



HEALTHY CANADIANS 2012

A FEDERAL REPORT ON
COMPARABLE HEALTH
INDICATORS



Government
of Canada

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Canada 

Health Canada is the federal department responsible for helping the people of Canada maintain and improve their health. We assess the safety of drugs and many consumer products, help improve the safety of food, and provide information to Canadians to help them make healthy decisions. We provide health services to First Nations people and to Inuit communities. We work with the provinces to ensure our health care system serves the needs of Canadians.

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Executive Summary

The 2000 First Ministers' Communiqué on Health articulated the commitment of federal, provincial and territorial governments to improve accountability and reporting to Canadians. It directed them to collaborate and develop a framework of comparable health indicators on health status, health outcomes and quality of service. It also committed governments to comprehensive and regular public reporting. These commitments were reiterated in the 2003 and 2004 Health Accords.

Healthy Canadians—A Federal Report on Comparable Health Indicators 2012 is the sixth in a series of reports on the health status of Canadians and the performance of our health care system.

Healthy Canadians 2012 presents 53 indicators that are based on input from health partners, experts and the public at large, and were identified as being of interest and/or use to Canadians. Data on the general population come largely from Statistics Canada, the Canadian Institute for Health Information, and the Public Health Agency of Canada. A subset of information on First Nations people is from the First Nations Information Governance Centre's First Nations Regional Health Survey, while data on Inuit are drawn from the Aboriginal Peoples Survey. Almost all of the reported data are from 2000 or later, and all highlighted differences are statistically significant.

Selected highlights from *Healthy Canadians 2012* are presented below:

The General Canadian Population:

- In 2011, 61.6% of Canadians aged 12 years and older reported that their health was “excellent” or “very good,” an increase from 59.7% in 2003.
- In 2007-09, life expectancy for Canadian men was 78.8 years, an increase from 76.6 years in 1999-2001. Life expectancy for women was 83.3 years in 2007-09, an increase from 81.9 years in 1999-2001.
- In 2010-11, fewer Canadians younger than 75 years of age were hospitalized for chronic conditions that could be cared for in the community—299 admissions per 100,000 population, down from 428 admissions per 100,000 population in 2002-03.
- Fewer teenagers reported smoking in 2011—9.4% of 12-to-19-year-olds said they were current smokers, compared to 14.9% in 2003.
- In 2011, more than half of Canadians (54.8%) aged 12 years and older stated that they were active or moderately active, an increase from 52.3% in 2003 and from 53.1% in 2010.
- In 2011, 14.2% of Canadians reported that they had been diagnosed by a health professional as having arthritis.
- In 2009, the incidence of breast cancer among Canadian women was 97.6 cases per 100,000 females, a decrease from 101.7 cases per 100,000 females in 2000.
- In 2009, the incidence of prostate cancer among Canadian men was 114.6 cases per 100,000 males, a decrease from 124.8 cases per 100,000 males in 2000.
- In 2009, the incidence of lung cancer was 55.1 cases per 100,000 population, a decrease from the 58.8 cases per 100,000 population in 2000. The incidence of lung cancer for males also decreased from 77.1 cases per 100,000 males in 2000 to 65.1 cases per 100,000 males in 2009, whereas the incidence of lung

cancer for females increased from 45.1 cases per 100,000 females in 2000 to 47.4 cases per 100,000 females in 2009.

- In 2011, about two-thirds of seniors (64.6%) aged 65 years and older reported having received a flu shot during the 12 months before they were surveyed, a lower percentage than in 2003 (67.2%), but higher than in 2010 (59.4%).
- In 2011, about a fifth (21.4%) of Canadians aged 15 years and older who required health services for themselves or a family member reported difficulty obtaining immediate care for a minor health problem; this number is lower than in 2009 (24.4%).
- In 2009, most Canadians (81%) aged 18 years and older reported being “very satisfied” or “somewhat satisfied” with the overall health care services they received in the past year, virtually unchanged from 79% in 2005.
- In 2011, 8.8% of Canadians aged 12 years and older reported having been diagnosed with asthma by a health professional, virtually unchanged from 8.5% in 2003.
- In 2011, almost one third of Canadians (32.8%) aged 18 years and older reported a weight and height that corresponded to a body mass index (BMI) in the overweight category, unchanged from 2003. In addition, 17.7% reported a weight and height that corresponded to a BMI in the obese category, an increase from 14.9% in 2003.
- In 2008/09, 5.6% of Canadians were diagnosed with diabetes by a physician, an increase from 3.8% in 2000/01.
- In 2008/09, 19.8% of Canadians aged 20 years and older were diagnosed with high blood pressure, an increase from 15.0% in 2000/01.

First Nations:

- Among First Nations adults living in First Nations communities,* 16.2% reported being diagnosed with diabetes—more than three times the rate for the total Canadian population.
- Almost one-quarter (23.0%) of First Nations youth aged 12 to 17 years living in First Nations communities report smoking daily, with another 13.8% smoking occasionally.
- Just over two in 10 (21.8%) First Nations adults living in First Nations communities reported having been diagnosed with high blood pressure. This is higher than the 13.5% figure for the total Canadian population of the same age.
- Over one-third (34.6%) of First Nations adults living in First Nations communities reported a weight and height corresponding to a BMI in the overweight category while an additional 39.9% had a weight and height that put them in the obese category.
- During the 10-year period from 1991-2001, mortality rates for cerebrovascular disease for Registered Indians aged 25 years and older (35.4 deaths per 100,000 males and 40.9 deaths per 100,000 females) were higher than the rates for Non-Aboriginal Canadians (28.2 deaths per 100,000 males and 21.4 deaths per 100,000 females).

* First Nations living on reserve and in northern First Nations communities.

Inuit:

- In 2006, 58% of Inuit in Canada aged 15 years and older reported that they were daily smokers and 8% reported smoking occasionally.
- During the five year-period from 2004 to 2008, both male and female residents of Inuit Nunangat[‡] had higher mortality rates for lung cancer (38.2 deaths per 100,000 males and 41.6 deaths per 100,000 females) than their general Canadian counterparts (17.1 deaths per 100,000 males and 12.3 deaths per 100,000 females).
- In the period from 2004 to 2008, the potential years of life lost due to suicide and self-inflicted injuries were 3,748.7 years per 100,000 residents of Inuit Nunangat, 11.4 times the rate for the overall Canadian population (328.1 years per 100,000 population).
- In 2004/08, the potential years of life lost due to unintentional injuries were 2,512.3 years per 100,000 residents of Inuit Nunangat, 4 times higher than for Canadians overall (622.2 years per 100,000 population).
- Life expectancy for the 2004/08 period for all residents of Inuit Nunangat was 70.8 years—9.8 years lower than that for the total population of Canada (80.6 years).

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

I Introduction

This section provides information on the Government of Canada's *Healthy Canadians* series and what is included in the *Healthy Canadians 2012* report.

Purpose of this Report

The Government of Canada is committed to being accountable and reporting to Canadians. To do this, it provides information on comparable health indicators to help stakeholders—such as federal, provincial and territorial jurisdictions and health care providers—follow trends and progress toward improving the health of Canadians.

Healthy Canadians—A Federal Report on Comparable Health Indicators 2012, is the sixth in a series of reports designed to provide the most current national information available on the health status of Canadians and the performance of our health care system. Since one of the major data sources for this report, the Canadian Community Health Survey, does not collect data from First Nations on reserve and some remote First Nations and Inuit communities, information for these groups is presented separately, where available.

Background

Several agreements outlined the commitment of the federal, provincial and territorial (F/P/T) governments to improve accountability and reporting to Canadians. These include the First Ministers' Meeting Communiqué on Health¹ (also referred to as the 2000 Communiqué), the 2003 First Ministers' Accord on Health Care Renewal² (also known as the 2003 Health Accord), and the 10-Year Plan to Strengthen Health Care (also known as the 2004 Health Accord).³ As part of their commitment to accountability, First Ministers also agreed to report to Canadians on health system performance. Details about these agreements have been published in previous editions of *Healthy Canadians*.⁴

Selection of Indicators

Healthy Canadians reports include various health indicators and related data to report on health system performance and health status. A health indicator is a summary measure, usually expressed as a number, which provides information on a particular topic. It keeps track of changes and compares information across years or geographical regions. For example, the indicator *Perceived Health* indicates the percentage of Canadians aged 12 years and older who rate their overall health as either "excellent" or "very good."

A preliminary list of indicators was generated using the complete list of 70 comparable health indicators approved by F/P/T Ministers of Health in 2004;⁵ recommendations from the Office of the Auditor General of Canada from her report on health indicator reporting in Canada that was tabled in February 2009;⁶ information from the Health Accords related to topics that might have been excluded from past editions of *Healthy Canadians*; information from Statistics Canada (SC) and the Canadian Institute for Health Information (CIHI) on what data are expected to be available in 2012 as well as on their revised Health Indicator Framework;⁷ and information from public opinion research to replace SC indicators on

satisfaction (e.g., satisfaction with overall health care services) that recently became optional content in its *Canadian Community Health Survey*⁸ (national-level data will no longer be available on these indicators).

An advisory group composed of representatives from Health Canada and the Public Health Agency of Canada was formed and asked for advice on the list of proposed indicators for inclusion in the *Healthy Canadians 2010* report. The group selected 52 indicators. A new indicator has been added on wait times; therefore, 53 indicators are included in this report.

Organization of this Report

Part II, *The Federal Government's Role in Health*, provides a brief overview of the Canadian health care system (including national health expenditures), and a more detailed description of the federal role in this system.

In Part III, *Measuring Performance*, national-level information is presented on the 53 indicators featured in this report, including: a description of what the indicators measure; how the indicators are used (where applicable); data limitations; data sources; results; and practical information for the reader (where applicable). Information on the general population is presented, as well as on First Nations and Inuit when data are available.

In Part IV, *Health Information—Challenges and Next Steps*, challenges facing the collection and reporting of health information are highlighted.

How Health Indicators Can Be Used

Comparable health indicators can be used by public health professionals, policy makers and individuals to monitor trends in a particular area, such as changes in the prevalence of smoking among teenagers. They can also be used to plan and evaluate health-related programs aimed at helping Canadians maintain and improve their health. While the authors of *Healthy Canadians 2012* have done their best to include information on the factors influencing each of the featured indicators, time and space constraints have limited what is displayed. Readers should therefore be cautious in terms of how they use this information. You should always consult a health care provider when you have questions about your health.

Methodological Note to Readers

In order to show changes over time, comparisons were made between the year for which the most recent data were available and the baseline year of 2000 (when the First Ministers' Meeting Communiqué on Health was signed), or the earliest subsequent year for which data were available. Comparisons were also made between the most recent year and the previous year. Where possible, comparisons were also made between the sexes.

Depending on whether age is considered to be an important factor affecting a particular indicator or if the same indicator is to be compared throughout several years, either raw or age-standardized data can

be used. Raw (or crude) data express a number on a particular indicator without transformation, such as the number of people who died from lung cancer in the past year. However, when comparing the same indicator across different populations or over several years, it is advised to transform these data so comparisons can be made without the effects of age of the different populations or age structure of different years. Age-standardization presents data as they would be if the population had a standard age structure. It corrects for Canada's aging population. It also corrects for different age structures between different populations as is the case for the First Nations population compared to the general Canadian population. In international data comparisons, age-standardization adjusts for the differences in population age structures between countries. By removing the influence of age, any observed differences can then be attributed to other underlying factors. When Canadian data are age-standardized, the 1991 Canadian age structure is used as the standard population. When First Nations and/or Inuit data are compared to the general Canadian population, the Canadian data used for these comparisons are age-standardized to the specific population it is compared to. For example, potential years of life lost due to suicide and self-inflicted injury death, potential years of life lost due to unintentional injury death, incidence and mortality rates for selected cancers, mortality rates for ischemic heart disease and cerebrovascular diseases, diabetes, life expectancy, infant mortality and low birth weight are all age-standardized to either the First Nations or Inuit population age structure. Finally, other countries and organizations employ different standard populations (e.g., the Organisation for Economic Co-operation and Development (OECD) uses the 2010 OECD total population as a standard population). The choice of a standard population can have an impact on the results and ranking of the countries being compared. Therefore, comparisons between data standardized using different populations are not recommended. As well, comparisons between age-standardized data and raw data are not advised.

All reported differences in the presentation of survey results (e.g., the Canadian Community Health Survey) are statistically significant ($p < 0.05$),⁹ i.e., they are based on tests that take into account the size of the sample and the design of the survey used, as well as the number of comparisons made. Where the data describe the overall population (e.g., Vital Statistics), no statistical testing was required (e.g., mortality, potential years of life lost, life expectancy and low birth weight).

Data for some indicators may be revised when new data are released for the following reasons—a change in the reporting of missing values (either included or excluded in the figure), or the collection of additional data for the reporting period. Therefore, the data presented in the *Healthy Canadians 2012* are the most accurate and up-to-date, and should not be compared with previous editions of *Healthy Canadians*.

While information on the general population and First Nations and Inuit are presented together, these populations differ in some significant ways. For example, First Nations and Inuit tend to be younger than the total Canadian population. In particular, the proportion of First Nations and Inuit populations under age 25 is 50% and 56%, respectively, while the proportion of the overall Canadian population under age 25 is 31%.¹⁰ In addition, some data for the Canadian population and First Nations and Inuit populations are derived from different sources. For example, data for self-reported health status for the general population were drawn from Statistics Canada's Canadian Community Health Survey (excludes persons living on First Nation reserves), whereas data for First Nations adults living in First Nations communities* were drawn from the First Nations Regional Health Survey, and data for Inuit were drawn

* First Nations living on reserve and in northern First Nations communities.

from the Aboriginal Peoples Survey. As a result, caution should be exercised when making comparisons between these distinct populations.

Other relevant details are presented in the notes beneath the figures or in Annex 2.

References

- ¹ Details on the *First Ministers' Meeting Communiqué on Health* are available at: <http://www.releases.gov.nl.ca/releases/2001/health/0926n07.htm>.
- ² Additional information on the 2003 *First Ministers' Accord on Health Care Renewal* is available at: <http://www.hc-sc.gc.ca/hcs-sss/delivery-prestation/fptcollab/2003accord/index-eng.php>.
- ³ Additional information on the 2004 *Health Accord* is available at: <http://www.hc-sc.gc.ca/hcs-sss/delivery-prestation/fptcollab/2004-fmm-rpm/index-eng.php>.
- ⁴ Information on the health agreements is available at the links in references #1-3 or at: <http://www.hc-sc.gc.ca/hcs-sss/indicat/index-eng.php>.
- ⁵ The list of 70 indicators has been previously published. See: <http://www.hc-sc.gc.ca/hcs-sss/indicat/index-eng.php>.
- ⁶ Additional information on this audit is available at: http://www.oag-bvg.gc.ca/internet/English/parl_oag_200812_08_e_31832.html.
- ⁷ Information on the CIHI/SC Health Indicator Framework is available at: http://www.cihi.ca/CIHI-ext-portal/pdf/internet/DEF_FRAMEWORK_JUNE09_EN.
- ⁸ Additional information on Statistics Canada's *Canadian Community Health Survey* is available in Annex 2 or at: <http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3226&lang=en&db=imdb&adm=8&dis=2>.
- ⁹ Statistical significance means that an observed difference would be unlikely to occur due to chance alone; thus, the observed difference can be attributed to a real difference in the population. The term "p<0.05" means there is less than a 5% probability that the difference is due to chance alone. Of note, the sample size in a study is an important determinant in how chance may affect the findings.
- ¹⁰ Statistics Canada. 2006 Census. *Aboriginal Peoples Highlight Tables*. Population by age groups, sex and Aboriginal identity groups, 2006 counts for both sexes, for Canada, provinces and territories—20% sample data (table). Ottawa: Statistics Canada; 2008. Catalogue No. 97-558-XWE2006002. Available from: <http://www12.statcan.ca/census-recensement/2006/dp-pd/hlt/97-558/pages/page.cfm?Lang=E&Geo=PR&Code=01&Table=2&Data=Count&Sex=1&Abor=1&StartRec=1&Sort=2&Display=Page&CSDFilter=250>.

II The Federal Government's Role in Health

Canada's health care system includes federal, provincial, territorial and municipal governments, health care providers, non-governmental organizations, the private sector and the Canadian public. The provinces and territories manage, organize and deliver health care services to the vast majority of Canadians, while the Government of Canada supports the publicly funded health care system by:

- providing funding to provinces and territories through the Canada Health Transfer (CHT) and other transfers targeted to health care
- supporting health research, health promotion and health protection
- administering the *Canada Health Act* (CHA)
- providing legislation and regulation of drugs and medical devices, consumer products and food, pesticides, chemicals, and nuclear and radiological safety
- providing health services to First Nations and Inuit, veterans, persons detained for immigration purposes, refugees and refugee claimants, and populations excluded from the CHA (military personnel, members of the Royal Canadian Mounted Police and inmates of federal correctional facilities).¹

For a more detailed description of the federal role in health, see Annex 1.

The *Canada Health Act* articulates the main objective of Canadian health care policy, which is “to protect, promote and restore the physical and mental well-being of residents of Canada to and to facilitate reasonable access to health services without financial or other barriers.” It specifies the criteria and conditions provinces and territories must adhere to—universality, accessibility, portability, comprehensiveness and public administration—in order to receive their full share of the federal cash contribution under the CHT.

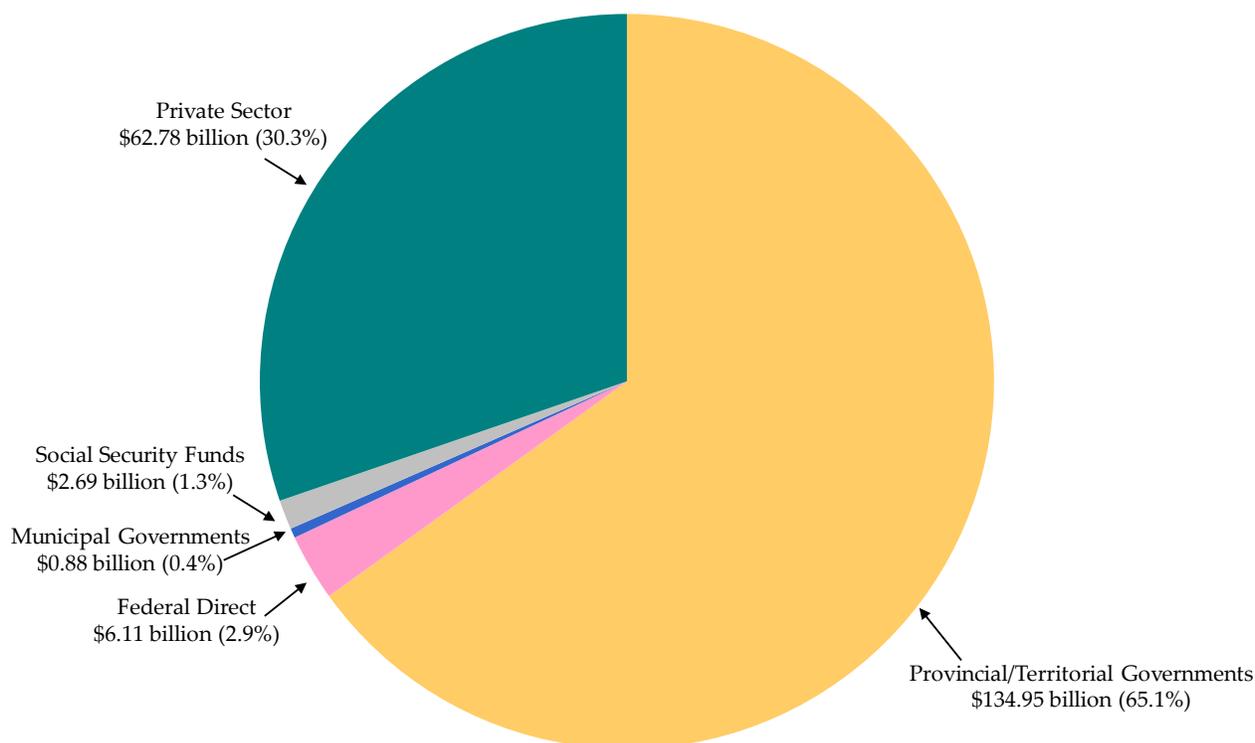
The *Canada Health Act* excludes:

members of the Canadian Forces, persons appointed to a position of rank within the Royal Canadian Mounted Police, persons serving a prison term in a federal penitentiary, and persons who have not completed a minimum period of residence in a province or territory (a period that must not exceed three months). In addition, the definition of “insured health services” excludes services to persons provided under any other Act of Parliament (e.g., foreign refugees) or under the workers’ compensation legislation of a province or territory.²

Expenditures on Health

In 2012, total health expenditures in Canada were forecast as \$207.4 billion.³ Over two-thirds (69.7%) of this came from public sector sources, and less than one-third (30.3%) from the private sector (Figure 1). The federal government provided 2.9% in the form of direct health care spending, and provincial/territorial governments provided about two-thirds (65.1%). However, a significant portion of provincial/territorial expenditures are drawn from federal CHT support.^{4, 5, 6}

**Figure 1 Total Forecasted Health Expenditure by Funding Source
Canada, 2012**



Source: Canadian Institute for Health Information. *National Health Expenditure Trends, 1975–2012, Table A.2.1.*

Notes: Public sector includes Provincial/territorial governments, Federal Direct, Municipal governments, and Social Security Funds.

These figures are forecast estimates. Final figures will not be available until December 2014.

The federal government provided \$6.1 billion in the form of direct health care spending for health research, health promotion and health protection, and for health services to the following populations: First Nations and Inuit, veterans, persons detained for immigration purposes, and refugees and refugee claimants. Specifically, the Government of Canada funds organizations like the Canadian Institutes of Health Research (CIHR), and organizations that support health-related knowledge development and dissemination, such as the Canadian Institute for Health Information (CIHI), the Health Council of Canada, the Mental Health Commission of Canada, the Canadian Patient Safety Institute, and the Canadian Agency for Drugs and Technologies in Health. It also makes direct investments to address health care priorities. For example, in support of governments' shared commitments to reduce wait times, as set out in the 2004 10-Year Plan to Strengthen Health Care, the federal government is providing provinces and territories with \$5.5 billion over ten years (from 2004–05 to 2013–14) through the Wait Times Reduction Fund.⁷ Complementing this investment, the federal government also provided jurisdictions with \$612 million (from 2007–08 to 2009–10) through the Patient Wait Times Guarantee Trust,⁸ as part of over \$1 billion in new funding to support the development of guarantees in select areas.

While provincial/territorial governments provided about two-thirds (65.1%) of total health expenditures, a significant portion of this money is drawn from federal CHT support.^{4,5,6} For example, in 2011–12 federal funding to the provinces and territories will amount to \$27 billion in cash transfers, and will increase to a minimum of \$38 billion by 2018–19.⁹ Provinces and territories also receive CHT support

through tax transfers which amount to \$13.1 billion in 2010-11 and that continue to grow in line with the economy.

References

- ¹ It provides some primary health care services to First Nations and Inuit and the Canadian Forces, as well as supplementary services (e.g., pharmaceuticals, dental and vision care, psychological and/or mental health care) to all these populations.
- ² To learn more about the Canada Health Act, please visit the following Web link: <http://www.hc-sc.gc.ca/hcs-sss/medi-assur/cha-lcs/index-eng.php>.
- ³ Information about health expenditures in Canada is available at: https://secure.cihi.ca/free_products/NHEXTrendsReport2012EN.pdf.
- ⁴ CIHI defines health expenditures as encompassing activities that are undertaken with the direct purpose of improving or maintaining health. Details can be found at the web link provided in reference #3, above.
- ⁵ Provincial and territorial health expenditures include provincial/territorial government funds, federal health transfers to the provinces/territories, and provincial government health transfers to municipal governments.
- ⁶ These are “autonomous social insurance schemes imposed and controlled by government,” e.g., workers’ compensation boards and the Quebec Drug Insurance Funds.
- ⁷ Details about this are available at: <http://www.fin.gc.ca/budget05/bp/bpc3-eng.asp>.
- ⁸ Details are available at: <http://pm.gc.ca/eng/media.asp?id=1611>.
- ⁹ Details about Budget 2012 are available at: <http://www.budget.gc.ca/2012/plan/pdf/Plan2012-eng.pdf>.

III Measuring Performance

Healthy Canadians—A Federal Report on Comparable Health Indicators 2012 provides the reader with the most current information available on the performance of our health care system and the health status of Canadians.

This section presents information on each of the 53 featured indicators and identifies the themes in recent Health Accords. It includes practical information to help Canadians maintain and improve their health. Practical information often refers to modifiable risk behaviours which are usually under your control, such as diet and lifestyle. In contrast, non-modifiable risk factors, which are not under your control, may include age, sex, the presence of a physical disability, or living or working in an environment that is not conducive to being physically active.

Information on the general population and First Nations and Inuit is included in this section. Data sources for the general population include members of some sub-groups under federal jurisdiction and exclude others. For example, the Canadian Community Health Survey includes veterans, members of the Royal Canadian Mounted Police, First Nations who are located off reserve and Inuit, part-time members of the Canadian Forces, persons detained for immigration purposes and refugees living on Canadian soil. However, it excludes persons living in First Nations communities and on Crown lands, residents of institutions, full-time members of the Canadian Forces and residents of certain remote regions. Additional information about data source exclusions is included in Annex 2.

In cases where data were available, international information is provided that compares data for various health indicators among the G7 countries. This may help the reader understand Canadian data in a broader international context.

G7 countries are the original seven largest industrialized economies in the world. They include Canada, France, Germany, Italy, Japan, the United Kingdom and the United States.

Overall, information presented in *Healthy Canadians 2012* shows health status improvements in several areas, such as life expectancy, ambulatory care sensitive conditions (chronic conditions that can be managed within the community rather than hospital settings), teenage smoking rates, physical activity and mortality rates for prostate and breast cancer. While this is certainly encouraging, deteriorations have been observed in other areas, such as in body mass index (notably in the obese category) and incidence and prevalence rates for diabetes.

Variation exists in the measurement and collection of wait times information across Canada, but the Canadian Institute for Health Information (CIHI) continues to make good progress in working with provinces and territories to develop and implement a common approach. To complement these efforts, Statistics Canada collects self-reported wait times information that is comparable across the country. However, as is mentioned in Annex 2, self-reported information is subject to known limitations.

It should be noted that indicators featured in *Healthy Canadians 2012* represent only a part of the story on Canada's health care system and the health status of Canadians. Additionally, some contradictions in the observed data have been noted. For example, most Canadians report that their health was "excellent" or "very good," yet the data also show that slightly more than half of the population report a body mass index corresponding to the overweight and obese categories.

Further research, as well as the continued development of additional indicators and collection of data, will contribute to a more fully developed picture of health status and health system performance in Canada, and to our shared understanding of progress toward Accord commitments.

THEME – ACCESS TO HEALTH CARE

1. PROPORTION OF THE POPULATION THAT REPORTS HAVING A REGULAR FAMILY DOCTOR

Key messages

- Having a regular family doctor improves access to preventive services
- Family doctors are an important link to diagnostic tests and medical specialists
- Most Canadians (83.1%) report having a regular family doctor in 2011

What does this indicator measure?

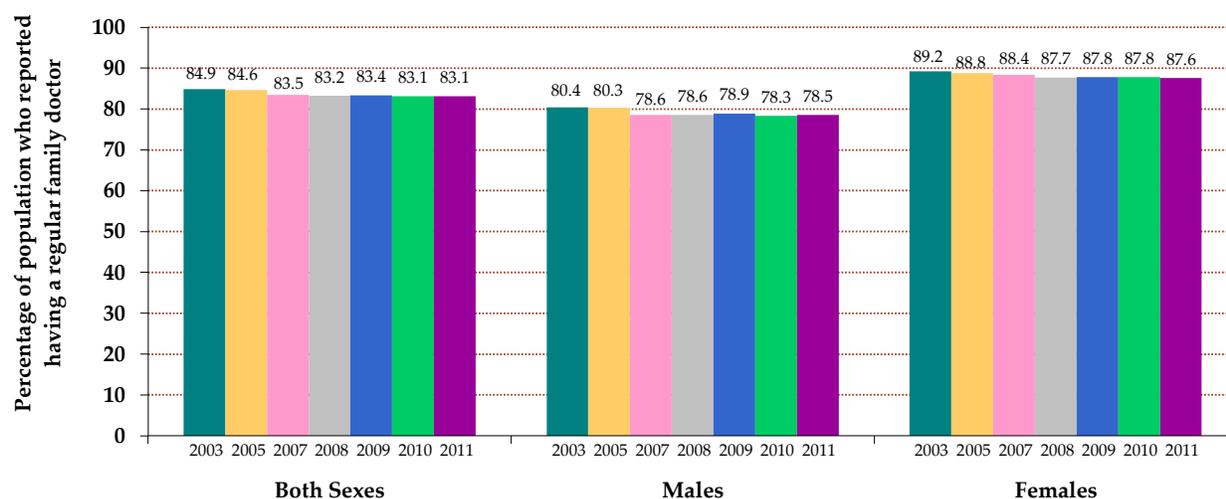
This indicator measures the percentage of the population aged 12 years and older who answered “yes” to the question: “Do you have a regular family doctor?”

Access to a family doctor . . .
. . . represents both a point of entry to
Canada’s health care system and a means of
ensuring continuity of care across the system.

Most Canadians have access to a regular family doctor, but numbers are on the decline

The percentage of the Canadian population aged 12 years and older who reported having a regular family doctor has declined by 1.8% from 84.9% in 2003 to 83.1% in 2011. The percentage of Canadian women (87.6%) who reported having a regular family doctor is consistently higher than for men (78.5%); both rates are also lower in 2011 than they were in 2003.

Figure 2 Proportion of Population that Reports Having a Regular Family Doctor
Percentage of population aged 12 years and older who reported having a regular family doctor, by sex (age-standardized), Canada,[§] 2003-11



Source: Statistics Canada. Health Services Access Survey; supplement to the Canadian Community Health Survey, 2003-11.
Notes: [§] For 2005, the Canadian total includes Yukon, Northwest Territories and Nunavut's 10 largest communities. For the other years, the Canadian totals do not include Yukon, Northwest Territories and Nunavut. Age-standardized to the 1991 Canadian population. For additional exclusions/limitations, see Annex 2.

What these results mean for you

Patients with a regular family doctor enjoy a range of benefits including access to preventive services that are based on expert guidelines as well as access to diagnostic test and referrals to medical specialists, such as oncologists or neurologists.^{1,2,3} Continuity of care might not be of benefit to all individuals; in particular, those who have few, if any, health problems such as young adults.^{1,4} However, having the same doctor seems to benefit the elderly, people with chronic health problems and the disabled.¹ The latter statement does not mean that these individuals are the *only* ones to benefit from having a doctor; everybody should see a doctor if they suspect they have a health problem.

