuit living off-reserve). While health inequities are present in all societies, the size of the gap in health status between the most advantaged and disadvantaged members of society not only varies greatly between and within countries but changes over time in response to changing political policies and social conditions. The health inequities reported here are amenable to change, as political, social, and health policies may lead to more or less equitable distribution of health among women and men. There is evidence that access to effective primary care can contribute to reducing health inequities.

Data from several sources were used to produce this chapter. These include: Statistics Canada’s Canadian Community Health Survey (CCHS) cycles 1.1, 2.1 and 3.1; the Canadian Institute for Health Information.
Discharge Abstract Database (CIHI-DAD); the integrated Public Health Information System (iPHIS); the Statistics Canada Mortality Database and the 2001 Census of Canada. We report on adults age 25 and older (with the exception of STI Indicators) in order to examine the relationship between education and illness burden. All the indicators are reported at the provincial level and at the Local Health Integration Network (LHIN) level when sample size allowed. At the provincial level, these indicators of health status and functional status were first stratified by sex and by age, and then further stratified by socioeconomic variables (income, education, ethnicity, immigration status and languages spoken) as allowed by sample size. At the LHIN level, indicators were stratified by sex, and then by age, income and education whenever possible. Age adjustment was done using indirect standardization. Appendix 3.3 provides a brief description of research methods.

A complete list of the indicators in this chapter and their data sources can be found in Appendix 3.2. The Table in Appendix 3.1 indicates which of the Ontario Health Quality Council’s nine attributes of a high performing health system each indicator assesses, and also which of the strategic objectives included in the MOHLTC strategy map would be met through improvement on each indicator.

Information presented in this chapter provides an overall picture of priority issues related to the burden of illness and disability in Ontario. More detailed information on selected chronic conditions that have a major impact on women’s health (e.g., cancer, cardiovascular disease, and depression) is included in subsequent sections of this report. By focusing on prevention and chronic disease management, it is possible to improve health and well-being, prevent or postpone disability and extend life expectancy for all Ontarians. We present this information as a tool to assist patients, providers, policy-makers, and advocates in achieving these objectives.
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A Guide to Reading Maps

Maps are the main visual representation of spatial patterns of data and analyses covered in this Report.

Ontario is difficult to map as a province, due to its vast areas in the North and detailed characteristics in the South. As such, all maps consist of three views—Northern Ontario, Toronto and surrounding areas, and Southern Ontario. The measures of distance and area on these views differ from one another.

There are two types of thematic maps in this Report that depict a magnitude of analyzed variables: 1) bar chart maps and 2) choropleth (shaded) maps. The following descriptions aim to help the reader correctly view and interpret these two map types.

BAR CHART MAPS

Bar chart maps can depict a variety of numeric variables including counts and ratios across Local Health Integration Networks (LHINs) in Ontario. In most of the maps in this Report, the bars show values of relative risks, odds ratios or rates (percentages).

The main feature to look for is the height of the bars, since it represents the value of the mapped attribute. The larger the attribute number (relative risk, odds ratio or rate), the taller the bar. The number at the top or beside each bar represents the actual value of the attribute.

If the attribute is presented in two subgroups (e.g., women and men) as in Figure 1, then each LHIN area on the map has two bars. When the attribute is presented in four subgroups (e.g., lower-education women, higher-education women, lower-education men, and higher-education men) as in Figure 2, then each LHIN area on the map has four bars. In all cases, the height of the bar is proportional to the value of the mapped attribute.

In the legend of the map the top set of bars reflects the highest observed value in the depicted data set. This can be used for visual comparison with the bars on the map.

The bottom set of bars shows the overall Ontario values of the depicted attributes and can be also compared visually to the bars on the map.
CHOROPLETH (SHADED) MAPS

Choropleth maps use different shades or colours to depict data values. Each colour generally represents a range of values, as shown in the map legend. In general, the darkness of the shade or colour is proportional to a larger data value—the larger the data value, the darker the shade or colour on the map. Shaded maps usually represent rate or ratio variables rather than raw counts or amounts.

Figure 3: Example of a Choropleth Map
Section 3A
Health and Functional Status

INTRODUCTION

A primary goal of both public health and health care services is to improve quality of life by optimizing health and functional status. A person’s overall health status is a product of their experiences over the life course.

These experiences are shaped by their socioeconomic position, the characteristics of their communities, and their interactions with the health care system. Functional status, or an individual’s ability to carry out their daily activities and the activities necessary to achieve their goals, is a product of overall physical and mental health. This section provides an assessment of the health and functional status of women and men in Ontario and how it varies by socioeconomic status, ethnicity and geographic area of residence.

There are important gender differences in health and functional status. For example, women are more likely than men to report impairments in their functional status. Income and education are also strong predictors of health and functional status for both women and men. An understanding of these differences is needed to inform the development of interventions aimed at improving the health and well-being of the population. In fact, there are enormous opportunities to improve the health and functional status of the population while at the same time reducing these gender and socioeconomic inequities in health. These goals can be achieved by addressing the social determinants of health, developing effective strategies for health promotion, and improving the quality and effectiveness of health care services across the continuum of care.

In this section we report on indicators that assess a number of different domains of health and functional status. These include:

- overall self-rated health and mental health status;
- the extent to which women’s and men’s activities are limited by long-term health conditions;
- the prevalence of disability as measured by limitations in Instrumental Activities of Daily Living (IADLs) (e.g., meal preparation, running errands, light or heavy housework, money management) and/or Activities of Daily Living (ADLs) (e.g., washing, dressing, eating, taking medications, moving about inside the house);
- the contribution of pain to activity limitations (there are effective but underused strategies for pain management that can lead to improvement on this indicator); and,
- rates of fall-related injury among seniors, the leading cause of injury-related hospitalizations for seniors in Canada (i.e., poor health and functional status increases the risk of falls and there is evidence for effective community-based and clinical interventions to reduce the risk of falls and their associated injuries).
EXHIBITS AND FINDINGS

SELF-RATED HEALTH

Self-rated health—also referred to as global, self-reported or self-perceived health—is an indicator of how people rate their overall health status.

Self-rated health is a well-validated measure of health status that has been shown to have strong predictive relationships with numerous health outcomes including mortality, health care utilization and health care costs in diverse populations. The percentage of the population who rated their health as being fair or poor is reported.

Overall, 13 percent of the adult population aged 25 and older and 13 percent of women and men individually in Ontario rated their health as fair or poor in 2005.

EXHIBIT 3A.1 | Age-standardized percentage of adults aged 25 and older who reported their health as fair or poor, by sex and annual household income, in Ontario, 2005

FINDINGS

• The percentage of adults who reported their health as fair or poor increased as income level decreased (an income gradient).

• Low-income women and men were more than three times as likely to report their health as fair or poor compared to those in the higher-income category.

• One in four low-income adults reported their health as fair or poor compared with less than one in ten adults in the higher-income category.

• Similar patterns were seen for both women and men.
FINDINGS

- Higher educational attainment was associated with lower rates of reporting fair or poor health. Ontarians with lower education levels were two to three times more likely than those with higher education to report that their health was fair or poor.

- Among women and men who did not graduate from secondary school, one in five reported their health as fair or poor compared to only eight percent of women and six percent of men who had a Bachelor’s degree or higher.

- Women and men with the same level of education reported similar rates of fair or poor health.

EXHIBIT 3A.2 | Age-standardized percentage of adults aged 25 and older who reported their health as fair or poor, by sex and education level, in Ontario, 2005

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1
**EXHIBIT 3A.3** Age-specific percentage of adults aged 25 and older who reported their health as fair or poor, by sex and annual household income, in Ontario, 2005

**FINDINGS**

- As expected, more seniors (aged 65 and older) reported their health as fair or poor compared to adults aged 25–64.

- In both age categories, the percentage of adults who reported their health as fair or poor increased as income level decreased.

- Women aged 25-64 in the low-income category were four times more likely to report fair or poor health compared to those in the higher-income category.

- Thirty-seven percent of low-income women and 38 percent of low-income men, aged 65 and older, reported their health as fair or poor.

---

**DATA SOURCE:** Canadian Community Health Survey (CCHS), Cycle 3.1

* Interpret with caution due to high sampling variability

**NOTE:** See Appendix 3.3 for definitions of annual household income categories
EXHIBIT 3A.4 | Age-standardized percentage of adults aged 25 and older who reported their health as fair or poor, by sex and ethnicity, in Ontario, 2005

**FINDINGS**

• The percentage of women and men who reported their health as fair or poor differed by ethnicity. Aboriginal women and men were most likely to report that their health was fair or poor. Twenty-nine percent of Aboriginal women and 24 percent of Aboriginal men reported their health as fair or poor.

• There were no sex differences in self-rated health in some ethnic groups (White and Black), whereas in other ethnic groups (Aboriginal, South and West Asian and Arab) a greater proportion of women than men reported fair or poor health.

EXHIBIT 3A.5 | Age-standardized percentage of adults aged 25 and older who reported their health as fair or poor, by sex and language spoken, in Ontario, 2005

**FINDINGS**

• Women and men who spoke French only were more likely to report fair or poor health than those who spoke English only, English and French, or English or French with another language. Ontarians who spoke neither English nor French were also more likely to report fair or poor health than those who spoke English.

*Interpret with caution due to high sampling variability*

**DATA SOURCE:** Canadian Community Health Survey (CCHS), Cycle 3.1

* Includes self-identified off-reserve Aboriginal adults (North American Indian, Métis, Inuit)

*** Includes Latin American, other racial and multiple racial origins

**NOTE:** Ethnic group names are those used by Statistics Canada in the CCHS

POWER Study
EXHIBIT 3A.6 | Age-standardized percentage of adults aged 25 and older who rated their health as fair or poor, by sex, annual household income and Local Health Integration Network (LHIN), in Ontario, 2005

FINDINGS

- Across all LHINs, lower-income women and men reported higher rates of fair or poor health than those with higher income; however, the magnitude of these differences varied substantially across LHINs.
- The proportion of lower-income women who rated their health as fair or poor ranged from 12 percent (North Simcoe Muskoka LHIN) to 29 percent (Mississauga Halton LHIN); in higher-income women the proportion ranged from seven percent (Champlain LHIN) to 14 percent (North West LHIN).
- Nearly a third (31 percent) of lower-income men in the North East LHIN reported their health as fair or poor.

Note: See Appendix 3.3 for definitions of annual household income categories

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

POWER Study
**SELF-RATED MENTAL HEALTH**

Self-rated mental health—also referred to as global, self-reported or self-perceived mental health—is an indicator of how people rate their overall mental health status. The percentage of the population who rated their mental health as being fair or poor is reported.

Overall, five percent of the adult population aged 25 and older in Ontario rated their mental health as fair or poor. Six percent of women and five percent of men rated their mental health as fair or poor.

---

**EXHIBIT 3A.7 | Age-standardized percentage of adults aged 25 and older who reported their mental health as fair or poor, by sex and annual household income, in Ontario, 2005**

**FINDINGS**

- The percentage of adults who reported their mental health as fair or poor increased as income level decreased.
- Low-income women were three times as likely as higher-income women to report their mental health as fair or poor.
- Low-income men were five times as likely as higher-income men to report their mental health as fair or poor.

**DATA SOURCE:** Canadian Community Health Survey (CCHS), Cycle 3.1

**NOTE:** See Appendix 3.3 for definitions of annual household income categories
ACTIVITY LIMITATIONS

Activity limitations is an indicator of the percentage of the population who reported that their activities at home, school or work had been limited due to a long-term physical condition, mental condition or health problem.

A long-term condition is one that is expected to last or has already lasted six months or more. The proportion of people with activity restrictions is a marker of population health status and will increase with population aging. A goal of public health and clinical practice is to improve functioning and reduce the proportion of the population whose health limits their everyday activities.

Overall, 25 percent of the adult population aged 25 and older in Ontario reported having activity limitations. Twenty-seven percent of women and 24 percent of men in Ontario reported having activity limitations.

EXHIBIT 3A.8 | Age-standardized percentage of adults aged 25 and older who reported having activity limitations¥, by sex and annual household income, in Ontario, 2005

FINDINGS

- There was a sizable income gradient in the percentage of adults who reported having activity limitations. The percentage of adults who reported having activity limitations increased as income level decreased. This pattern was similar for women and men.

- Over one-third of low-income women and men in Ontario reported having limitations in their ability to function at home, school or work.

- Women and men with lower levels of education were more likely to report activity limitations than those who had higher levels of education (data not shown).

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See Appendix 3.3 for definitions of annual household income categories.

¥ Activities at home, school or work have been limited due to a long-term physical condition, mental condition or health problem.

POWER Study
EXHIBIT 3A.9  |  Age-specific percentage of adults aged 25 and older who reported having activity limitations¥, by sex and annual household income, in Ontario, 2005

FINDINGS

- As expected, more seniors (aged 65 and older) reported having activity limitations compared to adults aged 25–64.
- In both age categories, the percentage of adults who reported having activity limitations increased as income level decreased.
- Fifty percent of low-income older women reported activity limitations, compared with 38 percent of higher-income older women. There was a similar pattern among adults aged 25–64, where 35 percent of low-income women vs. 20 percent of higher-income women reported activity limitations.

**Aged 25-64**

<table>
<thead>
<tr>
<th>Annual household income</th>
<th>Women (%)</th>
<th>Men (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>35</td>
<td>37</td>
</tr>
<tr>
<td>Lower middle</td>
<td>30</td>
<td>27</td>
</tr>
<tr>
<td>Middle</td>
<td>25</td>
<td>22</td>
</tr>
<tr>
<td>Higher</td>
<td>20</td>
<td>19</td>
</tr>
</tbody>
</table>

**Aged 65 and older**

<table>
<thead>
<tr>
<th>Annual household income</th>
<th>Women (%)</th>
<th>Men (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>50</td>
<td>40</td>
</tr>
<tr>
<td>Lower middle</td>
<td>44</td>
<td>39</td>
</tr>
<tr>
<td>Middle</td>
<td>37</td>
<td>36</td>
</tr>
<tr>
<td>Higher</td>
<td>38</td>
<td>34</td>
</tr>
</tbody>
</table>

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See Appendix 3.3 for definitions of annual household income categories

¥ Activities at home, school or work have been limited due to a long-term physical condition, mental condition or health problem
The proportion of adults who reported having activity limitations varied with ethnicity. Aboriginal women (45 percent) and men (38 percent) were most likely to report activity limitations.

Members of some ethnic groups (e.g., East and Southeast Asian) were less likely to report activity limitations than other groups. This observation may be due to the healthy immigrant effect.29, 30

The extent of the differences between women and men in the proportion who reported activity limitations varied by ethnic group.

EXHIBIT 3A.10 | Age-standardized percentage of adults aged 25 and older who reported having activity limitations¥, by sex and ethnicity, in Ontario, 2005

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aboriginal**</td>
<td>45</td>
<td>38</td>
</tr>
<tr>
<td>Black</td>
<td>20*</td>
<td>16*</td>
</tr>
<tr>
<td>South and West Asian, Arab</td>
<td>25</td>
<td>15*</td>
</tr>
<tr>
<td>East and Southeast Asian</td>
<td>16</td>
<td>11*</td>
</tr>
<tr>
<td>Other***</td>
<td>28</td>
<td>21</td>
</tr>
<tr>
<td>White</td>
<td>28</td>
<td>26</td>
</tr>
</tbody>
</table>

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

¥ Activities at home, school or work have been limited due to a long-term physical condition, mental condition or health problem

* Interpret with caution due to high sampling variability

** Includes self-identified off-reserve Aboriginal adults (North American Indian, Métis, Inuit)

*** Includes Latin American, other racial and multiple racial origins

NOTE: Ethnic group names are those used by Statistics Canada in the CCHS

POWER Study
EXHIBIT 3A.11 | Age-standardized percentage of adults aged 25 and older who reported having activity limitations\(^\ddagger\), by sex, annual household income and Local Health Integration Network (LHIN), in Ontario, 2005

**FINDINGS**

- There were differences across LHINs in the proportion of women and men who reported having activity limitations.
- The percentage of lower-income women who reported activity limitations ranged from 28 percent (Central West) to 39 percent (Toronto Central and Hamilton Niagara Haldimand Brant LHINs). Among higher-income women, the percentage reporting activity limitations ranged from 22 percent (Toronto Central and Central LHINs) to 30 percent (North West LHIN).
- In the North East LHIN 43 percent of lower-income men reported having activity limitations.

**Overall Ontario**

In Ontario, 34% of lower-income women, 25% of higher-income women, 30% of lower-income men and 23% of higher-income men reported having activity limitations.

Note: See Appendix 3.3 for definitions of annual household income categories

\(^\ddagger\)Activities at home, school or work that have been limited due to a long-term physical condition, mental condition or health problem

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1
PREVALENCE OF LIMITATIONS IN IADLS (INSTRUMENTAL ACTIVITIES OF DAILY LIVING) AND/OR ADLS (ACTIVITIES OF DAILY LIVING)

This indicator measures the percentage of the population who need the assistance of another person to carry out IADLs (Instrumental Activities of Daily Living—meal preparation, running errands, light and heavy household work and money management) and/or ADLs (Activities of Daily Living—washing, dressing, eating, taking medications, moving about inside the house).

IADL limitations represent difficulties in carrying out routine life activities and are generally interpreted as an indicator of mild to moderate disability. Limitations in ADLs reflect difficulty in carrying out self-care activities, and therefore represent a more severe disability. IADL and ADL limitations may result from either physical or mental impairments. Most people who report ADL limitations will also have IADL limitations.

Overall, 16 percent of the adult population aged 25 and older in Ontario reported having IADL and/or ADL limitations in 2005. Twenty percent of women and 11 percent of men reported having limitations in IADLs and/or ADLs.
FINDINGS

- There was an income gradient in the percentage of adults reporting limitations in IADLs and/or ADLs among adults aged 65 and older and also among those aged 25–64.

- In both age groups women were more likely than men to report these limitations. The gap between women and men was especially large in those aged 65 and older, regardless of income.

- More than half of low-income women age 65 and older reported IADL and/or ADL limitations.

- Among adults aged 25–64, 26 percent of low-income women and 20 percent of low-income men reported having IADL and/or ADL limitations.

- Women and men with lower levels of education were also more likely to report IADL and/or ADL limitations than those who had higher levels of education (data not shown).

EXHIBIT 3A.12 | Age-specific percentage of adults aged 25 and older who reported having limitations in IADLs (Instrumental Activities of Daily Living) and/or ADLs (Activities of Daily Living), by sex and annual household income, in Ontario, 2005

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1
NOTE: See Appendix 3.3 for definitions of annual household income categories

POWER Study
FINDINGS

- In all income categories, older women (those aged 65 and older) were much more likely than older men to report having limitations in IADLs.
- Forty-one percent of low-income older women and 37 percent of higher-income older women reported having limitations in IADLs.

EXHIBIT 3A.13 | Percentage of adults aged 65 and older who reported having limitations in IADLs (Instrumental Activities of Daily Living), by sex and annual household income, in Ontario, 2005

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See Appendix 3.3 for definitions of annual household income categories

EXHIBIT 3A.14 | Percentage of adults aged 65 and older who reported having limitations in ADLs (Activities of Daily Living)**, by sex and annual household income, in Ontario, 2005

FINDINGS

- Among older women living in the community, eight to 10 percent reported limitations in ADLs across income levels.
- Among older men living in the community, five to 10 percent reported limitations in ADLs across income levels.

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See Appendix 3.3 for definitions of annual household income categories
* Interpret with caution due to high sampling variability
** These adults may also have limitations in Instrumental Activities of Daily Living (IADLs)
EXHIBIT 3A.15  |  Age-standardized percentage of adults aged 25 and older who reported having limitations in Instrumental Activities of Daily Living (IADLs) and/or Activities of Daily Living (ADLs), by sex, education level and Local Health Integration Network (LHIN), in Ontario, 2005

**FINDINGS**

- There was regional variation in the percentage of adults who reported having limitations in IADLs and/or ADLs. Women were much more likely to report limitations than men, regardless of their level of educational attainment.
- The magnitude of the differences in the percentage of adults reporting limitations that were associated with educational attainment varied across LHINs.
- The percentage of women with a secondary school education or less who reported having IADL and/or ADL limitations ranged from 18 percent (Central West and Champlain LHINs) to 23 percent (Central, South East, North West and Mississauga Halton LHINs); and from 15 percent (Waterloo Wellington LHIN) to 23 percent (North West and South East LHINs) in women with at least some post-secondary school education.

*Interpret with caution due to high sampling variability*

**DATA SOURCE:** Canadian Community Health Survey (CCHS), Cycle 3.1
ACTIVITIES PREVENTED BY PAIN OR DISCOMFORT

This indicator measures the proportion of the population who reported that at least some of their activities were prevented due to pain or discomfort.

There are effective pain management strategies that can reduce the frequency and severity of chronic pain, therefore reducing its impact on daily activities.\textsuperscript{31, 32} Improvements on this indicator would represent improvements in functional status and quality of life.\textsuperscript{33}

Overall, 14 percent of the population aged 25 and older in Ontario reported having activity limitations due to pain or discomfort. Sixteen percent of women and 12 percent of men in Ontario reported having these limitations.

EXHIBIT 3A.16 | Age-standardized percentage of adults aged 25 and older who reported that their activities were prevented due to pain or discomfort, by sex and annual household income, in Ontario, 2000/01

| FINDINGS |

- There was an income gradient in the percentage of adults who reported that at least some of their activities were prevented due to pain or discomfort.

- One-quarter of low-income women and men in Ontario reported that their activities were limited by pain or discomfort.

- There was no difference between women and men in the percentage who reported pain-related activity limitations in both the low- and lower-middle income categories. Middle- and higher-income women were less likely than lower-income women (but more likely than men in these two income categories) to report that their activities were limited by pain or discomfort.

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 1.1

NOTE: See Appendix 3.3 for definitions of annual household income categories

POWER Study
FINDINGS

- There was a large income gradient in the percentage of adults who reported that their activities were prevented due to pain or discomfort, for adults aged 25–64 and those aged 65 and older.

- Twenty-five percent of low-income women and men aged 25–64 reported having pain or discomfort which prevented at least some of their activities.

- Older women were the most likely to report that their activities were limited due to pain or discomfort, with more than one-third (35 percent) of low-income women aged 65 and older reporting these limitations.

**EXHIBIT 3A.17** Age-specific percentage of adults aged 25 and older who reported that their activities were prevented due to pain or discomfort, by sex and annual household income, in Ontario, 2000/01

**DATA SOURCE:** Canadian Community Health Survey (CCHS), Cycle 1.1

* Interpret with caution due to high sampling variability

**NOTE:** See Appendix 3.3 for definitions of annual household income categories
HOSPITALIZATION RATE DUE TO FALL-RELATED INJURY AMONG SENIORS

Falls are the leading cause of injury-related hospitalizations for seniors in Canada.\textsuperscript{34}

This indicator measures rates of fall-related hospitalizations for older adults in Ontario. Fall-related injuries represent a significant health problem, as the consequences of fall injuries are far-reaching and result in many long-term disabilities and health problems. These injuries can also result in loss of independence or lead to institutionalization. Almost half of seniors who fall experience a minor injury, and five percent to 25 percent suffer a serious injury such as a fracture.\textsuperscript{35, 36} Of all fall-related fractures, hip fractures cause the greatest number of deaths and lead to the most severe health problems and reduced quality of life. In fact, falls cause more than 90 percent of all hip fractures in seniors and 20 percent die within a year of the fracture.\textsuperscript{37} There are effective public health and clinical interventions for reducing the rates of falls in seniors.