Benefits associated with having access to a regular family doctor

- Adults are more likely to receive recommended preventive services

- Access to diagnostic testing and specialist physicians
- Improved communication and trust fostered by an ongoing relationship with a family doctor
- Enhanced adherence to treatment
- Increased patient and doctor satisfaction
- Reduced use of emergency departments and hospital beds
- Fewer surgeries for children who have continuity of care
- Reduced health care costs
- Improved health status

Problems associated with not having access to a regular family doctor

- Difficulty accessing health care services
- Longer wait times for diagnostic tests
- Longer wait times to see medical specialists
- Poorer health outcomes

Some of the factors that might limit your ability to have access to a regular family doctor

- Where you live (rural versus urban)
- A limited supply of doctors in your community
- Your local area doctor is not taking new patients
- Language barriers
- Lack of or cost of transportation

Things you can do to find a family doctor if you do not have one

- Ask people you know including family, friends, and business associates
- Ask your nurse, pharmacist, or other health care provider for advice and guidance
- Contact provincial and territorial or regional/municipal departments of health
- If you need to consult a family doctor and one is not available, go to your nearest walk-in clinic

References

- ¹ Gray, D.P., Evans, P., Sweeney, K., Lings, P., Seamark, D., Seamark, C., Dixon, M., Bradley, N. (2003). Towards a theory of continuity of care. *Journal of the Royal Society of Medicine*. 96(4): 160-166. Available from: <http://jrsm.rsmjournals.com/content/96/4/160.full.pdf+html>.
- ² Rosser, W., Schultz, K. (2007). Promoting continuity of care should be integral to any health care system. *Canadian Medical Association Journal*. 177(11): 1385-1386. Available from: <http://www.canadianmedicaljournal.ca/content/177/11/1385.full>.
- ³ McIsaac, W.J., Fuller-Thomson, E., Talbot, Y. (2001). Does having regular care by a family physician improve preventive care? *Canadian Family Physician*. 47: 70-76. Available from: <http://171.66.125.180/cgi/reprint/47/1/70>.
- ⁴ Saultz, J.W., Lochner, J. (2005). Interpersonal continuity of care and care outcomes: a critical review. *Annals of Family Medicine*. 3: 159-166. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1466859/?tool=pubmed>.

2. **SELF-REPORTED DIFFICULTY OBTAINING ROUTINE OR ONGOING HEALTH SERVICES**
3. **SELF-REPORTED DIFFICULTY OBTAINING HEALTH INFORMATION OR ADVICE**
4. **SELF-REPORTED DIFFICULTY OBTAINING IMMEDIATE CARE**

Key Messages

- Access to health services, information or care is important in maintaining and improving health
- Most Canadians did not have trouble obtaining routine or ongoing health services, health information or advice, or immediate care in 2011
- In 2008/10, nearly four in 10 First Nations adults reported having less access to health services compared to other Canadians

What do these indicators measure?

These three indicators measure the percentage of the population 15 years of age and older who required health services for self or a family member in the 12 months prior to being surveyed, and who reported difficulties obtaining routine or ongoing health services, health information or advice, or immediate care for a minor health problem at any time of the day.

Also included is the percentage of First Nations adults aged 18 years and older living in First Nations communities* who stated that they have better access, the same level of access, or less access to health services compared to other Canadians.

An additional measure illustrates barriers to receiving health care in the past 12 months reported by First Nations adults aged 18 years and older living in First Nations communities.

<p>Routine or ongoing health services . . .</p> <p>. . . refers to health care provided by a family or general physician including an annual check-up, blood tests or routine care for an ongoing illness (for example, prescription refills).</p>	<p>Health information or advice . . .</p> <p>. . . includes information sought from a doctor's office, community health centre or Centre local de santé communautaire (CLSC), walk-in clinic, telephone health line, hospital emergency room, or another hospital service.</p>	<p>Immediate care for a minor health problem . . .</p> <p>. . . includes fever, vomiting, major headaches, sprained ankle, minor burns, cuts, skin irritation, unexplained rash, and other non-life threatening health problems or injuries due to a minor accident.</p>
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* First Nations living on reserve and in northern First Nations communities.

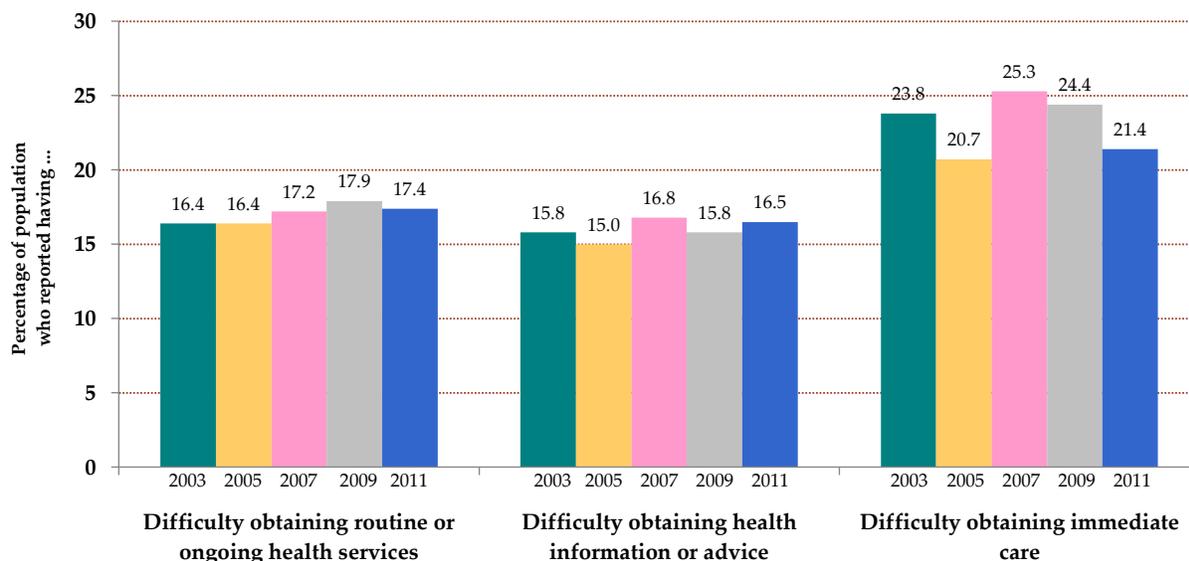
What are the limitations of these indicators?

These indicators for the general population only present the distribution of people reporting difficulty and they do not measure in any way the degree of difficulty. In other words, we do not know how difficult it was for them to obtain health information or advice, for example.

Most Canadians do not have difficulty accessing health services, health information or advice, or immediate care

Most Canadians requiring routine or ongoing health services, health information or advice, or immediate care for a minor health problem do not report difficulties obtaining them. For example, in 2011, 17.4% of Canadians reported difficulty obtaining routine or ongoing health services; 16.5% reported difficulty obtaining health information or advice; and 21.4% reported difficulty obtaining immediate care. In 2011, the percentage of the population reporting difficulty obtaining immediate care declined to 21.4% from 24.4% in 2009.

Figure 3 Self-Reported Difficulty Accessing Health Services, Health Information or Advice, or Immediate Care
 Percentage of population aged 15 years and older who reported having difficulty obtaining various health services, both sexes (age-standardized), Canada,[§] 2003-11



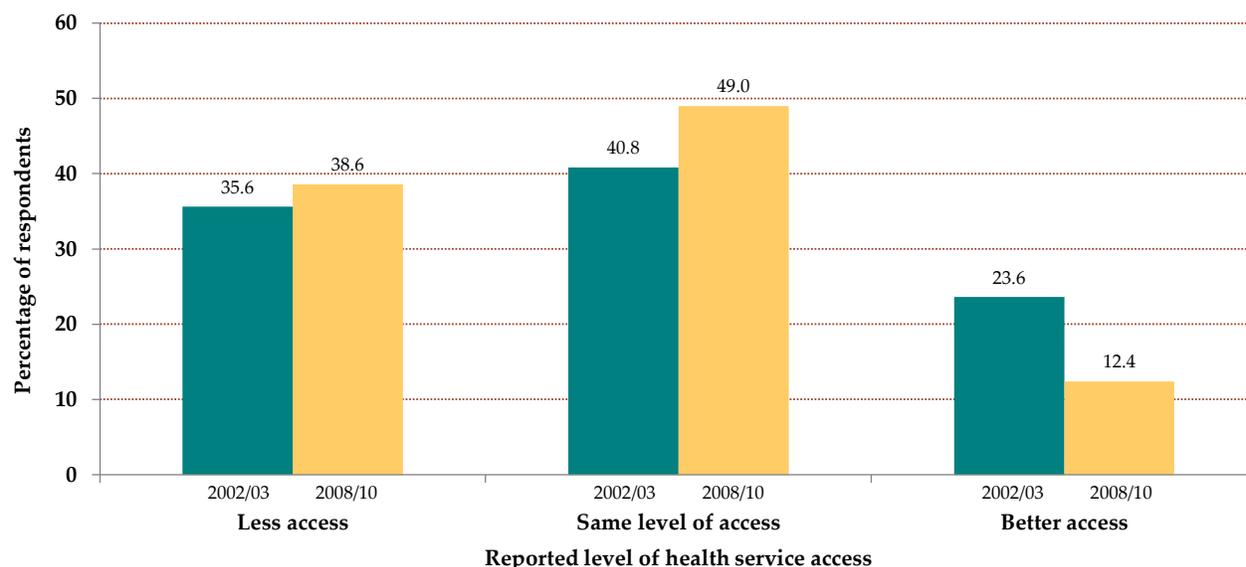
Sources: Statistics Canada. Health Services Access Survey; supplement to the Canadian Community Health Survey, 2003-11.
 Notes: Includes household population aged 15 years and older reporting difficulties accessing these services in the 12 months prior to the survey, for self or a family member.
[§]For 2005, the Canadian total includes Yukon, Northwest Territories and Nunavut's 10 largest communities. For the other years, the Canadian totals do not include Yukon, Northwest Territories and Nunavut.
 Age-standardized to the 1991 Canadian population.
 For additional exclusions/limitations, see Annex 2.

Nearly four in 10 First Nations adults living in First Nations communities* report having less access to health services compared to other Canadians

When asked how they would rate their level of access to health services compared to Canadians generally, 12.4% of First Nations adults aged 18 years and older living in First Nations communities state they have better access, 49.0% say their access is the same while 38.6% say they have less access to health services.

In the 2002/03 First Nations Regional Health Survey, a larger percentage (23.6%) said they had better access than in the 2008/10 survey (12.4%).

Figure 4 **Reported Level of Health Service Access**
Reported level of access to health services available compared to Canadians generally, First Nations adults living in First Nations communities,* aged 18 years and older, both sexes, 2002/03 and 2008/10



Source: First Nations Information Governance Centre. First Nations Regional Health Survey (RHS), 2002/03 and 2008/10.

Notes: * First Nations living on reserve and in northern First Nations communities.

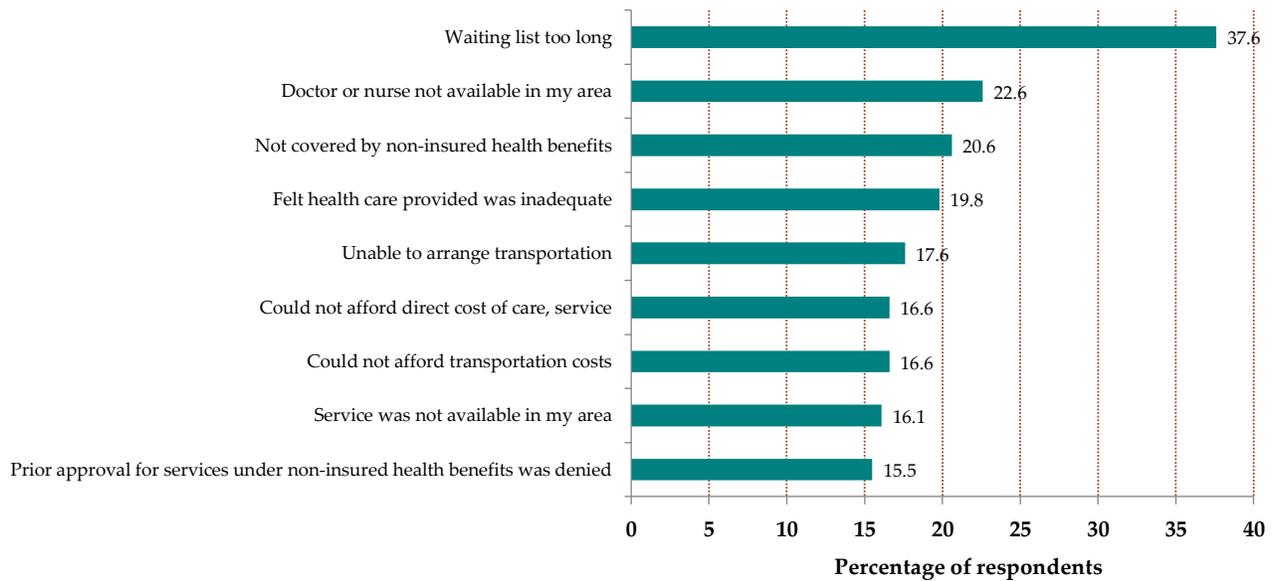
Population aged 18 years and older who reported their level of health service access compared to Canadians generally. For additional exclusions/limitations, see Annex 2.

* First Nations living on reserve and in northern First Nations communities.

Among First Nations adults, the most commonly reported barrier to accessing health services is long wait times

When First Nations adults aged 18 years and older living in First Nations communities* were asked if they had experienced any barriers to receiving health care in the past 12 months, the top reason given was that the waiting list was too long (37.6%).

Figure 5 Selected Perceived Barriers to Receiving Health Care
First Nations adults living in First Nations communities,* aged 18 years and older, both sexes, 2008/10



Source: First Nations Information Governance Centre. First Nations Regional Health Survey (RHS), 2008/10.
 Notes: * First Nations living on reserve and in northern First Nations communities.
 Population aged 18 years and older who reported their perceived barriers to receiving health services.
 For additional exclusions/limitations, see Annex 2.

* First Nations living on reserve and in northern First Nations communities.

What these results mean for you

Reported difficulty accessing services is an important measure of the Canadian public's ease of interacting with the health care system. Low rates are desirable as they suggest that there has been either a reduction in the need for these services, or more likely that these services are easier to access.

Accessing health services, health information or advice, or immediate care is essential in maintaining and improving health. For example, access to health information helps promote health, prevent diseases, and support clinical care, which is especially true for people with chronic diseases such as arthritis.¹ Moreover, information available through services such as Telehealth may result in fewer hospitalizations, emergency room admissions, urgent calls to the family physician, or problems related to a chronic condition.²

Research shows that health need—such as the number of health problems individuals may have and their self-perceived health status—is related to the use of health services. However, men and women with higher levels of education and income are more likely to access the services of a general practitioner than individuals with lower education or income. In addition, having a regular doctor is associated with having greater access to primary care and specialist care services.³

It is worth noting that populations most likely to benefit from services like health information may also be the least likely to access them, such as the elderly, immigrants, the disenfranchised, and the poor. To address this, health consumers need to be proactive to ensure that they fully understand the information that is available to them. Health professionals should also make attempts to tailor their messages for each specific patient.^{4, 5, 6}

Benefits of access to health services, health information or advice, or immediate care

- Empowerment as individuals actively participate in their health care
- Awareness of benefits regarding health promotion to maintain and improve health
- Improved compliance with treatment
- Improved health status

Barriers in accessing health services, health information or advice, or immediate care

- Health problems may limit your ability to access services
- Disabilities such as visual impairment
- Illiteracy or low literacy
- Geographic location (urban versus rural and remote)
- Culture/language
- Information on how to access these services is not readily available
- Service is not available (e.g., phone line is busy)

Things you can do to improve access to health services, health information or advice, or immediate care

- Seek help from a family member, friends or a trusted community member
- Ask your health care provider how to access services

- Seek out community educators to assist you in overcoming access barriers such as culture, language and low literacy levels
- Visit the website of your provincial/territorial department of health for tips and links to useful resources

References

- ¹ Lorig, K.R., Mazonson, P.D., Holman, H.R. (1993). Evidence suggesting that health education for self-management in patients with chronic arthritis has sustained health benefits while reducing health care costs. *Arthritis and Rheumatism*. 36(4): 439-446.
- ² Vitacca, M., Bianchi, L., Guerra, A., Fracchia, C., Spanevello, A. (2009). Tele-assistance in chronic respiratory failure patients: a randomised clinical trial. *European Respiratory Journal*. 33: 411-418. Available from: <http://erj.ersjournals.com/cgi/reprint/33/2/411>.
- ³ Dunlop, S., Coyote, P.C., McIsaac, W. (2000). Socio-economic status and the utilisation of physicians' services: results from the Canadian National Population Health Survey. *Social Science and Medicine*. 51: 123-133. Available from: <http://www.sciencedirect.com/science/article/pii/S0277953699004244>.
- ⁴ Zanchetta, M.S., Poureslami, I.M. (2006). Health literacy within the reality of immigrants' culture and language. *Canadian Journal of Public Health*. 97(2): S26-S30. Available from: http://www.douglas.bc.ca/_shared/assets/Health_Literacy_for_Immigrants62609.pdf.
- ⁵ Kalichman, S.C., Benotsch, E.G., Weinhardt, L.S., Austin, J., Luke, W. (2002). Internet use among people living with HIV/AIDS: association of health information, health behaviors, and health status. *AIDS Education and Prevention*. 14(1): 51-61. Available from: <http://guilfordjournals.com/doi/pdf/10.1521/aeap.14.1.51.24335>.
- ⁶ Eng, T.R., Maxfield, A., Patrick, K., Deering, M.J., Ratzan, S.C., Gustafson, D.H. (1998). Access to health information and support: a public highway or a private road. *Journal of the American Medical Association*. 280(15): 1371-1375. Available from: <http://jama.ama-assn.org/cgi/content/full/280/15/1371>.

5. SELF-REPORTED WAIT TIMES FOR DIAGNOSTIC SERVICES
6. SELF-REPORTED WAIT TIMES FOR SPECIALIST PHYSICIAN VISITS
7. SELF-REPORTED WAIT TIMES FOR SURGERY
8. PROCEDURES COMPLETED WITHIN NATIONAL BENCHMARKS

Key Messages

- Tracking wait times is an important part of assessing health system performance
- Early detection, diagnosis and treatment often leads to more favourable health outcomes
- Self-reported wait times for diagnostic services, non-emergency surgery and specialist physician visits remain relatively low and steady since 2003
- In areas identified as priorities for government wait time reduction efforts, eight out of ten patients received care within benchmarks in 2011
- Some patients who wait too long for non-urgent care may experience pain, stress and/or disability which can impact their quality of life¹

What do these indicators measure?

The first three indicators measure the self-reported median wait time (weeks people aged 15 years and older reported waiting) and the distribution (percentage of people aged 15 years and older that reported waiting less than one month, between one and three months, or more than three months) for (1) diagnostic services; (2) specialist physician visits; or (3) non-emergency surgery.

Diagnostic services only include the following: non-emergency magnetic resonance imaging (MRI) devices that do not use X-rays to detect and treat illness inside the body; computed tomography (CT or CAT) scans that use X-rays for illness detection and treatment; and angiographies that use X-rays to examine the inner opening of blood-filled structures such as veins and arteries.

Median wait time . . .

. . . is the 50th percentile of the distribution of wait times: half the patients wait less and half wait longer than the median number of weeks. This measure is often used to describe the 'typical' patient.

Canadians have also become familiar with other reporting on and measurement of wait times in recent years. The Canadian Institute for Health Information (CIHI) is mandated to work with provinces and territories to report on progress in reducing waits for the priority procedures identified in the 2004 Accord: cardiac, cancer, joint replacements, sight restoration and diagnostic imaging. In 2011, CIHI reported the first comparable data at the national level on wait times for procedures within the priority areas. The fourth indicator featured in this section draws on the CIHI data to show the proportion of Canadians (aged 18 years and older) receiving priority procedures within nationally established benchmarks. Benchmarks are evidence-based wait time goals that express the amount of time that clinical evidence shows is appropriate to wait for a procedure.

Advisory to Readers: Patients who had not yet received the service were excluded from the self-reported indicator calculations.

What are the limitations of the indicators?

Wait times based on the respondents' self-reporting are often affected by their capacity to remember the duration that they waited for that specific health service. Because of a lack of definition as to what represents the starting point of a wait time, its duration can be difficult to estimate and could vary among respondents. Therefore, self-reported data are not always as accurate as they would be if they came from an actual clinical database.²

The wait times information reported by CIHI is derived from comparative administrative data from each province, and is considered the most accurate measure of national surgical wait times. However, this data currently only represents about one eighth of all surgeries performed in Canada, focusing on the priority areas of the 2004 Accord. In addition, while it captures a well-defined timeframe (from decision to treat, as represented by the booking data, to the completion of the procedure), it does not cover other portions of the care journey (such as from referral to consultation with a specialist), so may not represent the entire wait as experienced by the patient.

Self-reported median wait time for diagnostic services remains relatively low and steady at three weeks

In 2011, the median wait time for diagnostic services was 3 weeks, up from recent years. Also in 2011, most Canadians (54.6%) aged 15 years and older who had a diagnostic service reported waiting less than one month for their test. However, 11.8% of Canadians reported that they waited over three months for diagnostic testing.

Table 1 Self-Reported Wait Times for Diagnostic Services
 Median wait times (in weeks), both sexes (age-standardized), Canada,[§] 2003-11

	2003	2005	2007	2009	2011
Number of weeks	2.0 ^{§§}	3.0	2.0	2.0	3.0

Source: Statistics Canada. Health Services Access Survey; supplement to the Canadian Community Health Survey, 2003-11.

Notes: Based on household population aged 15 years and older reporting having had a diagnostic service in the 12 months prior to the survey.

Diagnostic services include non-emergency MRIs, CT scans and angiographies only.

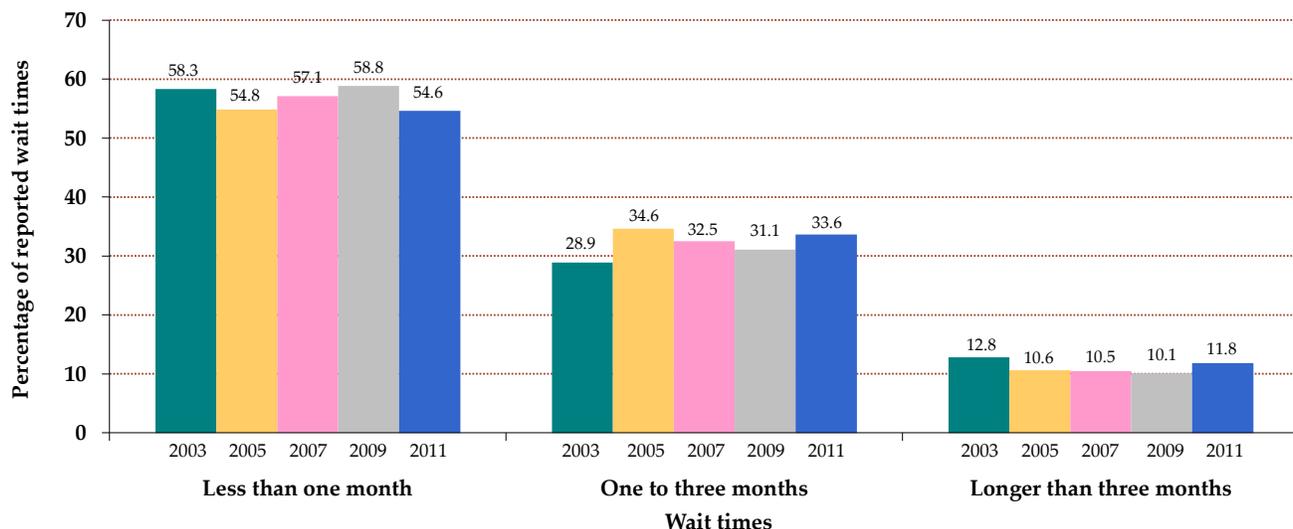
[§] For 2005, the Canadian total includes Yukon, Northwest Territories and Nunavut's 10 largest communities. For the other years, the Canadian totals do not include Yukon, Northwest Territories and Nunavut.

^{§§} Since the variability of this data point is relatively high (with a coefficient of variation between 16.6% and 33.3%), it should be used with caution.

Age-standardized to the 1991 Canadian population.

For additional exclusions/limitations, see Annex 2.

Figure 6 Self-Reported Wait Times for Diagnostic Services
 Distribution of wait times (in months), both sexes (age-standardized), Canada,[§] 2003-11



Source: Statistics Canada. Health Services Access Survey; supplement to the Canadian Community Health Survey, 2003-11.

Notes: Based on household population aged 15 years and older reporting having had a diagnostic service in the 12 months prior to the survey.

Diagnostic services include non-emergency MRIs, CT scans and angiographies only.

[§] For 2005, the Canadian total includes Yukon, Northwest Territories and Nunavut's 10 largest communities. For the other years, the Canadian totals do not include Yukon, Northwest Territories and Nunavut.

Age-standardized to the 1991 Canadian population.

For additional exclusions/limitations, see Annex 2.

Self-reported median wait time for specialist physician visits is relatively steady at four weeks

The self-reported median wait time for specialist physician visits for a new illness or condition was 4.3 weeks in 2011, having remained constant in recent years. Regarding the distribution of wait times, 45.0% of Canadians waited less than one month for specialist physician visits, while 37.9% waited from one to three months, and 17.1% waited longer than three months, continuing the trend of year over year increases.

Table 2 Self-Reported Wait Times for Specialist Physician Visits
Median wait times (in weeks), both sexes (age-standardized), Canada,[§] 2003-11

	2003	2005	2007	2009	2011
Number of weeks	4.0	4.0	4.3	4.3	4.3

Source: Statistics Canada. Health Services Access Survey; supplement to the Canadian Community Health Survey, 2003-11.

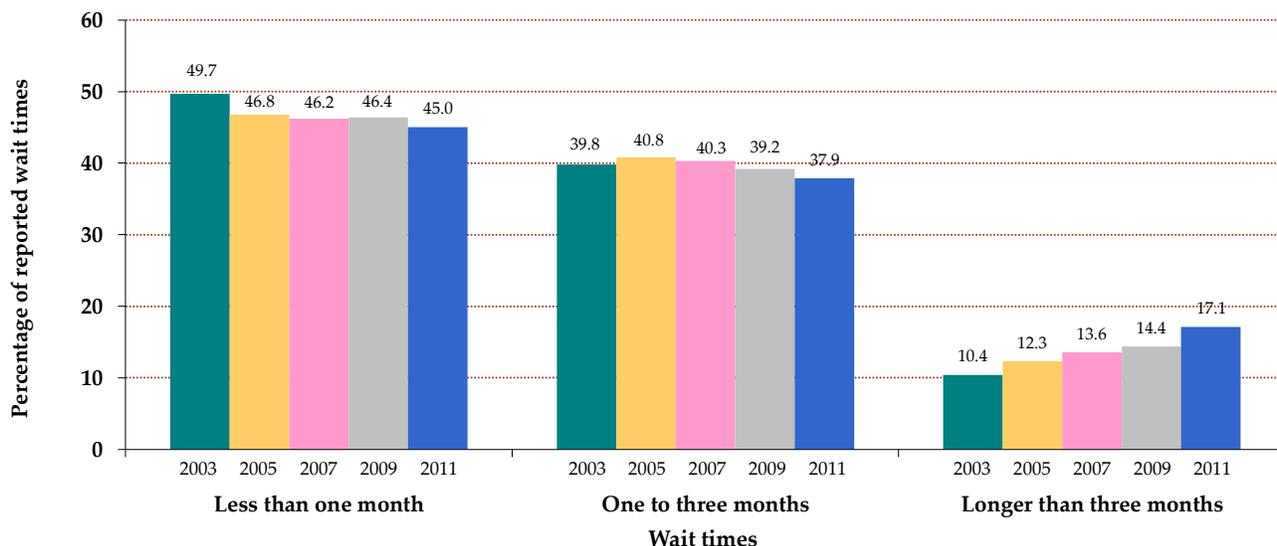
Notes: Based on household population aged 15 years and older reporting having seen a specialist physician for a diagnosis or consultation for a new illness or condition in the 12 months prior to the survey.

[§] For 2005, the Canadian total includes Yukon, Northwest Territories and Nunavut's 10 largest communities. For the other years, the Canadian totals do not include Yukon, Northwest Territories and Nunavut.

Age-standardized to the 1991 Canadian population.

For additional exclusions/limitations, see Annex 2.

Figure 7 Self-Reported Wait Times for Specialist Physician Visits
Distribution of wait times (in months), both sexes (age-standardized),
Canada,[§] 2003-11



Source: Statistics Canada. Health Services Access Survey; supplement to the Canadian Community Health Survey, 2003-11.
 Notes: Based on household population aged 15 years and older reporting having seen a specialist physician for a diagnosis or consultation for a new illness or condition in the 12 months prior to the survey.
[§] For 2005, the Canadian total includes Yukon, Northwest Territories and Nunavut's 10 largest communities. For the other years, the Canadian totals do not include Yukon, Northwest Territories and Nunavut.
 Age-standardized to the 1991 Canadian population.
 For additional exclusions/limitations, see Annex 2.

Self-reported median wait time for non-emergency surgery remains low and steady at four weeks

In 2011, the self-reported median wait time for non-emergency surgeries remained steady at 4.3 weeks, constant since 2003. Regarding distribution of wait times, 38.7% of Canadians reported that they waited less than one month, while 41.1% of Canadians reported that they waited one to three months, and 20.2% of Canadians reported that they waited longer than three months.

Table 3 Self-Reported Wait Times for Non-Emergency Surgery
Median wait times (in weeks), both sexes (age-standardized), Canada,[§] 2003-11

	2003	2005	2007	2009	2011
Number of weeks	4.3	4.3	4.3	4.3	4.3

Source: Statistics Canada. Health Services Access Survey; supplement to the Canadian Community Health Survey, 2003-11.

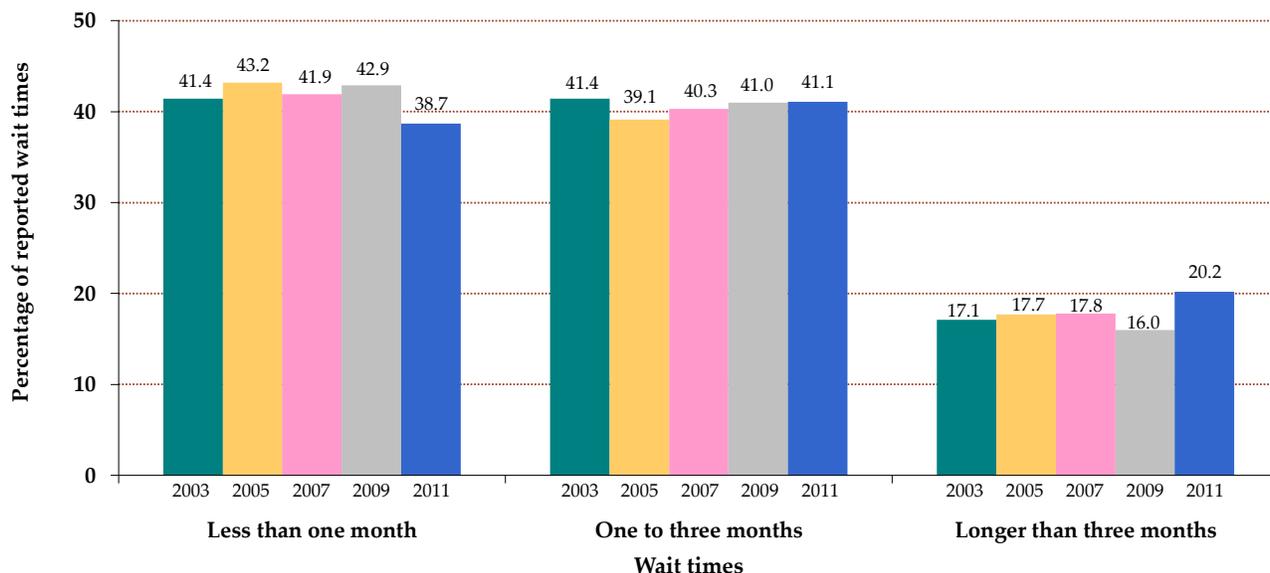
Notes: Based on household population aged 15 years and older reporting having had non-emergency surgery in the 12 months prior to the survey.

[§] For 2005, the Canadian total includes Yukon, Northwest Territories and Nunavut's 10 largest communities. For the other years, the Canadian totals do not include Yukon, Northwest Territories and Nunavut.

Age-standardized to the 1991 Canadian population.

For additional exclusions/limitations, see Annex 2.

Figure 8 Self-Reported Wait Times for Non-Emergency Surgery
Distribution of wait times (in months), both sexes (age-standardized),
Canada,[§] 2003-11



Source: Statistics Canada. Health Services Access Survey; supplement to the Canadian Community Health Survey, 2003-11.
 Notes: Based on household population aged 15 years and older reporting having had non-emergency surgery in the 12 months prior to the survey.

[§]For 2005, the Canadian total includes Yukon, Northwest Territories and Nunavut's 10 largest communities. For the other years, the Canadian totals do not include Yukon, Northwest Territories and Nunavut. Age-standardized to the 1991 Canadian population. For additional exclusions/limitations, see Annex 2.

Most Canadians receive priority procedures within national benchmarks

Wait times for priority procedures have remained steady since 2010. Although variation exists across priority areas, most patients are receiving these procedures within the medically acceptable timeframes, or benchmarks adopted by governments. Three quarters (75%) of patients received knee replacements within 26 weeks, while almost all (97%) received radiation therapy for cancer treatment within the recommended 4-week timeframe.

Table 4 Proportion of Patients Receiving Care Within Benchmarks
By priority area, Canada, 2010-12

Priority Area	Benchmark	2010	2011	2012
Hip Replacement	26 weeks	84%	82%	80%
Knee Replacement	26 weeks	79%	75%	75%
Hip Fracture Repair	48 hours	78%	79%	81%
Cataract	16 weeks	83%	82%	83%
Radiation Therapy	4 weeks	98%	97%	97%

Source: Canadian Institute for Health Information. *Wait Times for Priority Procedures in Canada, 2013*.

Notes: Canadian average for hip fracture repair does not include Quebec (Quebec wait times for hip fracture repair are not included due to methodological differences in the data).

National benchmarks for cardiac bypass surgery were also established, based on the urgency of a patient's condition. However, due to clinicians' use of different urgency rating tools and variation in the way such tools are applied, CIHI is no longer reporting the percentage of patients receiving cardiac bypass surgery within benchmarks.

What these results mean for you

Understanding why wait times for health care may become too long is complex, although it is most frequently a matter of demand for services exceeding the supply. This means that there are more patients requiring services than what the system is able to accommodate. Increases in demand for health services, such as diagnostic services,³ are rising in Canada due to such factors as advances in technology, clinical practices that allow for new ways to diagnose and treat illnesses, changing demographics, and inappropriate use of certain procedures. Wait times can also be impacted by larger, system-wide challenges such as health human resources shortages (e.g., not enough specialists), lack of available beds, inefficient use of available resources and limited availability of complementary health services needed to support patients before and after a procedure. A small portion of waits can also be the result of factors

other than increased demand, such as a patient's readiness for surgery or a requested delay to accommodate a patient's schedule.

To help address wait times in Canada, First Ministers, under the 2004 Health Accord, agreed to focus on reducing waits in priority areas, supported by a ten-year, \$5.5 billion Wait Times Reduction Fund. Following the Accord, governments worked together to establish evidence-based common benchmarks and associated indicators for medically acceptable wait times. To further support improving timely access to care, in 2007, provincial and territorial governments agreed to establish Patient Wait Times Guarantees⁴ in one clinical area by March 2010. This was supported by \$1 billion in federal funding. Guarantees allow patients who are coming close to the maximum medically acceptable wait time for a particular procedure to be offered an alternative option for care, such as seeing a different surgeon or travelling to a different hospital. One study showed, however, that given a choice, 63% of patients would not choose a surgeon with a shorter wait list.⁵

Evidence to date from provinces' own public reports shows that their considerable efforts to reduce wait times have decreased waits in priority areas in most parts of the country. This is reinforced by the data presented in CIHI's latest report, *Wait Times for Priority Procedures in Canada, 2013*,⁶ which is featured in Table 4. While there is variation within and across provinces and priority areas, that progress has been largely sustained.

Statistics Canada's self-reported wait times indicators discussed in the tables above continue to provide a complementary perspective on wait times in Canada by providing a national picture of Canadians' self-reported experiences with wait times in a few much broader categories of waits (e.g., self-reported waits for all surgeries as opposed to the specific set of procedures included in CIHI's annual *Wait Times in Canada* series).

Supporting efforts to reduce or better manage wait times remains a priority given some patients who wait for health services may be experiencing pain, stress or disability, which can impact quality of life or lead to inferior health outcomes.⁷ For this reason, federal, provincial and territorial governments and health care providers remain committed to improving timely access to health services in Canada.

Benefits of timely access to health services

- Faster access to services
- Decreased risk of a health condition becoming worse
- Higher satisfaction with health care
- Greater quality of life

Health risks associated with excessive wait times to access health services

- Waiting for required health services can be frustrating, frightening and stressful
- Decreased quality of life
- Increased cost of treatment after a longer wait time
- Increased morbidity and health consequences such as pain and lost productivity
- Increased mortality

What to do if you find yourself waiting too long for a service

- Follow your doctor's advice in order to lessen additional injury or pain
- Consider travelling to a facility a further distance away or transferring to another specialist if advised, as it could decrease your wait⁵
- Be willing to go at unusual times of the day if services are available
- Use this time to prepare your environment, prepare yourself mentally and arrange for any help you may need afterwards if applicable
- If your wait is for surgery, learn about what you can expect before, during, and after the surgery, becoming familiar with exercises or other post-op instructions you will be required to follow

To learn more about provincial/territorial efforts to address wait times, visit the Health Council of Canada *Progress Report 2011: Health Care Renewal in Canada*.

References

- ¹ Citation from *Supreme Court of Canada: Chaoulli v. Quebec (Attorney General)*, 2005. SCC 35 Date: 20050609 Docket: 29272. Page 7. Available from: <http://scc.lexum.org/en/2005/2005scc35/2005scc35.html>.
- ² Bhandari, A., Wagner, T. (2006). Self-reported utilization of health care services: improving measurement and accuracy. *Medical Care Research and Review*. 63(2): 217-235.
- ³ Details on volume of medical imaging exams in Canada, available on the Canadian Institute for Health Information website at: http://www.cihi.ca/CIHI-ext-portal/internet/en/Document/types+of+care/specialized+services/medical+imaging/RELEASE_26MAY11.
- ⁴ Details on Patient Wait Times Guarantees are available at: <http://pm.gc.ca/eng/media.asp?id=1611>.
- ⁵ Connor-Spady, B., Sanmartin, C., Johnston, G., McGurran, J., Kehler, M., Noseworthy, T. (2008). Willingness of patients to change surgeons for a shorter waiting time for arthroplasty. *Canadian Medical Association Journal*. 179(4): 327-332. Available from: <http://www.cmaj.ca/cgi/reprint/179/4/327>.
- ⁶ Details on CIHI's *Wait Times for Priority Procedures in Canada, 2013* are available at: https://secure.cihi.ca/free_products/wait_times_2013_en.pdf.
- ⁷ Steinbrook, R. (2006). Private health care in Canada. *The New England Journal of Medicine*. 354: 1661-1664. Available from: <http://www.nejm.org/doi/pdf/10.1056/NEJMp068064>.

9. SELF-REPORTED OUT-OF-POCKET PRESCRIPTION DRUG EXPENDITURE PER HOUSEHOLD

Key Messages

- Prescription medicines and drugs play an important role in disease prevention and treatment
- The average out-of-pocket expenditures per household on prescribed medications was \$388 in 2011
- Average household spending on prescribed drugs rose by 22.5% or \$49 between 2000 and 2009, but has slightly decreased in 2011 compared to 2010

What does this indicator measure?

This indicator measures the self-reported out-of-pocket expenditure spent by household on prescribed medicines, drugs and pharmaceutical products.

Out-of-pocket . . .
. . . refers to a full or partial expenditure that is not reimbursed through a drug plan or other health insurance plan.

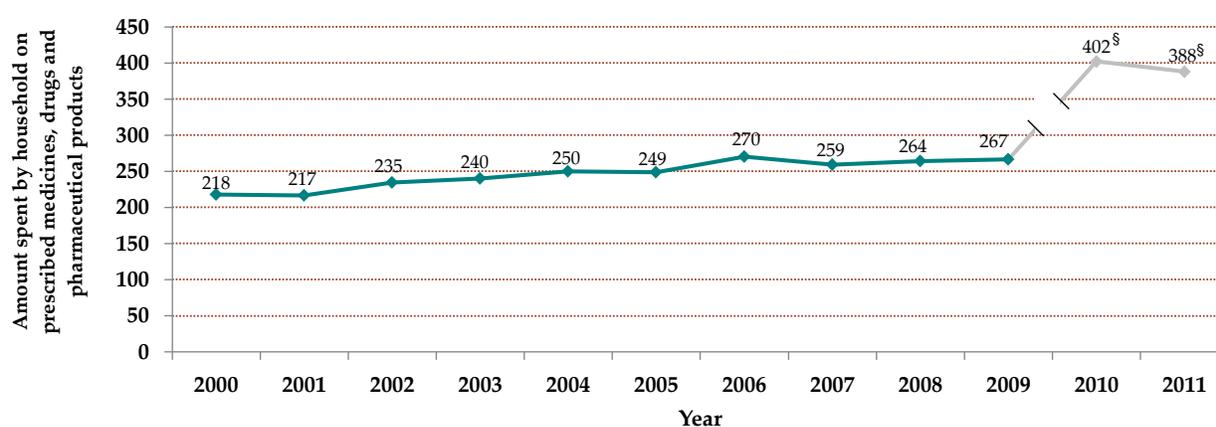
What are the limitations of this indicator?

Information on spending as reported by households represents an estimate and not the actual amount spent on prescription drugs. Due to methodological changes in data collection for the years 2010 and 2011, the data is comparable for two periods: 2000 to 2009, and from 2010 onwards.

Out-of-pocket drug expenditure has increased since 2000

After taking inflation into account (2000=100), average household spending on prescribed drugs rose by 22.5% (\$49) between 2000 and 2009. It has fallen down to \$388 in 2011, from \$402 in 2010. Due to differences in the methodology, data for 2010 and 2011 should not be compared to previous years. Because of the shorter recall in 2010 and 2011 (3 months instead of 12 months for previous years), the average household spending on prescribed medicine, drugs and pharmaceutical products is more likely to represent the actual amount spent by household compared to the previous methodology.

Figure 9 Self-Reported Out-of-Pocket Expenditure for Prescribed Medicines, Drugs and Pharmaceutical Products, per Household, in Constant (2000) Dollars Canada, 2000-11



Source: Statistics Canada. Survey of Household Spending, 2000-11.

Notes: [§] Due to a different methodology, data for 2010 and 2011 should not be compared to those of previous years. For instance, the reference period for the prescribed drugs question changed to a period of 3 months in 2010 and 2011 from a period of 12 months before 2010. In 2010 and 2011, the question was asked once, and the results for the three-month period were multiplied by 4 to get the amount for the entire year. Furthermore, the questions on prescribed drugs were the following:

- In 2010 and 2011: *In the last 3 months, what were the direct costs to members of your household for: medicines, drugs and pharmaceutical products prescribed by a doctor?* Then, this amount was multiplied by 4 to represent the cost for the entire year.
- From 2000 to 2009: *In the last year, what were the direct costs to members of your household for: prescribed medicines, drugs and pharmaceutical products?*

This indicator only includes prescribed medicines, drugs and pharmaceutical products purchased by households.

Over-the-counter drugs and drugs paid for by governments or insurance companies are not included.

Premiums for health care plans are not included.

For additional exclusions/limitations, see Annex 2.

What these results mean for you

Prescription drugs are a significant component in the fight against diseases and preventable mortality. In fact, a strong body of published evidence shows that prescription drugs have a positive impact on both the prevention and treatment of many conditions like cardiovascular disease,¹ rheumatoid arthritis,² diabetes,³ the hepatitis B virus,⁴ and sexually transmitted infections such as chlamydia.⁵

Treatment adherence (taking medication as prescribed) is essential in achieving positive health outcomes and helping contain health system costs. A wide range of factors have been described as influencing adherence, such as the type of medical condition one has, the presence of mental disorders such as

schizophrenia, language difficulties, poor memory, alcohol or substance abuse, the type of doctor-patient relationship one has, poor social supports, the route of drug administration, the appearance, colour and taste of medication, or its side effects. Meanwhile, demographic factors like age, sex and education are often not related to poor adherence.^{6,7} It has been recently estimated that 1 in 10 Canadians did not fill a prescription due to cost in 2011.⁸

Patients who do not take their medication according to the dosage and schedule are known to experience health problems, which result in a greater financial burden on health systems.⁹ In addition, non-adherence with antibiotics or drugs can give rise to resistant forms of some pathogens which do not respond well to treatments. For example, resistant strains of tuberculosis are more difficult to treat and increase the likelihood that the disease is spread in the community, leading to costly outbreaks.¹⁰

Moreover, in a meta-analysis of 21 clinical studies involving over 46,000 individuals, researchers found a consistent link between adherence to drug therapy and mortality. In people with good adherence to a drug therapy, mortality risk was about half of that of people with poor adherence, whether they took a beneficial drug therapy or a placebo.¹¹

Prescription drug use is also affected by cost, and whether or not an individual has coverage for the drug's cost through insurance. In fact, research has shown that cost-sharing policies—where individuals are required to pay a percentage of the cost of medication—may result in significant reductions in the number of prescribed drugs used per day by elderly patients and adult welfare recipients, resulting in a higher rate of adverse events and emergency department visits.¹²

Control of prescription drug prices is a tool used by many governments to ensure their population can afford their medication. The Patented Medicine Prices Review Board (PMPRB), an independent quasi-judicial administrative agency, regulates the prices of patented medicines (i.e., those drugs that are still protected by patents) to ensure they are not excessive. It is important to note that the PMPRB regulates the “factory gate” prices and does not have jurisdiction over prices charged by wholesalers or pharmacies, or over pharmacists' professional fees.

The PMPRB has no authority to regulate the prices of non-patented drugs, including those for which the patents have expired, and generic versions of these drugs. However, the PMPRB analyzes and reports to Canadians on price trends of all medicines and on research and development conducted by patentees. These reports are publicly available through their [website](#).

Benefits of prescription drugs

- Disease prevention and treatment
- Control of disease progression
- Decreased preventable mortality
- Improved health status

Problems associated with poor prescription drug adherence

- Increased morbidity
- Development of drug-resistant strains
- Increased mortality

A few factors influencing your total drugs cost

- Whether your drug is patented or not
- Whether your drug is a newer or older medication
- The number of prescribed medicines you take
- Whether or not you have insurance, and your level of coverage
- Retail and wholesale mark-ups
- Pharmacists' professional fees

Things you can do to control your prescription drug spending

- Speak with your doctor or pharmacist, or other health care provider
- Seek advice from your health insurance plan provider (whether provided by your employer or by your province or territory)
- To learn more about drug therapy, please visit the [Drugs and Health Products](#) section of the Health Canada website or the [Patented Medicine Prices Review Board](#) website

References

- ¹ Law, M.R., Morris, J.K., Wald, N.J. (2009). Use of blood pressure lowering drugs in the prevention of cardiovascular disease: meta-analysis of 147 randomised trials in the context of expectations from prospective epidemiological studies. *British Medical Journal*. 338(191): b1665. Available from: <http://www.bmj.com/content/338/bmj.b1665.pdf%2Bhtml>.
- ² Chen, Y.F., Jobanputra, P., Barton, P., Jowett, S., Bryan, S., Clark, W., Fry-Smith, A., Burls, A. (2006). A systematic review of the effectiveness of adalimumab, etanercept and infliximab for the treatment of rheumatoid arthritis in adults and an economic evaluation of their cost-effectiveness. *Health Technology Assessment*. 10(42). 266 pages. Available from: http://eprints.bham.ac.uk/1/1/Chen_YF%2C_Jobanputra_P._TNF_inhibs_for_RA_HTA_2006.pdf.
- ³ American Diabetes Association. (2008). Standards of Medical Care in Diabetes — 2008. *Diabetes Care*. 31(S1): S12-S54. Available from: http://care.diabetesjournals.org/content/31/Supplement_1/S12.full.pdf+html.
- ⁴ Marcellin, P., Chang, T.T., Lee Lim, S.G., Sievert, W., Tong, M., Arterburn, S., Borroto-Esoda, K., Frederick, D., Rousseau, F. (2008). Long-term efficacy and safety of Adefovir Dipivoxil for the treatment of hepatitis B e antigen-positive chronic hepatitis B. *Hepatology*. 48(3): 750-758. Available from: <http://www3.interscience.wiley.com/cgi-bin/fulltext/119163271/HTMLSTART>.
- ⁵ Manavi, K. (2006). A review on infection with Chlamydia trachomatis. *Best Practice and Research Clinical Obstetrics and Gynaecology*. 20(6): 941-951. Available from: <http://www.sciencedirect.com/science/article/pii/S1521693406000666>.
- ⁶ Griffith, S. (1990). A review of the factors associated with patient compliance and the taking of prescribed medicines. *British Journal of General Practice*. 40: 114-116. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1371078/pdf/brjgenprac00082-0026.pdf>.

- ⁷ Fenton, W.S., Blyler, C.R., Heinssen, R.K. (1997). Determinants of medication compliance in schizophrenia: empirical and clinical findings. *Schizophrenia Bulletin*. 23(4): 637-651. Available from: <http://schizophreniabulletin.oxfordjournals.org/cgi/reprint/23/4/637>.
- ⁸ Law, M.R., Cheng, L., Dhalla, I.A., Heard, D., Morgan, S.G. (2012). The effect of cost on adherence to prescription medications in Canada. *Canadian Medical Association Journal*. 184(3): 297-302. Available from: <http://www.cmaj.ca/content/early/2012/01/16/cmaj.111270.full.pdf>.
- ⁹ Vermeire, E., Hearnshaw, H., Van Royen, P., Denekens, J. (2001). Patient adherence to treatment: three decades of research. A comprehensive review. *Journal of Clinical Pharmacy and Therapeutics*. 26: 331-342. Available from: <http://www3.interscience.wiley.com/cgi-bin/fulltext/119018661/PDFSTART>.
- ¹⁰ Shah, N.S., Wright, A., Bai, G.H., Barrera, L., Boulahbal, F., Martín-Casabona, N., Drobniewski, F., Gilpin, C., Havelková, M., Lepe, R., Lumb, R., Metchock, B., Portaels, F., Rodrigues, M.F., Rüsck-Gerdes, S., Van Deun, A., Vincent, V., Laserson, K., Wells, C., Cegielski, J.P. (2007). Worldwide emergence of extensively drug-resistant tuberculosis. *Emerging Infectious Diseases*. 13(3): 380-387. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2725916/>.
- ¹¹ Simpson, S.H., Eurich, D.T., Majumdar, S.R., Padwal, R.S., Tsuyuki, R.T., Varney, J., Johnson, J.A. (2006). A meta-analysis of the association between adherence to drug therapy and mortality. *British Medical Journal*. 333(7557): 15. Available from: <http://www.bmj.com/content/333/7557/15.pdf%2Bhtml>.
- ¹² Tamblyn, R., Laprise, R., Hanley, J.A., Abrahamowicz, M., Scott, S., Mayo, N., Hurley, J., Grad, R., Latimer, E., Perreault, R., McLeod, P., Huang, A., Larochelle, P., Mallet, L. (2001). Adverse events associated with prescription drug cost-sharing among poor and elderly persons. *Journal of the American Medical Association*. 285(4): 421-429. Available from: <http://jama.ama-assn.org/cgi/reprint/285/4/421>.

THEME – QUALITY OF HEALTH CARE

10. PATIENT SATISFACTION WITH HEALTH SERVICES (PUBLIC OPINION RESEARCH)

Key Messages

- Research on patient satisfaction with the health care system has become a widely assessed outcome for quality improvement
- However, the concept of satisfaction is not always well defined in research
- In 2009, most Canadians (81%) were satisfied with the health care services they received

What does this indicator measure?

This indicator measures the percentage of surveyed Canadians aged 18 years and older who were satisfied with the health care services they received in the past year.¹

The results were collected through a national telephone survey of 1,750 Canadian adults, in the fall of 2009. Similar surveys were done in 2005 and 2007. The question asked Canadians who have received health care services in the last 12 months “How satisfied were you with the service you received?”

What are the limitations of this indicator?

Ratings of satisfaction may be influenced by respondent characteristics such as age,² educational attainment,^{3,4,5} the respondent’s expectations,⁶ health status,⁴ utilization of services, and by socio-psychological effects such as self-interest⁷ and gratitude.^{8,9}

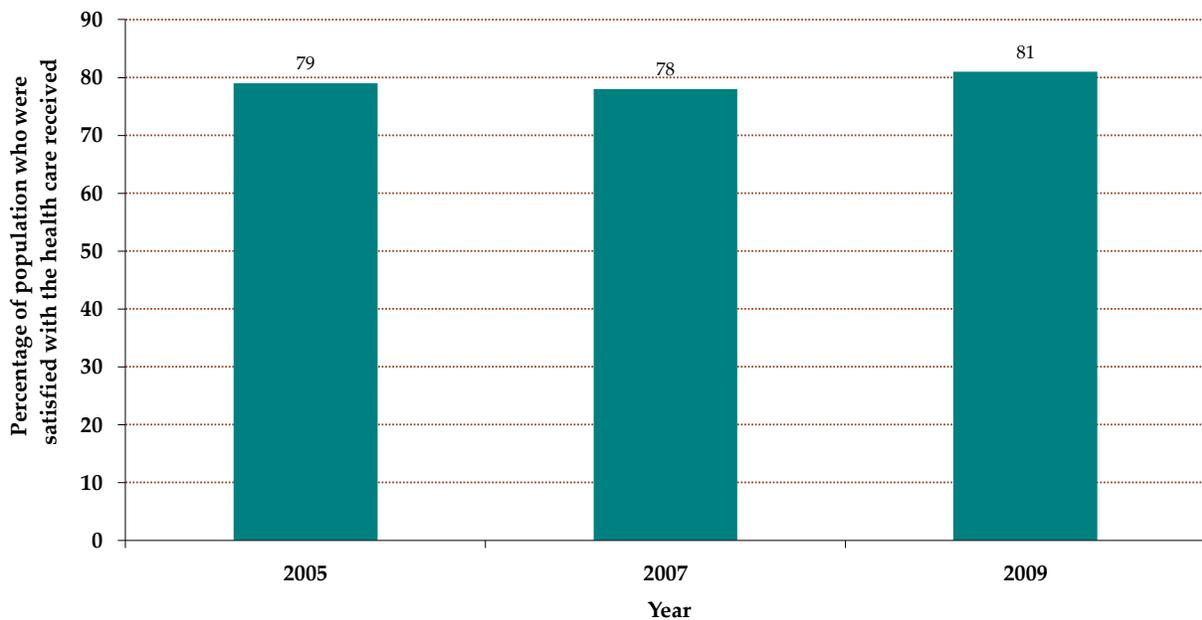
Furthermore, the accuracy of ratings may be affected by bias in the sampling. However, national results were weighted by gender and age to ensure that results were representative of the Canadian population.¹

The majority of Canadians are satisfied with the health care services they received within the last year.

Canadians satisfied with the health care service received

In 2009, 81% of Canadians who received health care services were satisfied with the service they received. Only 10% of Canadians were dissatisfied with this service. The other 9% were neither satisfied nor dissatisfied.¹

Figure 10 Patient Satisfaction with the Health Care Service Received
Percentage of Canadians who were satisfied with the health care service received within the last year, Canada, 2005-09



Source: Health Canada Performance Survey 2009. The Strategic Counsel.

What these results mean for you

Canadians are generally satisfied with the health care services they received and the level of satisfaction has been consistent over time, with a slight increase since 2005.

Patient satisfaction has been used as an indicator of the quality of health care services. Quality can be seen from various perspectives. Taking into account patient characteristics that may influence their assessment (such as age, gender, income level, education level), patients have been found to be more satisfied with care when they have good communication, and when their health care provider listens to them and has a patient-centred approach.¹⁰

Patient satisfaction is a very broad concept. Hence the interpretation of the results of this indicator is limited because it does not specify which aspects of the health services respondents were most satisfied with and which may still need to be improved.

Most Canadians are satisfied with their family doctor. Since most Canadians do not have other interaction with the health care system than with their doctor in a year's period, the high level of satisfaction reported may be more reflective of their satisfaction with the care they received from their doctor.

Patient satisfaction is an important indicator as it takes the perspective of the people actually receiving health care services. However, it is difficult to act upon because it leaves very little information on the reasons. More recently, the use of surveys of patient experience with care has expanded and these ask more specific questions on the aspect of the care. When administered after one has made use of a service, they can provide valuable information to health care providers on the actions to take to improve the quality of the care for the patient.

Benefits of being satisfied with health care services

- Better adherence to treatment and doctor's recommendations
- Improved psychological well-being
- More likely to return for services when in need of care, preventing future complications
- May provide information about the health system and possible areas of concern

Disadvantages of health satisfaction studies

- Lack of evidence-based information to guide health system decision-making
- The distribution of scores is often heavily skewed toward the higher end of the satisfaction rating scale
- Difficult to link satisfaction with actual health care services because tools used to measure satisfaction are often neither valid nor reliable

Supplementary information on health satisfaction studies

Patients dissatisfied with the care they receive should take the time to express the details of their dissatisfaction with health-care provider administrators. Patient advocacy groups, satisfaction surveys and/or comment cards may be some key means to having one's concerns expressed in the public domain.

References

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- ¹ The Strategic Counsel. *Health Canada Performance Survey 2009*. Page 49.
- ² Rahmqvist, M. (2001). Patient satisfaction in relation to age, health status and other background factors: a model for comparisons of care units. *International Journal for Quality in Health Care*. 13(5): 385-390. Available from: <http://intqhc.oxfordjournals.org/content/13/5/385.full.pdf+html>.

- ³ Hall, J.A., Dornan, M.C. (1990). Patient sociodemographic characteristics as predictors of satisfaction with medical care: a meta-analysis. *Social Science and Medicine*. 30(7): 811-819. Available from: <http://www.sciencedirect.com/science/article/pii/0277953690902057>.
- ⁴ Xiao, H., Barber, J.P. (2008). The effect of perceived health status on patient satisfaction. *Value in Health*. 11(4): 719-725. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/j.1524-4733.2007.00294.x/pdf>.
- ⁵ Becker, G., Newsom, E. (2003). Socioeconomic status and dissatisfaction with health care among chronically ill African Americans. *American Journal of Public Health*. 93: 742-748. Available from: <http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.93.5.742>.
- ⁶ Bleich, S.N., Özaltin, E., Murray, C.J.L. (2009). How does satisfaction with the health-care system relate to patient experience? *Bulletin of the World Health Organization*. 87: 271-278. Available from: <http://www.scielosp.org/pdf/bwho/v87n4/v87n4a12.pdf>.
- ⁷ LeVois, M., Nguyen, T.D., Attkisson, C.C. (1981). Artifact in client satisfaction assessment: experience in community mental health settings. *Evaluation and Program Planning*. 4: 139-150. Available from: <http://www.sciencedirect.com/science/article/pii/0149718981900045>.
- ⁸ Williams, B. (1994). Patient satisfaction: a valid concept? *Social Science and Medicine*. 38: 509-516. Available from: <http://www.sciencedirect.com/science/article/pii/027795369490247X>.
- ⁹ Sitzia, J., Wood, N. (1997). Patient satisfaction: a review of issues and concepts. *Social Science and Medicine*. 45(12): 1829-1842. Available from: <http://www.sciencedirect.com/science/article/pii/S0277953697001287#>.
- ¹⁰ Cleary, P.D., McNeil, B.J. (1988). Patient satisfaction as an indicator of quality care. *Inquiry*. 25(1): 25-36. Available from: <http://www.jstor.org/discover/10.2307/29771928?uid=16997896&uid=3739448&uid=2129&uid=2&uid=70&uid=3737720&uid=3&uid=67&uid=16268344&uid=62&sid=21102167368457>.

11. HOSPITALIZATION RATE FOR AMBULATORY CARE SENSITIVE CONDITIONS (ACSC)

Key Messages

- Hospitalization rate for Ambulatory Care Sensitive Conditions (ACSC) is an indicator of access to appropriate community-based care
- A disproportionately high rate for this indicator could reflect problems in obtaining access to, or the quality of, primary and preventative care
- Hospitalization rates for these conditions tend to vary greatly by socio-economic status and between urban and rural regions
- Hospitalization rates for chronic conditions that can be cared for in the community have declined since 2002–03

What are Ambulatory Care Sensitive Conditions?¹

Ambulatory Care Sensitive Conditions are long-term health conditions which can often be managed with timely and effective treatment in the community without hospitalization. Conditions include angina, asthma, congestive heart failure, chronic obstructive pulmonary disease, diabetes, epilepsy and hypertension. High rates of hospital admissions for ACSCs may provide indirect evidence of problems with patient access to primary health care, ineffective chronic disease management, inadequate system resources and provider skills, or gaps in coordination with specialist services.

What does this indicator measure?

This indicator measures the acute care hospitalization rate for conditions where appropriate ambulatory care prevents or reduces the need for admission to hospital, per 100,000 population under the age of 75 years.

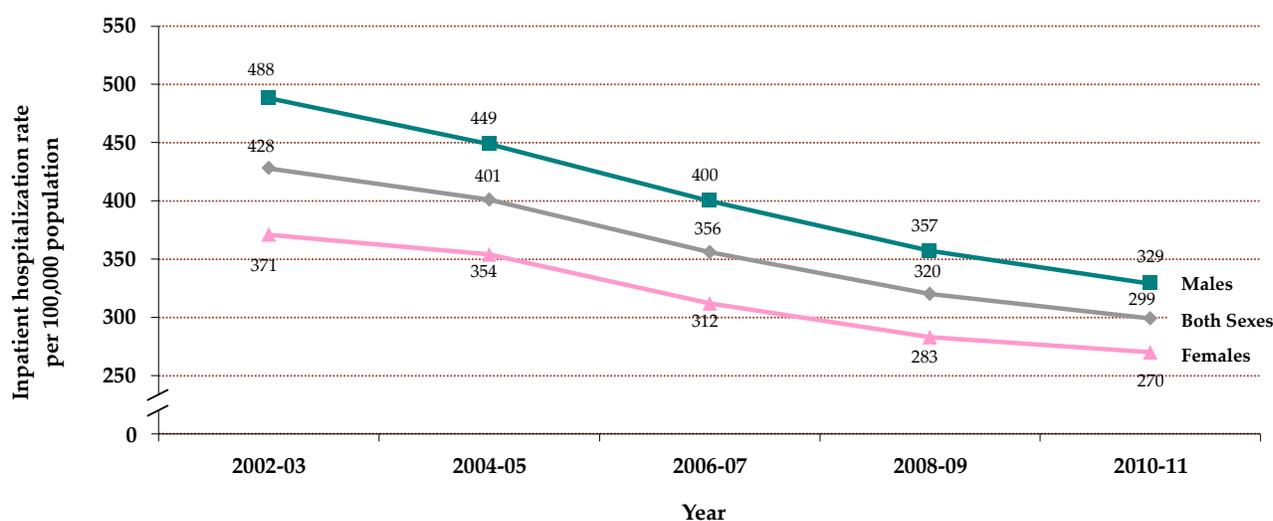
Only visits resulting in an inpatient admission in a hospital are included from the Hospital Morbidity Database.