Overall, there were 23,923 fall-related hospitalizations in adults aged 65 and older in 2005/06 (16,692 in women and 7,231 in men). The rate of fall-related hospitalizations in that year was 1,483 per 100,000 adults aged 65 and older (1,837 per 100,000 women and 1,026 per 100,000 men).
**EXHIBIT 3A.18** | Rate of fall-related hospitalizations per 100,000 adults aged 65 and older, by sex, in Ontario, 2005/06

**FINDINGS**
- The number of fall-related hospitalizations increased with age for both women and men, with the highest rates observed among those aged 80 and older.
- Across all age groups, older women were more likely to be admitted to a hospital for fall-related injury than older men.

**DATA SOURCE:** Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

POWER Study
EXHIBIT 3A.19  | Age-standardized rate of fall-related hospitalizations per 100,000 adults aged 65 and older, by sex and neighbourhood income quintile, in Ontario, 2005/06

FINDINGS

- For all income groups, older women were approximately 50 percent more likely than older men to be admitted to a hospital for a fall-related injury.
- Low-income women and men were more likely to have a fall-related hospitalization than higher-income women and men, but the differences associated with income were not large.

DATA SOURCES: Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD); Statistics Canada 2001 Census

NOTE: See Appendix 3.3 for details about neighbourhood income quintile calculation
### EXHIBIT 3A.20 | Age-standardized rate of fall-related hospitalizations per 100,000 adults aged 65 and older, by sex, neighbourhood income and Local Health Integration Network (LHIN), in Ontario, 2005/06

<table>
<thead>
<tr>
<th>LHIN</th>
<th>Women Lower-income</th>
<th>Women Higher-income</th>
<th>Men Lower-income</th>
<th>Men Higher-income</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Erie St. Clair</td>
<td>1,877</td>
<td>1,771</td>
<td>1,343</td>
<td>1,158</td>
</tr>
<tr>
<td>2. South West</td>
<td>2,187</td>
<td>1,923</td>
<td>1,414</td>
<td>1,228</td>
</tr>
<tr>
<td>3. Waterloo Wellington</td>
<td>1,678</td>
<td>1,650</td>
<td>1,265</td>
<td>1,109</td>
</tr>
<tr>
<td>4. Hamilton Niagara Haldimand Brant</td>
<td>1,760</td>
<td>1,680</td>
<td>1,256</td>
<td>1,215</td>
</tr>
<tr>
<td>5. Central West</td>
<td>1,324</td>
<td>1,350</td>
<td>893</td>
<td>969</td>
</tr>
<tr>
<td>6. Mississauga Halton</td>
<td>1,550</td>
<td>1,556</td>
<td>1,057</td>
<td>987</td>
</tr>
<tr>
<td>7. Toronto Central</td>
<td>1,255</td>
<td>1,321</td>
<td>819</td>
<td>814</td>
</tr>
<tr>
<td>8. Central</td>
<td>1,475</td>
<td>1,319</td>
<td>940</td>
<td>975</td>
</tr>
<tr>
<td>9. Central East</td>
<td>1,655</td>
<td>1,473</td>
<td>1,060</td>
<td>1,004</td>
</tr>
<tr>
<td>10. South East</td>
<td>2,017</td>
<td>1,796</td>
<td>1,227</td>
<td>1,077</td>
</tr>
<tr>
<td>11. Champlain</td>
<td>1,885</td>
<td>1,668</td>
<td>1,398</td>
<td>1,241</td>
</tr>
<tr>
<td>12. North Simcoe Muskoka</td>
<td>2,071</td>
<td>1,988</td>
<td>1,589</td>
<td>1,467</td>
</tr>
<tr>
<td>13. North East</td>
<td>2,081</td>
<td>2,198</td>
<td>1,314</td>
<td>1,307</td>
</tr>
<tr>
<td>14. North West</td>
<td>1,950</td>
<td>1,958</td>
<td>1,326</td>
<td>1,405</td>
</tr>
<tr>
<td>Overall Ontario</td>
<td>1,742</td>
<td>1,622</td>
<td>1,171</td>
<td>1,105</td>
</tr>
</tbody>
</table>

**FINDINGS**

- Across all LHINs, women had a higher rate of fall-related hospitalizations than men.
- Rates of fall-related hospitalizations varied considerably across LHINs. For example, among lower-income women rates ranged from 1,255 per 100,000 (Toronto Central LHIN) to 2,187 per 100,000 (South West LHIN).
- The extent of the differences associated with income varied across LHINs.

**DATA SOURCES:** Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD) and Statistics Canada Census 2001

**NOTE:** Lower-income includes the two lowest neighbourhood income quintiles (Q1 and Q2); higher-income includes the three higher neighbourhood income quintiles (Q3, Q4 and Q5); see Appendix 3.3 for details about neighbourhood income calculation.
Section 3A

SUMMARY OF FINDINGS

There were large and potentially modifiable differences in health and functional status associated with income and education in Ontario. Low-income and less educated women and men in Ontario were much more likely to report fair or poor health, fair or poor mental health, activity limitations, IADL and/or ADL limitations, and limitations in their activities due to pain or discomfort than those with higher income or more education. For example, low-income women and men were more than three times as likely to report that their health was fair or poor compared to those in the highest income group. Among seniors, low-income women and men were also somewhat more likely to be hospitalized due to a fall. While women and men reported a similar distribution of fair or poor health, women reported higher rates of disability. Older women had higher rates of fall-related hospitalizations than older men. There was also variation in health and functional status across the Local Health Integration Networks (LHINs).

Ethnicity and language was also associated with health and functional status. In particular Aboriginal women and men (off-reserve) were more likely to report fair or poor health and activity limitations than other ethnic groups, with Aboriginal women more likely to report fair or poor health and activity limitations than Aboriginal men. Ontarians who spoke only French or neither French nor English were more likely to report fair or poor health than Ontarians who spoke English.

Findings for the indicators reported in this section are summarized below.

**Self-Rated Health**

There were large differences in self-rated health in Ontario associated with income, education, ethnicity and language, as well as across LHINs. Ontarians were more likely to report fair or poor health if they had lower income; lower levels of educational attainment; spoke French only or neither French nor English; or were Aboriginal people (off-reserve).

Overall, low-income women and men were more than three times more likely to report fair or poor health than higher-income women and men—the magnitude of these differences varied across Ontario LHINs.

**Self-Rated Mental Health**

There were large differences in self-rated mental health associated with income. Low-income women and men in Ontario were much more likely to report fair or poor mental health than those with higher-incomes.

**Activity Limitations**

Ontarians with low income and less education were much more likely to report that their activities at home, school or work had been limited due to a long-term physical condition, mental condition, or health problem than those with higher income or more education. Over one-third of low-income women and men in Ontario reported having activity limitations. A sizable income gradient in activity limitations was observed among adults both over and under age 65. Aboriginal adults
(women more so than men) were more likely to report activity limitations than other ethnic groups. While the prevalence of activity limitations varied by LHIN, they were more prevalent in lower versus higher-income women and men across most LHINs.

**IADL and ADL Limitations**

Ontarians with low income and less education were much more likely to report having a disability—as measured by reported limitations in IADLs (Instrumental Activities of Daily Living) and/or ADLs (Activities of Daily Living)—than those with higher income or more education. There was an income gradient in the percentage of adults reporting IADL and/or ADL limitations among adults aged 25–64 and those aged 65 and older. In both age groups women were more likely to report IADL and/or ADL limitations than men. Among lower-income adults, over 50 percent of older women and 25 percent of women aged 25–64 reported having limitations in IADLs and/or ADLs. Among adults aged 65 and older, eight to 10 percent of women and five to 10 percent of men reported limitations in ADLs across income levels.

**Activities Prevented by Pain**

There was also an income gradient in the percentage of adults who reported that at least some of their activities were prevented due to pain or discomfort. One in four low-income women and men in Ontario reported having activity limitations due to pain or discomfort. Older women were most likely to report that their activities were limited due to pain or discomfort, with 35 percent of low-income women aged 65 and older reporting these limitations.

**Fall-related Hospitalizations**

The number of fall-related hospitalizations increased with age, for both women and men, with the highest rates observed among individuals aged 80 and older. Older women were approximately 50 percent more likely than older men to be admitted to a hospital for a fall-related injury. Low-income women and men were somewhat more likely to have a fall-related hospitalization than higher-income women and men. The rate of fall-related hospitalizations varied across LHINs.
Chapter 3

Project for an Ontario Women’s Health Evidence-Based Report (POWER) Study

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Section 3B

Chronic disease risk factors

INTRODUCTION

Chronic diseases are a major contributor to health inequities in Ontario. Social determinants of health, such as income and education level, and health behaviours, such as smoking and sedentary lifestyle, increase the risk of developing chronic disease.5

Common, modifiable risk factors—smoking, obesity, physical inactivity, and inadequate fruit and vegetable intake—contribute to the development of many different chronic conditions including hypertension, cardiovascular disease, diabetes and cancer. Health behaviours are influenced by culture, living and working conditions, income, education, and by other social factors as well as by individual choices.10, 39, 40 Health behaviours such as poor diet and sedentary lifestyle are responsible for rising prevalence of obesity, a major public health concern.41 Food insecurity also increases the risk of obesity as lower-cost foods are often high in calories and fat.42 Poverty increases the risk of poor health and creates many barriers to accessing resources to improve health such as safe, well-designed neighbourhoods for physical activity or an affordable nutritious diet.43 Low levels of health literacy associated with lower levels of educational attainment can make it more difficult to access and understand information about improving health.44, 45 This section provides an assessment of the prevalence of major risk factors for chronic disease among women and men in Ontario and how these vary by socioeconomic status, ethnicity and where one lives.

While the same risk factors contribute to the development of chronic disease for women and men, there are gender differences in the prevalence of these risk factors.46 Therefore, their relative contribution to the development of chronic disease in women and men also differs. In addition, women are more likely than men to live in poverty, be single parents, or have care-giving responsibilities that can create barriers to a healthy lifestyle.47, 48

Population and public health interventions can be effective in reducing the prevalence of high-risk behaviours, as can chronic disease prevention services in clinical settings. To be successful, interventions need to address the contextual factors—socioeconomic, social and environmental—that influence health behaviours.39 Policies that address the social determinants of health need to be an important component of efforts to reduce population risk for chronic disease.25 To be most effective, prevention efforts must be tailored to gender differences, as well as target the specific needs of vulnerable population subgroups. Tracking these indicators over time can serve to monitor the effectiveness of these interventions.

In this section we report on indicators that assess selected health behaviours and social determinants of health known to increase the risk of developing common chronic conditions.
Social Determinants of Health

Income and education are measures of socio-economic status and are important social determinants of health. A strong relationship has been consistently found between both income and education and health status, such that having lower income and lower levels of educational attainment greatly increases the risk of developing chronic disease. As it is possible to reduce the proportion of the population living in poverty, as well as increase the levels of educational attainment these indicators represent important, modifiable risk factors for chronic disease.

Food insecurity, or inadequate access to a healthy diet, is associated with worse health status and increased use of clinical services. Because many lower-cost foods are high in fats and carbohydrates, food insecurity has also been linked to obesity. Good nutrition promotes health, reduces the risk of illness and chronic disease, and improves health outcomes among individuals with chronic conditions.

Health Behaviours

Physical inactivity increases the risk of many chronic conditions including cardiovascular disease, hypertension, cancer and osteoporosis. Physical activity is associated with positive mental health, leading to increased self-confidence and an improved sense of well-being. Physical inactivity is an important risk factor for being overweight or obese.

Inadequate fruit and vegetable consumption is associated with many negative health consequences including an increased risk of cancer, cardiovascular disease, stroke and the acceleration of many functional declines associated with aging.

Being overweight or obese is associated with numerous health problems including Type 2 diabetes, dyslipidemia, hypertension, ischemic heart disease, stroke, gallbladder disease, obstructive sleep apnea and certain cancers. Obesity costs Ontario $1.6 billion annually: $647 million in direct costs and $905 million in indirect costs. From 1985 to 2000, a total of 57,000 deaths in Canada were associated with being overweight or obese.

Smoking is linked to high relative risks of mortality and morbidity from cardiovascular and respiratory diseases and lung cancer, making tobacco use the leading preventable cause of premature death, disease and disability. In Ontario, tobacco-related disease results in approximately $1.6 billion in health care annually, $4.4 billion in productivity losses, at least 500,000 hospital days, and 16,000 deaths each year.

Ontario has had some success in reducing population risk by reducing the number of its citizens who smoke through Ontario’s Smoke-Free Strategy. Other initiatives through Ontario’s Ministry of Health Promotion, Ministry of Health and Long-Term Care and Public Health Units are aimed at increasing physical activity, reducing obesity, and promoting healthy diets in Ontario. However, the prevalence of these risk factors remains high. To be most effective, prevention efforts must be tailored to gender differences as well as target vulnerable population subgroups.
EXHIBITS AND FINDINGS

INCOME AND EDUCATION

Education and income are measures of socioeconomic status and are important social determinants of health. They are both strongly associated with health and functional status and the risk of developing chronic disease. These indicators measure the percentage of the population who reported living in lower-income households or having lower levels of education, defined here as secondary school graduation or less.

Overall, 32 percent of Ontarians aged 25 and older reported having secondary school graduation or less and 21 percent lived in lower-income households in 2005. Among women, 33 percent reported having secondary school graduation or less, and 24 percent lived in lower-income households in 2005. Among men, 31 percent reported having secondary school graduation or less, and 18 percent lived in lower-income households in 2005.
**EXHIBIT 3B.1** Percentage of adults aged 25 and older who reported a lower annual household income or less education, by sex and selected sociodemographic characteristics, in Ontario, 2005

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Women Lower-income</th>
<th>Men Lower-income</th>
<th>Women Less education</th>
<th>Men Less education</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age group (years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>25–44</td>
<td>21</td>
<td>15</td>
<td>21</td>
<td>23</td>
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<td>45–64</td>
<td>18</td>
<td>15</td>
<td>34</td>
<td>31</td>
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<tr>
<td>65–79</td>
<td>44</td>
<td>33</td>
<td>57</td>
<td>46</td>
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<tr>
<td>80+</td>
<td>52</td>
<td>35</td>
<td>68</td>
<td>48</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
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<td>15</td>
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<tr>
<td>Black</td>
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<tr>
<td>East and Southeast Asian</td>
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<tr>
<td>Arab, South and West Asian</td>
<td>47</td>
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</tr>
<tr>
<td>Other</td>
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<td>Aboriginal</td>
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<td>34</td>
<td>47</td>
<td>43</td>
</tr>
<tr>
<td><strong>Knowledge of official languages</strong></td>
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<td></td>
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<tr>
<td>English only</td>
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<td>16</td>
<td>33</td>
<td>34</td>
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<tr>
<td>French only</td>
<td>36*</td>
<td>53</td>
<td>46</td>
<td>77</td>
</tr>
<tr>
<td>English and French only</td>
<td>19</td>
<td>11</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>English or French with other language</td>
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<td>23</td>
<td>30</td>
<td>25</td>
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<tr>
<td>Neither English nor French</td>
<td>45</td>
<td>33</td>
<td>58</td>
<td>58</td>
</tr>
<tr>
<td><strong>Urban and rural living</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>24</td>
<td>18</td>
<td>32</td>
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</tr>
<tr>
<td>Rural</td>
<td>21</td>
<td>18</td>
<td>35</td>
<td>36</td>
</tr>
<tr>
<td><strong>Length of immigration</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0–9 years</td>
<td>43</td>
<td>45</td>
<td>26</td>
<td>18</td>
</tr>
<tr>
<td>10+ years</td>
<td>28</td>
<td>20</td>
<td>36</td>
<td>30</td>
</tr>
<tr>
<td>Non-immigrants</td>
<td>20</td>
<td>14</td>
<td>32</td>
<td>30</td>
</tr>
</tbody>
</table>

**DATA SOURCE:** Canadian Community Health Survey (CCHS), Cycle 3.1

* Interpret with caution due to high sampling variability

** Age-standardized; ethnic group names are those used by Statistics Canada in the CCHS

^ Lower-income includes the two lowest annual household income categories; see Appendix 3.3 for definitions of annual household income categories

¥ Less education denotes secondary school education or less
EXHIBIT 3B.1 | Percentage of adults aged 25 and older who reported a lower annual household income or less education, by sex and selected sociodemographic characteristics, in Ontario, 2005

FINDINGS

• The proportion of the population who reported lower income or a lower level of educational attainment varied by sex, as well as by age group, ethnicity, knowledge of official languages, rural or urban living, and length of immigration.

Age Group

• Across all age groups, women were more likely to report lower income than men, with differences greatest among women aged 65 and older. Forty-four percent of women aged 65–79 and 52 percent of those aged 80 and older reported lower income compared to 33 percent and 35 percent of men in those age groups, respectively.

• Among women and men aged 25–64, a similar proportion reported having a secondary school education or less. However, among adults aged 65 and older women were much more likely to report lower levels of educational attainment. Fifty-seven percent of women aged 65–79 and 68 percent of those over 80 years of age reported a secondary school education or less compared to 46 percent and 48 percent of men in those age groups, respectively.

Ethnicity

• There were large differences in income associated with race and ethnicity. White Ontarians were least likely to reside in lower-income households, including 21 percent of women and 15 percent of men. Women and men of all other racial and ethnic groups were more likely to report living in lower-income households. Forty-two percent of Black women and 41 percent of Black men resided in lower-income households, as did 44 percent of Aboriginal women and 34 percent of Aboriginal men, and 47 percent of Arab, South and West Asian women and 38 percent of Arab, South and West Asian men.

• There were also large differences in education associated with race and ethnicity. About one in three White Ontarians reported a secondary school education or less. East and Southeast Asians reported the highest levels of educational attainment with 27 percent of women and 22 percent of men reporting a high school education or less. Among Black Ontarians women had higher levels of educational attainment than men, whereas Arab, South and West Asian men reported higher levels of educational attainment than women. Forty-seven percent of Aboriginal women and 43 percent of Aboriginal men reported secondary school graduation or less.

Knowledge of Official Languages

• Languages spoken were also associated with income and education. Ontarians who spoke only French or neither French nor English were most likely to reside in low-income households and have a secondary school education or less. Only 11 percent of men who spoke both French and English resided in lower-income households.

Length of Immigration

• Despite higher levels of educational attainment than the overall Ontario population, immigrants who have resided in Canada for 0–9 years were much more likely to reside in lower-income households. Among these recent immigrants, 43 percent of women and 45 percent of men lived in lower-income households compared to 20 percent of women and 14 percent of men who were born in Canada.
EXHIBIT 3B.2  | Age-standardized percentage of adults aged 25 and older who reported having lower annual household income, by sex and Local Health Integration Network (LHIN), in Ontario, 2005

FINDINGS

• The percentage of adults who reported having lower household income (the two lowest annual household income categories) varied by LHIN.

• Across nearly all LHINs, women were more likely to report having lower household income than men.

• The North East LHIN had the highest percentage of low-income women (32 percent) and men (23 percent).
EXHIBIT 3B.3 | Age-standardized percentage of adults aged 25 and older who reported having secondary education or less, by sex and Local Health Integration Network (LHIN), in Ontario, 2005

FINDINGS

- The percentage of adults who reported having secondary school graduation or less varied by LHIN.
- The magnitude and direction of the difference in the percentage of women and men who reported having less education also varied across LHINs.
- The percentage of women who reported having less education ranged from 25 percent (Toronto Central LHIN) to 41 percent (North East LHIN); and among men the percentage ranged from 19 percent (Mississauga Halton LHIN) to 42 percent (Central West LHIN).

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1
FOOD INSECURITY

Food insecurity is an indicator of the percentage of adults who reported that due to a lack of money they or a member of their household did not have enough to eat, worried about there not being enough to eat, or did not eat the quality or variety of foods desired.

Good nutrition promotes health, reduces the risk of illness and chronic disease, and improves health outcomes among individuals with chronic conditions. As such, food insecurity is associated with worse health status and increased use of clinical services.

Overall, five percent of Ontario adults aged 25 and older reported food insecurity in 2005. Food insecurity was reported by six percent of women and four percent of men.

EXHIBIT 3B.4 | Age-standardized percentage of adults aged 25 and older who reported food insecurity, by sex and annual household income, in Ontario, 2005

FINDINGS

- There was a large income gradient in the percentage of adults who reported food insecurity, with one-quarter of low-income women and men reporting that they did not have enough to eat, worried about there not being enough to eat, or did not eat the quality or variety of foods they desired due to a lack of money.

- Not surprisingly, food insecurity was not reported to be a problem in the higher-income category.

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See Appendix 3.3 for a description of annual household income categories

* Interpret with caution due to high sampling variability
HEALTH BEHAVIOURS THAT INCREASE THE RISK OF CHRONIC DISEASE

This group of indicators measures the percentage of the population who reported four major factors that increase the risk for chronic diseases and their associated morbidity and premature mortality: physical inactivity, inadequate fruit and vegetable intake, being overweight or obese and smoking.

Physical Inactivity: This indicator measures the percentage of the population who reported physical inactivity (physical activity index of less than 1.5 kcal/kg/day).\(^{60}\)

Inadequate Fruit and Vegetable Intake: This indicator measures the percentage of the population who reported having inadequate fruit and vegetable consumption (less than five servings per day).

Being Overweight or Obese: This indicator measures the percentage of the population whose Body Mass Index (BMI), calculated from self-reported height and weight, is greater than or equal to 25. This indicator is particularly subject to measurement error as people may under or over report their height and weight.

Smoking: This indicator measures the percentage of the population who reported being current smokers (daily or occasional).

Overall, more than half of Ontario adults aged 25 and older reported physical inactivity (51 percent), inadequate fruit and vegetable intake (57 percent), and being overweight or obese (53 percent), while one fifth were current smokers (22 percent). Among women, 54 percent reported physical inactivity, 50 percent reported inadequate fruit and vegetable intake, 45 percent were overweight or obese and 19 percent were current smokers. Among men, 49 percent reported physical inactivity, 64 percent reported inadequate fruit and vegetable intake, 62 percent were overweight or obese and 24 percent were current smokers.
FINDINGS

• The proportion of Ontarians who reported these risk factors was high across all levels of education.

• Overall, lower levels of education were associated with a higher prevalence of factors that are known to increase the risk of chronic diseases. A similar pattern was observed for income (data not shown).

• Women and men with lower levels of education were more likely to report being physically inactive—65 percent of women and 59 percent of men with less than a secondary school education compared to 48 percent of women and 41 percent who had a Bachelor’s degree or higher.

• Women and men with lower levels of education were more likely to report inadequate fruit and vegetable intake—60 percent of women and 69 percent of men with less than a secondary school education compared to 42 percent of women and 57 percent who had a Bachelor’s degree or higher.

• Women and men with lower levels of education were more likely to be overweight or obese—55 percent of women and 66 percent of men with less than a secondary school education compared to 34 percent of women and 55 percent of men who had a Bachelor’s degree or higher. The differences associated with education were larger for women.