Hospitalization rates for ambulatory care sensitive conditions are decreasing since 2002-03

Hospitalization rates for chronic conditions that can be cared for in the community have declined for males and females. For both sexes combined, the latest data (2010-11) showed a rate falling to 299 admissions per 100,000 population, from 320 admissions per 100,000 population in the previous time frame (2008-09) and 428 admissions per 100,000 population in 2002-03.

The rate for males decreased to 329 admissions per 100,000 males in 2010-11 from 357 hospitalizations per 100,000 males in 2008-09, and from 488 admissions per 100,000 males in 2002-03. The rate for females decreased to 270 admissions per 100,000 females in 2010-11 from 283 hospitalizations per 100,000 females in 2008-09, and from 371 admissions per 100,000 females in 2002-03. Canadian males continue to have higher rates of hospitalizations than females (329 admissions per 100,000 males versus 270 admissions per 100,000 females in 2010-11). The difference in rates between males and females is smaller than it was in 2002-03 and in 2008-09.

Figure 11 Ambulatory Care Sensitive Conditions
Hospitalization rate for ambulatory care sensitive conditions, per 100,000 population under 75 years old, by sex (age-standardized), Canada, 2002-03 to 2010-11



Sources: Canadian Institute for Health Information. Hospital Morbidity Database.
Fichier des hospitalisations MED-ÉCHO, Ministère de la Santé et des Services sociaux, Québec.

Notes: Starting with 2006-07, the indicator definition was revised and data were recalculated for the years beginning 2001-02 onwards. Comparison with rates from editions of *Healthy Canadians* published before 2008 should not be made. Excludes patients not treated as inpatients in acute care hospitals, patients 75 years of age and older, and patients who died before discharge. Age-standardized to the 1991 Canadian population. For additional exclusions/limitations, see Annex 2.

What these results mean for you

Quality primary health care is a key element in effective and efficient health systems. Primary care includes many services that are often difficult to measure and availability of primary health care data is

limited. The hospitalization rate for ambulatory care sensitive conditions, however, may represent an indirect measure for the availability and quality of primary health care as it represents the volume of hospital activity that is potentially preventable by timely and effective primary care.^{2,3}

Although appropriate preventive care, primary care and community-based management of these conditions will not eliminate all hospitalizations, such steps could prevent many of them. While not all admissions for ambulatory care sensitive conditions are avoidable, it is assumed that appropriate ambulatory care (i.e., community care) could prevent the onset of this type of illness or condition, control an acute episodic illness or condition, or manage a chronic disease or condition.⁴ For instance, a chronic disease management program implemented by Alberta Health Services in Calgary showed a 41% decrease of in-patient hospital admissions in the first year.⁵

Hospitalization rates for ambulatory care sensitive conditions have fallen over time. While the reasons for this decline are unclear, there have been a number of improvements to primary care. All Provinces and Territories are implementing initiatives designed to enhance primary health care access and quality through increased physician supply, improved coordination and continuity of care, or setting standards for treatment of major chronic diseases. To help manage chronic disease in Canada, primary health care initiatives have focussed on improving access to services, patient education, and implementing telehealth networks and interdisciplinary teams to facilitate patient follow-up and continuity of care. Examples include Primary Care Networks in Alberta, Family Health Teams in Ontario, and Community Health Centres across the country, to name a few.^{6,7,8}

While the quality of primary health care is important, a number of other factors may also play a role in the hospitalization rate for ambulatory care sensitive conditions. This includes the severity of a patient's disease, the number of other diseases present, socio-economic status, and patient lifestyle and willingness to seek care.

Optimizing the management and treatment of ambulatory care sensitive conditions will contribute to both improved patient health outcomes and more efficient resource utilization.⁹

Benefits of primary care and chronic disease management

- Improved patient health
- Patients can stay home instead of in the hospital
- Decreased risks of hospital-acquired infections (e.g., nosocomial infections)
- Better overall community health status
- Decreased health care costs

Impact of unnecessary hospitalization

- Increased wait times in hospital emergency rooms for everyone
- Increased risks of hospital-acquired infections (e.g., nosocomial infections)
- Hospital beds that could be used for more critical cases are not available
- Increased costs to the health care system

Things you can do to prevent hospitalization for ACSC

- Talk to your health care provider about any routine or on-going care that will help you in the management of your health and about the health care services and/or resources available in your community

References

- ¹ Canadian Institute for Health Information. (2008). *Health Indicators 2008*. Available from: https://secure.cihi.ca/free_products/HealthIndicators2008_ENGweb.pdf.
- ² Roos, L.L., Walld, R., Uhanova, J., Bond, R. (2005). Physician visits, hospitalizations, and socioeconomic status: ambulatory care sensitive conditions in a Canadian setting. *Health Research and Educational Trust*. 40(4): 1167-1185. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/j.1475-6773.2005.00407.x/pdf>.
- ³ Agabiti, N., Pirani, M., Schifano, P., Cesaroni, G., Davoli, M., Bisanti, L., Caranci, N., Costa, G., Forastiere, F., Marinacci, M., Russo, A., Spadea, T., Perucci, C.A., and Italian Study Group on Inequalities in Health Care. (2009). Income level and chronic ambulatory care sensitive conditions in adults: a multicity population-based study in Italy. *BioMed Central Public Health*. 9: 457-464.
- ⁴ Levinton, C., Lacroix, J., Choi, L., Tallentire, M., Paul, J. (2006). Ambulatory care sensitive conditions technical summary. Hospital Report 2006: Acute Care. *Canadian Institute for Health Information*. Available from: <http://www.canadianopenlibrary.ca/SwfDocs/204/204559.pdf>.
- ⁵ Health Council of Canada. (2009). *Getting it right: case studies of effective management of chronic disease using primary health care teams*. Available from: http://www.healthcouncilcanada.ca/rpt_det.php?id=164.
- ⁶ Alberta Health. (2012). *Primary Care Network (PCN)*. Available from: <http://www.health.alberta.ca/services/primary-care-networks.html>.
- ⁷ Ontario Ministry of Health and Long-Term Care. (2012). *Family Health Teams*. Available from: <http://www.health.gov.on.ca/en/pro/programs/fht/>.
- ⁸ Canadian Association of Community Health Centres. (2012). Available from: <http://www.cachc.ca/>.
- ⁹ Statistics Canada. (2004). *Primary Health Care – Hospitalization rate for ambulatory care sensitive conditions*. Available from: <http://www.statcan.gc.ca/pub/82-401-x/2002000/considerations/pc/4064257-eng.htm>.

12. READMISSION RATE FOR ACUTE MYOCARDIAL INFARCTION (AMI)

Key Messages

- Examining hospital readmission rates for selected conditions is one way of measuring the quality and efficiency of acute care
- Multifaceted interventions provided in the community by different health care professionals have been shown to decrease the readmission rate for AMI
- Readmission rate for AMI is decreasing

What does this indicator measure?

This indicator measures the risk-adjusted rate of unplanned readmission following discharge for AMI. A case is counted as a readmission if it is for a relevant diagnosis and occurs within 28 days after the index (or first) episode of care. An episode of care refers to all contiguous acute care hospitalizations and same-day surgery visits.

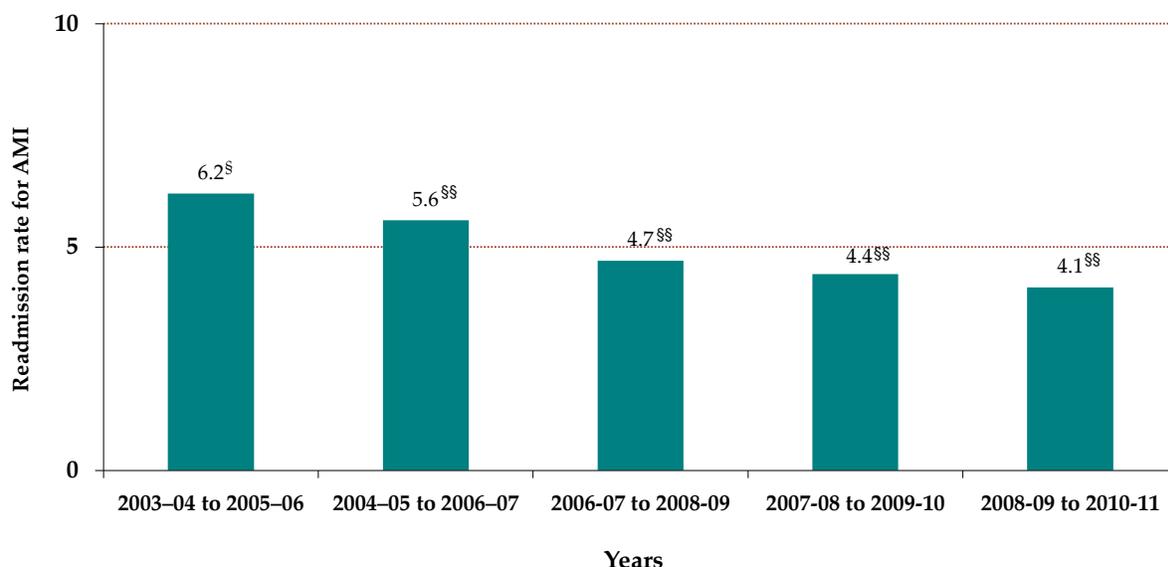
What are the limitations of this indicator?

From 2003–04 to 2005–06, case selection criteria were revised to account for the fact that an increasing number of AMI patients were undergoing revascularization procedures (e.g., percutaneous coronary intervention or coronary artery bypass) at their initial admission. In the case of revascularization procedures, AMI diagnosis may not have been documented as the reason for the hospital admission.

Readmission rate for AMI is decreasing

Readmission rate for AMI for 2008-09 to 2010-11 was 4.1% (each point is an average covering a three-year period). This is a decrease from 4.4% in 2007-08 to 2009-10, and from 6.2% in 2003-04 to 2005-06.

Figure 12 Readmission Rate for Acute Myocardial Infarction (AMI)
Both sexes, Canada,^{§, §§} 2003-04 to 2010-11



Sources: Canadian Institute for Health Information. Discharge Abstract Database; National Ambulatory Care Reporting System. Alberta Ambulatory Care Database, Alberta Health and Wellness.

Notes: [§] Due to differences in collection, Quebec and Manitoba data are not included in the 2003-04 to 2005-06 average.

^{§§} Due to differences in collection, Quebec data are not included in the 2004-05 to 2006-07, 2006-07 to 2008-09, 2007-08 to 2009-10, and 2008-09 to 2010-11 averages.

For additional exclusions/limitations, see Annex 2.

What these results mean for you

A low readmission rate after hospital discharge is increasingly being viewed as an indicator of quality and efficiency of care.¹ Factors that can influence readmission include: errors related to the medication that is prescribed when an individual is initially discharged from the hospital (such as dosage or type of medication); patient compliance with post-discharge therapy (e.g., medication); the availability and quality of follow-up care in the community; and the quality and completeness of care during initial hospitalization.² Some of these factors are directly related to care at the hospital while others relate to the availability of appropriate services in the community.

Several studies have shown the effectiveness of various quality improvement interventions, such as pairing patients with peer advisors after discharge,³ disease management programs administered by home health nurses,⁴ and enrolment in cardiac rehabilitation programs,^{5,6} all of which can be used to reduce the risk of readmission and improve outcomes for patients with AMI. These examples suggest

that readmission rates can be reduced after hospitalization for AMI, in many cases by having health care providers in hospitals connect patients with appropriate community services after discharge.⁷

Although readmission for medical conditions can involve factors outside the direct control of the hospital, high rates of readmission act as a signal for hospitals to look more carefully at their practices, including the risk of discharging patients too early and the relationship with community physicians and community-based care.²

Benefits of not being readmitted to hospital following AMI

- Patients are followed up in the community instead of in the hospital
- Increased knowledge and management of risk factors for the patient
- Patient is more in control of his/her health
- Lower cost to the health care system

Risks associated with AMI

- Smoking
- Physical inactivity
- Diet high in saturated and trans fats
- Diet high in sodium
- High blood cholesterol
- High blood pressure
- Obesity
- Diabetes
- Excessive alcohol drinking
- Stress
- A family history of heart disease

Things you can do to prevent readmission for AMI

Talk to your health care provider about the following:

- Lifestyle modification and/or treatment of risk factors
- Enrollment in cardiac rehabilitation programs
- Pairing with a peer advisor after discharge to promote active participation in cardiac rehabilitation programs
- Discussing disease management programs available within your community

References

¹ Desai, M.M., Stauffer, B.D., Feringa, H.H.H., Schreiner, G.C. (2009). Statistical models and patients predictors of readmission for acute myocardial infarction. *Circulation: Cardiovascular Quality and Outcomes*. 2: 500-507. Available from: <http://circoutcomes.ahajournals.org/cgi/content/full/2/5/500-R2-832949>.

- ² Canadian Institute for Health Information. (2010). *Health Indicators 2010: Definitions. Data Sources and Rationale* (Ottawa, Ont.: CIHI, 2010). Available from: http://www.cihi.ca/CIHI-external/pdf/internet/DEFINITIONS_052010_EN.
- ³ Carroll, D.L., Rankin, S.H., Cooper, B.A. (2007). The effects of a collaborative peer advisor/advanced practice nurse intervention: cardiac rehabilitation participation and rehospitalization in older adults after a cardiac event. *Journal of Cardiovascular Nursing*. 22: 313-319.
- ⁴ Young, W., Rewa, G., Goodman, S.G., Jaglal, S.B., Cash, L., Lefkowitz, C., Coyte, P.C. (2003). Evaluation of a community-based inner-city disease management program for postmyocardial infarction patients: a randomized controlled trial. *Canadian Medical Association Journal*. 169: 905-910. Available from: <http://www.cmaj.ca/content/169/9/905.full.pdf+html>.
- ⁵ Ades, P.A., Huang, D., Weaver, S.O. (1992). Cardiac rehabilitation participation predicts lower rehospitalization costs. *American Heart Journal*. 123: 916-921.
- ⁶ Bondestam, E., Breikss, A., Hartford, M. (1995). Effects of early rehabilitation on consumption of medical care during the first year after acute myocardial infarction in patients ≥ 65 years of age. *American Journal of Cardiology*. 75: 767-771. Available from: <http://www.sciencedirect.com/science/article/pii/S0002914999804081>.
- ⁷ Ades, P.A., Pashkow, F.J., Nestor, J.R. (1997). Cost-effectiveness of cardiac rehabilitation after myocardial infarction. *Journal of Cardiopulmonary Rehabilitation*. 17(4): 222-231.

THEME – SUSTAINABILITY OF THE HEALTH CARE SYSTEM

13. NUMBER OF FAMILY PHYSICIANS
14. NUMBER OF SPECIALIST PHYSICIANS
15. NUMBER OF REGISTERED NURSES
16. NUMBER OF LICENSED PRACTICAL NURSES

Key Messages

- The supply, distribution and mix of family and specialist physicians and nurses affect the health care available to (and therefore the health status of) a population
- The number of family and specialist physicians has increased during the period 2000 to 2011
- The number of registered nurses and licensed practical nurses in the workforce has increased respectively by 4.9% and 21.2% between 2007 and 2011
- The average age of family and specialist physicians is on the rise
- The average age of registered nurses is stable since 2007, but the average age of licensed practical nurses has decreased by one year from 2007 to 2011
- Strategies are in place to address health human resource issues in Canada

What do these indicators measure?

These indicators measure the number of family physicians/doctors (family medicine and emergency medicine specialists) and specialist physicians (medical, surgical and laboratory specialists), as well as the number of registered nurses and licensed practical nurses, who were active on December 31 of the reference year, per 100,000 population.

There are three regulated nursing professions in Canada: registered nurses (includes nurse practitioners), licensed practical nurses (the title in Ontario is registered practical nurses) and registered psychiatric nurses. Registered psychiatric nurses (total workforce of 5,261 in 2011) are regulated and employed in only five jurisdictions—Manitoba, Saskatchewan, Alberta, British Columbia and Yukon. Therefore, the indicator on nurses nationally includes only the registered nurses and licensed practical nurses. There were 360,572 regulated nurses working in nursing in Canada in 2011 proportionately broken down as follows between the 3 categories: 75.1% of registered nurses, 23.5% of licensed practical nurses and 1.5% of registered psychiatric nurses.

Nurse practitioners are a regulated subset of registered nurses who have additional educational preparation and experience. They are registered in all provinces and territories, with the exception of Yukon where the regulation is pending. The number of nurse practitioners in the workforce has doubled from 1,344 in 2007 to 2,777 in 2011.¹

What are the limitations of these indicators?

Due to differences in data collection, processing and reporting methodology, CIHI data may differ from that originating from provinces and territories. Readers are cautioned to avoid inferences regarding the adequacy of provider resources based on supply ratios alone.

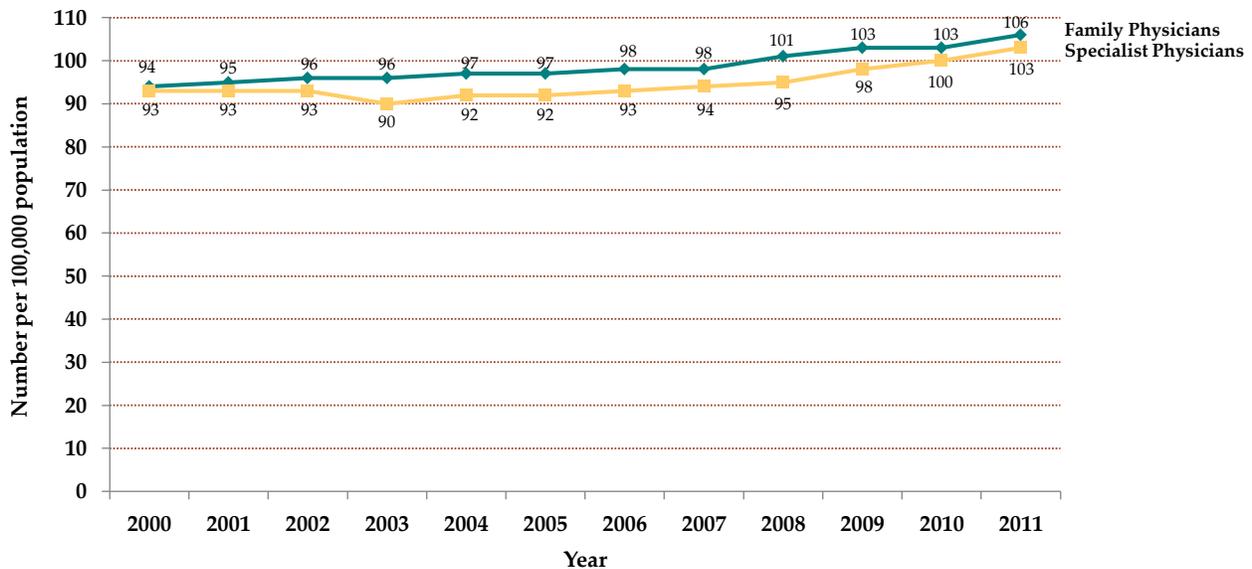
Data for the Organisation for Economic Co-operation and Development (OECD) may differ from Canadian data on the same indicators shown here because the original data source may have undergone a periodic revision or reference years may differ according to the country. Therefore, data are not directly comparable between Canadian and international graphs.

See Annex 2 for additional information.

The number of family and specialist physicians and nurses is on the rise

Relative to 2000, more family and specialist physicians were practicing in Canada in 2011 (106 and 103 per 100,000 population, respectively). A similar trend is seen in nursing with more registered nurses and licensed practical nurses practicing in Canada (785 registered nurses and 246 licensed practical nurses per 100,000 population, respectively). According to CIHI, the number of registered nurses in the workplace has increased by close to 4.9% between 2007 and 2011.¹ However, the ratio of registered nurses of the early 1990s (824 registered nurses per 100,000 population) has not been reached yet. On the other hand, the number of licensed practical nurses has gone up by 21.2% between 2007 and 2011.

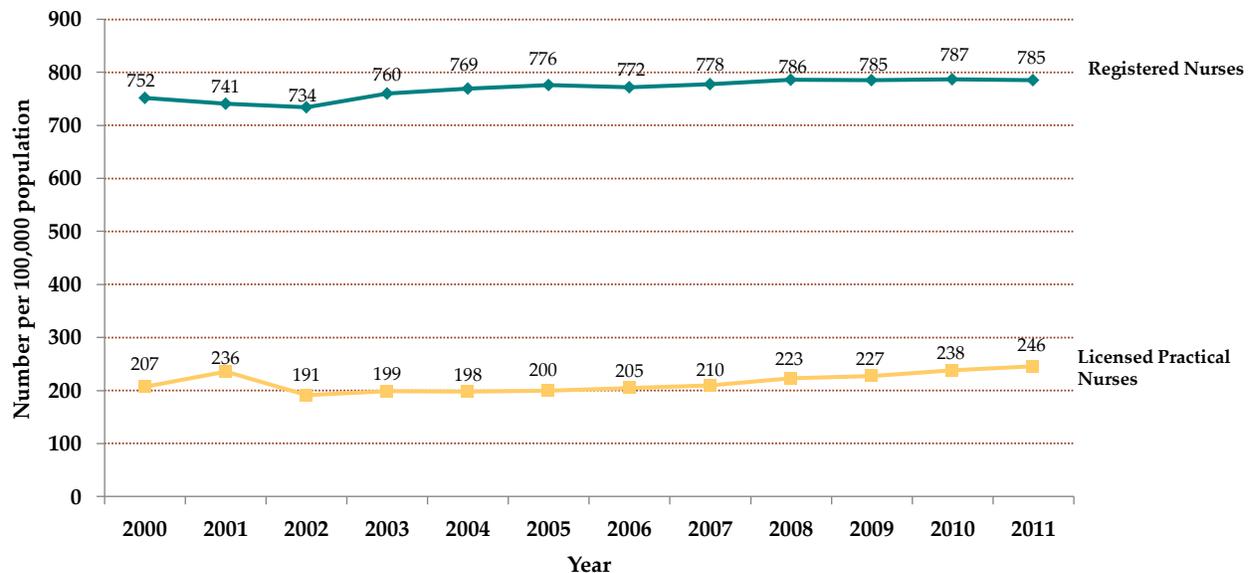
Figure 13 Number of Family and Specialist Physicians Per 100,000 population, Canada, 2000-11



Source: Canadian Institute for Health Information. Scott’s Medical Database.

Notes: Non-certified specialists are counted as family medicine physicians for all jurisdictions except, as of 2004, Newfoundland and Labrador and Saskatchewan and, as of 2007, Nova Scotia, New Brunswick and Yukon, where they are counted as specialists.
For additional exclusions/limitations, see Annex 2.

Figure 14 Number of Active-Practising Registered Nurses and Licensed Practical Nurses Per 100,000 population, Canada, 2000-11



Sources: Canadian Institute for Health Information. *Health Indicators 2002-12* and *Regulated Nurses: Canadian Trends, 2007 to 2011*.

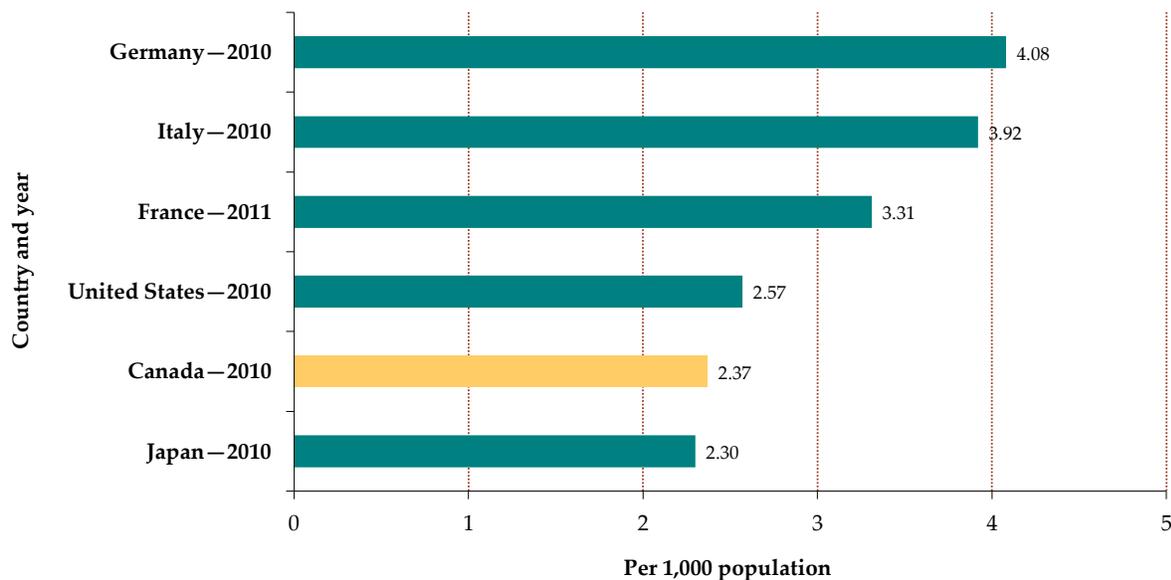
Notes: Because confidence intervals were not available for nurses, the analysis on this professional group does not refer to statistical significance.

For additional exclusions/limitations, see Annex 2.

Canada has less active physicians than most other G7 countries, but is in the average for active nurses

Internationally, in 2010 with respect to physicians, Canada ranked fifth of the six G7 countries for which data were available, with 2.37 professionally active physicians per 1,000 population. Regarding nurses, Canada ranked third of the five G7 countries for which the latest data were available, with 10.40 professionally active nurses per 1,000 population.

Figure 15 Professionally Active Physicians
Per 1,000 population, selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

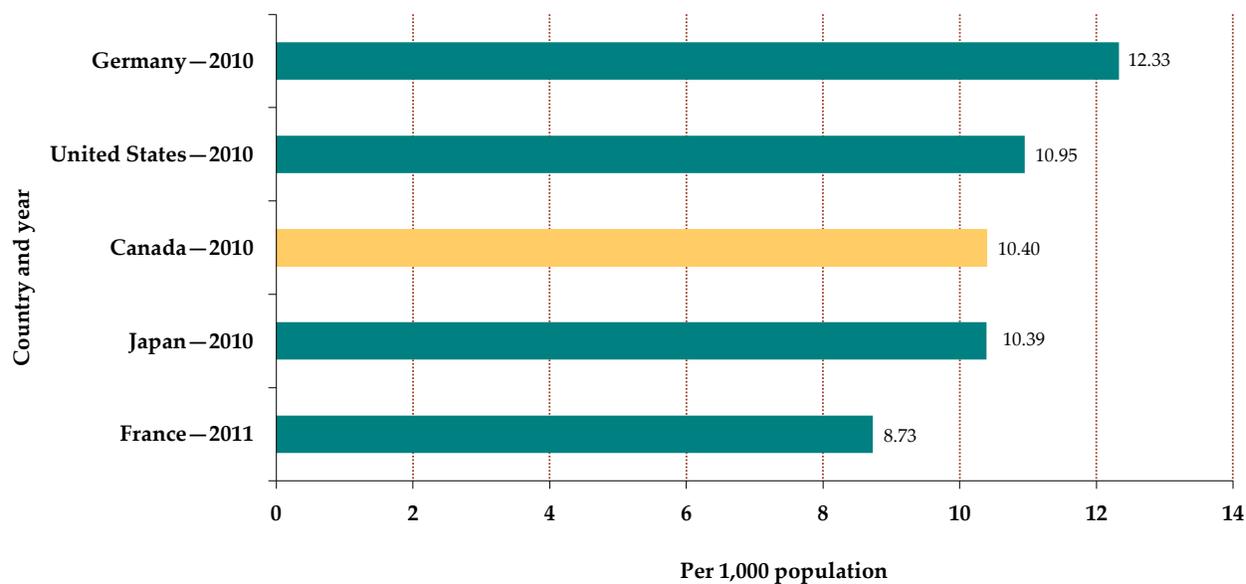
Notes: Data were not available for the United Kingdom.

Canadian data shown in this OECD graph are not comparable to Canadian data on similar indicators shown elsewhere in *Healthy Canadians 2012* because the original data source may have undergone a periodic revision.

Includes physicians who have contact with patients, plus managers, professors, researchers, etc.

For additional exclusions/limitations, see Annex 2.

Figure 16 Professionally Active Nurses
Per 1,000 population, selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

Notes: Data were not available for Italy and the United Kingdom.

Includes professional nurses, associate professional nurses, nurses providing services directly to patients, nurses working in administration, management, research and in other posts excluding direct contact with patients.

Canadian data shown in this OECD graph are not comparable to Canadian data on similar indicators shown elsewhere in *Healthy Canadians 2012* because the original data source may have undergone a periodic revision.

For additional exclusions/limitations, see Annex 2.

What these results mean for you

The supply, distribution and mix of health human resources have an important impact on the health of a population. Indeed, the largely knowledge-based nature of these resources makes it possible to dispense needed services to individuals and communities in a timely, cost-effective manner.² This, in turn, has a very real impact on health outcomes.³ Therefore, to help improve the health status of individuals and communities, decision-makers must understand their health needs and tailor health human resource supplies and their distribution efficiently.

According to CIHI, the demographic profile of physicians has been changing.⁴ In fact, in 2011, the average age of family and specialist physicians combined was 50.5 years, which is a slight increase from 50.0 in 2010. Moreover, the number of male physicians increased by 9.4% between 2007 and 2011, while the number of female physicians increased by 22.6%. Also in 2011, 36.5% of the physician workforce was composed of females, up from 33.9% in 2007.

Regarding nurses, the demographic profile of the workforce has been varying very slightly.¹ In 2011, the average age of registered nurses was 45.3 years, slightly up from 45.0 years in 2007. However, the average age of licensed practical nurses was 42.9 years in 2011, a decrease of one year since 2007. In 2011, 92.9% of the workforce of registered nurses and licensed practical nurses were females, which is a consistent demographic trend.

The Health Human Resource Strategy, developed out of the 2003 and 2004 Health Accords, supports a range of innovation projects undertaken with interested jurisdictions and stakeholders. These projects are intended to increase health human resources planning capacity and optimize the delivery of health care services to better meet population health needs.

Nursing policy issues are addressed at Health Canada, through the Nursing Policy Unit, Health Human Resources Policy Division of the Strategic Policy Branch within the Department. For example, the work of this Unit focuses on what needs to occur in the nursing workforce to ensure that all Canadians have access to health services when and where they need them.

Supplementary information on the supply of physicians and nurses in Canada

- Consult CIHI's documents for more information on the supply of [physicians](#) and [nurses](#) in Canada
- [Government of Canada's Health Human Resources Strategy](#)

References

- ¹ Canadian Institute for Health Information. (2012). *Regulated Nurses: Canadian Trends, 2007 to 2011*. Available from: https://secure.cihi.ca/free_products/Regulated_Nurses_EN.pdf.
- ² Dussault, G., Dubois, C.A. (2003). Human resources for health policies: a critical component in health policies. *Human Resources for Health*. 1: 1. Available from: <http://www.human-resources-health.com/content/pdf/1478-4491-1-1.pdf>.
- ³ Anand, S., Bärnighausen, T. (2004). Human resources and health outcomes: cross-country econometric study. *The Lancet*. 364: 1603-1609. Available from: <http://www.sciencedirect.com/science/article/pii/S0140673604173133>.