• Women and men with lower levels of education were more likely to smoke—28 percent of women and 40 percent of men with less than a secondary school education compared to 8 percent of women and 13 percent of men who had a Bachelor’s degree or higher.

• In general, women were somewhat more likely to report that they were physically inactive, but had a lower prevalence of inadequate fruit and vegetable intake, being overweight or obese and smoking, than men.

EXHIBIT 3B.5 Age-standardized percentage of adults aged 25 and older who reported health behaviours that increase the risk of chronic diseases, by sex and education level, in Ontario, 2005

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

* Physical Activity Index of < 1.5 cal/kg/day

** Daily consumption of less than five servings of fruits and vegetables

*** Body Mass Index (BMI) ≥ 25, calculated from self-reported height and weight

^ Current smokers (daily or occasional)
**FINDINGS**

- The percentage of adults who reported health behaviours that increase the risk of chronic disease varied by ethnicity and sex.

- Aboriginal men were more likely to be physically active, but reported higher rates of inadequate fruit and vegetable intake, obesity and smoking than women.

- East and Southeast Asian women had the lowest prevalence of being overweight or obese (17 percent).

- East and Southeast Asian women (four percent), South and West Asian, and Arab women (five percent) were least likely to report that they were current smokers.

- Aboriginal women and men (39 percent and 43 percent, respectively), followed by White women and men (22 percent and 25 percent, respectively) were most likely to report that they were current smokers.

**DATA SOURCE:** Canadian Community Health Survey (CCHS), Cycle 3.1

* Interpret with caution due to high sampling variability

** Includes self-identified off-reserve Aboriginal adults (North American Indian, Métis, Inuit)

*** Includes Latin American, other racial and multiple racial origins

**NOTE:** The ethnic group names are those used by Statistics Canada in the CCHS

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**EXHIBIT 3B.6** | Age-standardized percentage of adults aged 25 and older who reported physical inactivity, inadequate fruit and vegetable intake, being overweight or obese, or being current smokers, by sex and ethnicity, in Ontario, 2005
EXHIBIT 3B.7 | Age-standardized percentage of adults aged 25 and older who reported physical inactivity**, by sex, education level and Local Health Integration Network (LHIN), in Ontario, 2005

FINDINGS

- There was variation across LHINs in the percentage of adults who reported being physically inactive.
- Across all LHINs women and men who had a secondary school education or less were more likely to report being physically inactive than women and men who had at least some post-secondary education.

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1
EXHIBIT 3B.8 | Age-standardized percentage of adults aged 25 and older who reported having inadequate fruit and vegetable intake**, by sex, education level and Local Health Integration Network (LHIN), in Ontario, 2005

FINDINGS

• There was variation across LHINs in the percentage of adults who reported having inadequate fruit and vegetable intake.

• Across all LHINs, men were more likely to report inadequate fruit and vegetable intake than women; in several LHINs nearly three-quarters of less-educated men reported this risk factor.

• Women with less education were more likely to report having inadequate fruit and vegetable intake than those with more education. The same pattern was seen for men.

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1
EXHIBIT 3B.9  |  Age-standardized percentage of adults aged 25 and older who were overweight or obese**, by sex, education level and Local Health Integration Network (LHIN), in Ontario, 2005

FINDINGS

- There was some variation across LHINs in the percentage of adults who were overweight or obese (using Body Mass Index calculated from self-reported height and weight).

- The percentage of women who were overweight or obese ranged from 45 percent (Central East LHIN) to 56 percent (Erie St. Clair LHIN) among those with less education; and from 35 percent (Central LHIN) to 55 percent (North West LHIN) among women who were more educated.

- The percentage of men who were overweight or obese ranged from 57 percent (Central LHIN) to 74 percent (North West LHIN) among those with less education; and from 54 percent (Toronto Central LHIN) to 71 percent (North East and North West LHINs) among men who were more educated.

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

Note: Lower education denotes secondary school graduation or less.
**EXHIBIT 3B.10** | Age-standardized percentage of adults aged 25 and older who reported being daily or occasional smoker, by sex, education level and Local Health Integration Network (LHIN), in Ontario, 2005

**FINDINGS**

- There was variation across LHINs in the percentage of adults who reported being current smokers.
- Reported smoking behaviour varied with education level, ranging from 11 percent in more educated to 38 percent in less educated women (in the Central and North West LHINs, respectively) and 15 percent in more educated men to 47 percent in less educated men (in the Champlain and Toronto Central LHINs, respectively).
- The magnitude of the difference between women and men with similar levels of education varied across LHINs.

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**Overall Ontario**

In Ontario, 27% of women with lower education, 16% of women with higher education, 34% of men with lower education and 20% of men with higher education reported being current smokers.

Note: Lower education denotes secondary school graduation or less

**DATA SOURCE:** Canadian Community Health Survey (CCHS), Cycle 3.1
Section 3B

SUMMARY OF FINDINGS

Women were more likely to be living in lower-income households than men. The prevalence of low-income and lower levels of educational attainment varied by age, gender, ethnicity, language spoken and length of time residing in Canada. Food insecurity was common among low-income Ontarians with one in four reporting challenges in accessing a healthy diet. The proportion of Ontarians who reported health behaviours that increase the risk of chronic disease—smoking, obesity, physical inactivity, and inadequate fruit and vegetable intake—was, in general, high across all levels of education and income. There were sizable and modifiable differences in the prevalence of these risk factors associated with education, income and ethnicity. Lower levels of education and income were consistently associated with a higher prevalence of these risk factors. In general, women were somewhat more likely to report that they were physically inactive than men, but had a lower prevalence than men of inadequate fruit and vegetable intake, being overweight or obese and smoking. Across the Local Health Integration Networks (LHINs), there was also variation in income and education, food insecurity and health behaviours that increase the risk of chronic disease.

Findings for the indicators reported in this section are summarized below.

Income and Education

Across all age groups, women were more likely to report lower income than men, with differences greatest among those aged 65 and older. Among men and women aged 25–64, a similar proportion reported having a secondary school education or less. However, among adults aged 65 and older, women were much more likely than men to report lower levels of educational attainment. There were large differences in income associated with ethnicity. White Ontarians were least likely to reside in lower-income households. Women and men of all other ethnic groups were more likely to report living in lower-income households. There were also large differences in education associated with ethnicity. East and Southeast Asians reported the highest levels of educational attainment. Among Black Ontarians, women had higher levels of educational attainment than men, whereas among Arab, South and West Asians, men reported higher levels of educational attainment than women. Forty-seven percent of Aboriginal women and 44 percent of Aboriginal men reported secondary school graduation or less. Languages spoken were also associated with income and education. Ontarians who spoke only French or neither French nor English were most likely to report residing in low-income households and having a secondary school education or less. Despite higher levels of educational attainment than the overall Ontario population, immigrants who have resided in Canada for 0–9 years were much more likely to reside in households with lower income. There was variation in the proportion of men reporting low income and lower levels of education across the LHINs.

Food Insecurity

While overall five percent of Ontarians report food insecurity, one in four low-income women and men reported that they did not have enough to eat, worried about there not being enough to eat, or did not eat the quality or variety of foods they desired due to a lack of money.
Southeast Asian, South and West Asian and Arab women were least likely to report that they were current smokers, while 39 percent of Aboriginal women reported smoking. Aboriginal men had the lowest rates of physical inactivity but reported higher rates of inadequate fruit and vegetable intake, being overweight or obese and smoking. There was variation in the prevalence of these risk factors and the magnitude of the difference between men and women across LHINs.

Health behaviours that increase the risk of chronic disease

The percentage of adults who reported health behaviours that increase the risk of chronic disease was high and varied by sex, education, income, ethnicity and geography. Lower levels of education and income were consistently associated with a higher prevalence of these risk factors. Ontario women were more physically inactive but had lower rates of inadequate fruit and vegetable intake, being overweight or obese and smoking than men. East and Southeast Asian women had the lowest prevalence of being overweight or obese. East and
Section 3C

Chronic Conditions

INTRODUCTION

Chronic conditions have a large impact on quality of life and the affected individual’s ability to function and work, while placing enormous demands upon the health care system.

In this section we report on selected chronic health conditions—hypertension (high blood pressure), arthritis, obstructive lung disease (asthma, chronic bronchitis, emphysema and chronic obstructive pulmonary disease), diabetes, heart disease and stroke, urinary incontinence and depression and how they vary by gender and income. These conditions are among the most prevalent in Canada and cause substantial burden to individuals, their families, the health care system and society as a whole. According to the Public Health Agency of Canada (PHAC), 16 million Canadians live with a chronic illness, and more than half of these are women.\(^{61}\) Furthermore, chronic diseases are estimated to account for 87 percent of disability in Canada. In 2007, PHAC estimated that 67 percent of total health care costs were due to chronic diseases, with an additional $52 billion in indirect costs due to loss of productivity and foregone income.\(^{61}\) As the population of Ontario ages, the prevalence of chronic disease and its associated burden will continue to rise.

The causes of chronic disease are multi-factorial; many of them are modifiable. As such, it is possible to prevent much of the morbidity and premature mortality associated with chronic illness. Factors which contribute to the development of chronic conditions include lifestyle, such as diet, body weight, physical activity level, smoking and drinking; environmental exposures; and genetics.\(^{62, 63}\)

Many of the risk factors for different chronic conditions are the same. Therefore, many people with chronic illness have more than one condition. For example smoking increases the risk of lung disease, heart disease, stroke and cancer; obesity increases the risk of arthritis, diabetes, heart disease, hypertension and cancer.

Patterns of chronic disease and their consequences differ for women and men. For example, women are more likely than men to have arthritis, which leads to higher rates of disability. Women usually develop heart disease about ten years later than men, but women who have diabetes lose this advantage. Women are more likely to experience depression or have multiple chronic conditions than men.

The prevalence of chronic disease also varies by ethnicity. Aboriginal people have a higher prevalence of diabetes than Canadians of European origin. South Asians are at increased risk for heart disease. Furthermore, socioeconomic position is strongly associated with an increased burden of common chronic conditions and comorbidity. Individuals with low income and/or less education are more likely to have chronic illness and comorbidity than those who have higher income or more education.\(^ {50, 64, 65}\)

While much can be done to reduce the burden of illness and disability associated with chronic disease, a number of important challenges exist. First, prevention through both public health and clinical services has traditionally been under-resourced. Second, while there is considerable...
Arthritis accounts for over $17 billion annually in health care expenses and lost workdays. As the baby boomer population ages, the burden of illness due to arthritis will continue to rise. It has been estimated that one million more Canadians per decade will be diagnosed with arthritis. 

Women experience a higher prevalence of arthritis than men. 

Women with arthritis are more likely than women with other chronic conditions to experience long-term disability, report worse health status, experience pain and be dependent upon others for assistance. 

Obstructive lung disease

Obstructive lung disease (asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease [COPD]) is an important cause of morbidity and mortality, and often leads to activity restrictions. These conditions cause obstruction of airflow in the lungs that interferes with normal breathing.

In childhood, asthma is more common among boys than girls; however, beyond childhood women are more likely to develop asthma than men.

Historically, men were more likely to get COPD than women due to higher rates of smoking, but since the rate of smoking among women has increased, the rate of COPD among women has also increased.

Important risk factors for obstructive lung disease include exposure to tobacco smoke, long-term exposure to air pollution (both in the home and outdoors) and occupational exposures.

Diabetes

About 900,000 Ontarians live with diabetes (8.8 percent of the province’s population) and this number is expected to grow to 1.2 million by 2010.

Diabetes and its complications (e.g., heart disease, stroke, kidney disease and blindness) cost the health care system over five billion dollars annually.
• The number of people with diabetes is projected to increase substantially over the next 20 years, largely as a result of increases in rates of obesity and physical inactivity, and the aging of the population.\textsuperscript{72}

• Lifestyle changes—healthy diet, physical activity and maintaining a healthy weight—reduce the risk of developing diabetes. Evidence-based disease management can greatly reduce the risk of developing complications from the disease.

Heart disease or stroke  
• Cardiovascular disease (heart disease and stroke) is a leading cause of morbidity and mortality for both women and men in Ontario.

• The onset of coronary heart disease (CHD) in women lags behind men by about 10 years due to the protective effect of estrogen prior to menopause. Although the prevalence of CHD among women before menopause is lower than that in men, this difference narrows with age—at age 80 the prevalence of CHD is nearly equal for women and men.

• Although men are more likely than women to have a stroke, women are more likely than men to die from stroke, primarily because women who have strokes are older and stroke mortality is higher with increasing age.

• As for other chronic conditions, lifestyle changes—healthy diet, physical activity, maintaining a healthy weight, and smoking cessation—reduce the risk of developing heart disease or stroke, and evidence-based disease management can greatly reduce the risk of developing complications from chronic diseases.

Urinary incontinence  
• Urinary incontinence, or the involuntary leakage of urine, is more common in women than in men.

• Urinary incontinence can have a large impact on quality of life and functional status.

• It is a common problem among older adults and is a leading cause of institutionalization among the elderly, with at least 50 percent of long-term care facility admissions listing a diagnosis of incontinence.

• Many people believe that urinary incontinence is a normal part of aging, when in fact it is not. For this reason, many people don’t seek medical help and never get properly diagnosed.\textsuperscript{73}

Depression  
• Depression is a chronic mental health condition which causes clinically significant distress or impairment in physical, social, occupational and other key areas of functioning.

• Women are twice as likely as men to experience an episode of depression in their lifetime. Factors such as stress, violence, poverty, inequality, sexism, caregiving, relational problems and low self-esteem are thought to increase women’s vulnerability to depression.

• Effective treatment can greatly reduce morbidity associated with depression.

Comorbidity (Multiple Chronic Conditions)  
• Because many of the risk factors for different chronic conditions are the same (e.g., diet, lack of physical exercise, and smoking) many people with chronic illness have more than one chronic condition.

• The majority of adults aged 65 and older have two or more chronic conditions.

• Women are more likely to have multiple chronic conditions than men.

• People who have multiple chronic conditions require coordinated patient-centred care to optimize health outcomes.

There are a number of initiatives in Ontario aimed at reducing illness burden from chronic disease. For example, the Ontario Ministry of Health Promotion supports chronic disease prevention through the Chronic Disease Prevention Program (CDP). The CDP aims to reduce the premature mortality and morbidity from preventable chronic diseases. The recently released diabetes strategy of the Ministry of Health and Long-Term Care seeks to implement a chronic disease model for diabetes care.\textsuperscript{72}
EXHIBITS AND FINDINGS

PREVALENCE OF SELECTED CHRONIC CONDITIONS

This group of indicators measures the prevalence of selected chronic conditions (the percentage of the population who reported having these conditions diagnosed by a health professional): hypertension, arthritis, obstructive lung disease (asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease), diabetes, heart disease or stroke, and urinary incontinence.

Many chronic conditions such as hypertension or diabetes can be present for years without causing symptoms. If persons who are socioeconomically disadvantaged encounter more barriers accessing care and therefore are not diagnosed, this would result in an underestimate of prevalence in these populations, as well as an underestimate of the differences between the most and least advantaged groups. The causes for these common chronic conditions are multi-factorial, but a large proportion of these conditions are preventable. Health behaviours (e.g., diet, body weight, physical activity, and smoking), environmental exposures, and social and community factors associated with the development of these conditions are all modifiable.

Overall in 2005, 25 percent of Ontario adults aged 25 and older reported hypertension, 21 percent reported arthritis, 10 percent reported obstructive lung disease, six percent reported diabetes, seven percent reported heart disease or stroke and four percent reported urinary incontinence. For Ontario women, 25 percent reported hypertension, 25 percent reported arthritis, 12 percent reported obstructive lung disease, five percent reported diabetes, six percent reported heart disease or stroke and five percent reported urinary incontinence. For Ontario men, 24 percent reported hypertension, 17 percent reported arthritis, eight percent reported obstructive lung disease, seven percent reported diabetes, eight percent reported heart disease or stroke and three percent reported urinary incontinence.
**FINDINGS**

- Women and men in the low-income category were most likely to report having hypertension, arthritis, obstructive lung disease, diabetes, or heart disease or stroke. An income gradient was observed for most of these conditions.
- Approximately 30 percent of low-income women and men reported having hypertension.
- Across all income categories, women were more much likely than men to report having arthritis—32 percent and 20 percent for low-income women and men, respectively.
- Diabetes was reported by eight percent of women in the low-income category compared to three percent in the higher-income category. Among men, 10 percent in the low-income category reported having diabetes compared to five percent in the higher-income category.
- A similar pattern was observed for education (data not shown).

**EXHIBIT 3C.1** Age-standardized percentage of adults aged 25 and older who reported having selected chronic diseases, by sex and annual household income, in Ontario, 2005.

**DATA SOURCE:** Canadian Community Health Survey (CCHS), Cycle 3.1

* Obstructive lung disease includes asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease

**NOTE:** See Appendix 3.3 for definitions of annual household income categories
FINDINGS

- As expected, adults aged 65 and older were more likely to report having chronic disease than adults aged 25–64.

- Women of all ages were more likely than men in the same age group to report having arthritis, whereas men were more likely to report having heart disease or stroke and diabetes. Hypertension was more prevalent among older women compared to older men.

- There was an income gradient in the percentage of adults reporting most chronic diseases, specifically among both women and men aged 25–64 and those aged 65 and older.

- Among low-income women aged 65 and older, two in three reported having hypertension or arthritis, one in five reported having diabetes and one in four reported having heart disease or stroke.

- Among low-income men aged 65 and older, one in two reported having hypertension, one in three reported having arthritis, one in five reported having diabetes and nearly one in three reported having heart disease or stroke.

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

* Interpret with caution due to high sampling variability

NOTE: See Appendix 3.3 for definitions of annual household income categories
EXHIBIT 3C.3 | Percentage of adults aged 65 and older who reported having urinary incontinence, by sex and annual household income, in Ontario, 2005

FINDINGS

• Urinary incontinence was reported by about one in 10 women and men aged 65 and older (rates of urinary incontinence from the CCHS are lower than those of other population health surveys which may be due to the way the question was asked). The percentages of women and men who reported having urinary incontinence did not vary greatly across income categories.

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

* Interpret with caution due to high sampling variability

NOTE: See Appendix 3.3 for a description of annual household income categories

POWER Study
**EXHIBIT 3C.4** | Age-standardized percentage of adults aged 25 and older who reported having arthritis, by sex, education level and Local Health Integration Network (LHIN), in Ontario, 2005

**FINDINGS**

- The percentage of adults who reported having arthritis was higher in women than in men across all LHINs.
- The percentage of women who reported having arthritis ranged from 24 percent (Central East LHIN) to 34 percent (North East and Erie St. Clair LHINs) among those with less education; and from 18 percent (Central LHIN) to 33 percent (North West LHIN) among women who were more educated.

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

**Overall Ontario**

In Ontario, 28% of women with lower education, 23% of women with higher education, 19% of men with lower education and 16% of men with higher education reported having arthritis.

Note: Lower education denotes secondary school graduation or less.
**EXHIBIT 3C.5** | Age-standardized percentage of adults aged 25 and older who reported having hypertension, by sex, education level and Local Health Integration Network (LHIN), in Ontario, 2005

**FINDINGS**

- The percentage of the population who reported having hypertension varied across LHINs.
- The magnitude and direction of the difference in the percentage of women and men who reported having hypertension varied across LHINs.

**Overall Ontario**
In Ontario, 27% of women with lower education, 23% of women with higher education, 25% of men with lower education and 24% of men with higher education reported having hypertension.

**Note:** Lower education denotes secondary school graduation or less.

**DATA SOURCE:** Canadian Community Health Survey (CCHS), Cycle 3.1

**POWER Study**
PREVALENCE OF DEPRESSION

This indicator measures the percentage of adults who—based on their scores in the Composite International Diagnostic Interview-Short Form for Major Depression (CIDI-SFMD) questionnaire—had a high probability of having major depression.

Many more Ontarians have milder forms of depression. The CIDI-SFMD was never fully validated, therefore, the percentages reported here may differ from actual population prevalence. However, the relationship between this indicator and sex and income are illustrated (see Appendix 3.3 for further details).

Depression is among the most common mental disorders and is the most treatable one. Approximately eight percent of adults will experience major depression at some time in their lives. Depression is associated with considerable utilization of health services and can impair functioning and cause substantial suffering and disruption in the lives of those affected. Depression is known to be associated with socioeconomic status, ethnicity, immigration status, geography of residence (urban versus rural), health behaviours, psychological well-being, social resources, stress and physical illness.

In Ontario, an estimated four percent of the population had probable depression. Overall, six percent of Ontario adults aged 25 and older had probable depression in 2005, including seven percent of women and four percent of men.

EXHIBIT 3C.6 | Age-standardized percentage of adults aged 25 and older who had probable depression, by sex and annual household income, in Ontario, 2003

<table>
<thead>
<tr>
<th>Annual household income</th>
<th>Women</th>
<th>Men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>13%</td>
<td>5%</td>
</tr>
<tr>
<td>Lower middle</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>Middle</td>
<td>7%</td>
<td>3%</td>
</tr>
<tr>
<td>Higher</td>
<td>6%</td>
<td>4%</td>
</tr>
</tbody>
</table>

FINDINGS

- There was an income gradient in the percentage of women who had probable depression. Thirteen percent of low-income women had probable depression compared to six percent of higher-income women.

- Men reported lower rates of depression than women and there was no apparent income gradient (five percent and four percent in the low- and higher-income categories, respectively).

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 2.1
* Interpret with caution due to high sampling variability
NOTE: See Appendix 3.3 for a description of annual household income categories

POWER Study
**PREVALENCE OF COMORBIDITY (MULTIPLE CHRONIC CONDITIONS)**

This indicator measures the percentage of adults who reported having more than one chronic condition (comorbidity) diagnosed by a health professional.

Chronic conditions included in this indicator were: Alzheimer's disease or other dementia; bowel disorders (Crohn's disease, ulcerative colitis, Irritable Bowel Syndrome or bowel incontinence); cancer (non-skin); diabetes; epilepsy; heart disease or stroke; high blood pressure; thyroid condition; urinary incontinence; arthritis or rheumatism excluding fibromyalgia, back problems excluding fibromyalgia and arthritis; obstructive lung disease (asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease); chronic fatigue syndrome or fibromyalgia.

As in the prevalence of specific conditions, the prevalence of multiple chronic conditions may be particularly underestimated in socioeconomically disadvantaged populations if they encounter barriers to care and thus are not diagnosed.

Overall, 29 percent of Ontario adults aged 25 and older reported having two or more chronic conditions in 2005. Thirty-one percent of women and 25 percent of men reported having two or more chronic conditions.
FINDINGS
• The majority of Ontarians aged 25 and older reported having been diagnosed with at least one chronic condition, with women somewhat more likely to have reported a chronic condition. Sixty-two percent of women and 55 percent of men reported having at least one chronic condition.

• Women were more likely than men to report having two or more chronic conditions (31 vs. 25 percent, respectively).

• Fourteen percent of women and nine percent of men reported having three or more chronic conditions.

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1
** Proportions may not add up to 100 percent due to rounding

POWER Study
FINDINGS

- An income gradient was observed in the percentage of adults who reported having two or more chronic conditions.

- Low-income women and men were more likely to report having two or more chronic conditions compared to those in the higher-income category.

- Almost four in ten low-income women and one in three low-income men reported having two or more chronic conditions.

- Across all income categories women were more likely than men to report having two or more chronic conditions.

- A similar pattern was observed for education (data not shown).

EXHIBIT 3C.8 | Age-standardized percentage of adults aged 25 and older who reported having two or more chronic conditions, by sex and annual household income, in Ontario, 2005

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See Appendix 3.3 for a description of annual household income categories

POWER Study
EXHIBIT 3C.9 | Age-specific percentage of adults aged 25 and older who reported having two or more chronic conditions, by sex and annual household income, in Ontario, 2005

FINDINGS

- Adults aged 65 and older were much more likely to report having two or more chronic conditions than adults aged 25–64.

- For both age groups, those with higher income were less likely to report having two or more chronic conditions. Seventy percent of low-income older women reported having two or more chronic conditions, compared to 57 percent of higher-income older women.

- For adults aged 25–64, 34 percent and 28 percent of low-income women and men, respectively reported having two or more chronic conditions compared to 21 percent and 16 percent of high-income women and men, respectively.

- Among both age groups, women were more likely to report having multiple chronic conditions than men.

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

NOTE: See Appendix 3.3 for a description of annual household income categories

POWER Study
FINDINGS

- The proportion of adults who reported having two or more chronic conditions varied with ethnicity. Aboriginal adults (48 percent of women and 41 percent of men) were most likely to have reported having two or more chronic conditions. Among White adults 34 percent of women and 26 percent of men reported having two or more chronic conditions.

- East and Southeast Asian adults (16 percent of women and men) were least likely to report having two or more chronic conditions.

- In general, women were more likely than men to report having two or more chronic conditions.

DATA SOURCE: Canadian Community Health Survey (CCHS), Cycle 3.1

* Interpret with caution due to high sampling variability.

** Includes self-identified off-reserve Aboriginal adults (North American Indian, Métis, Inuit)

*** Includes Latin American, other racial and multiple racial origins.

NOTE: Ethnic group names are those used by Statistics Canada in the CCHS.
**EXHIBIT 3C.11** | Age-standardized percentage of adults aged 25 and older who reported having two or more chronic conditions, by sex, annual household income and Local Health Integration Network (LHIN), in Ontario, 2005

**FINDINGS**

- Across most LHINs, women were more likely than men to report having two or more chronic conditions.
- Among individuals who reported having two or more chronic conditions, the magnitude of the difference in the proportion of women and men and between those with lower- and higher-incomes varied across LHINs.
- The percentage of women who reported having two or more chronic conditions ranged from 24 percent (Central West LHIN) to 46 percent (South East LHIN) among those who reported lower income; and from 26 percent (Central East LHIN) to 38 percent (North East and North West LHINs) among women who reported higher income.

**POWER Study**

**DATA SOURCE:** Canadian Community Health Survey (CCHS), Cycle 3.1

**Note:** See Appendix 3.3 for definitions of annual household income categories

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**Overall Ontario**

In Ontario, 37% of lower-income women, 30% of higher-income women, 30% of lower-income men and 24% of higher-income men reported having two or more chronic conditions.

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**Local Health Integration Networks (LHINs)**

- Erie St. Clair
- South West
- Waterloo Wellington
- Hamilton Niagara Haldimand Brant
- Central West
- Mississauga Halton
- Toronto Central
- Champlain
- North Simcoe Muskoka
- North East
- North West

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**Toronto and surrounding areas**

- Interpret with caution due to high sampling variability

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**Southern Ontario**

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**Northern Ontario**

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Section 3C

SUMMARY OF FINDINGS

The majority of women and men in Ontario are living with at least one chronic disease. Nearly one in three women and one in four men reported having two or more chronic conditions. Lower-income and less educated women and men were most likely to report having common chronic conditions (hypertension, arthritis, obstructive lung disease, diabetes, heart disease or stroke and depression). They were also more likely to report having multiple chronic conditions (comorbidity). The prevalence of comorbidity also varied by ethnicity. Nearly half (48 percent) of Aboriginal women reported having two or more chronic conditions compared to 16 percent of East and Southeast Asian women. Women were more likely than men to report having arthritis, depression and multiple chronic conditions. There was variation across Local Health Integration Networks (LHINs) in the percentage of women and men who reported chronic conditions and comorbidity.

Findings for the indicators reported in this section are summarized below.

Prevalence of selected chronic conditions

There was an income gradient in the prevalence of common chronic diseases (hypertension, arthritis, obstructive lung disease, diabetes and heart disease or stroke) among both women and men. A similar pattern was observed for educational attainment. Across all income categories women were much more likely to report having arthritis than men. For example arthritis was reported by 32 percent and 20 percent of low-income women and men, respectively and by 21 percent and 15 percent of higher-income women and men, respectively. Older adults reported a high prevalence of chronic disease. There was an income gradient in the percentage of adults reporting most chronic diseases among women and men aged 25–64 and aged 65 and older. Among low-income women aged 65 and older, two in three reported having hypertension, two in three reported having arthritis, one in five reported having diabetes, and one in four reported having heart disease or stroke.

Prevalence of depression

There was an income gradient in the percentage of women who had probable depression. Thirteen percent of low-income and six percent of high-income women had probable depression. Men had lower rates of probable depression than women and there was no apparent income gradient among men (five percent and four percent in the low- and high-income categories, respectively).

Prevalence of multiple chronic conditions

The prevalence of multiple chronic conditions varied with sex, age, income and ethnicity. In general, women were more likely than men to report having two or more chronic conditions. Nearly 40 percent of low-income women and 33 percent of low-income men reported having two or more chronic conditions. Older adults were two to three times more likely to report having two or more chronic conditions than adults aged 25 to 64, and there was a clear income gradient for both age groups. Among women aged 65 and older, 70 percent of low-income women, compared to 57 percent of higher-income women, reported having two or more chronic conditions. Among adults aged 25–64, 34 percent and 28 percent of low-income women and men, respectively, reported having two or more chronic conditions. In comparison, 21 percent and 16 percent of higher-income women and men, respectively, reported having two or more chronic conditions. Aboriginal women and men reported the highest prevalence of multiple chronic conditions (48 percent and 41 percent for women and men, respectively).
Section 3D
Sexually-Transmitted Infections

INTRODUCTION

Sexually-transmitted infections (STIs) are an important cause of avoidable morbidity and mortality among women and men.79

STIs are transmitted by direct sexual contact via genital, anal and oral fluids of an infected person and from mother to child.80, 81

STIs can have significant health consequences and their incidence is associated with a wide range of biological, psychological and social determinants. While there have been many efforts aimed at STI-related prevention, education and health promotion, rates of STIs continue to rise in Ontario and nationally.82 Many STIs go undiagnosed and untreated.

STIs affect women and men differently, largely as a result of differences in the symptoms and long-term health consequences of these infections. In women, chlamydia and gonorrhea can result in infertility and worse outcomes for babies of infected mothers.83 HIV infection is an important and preventable cause of morbidity and mortality. Health behaviours (high-risk sexual activity) and lower socioeconomic status are associated with higher rates of sexually-transmitted infections.

Rates of STI infection and their impact on health status can be reduced through public health and health promotion strategies as well as through clinical diagnosis and management, particularly in primary care. Prevention and intervention programs are most effective when targeted towards high-risk groups. Reporting indicators for these infections provides information needed to assess needs, target interventions and monitor their effectiveness.

We report on indicators for three STIs: chlamydia, gonorrhea and HIV/AIDS.

Chlamydia

Chlamydia infection is the most prevalent reportable STI in North America.80, 81 The most common symptoms are vaginal discharge and discomfort when urinating. However, about three-quarters of infected women and about half of infected men have no symptoms, thus increasing the risk of transmission of this infection. Women are disproportionately affected by chlamydia.84 Routine chlamydia screening and early treatment can reduce the burden of these infections. Current Canadian STI guidelines85 recommend regular chlamydia screening for sexually active women under 25 years of age as well as for high-risk groups (e.g., new sexual partner, two or more sexual partners in the previous year) and all pregnant women. There is insufficient evidence about the effectiveness of screening in men. However, these guidelines also state that it is “prudent” to recommend screening in sexually active men under the age of 25. Practiced-based quality improvement interventions have been shown to improve chlamydia screening rates among young women.85

Most cases of chlamydia infection are undiagnosed. Untreated chlamydia can spread to the uterus and the fallopian tubes, causing pelvic inflammatory disease, which can lead to tubal infertility, chronic pelvic pain and ectopic pregnancy.62, 81, 83, 84 During pregnancy, chlamydia infection can increase the risk of prematurity and low birth weight. After a vaginal delivery, chlamydia can cause conjunctivitis and pneumonia in newborn infants of infected mothers. In addition, women infected with chlamydia are up to five times more likely to become infected with HIV, if exposed.86

Reported rates of chlamydia have been steadily increasing in Canada since 1997. Between 1997 and 2004, the
overall chlamydia rate rose by 70 percent. Because of underreporting, these rates underestimate the true burden of chlamydia infection in the population.

**Gonorrhea**

Gonorrhea is the second most commonly reported STI in Canada. Gonorrhea infection, like chlamydia, can result in pelvic inflammatory disease, infertility, increased risk of ectopic pregnancy and infection of infants born to infected mothers. Individuals infected with gonorrhea are often at the same time infected with chlamydia. Between 1997 and 2004, the overall rate of gonorrhea infection in Canada rose by 94 percent.

Data on chlamydia and gonorrhea incidence were obtained from the integrated Public Health Information System (iPHIS) at the Ontario Ministry of Health and Long-Term Care.

**HIV Infection**

HIV infection is a serious condition caused by the human immunodeficiency virus (HIV). The virus causes disease by infecting and destroying specific cells in the immune system, leaving individuals vulnerable to opportunistic infections and some malignancies. Without treatment, HIV infection is commonly a life-threatening condition. Due to effective antiretroviral medications and ways to prevent and treat opportunistic infections, HIV infection has become a chronic disease and individuals infected with the virus can live for many decades. In Ontario, the number of people living with HIV infection has increased significantly over time, from an estimated 18,070 people in 2000 to an estimated 26,356 people in 2006. While treatment has extended the lifespan of people with HIV, there is currently no cure for HIV infection, which has taken the lives of more than 8,700 Ontarians.

Strategies for tackling HIV/AIDS should be multi-pronged and include prevention, education, support services and research. Further, these strategies should be targeted to specific subpopulations at higher risk. In Ontario, the highest risk populations for HIV/AIDS are homosexual and bisexual men, Ontarians from African and Caribbean countries, people who use injection drugs and Aboriginal people.

While men represent the majority of those infected with HIV (in particular men who have sex with men [MSM]), HIV infection is an important and growing public health problem for women as well. The percentage of HIV infections in Ontario women rose from 16.9 percent in 1995 to 24.5 percent in 2005. Young women (aged 15–29), as well as Aboriginal and Black women, have been found to be at higher risk of infection. It has been estimated that 30 percent of persons infected with HIV in Canada are unaware of their infection. Women can transmit HIV to their babies during pregnancy, childbirth and breastfeeding. Significant progress has been made over the last decade in the number of women who receive perinatal HIV testing.

Data on HIV and AIDS were obtained from the Ontario HIV Epidemiologic Monitoring Unit at the Dalla Lana School of Public Health, University of Toronto. We report on the prevalence of HIV cases by sex and Ontario health region, the proportion of HIV cases that can be linked to various HIV exposure categories, as well as the number of new (incident) AIDS cases and cumulative incidence rate of AIDS from 1981 to 2005, by age at diagnosis and sex. We also report on the rates of prenatal HIV testing. Volume 2 of the POWER Study Report will feature a full chapter dedicated to HIV/AIDS, with a more extensive set of indicators and more detailed analyses.

While we know from the literature that rates of STIs are higher for those with lower income and also for Aboriginal people, information on ethnicity and socio-economic status of persons with sexually-transmitted infections is not currently available in Ontario.

Because of data limitations we cannot currently report these indicators by income, LHIN or ethnicity. However, work is being done to improve data quality and it should be possible to report these indicators by income and LHIN in the future.
EXHIBITS AND FINDINGS

INCIDENCE OF CHLAMYDIA

This indicator measures the incidence or new cases of chlamydia among Ontario adults aged 15 and older.

Genital chlamydia is the most commonly reported notifiable disease in Canada.

Untreated chlamydia can lead to pelvic inflammatory disease (PID), which can result in chronic pelvic pain, ectopic pregnancy, and infertility. Since this infection disproportionately affects a younger population (women in particular), the consequences of untreated infection are of particular concern. Like all bacterial sexually-transmitted infections, chlamydia increases the risk of acquisition and/or transmission of HIV. Three-quarters of women and half of all men infected with chlamydia will have no symptoms. Therefore, reported incidence underestimate the true incidence of the disease in the population. Chlamydia screening is recommended in sexually active young women and sexual partners should be treated.82

In Ontario in 2006, the overall incidence of chlamydia was 206 per 100,000 population aged 15 and older—252 per 100,000 for women and 157 per 100,000 for men.

EXHIBIT 3D.1 | Age-specific incidence of chlamydia per 100,000 population aged 15 to 64, by sex, in Ontario, 2006

FINDINGS

- The highest incidence of chlamydia was found among women aged 20–24, followed by women aged 15–19 (1,403 and 1,072 per 100,000, respectively).
- Incidence was lower for men in both of these age groups: 760 per 100,000 in men aged 20–24 and 236 per 100,000 in those aged 15–19. Men with chlamydia infection may be less likely to be diagnosed, so the actual difference in incidence between men and women is likely less than reported here.
- Incidence of chlamydia was much lower in those aged 25–44 and lowest in those aged 45–64.

DATA SOURCE: integrated Public Health Information System (iPHIS)
INCIDENCE OF GONORRHEA

Gonorrhea is the second most commonly reported STI in Canada. Rates of gonorrhea continue to increase in Canada, with an increase of 94 percent between 1997 and 2004.

Consequences of untreated gonorrhea infection can be quite severe for women (e.g., pelvic inflammatory disease which can lead to chronic pelvic pain, ectopic pregnancy and infertility). Men with an untreated infection are at risk of epididymitis. Gonorrhea in an HIV-positive individual increases virus transmission, and conversely, those with gonorrhea who are exposed to HIV are more likely to acquire the virus. This indicator measures the rate of incident (new) cases of gonorrhea in Ontario adults aged 15 and older.82

In Ontario in 2006, the overall incidence of gonorrhea was 35 per 100,000 population aged 15 and older—25 per 100,000 for women and 46 per 100,000 for men.

EXHIBIT 3D.2 | Age-specific incidence of gonorrhea per 100,000 population aged 15 to 64, by sex, in Ontario, 2006

FINDINGS

- Among women, the highest incidence of gonorrhea was reported in those aged 20–24, followed by those aged 15–19 (119 and 115 per 100,000, respectively).

- Incidence was higher in men than women, among those aged 20–24 (137 vs. 119 per 100,000), aged 25–44 (81 vs. 22 per 100,000) and aged 45–64 (17 vs. 2 per 100,000).

- Among adolescents (aged 15–19) incidence was higher in women than men (115 vs. 50 per 100,000, respectively).

DATA SOURCE: integrated Public Health Information System (iPHIS)

POWER Study
NUMBER OF PREVALENT HIV CASES

HIV has become a major cause of death from infectious diseases particularly in younger men but rates for women continue to rise.

In the nine-year period from 1996 to 2005, HIV prevalence in Ontario increased 69 percent, for an average annual increase of six percent. This increase is partly related to improved survival among HIV-infected persons. HIV surveillance data understate the magnitude of the HIV epidemic and do not reflect the total number of infections due to delays in reporting, underreporting and changing patterns in HIV testing behaviours (i.e., who comes forward for testing). This indicator measures the total estimated number of persons infected with HIV (prevalent HIV cases) in Ontario in 2005.92

In Ontario overall, in December 2005 there were an estimated 24,890 persons infected with HIV, including 3,750 women and 21,140 men.

Note: Numbers in Exhibit 3D.3 may not add up to these totals due to rounding.

EXHIBIT 3D.3  |  Number of persons infected with HIV* (prevalent HIV cases), by sex and health region, in Ontario, in December 2005

FINDINGS

• There were more cases of HIV infection among men than women across health regions in Ontario.

• The Toronto health region had the greatest number of HIV cases in women (1,860 cases) and men (13,780 cases) followed by Ottawa (630 and 2,250 cases in women and men, respectively).

• The Northern health region had the lowest number of cases in men (480 cases) while the Eastern, other health region had the lowest number of cases in women (130 cases).

DATA SOURCE: HIV Laboratory, Laboratories Branch, Ontario Ministry of Health and Long-Term Care

“Eastern, other” = Eastern health region other than Ottawa; “Central East, other” = Central East region other than Toronto.

* Modelled92 (cumulative HIV incidence less cumulative AIDS mortality). See Appendix 3.3 for further details.

POWER Study
**HIV RISK FACTORS**

This indicator measures the percentage of HIV infections that can be attributed to specific risk factors for HIV infection (exposure categories).

Knowledge of the distribution of exposures resulting in HIV infection is used to target public health prevention strategies. In Canada, sexual transmission accounts for a large proportion of reported cases of HIV. The HIV exposure categories reported are:

- Men who have sex with men (MSM)
- Men who have sex with men and engage in injection drug use (MSM-IDU)
- Injection drug use (IDU)
- Mother to child (perinatal) transmission (MTC)
- Clotting factor recipient prior to November 1985 (Clotting factor)
- Blood transfusion recipient prior to November 1985 (Transfusion)
- Origin/residence in an HIV-endemic area (HIV-endemic)
- High-risk heterosexual transmission: Persons reporting a history of sexual contact with a person known to be HIV-infected or with someone at high risk of HIV infection. For example, bisexual man (women only), IDU, clotting factor recipient or person from an HIV-endemic region.
- Low-risk heterosexual transmission: All other persons who have had sex with persons of the opposite sex, none of whom were known to be HIV-infected or at increased risk of being HIV-infected.
- Other: includes infection from needle-stick, acupuncture, tattoo, etc.

In Ontario from 1985 to 2005, the most common exposure categories for women and men combined were: men who had sex with men (63.8 percent), those whose origin/residence was an HIV-endemic region (10.7 percent) and injection drug use (7.9 percent).92
FINDINGS

- Among persons with HIV infection the percentage of HIV diagnoses attributed to specific HIV risk factors (exposure categories) were very different for women and men.

- Among women, the three top exposure categories associated with HIV infection were: those from an HIV-endemic region (38.7 percent), those who reported only low-risk heterosexual experiences (17.7 percent) and those who reported high-risk heterosexual experiences (16.1 percent).

- For men, the three top exposure categories associated with HIV infection were: men who have sex with men (74.2 percent), injection drug use (6.5 percent) and those from an HIV-endemic region (6.1 percent).

EXHIBIT 3D.4 | Percentage* of HIV diagnoses (adjusted**), by exposure category and sex, in Ontario, 1985 to 2005

DATA SOURCE: HIV Laboratory, Laboratories Branch, Ontario Ministry of Health and Long-Term Care

* Percentage of cases with known source of exposure.

** Unknown sex assigned according to the distribution of those with known sex; unknown exposure category assigned according to proportion among the known exposures and results of the Lab Enhancement Study, thus, totals may differ slightly due to rounding.

^ Includes only HIV-infected infants

¥ Includes needle-stick, acupuncture, tattoo, etc.
**AIDS INCIDENCE**

This indicator measures the number of incident (new) cases of AIDS and the AIDS incidence (new cases of AIDS per 100,000 population) in Ontario from 1981 to 2005.

The time between infection with HIV and the subsequent development of AIDS is typically many years. Therefore, the number of AIDS cases is smaller than the overall number of people infected with HIV. Treatment with antiretroviral therapy delays the onset of AIDS in persons with HIV infection.

There were 8,233 reported incident cases of AIDS in Ontario from 1981 to 2005—674 for women and 7,559 for men. The overall cumulative incidence of reported AIDS cases was 74 per 100,000 population—12 per 100,000 for women and 138 per 100,000 for men. In 2005, there were 124 new cases of AIDS among men and 36 among women. The highest annual number of new AIDS cases was 699 among men in 1993 and 60 among women in 1996.

Note: Numbers in Exhibit 3D.5 may not add up to these totals due to rounding.
EXHIBIT 3D.5  | Number of AIDS cases and cumulative incidence per 100,000, by sex and age group at diagnosis, in Ontario, 1981–2005

**FINDINGS**

- Between 1981 and 2005, the greatest number of AIDS cases was diagnosed among men aged 30–34 (1,623 cases) and 35–39 (1,647 cases). Very few men were under the age of 25 at diagnosis.

- The number of AIDS cases diagnosed in women was much smaller, with the greatest number of cases diagnosed in those aged 30–34 (150 cases) and 25–29 (118 cases).

- The cumulative incidence of AIDS was highest in men diagnosed between ages 35–39 (340 per 100,000), 30–34 (324 per 100,000) and 40–44 (308 per 100,000). In women, the cumulative incidence was highest in those diagnosed between ages 30–34 (30 per 100,000) and 25–29 (29 per 100,000).

**DATA SOURCES:** Ontario AIDS Surveillance Program, Public Health Division, Ministry of Health and Long-Term Care (cases reported to September 2006); Statistics Canada 1996 Census

**POWER Study**
PRENATAL HIV TESTING

Appropriate treatment can greatly reduce the rate of HIV infection in newborn infants of HIV-infected women.

In Ontario, HIV screening is offered to all pregnant women so that when infection is identified, transmission of the infection to their babies can be prevented. This indicator measures the percentage of pregnant women who had prenatal HIV testing in Ontario during their current pregnancy.

EXHIBIT 3D.6 | Annual percentage of pregnant women who had prenatal HIV testing in their current pregnancy, in Ontario, 1999 to 2005

FINDINGS

• The percentage of pregnant women in Ontario who had prenatal HIV testing increased steadily over time, more than doubling from 1999 to 2005 (41 percent to 86 percent).

• No information was available on rates of screening by socioeconomic status, ethnicity or HIV risk group.

DATA SOURCES: HIV Laboratory, Laboratories Branch, Ontario Ministry of Health and Long-Term Care as cited in Report on HIV/AIDS in Ontario, 200592, Public Health Division, Ministry of Health and Long-Term Care

POWER Study
Section 3D

SUMMARY OF FINDINGS

Sexually-transmitted infections (STIs) are an important public health problem in Ontario. Unlike chronic diseases which are more prevalent among older adults, STIs primarily affect adolescents and young adults. Chlamydia infection and its consequences primarily affect adolescent and young adult women (aged 15–24). Reported incidence of gonorrhea infection among women aged 15–19 were more than twice as high as that for adolescent men. For those aged 20 and older, rates were higher among men than women; however this difference was small among those aged 20–24. While men were more likely than women to be infected with HIV, rates of HIV infection in women have risen, and one-fourth of new HIV infections occur in women. Risk factors for HIV infection differ greatly for men and women. Among women in Ontario most infections are due to heterosexual transmission, whereas for men, homosexual transmission is more common.