⁴ Canadian Institute for Health Information. (2012). *Supply, Distribution and Migration of Canadian Physicians, 2011*. Available from: <https://secure.cihi.ca/estore/productFamily.htm?locale=en&pf=PFC1968>.

- 17. NUMBER OF MAGNETIC RESONANCE IMAGING (MRI) SCANNERS
- 18. NUMBER OF MAGNETIC RESONANCE IMAGING (MRI) TESTS
- 19. NUMBER OF COMPUTED TOMOGRAPHY (CT) SCANNERS
- 20. NUMBER OF COMPUTED TOMOGRAPHY (CT) TESTS

Key messages

- Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) Scanners are important diagnostic tools that help identify diseases and other health problems
- In 2012, 8.9 MRI scanners and 14.7 CT scanners per million population were operational in Canada, an increase from 4.7 MRI scanners and 10.3 CT scanners per million population in 2003

What do these indicators measure?

These indicators measure the number of MRI and CT scanners, respectively, and the number of MRI and CT tests, respectively.

An **MRI scan** is a pain-free, non-invasive test that uses a magnetic field and radio waves to generate three dimensional images of the body. Using these images, a doctor can identify abnormalities from a computer screen.

A **CT scan** is a pain-free, non-invasive test that uses X-rays to generate three dimensional images of the body. Using these images, a doctor can identify abnormalities from a computer screen.

MRI OR CT SCAN?

The decision as to which scanner is the best tool to diagnose a health condition depends, in part, on available resources (e.g., availability of scanners and the technicians needed to use them), the type of condition the physician thinks you may have and which type of tissue or structure may be affected. MRI scans are known to provide more detail. CT scans are better at scanning bone or “hard” tissue while MRI scans are better for “soft” tissue. The MRI cannot be used if patients have metal in their body.

What are the limitations of these indicators?

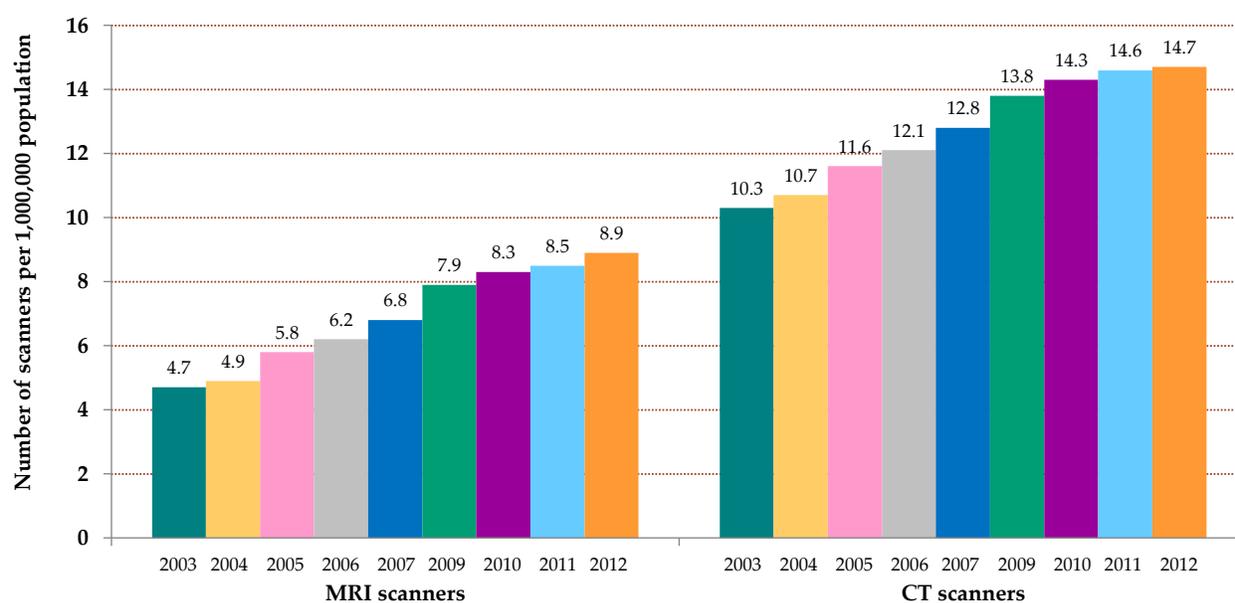
According to the Canadian Institute of Health Information (CIHI), wide variation exists across Canada in terms of the use of these machines.¹

Data for the Organisation for Economic Co-operation and Development (OECD) may differ from Canadian data on the same indicators shown here because the original data source may have undergone a periodic revision or reference years may differ according to the country. Therefore, data are not directly comparable between Canadian and international graphs.

The number of MRI and CT scanners continues to rise in Canada

In 2012, 8.9 MRI and 14.7 CT scanners per 1,000,000 population, respectively, were available in Canada, which are increases from 4.7 MRI and 10.3 CT scanners per 1,000,000 population in 2003, and 8.5 MRI and 14.6 CT scanners per 1,000,000 population in 2011.

Figure 17 Number of Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) Scanners, per 1,000,000 population Canada, 2003-12



Source: Canadian Institute for Health Information. National Survey of Selected Medical Imaging Equipment.

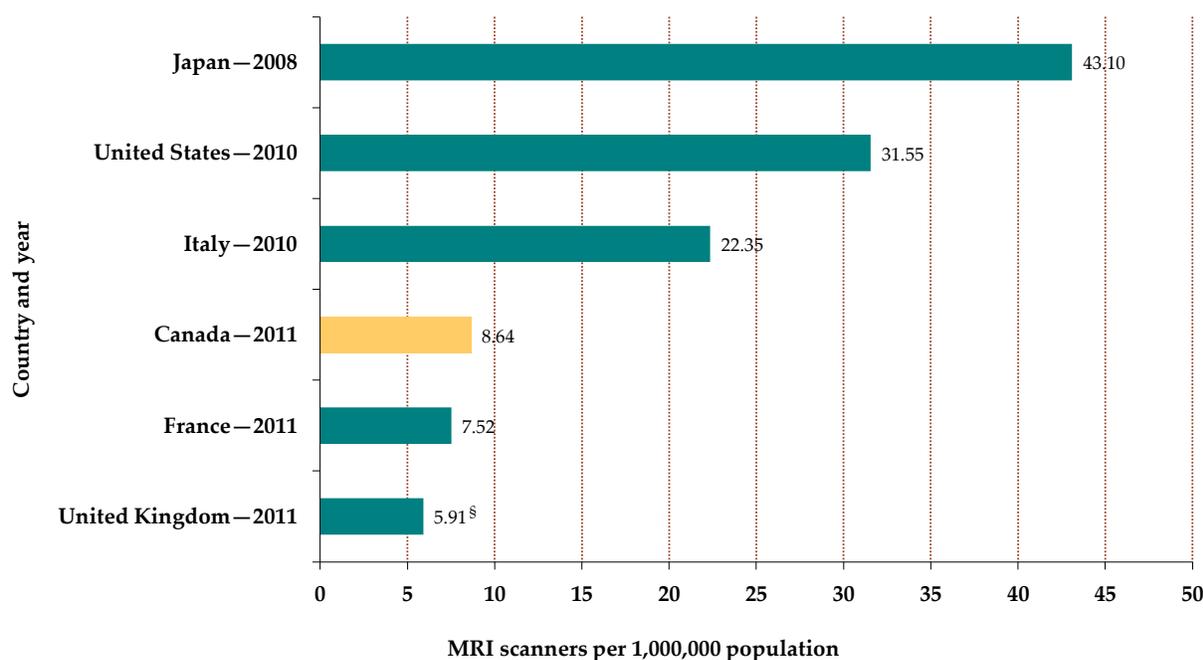
Notes: Data for 2008 were not available.

For additional exclusions/limitations, see Annex 2.

Canada ranks fourth out of six G7 countries in number of MRI and CT scanners, but wide variation exists across countries

Internationally, in 2011 Canada ranked fourth of the six G7 countries for which data were available, with 8.64 MRI scanners per 1,000,000 population, and 14.98 CT scanners per 1,000,000 population. A large degree of variation exists across OECD countries in the number of MRI and CT scanners that are available.

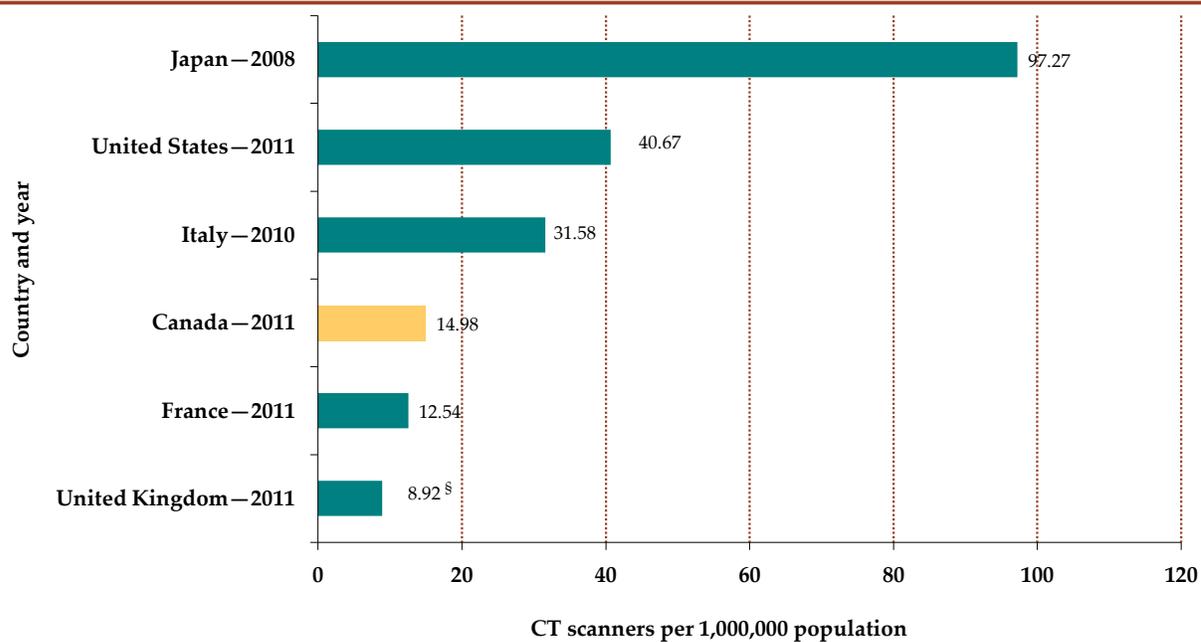
Figure 18 Number of Magnetic Resonance Imaging (MRI) units per 1,000,000 population Selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

Notes: [§]Data for the United Kingdom are an estimate.
 Data were not available for Germany.
 For additional exclusions/limitations, see Annex 2.

Figure 19 Number of Computed Tomography (CT) Scanners per 1,000,000 population
Selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

Notes: [§]Data for the United Kingdom are an estimate.

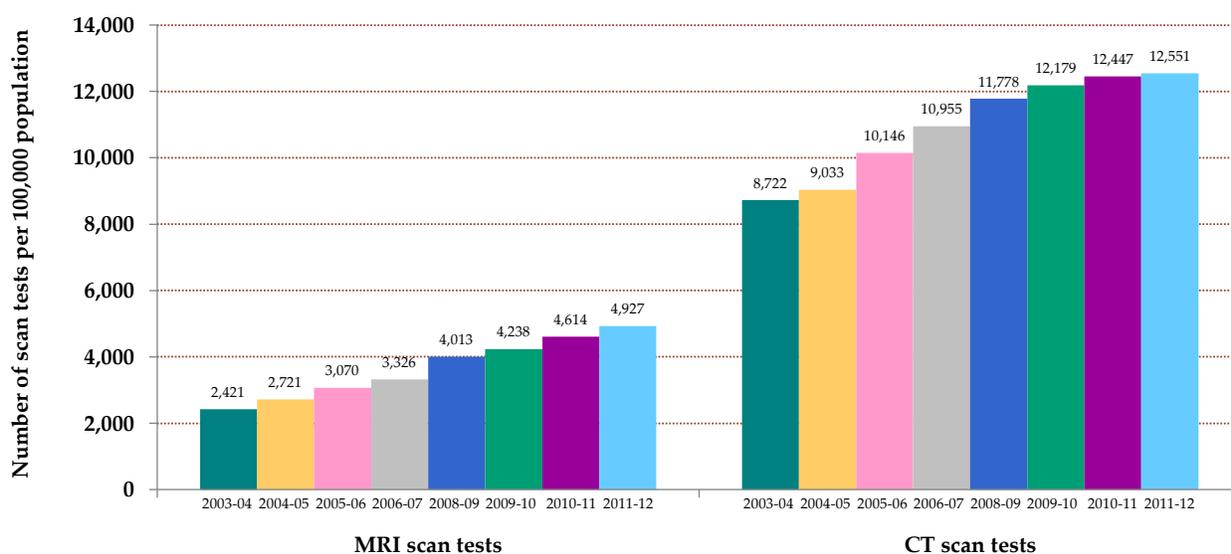
Data were not available for Germany.

For additional exclusions/limitations, see Annex 2.

The number of MRI and CT scan tests continues to rise in Canada

In 2011-12, 4,927 MRI tests per 100,000 population were done in Canada, which is an increase from 2,421 MRI tests per 100,000 population done in 2003-04 and 4,614 tests per 100,000 population done in 2010-11. In 2011-12, 12,551 CT scan tests per 100,000 population were done in Canada, an increase from 8,722 CT scan tests per 100,000 population done in 2003-04 and 12,447 CT scan tests per 100,000 population done in 2010-2011.

Figure 20 Number of Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) Scan Tests, per 100,000 population Canada, 2003-04 to 2011-12



Source: Canadian Institute for Health Information. National Survey of Selected Medical Imaging Equipment.

Notes: In each year, exams failed to be reported for a number of MRI and CT scanners. Exams for these scanners were imputed by CIHI according to a single method for the years 2003-04 to 2006-07, but a different method for 2008-09 resulting in a break in series. Therefore, the number of exams in 2008-09 is not strictly comparable to the numbers for the preceding years.

For additional exclusions/limitations, see Annex 2.

What these results mean for you

While physicians can diagnose many conditions by undertaking a clinical examination of the patient, they often require more sophisticated technologies to improve upon their diagnostic skills, thus benefiting the patient. Devices such as MRI and CT scanners are important tools that help identify diseases and other health problems. Moreover, as the population ages, these technologies will certainly become more in demand.² Although both are useful to diagnose a range of conditions, each has strengths and weaknesses.

Research suggests that, relative to other technologies, MRI machines can more accurately identify conditions such as brain haemorrhage or ischemia,³ fractures,⁴ or some gastrointestinal tumours (e.g., assessments of liver metastases).⁵

CT scanners have plenty of uses as well. For example, they outperform ordinary x-rays when screening patients at very high risk of cervical spine injury,⁶ have been shown to be highly sensitive in their ability to rule out significant coronary artery disease in the assessment of chest pain,⁷ or, compared to the MRI, can more accurately identify certain gastrointestinal tumours (e.g., assessments of mesenteric metastases).⁶

These devices do have some risks associated with them.⁸ For example, MRIs can exert unwanted forces on metallic implants (e.g., pacemakers, metal pins or clips), so patients with implants and metal are generally not accepted as candidates. These objects may also cause burns. In addition, an MRI's magnetic field can magnetize nearby objects which can then become dangerous projectiles in an examination room. MRI scanners are also very noisy and can restrict the movement of the patient. As a result, these devices can sometimes evoke claustrophobia or anxiety.⁹ Still, MRI machines are generally safe for patients with no metal in their body.

Meanwhile, CT scanners expose you to levels of radiation that are 100 to 500 times¹⁰ as those of a routine chest X-ray. At very high doses, radiation is known to increase the risk of developing radiation-induced cancer. The benefits of each CT exam should be weighed against its risks and discussed with your doctor.

MRI and CT scans may require the use of contrast agents, which are solutions that the patient receives orally or by injection, in order to enhance the contrast of the image. These agents may have side effects ranging from the benign (such as the after-taste they may leave behind) to the more serious (such as Nephrogenic Systemic Fibrosis), although serious effects are rarely encountered in a typical health care practice.^{11, 12, 13}

There is no consensus on the ideal number of MRI or CT scanners or volume of exams is for a population. There is an increase in research examining the 'appropriateness' of tests for a given situation, meaning the test is cost-effective and its benefit outweighs potential harm. The Canadian Association of Radiologists found that as many as 30% of imaging studies are inappropriate or contribute no useful information, which wastes resources, increases wait times and may negatively impact quality of care.¹⁴ This is why there is an increasing focus on ensuring the right test is done at the right time, leading to more efficient and effective use of both imaging equipment and health human resources, and to increased patient safety by, for example, reducing exposure to unnecessary radiation.¹⁵

Benefits of undergoing MRI or CT scans

- Improved localization of possible medical conditions or treatment needs
- Improved image quality compared to some other image modalities
- Availability of multiple views and, in some cases, 3D representation of anatomy
- Non-invasive procedure
- Possible improvement or confirmation of diagnosis

Risks of not having a required MRI or CT diagnostic exam

- Poor diagnostic information available to determine treatment options
- Increased morbidity
- Death

Things you can do to be better informed about MRI and CT scanners

- Always ask your health care provider if the exam is necessary and if the benefit outweighs the known risks (such as high radiation dosages)
- More information on MRI and CT scanners is available on [Health Canada's website](#)

References

- ¹ Canadian Institute for Health Information. (2010). *Use of MRI and CT exams varies greatly among provinces*. Available from: http://www.cihi.ca/CIHI-ext-portal/internet/en/document/types+of+care/specialized+services/medical+imaging/release_22jul2010.
- ² Wang, L., Nie, J.X., Tracy, S., Moineddin, R., Upshur, R.E.G. (2008). Utilization patterns of diagnostic imaging across the late life course: a population-based study in Ontario, Canada. *International Journal of Technology Assessment in Health Care*. 24(4): 384-390. Available from: <http://journals.cambridge.org/action/displayFulltext?type=6&fid=2347084&jid=THC&volumeId=24&tissueId=04&aid=2347080&fulltextType=RA&fileId=S0266462308080501>.
- ³ Kidwell, C.S., Chalela, J.A., Saver, J.L., Starkman, S., Hill, M.D., Demchuk, A.M., Butman, J.A., Patronas, N., Alger, J.R., Latour, L.L., Luby, M.L., Baird, A.E., Leary, M.C., Tremwel, M., Ovbiagele, B., Fredieu, A., Suzuki, S., Villablanca, J.P., Davis, S., Dunn, B., Todd, J.W., Ezzeddine, M.A., Haymore, J., Lynch, J.K., Davis, L., Warach, S. (2004). Comparison of MRI and CT for detection of acute intracerebral hemorrhage. *Journal of the American Medical Association*. 292(15): 1823-1830. Available from: <http://jama.jamanetwork.com/article.aspx?articleid=199622>.
- ⁴ Brydie, A. (2003). Early MRI in the management of clinical scaphoid fracture. *The British Journal of Radiology*. 76: 296-300. Available from: <http://bjr.birjournals.org/content/76/905/296.full.pdf+html>.
- ⁵ Sandrasegaran, K., Rajesh, A., Rushing, D.A., Rydberg, J., Akisik, F.M., Henley, J.D. (2005). Gastrointestinal stromal tumors: CT and MRI findings. *European Radiology*. 15: 1407-1414. Available from: <http://www.springerlink.com/content/r2682761v6033017/fulltext.pdf>.
- ⁶ Holmes, J.F., Akkinepalli, R. (2005). Computed tomography versus plain radiography to screen for cervical spine injury: a meta-analysis. *Journal of Trauma-Injury Infection and Critical Care*. 58(5): 902-905.
- ⁷ Mowatt, G., Cook, J.A., Hillis, G.S., Walker, S., Fraser, C., Jia, X., Waugh, N. (2008). 64-slice computed tomography angiography in the diagnosis and assessment of coronary artery disease: systematic review and meta-analysis. *Heart*. 94(11): 1386-1393.
- ⁸ Health Canada. (2003). Whole body screening using MRI or CT technology. *It's Your Health*. Available from: http://www.hc-sc.gc.ca/hl-vs/alt_formats/pacrb-dgapcr/pdf/iyh-vsv/med/mri-irm-eng.pdf.
- ⁹ Murphy, K.J., Brunberg, J.A. (1997). Adult claustrophobia, anxiety and sedation in MRI. *Magnetic Resonance Imaging*. 15(1): 51-54. Available from: <http://www.sciencedirect.com/science/article/pii/S0730725X96003517>.
- ¹⁰ National Council on Radiation Protection and Measurements. (2009). *Ionizing Radiation Exposure of the Population of the United States*. NCRP Report No. 160. Available from: http://www.ncrponline.org/PDFs/2012/DAS_DDM2_Athens_4-2012.pdf.

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- ¹¹ Lin, S.P., Brown, J.J. (2007). MR contrast agents: physical and pharmacologic basics. *Journal of Magnetic Resonance Imaging*. 25: 884-899. Available from: <http://onlinelibrary.wiley.com/doi/10.1002/jmri.20955/pdf>.
- ¹² Health Canada. (2007). *Association of gadolinium-containing contrast agents and Nephrogenic Systemic Fibrosis/Nephrogenic Fibrosing Dermopathy (NSF/NFD) – Notice to hospitals*. Available from: http://www.hc-sc.gc.ca/dhp-mps/medeff/advisories-avis/prof/_2007/gadolinium_nth-aah-eng.php.
- ¹³ Hill, B.C., Johnson, S.C., Owens, E.K., Gerber, J.L., Senagore, A.J. (2010). CT scan for suspected acute abdominal process: impact of combinations of IV, oral, and rectal contrast. *World Journal of Surgery*. 34: 699-703. Available from: <http://www.springerlink.com/content/9645u30468832602/fulltext.pdf>.
- ¹⁴ The Canadian Association of Radiologists. (2009). *Do you need that scan?* Ottawa: CAR. Available from: http://www.car.ca/uploads/news%20publications/car_cat_scan_eng.pdf.
- ¹⁵ Reed, M. (2010). Patient safety through medical imaging appropriateness. *Technology for Doctors, online*. November 11, 2010 issue. Available from: http://www.car.ca/uploads/news%20publications/safety_through_appropriateness_reprint259low.pdf.

THEME – HEALTH STATUS AND WELLNESS

21. POTENTIAL YEARS OF LIFE LOST DUE TO SUICIDE

22. POTENTIAL YEARS OF LIFE LOST DUE TO UNINTENTIONAL INJURY DEATHS

Key Messages

- Injuries are the leading cause of death of children, youth and young adults in Canada
- Many injuries are preventable
- Potential years of life lost due to injury death and suicide are greater among those in Inuit and First Nations communities compared to others in Canada

What do these indicators measure?

These indicators measure the number of potential years of life lost due to suicide or unintentional injury death when a person dies “prematurely,” which is defined as dying before age 75, per 100,000 population. For example, a death due to suicide or unintentional injury at age 25 represents a loss of 50 potential years of life.

For Registered Indians living on and off reserve, these indicators measure the number of potential years of life lost due to suicide and unintentional injury when a person dies “prematurely,” which in this case is defined as dying between the ages of 25 and 74 years, per 100,000 population.[§] Registered Indians are those registered under the *Indian Act*.

The indicators for Inuit Nunangat[‡] measure the number of potential years of life lost due to suicide or unintentional injury when a person dies “prematurely,” which is defined as dying before age 75, per 100,000 population.

In this report, children are defined as under the age of 12 years, youth are between the ages of 12 to 19 years, and young adults are aged between 20 and 29 years.

What are the limitations of these indicators?

Quality studies done on the certification have shown that approximately one third of certificates from the Vital Statistics – Death Database contain major errors, mainly due to the use of non-specific conditions and competing causes of death.¹ Misclassification of injuries by cause could also represent a limitation.² It is also important to remember that the actual number of suicides in Canada may be under-reported. A death is only certified as a suicide by medical and legal authorities when the victim’s intent is clearly proven.³

[§] Unlike for the general Canadian population, data for Registered Indians were available only for those dying between the ages of 25 and 74 years.

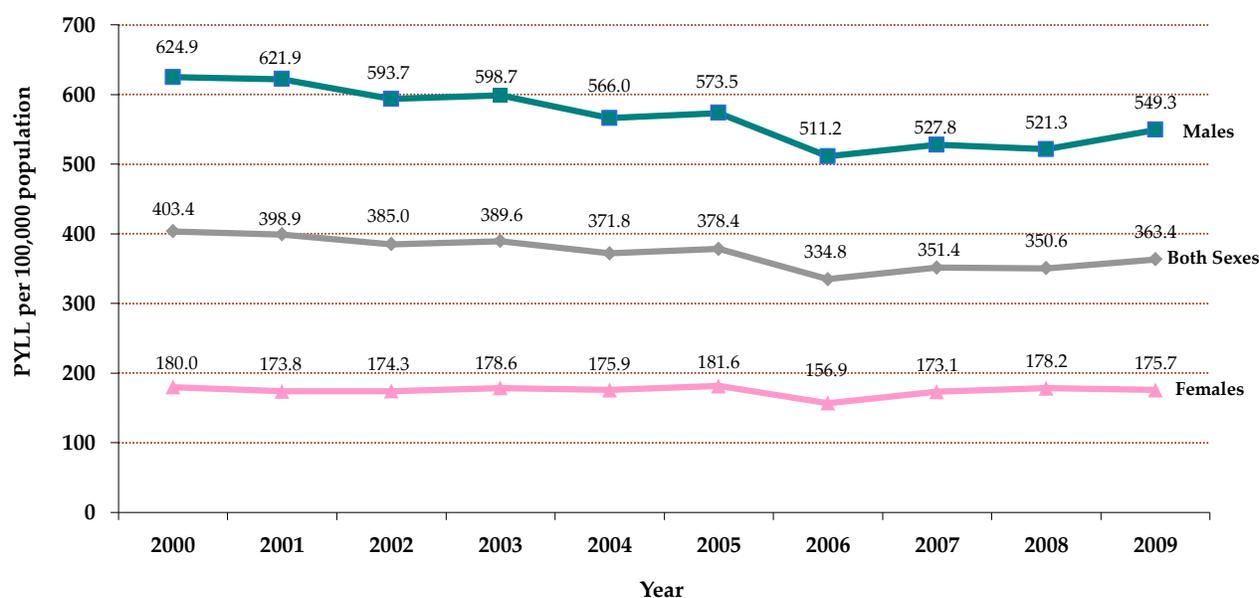
[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

While vital statistics data specific to Inuit are not consistently collected in administrative databases across the country, a method has been developed which allows the use of geographic identifiers to inform the health of Inuit in Canada. Because a high proportion of residents of Inuit Nunangat are Inuit (approximately 82%), health indicators for residents of Inuit Nunangat can serve as a proxy for Inuit-specific health indicators. It should be noted that because these data also include non-Inuit residents of these regions, who tend to have better health outcomes than the Inuit population living in the same area, caution should be used when interpreting these results. While this information is not Inuit-specific, it can be used to infer the health of Inuit in Canada.

Rates of potential years of life lost due to suicide are decreasing for males and both sexes combined since 2000

In 2009, the rate of potential years of life lost (PYLL) due to suicide in Canada was 363.4 years lost per 100,000 population. The rates of PYLL due to suicide for males and females were 549.3 years per 100,000 males and 175.7 years per 100,000 females, respectively. Rates of PYLL due to suicide have been decreasing for males and both sexes combined since 2000, although a small increase in the rates for both sexes and males are observed in the last year.

Figure 21 Potential Years of Life Lost (PYLL) due to Suicide Per 100,000 population aged 0-74 years, by sex, Canada, 2000-09



Sources: Statistics Canada. Vital Statistics — Death Database and Demography Division (population estimates).

Notes: PYLL is calculated for ages <75 years.

World Health Organization (WHO), International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), codes X60–X84, Y87.

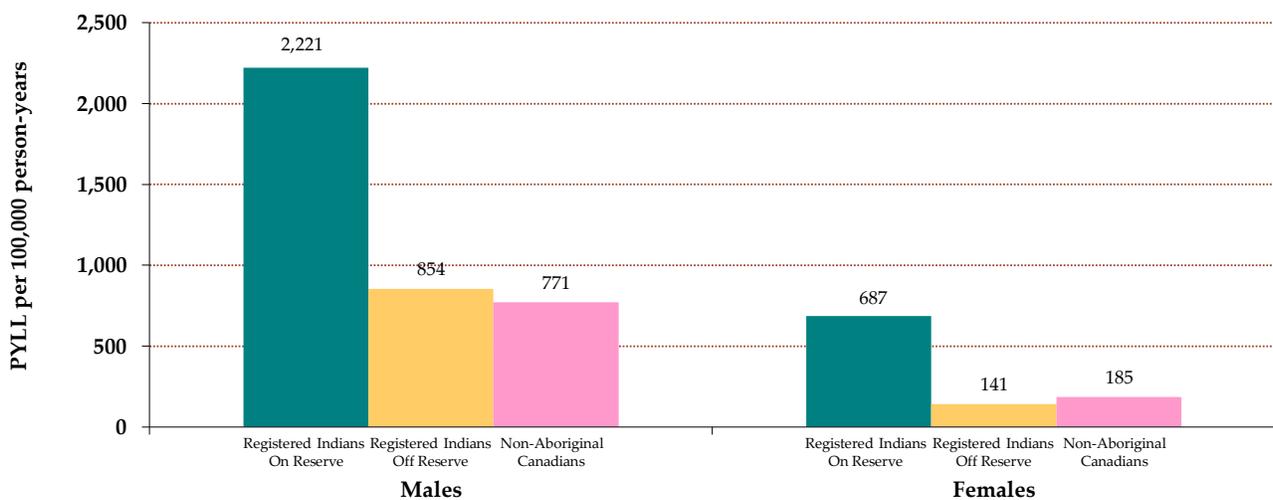
For additional exclusions/limitations, see Annex 2.

Rates of potential years of life lost due to suicide are much higher for Registered Indian men and women living in First Nations communities

For the 1991-2001 period, the rate of potential years of life lost due to suicide and self-inflicted injury death for Registered Indian men aged 25 to 74 years living in First Nations communities was almost 3 times the rate of for non-Aboriginal men (2,221 per 100,000 person-years compared to 771 per 100,000 person-years). For Registered Indian men living outside of First Nations communities, the rate was 854 per 100,000 person-years.

For Registered Indian women aged 25 to 74 years living in First Nations communities, the rate of potential years of life lost due to suicide and self-inflicted injury death was nearly four times the rate for non-Aboriginal women – 687 per 100,000 person-years compared with 185 per 100,000 person-years. The rate for Registered Indian women living outside of First Nations communities was 141 per 100,000 person-years.

Figure 22 Potential Years of Life Lost (PYLL) due to Suicide and Self-Inflicted Injury Death
 PYLL rate per 100,000 person-years at risk, aged 25-74 years, Registered Indians living on and off reserve, and non-Aboriginal Canadians, by sex, 1991-2001



Source: Statistics Canada. The Canadian census mortality follow-up study, 1991 through 2001.

Notes: PYLL is calculated for ages 25 through 74 years.

World Health Organization (WHO), International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), codes X60–X84, Y87.

Numbers and rates on this graph are based on the summation of data for five consecutive years of deaths.