Findings for the indicators reported in this section are summarized below.

Chlamydia and Gonorrhea infection

The highest incidence of chlamydia infection was found in young adult women aged 20–24, followed by adolescent women aged 15–19 (1,403 and 1,072 per 100,000, respectively). Incidence was lower among those aged 25–44 and lowest among those aged 45–64.

The incidence of gonorrhea was highest among women and men aged 20–24 (119 and 137 per 100,000, respectively). The incidence of gonorrhea among Ontarians aged 15-19 was more than two times higher in women than in men, but nearly four times higher in men than women aged 25–44.

HIV Infection

There were more estimated cases of HIV infection among men than women across health regions in Ontario in December 2005. The greatest total number of HIV cases was reported in the Toronto health region for women (1,860 cases) and men (13,780 cases); followed by Ottawa (630 and 2,250 cases for women and men, respectively). The lowest total number of HIV cases was found in the Eastern, other health region for women (130 cases) and in the Northern health region for men (480 cases).

Among persons with HIV infection, the percentage of HIV diagnoses attributed to specific HIV risk factors (exposure categories) were very different for women and men. Among women, the top three exposure categories associated with HIV infection being from an HIV-endemic region (38.7 percent), having only low-risk heterosexual experiences (17.7 percent) and having high-risk heterosexual experiences (16.1 percent). For men, the top three exposure categories associated with HIV infection were: men who have sex with men (74.2 percent), injection drug use (6.5 percent) and being from an HIV-endemic region (6.1 percent).

The number of incident (new) cases of AIDS diagnosed from 1981 to 2005 was highest among men aged 30–34 and 35–39 (1,623 and 1,647 cases, respectively). The number of incident AIDS cases diagnosed in women was much smaller, but followed a similar pattern, with the highest number of cases diagnosed in women aged 30–34 (150 cases) and 25-29 (118 cases). Very few men were under the age of 25 at diagnosis.

In women, the cumulative incidence of AIDS was highest in those diagnosed between the ages of 30–34 (30 per 100,000) and 25-29 (29 per 100,000). The highest rate in men was among those diagnosed between the ages of 35–39 (340 men per 100,000) and 30–34 (324 per 100,000).

The percentage of pregnant women who had prenatal HIV testing increased steadily over time, more than doubling from 1999 to 2005 (41 percent to 86 percent).
Section 3E
Mortality

INTRODUCTION

Mortality indicators are important measures of population health and are widely used internationally to assess health inequities.94 Both health care delivery and public health practice are aimed at improving health by enhancing quality and extending length of life.95

In previous sections of this chapter we assessed quality of life. In this section we assess length of life by examining patterns of mortality in Ontario.

Overall mortality rates are dynamic, and change in response to the social, economic, and political conditions of society.96 Although mortality rates in Canada have declined substantially over the course of the twentieth century, socioeconomic differentials in mortality rates persist.97, 98, 99 Women have historically had lower mortality rates and longer life expectancies than men; however, in part due to increased smoking rates, differences between women and men have narrowed in recent decades.95 Sex and socioeconomic differences in mortality also vary with societal conditions. In addition, rates of premature mortality vary with neighbourhood characteristics and are highest among people who live in socioeconomically deprived neighbourhoods.100

Canadians who are university educated, employed, working in professional and managerial occupations and in the top income brackets have the lowest mortality rates. The highest mortality rates are seen among those who have not graduated secondary school, are unemployed, are working in unskilled jobs, and are in the lowest income brackets.98 Aboriginal people (First Nation, Métis or Inuit) also have higher mortality rates than those without Aboriginal ancestry.98

The total number of excess deaths due to higher mortality rates of those in lower-income groups compared to those in the highest-income group make socioeconomic inequalities the second leading cause of death in Canada.101 The four leading causes of income-related deaths in the country were cardiovascular disease, injuries, cancer and infections. Many of these excess deaths can be attributed to preventable causes,102, 103 and thus these rates are amenable to change. Between 1971 and 1996, reduction in rates of avoidable mortality from causes amenable to medical care (i.e., physician and hospital services) made the greatest contribution to narrowing socioeconomic inequities in mortality. However, during the same time period there was little improvement in the socioeconomic differentials in mortality rates amenable to public health intervention, those where medical services are less effective and where various interventions are known to prevent the condition from occurring (e.g., changes in health behaviours such as quitting smoking and legislative changes such as requiring the use of seatbelts). This lack of improvement suggests that additional reductions could be achieved by targeting these causes.99

Disability-free life expectancy (DFLE) is the number of years of life lived without disability and captures quality as well as the length of life. Rates of DFLE vary by sex and socioeconomic status.14, 24 Women not only live longer
than men, but also live more years without disability than men.\textsuperscript{14, 24} However, because they live longer, they also live more years with disability. Chronic disease and certain health behaviours (e.g., smoking, physical inactivity) significantly reduce DFLE.\textsuperscript{14, 24} In Canada, among women the greatest number of years of DFLE lost were for diabetes (14.1 years), arthritis (8.8 years), and physical inactivity (6.0 years); while among men, the greatest number of years of DFLE lost were for diabetes (10.5 years), smoking (6.9 years), arthritis (6.5 years), and cancer (6.4 years).\textsuperscript{14, 24}

We report on indicators of all-cause mortality, premature mortality, cause-specific mortality, life expectancy, and disability-free life expectancy for Ontarians living in census metropolitan areas, by sex and neighbourhood income quintile.

- All-cause mortality rates, or the total number of deaths for all causes per 100,000 population.
- Three measures of premature mortality and its consequences: premature mortality (the probability of dying before age 75), excess number of deaths before age 75 (the number of deaths observed less the number of deaths that would be expected if all neighbourhood income quintiles had experienced the age-specific death rates of the wealthiest quintile), and potential years of life lost (PYLL) before age 75 (due to these early deaths).
- Cause-specific mortality rates from chronic disease (circulatory diseases, diabetes, chronic obstructive pulmonary disease) infectious disease (pneumonia), and trauma/injury (road traffic accidents, intentional and non-intentional injuries and falls).
- Life expectancy and disability-free life expectancy, at birth and at age 65.

The findings by neighbourhood income quintile presented in this section were provided by the Health Information and Research Division of Statistics Canada, based on death data from the Canadian Mortality Database coded to census tract. The findings by neighbourhood income tercile were extracted from tables presented in the Performance Indicators Reporting Committee (PIRC) Report\textsuperscript{24} (see Appendix 3.3 for more details). All indicators are reported at the provincial level.
EXHIBITS AND FINDINGS

ALL-CAUSE MORTALITY RATE

All-cause mortality is a measure of the total number of deaths in a given year relative to the total population for that year (per 100,000 population).

Mortality statistics are an important indicator of population health status. Differences in mortality rates by socioeconomic status (SES) reflect health inequalities. We report age-standardized mortality rates (ASMRs).

The overall Ontario mortality rate was 461 per 100,000 population in 2001—365 per 100,000 for women and 570 per 100,000 for men.

EXHIBIT 3E.1 | Age-standardized all-cause mortality rate per 100,000 population, by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

- Women and men in the lowest neighbourhood income quintiles had the highest mortality rates.
- Women in the lowest neighbourhood income quintile had an all-cause mortality rate of 418 per 100,000 compared to 362 per 100,000 for women in the highest neighbourhood income quintile.
- An income gradient was observed for men. While men in the lowest neighbourhood income quintile had an all-cause mortality rate of 686 per 100,000, the rate was 523 per 100,000 for men in the highest neighbourhood income quintile.
- Across all neighbourhood income quintiles, men had higher all-cause mortality rates than women.
- Differences between women and men were greatest among those in the lower-income quintiles.

DATA SOURCE: Statistics Canada’s Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included

NOTE: See Appendix 3.3 for details about neighbourhood income quintile calculation

POWER Study
PREMATURE MORTALITY: DEATHS BEFORE AGE 75

Premature mortality, or death before age 75, is a powerful indicator of disparities in health status.

Studies have shown that the risk of premature death directly increases with economic deprivation and thus the incidence of premature mortality is higher among persons living in economically deprived areas compared to those in high-income areas. This indicator measures the percentage of the population who died before reaching the age of 75.

Overall, in 2001, 27 percent of the Ontario population died before reaching the age of 75. Twenty-one percent of women and 32 percent of men died prematurely.

EXHIBIT 3E.2 | Percentage of the population who died before age 75 (premature mortality), by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS
- The percentage of adults who died before age 75 increased as income level decreased (an income gradient). This income gradient was steeper for men than for women.
- In 2001, 41 percent of men and 26 percent of women in the lowest neighbourhood income quintile (compared with 28 percent of men and 19 percent of women in the highest neighbourhood income quintile) did not live to 75.
- Across all neighbourhood income quintiles, men were more likely to die prematurely than women.

DATA SOURCE: Statistics Canada’s Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

NOTE: See Appendix 3.3 for details about neighbourhood income quintile calculation.

POWER Study
EXCESS DEATHS BEFORE AGE 75

The excess number of deaths before age 75 is the number of deaths observed less the number of deaths that would be expected if all neighbourhood income quintiles had experienced the age-specific death rates of the wealthiest quintile (Q5).

In Ontario, the overall excess number of deaths before age 75 across all age groups was 3,373 in 2001—947 for women and 2,426 for men.

FINDINGS

- In Ontario, for nearly all age groups, there were more excess deaths among men than women. For example, in 2001, there were 93 more deaths for women aged 50–54 and 356 more deaths for men aged 50–54 than would be expected in that same age group if all neighbourhood income quintiles had experienced the age-specific death rates of the wealthiest quintile (Q5).

- Among children the greatest number of excess deaths occurred in boys and girls in their first year of life.

- After age 30, the excess number of deaths increased with age for both women and men.

- The sex gap in the number of excess deaths widened with increasing age. For example, in those aged 65–69, men had more than twice the excess number of deaths as women (428 vs. 191).

EXHIBIT 3E.3 | Excess number of deaths for the population aged 0–74*, by sex and age group, in Ontario, 2001

DATA SOURCE: Statistics Canada’s Canadian Mortality Database and 2001 Census

* The excess number of deaths before age 75 is the number of deaths observed less the number of deaths that would be expected if all neighbourhood income quintiles had experienced the age-specific death rates of the wealthiest quintile (Q5).
**POTENTIAL YEARS OF LIFE LOST (PYLL)* BEFORE AGE 75**

Potential years of life lost (PYLL) (total mortality) is the number of years of life “lost” when a person dies “prematurely” from any cause—before age 75.

A person dying at age 25, for example, has lost 50 years of life. This indicator places more weight on causes of early death than on causes of death at older ages.\(^{105,106}\)

The distribution by cause of PYLL differs by sex. In women, a larger number of PYLL are attributable to cancer, whereas in men, a larger number of PYLL are frequently attributable to accidents. PYLL also varies by socioeconomic status and geographic area.

In Ontario, there were 364,706 PYLL in 2001—142,102 for women and 222,603 for men.

### EXHIBIT 3E.4  |  Potential years of life lost (PYLL) before age 75 (person-years), by sex and neighbourhood income quintile, in Ontario*, 2001

<table>
<thead>
<tr>
<th>Neighbourhood income quintile</th>
<th>Men (Person-years)</th>
<th>Women (Person-years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 (Lowest Income)</td>
<td>36,118</td>
<td>25,336</td>
</tr>
<tr>
<td>Q2</td>
<td>28,683</td>
<td>24,275</td>
</tr>
<tr>
<td>Q3</td>
<td>26,806</td>
<td>38,190</td>
</tr>
<tr>
<td>Q4</td>
<td>40,826</td>
<td>38,892</td>
</tr>
<tr>
<td>Q5 (Highest Income)</td>
<td>56,914</td>
<td>38,892</td>
</tr>
</tbody>
</table>

**FINDINGS**

* There was an income gradient in the potential years of life lost before age 75. Women and men in the lowest neighbourhood income quintiles lost more potential years of life than those in higher-income neighbourhoods.

* Women in the lowest neighbourhood income quintile lost 36,118 years of potential life compared to 25,336 potential years of life lost for women in the highest neighbourhood income quintile.

* Men in the lowest neighbourhood income quintile lost 56,914 years of potential life compared to 38,892 potential years of life lost for men in the highest neighbourhood income quintile.

* Across all neighbourhood income quintiles men lost more potential years of life than women.

**DATA SOURCE:** Statistics Canada’s Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

**NOTE:** See Appendix 3.3 for details about neighbourhood income quintile calculation.

POWER Study
**CHRONIC DISEASE MORTALITY RATES**

Disease-specific chronic disease mortality rates measure the total number of deaths from selected chronic diseases in a given year per 100,000 population.

We report age-standardized mortality rates (ASMRs) from circulatory diseases (ischemic heart disease, cerebrovascular disease and other circulatory diseases), diabetes and chronic obstructive pulmonary disease (bronchitis, emphysema, and chronic airways obstruction not elsewhere classified).

Overall, the 2001 mortality rate in Ontario was 144 per 100,000 for circulatory diseases (108 and 185 per 100,000 for women and men, respectively); 16 per 100,000 for diabetes (13 and 20 per 100,000 for women and men, respectively) and 17 per 100,000 for chronic obstructive pulmonary disease (13 and 22 per 100,000 for women and men, respectively).
**EXHIBIT 3E.5 |** Age-standardized circulatory disease mortality rate per 100,000 population, by sex, type of disease and neighbourhood income quintile, in Ontario*, 2001

**FINDINGS**

- Across all neighbourhood income quintiles men had higher circulatory disease mortality rates than women.

- Women and men in the lowest neighbourhood income quintile had the highest rates of mortality from circulatory disease.

- Women in the lowest neighbourhood income quintile had a circulatory disease mortality rate of 123 per 100,000 compared to 111 per 100,000 for women in the highest neighbourhood income quintile.

- An income gradient was observed for men. Men in the lowest neighbourhood income quintile had a circulatory disease mortality rate of 222 per 100,000 compared to 169 per 100,000 for men in the highest neighbourhood income quintile.

- Ischemic heart disease mortality comprised the greatest proportion of circulatory disease mortality across all neighbourhood income quintiles for both women and men. Ischemic heart disease mortality rates ranged from 49–67 per 100,000 for women and from 102–147 per 100,000 for men.

- Cerebrovascular disease mortality ranged from 25–30 per 100,000 for women and from 32–35 per 100,000 for men.

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**DATA SOURCE:** Statistics Canada’s Canadian Mortality Database and 2001 Census

*Includes bronchitis, emphysema, and chronic airways obstruction not elsewhere classified

* Only Ontario Census Metropolitan Areas (CMAs) were included.

**NOTE:** See Appendix 3.3 for details about neighbourhood income quintile calculation.
FINDINGS

- Women and men in the lowest neighbourhood income quintiles had the highest mortality rate from diabetes.
- Women in the lowest neighbourhood income quintile had a diabetes mortality rate of 17 per 100,000 compared to 10 per 100,000 for women in the highest neighbourhood income quintile.
- Men in the lowest neighbourhood income quintile had a diabetes mortality rate of 27 per 100,000 compared to 17 per 100,000 for men in the highest neighbourhood income quintile.
- An income gradient was observed for both women and men.
- Across all neighbourhood income quintiles men had higher diabetes mortality rates than women.

DATA SOURCE: Statistics Canada’s Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

NOTE: See Appendix 3.3 for details about neighbourhood income quintile calculation.
EXHIBIT 3E.7 | Age-standardized chronic obstructive pulmonary disease (COPD)^ mortality rate per 100,000 population, by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

• Women and men in the lowest neighbourhood income quintiles had the highest rates of COPD mortality.

• Women in the lowest neighbourhood income quintile had a COPD mortality rate of 17 per 100,000 compared to 11 per 100,000 for women in the highest neighbourhood income quintile.

• Men in the lowest neighbourhood income quintile had a COPD mortality rate of 28 per 100,000 compared to 20 per 100,000 for men in the highest neighbourhood income quintile.

• Across all neighbourhood income quintiles men had higher COPD mortality rates than women.

DATA SOURCE: Statistics Canada’s Canadian Mortality Database and 2001 Census

^ Includes bronchitis, emphysema, and chronic airways obstruction not elsewhere classified

* Only Ontario Census Metropolitan Areas (CMAs) were included.

NOTE: See Appendix 3.3 for details about neighbourhood income quintile calculation
PNEUMONIA MORTALITY RATE

The pneumonia mortality rate measures the total number of deaths from pneumonia in a given year relative to the total population.

This indicator measures the mortality rate from pneumonia per 100,000 population. We report age-standardized mortality rates (ASMRs).

Overall, the pneumonia mortality rate for the Ontario population was 8.3 per 100,000 in 2001. The rate was 6.7 per 100,000 for women and 10.3 per 100,000 for men.

EXHIBIT 3E.8  Age-standardized pneumonia mortality rate per 100,000 population, by sex and neighbourhood income quintile, in Ontario*, 2001

**FINDINGS**

- Pneumonia mortality rates in women ranged from 5 per 100,000 to 7 per 100,000 and did not vary significantly by income.

- Men in the two lowest neighbourhood income quintiles had a pneumonia mortality rate of 12 per 100,000 compared to 9 per 100,000 for men in the highest neighbourhood income quintile. While the data suggest an income gradient in men, the differences were not significant.

- Across all neighbourhood income quintiles men had higher pneumonia mortality rates than women.

- Mortality rates for influenza were negligible and were not included.

**DATA SOURCE:** Statistics Canada’s Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

**NOTE:** See Appendix 3.3 for details about neighbourhood income quintile calculation

POWER Study
MORTALITY RATE FROM TRAUMA AND INJURY

Mortality rates from trauma and injury measure the rate of death per 100,000 population for selected causes of injury in a given year relative to the total population.

Mortality rates due to road traffic accidents (RTA) (motor vehicle traffic crash; traffic related pedestrian and bicycle accidents), other intentional and non-intentional injuries (homicide; fires; drowning; poisoning) and fall-related injuries are reported. We report age-standardized mortality rates (ASMRs).\textsuperscript{97, 107}

Overall, the RTA mortality rate was 5.3 per 100,000 population—3.4 per 100,000 for women and 7.2 per 100,000 for men. The overall mortality rate from other intentional and non-intentional causes was 4.1 per 100,000 in 2001—2.4 per 100,000 for women and 6.1 per 100,000 for men. The overall fall-related mortality rate was 5.8 per 100,000—4.5 per 100,000 for women and 7.2 per 100,000 for men.
FINDINGS

- Road traffic accident mortality rates ranged from 2.4 to 4.5 per 100,000 women and 5.5 to 10.1 per 100,000 men.

- Women and men in the highest neighbourhood income quintile had higher road traffic accident mortality rates than those in lower neighbourhood income quintiles. However, these differences were not significant.

- Pedestrian accident mortality ranged from 0.3 to 0.7 per 100,000 women and from 0.6 to 1.8 per 100,000 men.

- Across all neighbourhood income quintiles men had higher road traffic accident mortality rates than women. Mortality rates from pedestrian accidents only were the same or higher for men compared with women, across all neighbourhood income quintiles.

DATA SOURCE: Statistics Canada’s Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

NOTE: See Appendix 3.3 for details about neighbourhood income quintile calculation

POWER Study
EXHIBIT 3E.10 | Age-standardized mortality rate from homicide, fire, drowning and poisoning, per 100,000 population, by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

- Across all neighbourhood income quintiles men had mortality rates from homicide, fire, drowning and poisoning that were at least twice as high as those of women.

- Women in the lowest neighbourhood income quintile had a mortality rate from homicide, fire, drowning and poisoning of 3.3 per 100,000 compared to 2.3 per 100,000 for women in the highest neighbourhood income quintile.

- Men in the lowest neighbourhood income quintile had a mortality rate from homicide, fire, drowning and poisoning of 10.2 per 100,000 compared to 4.6 per 100,000 for men in the highest neighbourhood income quintile.

DATA SOURCE: Statistics Canada’s Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

NOTE: See Appendix 3.3 for details about neighbourhood income quintile calculation

POWER Study
FINDINGS

- Across all neighbourhood income quintiles, men had higher fall-related mortality rates than women.

- Women in the lowest neighbourhood income quintile had a fall-related mortality rate of 5.1 per 100,000 compared to 5.7 per 100,000 for women in the highest neighbourhood income quintile.

- Men in the lowest neighbourhood income quintile had a fall-related mortality rate of 8.5 per 100,000 compared to 7.4 per 100,000 for men in the highest neighbourhood income quintile.

- Among women, fall-related mortality appeared to be greatest in those in the highest neighbourhood income quintile, while among men fall-related mortality appeared greatest in the lowest neighbourhood income quintile. However, income differences were not statistically significant.

**EXHIBIT 3E.11** | Age-standardized fall-related mortality rate per 100,000 population, by sex and neighbourhood income quintile, in Ontario*, 2001

**DATA SOURCE:** Statistics Canada's Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

**NOTE:** See Appendix 3.3 for details about neighbourhood income quintile calculation
LIFE EXPECTANCY AT BIRTH

Life expectancy at birth is the number of years a person would be expected to live from their date of birth, on the basis of the mortality statistics for a given observation period.

A widely used indicator of the health of a population, life expectancy measures quantity rather than quality of life. It provides a useful summary measure of the overall health status of a population. Use of area level income underestimates mortality differences for women.98

Overall, the life expectancy at birth for the Ontario population was 80.1 years in 2001. Women were expected to live for 82.4 years and men for 77.8 years, a difference of 4.6 years.

EXHIBIT 3E.12 | Life expectancy at birth, by sex and neighbourhood income quintile, in Ontario*, 2001

FINDINGS

• Life expectancy at birth was greater for women than for men, across all neighbourhood income quintiles.

• Women residing in neighbourhoods with the lowest income quintile had a life expectancy at birth that is 1.5 years less than women residing in the highest income neighbourhoods (81.0 vs. 82.5 years)

• Men residing in neighbourhoods with the lowest income quintile had a life expectancy at birth that was 3.5 years less than men residing in the highest income neighbourhoods (75.4 vs. 78.9 years).

DATA SOURCE: Statistics Canada’s Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

NOTE: See Appendix 3.3 for details about neighbourhood income quintile calculation
**LIFE EXPECTANCY AT AGE 65**

Life expectancy at age 65 is the number of years a person would be expected to live, conditional on living to age 65, on the basis of the mortality statistics for a given observation period.

Life expectancy at age 65 is a traditional method of estimating population health, and is an overall indicator of the effect of several factors that influence death rates in older people. These include lifestyle, nutritional and environmental factors, and access to and the quality of treatment services for diseases and injury. Use of area level income underestimates mortality differences for women.\

Although women who have reached the age of 65 can still expect to live longer than men of the same age, the difference is smaller than the difference between the sexes for life expectancy at birth. This reflects the fact that men are at greater risk than women of dying before they reach the age of 65, primarily from injury, suicide and cardiovascular disease.

Overall, the life expectancy for Ontario adults aged 65 and older was 19.1 years in 2001. At age 65, women had a life expectancy of 20.6 years and men had a life expectancy of 17.5 years, a difference of 3.1 years.