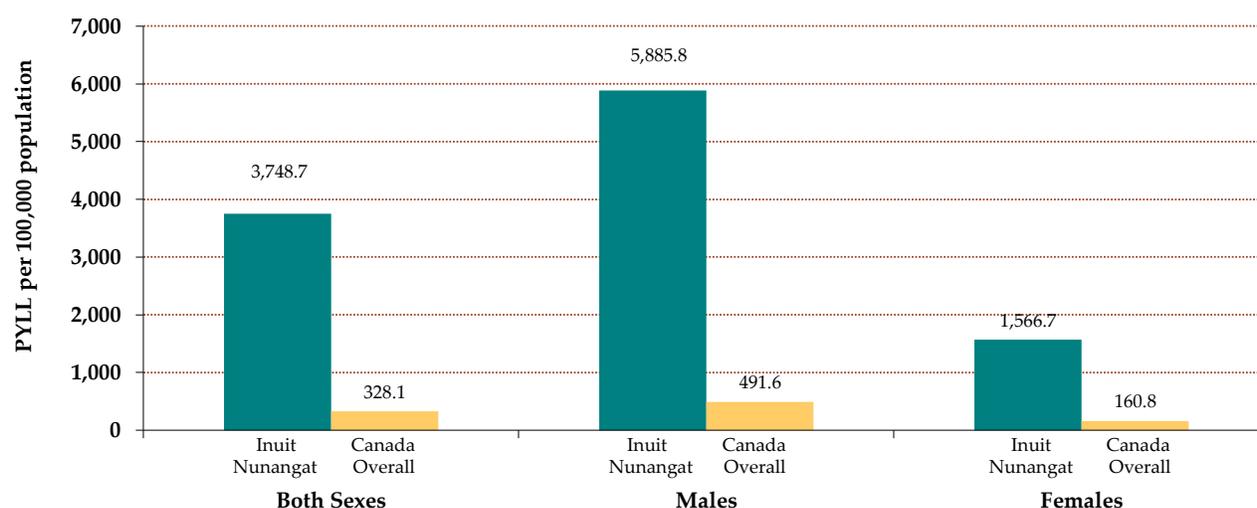
Age-standardized to the Aboriginal age distribution (five-year age groups).

For additional exclusions/limitations, see Annex 2.

Rates of potential years of life lost due to suicide much higher among residents of Inuit Nunangat[†]

In 2004/08, the rate of potential years of life lost due to suicide and self-inflicted injury death among residents of Inuit Nunangat was 3,748.7 years lost per 100,000 population. The rates of PYLL due to suicide and self-inflicted injury death for male and female residents of Inuit Nunangat were 5,885.8 years per 100,000 males and 1,566.7 years per 100,000 females. Compared to the male and female Canadian populations for that same period, rates of potential years of life lost due to suicide and self-inflicted injury death were 12 times and 9.7 times higher, respectively, among the male and female populations of Inuit Nunangat.

Figure 23 Potential Years of Life Lost (PYLL) due to Suicide and Self-Inflicted Injury Death
Per 100,000 population aged 0-74 years, by sex, Inuit Nunangat[†] and Canada overall, 2004/08



Sources: Statistics Canada. Table 102-0705 - Potential years of life lost, by selected causes of death (ICD-10) and sex, five-year average, Canada and Inuit regions, every 5 years, CANSIM (database). Vital Statistics — Death Database and Demography Division (population estimates).

Notes: PYLL is calculated for ages <75 years.

World Health Organization (WHO), International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), codes X60—X84, Y87.

Numbers and rates on this graph are based on the summation of data for five consecutive years of deaths.

Age-standardized to the 2001 total population age structure of Inuit Nunangat.

[†] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Wide variations exist in the confidence intervals for PYLL among residents of Inuit regions. Thus, comparisons between these and those for the general population should be interpreted with caution.

For additional exclusions/limitations, see Annex 2.

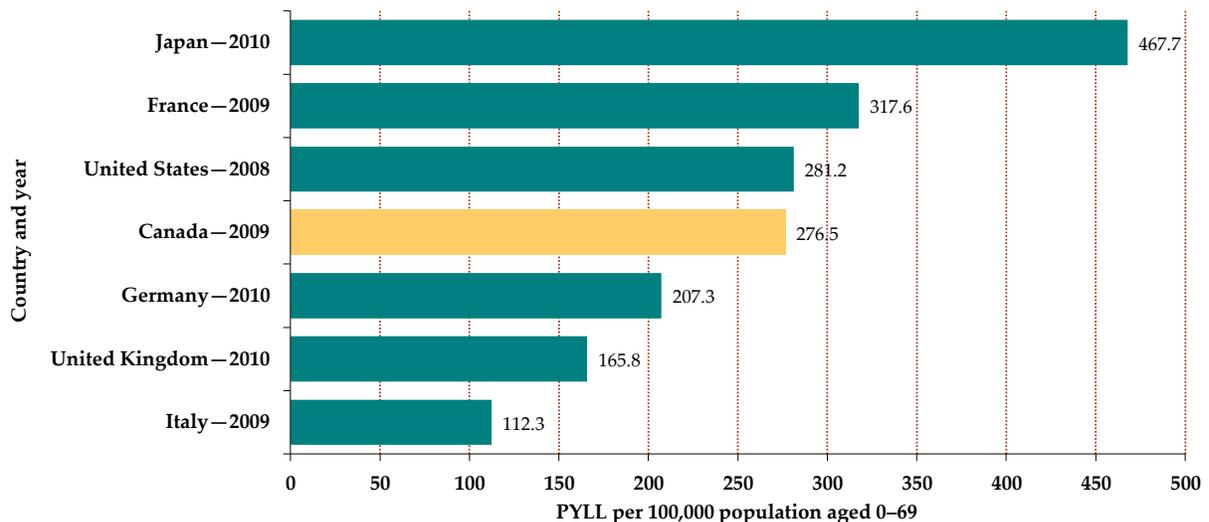
[†] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Canada has fourth highest PYLL due to intentional self-harm

Reference years for the Organisation for Economic Co-operation and Development (OECD) data differ according to the country. In addition, OECD data are age-standardized to the 2010 total OECD population whereas Canadian data (presented in Figure 21, *Potential Years of Life Lost Due to Suicide*) are not age-standardized. Lastly, OECD’s PYLL is calculated to age 70 rather than age 75. Thus, data are not directly comparable between Canadian and international graphs.

Of the G7 countries, Canada had the fourth highest rate of PYLL due to intentional self-harm, with 276.5 PYLL per 100,000 population.

Figure 24 Potential Years of Life Lost (PYLL) due to Intentional Self-Harm
 Per 100,000 population aged 0-69 years, both sexes (age-standardized), selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

Notes: World Health Organization (WHO), International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), codes X60–X84.

Data are for selected years.

Data are not comparable to Canadian trend data for the indicator *Potential years of life lost due to suicide* because OECD data are age-standardized to the 2010 total OECD population whereas the data in the Canadian graph are not age-standardized. In addition, PYLL is calculated to age 70, rather than age 75.

For additional exclusions/limitations, see Annex 2.

Rates of potential years of life lost due to unintentional injury deaths have decreased since 2000

In 2009, the rate of PYLL due to unintentional injury deaths in Canada was 545.8 years per 100,000 population. The rates of PYLL for males and females were 799.2 years per 100,000 males and 290.0 years per 100,000 females, respectively. The rates of PYLL due to unintentional injury deaths have decreased for both sexes, males and females since 2000.

Figure 25 Potential Years of Life Lost due to Unintentional Injury Death Per 100,000 population aged 0-74 years, by sex, Canada, 2000-09



Sources: Statistics Canada. Vital Statistics — Death Database and Demography Division (population estimates).

Notes: PYLL is calculated for ages <75 years.

World Health Organization (WHO), International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), V01-X59, Y85-Y86.

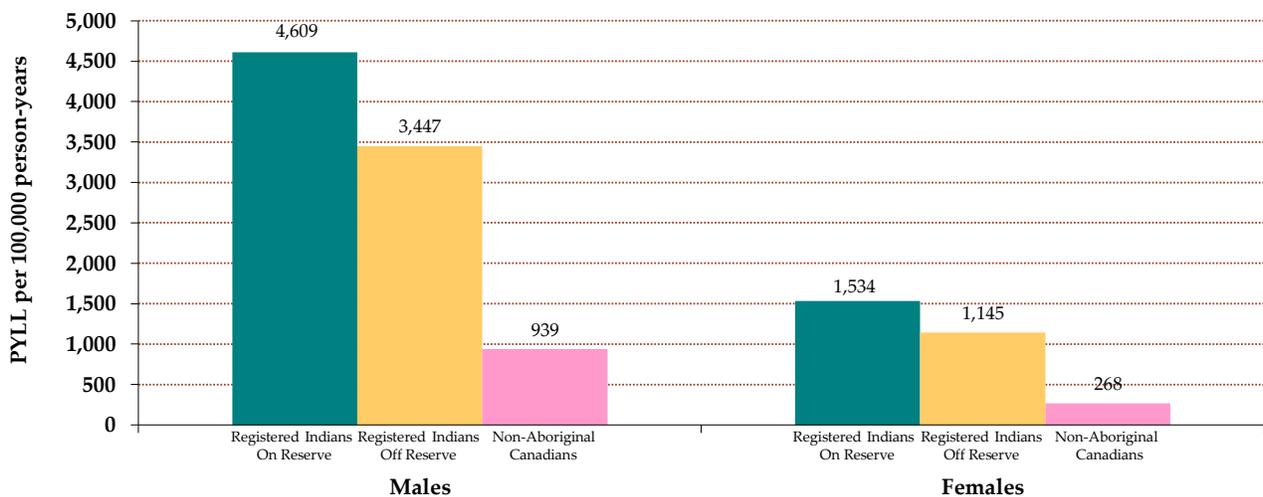
For additional exclusions/limitations, see Annex 2.

Rates of potential years of life lost due to unintentional injury deaths are much higher for Registered Indians living in First Nations communities

For the 1991–2001 period, the rate of potential years of life lost due to unintentional injury deaths for Registered Indian men aged 25 to 74 living in First Nations communities was almost 5 times the rate for non-Aboriginal men (4,609 per 100,000 person-years compared to 939 per 100,000 person-years). For Registered men living outside of First Nations communities, the rate was 3,447 per 100,000 person-years.

For Registered women aged 25 to 74 living in First Nations communities, the rate of potential years of life lost due to unintentional injuries was 5.7 times the rate for non-Aboriginal women – 1,534 per 100,000 person-years compared with 268 per 100,000 person-years. The rate was 1,145 per 100,000 person-years for Registered women living outside of First Nations communities.

Figure 26 Potential Years of Life Lost (PYLL) due to Unintentional Injury Death
 PYLL rate per 100,000 person-years at risk, aged 25-74 years, Registered Indians living on and off reserve, and non-Aboriginal Canadians, by sex, 1991-2001



Source: Statistics Canada. The Canadian census mortality follow-up study, 1991 through 2001.

Notes: PYLL is calculated for ages 25 through 74 years.

World Health Organization (WHO), International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), V01-X59, Y85-Y86.

Numbers and rates on this graph are based on the summation of data for five consecutive years of deaths.

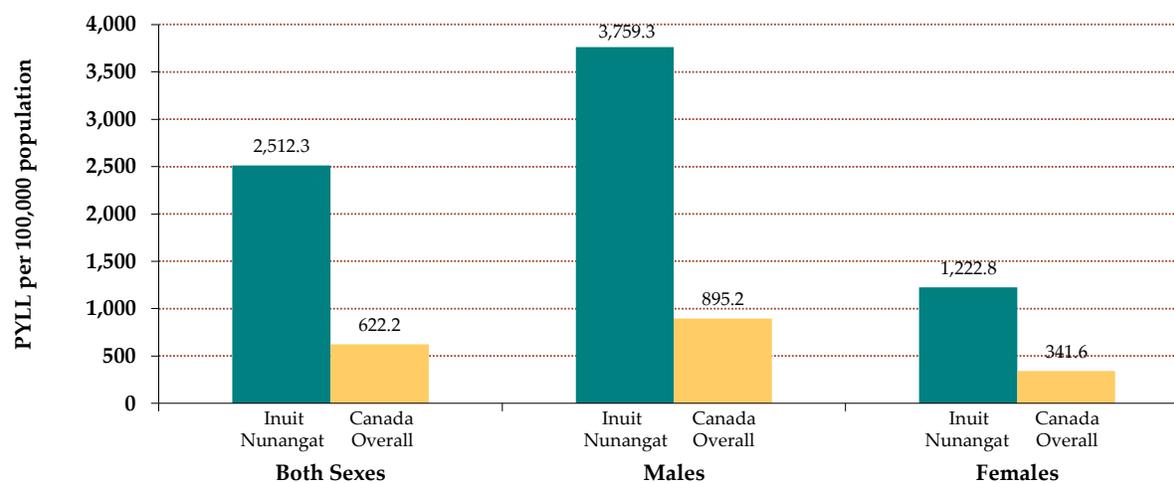
Age-standardized to the Aboriginal age distribution (five-year age groups).

For additional exclusions/limitations, see Annex 2.

Rates of potential years of life lost due to unintentional injury deaths are much higher among residents of Inuit Nunangat[‡]

In 2004/08, the rate of PYLL due to unintentional injury deaths in Canada among residents of Inuit Nunangat was 2,512.3 years per 100,000 population. The rates of PYLL for male and female residents of Inuit Nunangat were 3,759.3 years per 100,000 males and 1,222.8 years per 100,000 females. Compared to the overall Canadian population for that same period, rates of potential years of life lost due to unintentional injury deaths among residents of Inuit Nunangat were approximately 4.2 times and 3.6 times higher in males and females, respectively.

Figure 27 Potential Years of Life Lost (PYLL) due to Unintentional Injury Death
Per 100,000 population aged 0-74 years, by sex, Inuit Nunangat[‡] and Canada overall, 2004/08



Sources: Statistics Canada. Table 102-0705 - Potential years of life lost, by selected causes of death (ICD-10) and sex, five-year average, Canada and Inuit regions, every 5 years, CANSIM (database). Vital Statistics — Death Database and Demography Division (population estimates).

Notes: PYLL is calculated for ages <75 years.

World Health Organization (WHO), International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10), V01-X59, Y85-Y86.

Numbers and rates on this graph are based on the summation of data for five consecutive years of deaths.

Age-standardized to the 2001 total population age structure of Inuit Nunangat.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Wide variations exist in the confidence intervals for PYLL among residents of Inuit regions. Thus, comparisons between these and those for the general population should be interpreted with caution.

For additional exclusions/limitations, see Annex 2.

What these results mean for you

Injury is a serious public health issue with a major impact on the lives of Canadians. It is the leading cause of death of children, youth and young adults and is among the leading causes of hospitalization for children, youth, young adults and seniors.⁴ Injury is also a major cause of short- and long-term impairment and disability for Canadians.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

The mechanism of injury for both intentional and unintentional injuries can include events such as motor vehicle collisions, falls, fires and poisoning. Intentional injuries include those that are self-inflicted (i.e., suicide or suicide attempt), as well as those inflicted by someone else (i.e., homicide or assault). Injuries can also be unintentional, where there was no intention to cause deliberate harm to self or others. Unintentional injuries are the leading cause of death for Canadian children and youth from one to 19 years of age.⁵

Injuries differ from other diseases in that they have an immediate onset. An individual goes from being perfectly healthy one minute and seconds later is injured, disabled or fatally wounded. Injuries also result in a diminished quality of life from emotional anguish, pain, disability and activity limitations, as well as the grief associated with the death of a loved one from a fatal injury.⁶ Studies also suggest that injuries carry a significant economic burden.^{6,7,8} Many injuries are preventable through the application of interventions such as the development of policy,⁹ proper awareness and education,⁸ screening to identify high-risk behaviours,⁸ preventive counselling,¹⁰ treatment and weapon restrictions.⁸

Useful everyday safety tips

- Choose "green" or non-toxic cleaning products
- Look at your home from a child's point of view
- Introduce new outdoor activities carefully and with patience
- Make sure indoor and outdoor play spaces are safe
- Keep constant watch over children around water, in parks and public places
- Wear protective equipment approved by the Canadian Standards Association (CSA) when appropriate
- Follow the rules and laws of the road by buckling up, slowing down and eliminating distractions
- Do not use your hand-held cellular and/or text while driving
- For more helpful safety tips to prevent injuries, please visit the [Healthy Canadians website](#)

Benefits of safe practices

- Decreases the risk of injuring yourself and others
- Reduces activity limitations due to unintentional injuries
- Reduces time away from work due to unintentional injuries
- Promotes peace of mind and safe environments

Benefits of good mental health

- Reduces the risk of depression, psychological and social problems
- Helps you enjoy life, the environment and people around you
- Encourage you to create, learn, try new things, and take calculated risks
- Helps you cope with difficult times in your personal and professional life
- Prevents the onset or relapse of a physical or mental illness

Ways to improve your mental health

- Frequently engage in shared activities
- Surround yourself with supportive peers
- Participate in extracurricular activities
- Consult counsellors or nurses in your community

References

- ¹ Statistics Canada. (2006). *Mortality, Summary List of Causes - Data quality, concepts and methodology*. Available from: <http://www.statcan.gc.ca/pub/84f0209x/2001000/4078972-eng.htm>.
- ² Pan, S.Y., Ugnat, A.-M., Semenciw, R., Desmeules, M., Mao, Y., MacLeod, M. (2006). Trends in childhood injury mortality in Canada, 1979-2002. *Injury Prevention*. 12(3): 155-160. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2563519/>.
- ³ Government of Canada. (1990). *Teen Suicide*. Available from: <http://dsp-psd.pwgsc.gc.ca/Collection-R/LoPBdP/BP/bp236-e.htm>.
- ⁴ Public Health Agency of Canada. (2008). *Leading Causes of Death and Hospitalization in Canada*. Available from: <http://www.phac-aspc.gc.ca/publicat/lcd-pcd97/index-eng.php>.
- ⁵ Public Health Agency of Canada. (2006). *Facts on Injury*. Available from: www.phac-aspc.gc.ca/injury-bles/facts-eng.php.
- ⁶ Health Canada. (2001). *Unintentional and Intentional Injury Profile for Aboriginal People in Canada*. Available from: http://www.hc-sc.gc.ca/fniah-spnia/pubs/promotion/injury-bless/2001_trauma/index-eng.php.
- ⁷ Clayton, D., Barceló, A. (1999). The cost of suicide mortality in New Brunswick, 1996. *Chronic Diseases in Canada*. 20(2): 89-95.
- ⁸ Mann, J.J., Apter, A., Bertolote, J. (2005). Suicide prevention strategies: a systematic review. *Journal of the American Medical Association*. 294(16): 2064-2074. Available from: <http://jama.ama-assn.org/cgi/reprint/294/16/2064>.
- ⁹ Doessel, D.P., Williams, R.F.G., Whiteford, H. (2009). A reassessment of suicide measurement – some comparative PYLL-based trends in Queensland, Australia, 1920-2005. *Crisis*. 30(1): 6-12. Available from: <http://www.psycontent.com/content/1u401x444844121t/>.
- ¹⁰ Ballesteros, M.F., Gielen, A.C. (2010). Patient counseling for unintentional injury prevention. *American Journal of Lifestyle Medicine*. 4(1): 38-41. Available from: <http://ajl.sagepub.com/content/4/1/38.full.pdf+html>.

- 23. INCIDENCE RATE FOR LUNG CANCER
- 24. INCIDENCE RATE FOR PROSTATE CANCER
- 25. INCIDENCE RATE FOR BREAST CANCER
- 26. INCIDENCE RATE FOR COLORECTAL CANCER

Key Messages

- Lung cancer is the most commonly diagnosed cancer in the world¹
- Incidence rates of these cancers are either stable or decreasing, except for the incidence rate of lung cancer in females
- Despite the decrease in incidence rates, the number of new cancer cases and deaths continues to rise steadily as the Canadian population grows and ages
- For residents of Inuit Nunangat,[‡] rates of prostate and breast cancer are lower than for the rest of Canada, but higher for lung and bronchus and colorectal cancer
- Adopting a healthy lifestyle can strongly mitigate the risks of developing cancer

What do these indicators measure?

These four indicators measure the number of newly diagnosed primary cancer cases in a given year for lung, prostate, breast and colorectal sites per 100,000 population that would be observed in the population if it had the same age composition as the reference or “standard” population. This is called “age-standardized incidence rate.”

For residents of Inuit Nunangat, these four indicators measure the age-standardized number of newly diagnosed primary cancer cases in a specified period for lung and bronchus, prostate, breast and colorectal sites per 100,000 population.²

What are the limitations of these indicators?

Age-standardized rates have been relatively stable but, overall, the actual numbers are increasing due to the aging Canadian population, potentially representing an increased burden on the health care system. Changes in population size and age structure are the primary components of the increasing burden of cancer among Canadians.³

These incidence rates are influenced by two factors:

1. The underlying rate of cancer incidence, which partly reflects the past prevalence of risk factors such as smoking and, therefore, the success of past primary prevention efforts; and
2. The rate of detection and diagnosis of cancers, which can be influenced by the intensity and effectiveness of cancer screening programs.

These two factors, however, work in opposite directions. For example, an increase in cancer incidence could be due either to an increase in risk factors or an over-diagnosis of cancers (detection of a cancer

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

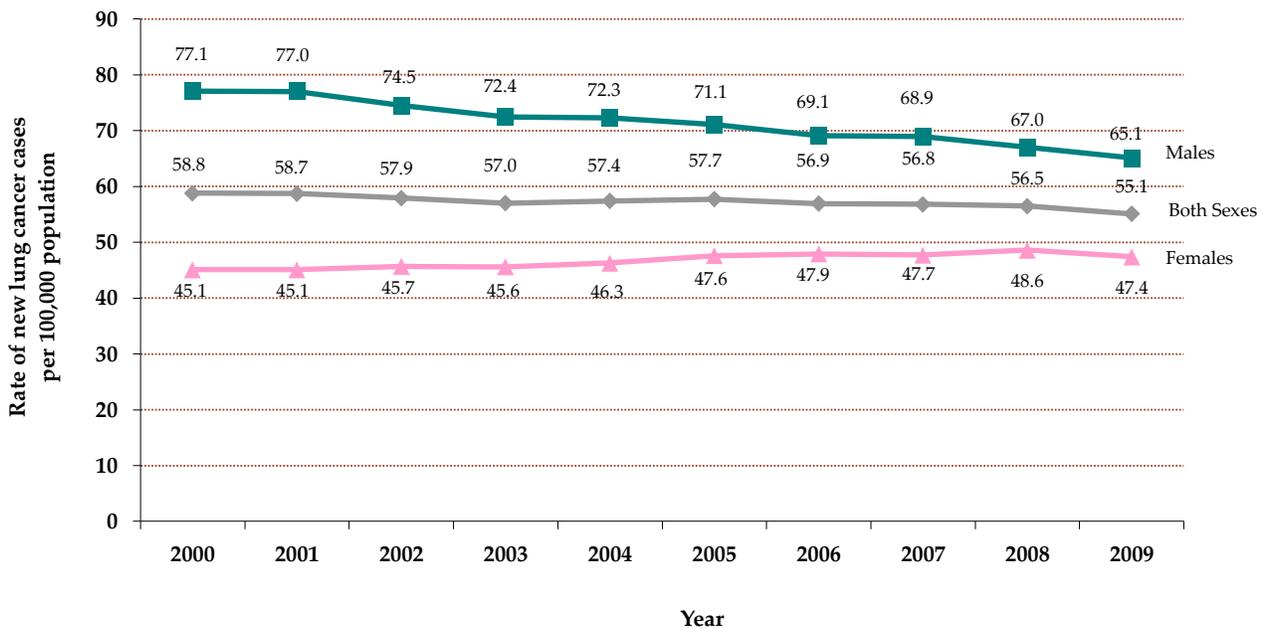
that would never cause symptom or death during a patient's lifetime). It is unlikely that this over-detection continues for an extended period of time so that, generally, a declining incidence of cancer suggests a positive change in population health. This interpretation issue is being addressed by the addition of "staging" data to the cancer registry systems. Cancer staging provides information on how advanced the cancer is (i.e., what stage it is) at the time of diagnosis.

While vital statistics data specific to Inuit are not consistently collected in administrative databases across the country, a method has been developed which allows the use of geographic identifiers to inform the health of Inuit in Canada. Because a high proportion of residents of Inuit Nunangat are Inuit (approximately 82%), health indicators for residents of Inuit Nunangat can serve as a proxy for Inuit-specific health indicators. It should be noted that because these data also include non-Inuit residents of these regions, who tend to have better health outcomes than the Inuit population living in the same area, caution should be used when interpreting these results. While this information is not Inuit-specific, it can be used to infer the health of Inuit in Canada.

Lung cancer incidence rates are decreasing, overall and for males, but increasing among females

In 2009, the overall lung cancer incidence rate in Canada was 55.1 new cases per 100,000 population, which is a decrease from the 58.8 new cases per 100,000 population in 2000. The lung cancer rate for males in 2009 decreased to 65.1 new cases per 100,000 males from 77.1 new cases per 100,000 males in 2000. The lung cancer rate for females in 2009 was 47.4 new cases per 100,000 females, an increase from 45.1 new cases per 100,000 females in 2000. However, the small reduction in the female rate from 2008 to 2009 may herald a longer-term decline in the lung cancer incidence rate of females. Males continue to have a higher incidence rate of lung cancer, though the difference between male and female rates has decreased since 2000.

Figure 28 Incidence Rate for Lung Cancer
Per 100,000 population, by sex (age-standardized), Canada, 2000-09

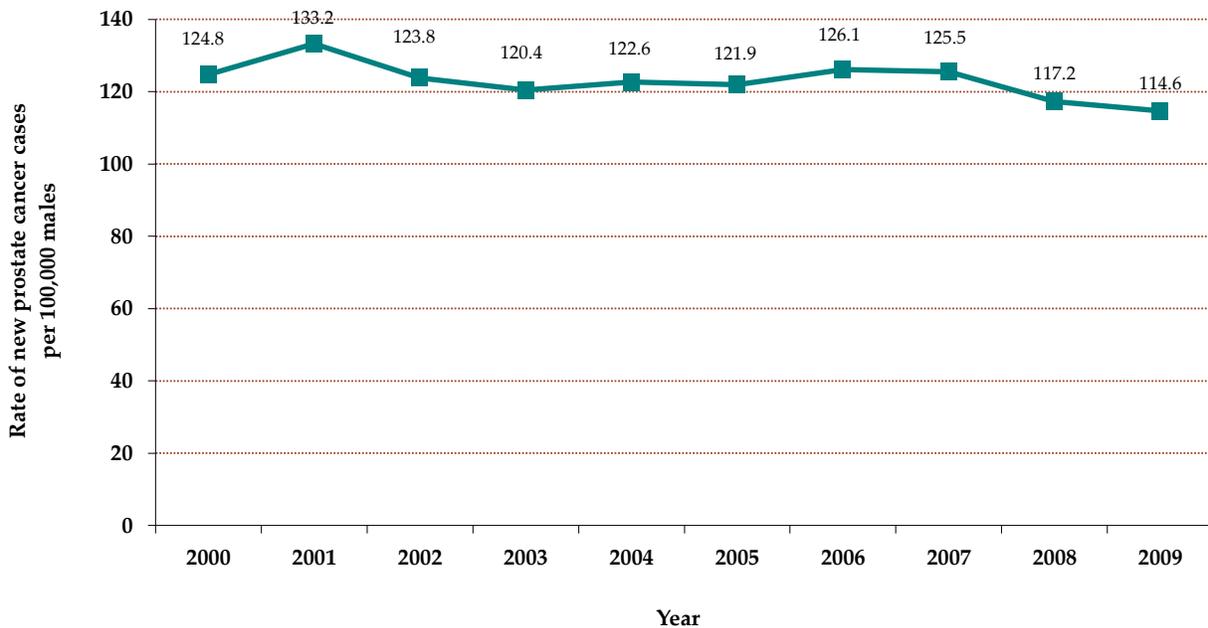


Source: Statistics Canada. Canadian Cancer Registry.
 Notes: Includes cancers of the lungs and bronchus (ICD-O-3, code C34).
 Actual incidence data were available to 2009 for all provinces except Quebec (2007).
 Age-standardized to the 1991 Canadian population.
 For additional exclusions/limitations, see Annex 2.

Prostate cancer incidence rate is decreasing

In 2009, the prostate cancer incidence rate was 114.6 new cases per 100,000 males, a decrease from the 124.8 new cases per 100,000 males in 2000. The higher rate in 2001 may reflect a variation in screening in prostate cancer.

Figure 29 Incidence Rate for Prostate Cancer
Per 100,000 males (age-standardized), Canada, 2000-09



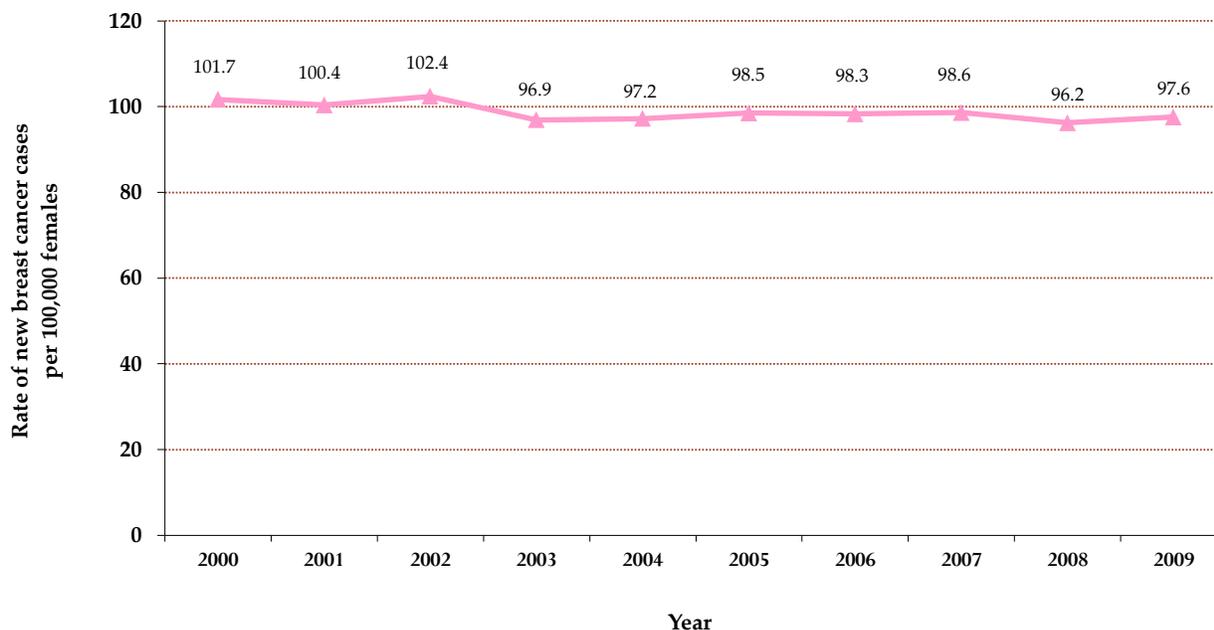
Source: Statistics Canada. Canadian Cancer Registry.

Notes: International Classification of Diseases for Oncology (ICD-O-3, code C61.9).
Actual incidence data were available to 2009 for all provinces except Quebec (2007).
Age-standardized to the 1991 Canadian population.
For additional exclusions/limitations, see Annex 2.