**EXHIBIT 3E.13 | Life expectancy at age 65, by sex and neighbourhood income quintile, in Ontario*, 2001**

**FINDINGS**

- Life expectancy at age 65 was greater for women than for men, across all neighbourhood income quintiles.
- Across income quintiles, at age 65 women could expect to live an additional 20–21 years.
- Men residing in the lowest income quintile neighbourhoods had a life expectancy at age 65 that was 1.2 years less than men residing in the highest income quintile neighbourhoods (16.6 vs. 17.8 years).

**DATA SOURCE:** Statistics Canada’s Canadian Mortality Database and 2001 Census

* Only Ontario Census Metropolitan Areas (CMAs) were included.

**NOTE:** See Appendix 3.3 for details about neighbourhood income quintile calculation.
DISABILITY-FREE LIFE EXPECTANCY

Disability-free life expectancy (DFLE) is a measure of the years of life free of any activity limitations.

DFLE is used to distinguish between years of life free of any activity limitation and years experienced with at least one activity limitation. To that end, disability-free life expectancy establishes a threshold based on the nature of such limitations. Years of life lived in conditions above this threshold are counted in full, while those lived in conditions below the threshold are not counted. Thus the emphasis is not exclusively on the length of life, as is the case for life expectancy, but also on the quality of life.

Overall in 1996/97, the disability-free life expectancy at birth for the Ontario population was 67.2 years (68.4 years for women and 65.9 years for men), whereas the DFLE at age 65 was 10.8 years overall (11.4 for women and 10.2 for men).24
**FINDINGS**

- Disability-free life expectancy (DFLE) at birth and at age 65 was higher for women than for men across neighbourhood income terciles.

- DFLE at birth increased with neighbourhood income tercile by 5.6 years for women (66.2 vs. 71.8 years in the lowest vs. highest neighbourhood income tercile, respectively) and seven years for men (62.5 vs. 69.5 years in the lowest vs. highest income tercile, respectively).

- The difference in DFLE at birth between women and men was 3.7 years among those in the lowest income tertile and 2.3 years among those in the highest income tercile.

- The same pattern was seen in DFLE at age 65 for both women (11.5 vs. 12.8 years in the lowest vs. highest neighbourhood income tercile, respectively) and men (9.6 vs. 11.6 years in the lowest vs. highest neighbourhood income tercile, respectively).

- The difference in DFLE at age 65 between men and women was 1.9 years among those in the lowest income tercile and 1.2 years among those in the highest income tercile.

- A similar pattern was observed for education level (data not shown).

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**EXHIBIT 3E.14** | Disability-free life expectancy at birth and at age 65, by sex and neighbourhood income tercile, in Ontario, 1996/97

**DATA SOURCE:** Statistics Canada’s Canadian Mortality Database and 1996 Census of Canada

**NOTE:** See Appendix 3.3 for details about neighbourhood income tercile calculation

**POWER Study**
Section 3E

SUMMARY OF FINDINGS

Low-income women and men had higher mortality rates both overall and for specific causes of death, including chronic disease, infections, and injuries (with the exception of motor vehicle accidents). They also had a higher probability of premature mortality, shorter life expectancies and shorter disability-free life expectancies than those with higher income. For most measures, an income gradient was seen across neighbourhood income quintiles. In the lowest neighbourhood income quintile, 26 percent of women and 41 percent of men did not live to 75 years of age. If all Ontarians had the same mortality rate as Ontarians living in the highest income neighbourhoods, there would be 3,373 fewer deaths each year (947 women and 2,426 men) among Ontarians living in metropolitan areas. Men had higher all-cause mortality rates than women, as well as higher rates of mortality for all causes examined—including falls, which were more prevalent in women. Women had longer life expectancies than men, both at birth and at age 65. Use of area level to measure income may result in a greater underestimate in income gaps for women than for men, thus income differences among women based upon individual income may be larger than those reported here. Findings for the indicators reported in this section are summarized below.

All-Cause and Premature Mortality

In both women and men, the total number of deaths in 2001 per 100,000 population increased as income level decreased. All-cause mortality rates in men were 30 to 40 percent higher than in women, regardless of income level. The percentage of the population that died before age 75 increased as income level decreased. Forty-one percent of men and 26 percent of women in the lowest neighbourhood income quintile did not live to 75 years of age in 2001 (compared with 28 percent of men and 19 percent of women in the highest neighbourhood income quintile). Across all neighbourhood income quintiles, men were more likely than women to die prematurely. Differences between men and women were greatest among those in the lower-income quintiles. Men also lost more potential years of life than women. Women in the lowest neighbourhood income quintile lost 36,118 years of potential life before age 75 compared to 25,336 potential years of life lost for women in the highest neighbourhood income quintile. Men in the lowest neighbourhood income quintile lost 56,914 years of potential life before age 75 compared to 38,892 potential years of life lost for men in the highest neighbourhood income quintile.

Disease-Specific Mortality

Men were much more likely than women to die from ischemic heart disease, cerebrovascular disease, other circulatory diseases, diabetes and chronic obstructive pulmonary disease in 2001. Mortality rates for these conditions among women and men were highest in the lowest income quintile. Men were also more likely than women to die from pneumonia across all income quintiles. Across all income quintiles, men were more likely than women to die from road traffic accidents, injuries (intentional and non-intentional) and falls. The highest rate of deaths from motor vehicle accidents occurred in the highest income quintile for both men (10.1 per 100,000 population) and women (4.5 per 100,000 population). Conversely, deaths from injuries and falls were highest in low-income men.
Life Expectancy and Disability-Free
Life Expectancy

Life expectancies at birth and at age 65 were both greater for women than for men, across all neighbourhood income quintiles. Women residing in lower-income neighbourhoods had a life expectancy at birth that was 1.5 years less than women residing in the highest income neighbourhoods (81.0 vs. 82.5 years). Men residing in neighbourhoods with the lowest income quintile had a life expectancy at birth that was 3.5 years less than men residing in neighbourhoods with the highest income quintile (75.4 vs. 78.9 years). Across income quintiles women at age 65 could expect to live an additional 20 to 21 years.

Disability-free life expectancy was two to three years longer at birth, across neighbourhood income terciles, in women compared to men and one to two years longer at age 65, regardless of neighbourhood income level. DFLE at birth increased with neighbourhood income tercile by 5.6 years for women (66.2 vs. 71.8 years in the lowest vs. highest neighbourhood income tercile, respectively) and seven years for men (62.5 vs. 69.5 years in the lowest vs. highest income tercile, respectively). The difference in DFLE at birth between women and men was 3.7 years among those in the lowest income tercile and 2.3 years among those in the highest income tercile. The same pattern was seen in disability-free life expectancy at age 65. A similar pattern was observed for education level.
Chapter Summary of Findings

In this chapter we paint a picture of the burden of illness experienced by the women and men of Ontario by reporting on the presence and magnitude of health inequities in five key areas:

A. Health and functional status
B. Chronic disease risk factors
C. Chronic conditions
D. Sexually-transmitted infections
E. Mortality

A summary of the key findings from the five chapter sections follows:

Health and Functional Status

Low-income women and men were more than three times as likely to report that their health was fair or poor compared to those in the highest-income group (Exhibit 3A.1). They were also more likely to report having two or more chronic conditions and that their activities were limited by a chronic health condition (Exhibit 3A.9).

Aboriginal women and men were more likely to report fair or poor health, multiple chronic conditions and activity limitations than women and men in other ethnic groups. Forty-five percent of women who self-identified as Aboriginal reported that their activities were limited by a chronic health condition (Exhibit 3A.10).

Ontarians who spoke French only or who did not speak French or English were more likely to report that their health was fair or poor than those who spoke English only or who were bilingual in French and English (Exhibit 3A.5).

Low-income Ontarians were much more likely to report that at least some of their activities were prevented due to pain or discomfort than those with higher income. (Exhibit 3A.16). One-quarter of low-income women and men in Ontario reported that their activities were limited by pain or discomfort. Older women were the most likely to report that their activities were limited due to pain or discomfort, with 35 percent of low-income women aged 65 and older reporting activity limitations due to pain or discomfort (Exhibit 3A.17).

The number of fall-related hospitalizations increased with age, for both women and men, with highest rates observed among individuals aged 80 and older (Exhibit 3A.18). Overall, 1,483 per 100,000 adults aged 65 and older in Ontario were hospitalized due to fall-related injuries in 2005/06. A total of 1,837 per 100,000 women and 1,026 per 100,000 men in Ontario were hospitalized due to fall-related injuries over the course of that year.

Chronic Disease Risk Factors

Across all age groups, women were more likely to live in lower-income households than men, with gender differences in income greatest among those aged 65 and older. Forty-four percent of women aged 65-79 and 52 percent of those aged 80 and older reported living in a lower-income household compared to 33 percent and 35 percent of men in these age groups, respectively (Exhibit 3B.1).

Recent immigrants, members of racial and ethnic minority groups, and Francophones who spoke French only were also more likely to live in lower-income households than the overall Ontario population (Exhibit 3B.1). The proportion of Ontarians who reported four major risk factors that increase the risk for chronic diseases and their associated morbidity and premature mortality (physical inactivity, inadequate fruit and vegetable intake, being overweight or obese and smoking) was high across all levels of education and income (Exhibit 3B.5).

Lower levels of education and income were associated with a higher prevalence of these risk factors. For example,
women and men with lower levels of education were more likely to smoke; 28 percent of women and 40 percent of men with less than a secondary school education compared to eight percent of women and 13 percent of men who had a Bachelor’s degree or higher (Exhibit 3B.5).

Women were more likely to report that they were physically inactive but less likely to report inadequate fruit and vegetable intake, being overweight or obese and smoking than men.

While five percent of Ontarians overall reported food insecurity, one in four low-income women and men reported that they did not have enough to eat, worried about there not being enough to eat, or did not eat the quality or variety of foods desired due to a lack of money (Exhibit 3B.4).

### Chronic Conditions

The majority of women and men in Ontario were living with at least one chronic condition. Nearly one in three women and one in four men reported having two or more chronic conditions (Exhibit 3C.7).

There was an income gradient in the prevalence of common chronic diseases among both women and men and a similar pattern was seen for education. Lower-income and less educated women and men were most likely to report having common chronic conditions (hypertension, arthritis, obstructive lung disease, diabetes, heart disease or stroke and depression) as well as having multiple chronic conditions (comorbidity) (Exhibit 3C.1).

The prevalence of comorbidity also varied by ethnicity. Nearly half (48 percent) of Aboriginal women reported having two or more chronic conditions compared to 16 percent of East and Southeast Asian women (Exhibit 3C.10).

Women were more likely to report having arthritis, depression, and multiple chronic conditions than men.

Among low-income women aged 65 and older, two in three reported having hypertension or arthritis, one in five reported having diabetes, and one in four reported having heart disease or stroke (Exhibit 3C.2).

### Sexually-transmitted Infections

Chlamydia infection and its consequences primarily affects adolescent and young adult women (aged 15–24) (Exhibit 3D.1).

Reported incidence rates of gonorrhea infection among women aged 15–19 were more than twice as high as rates reported for adolescent men. For those aged 20 and older, rates were higher among men than women; however, this difference was small among those aged 20–24 (Exhibit 3D.2).

While men were more likely than women to be infected with HIV, one-fourth of new HIV infections occurred in women. Risk factors for HIV infection differed greatly for women and men. Among women in Ontario most infections were due to heterosexual transmission, whereas homosexual transmission was more common for men (Exhibit 3D.4).

### Mortality

Low-income women and men had higher mortality rates both overall (Exhibit 3E.1) and for specific causes of death—including chronic disease, infections, and injuries (with the exception of motor vehicle accidents). They also had a higher probability of premature mortality, shorter life expectancies and shorter disability-free life expectancies than those with higher income.

For most measures of mortality, an income gradient was observed across neighbourhood income quintiles. In addition, sex differences in mortality rates tended to be greatest among low-income women and men indicating a marked survival disadvantage for low-income men.

Forty-one percent of men and 26 percent of women in the lowest income quintile died before age 75 (premature mortality), compared to 28 percent of men and 19 percent of women in the highest income quintile (Exhibit 3E.2).
Discussion

We found sizable and modifiable inequities in health in Ontario associated with gender, income, education, ethnicity and geography. Ontarians of lower socioeconomic position experienced much higher levels of chronic disease and disability than those who were more advantaged.

They were also more likely to die prematurely. We identify many opportunities for improvement, present objective evidence to inform priority setting and provide a baseline from which to measure progress.

The impact of these inequities was substantial. If all Ontarians had the same health as Ontarians with higher income, an estimated 318,000 fewer people (166,000 women and 152,000 men) would be in fair or poor health, an estimated 231,000 fewer people (110,000 women and 121,000 men) would be disabled and there would be an estimated 3,373 fewer deaths each year (947 women and 2,426 men) among Ontarians living in metropolitan areas.

Gender matters. There were large differences in health associated with income, education and ethnicity among both women and men. The differences between subgroups of women associated with income, education and ethnicity were often larger than the overall differences between women and men. For example, while 13 percent of women and men in Ontario reported their health as being fair or poor, 26 percent of low-income women versus only eight percent of higher-income women reported their health as fair or poor. The social determinants of health influenced women and men differently. For example, disadvantaged women (i.e., low-income) were particularly at risk for disability and chronic pain and disadvantaged men were particularly at risk for early death. Women were more likely to report comorbidity and disability than men, and men had higher rates of potentially avoidable mortality and premature death. In addition, women were more likely to be poor than men, adding greatly to the high burden of illness that they experienced.

Ethnicity and language were also associated with health and functional status. In particular Aboriginal women and men (living off-reserve) were more likely to report fair or poor health and activity limitations than other ethnic groups. Aboriginal women were more likely to report fair or poor health and activity limitations than Aboriginal men. Ontarians who spoke French only or who spoke neither French nor English also reported worse health than those who spoke English only or were bilingual (French and English).

Geography also matters. There were important differences across Ontario Local Health Integration Networks (LHINs) in the health and functional status of their residents, as well as the distribution of risk factors for chronic disease (smoking, obesity, and sedentary lifestyles).

It is not surprising that we found health inequities in the province—health inequities associated with socioeconomic position have been well-documented in many societies. What is surprising and of great concern is the size of these health inequalities. This may be a reflection of growing income inequality and rates of poverty. In the mid 1990’s in Canada, levels of income inequality and poverty began to climb (following a period of two decades when these levels were on the decline). In fact, inequality and poverty rates in Canada
were recently reported to exceed the average of the member countries of the Organization for Economic Co-operation and Development (OECD) countries.\textsuperscript{108}

The good news is that there is a lot we can do to close these gaps in health equity. There is growing evidence for the effectiveness of interventions to reduce overall population risk, improve health outcomes and close the health gaps between the less advantaged and more advantaged members of society.\textsuperscript{25, 109-111} Many of these objectives were detailed in the Ottawa Charter over two decades ago.\textsuperscript{112} There are now several decades of international experience in developing and implementing strategies for health equity. Addressing health inequities is a policy priority and explicit objective for many international organizations (e.g., European Union (EU), the OECD, the World Health Organization (WHO))\textsuperscript{113} and many nations (the United Kingdom, Sweden, the Netherlands, New Zealand and Finland).\textsuperscript{114} Lessons learned from their efforts can help inform interventions in Ontario. The WHO Commission on the Social Determinants of Health recently concluded that through a concerted effort, it is possible to close these gaps in a generation.\textsuperscript{25}

There are many innovative models to draw upon in Ontario, across Canada and internationally by communities, health care providers, health systems, public health systems and organizations to effect improvement. For example, Community Health Centres in Ontario have developed models of care that address the social determinants of health and foster cultural and linguistic access to services. British Columbia has implemented both a provincial chronic disease management program and ActNow, BC\textsuperscript{115} involving multiple sectors in health promotion. In the United Kingdom, improvements in health equity have been achieved through quality improvements in primary care.

Our findings highlight the need to ensure that efforts to reduce population risk factors for chronic disease reach those who are at the greatest risk. For example, through Ontario’s Smoke-Free Strategy success has been achieved by reducing the number of Ontarians who smoke.\textsuperscript{58,116} Nevertheless, we found that 40% of men and 28% of women with less than a secondary school education, as well as 39% of Aboriginal women and 43% of Aboriginal men currently smoke. Thus, to be most effective, prevention and improvement efforts must also target vulnerable population subgroups. See the “Reducing the Burden of Illness: Different Approaches” Section for a description of Ontario’s Smoke-Free Strategy as well as other examples of successful intervention models we can draw from.

With a commitment to achieving health equity, and a concerted coordinated effort to tackle the problems identified in this chapter, much progress can be made. This can be accomplished through incorporating determinants of health, as well as focusing on and emphasizing chronic disease prevention and management as described below. Ongoing measurement, monitoring and evaluation are essential elements for accomplishing desired change.

**Determinants of Health and Constrained Choices**

Common modifiable risk factors such as smoking, overweight and obesity are responsible for much of the chronic illness present in both women and men. For example, a recent study found that more than half (55 percent) of deaths in women can be attributed to the combination of smoking, being overweight, lack of physical activity and a low–quality diet.\textsuperscript{38} However, the degree to which each of these risk factors contribute to chronic disease differs by gender.\textsuperscript{117} Thus, gender-sensitive interventions are needed to reduce risk. Also, to be successful these interventions need to address factors that influence health behaviours,\textsuperscript{1} including social factors (e.g., living and working conditions, income, education, culture) as well as individual choices.

Good nutrition promotes health, reduces the risk of illness and chronic disease and improves health outcomes among individuals with chronic conditions. Food insecurity, or inadequate access to a healthy diet constrains food choices and is associated with worse...
health status including diabetes and obesity.\textsuperscript{42, 53, 54} In 2005, five percent of Ontarians reported food insecurity. However, there was a large income gradient in the percentage of adults who reported food insecurity, with one-quarter of low-income men and women reporting that they “did not have enough to eat, worried about there not being enough to eat or did not eat the quality or variety of foods desired due to a lack of money.” In Ontario, neighbourhood characteristics have been shown to be linked to the prevalence of diabetes both through less access to a healthy diet and neighbourhood conditions that make it more difficult to make healthy choices, such as limited (and unsafe) green spaces for physical activity.\textsuperscript{43}

Bird and Rieker\textsuperscript{118} have developed a model of constrained choice that explains how the social determinants of health influence health behaviors. The model addresses how policy decisions can have unintended and cumulative effects by discouraging or preventing healthy choices. Constrained choice can result from national-level social policy, community decisions about neighbourhoods that limit opportunities for walking and exercise or workplace actions that limit employees’ autonomy over their work and schedule.\textsuperscript{118} Therefore, reducing population risk requires addressing those factors that result in constrained choices.

**Chronic Disease Prevention and Management**

Much of the illness burden that we report is attributable to chronic illness. The current health care system is ill-suited to meet the needs of individuals with chronic illness and disability. Moreover, insufficient attention is paid to prevention and there is typically little coordination between community-based and health sector interventions. Because women and socioeconomically disadvantaged persons are more likely to have multiple chronic conditions and disability, they are affected disproportionately by the mismatch between the way care is currently organized and the needs of persons with chronic illness.\textsuperscript{119, 120} This in turns leads to worse health status and thus contributes to health inequities. Health system redesign that supports chronic illness care and fosters patient empowerment and community partnership is an important strategy for achieving health equity.\textsuperscript{114}

In order to improve chronic disease prevention and management in the province, the Ontario Ministry of Health and Long-Term Care (MOHLTC) has adopted the Chronic Disease Prevention and Management Framework (Figure 4). This framework provides a roadmap for creating a patient-centred delivery system that meets the needs of individuals with chronic illness. The Framework is based upon the Chronic Care Model (CCM) developed by Wagner and colleagues.\textsuperscript{121} The CCM, which has guided efforts to improve healthcare quality using a health systems approach, includes the role of community resources and policy in improving health outcomes. It has been used to improve the quality of care in diverse practice settings in many countries.\textsuperscript{67} The CCM recognizes that good health outcomes are dependent upon productive interactions between an individual and a proactive health care team and empowers patients to take an active role in their care.

Subsequent iterations of the CCM expand upon the role of both communities and the policy environment in fostering health, providing a framework that can be used to address the social determinants of health in the context of system redesign and improvement.\textsuperscript{66} In Canada, the province of British Columbia is using the “Expanded Chronic Care Model” which emphasizes the role of an activated community as a partner and incorporates a focus on disease prevention and health promotion.\textsuperscript{66} This has led to innovations and improvements in chronic disease care management.

More widespread implementation of Ontario’s Chronic Disease Prevention and Management Framework would foster needed improvements in the province to reduce the burden of chronic disease and disability.
Measurement, Monitoring, Improvement, and Evaluation

Measurement, monitoring, improvement and evaluation are critical elements for tackling health inequities.\textsuperscript{122, 123} The WHO Commission on the Social Determinants of Health concluded “Goals and targets can redirect policy, improve resource allocation and improve development outcomes. Regular public reporting and the development of data systems, globally and nationally, ensure that the world can see which targets are being met and where further efforts are needed.”\textsuperscript{25}

We report on a set of indicators, currently measurable using data available in the province, to inform priority setting, development of goals and targets and the identification and development of interventions for improvement. By presenting data at the level of the LHIN, we provide important information needed by providers and policymakers to tackle and reduce health inequities across the province. Monitoring these indicators over time will allow us to evaluate the effectiveness of efforts to improve population health and whether progress is being made in both reducing the gap between those who are least and most advantaged and reducing the gradient across all levels of income and education.

A number of tools have been developed to help guide policymakers, providers and communities in designing, implementing and evaluating interventions to reduce...
Health inequities are used to assess the cause of health inequities in a defined population and to develop and implement programs to address them. Health Impact Assessments (HIAs) are used to assess the impact of policy on population health and health equity. The Equity Gauge, recently adapted for the Canadian context, is a model that incorporates community empowerment and has been primarily used in the developing world. Tugwell and colleagues have proposed a “health equity loop” that recognizes the need for an iterative learning process for health equity policies and interventions. Use of these tools provincially, regionally and locally can contribute to accelerating progress.

**Coordinating a Response**

There are many important, ongoing activities aimed at improving health in the province that can lead to improvements in population health. However, they are not always coordinated. Efforts to integrate and coordinate these activities, including those outside the health sector, could produce synergies that could accelerate progress in improving health and reducing health inequities among Ontarians.

The MOHLTC has a number of strategies aimed at reducing the burden of illness among Ontarians. For example, its Diabetes Strategy incorporates the Chronic Disease Model to improve the quality and outcomes of diabetes care. The Aging in Place Strategy seeks to keep older Ontarians in their homes. Improved chronic disease prevention and management, pain management and falls prevention would all support this objective. Primary care reform and expansion of Family Health Teams can also contribute to improving the health of the population. Many providers have implemented efforts to improve the quality of care provided for chronic disease.

Two efforts of the Ontario Ministry of Health Promotion—the Healthy Eating and Active Living Action Plan and the Healthy School’s Recognition Program—are focused on modifying important risk factors for chronic disease. The new Ontario Public Health Standards include identifying, reporting and using information about health inequities and tailoring strategies to inform actions that meet the needs of priority populations. Poverty reduction strategies address the social determinants of health.

Many LHINs have identified equity as a priority issue. For example, the Toronto Central LHIN created a Health Equity Task Force and has developed a plan for improving health equity in the LHIN. Efforts to integrate and coordinate these efforts could produce synergies to accelerate progress in improving health and reducing health inequities among Ontarians.