Breast cancer incidence rate has decreased from 2000

In 2009, the breast cancer incidence rate in females decreased to 97.6 new cases per 100,000 females from 101.7 new cases per 100,000 females in 2000.

Figure 30 Incidence Rate for Breast Cancer
Per 100,000 females (age-standardized), Canada, 2000-09

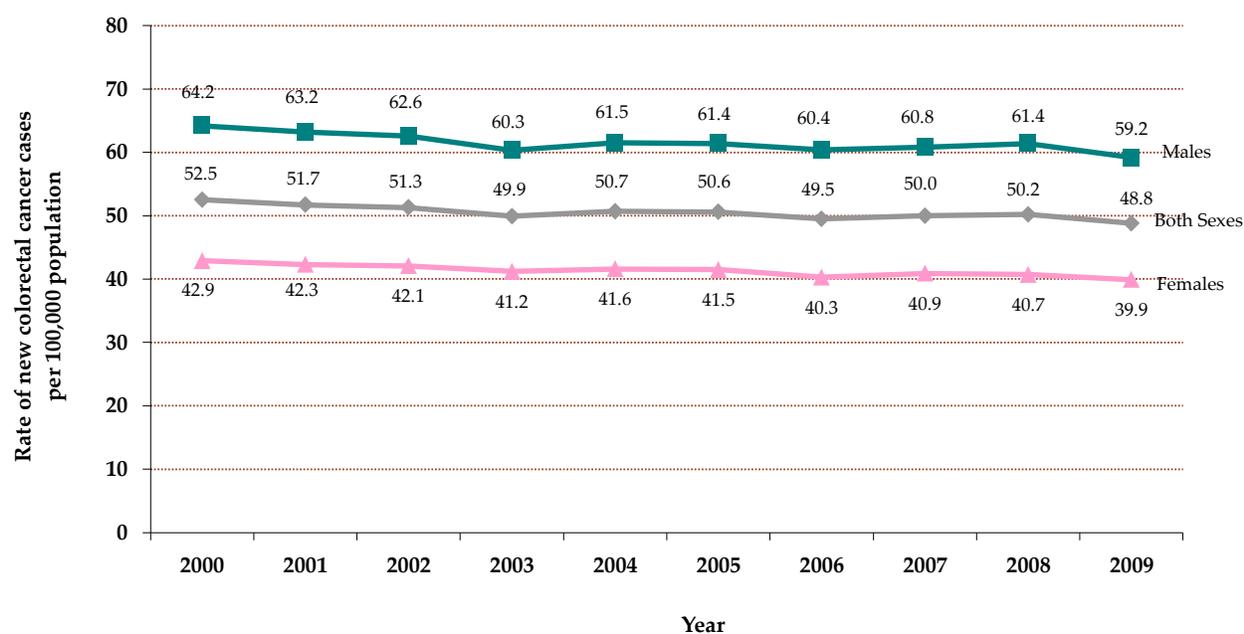


Source: Statistics Canada. Canadian Cancer Registry.
 Notes: International Classification of Diseases for Oncology (ICD-O-3, code C50).
 Actual incidence data were available to 2009 for all provinces except Quebec (2007).
 Age-standardized to the 1991 Canadian population.
 For additional exclusions/limitations, see Annex 2.

Incidence rates of colorectal cancer are on the decline

In 2009, the overall colorectal cancer incidence rate in Canada was 48.8 new cases per 100,000 population, a decrease from 52.5 new cases per 100,000 population in 2000. The colorectal cancer rate for males in 2009 was 59.2 new cases per 100,000 males, a decrease from 64.2 new cases per 100,000 males in 2000. Also in 2009, the colorectal cancer rate for females was 39.9 new cases per 100,000 females, a decrease from 42.9 new cases per 100,000 females in 2000.

Figure 31 Incidence Rate for Colorectal Cancer
Per 100,000 population, by sex (age-standardized), Canada, 2000-09



Source: Statistics Canada. Canadian Cancer Registry.

Notes: Includes cancers of the colon, rectum, rectosigmoid junction, and intestinal tract, part unspecified (ICD-O-3, codes C18–C20, C26.0).

Actual incidence data were available to 2009 for all provinces except Quebec (2007).

Age-standardized to the 1991 Canadian population.

For additional exclusions/limitations, see Annex 2.

Rates of prostate and breast cancer are lower for those in Inuit Nunangat[‡]

The incidence rate for lung and bronchus cancer for males living in Inuit Nunangat was more than double that for males in the rest of Canada—113.2 new cases per 100,000 males compared with 50.9 new cases per 100,000 males. Among females living in Inuit Nunangat, the rate was 123.2 new cases per 100,000 females, which was 3.7 times the rate for women living in the rest of Canada (33.3 new cases per 100,000 females). The difference between men and women living in Inuit Nunangat was not significant.

The prostate incidence rate for males living in Inuit Nunangat was lower than that for males living elsewhere in Canada—17.0 new cases per 100,000 males compared with 85.2 new cases per 100,000 males.

Females living in Inuit Nunangat had a lower breast cancer incidence rate than did women living in the rest of Canada—45.3 new cases per 100,000 females compared with 80.7 new cases per 100,000 females.

The colorectal cancer incidence rate for males living in Inuit Nunangat was 62.6 new cases per 100,000 males—about one and one half times higher than the rate of 43.3 new cases per 100,000 males living elsewhere in Canada. The rate for females in Inuit Nunangat (57.6 new cases per 100,000 females) was almost twice that of females in other parts of the country (30.8 new cases per 100,000 females).

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Table 5 Incidence Rates for Selected Cancers
 For residents of Inuit Nunangat[†] and the rest of Canada (per 100,000 population), by sex (age-standardized), 1998-2007

Cancers	Males		Females	
	Inuit Nunangat	Rest of Canada	Inuit Nunangat	Rest of Canada
Lung and bronchus	113.2	50.9	123.2	33.3
Prostate	17.0	85.2	----	----
Breast	----	----	45.3	80.7
Colorectal	62.6	43.3	57.6	30.8

Source: Carrière, G.M., Tjepkema, M., Pennock, J., Goedhuis, N. (2012). Cancer patterns in Inuit Nunangat: 1998-2007. *International Journal of Circumpolar Health*. 71: 18581. Available from: <http://dx.doi.org/10.3402/ijch.v71i0.18581>.

Notes: Lung and bronchus cancer (ICD-O-3, codes C34.0 to C34.9).

Prostate cancer (ICD-O-3, code C61.9).

Breast cancer (ICD-O-3, code C50.0 to C50.9).

Colorectal cancer (ICD-O-3, codes C18.0 to 18.9, C19.9, C20.9, C26.0).

Age-standardized to the World Population. Cancer incidence in 5 continents.

[†] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Rates for the rest of Canada that are shown in this table will differ from Canadian mortality rates (on the same conditions) that are displayed elsewhere in *Healthy Canadians 2012*; thus, these data should not be compared with each other.

For additional limitations, see Annex 2.

What these results mean for you

In recent years, incidence rates for the four most common cancers (lung, prostate, breast and colorectal) have decreased, with the exception of female lung cancer. For instance, the lung cancer incidence rate for males has dropped by 1.8% per year since 1998.³ The incidence rate for prostate cancer has declined by 0.6% per year between 2001 and 2007.³ The incidence rate for female breast cancer has declined by 0.7% per year since 1998.³ In both sexes, the incidence rates for colorectal cancer have declined by 0.8% per year since 2000.³ However, female lung cancer incidence rate has increased by 1.1% per year between 1998 and 2007.³ Despite declining incidence rates, the total number of new cancer cases in Canada continues to rise steadily as the Canadian population grows and ages.

Although genetic factors can be determinants in cancer development, one's lifestyle has a very strong impact on cancer risk. Therefore, adopting a healthy lifestyle can strongly mitigate the risks of developing cancer. Even after cancer is diagnosed, a change towards a healthy lifestyle has some influence on slowing the progression of the disease and possibly preventing its associated mortality.^{4, 5, 6}

Smoking is a well-known risk factor for multiple chronic diseases, including lung disease, cardiovascular disease and some types of cancer. Heavy smoking increases the risk of lung cancer by around 30-fold, and smoking causes over 80% of lung cancer in western countries.⁷ Smoking is also a risk factor for other

cancers such as larynx, pharynx, oesophageal, pancreas, stomach, bladder, kidney and cervix.⁸ Consequently, smoking cessation is the single most effective modifiable risk factor for cancer.

When it comes to the effect of diet on cancer incidence and mortality, several studies show conflicting results. For example, eating a diet high in fruits and vegetables may help protect against lung cancer, especially in women.⁹ Some research shows that eating large amounts of fruits, vegetables and fibre decreases the risk for colorectal cancer,^{10, 11, 12, 13} while other studies have shown that it may not be beneficial.^{14, 15, 16} On the other hand, high consumption of preserved meats and red meats have been associated with a higher incidence and mortality from colorectal and prostate cancers,^{13, 17, 18} while high consumption of dairy products may lead to prostate cancer.¹⁹

Obesity is a contributor to a wide variety of cancers including breast, colon and prostate cancer.²⁰ There is also strong evidence that physical activity decreases the risk of colon and breast cancer,^{21, 22, 23} and has a moderate effect on prostate and lung cancer.²¹

Benefits of a healthy lifestyle

- Better health
- Better control over your weight
- Decreased risk of diseases including cancers
- Better control of a disease
- More energy to fight a disease if a disease occurs

Risk factors for cancer

Lung Cancer	Prostate Cancer	Breast Cancer	Colorectal Cancer
<ul style="list-style-type: none"> • Smoking • Exposure to second-hand smoke • Alcohol consumption • Diet low in fruits and vegetables • Exposure to environmental pollutants (radon, asbestos, etc.) 	<ul style="list-style-type: none"> • Obesity • Physical inactivity • Diet low in tomatoes • Diet high in saturated and trans fats and red meat • Diet high in dairy products • Diet low in fruits and vegetables 	<ul style="list-style-type: none"> • Obesity • Alcohol consumption • Young age at menarche • Older age at menopause • Recent use of oral contraceptives • No full-term pregnancies • Having a full-term first pregnancy after age 30 • No breastfeeding • Physical inactivity • Diet high in saturated and trans fats • Diet low in fruits and vegetables 	<ul style="list-style-type: none"> • Obesity • Alcohol consumption • Physical inactivity • Diet rich in red meats and/or preserved meats • Diet high in fats • Diet low in fibre, fruits and vegetables

Things you can do to prevent cancer

- Do not smoke / stop smoking
- Exercise regularly
- Keep a healthy body weight
- Reduce your alcohol consumption
- Eat a healthy diet
- See your doctor regularly and discuss any sudden changes in your body (blood in urine, stool or sputum, persistent cough, sudden weight change, change in sleep patterns, lump in breast, etc.) with him/her; don't wait until your health deteriorates and you have no choice but to see your doctor
- Follow your doctor's advice, be it having screening tests, making changes in lifestyle or diet, and/or taking prescribed medication
- For more information on cancer, visit [Health Canada's website](#)

References

- ¹ Ferlay, J., Shin, H.R., Bray, F., Forman, D., Mathers, C., Parkin, D.M. (2010). GLOBOCAN 2008, v1.2, *Cancer Incidence and Mortality Worldwide*. IARC Cancer Base No. 10 [Internet]. Lyon, France: International Agency for Research on Cancer. Available from: <http://globocan.iarc.fr/>.
- ² Carrière, G.M., Tjepkema, M., Pennock, J., Goedhuis, N. (2012). Cancer patterns in Inuit Nunangat: 1998-2007. *International Journal of Circumpolar Health*. 71: 18581. Available from: <http://dx.doi.org/10.3402/ijch.v71i0.18581>.
- ³ Canadian Cancer Society's Steering Committee on Cancer Statistics. (2012). *Canadian Cancer Statistics 2012*. Toronto, ON: Canadian Cancer Society. Available from: <http://www.cancer.ca/en/cancer-information/cancer-101/canadian-cancer-statistics-publication/?region=on>.
- ⁴ Rock, C.L., Demark-Wahnefried, W. (2002). Can lifestyle modification increase survival in women diagnosed with breast cancer? *Journal of Nutrition*. 132: 3504S-3509S. Available from: <http://jn.nutrition.org/content/132/11/3504S.full.pdf+html>.
- ⁵ Ornish, D., Weidner, G., Fair, W.R., Marlin, R., Pettengill, E.B., Raisin, C.J., Dunn-Emke, S., Crutchfield, L., Jacobs, F.N., Barnard, R.J., Aronson, W.J., McCormac, P., McKnight, D.J., Fein, J.D., Dnistrian, A.M., Weinstein, J., Ngo, T.H., Mendell, N.R., Carroll, P.R. (2005). Intensive lifestyle changes may affect the progression of prostate cancer. *Journal of Urology*. 174: 1065-1070. Available from: <http://www.sciencedirect.com/science/article/pii/S0022534701685185>.
- ⁶ Jones, L.W., Demark-Wahnefried, W. (2006). Diet, exercise, and complementary therapies after primary treatment for cancer. *The Lancet Oncology*. 7(12): 1017-1026. Available from: <http://www.sciencedirect.com/science/article/pii/S1470204506709767>.
- ⁷ International Agency for Research on Cancer. Cancer: Causes, Occurrence and Control. IARC Scientific Publications No. 100. Lyon: IARC, 1990.
- ⁸ Centers for Disease Control and Prevention. (2004). *The Health Consequence of Smoking*. Available from: http://www.cdc.gov/tobacco/data_statistics/sgr/2004/complete_report/index.htm.
- ⁹ Feskanich, D., Ziegler, R.G., Michaud, D.S., Giovannucci, E.L., Speizer, F.E., Willett, W.C., Colditz, G.A. (2000). Prospective study of fruit and vegetable consumption and risk of lung cancer among men and women. *Journal of the National Cancer Institute*. 92: 1812-1823. Available from: <http://jnci.oxfordjournals.org/content/92/22/1812.full.pdf+html>.
- ¹⁰ Potter, J.D., Steinmetz, K. (1996). Vegetables, fruit and phytoestrogens as preventive agents. In: Stewart, B.W., McGregor, D., eds. *Principles of Chemoprevention*. IARC Scientific Publication No. 139. Lyon: IARC, pages 61-90.
- ¹¹ Jacobs, D.R.J., Marquart, L., Slavin, J., Kushi, L.H. (1998). Whole-grain intake and cancer: an expanded review and meta-analysis. *Nutrition and Cancer*. 30: 85-96. Available from: <http://www.tandfonline.com/doi/pdf/10.1080/01635589809514647>.
- ¹² Murphy, N., Norat, T., Ferrari, P., Jenab, M., Bueno-de-Mesquita, B., Skeie, G., Dahm, C.C., Overvad, K., Olsen, A., Tjønneland, A., Clavel-Chapelon, F., Boutron-Ruault, M.C., Racine, A., Kaaks, R., Teucher, B., Boeing, H., Bergmann, M.M., Trichopoulou, A., Trichopoulos, D., Lagiou, P., Palli, D., Pala, V., Panico, S., Tumino, R., Vineis, P., Siersema, P., van Duijnhoven, F., Peeters, P.H.M., Hjartaker, A., Engeset, D., González, C.A., Sánchez, M.-J., Dorronsoro, M., Navarro, C., Ardanaz, E., Quirós, J.R., Sonestedt, E., Ericson, U., Nilsson, L., Palmqvist, R., Khaw, K.-T., Wareham, N., Key, T.J., Crowe, F.L., Fedirko, V., Wark, P.A., Chuang, S.-C., Riboli, E. (2012). Dietary fibre intake and risks of cancers of the colon and rectum in the European Prospective Investigation into Cancer and Nutrition (EPIC). *PLoS ONE*. 7(6): e39361. Available from: <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039361;jsessionid=5AF91AF5AA3F2C3E7B94C7B73B9AE8C2>.
- ¹³ Magalhães, B., Peleteiro, B., Lunet, N. (2012). Dietary patterns and colorectal cancer: systematic review and meta-analysis. *European Journal of Cancer Prevention*. 21: 15-23.

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- ¹⁴ Bueno De Mesquita, H.B., Ferrari, P., Riboli, E., on behalf of EPIC. (2002). Plant foods and the risk of colorectal cancer in Europe: preliminary findings. *IARC Scientific Publications Series*. 156: 89-95.
- ¹⁵ Fuchs, C.S., Giovannucci, E.L., Colditz, G.A., Hunter, D.J., Stampfer, M.J., Rosner, B., Speizer, F.E., Willett, W.C. (1999). Dietary fiber and the risk of colorectal cancer and adenoma in women. *The New England Journal of Medicine*. 340: 169-176. Available from: <http://www.nejm.org/doi/pdf/10.1056/NEJM199901213400301>.
- ¹⁶ Michels, K.B., Giovannucci, E., Joshipura, K.J., Rosner, B.A., Stampfer, M.J., Fuchs, C.S., Colditz, G.A., Speizer, F.E., Willett, W.C. (2000). Prospective study of fruit and vegetable consumption and incidence of colon and rectal cancers. *Journal of the National Cancer Institute*. 92: 1740-1752. Available from: <http://jnci.oxfordjournals.org/content/92/21/1740.full.pdf+html>.
- ¹⁷ Norat, T., Lukanova, A., Ferrari, P., Riboli, E. (2002). Meat consumption and colorectal cancer risk: a dose–response meta-analysis of epidemiological studies. *International Journal of Cancer*. 98: 241-256. Available from: <http://onlinelibrary.wiley.com/doi/10.1002/ijc.10126/pdf>.
- ¹⁸ Michaud, D.S., Augustsson, K., Rimm, E.B., Stampfer, M.J., Willett, W.C., Giovannucci, E. (2001). A prospective study on intake of animal products and risk of prostate cancer. *Cancer Causes and Control*. 12: 557-567. Available from: <http://www.jstor.org/stable/3553655>.
- ¹⁹ Gao, X., LaValley, M.P., Tucker, K.L. (2005). Prospective studies of dairy product and calcium intakes and prostate cancer risk: a meta-analysis. *Journal of the National Cancer Institute*. 97(23): 1768-1777. Available from: <http://jnci.oxfordjournals.org/content/97/23/1768.full.pdf+html>.
- ²⁰ Public Health Agency of Canada. (2009). *Obesity in Canada: Snapshot*. Available from: <http://www.phac-aspc.gc.ca/publicat/2009/oc/pdf/oc-eng.pdf>.
- ²¹ Kruk, J., Aboul-Enein, H.Y. (2006). Physical activity in the prevention of cancer. *Asian Pacific Journal of Cancer Prevention*. 7: 11-21.
- ²² Hardman, A.E. (2001). Physical activity and cancer risk. *Proceedings of the Nutrition Society*. 60: 107-113.
- ²³ McTiernan, A. (2008). Mechanisms linking physical activity with cancer. *Nature Reviews Cancer*. 8: 205-211. Available from: <http://www.nature.com/nrc/journal/v8/n3/pdf/nrc2325.pdf>.

- 27. MORTALITY RATE FOR LUNG CANCER
- 28. MORTALITY RATE FOR PROSTATE CANCER
- 29. MORTALITY RATE FOR BREAST CANCER
- 30. MORTALITY RATE FOR COLORECTAL CANCER

Key Messages

- Lung cancer is the leading cause of cancer death in Canada and worldwide, followed by breast cancer
- Mortality rates for these four cancers are decreasing, with the exception of lung cancer for females
- Despite these decreases in mortality rates, the number of new cancer cases and deaths continues to rise steadily as the Canadian population grows and ages
- Compared to the other G7 countries, Canada has the second highest mortality rate for lung and colon cancers, the fourth highest mortality rate for prostate cancer, and the fifth highest mortality rate for breast cancer
- Mortality rates for intestinal and rectal cancer for female Registered Indians are higher than for female Non-Aboriginal Canadians
- Mortality rates for lung and colorectal cancers are higher for residents of Inuit Nunangat[‡] compared to Canada overall
- Adopting a healthy lifestyle can strongly mitigate the risks of developing cancer, and may slow the progress of the disease once it is diagnosed

What do these indicators measure?

These four indicators measure the number of deaths of individuals where the underlying cause of death is lung, prostate, breast or colorectal cancer per 100,000 population that would be observed in the population if it had the same age composition as the reference or “standard” population. This is called “age-standardized mortality rate.”

For Registered Indians, the indicator is the number of deaths of individuals 25 years and older in which the underlying cause of death is tracheal/bronchial/lung, prostate, breast, or intestinal/rectal cancer per 100,000 population that would be observed in the population if it had the same age composition as the reference or “standard” population. Data for Registered Indians are an average from 1991 to 2001 in order to provide more stability in numbers.

These indicators also measure the number of deaths of individuals living in Inuit Nunangat where the underlying cause of death is lung, prostate, breast or colorectal cancer per 100,000 population. The rates for Inuit Nunangat are also age standardized.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

What are the limitations of these indicators?

Lung, breast, colorectal and prostate cancer represent the four most common cancer mortalities. The mortality rates presented here are age-standardized. Age-standardized rates are useful for comparison between years because of the aging Canadian population, but may underestimate the burden on the health care system, as changes in population size and age structure are the primary components of the increasing burden of cancer among Canadians.

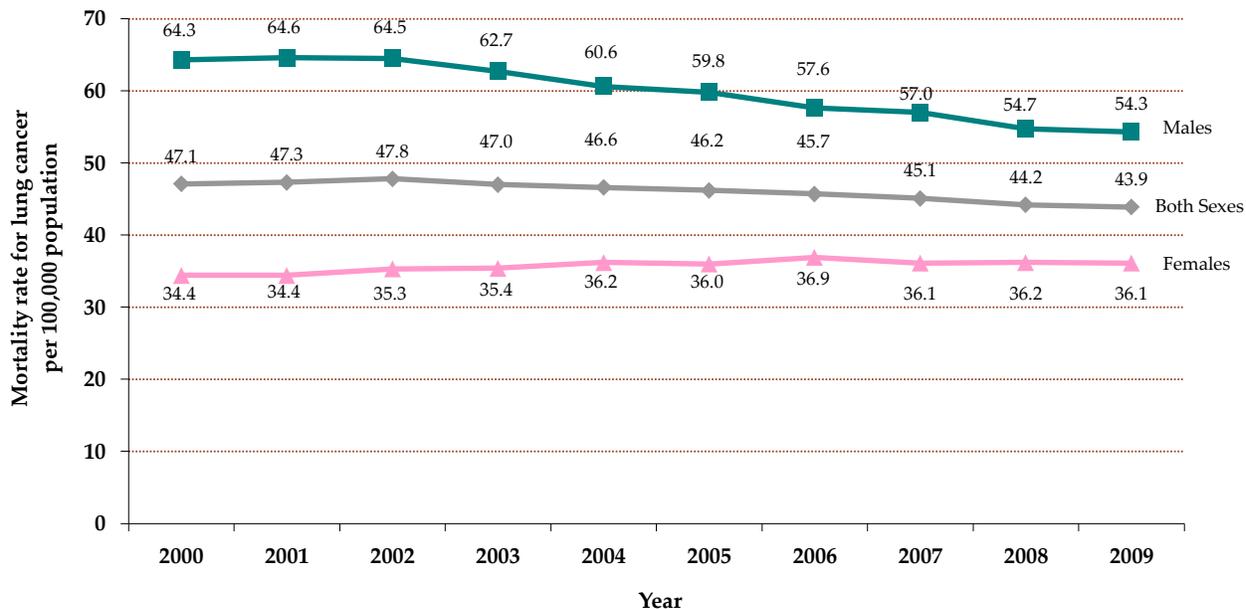
Changes in risk factors, early detection and improved treatment can influence death rates due to cancer. Treatment may involve one or some combination of surgery, radiation therapy, chemotherapy, and/or hormonal therapy.

While vital statistics data specific to Inuit are not consistently collected in administrative databases across the country, a method has been developed which allows the use of geographic identifiers to inform the health of Inuit in Canada. Because a high proportion of residents of Inuit Nunangat are Inuit (approximately 82%), health indicators for residents of Inuit Nunangat can serve as a proxy for Inuit-specific health indicators. It should be noted that because these data also include non-Inuit residents of these regions, who tend to have better health outcomes than the Inuit population living in the same area, caution should be used when interpreting these results. While this information is not Inuit-specific, it can be used to infer the health of Inuit in Canada.

Mortality rate of lung cancer decreasing for males but increasing for females

In 2009, the overall lung cancer mortality rate in Canada was 43.9 deaths per 100,000 population, a decrease from 47.1 deaths per 100,000 population in 2000. The lung cancer mortality rate for males has been decreasing to 54.3 deaths per 100,000 males in 2009 from 64.3 deaths per 100,000 males in 2000. The lung cancer mortality rate for females has increased to 36.1 deaths per 100,000 females in 2009 from 34.4 deaths per 100,000 females in 2000.

Figure 32 Mortality Rate for Lung Cancer
 Per 100,000 population, by sex (age-standardized), Canada, 2000-09



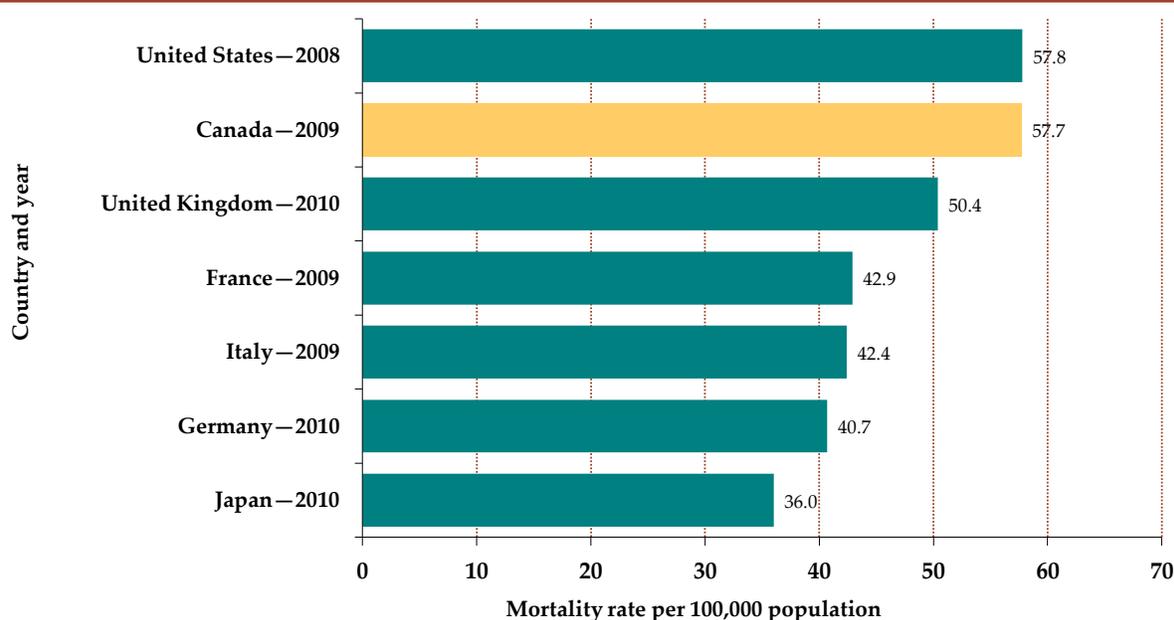
Source: Statistics Canada. Vital Statistics — Death Database.
 Notes: Includes cancers of the bronchus and lung (ICD-10, codes C33-C34).
 Age-standardized to the 1991 Canadian population.
 For additional exclusions/limitations, see Annex 2.

Canada has one of the highest lung cancer mortality rates of G7 countries

Reference years for the Organisation for Economic Co-operation and Development (OECD) data differ according to the country in question. In order to allow comparisons among OECD countries, data presented in OECD charts have been age-standardized to the 2010 total OECD population. Because data reported by Statistics Canada (in each Canadian mortality graph) are age-standardized to the 1991 Canadian population, data are not directly comparable between Canadian and international graphs and may vary.

In 2009, Canada had the second highest lung cancer mortality rate of the G7 countries with 57.7 deaths per 100,000 population, behind the United States.

Figure 33 Mortality Rate for Lung Cancer
Per 100,000 population, both sexes (age-standardized), selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

Notes: Data are for selected years.

Includes cancers of the trachea, bronchus and lung (ICD-10, codes C33-C34).

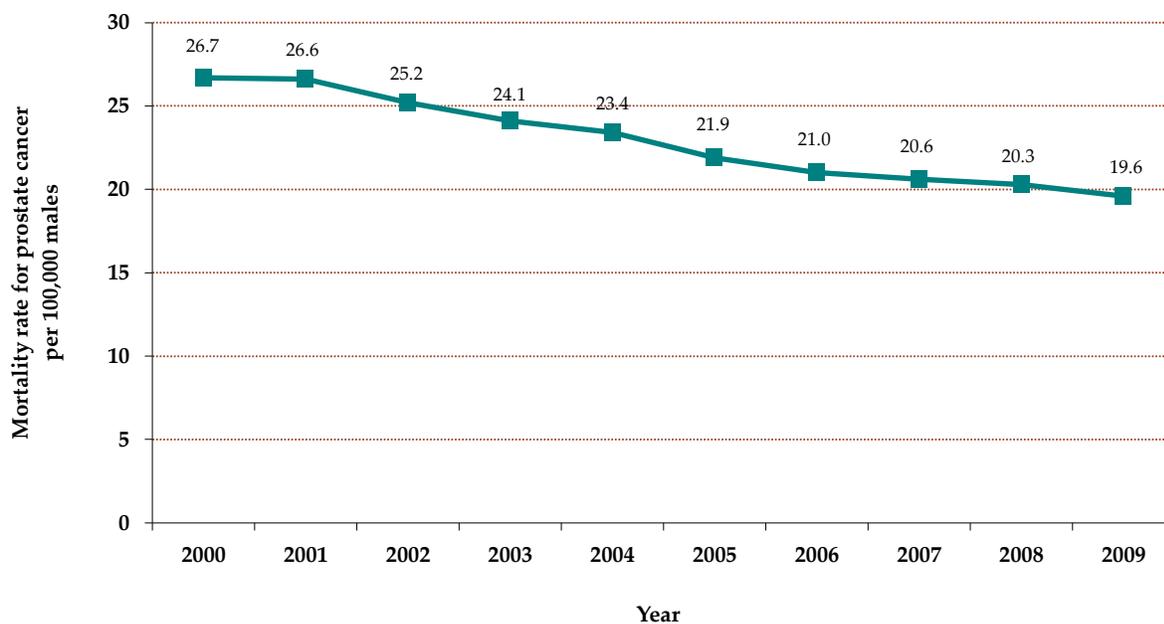
Data are not comparable to Canadian trend data for the indicator *Mortality rate for lung cancer* because OECD data are age-standardized to the 2010 total OECD population rather than the 1991 Canadian population.

For additional exclusions/limitations, see Annex 2.

Prostate cancer mortality rate on the decline

In 2009, males had a prostate cancer mortality rate of 19.6 deaths per 100,000 males, a decrease from 26.7 deaths per 100,000 males in 2000.

Figure 34 Mortality Rate for Prostate Cancer
Per 100,000 males (age-standardized), Canada, 2000-09



Source: Statistics Canada. Vital Statistics — Death Database.