**Limitations**

Our study has a number of limitations. Many of the indicators are measured using the Canadian Community Health Survey (CCHS) and are based upon self-report. Self-report of chronic disease prevalence is widely used for reporting and has been well-validated as a measure. Nevertheless, it is subject to reporting error. Importantly, many chronic conditions such as hypertension or diabetes can be present for years without causing symptoms. If persons who are socioeconomically disadvantaged encounter more barriers to access to care and therefore are not diagnosed, this would result in an underestimate of prevalence in this population, as well as an underestimate of the differences between the most and least advantaged groups. The way a question is asked can also influence the accuracy of response. For example, rates of urinary incontinence from the CCHS are lower than those of other population health surveys which may be due to the way the question is asked.

Some indicators are more subject to measurement error than others. For example, the indicator for being overweight or obese is particularly subject to measurement error as people may under- or over-report their height and weight. The indicator of depression prevalence measures the percentage of adults who—based on their scores in the Composite...
International Diagnostic Interview-Short Form for Major Depression (CIDI-SFMD) questionnaire—had a high probability of having major depression. Many more Ontarians have milder forms of depression. The CIDI-SFMD was never fully validated so that the percentages reported here may differ from actual population prevalence.

In other circumstances, important questions may not be asked. The measure of disability we used assesses the proportion of the population who need the assistance of another person to carry out Instrumental Activities of Daily Living and/or Activities of Daily Living. Survey respondents were not asked whether they received this assistance. We therefore were not able assess unmet need for assistance with these activities.

The CCHS includes only self-identified, off-reserve, Aboriginal adults (North American Indian, Métis, Inuit). Thus, our measures of Aboriginal health excluded those living on reserves and are not representative of the overall Aboriginal population in Ontario. If Aboriginal people living on reserves have worse health than those living off-reserves then the health gap between Aboriginal people and those of other ethnic groups would be larger than reported here.

For indicators using administrative data, income level was assessed using neighbourhood income quintiles. This measure captures the impact on health of living in a low-income neighbourhood. This measure has been well-validated as a proxy for individual income, but it is subject to measurement error in neighbourhoods where households with a mix of income levels reside. Mortality indicators were analyzed by Statistics Canada and are limited to residents of Census Metropolitan Areas (CMAs).

Most of the indicators we report are from 2005. We have provided a baseline from which to monitor progress that can be updated as newer data become available.

**What We Can’t Measure**

Due to data limitations, there are a number of important aspects of burden of illness that we were unable to measure. Limited data are available in the province on ethnicity. The data that are available come from the CCHS, and sample sizes are not large enough to report on all indicators for the diverse ethnic groups that comprise the Ontario population. It was not possible to assess whether the health of ethnic minorities differed across the LHINs. Likewise, similar limitations apply to assessing the health of Francophones in the province or those who did not speak one of the official languages. We were also unable to provide a full picture of Aboriginal health across the province.

Better data on ethnicity and language can be obtained through oversampling specific populations in surveys to increase sample size, targeting surveys to specifically assess the health of populations of interest, collecting data on ethnicity and language in administrative data or linking datasets containing this information to health data.

Data quality and completeness also limit our measurement ability. Due to missing postal codes in the iPHIS database, we were unable to assess rates of sexually-transmitted infections (STIs) by income or at the LHIN-level. This limitation is being addressed and it is anticipated that it will be possible to report variation in rates of STIs by region and income in the future.

We do not have data on important factors that influence women’s health such as caregiving responsibilities or exposure to domestic violence. Importantly, income, education, ethnicity, language and geography do not operate alone to influence health and well-being. Rather they operate together and interact to shape the health of women and men. We were only able to examine these factors separately. Thus, we do not capture the impact of their intersectionality.
KEY MESSAGES

There are enormous opportunities to improve overall population health while reducing health inequities in Ontario. It is not surprising that we identified health inequities, as these are common in all societies and are well-documented in Canada. However, the large size of the identified inequities is of concern. There is growing evidence for interventions to reduce overall population risk and to close the health gaps between the less and more advantaged members of society.\textsuperscript{109}

The following four key actions can accelerate progress in improving the health of and reducing inequities among all Ontarians:

1. Prioritize chronic disease prevention and management;
2. Coordinate population health, community and clinical responses for improving health;
3. Address the broader social determinants of health and
4. Routinely include gender and equity analysis in health indicator monitoring and reporting.

Prioritize Chronic Disease Prevention and Management

• Because chronic diseases and their risk factors contribute greatly to health inequities, the implementation of a comprehensive and coordinated chronic disease prevention and management strategy—that addresses the needs of at-risk populations—is the key to improving population health and achieving health equity.

• It is especially important to identify specific opportunities to improve quality of life and functional status through both community-based and health care interventions. For example, improved pain management and falls prevention interventions can reduce illness burden and contribute to the goal of helping older Ontarians remain active and independent.

Coordinate Population Health, Community and Clinical Responses

• There are many important ongoing activities aimed at improving health in the province including: targeting population-based health promotion, enhancing the quality and capacity of community-based services and improving the quality of care delivered in clinical settings. Efforts to integrate and coordinate these activities could produce synergies to accelerate progress in improving health and reducing health inequities among Ontarians.

Address the Broader Social Determinants of Health

• There is a need to address the broader social determinants of health (i.e., income, education, food security, housing and environment) and to integrate these efforts with health policy. Cross-sectoral partnerships are needed to accomplish this goal.

• To guide these efforts, tools such as Health Impact Assessments (HIAs) are available to assess the health impact of policy—including those in non-health sectors such as education, housing and environment—on both population health and health inequities. The results of HIAs in key priority areas in Ontario could help to support efforts to achieve health equity.

Routinely Include Gender and Equity Analysis in Health Indicator Monitoring

• A gender and equity focus should be routinely incorporated into health indicator reporting and monitoring. This provides the needed information to effectively target gender, socioeconomic and ethnic inequities in health. Monitoring these indicators over time will allow us to assess progress in improving health and reducing inequities.

• Improvements in data quality, availability, and timeliness are needed to support monitoring and reporting strategies. There is a particular need for data on ethnicity to improve the capacity to measure, monitor and improve health for Ontario’s diverse communities.
Reducing Burden of Illness: Different Approaches

There are many models to draw upon, including innovations in Ontario, across Canada and internationally by communities, providers, health systems and public health organizations to effect improvement.

**Chronic Disease Management in British Columbia**

The Ministry of Health in British Columbia developed a chronic disease management (CDM) program with initiatives that focus on prevention, early detection and management of chronic conditions. The multi-disciplinary program involves the collaborative efforts of medical and health care professionals, health authorities, researchers and organizations across all sectors of the health care system. The program was based upon the Expanded Chronic Care Model. This strategy led to provincial and local interventions designed to improve quality and outcomes of care. A province-wide congestive heart failure collaborative led to substantial improvements in adherence to evidence-based guidelines for patients with heart failure. A chronic disease management toolkit was developed and made available to practitioners that included electronic access to guidelines, patient flow sheets and the ability to generate clinical and administrative reports on quality of care provided.

**Reducing Population Risk: The Ontario Smoke-Free Strategy**

The Government of Ontario developed the Smoke-Free Strategy—a comprehensive tobacco control program—with the goal of reducing tobacco consumption by 20 percent by the end of 2007. This was achieved with a 31.8 percent decline in tobacco consumption between 2003 and 2006. The program’s main initiatives aimed to: prevent children and youth from starting to smoke; help current smokers to quit and reduce involuntary exposure to second-hand smoke. Central to the strategy is the *Smoke-Free Ontario Act*, which came into force on May 31, 2006. The Act bans smoking in enclosed public places and enclosed work places, strengthens laws on tobacco sales to minors and restricts the display of tobacco products in retail outlets in order to reduce population risk from exposure to tobacco smoke in the province.

**Community Health Centres—Crossing Boundaries**

Many Community Health Centres in Ontario have implemented programs that cross boundaries to address the social determinants of health in order to improve health outcomes among the at-risk populations that they serve.

In response to community need, The London InterCommunity Health Centre developed the *Latin American Diabetes Program* targeting the special needs of the large Latin American community in the region. The program addresses both prevention and chronic disease management. The centre provides a multi-disciplinary screening and treatment program, using electronic patient records to monitor patients and assess program
effectiveness. In addition to the medical program, community health workers and social workers address the socioeconomic status of their patients such as housing and employment issues. The program has substantially improved diabetes control, resulted in risk factor reduction through weight loss, increased physical activity, blood pressure and cholesterol control and proved to be cost saving by reducing health care costs associated with diabetes and its complications.\textsuperscript{137,138,139} Access to an affordable and healthy diet is essential to reducing the risk of developing chronic diseases such as diabetes, heart disease and high blood pressure, improving health outcomes and reducing the risk of complications among those who develop these conditions. Unfortunately, many low-income Ontarians report food insecurity. The Barrie Good Food Box is a buying club sponsored by the Barrie Community Health Centre that provides nutritious fruits and vegetables at wholesale prices to participants.\textsuperscript{140}

**Performance Measurement and Quality Improvement**

Structured performance measurement and quality improvement initiatives can lead to better prevention and care for chronic conditions\textsuperscript{141} and can result in increased equity.\textsuperscript{142,143} In the United Kingdom, the Quality and Outcomes Framework provides financial incentives to primary care physicians to improve quality of care measured by performance on a standard set of quality indicators.\textsuperscript{144} The implementation of this framework has lead to overall improvement in chronic disease management (e.g., control of hypertension) with narrowing of inequities in performance between practices serving the most- and the least-deprived communities.

**Cultural and Linguistic Access to Care**

Women’s Health in Women’s Hands [WHIWH] Community Health Centre provides community, mental and clinical care, health promotion and support to Black women and women of colour from the Caribbean, African, Latin American and South Asian communities in Metropolitan Toronto and surrounding municipalities.\textsuperscript{145} They use a multidisciplinary model of care that is based on an understanding that women’s health issues are personal, cultural, social, racial and economic as well as medical. WHIWH employs multilingual and culturally aware staff (speaking 21 languages and 4 dialects). They have adopted several strategies designed to overcome the challenges and barriers encountered by women of colour in accessing care. These include involving marginalized groups in decision-making at all levels of the organization including the Board of Directors; ensuring that healthcare providers are representative of their various client populations and offering integrated multidisciplinary services where clients make one visit for more than a single purpose. WHIWH has a diabetes program that includes a Diabetes Nurse Educator who engages with the community in their familiar surroundings, and community dieticians who offer nutritional information that incorporates a cultural understanding of food and nutrition.

**Tackling Root Causes: Poverty Reduction**

In 2002, the Province of Québec enacted a law to combat poverty and social exclusion. The goals of the Act to Combat Poverty and Social Exclusion are: “to promote respect for and protection of the dignity of persons living in poverty and combat prejudices in their regard; to improve the economic and social situation of persons and families living in poverty and social exclusion;
to reduce the inequalities that may be detrimental to social cohesion; to encourage persons and families living in poverty to participate in community life and social development and to develop and reinforce the sense of solidarity throughout Québec, so that society as a whole may participate in the fight against poverty and social exclusion. The government developed a multi-pronged action plan titled *Reconciling Freedom and Social Justice: A Challenge for Tomorrow*, to achieve these goals. As a result, Quebec has had a steady decline in the number of adults and children living in poverty, as well as a reduction in the number of persons requiring social assistance.

**Bridging Population Health and Clinical Practice**

The Norsjo Community Intervention Program in Sweden is an example of a successful model that combines population health and health sector interventions. The program was able to reduce cardiovascular disease risk in the population by creating a local health promotion collaboration between healthcare providers, grocery stores, schools and municipal authorities. Primary care physicians contacted patients for systematic risk factor screening and counseling aimed at cardiovascular risk reduction. Community interventions included changes in food labeling to make it easier to adhere to dietary recommendations. As a result of this collaboration, the predicted coronary heart disease mortality was reduced by 36 percent in the intervention area compared to one percent in a control community. Socially less-privileged groups benefited the most from the program. 

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Appendix 3.1

INDICATORS AND THEIR LINKS TO PROVINCIAL STRATEGIC OBJECTIVES

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Link(s) to OHQC Attributes of a High-Performing Health System</th>
<th>Link(s) to MOHLTC Strategic Objectives</th>
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</thead>
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<td><strong>Section A – Health and Functional Status</strong></td>
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<tr>
<td>Self-rated Health (Global Health)</td>
<td>• Effective</td>
<td>• Improve clinical and population health outcomes</td>
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<tr>
<td></td>
<td>• Patient-centred</td>
<td>• Improve health status of Ontarians</td>
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<tr>
<td></td>
<td>• Focused on population health</td>
<td></td>
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<tr>
<td>Self-rated Mental Health (Global Mental Health)</td>
<td>• Effective</td>
<td>• Improve clinical and population health outcomes</td>
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<td></td>
<td>• Patient-centred</td>
<td>• Improve health status of Ontarians</td>
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<tr>
<td></td>
<td>• Focused on population health</td>
<td></td>
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<tr>
<td>Activity Limitations</td>
<td>• Effective</td>
<td>• Improve clinical and population health outcomes</td>
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<tr>
<td></td>
<td>• Patient-centred</td>
<td>• Improve health status of Ontarians</td>
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<tr>
<td></td>
<td>• Focused on population health</td>
<td></td>
</tr>
<tr>
<td>Limitations in Instrumental Activities of Daily Living (IADLs) and/or Activities of Daily Living (ADLs)</td>
<td>• Effective</td>
<td>• Improve clinical and population health outcomes</td>
</tr>
<tr>
<td></td>
<td>• Patient-centred</td>
<td>• Improve health status of Ontarians</td>
</tr>
<tr>
<td></td>
<td>• Focused on population health</td>
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<tr>
<td>Activities Prevented by Pain or Discomfort</td>
<td>• Effective</td>
<td>• Improve chronic disease management</td>
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<tr>
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<td>• Patient-centred</td>
<td>• Improve clinical and population health outcomes</td>
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<td>• Focused on population health</td>
<td>• Improve health status of Ontarians</td>
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<td>Hospitalization Rate Due to Fall-related Injury Among Seniors</td>
<td>• Effective</td>
<td>• Improve chronic disease management</td>
</tr>
<tr>
<td></td>
<td>• Patient-centred</td>
<td>• Improve clinical and population health outcomes</td>
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<tr>
<td></td>
<td>• Integrated</td>
<td>• Increase sustainability of the health system</td>
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<tr>
<td></td>
<td>• Focused on population health</td>
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<tr>
<td><strong>Section B – Chronic Disease Risk Factors</strong></td>
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</tr>
</tbody>
</table>
| Social Determinants of Health | • Equitable  
• Focused on population health | • Influence broader determinants of health  
• Improve clinical and population health outcomes  
• Improve health status of Ontarians |
| • Low income  
• Low education  
• Food insecurity | | |
| Health Behaviours | • Focused on population health | • Improve healthy behaviours, health promotion and disease prevention  
• Improve clinical and population health outcomes  
• Improve health status of Ontarians |
| • Physical inactivity  
• Inadequate fruit and vegetable intake  
• Being overweight or obese  
• Smoking | | |
| **Section C – Chronic Conditions** | | |
| Prevalence of Chronic Conditions | • Effective  
• Focused on population health | • Improve healthy behaviours, health promotion and disease prevention  
• Improve health status of Ontarians  
• Influence broader determinants of health  
• Increase sustainability of the health system |
| • Arthritis  
• Obstructive lung disease (Asthma, chronic bronchitis, emphysema or COPD)  
• Diabetes  
• Heart disease or stroke  
• Hypertension  
• Urinary incontinence | | |
| Prevalence of Depression | • Effective  
• Focused on population health | • Improve clinical and population health outcomes  
• Improve health status of Ontarians  
• Influence broader determinants of health |
| Prevalence of Comorbidity | • Effective  
• Focused on population health | • Improve health status of Ontarians  
• Influence broader determinants of health  
• Increase sustainability of the health system |
| • Two or more chronic conditions** | | |
### APPENDIX 3.1 | Burden of illness indicators: links to the *Ontario Health Quality Council (OHQC) Attributes of a High-Performing Health System* and the *Ministry of Health and Long-Term Care (MOHLTC) Strategic Objectives*

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<td><strong>Section D – Sexually-transmitted Infections</strong></td>
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<tr>
<td>Incidence of Sexually-transmitted Infections • Chlamydia • Gonorrhea</td>
<td>• Effective • Focused on population health</td>
<td>• Improve healthy behaviours, health promotion and disease prevention • Improve clinical and population health outcomes • Improve health status of Ontarians • Influence broader determinants of health</td>
</tr>
<tr>
<td><strong>HIV/AIDS</strong></td>
<td>• HIV prevalence • HIV risk factors (exposure categories) • AIDS incidence • Prenatal HIV testing</td>
<td>• Effective • Focused on population health</td>
</tr>
<tr>
<td><strong>Section E – Mortality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All-cause Mortality Rate</td>
<td>• Effective • Focused on population health</td>
<td>• Improve clinical and population health outcomes • Improve health status of Ontarians • Influence broader determinants of health</td>
</tr>
<tr>
<td>Premature Mortality • Deaths before age 75 • Excess deaths before age 75 • Potential years of life lost (PYLL) before age 75</td>
<td>• Effective • Focused on population health</td>
<td>• Improve clinical and population health outcomes • Improve health status of Ontarians • Influence broader determinants of health</td>
</tr>
<tr>
<td>Chronic Disease Mortality Rates • Circulatory diseases • Diabetes • Chronic obstructive pulmonary disease (COPD)</td>
<td>• Effective • Focused on population health</td>
<td>• Improve clinical and population health outcomes • Improve health status of Ontarians • Influence broader determinants of health</td>
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<tr>
<td>Infectious Disease Mortality Rate</td>
<td>• Effective</td>
<td>• Improve clinical and population health outcomes</td>
</tr>
<tr>
<td>• Pneumonia</td>
<td>• Focused on population health</td>
<td>• Improve health status of Ontarians</td>
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<td></td>
<td></td>
<td>• Influence broader determinants of health</td>
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<tr>
<td>Mortality from Trauma and Injury</td>
<td>• Effective</td>
<td>• Improve clinical and population health outcomes</td>
</tr>
<tr>
<td>• Road traffic accidents (RTA)</td>
<td>• Focused on population health</td>
<td>• Improve health status of Ontarians</td>
</tr>
<tr>
<td>• Intentional and non-intentional injuries (homicide, fire, drowning and poisoning)</td>
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<td>• Influence broader determinants of health</td>
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<tr>
<td>• Fall-related mortality rate</td>
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<tr>
<td>Life Expectancy</td>
<td>• Effective</td>
<td>• Improve clinical and population health outcomes</td>
</tr>
<tr>
<td>• At birth</td>
<td>• Focused on population health</td>
<td>• Improve health status of Ontarians</td>
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<tr>
<td>• At age 65</td>
<td></td>
<td>• Influence broader determinants of health</td>
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<tr>
<td>Disability-free Life Expectancy</td>
<td>• Effective</td>
<td>• Improve clinical and population health outcomes</td>
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<td>• At birth</td>
<td>• Focused on population health</td>
<td>• Improve health status of Ontarians</td>
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<tr>
<td>• At age 65</td>
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<td>• Influence broader determinants of health</td>
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</tbody>
</table>

** Chronic conditions included in this list are: Alzheimer’s disease or other dementia; bowel disorders (Crohn’s disease, ulcerative colitis, Irritable Bowel Syndrome or bowel incontinence); cancer (non-skin); diabetes; epilepsy; heart disease or stroke; high blood pressure; thyroid condition; urinary incontinence; arthritis or rheumatism excluding fibromyalgia, or back problems excluding fibromyalgia and arthritis; obstructive lung disease (asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease); chronic fatigue syndrome or fibromyalgia
# Appendix 3.2

## INDICATORS AND THEIR SOURCES*

### APPENDIX 3.2 | Burden of illness indicators: indicator sources and data sources

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<tr>
<th>Indicator</th>
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<td>Self-rated Health (Global Health)</td>
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<td>Canadian Community Health Survey (CCHS), Cycle 3.1</td>
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<td></td>
<td>• Association of Public Health Epidemiologist in Ontario (APHEO)</td>
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<td></td>
<td>• Australia. Report of New South Wales Chief Health Officer: Burden of Disease</td>
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<tr>
<td>Self-rated Mental Health (Global Mental Health)</td>
<td>• Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004</td>
<td>CCHS 3.1</td>
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<td></td>
<td>• ICES Atlas: Adding Years to Life and Life to Years: Life and Health Expectancy in Ontario, January 2001</td>
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<td>Activity Limitations</td>
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<td>CCHS 3.1</td>
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<td>• Association of Public Health Epidemiologists of Ontario (APHEO)</td>
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<td>Limitations in Instrumental Activities of Daily Living (IADLs) and/or Activities of Daily Living (ADLs)</td>
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<td></td>
<td>• Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario</td>
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<td>Activities Prevented by Pain or Discomfort</td>
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<td>• ICES Atlas: Adding Years to Life and Life to Years: Life and Health Expectancy in Ontario, January 2001</td>
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<td>Hospitalization Rate Due to Fall-related Injury Among Seniors</td>
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<td>Canadian Institute for Health Information — Discharge Abstract Database (CIHI-DAD)</td>
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<tr>
<td>• Low education</td>
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<td>• Food insecurity</td>
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<td>Health Behaviours</td>
<td>• Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004</td>
<td>CCHS 3.1</td>
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<td>• Physical inactivity</td>
<td>• Association of Public Health Epidemiologist in Ontario (APHEO)</td>
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<tr>
<td>• Inadequate fruit and vegetable intake</td>
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<tr>
<td>• Being overweight or obese</td>
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<tr>
<td>• Smoking</td>
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<td><strong>Section C – Chronic Conditions</strong></td>
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<td>• Arthritis</td>
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<td>• Obstructive lung disease (Asthma, chronic bronchitis, emphysema or COPD)</td>
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<tr>
<td>• Diabetes</td>
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<td>• Heart disease or stroke</td>
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<td>• Hypertension</td>
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<td>• Urinary incontinence</td>
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<td>Prevalence of Depression</td>
<td>• Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004</td>
<td>CCHS 2.1</td>
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<td>Prevalence of Comorbidity</td>
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<td>CCHS 3.1</td>
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<td>• Two or more chronic conditions**</td>
<td>• Australian Institute of Health and Welfare. Burden of Disease and Injury in Australia, 1999</td>
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<td><strong>Section D – Sexually transmitted Infections</strong></td>
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</table>
| Incidence of Sexually transmitted Infections  
  • Chlamydia  
  • Gonorrhea | • Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004  
  • Association of Public Health Epidemiologist in Ontario (APHEO)  
  • Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario | Integrated Public Health Information System (iPHIS) |
| HIV/AIDS  
  • HIV prevalence  
  • HIV risk factors (exposure categories)  
  • AIDS incidence  
  • Prenatal testing | • Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004  
  • Ontario HIV Epidemiologic Monitoring Unit | HIV Laboratory, Laboratories Branch, Ontario Ministry of Health and Long-Term Care |
| **Section E – Mortality** |
| All-cause Mortality Rate | • Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004  
  • Association of Public Health Epidemiologist in Ontario (APHEO)  
| Premature Mortality  
  • Deaths before age 75  
  • Excess deaths before age 75 | • Organisation for Economic Co-Operation and Development, Health at a Glance, 2007  
|  
  • Potential Years of Life Lost (PYLL) before age 75 | • Association of Public Health Epidemiologist in Ontario (APHEO) | |
| Chronic Disease Mortality Rates  
  • Circulatory diseases  
  • Diabetes  
  • Chronic obstructive pulmonary disease (COPD) | • Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004  
  • Association of Public Health Epidemiologist in Ontario (APHEO)  
## APPENDIX 3.2 | Burden of illness indicators: indicator sources and data sources

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Indicator Source</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Section E – Mortality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infectious Disease Mortality Rate</td>
<td>• Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004</td>
<td>Statistics Canada's Canadian Mortality Database and 2001 Census.</td>
</tr>
<tr>
<td>• Pneumonia</td>
<td>• Association of Public Health Epidemiologist in Ontario (APHEO)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario</td>
<td></td>
</tr>
<tr>
<td>Mortality from Trauma and Injury</td>
<td>• Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004</td>
<td>Statistics Canada's Canadian Mortality Database and 2001 Census.</td>
</tr>
<tr>
<td>• Road traffic accident (RTA)</td>
<td>• Association of Public Health Epidemiologist in Ontario (APHEO)</td>
<td></td>
</tr>
<tr>
<td>• Intentional and non-intentional injuries (homicide, fire, drowning and poisoning)</td>
<td>• Public Health Research, Education and Development: Report on the Health Status of the Residents of Ontario</td>
<td></td>
</tr>
<tr>
<td>• Fall-related mortality rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life Expectancy</td>
<td>• Statistics Canada: Comparable Health Indicators - Canada, Provinces and Territories, 2004</td>
<td>Statistics Canada's Canadian Mortality Database and 2001 Census.</td>
</tr>
<tr>
<td>• At birth</td>
<td>• Association of Public Health Epidemiologist in Ontario (APHEO)</td>
<td></td>
</tr>
<tr>
<td>• At age 65</td>
<td>• ICES Atlas: Adding Years to Life and Life to Years: Life and Health Expectancy in Ontario, January 2001.</td>
<td></td>
</tr>
<tr>
<td>• At birth</td>
<td>• Association of Public Health Epidemiologist in Ontario (APHEO)</td>
<td></td>
</tr>
<tr>
<td>• At age 65</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* There may be small differences in the indicator reported compared to the indicator source(s) listed here.

** Chronic conditions included in this list are: Alzheimer’s disease or other dementia; bowel disorders (Crohn’s disease, ulcerative colitis, Irritable Bowel Syndrome or bowel incontinence); cancer (non-skin); diabetes; epilepsy; heart disease or stroke; high blood pressure; thyroid condition; urinary incontinence; arthritis or rheumatism excluding fibromyalgia, or back problems excluding fibromyalgia and arthritis; obstructive lung disease (asthma, chronic bronchitis, emphysema or chronic obstructive pulmonary disease); chronic fatigue syndrome or fibromyalgia
Appendix 3.3

HOW THE RESEARCH WAS DONE

1. Indicator Selection and Reporting

The indicators we report are the result of a rigorous selection process which included an extensive literature review of peer-reviewed and grey literature (see Chapter 1 for a more detailed description of the indicator selection process). The review of literature identified approximately 200 indicators. The working group reviewed the indicators using the defined indicator selection criteria and prepared a list containing potential indicators for inclusion for review by a Technical Expert Panel (TEP). Indicators were then selected through a modified Delphi process by the TEP using a two step process—first through an online questionnaire and then at a face-to-face meeting on December 12, 2006. The final list included 44 burden of illness indicators (see Appendix 3.1 or 3.2 for a complete indicator list).

All indicators are reported at the provincial level and at the Local Health Integration Network (LHIN) level, when sample size allowed. At the provincial level, these indicators were first stratified by sex and then by age, and then further stratified by socioeconomic variables (income, education, ethnicity, immigration status and languages spoken) as allowed by sample size and data availability. At the LHIN level, indicators were stratified by sex, and then by age, income, and education as allowed by sample size and data availability. Age adjustment was done using indirect standardization.

2. Data Sources and Measures

Data from various sources were used to produce this report. See Appendix 3.2 for data sources for individual indicators.

2.1 Canadian Community Health Survey (CCHS)

The analyses for many of the indicators in this chapter were based on data from the Canadian Community Health Survey (CCHS) Cycles 1.1, 2.1 and 3.1. The CCHS is a nationally representative, cross-sectional survey of the Canadian community-dwelling population conducted by Statistics Canada. The survey collects self-reported information on health and functional status, access to health care and health determinants. Residents living on Indian Reserves and on Crown Lands, institutional residents, full-time members of the Canadian Armed Forces and residents of certain remote regions are excluded. The Ontario share files for the survey were used for all analyses.

For all the CCHS-based indicators, we included all respondents aged 25 and older. Using this inclusion criterion for age allowed us to assess the relationship between education and illness burden because respondents were more likely to have finished their education. Cycle 1.1 (2000/01), was used to assess self-reported data regarding activities prevented by pain. Cycle 3.1 (2005), was used to assess: self-rated health status; self-rated mental health status; activity limitations (any difficulty hearing, seeing, communicating, walking, climbing stairs, bending, learning or doing any similar activities); limitations in Instrumental Activities of Daily Living (IADL) or Activities of Daily Living (ADL); self-reported chronic disease risk factors; food insecurity; selected chronic conditions and multiple chronic conditions.

The prevalence of depression was assessed using CCHS Cycle 2.1 (2003), which included the Composite
International Diagnostic Interview-Short Form for Major Depression (CIDI-SFMD). The CIDI-SFMD consists of a series of questions used to calculate the predicted probability of major depressive episodes occurring within the year preceding the CCHS interview. Those who had a CIDI-SFMD predicted probability score of ≥0.9 were considered to have probable depression. However, since this scale was never fully validated, percentages reported here may differ from actual population prevalence.

In analyses that use the CCHS, income levels are based on information collected about annual household income, a variable derived by Statistics Canada that accounts for total household income and household size. Income data were missing for nine percent of the sample. Definitions of annual household income categories, as well as descriptions of other socioeconomic categories from CCHS analyses are found in Table 3.1.

**Analysis**

Bivariate analyses using data from the CCHS were used to estimate the burden of chronic illness and disability in Ontario, as well as differences in the prevalence of chronic conditions, comorbidity, and functional status, by sex and socioeconomic status (SES). The data were weighted to represent the demographic makeup of the Ontario population in the respective cycle years. The proportions were calculated at both provincial and Local Health Integration Network (LHIN) levels whenever feasible. Indirect age-standardization to the provincial cohort was used. Indirect standardization was used to overcome the problem of small cell sizes. At the provincial level, descriptive analyses were conducted by the socio-demographic characteristics of sex and by age and then by income, education, ethnicity, immigration status and languages spoken. At the LHIN level, due to small cell sizes, the analyses were done by sex, age, income and education.

The Studentized range test was used to assess the statistical significance of differences in the rates. The standard errors of the rates and 95 percent confidence intervals were calculated using 500 bootstrap weights provided by Statistics Canada. In addition, relative rates were calculated for women to men, lowest to highest income groups and lowest to highest education groups. Statistics Canada rules were followed in the reporting of estimates using the Ontario share file as follows:

- Estimates should not be reported if the unweighted sample is less than 10;
- Estimates are adequate and can be reported if the coefficient of variation is 16.5 or less;
- Estimates should be reported with caution if the coefficient of variation is between 16.6 and 33.3;
- Estimates should be suppressed if the coefficient of variation is greater than 33.3.

All estimates, with the exception of numbers less than ten, were rounded to the nearest integer for presentation of exhibits. As such, proportional distributions may not add up to 100 percent.

**Limitations**

The results based on CCHS data should be interpreted with caution for the following reasons:

- The survey relies on self-report and voluntary participation of randomly selected participants, and thus the data reflect individuals’ interpretation of questions and how they perceive their own health. Hence, results may be an under- or over-estimation of the prevalence of some conditions.
- The CCHS does not survey Aboriginal people living on reserves. Thus the numbers reported may be an underestimate of the burden of illness among Aboriginal people in Ontario.
• The ethno-cultural populations captured in the CCHS include recent immigrants, immigrants living in Canada for more than 10 years and those born in Canada. Hence the lower rates of functional limitations observed in some cultural groups may be due to “the healthy immigrant effect” which is the observation that immigrants tend to be in better health than their native population. In addition, depending on the level of acculturation, the self-rated health questions may be interpreted differently.

• The CCHS survey was conducted before LHINs were created and there was inadequate sample size for some measures for some LHINs. This prevented comparative analysis of some indicators.

• Income information was missing for nine percent of Ontario survey respondents.

• Lack of adequate sample size for some variables prevented comprehensive analysis (e.g., length of immigration, ethnicity and knowledge of official languages).

### TABLE 3.1 | Stratifying variables for CCHS indicators

<table>
<thead>
<tr>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25–44</td>
</tr>
<tr>
<td>45–64</td>
</tr>
<tr>
<td>65–79</td>
</tr>
<tr>
<td>80+</td>
</tr>
</tbody>
</table>

**Household income** – Provincial-level analyses

<table>
<thead>
<tr>
<th>Low income</th>
<th>&lt; $15,000 if 1 or 2 people &lt; $20,000 if 3 or 4 people &lt; $30,000 if 5+ people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower middle income</td>
<td>$15,000 to $29,999 if 1 or 2 people $20,000 to $39,999 if 3 or 4 people $30,000 to $59,999 if 5+ people</td>
</tr>
<tr>
<td>Upper middle income</td>
<td>$30,000 to $59,999 if 1 or 2 people $40,000 to $79,999 if 3 or 4 people $60,000 to $79,999 if 5+ people</td>
</tr>
<tr>
<td>Higher income</td>
<td>≥ $60,000 if 1 or 2 people ≥ $80,000 if 3+ people</td>
</tr>
</tbody>
</table>

**Household income** – LHIN-level analyses

<table>
<thead>
<tr>
<th>Lower income (Low/Lower Middle)</th>
<th>&lt; $30,000 if 1 or 2 people &lt; $40,000 if 3 or 4 people &lt; $60,000 if 5+ people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher income (Upper Middle/Higher)</td>
<td>≥ $30,000 if 1 or 2 people ≥ $40,000 if 3 or 4 people ≥ $60,000 if 5+ people</td>
</tr>
</tbody>
</table>
TABLE 3.1 | Stratifying variables for CCHS indicators

Education – Provincial level analyses (highest level of education attained)
- Less than secondary school graduation
- Secondary school graduation
- At least some post-secondary school
- Bachelor’s degree or higher

Education – LHIN level analyses (highest level of education attained)
- Lower education
- Secondary school graduation or less
- Higher education
- At least some post-secondary school

Immigration
- Recent immigrants
- 0–9 years of residency in Canada
- Non-recent immigrants
- 10+ years of residency in Canada
- Non-immigrants
- Born in Canada or born with Canadian citizenship

Ethnicity
- White
- Black
- East and Southeast Asian
- Filipino, Japanese, Korean, Chinese, Southeast Asian
- Arab, West and South Asian
- South Asian, Arab, and West Asian
- Other
- Latin American, other racial or cultural origins, multiple racial origins
- Aboriginal
- North American Indian, Métis or Inuit

Knowledge of official languages
- English only
- French only
- English and French only
- English and/or French with other languages
- Neither English nor French

2.2 Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD)
The 2005/06 Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD), held at the Institute for Clinical Evaluative Sciences (ICES), was used to identify hospitalizations for fall-related injuries in seniors aged 65 and older. The CIHI-DAD is a national database of information on all acute care institution separations (i.e., discharges, deaths, sign-outs, transfers).

How the analysis was done
Age-standardized rates of fall-related hospitalizations were calculated using indirect standardization method. The denominators were from the 2006 provincial estimates obtained from the Registered Persons Database (RPDB), also held at ICES. The RPDB overestimates the number of people living in Ontario. This overestimate was corrected by using a methodology that adjusts the RPDB so that population counts by age and sex match estimates from Statistics Canada. Analyses were conducted at the provincial- and LHIN-level by sex,
age and income. Since CIHI-DAD does not contain socio-economic variables, it was linked to the 2001 Census of Canada to allow for ecological analyses of SES.

Income was calculated using the neighbourhood income per person equivalent (IPPE). Ontario neighbourhoods are then classified into one of five approximately equal-sized groups (quintiles), ranked from poorest to wealthiest, where Q1 is the poorest and Q5 is the wealthiest. These income quintiles are used as proxy for overall SES, which has been shown to be related to population health status and levels of health care utilization. Individual geographic information from ICES databases was used to define the best known postal code for each person on July 1 of each year (available from 1991 to 2004). Postal codes were then used to assign people to Enumerations Areas (EAs) or Dissemination Areas (DAs) (using the Statistics Canada Postal Code Conversion File) and thus to one of the income quintiles. EAs and DAs are small adjacent geographic areas, designated for collection of census data. DAs replaced EAs in 2001 and have a population of 400–700 persons.\(^{151, 152}\)

For crude rates, \(p\)-values were calculated for non-ordinal groups using the chi-square test and for ordinal groups using the trend test. For indirectly standardized rates, \(p\)-values were calculated using the chi-square test. In addition, relative rates were calculated for women to men; and lowest to highest income groups. Ninety-five percent confidence intervals were calculated for all rates.

**Limitations**

There are coding variations in CIHI-DAD data due to differences in the interpretation of coding/reporting guidelines and varying documentation practices.

### 2.3 Integrated Public Health Information System (iPHIS)

The analyses for the two sexually-transmitted infection (STI) indicators (chlamydia and gonorrhea) were based on preliminary data of confirmed cases of these reportable diseases with onset dates in 2006 as reported in the integrated Public Health Information System (iPHIS). The iPHIS database is administered and supported by the Infectious Diseases Surveillance Section of the Ontario Ministry of Health and Long-Term Care (MOHLTC). The Surveillance Section collects information on all cases of reportable diseases in Ontario from public health units; it conducted data extraction and analysis for these two indicators.

**Analysis**

Cross-tabulations of iPHIS data were used to describe the incidence of chlamydia and gonorrhea in Ontario. Descriptive analyses were conducted at the provincial and health region level by sex and age. Crude incidence rates were calculated using population denominators from the 2006 provincial estimates obtained from the Profile for Age and Sex for Canada, Provinces, Territories, Census Divisions and Census Subdivisions, 2006 Census.\(^{153}\)

**Limitations**

The results based on iPHIS data should be interpreted with caution for the following reasons:

- Data are preliminary and are subject to change in the future;
- Forty-five percent of chlamydia and 34 percent of gonorrhea cases were reported in iPHIS with missing postal codes. Because differences in incidence rates observed across regions may be due to differences in reporting postal code across regions these indicators were not reported at the LHIN level;
- The higher rates of chlamydia observed in women compared to men may be due to differences in manifestation of symptoms which may lead to fewer men being tested as well as much higher rates of routine screening in women;
- While this is reported as incidence, it is prone to reporting biases.
2.4 HIV/AIDS data

Data for HIV and AIDS indicators were obtained from the Report on HIV/AIDS in Ontario 2005.\textsuperscript{92} The report includes:

- HIV diagnosis data from Ontario’s voluntary HIV testing system;
- Data on reported AIDS cases from the Ontario notifiable disease system;
- Data on mother-infant HIV infection from the Canadian Pediatric AIDS Research Group and
- Estimates of HIV infection in Ontario based on statistical modelling.

Analysis

Serodiagnostic data from 1985 to 2005 were obtained from the HIV Laboratory, Central Public Health Laboratory (CPHL) of Ontario. Cumulative incidence rates for HIV and AIDS were calculated with the 1996 census population as the denominator. The number and proportion of first-time HIV diagnoses were calculated according to sex, age group at time of first HIV-positive test, exposure category and year of diagnosis. Analyses were performed by major Ontario health region and annual population estimates were used to calculate rates of HIV testing according to health region from 1992 to 2005.

The Public Health Division of the Ontario MOHLTC provided data on AIDS cases diagnosed to December 31, 2005 and reported to September 2006. The Reportable Disease Information System (RDIS) of the MOHLTC maintained AIDS data until April 2005, after which point the RDIS was replaced by iPHIS. Cumulative incidence rates (1981 to 2005) were calculated using the 1996 population as the denominator. The number of AIDS cases and cumulative incidence rate were calculated according to sex, age at AIDS diagnosis, exposure category, health region and year of AIDS diagnosis. The date of diagnosis was defined as the date of the earliest AIDS-defining illness, if available, or the reported date of diagnosis otherwise.

Data for prenatal testing (including HIV results) were extracted from LAByrinth, an information system which links CPHL to the regional laboratories, using the pregnancy (not the subject or test) as the unit of analysis. Current tests for HIV (during a given pregnancy) or prior tests (before pregnancy) were also examined. Records of women receiving prenatal care from January 1999 to December 2005 were used to quantify the number and proportion of pregnant women tested for HIV (prior or current), by quarter and health region. The number and rate of HIV-positive results were also calculated by quarter and health region using the number of pregnancies with at least one prenatal test as the denominator. If a woman had both a prior test and a current one, the current test was used to classify the pregnancy.

Modeled estimates were calculated using data from a variety of sources in order to estimate the incidence of HIV infection from 1997 to 2005 with greater precision. For more details, see The Report on HIV/AIDS in Ontario in 2005.\textsuperscript{92}

Limitations

- Incidence of HIV may be underestimated because Ontario residents have been tested outside of Ontario; persons may have either tested elsewhere before establishing residence in Ontario or traveled out of province to have an HIV test.
- HIV diagnoses may not be representative of all persons infected with HIV due to the following data quality problems:
  - Not all HIV-infected persons have been tested.
  - The date of diagnosis does not reflect the date of infection as some persons are diagnosed many years after infection.
  - The methodology used to assign exposure categories to cases without risk factors or reassign risk factors initially misclassified may be imprecise due to the
small number of respondents in the Laboratory Enhancement Study in some exposure categories.

- The transition from RDIS to iPHIS has posed several challenges to the AIDS surveillance database. The proportion of cases without information on risk factors increased from 6.7 percent of cases in RDIS to 69.4 percent of cases in iPHIS. Although cases with missing data in several analyses are based on the distribution among cases with known exposure category stratified by sex, health region and year of diagnosis, this method may not represent the true exposure category for those cases.

- The increase in HIV diagnoses in some categories observed since 2001 may be due to changes in testing policy for immigrants and refugees.

- The inability to ensure 100 percent matching between the prenatal and the diagnostic databases may lead to a slight underestimation of the percentage of pregnant women tested for HIV.

- The increasing proportion of HIV infection for women may be partly due to policy changes at Citizenship and Immigration Canada and the provincial HIV prenatal screening program.

2.5 Vital Statistics

The analyses for the mortality indicators were based on death registration data from 2001 Vital Statistics assembled by Statistics Canada (including deaths of Ontario residents occurring in other parts of Canada and the United States) and population data from the 2001 Census of Canada. The Vital Statistics registries across Canada and the United States provide information on deaths of Canadian residents as well as selected demographic characteristics and place of residence. The findings by neighbourhood income quintile presented in this section were provided by the Health Information and Research Division of Statistics Canada. However, their selection, presentation and interpretation were the responsibility of the POWER study authors. The findings by neighbourhood income tertile were extracted from tables presented in the Technical Report to the Performance Indicators Reporting Committee (PIRC) of the Federal-Provincial-Territorial Conference of Deputy Ministers of Health.\textsuperscript{24} For more details, see the report by Wilkens and colleagues.\textsuperscript{97}

Analysis

These indicators were calculated using death data from the Canadian Mortality Database which was linked to census data to determine neighbourhood income quintile. The 2001 Vital Statistics data were used to estimate the mortality rates for the population living in Ontario’s 11 Census Metropolitan Areas (CMAs). Those CMAs, which account for 74% of the total Ontario population, were used because neighbourhoods are more clearly defined and residential segregation by income is more pronounced in big cities than in small towns and rural areas. Descriptive analyses were conducted by sex, age group and neighbourhood income quintile. Since the Vital Statistics database does not contain SES variables, it was linked to 2001 census profile data at the census tract (CT) level to allow for analyses of mortality by neighbourhood income quintile. CTs are small, relatively stable areas that usually have a population of 2,500 to 8,000.\textsuperscript{154} Neighbourhood income quintiles were defined within each CMA, based on census tract percentage of population under the Statistics Canada low-income cut-off (LICO) applicable at the time of the 2001 census. Causes of death were coded according to the 10th revision of the International Classification of Diseases\textsuperscript{152} and were analyzed according to ICD chapter and by common groupings of specific causes within chapters.

Death rates per 100,000 population by sex and neighbourhood income quintile in CMAs were calculated using denominators from the 2001 census. Age-standardized mortality rates (ASMRs) for each sex, neighbourhood income quintile and cause of death group were calculated using a direct standardization method. The 1986 CMA population of Canada, including both sexes together, was used as the standard population. ASMRs for both sexes together were standardized by sex as well as by age. Standard errors for the ASMRs
were calculated as described by Spiegelman\textsuperscript{155} and Brillinger.\textsuperscript{156} Asymmetric confidence intervals for the ASMRs were calculated by the method of Carriere and Roos.\textsuperscript{157} Excess mortality was defined as the ASMR for the total population less the ASMR of the richest quintile. Age-specific mortality rates were calculated by sex for each income quintile. Mortality rates were calculated for: all cause; selected chronic diseases; infectious diseases; trauma and injury.

Potential years of life lost (PYLL) were calculated for the population less than 75 years by the method described by Romeder and McWhinnie,\textsuperscript{158} except that infant deaths and deaths from age 70 to 74 were included by age group. PYLL were calculated for each age group (<1, 1–4, 5–9, …, and 70–74) by multiplying the number of deaths by the difference between age 75 and the midpoint of each age group at which the deaths occurred. PYLL correspond to the sum of the products obtained for each age group. The rate was obtained by dividing total potential years of life lost by the total population under age 75. Excess PYLL was defined as the difference between observed and expected PYLL, where expected PYLL was that which would have occurred if the age- and sex-specific mortality rates in the richest quintile applied to the total population.

Life expectancy: Abridged life tables for 2001 and corresponding standard errors for life expectancy and the probability of survival to each age were calculated for each income quintile and sex according to the method of Chiang.\textsuperscript{159}

**Limitations**

The results based on the Vital Statistics data should be interpreted with caution for the following reasons:

- Only deaths in the CMAs, which represent 74 percent of Ontario’s population, were included in the analysis. Hence we have no information for people living in smaller urban and rural areas whose mortality patterns may differ from those living in CMAs.
- The Statistics Canada data were unable to completely identify usual residents of health related institutions, so usual residents of institutions were included in both the deaths and populations at risk. This may affect the results because ideally, deaths of residents of long-term care facilities should be excluded as the income level of the CT in which an institution is located might be unrelated to the income of its residents.
- Ontario CMAs have the highest proportion of immigrants compared to other provinces. This may confound the results. Because of the lower mortality of immigrants overall, combined with a higher proportion of immigrants in the lower-income quintiles, the higher mortality of non-immigrants in the lower-income quintiles is at least partly obscured.
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