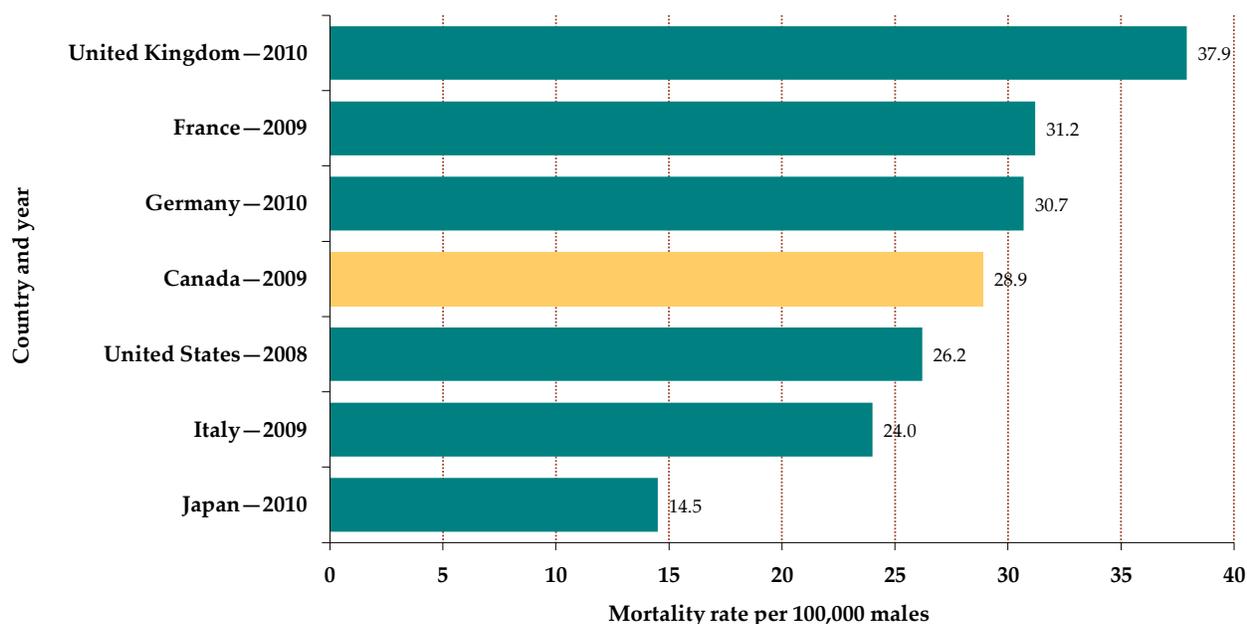
Notes: International Statistical Classification of Diseases and Related Health Problems (ICD-10, code C61).
Age-standardized to the 1991 Canadian population.
For additional exclusions/limitations, see Annex 2.

Canadian males have the fourth highest mortality rate for prostate cancer among G7 countries

Reference years for the Organisation for Economic Co-operation and Development (OECD) data differ according to the country in question. In order to allow comparisons among OECD countries, data presented in OECD charts have been age-standardized to the 2010 total OECD population. Because data reported by Statistics Canada (in each Canadian mortality graph) are age-standardized to the 1991 Canadian population, data are not directly comparable between Canadian and international graphs and may vary.

In 2009, Canada had the fourth highest prostate cancer mortality rate in the G7 countries with 28.9 deaths per 100,000 males, behind the United Kingdom, France and Germany.

Figure 35 Mortality Rate for Prostate Cancer
Per 100,000 males (age-standardized), selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

Notes: Data are for selected years.

International Statistical Classification of Diseases and Related Health Problems (ICD-10, code C61).

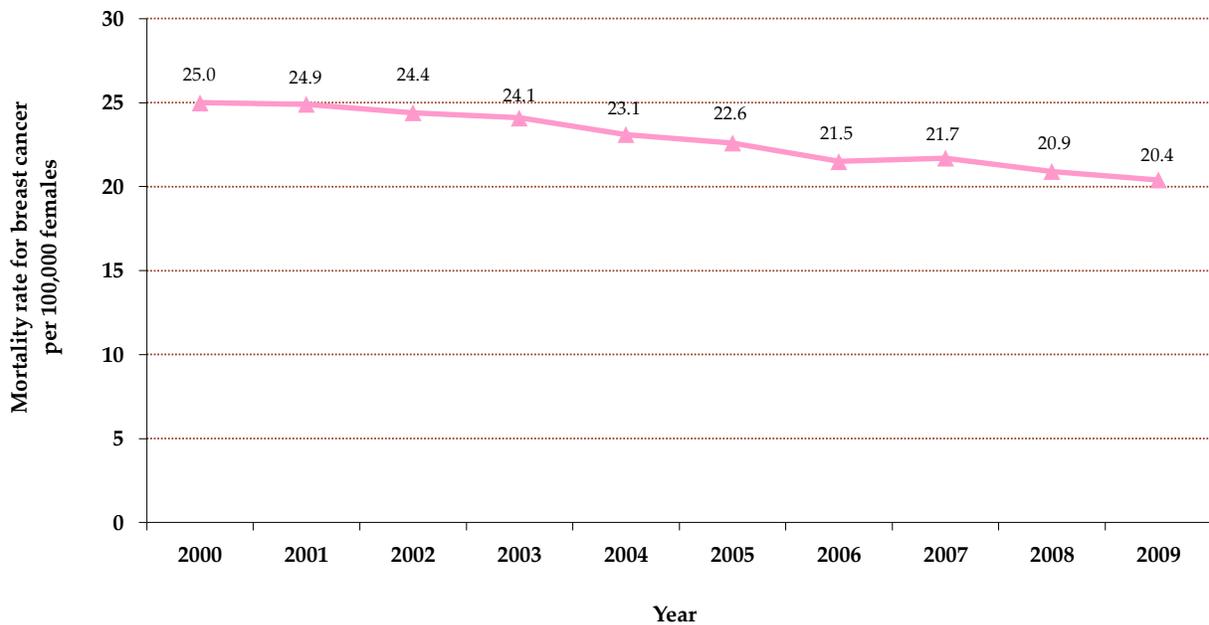
Data are not comparable to Canadian trend data for the indicator *Mortality rate for prostate cancer* because OECD data are age-standardized to the 2010 total OECD population rather than the 1991 Canadian population.

For additional exclusions/limitations, see Annex 2.

Breast cancer mortality rate declining

In 2009, the breast cancer mortality rate was 20.4 deaths per 100,000 females, compared to 25.0 deaths per 100,000 females in 2000.

Figure 36 Mortality Rate for Breast Cancer
Per 100,000 females (age-standardized), Canada, 2000-09



Source: Statistics Canada. Vital Statistics — Death Database.

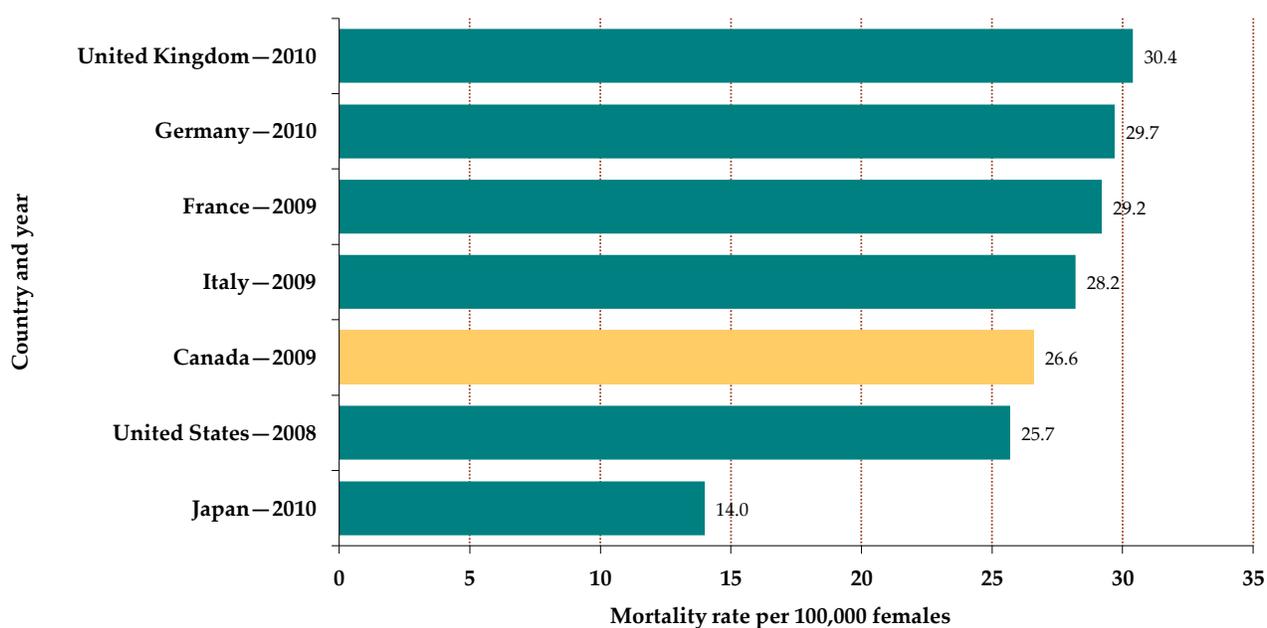
Notes: International Statistical Classification of Diseases and Related Health Problems (ICD-10, code C50).
Age-standardized to the 1991 Canadian population.
For additional exclusions/limitations, see Annex 2.

Canadian females have the fifth highest mortality rate for breast cancer among G7 countries

Reference years for the Organisation for Economic Co-operation and Development (OECD) data differ according to the country in question. In order to allow comparisons among OECD countries, data presented in OECD charts have been age-standardized to the 2010 total OECD population. Because data reported by Statistics Canada (in each Canadian mortality graph) are age-standardized to the 1991 Canadian population, data are not directly comparable between Canadian and international graphs and may vary.

In 2009, Canada had the fifth highest breast cancer mortality rate of G7 countries at 26.6 deaths per 100,000 population, behind the United Kingdom, Germany, France and Italy.

Figure 37 Mortality Rate for Breast Cancer
Per 100,000 females (age-standardized), selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

Notes: Data are for selected years.

International Statistical Classification of Diseases and Related Health Problems (ICD-10, code C50).

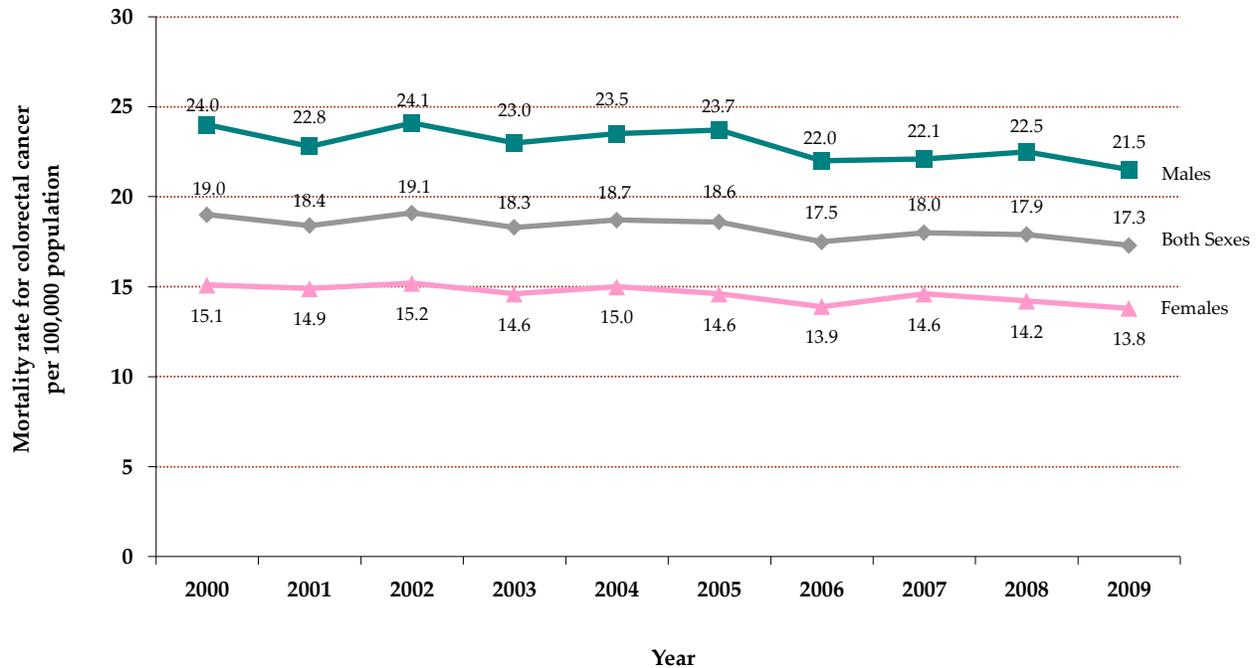
Data are not comparable to Canadian trend data for the indicator *Mortality rate for breast cancer* because OECD data are age-standardized to the 2010 total OECD population rather than the 1991 Canadian population.

For additional exclusions/limitations, see Annex 2.

Mortality rate for colorectal cancer is higher in males than in females

The overall colorectal cancer mortality rate in Canada in 2009 was 17.3 deaths per 100,000 population, a decrease from 19.0 deaths per 100,000 population in 2000. The colorectal cancer mortality rate is higher for males than females, with 21.5 deaths per 100,000 males and 13.8 deaths per 100,000 females. Both rates have decreased since 2000.

Figure 38 Mortality Rate for Colorectal Cancer
Per 100,000 population, by sex (age-standardized), Canada, 2000-09



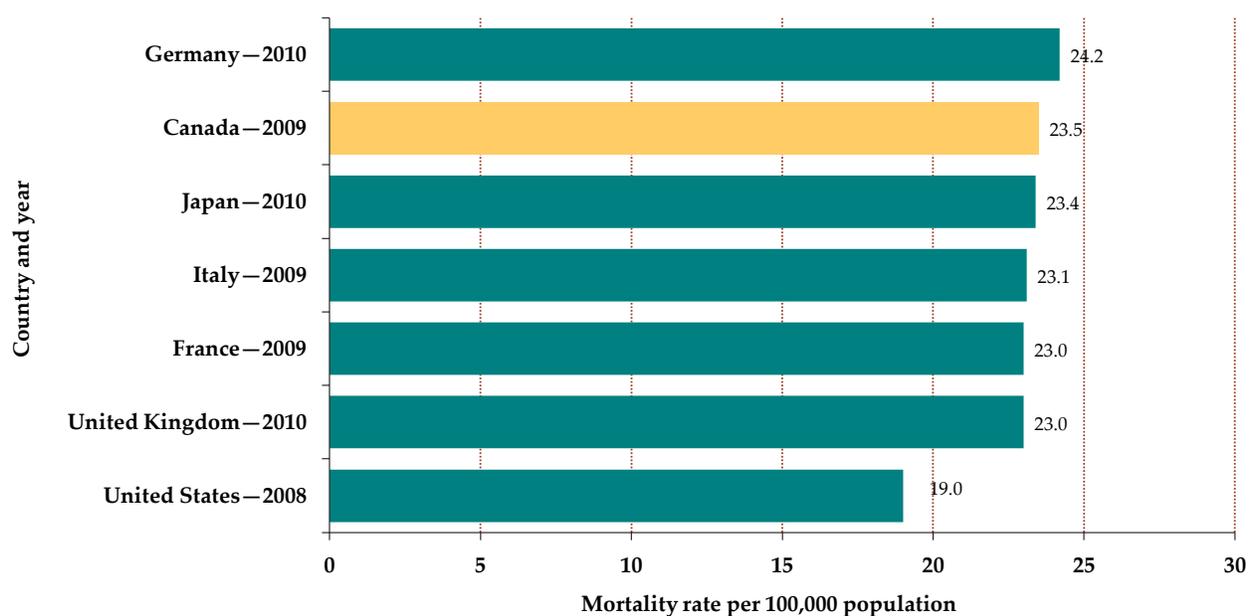
Source: Statistics Canada. Vital Statistics — Death Database.
 Notes: Includes cancers of the colon, rectum and anus (ICD-10, codes C18-C21).
 Age-standardized to the 1991 Canadian population.
 For additional exclusions/limitations, see Annex 2.

Canada has the second highest mortality rate for colon cancer among G7 countries

Reference years for the Organisation for Economic Co-operation and Development (OECD) data differ according to the country in question. In order to allow comparisons among OECD countries, data presented in OECD charts have been age-standardized to the 2010 total OECD population. Because data reported by Statistics Canada (in each Canadian mortality graph) are age-standardized to the 1991 Canadian population, data are not directly comparable between Canadian and international graphs and may vary.

In 2009, Canada had the second highest colon cancer mortality rate among G7 countries with 23.5 deaths per 100,000 population, after Germany.

Figure 39 Mortality Rate for Colon Cancer
Per 100,000 population, both sexes (age-standardized), selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

Notes: Data are for selected years.

OECD data include mortality due to cancers of the colon, rectum and anus (ICD-10, codes C18–C21).

Data are not comparable to Canadian trend data for the indicator *Mortality rate for colorectal cancer* because OECD data are age-standardized to the 2010 total OECD population rather than the 1991 Canadian population.

For additional exclusions/limitations, see Annex 2.

Mortality rate for intestinal and rectal cancer for female Registered Indians is higher than for female Non-Aboriginal Canadians

In 1991-2001, the mortality rate for intestinal and rectal cancer was higher for female Registered Indians (22.6 deaths per 100,000 person-years) than for female Non-Aboriginal Canadians (14.8 deaths per 100,000 person-years). No statistically significant differences were found between groups for the other types of cancers.¹

Table 6 Mortality Rates for Selected Cancers
For Registered Indians and Non-Aboriginal Canadians aged 25 years and older (per 100,000 person-years), by sex (age-standardized), 1991-2001

Cancers	Males		Females	
	Registered Indian	Non-Aboriginal Canadian	Registered Indian	Non-Aboriginal Canadian
Lung	49.6	56.8	30.1	28.9
Prostate	15.8	17.4	----	----
Breast	----	----	25.0	28.9
Intestinal/Rectal	18.3	23.1	22.6	14.8

Source: Tjepkema, M., Wilkins, R., Senécal, S., Guimond, E., Penney, C. (2009). Mortality of Métis and Registered Indian adults in Canada: An 11-year follow-up study. *Health Reports* (Statistics Canada, Catalogue 82-003-X). 20(4): 1-21. Available from: <http://www.statcan.gc.ca/pub/82-003-x/2009004/article/11034-eng.htm>.

Notes: Cancers of the trachea, bronchus and lung (ICD-10, codes C33-C34).
Prostate cancer (ICD-10, code C61).
Breast cancer (ICD-10, code C50).
Intestinal/Rectal includes cancer of the small intestine, colon, rectosigmoid junction, rectum, anus and intestinal tract, part unspecified (ICD-10, codes C17-C21, C26.0).
Age-standardized using the 1991 to 2001 total Aboriginal population structure (person-years at risk).
Registered Indians refer to Registered First Nations.
These mortality statistics are estimates. Rates for Canadians that are shown in this table will differ from Canadian mortality rates (on the same conditions) that are displayed elsewhere in *Healthy Canadians 2012*; thus, these data should not be compared with each other.
For additional limitations, please consult the published article noted above.

Mortality rates for lung cancer are higher for residents of Inuit Nunangat[‡] compared to Canada overall

In 2004/08, male and female residents of Inuit Nunangat had higher mortality rates for lung cancer compared to all Canadian males and females. Female residents of Inuit Nunangat also had a higher colorectal cancer mortality rate (9.4 deaths per 100,000 females) than all Canadian females (4.3 deaths per 100,000 females). No statistically significant differences were found between residents of Inuit Nunangat and all Canadians for prostate and breast cancers.

Table 7 Mortality Rates for Selected Cancers
For Residents of Inuit Nunangat[‡] and all Canadians (per 100,000 population), by sex (age-standardized), 2004/08

Cancers	Males		Females	
	Inuit Nunangat	Canada overall	Inuit Nunangat	Canada overall
Lung	38.2	17.1	41.6	12.3
Prostate	7.0 [§]	5.2 [§]	----	----
Breast	----	----	9.5	9.0
Colorectal	12.0	6.7	9.4	4.3

Sources: Statistics Canada. Table 102-0704 - Mortality, by selected causes of death (ICD-10) and sex, five-year average, Canada and Inuit regions, every 5 years, CANSIM (database). Vital Statistics — Death Database and Demography Division (population estimates).

Notes: Lung cancer includes cancer of the trachea, bronchus and lung (ICD-10, codes C33-C34).

Prostate cancer (ICD-10, code C61).

Breast cancer (ICD-10, code C50).

Colorectal includes cancer of the colon, rectosigmoid junction, rectum and anus (ICD-10, codes C18-C21).

[§] Data for prostate cancer for both Inuit Nunangat and Canada overall are from 1999/2003.

Age-standardized to the 2001 total population age structure of Inuit Nunangat.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Numbers and rates on this table are based on the summation of five consecutive years of deaths data.

These mortality statistics are estimates. Rates for Canadians that are shown in this table will differ from Canadian mortality rates (on the same conditions) that are displayed elsewhere in *Healthy Canadians 2012*; thus, these data should not be compared with each other.

For additional limitations, see Annex 2.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

What these results mean for you

In recent years, mortality rates for the four most common cancers (lung, prostate, breast and colorectal) have decreased, with the exception of female lung cancer. For instance, the lung cancer mortality rate for males has dropped 2.3% per year since 1998.² The mortality rate for prostate cancer has declined by 4.3% per year between 2001 and 2007.² The mortality rate for female breast cancer has declined by 2.2% per year since 1998.² The mortality rates for colorectal have decreased by 2.6% per year for males since 2003, and by 1.8% per year in females since 1998.² However, female lung cancer mortality rate has increased by 0.7% per year since 1998.² Despite the decrease in mortality rates, the total number of deaths in Canada continues to rise steadily as the Canadian population grows and ages.

Although genetic factors can be determinants in cancer development, one's lifestyle has a very strong impact on cancer risk; adopting a healthy lifestyle can strongly mitigate the risks of developing cancer. Even after cancer is diagnosed, a change towards a healthy lifestyle has some influence on the slowing of the progression of the disease and might prevent its associated mortality.^{3, 4, 5} It is estimated that about 30% of cancer deaths are due to the five leading behavioural and dietary risks: high body mass index, low fruit and vegetable intake, lack of physical activity, tobacco use and alcohol use.⁶

Smoking is a well-known risk factor for multiple chronic diseases, including lung disease, cardiovascular disease and some types of cancer. Heavy smoking increases the risk of lung cancer by around 30-fold, and smoking causes over 80% of lung cancer in western countries.⁷ Smoking is also a risk factor for other cancers such as larynx, pharynx, oesophageal, pancreas, stomach, bladder, kidney and cervix.⁸ Therefore, smoking cessation is the single most effective modifiable risk factor for cancer.

When it comes to the effect of diet on cancer incidence and mortality, multiple studies have demonstrated that an unhealthy diet may increase the risk of cancer. Eating a balanced diet high in fruits, vegetables and fibre, and low in saturated fats and processed meats may help protect against a number of different types of cancer⁹ including stomach, colorectal,^{10, 11, 12, 13, 14} prostate and breast cancers.^{15, 16, 17}

Obesity is a contributor to a wide variety of cancers including breast, colon and prostate cancer.¹⁸ There is also strong evidence that physical activity decreases the risk of colon and breast cancer,^{19, 20, 21} and may have a moderate effect on prostate and lung cancer.¹⁹

Together with screening and early detection, diagnosis and improved treatment, lifestyle modification may also have an influence on cancer survival.

Things you can do to reduce the risk of cancer-related death

- Do not smoke / stop smoking
- Exercise regularly
- Keep a healthy body weight
- Reduce your alcohol consumption
- Eat a healthy diet

- See your doctor regularly and discuss any sudden changes in your physiology (blood in urine, stool or sputum, persistent cough, sudden weight change, change in sleep patterns, lump in breast, etc.) with him/her; don't wait until your health deteriorates and you have no choice but to see your doctor
- Follow your doctor's advice, be it having screening tests, making changes in lifestyle or diet
- To learn more about cancer prevention and screening, visit the [Canadian Partnership Against Cancer's website](#)
- For additional information on these cancers risk factors, go to page 81 on the incidence rates for cancer

References

- ¹ Tjepkema, M., Wilkins, R., Senécal, S., Guimond, E., Penney, C. (2009). Mortality of Métis and Registered Indian adults in Canada: An 11-year follow-up study. *Health Reports*. Ottawa: Statistics Canada. Catalogue No. 82-003-X. 20(4): 1-21. Available from: <http://www.statcan.gc.ca/pub/82-003-x/2009004/article/11034-eng.htm>.
- ² Canadian Cancer Society's Steering Committee on Cancer Statistics. (2012). *Canadian Cancer Statistics 2012*. Toronto, ON: Canadian Cancer Society. Available from: <http://www.cancer.ca/en/cancer-information/cancer-101/canadian-cancer-statistics-publication/?region=on>.
- ³ Rock, C.L., Demark-Wahnefried, W. (2002). Can lifestyle modification increase survival in women diagnosed with breast cancer? *Journal of Nutrition*. 132: 3504S-3509S. Available from: <http://jn.nutrition.org/cgi/reprint/132/11/3504S>.
- ⁴ Ornish, D., Weidner, G., Fair, W.R., Marlin, R., Pettengill, E.B., Raisin, C.J., Dunn-Emke, S., Crutchfield, L., Jacobs, F.N., Barnard, R.J., Aronson, W.J., McCormac, P., McKnight, D.J., Fein, J.D., Dnistrian, A.M., Weinstein, J., Ngo, T.H., Mendell, N.R., Carroll, P.R. (2005). Intensive lifestyle changes may affect the progression of prostate cancer. *Journal of Urology*. 174: 1065-1070. Available from: <http://www.sciencedirect.com/science/article/pii/S0022534701685185>.
- ⁵ Jones, L.W., Demark-Wahnefried, W. (2006). Diet, exercise, and complementary therapies after primary treatment for cancer. *The Lancet Oncology*. 7(12): 1017-1026. Available from: <http://www.sciencedirect.com/science/article/pii/S1470204506709767>.
- ⁶ World Health Organization. (2012). *Cancer*. WHO fact sheet no. 297. Geneva: WHO, Feb. 2012. Available from: <http://www.who.int/mediacentre/factsheets/fs297/en/>.
- ⁷ International Agency for Research on Cancer. *Cancer: Causes, Occurrence and Control*. IARC Scientific Publications No. 100. Lyon: IARC, 1990.
- ⁸ Centers for Disease Control and Prevention. (2004). *The Health Consequences of Smoking*. Available from: http://www.cdc.gov/tobacco/data_statistics/sgr/2004/complete_report/index.htm.
- ⁹ Boeing, H., Bechthold, A., Bub, A., Ellinger, S., Haller, D., Kroke, A., Leschik-Bonnet, E., Müller, M.J., Oberritter, H., Schulze, M., Stehle, P., Watzl, B. (2012). Critical review: vegetables and fruit in the prevention of chronic diseases. *European Journal of Nutrition*. 51: 637-663. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3419346/pdf/394_2012_Article_380.pdf.
- ¹⁰ Potter, J.D., Steinmetz, K. (1996). Vegetables, fruit and phytoestrogens as preventive agents. In: Stewart, B.W., McGregor, D., eds. *Principles of Chemoprevention*. IARC Scientific Publication No. 139. Lyon: IARC, pages 61-90.
- ¹¹ Jacobs, D.R.J., Marquart, L., Slavin, J., Kushi, L.H. (1998). Whole-grain intake and cancer: an expanded review and meta-analysis. *Nutrition and Cancer*. 30: 85-96. Available from: <http://www.tandfonline.com/doi/pdf/10.1080/01635589809514647>.

- ¹² Murphy, N., Norat, T., Ferrari, P., Jenab, M., Bueno-de-Mesquita, B., Skeie, G., Dahm, C.C., Overvad, K., Olsen, A., Tjønneland, A., Clavel-Chapelon, F., Boutron-Ruault, M.C., Racine, A., Kaaks, R., Teucher, B., Boeing, H., Bergmann, M.M., Trichopoulou, A., Trichopoulos, D., Lagiou, P., Palli, D., Pala, V., Panico, S., Tumino, R., Vineis, P., Siersema, P., van Duijnhoven, F., Peeters, P.H.M., Hjartaker, A., Engeset, D., González, C.A., Sánchez, M.-J., Dorronsoro, M., Navarro, C., Ardanaz, E., Quirós, J.R., Sonestedt, E., Ericson, U., Nilsson, L., Palmqvist, R., Khaw, K.-T., Wareham, N., Key, T.J., Crowe, F.L., Fedirko, V., Wark, P.A., Chuang, S.-C., Riboli, E. (2012). Dietary fibre intake and risks of cancers of the colon and rectum in the European Prospective Investigation into Cancer and Nutrition (EPIC). *PLoS ONE*. 7(6): e39361. Available from: <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0039361;jsessionid=5AF91AF5AA3F2C3E7B94C7B73B9AE8C2>.
- ¹³ Magalhães, B., Peleteiro, B., Lunet, N. (2012). Dietary patterns and colorectal cancer: systematic review and meta-analysis. *European Journal of Cancer Prevention*. 21: 15-23.
- ¹⁴ Norat, T., Lukanova, A., Ferrari, P., Riboli, E. (2002). Meat consumption and colorectal cancer risk: a dose-response meta-analysis of epidemiological studies. *International Journal of Cancer*. 98: 241-256. Available from: <http://onlinelibrary.wiley.com/doi/10.1002/ijc.10126/pdf>.
- ¹⁵ Michaud, D.S., Augustsson, K., Rimm, E.B., Stampfer, M.J., Willett, W.C., Giovannucci, E. (2001). A prospective study on intake of animal products and risk of prostate cancer. *Cancer Causes and Control*. 12: 557-567. Available from: <http://www.jstor.org/stable/3553655>.
- ¹⁶ Gao, X., LaValley, M.P., Tucker, K.L. (2005). Prospective studies of dairy product and calcium intakes and prostate cancer risk: a meta-analysis. *Journal of the National Cancer Institute*. 97(23): 1768-1777. Available from: <http://jnci.oxfordjournals.org/content/97/23/1768.full.pdf+html>.
- ¹⁷ Gandini, S., Merzenich, H., Robertson, C., Boyle, P. (2000). Meta-analysis of studies on breast cancer risk and diet: the role of fruit and vegetable consumption and the intake of associated micronutrients. *European Journal of Cancer*. 36: 636-646. Available from: <http://www.sciencedirect.com/science/article/pii/S0959804900000228>.
- ¹⁸ Public Health Agency of Canada. (2009). *Obesity in Canada: Snapshot*. Available from: <http://www.phac-aspc.gc.ca/publicat/2009/oc/pdf/oc-eng.pdf>.
- ¹⁹ Kruk, J., Aboul-Enein, H.Y. (2006). Physical activity in the prevention of cancer. *Asian Pacific Journal of Cancer Prevention*. 7: 11-21.
- ²⁰ Hardman, A.E. (2001). Physical activity and cancer risk. *Proceedings of the Nutrition Society*. 60: 107-113.
- ²¹ McTiernan, A. (2008). Mechanisms linking physical activity with cancer. *Nature Reviews Cancer*. 8: 205-211. Available from: <http://www.nature.com/nrc/journal/v8/n3/pdf/nrc2325.pdf>.

31. MORTALITY RATE FOR ACUTE MYOCARDIAL INFARCTION (AMI)**32. MORTALITY RATE FOR CEREBROVASCULAR DISEASES****Key Messages**

- Despite a steady decline over the past several decades, cardiovascular diseases (CVD) still account for almost 30% of all deaths in Canada
- They include, among others, acute myocardial infarction (AMI) and cerebrovascular diseases
- Mortality rates for AMI and cerebrovascular diseases have been declining for decades
- Mortality rates for both ischemic heart disease and cerebrovascular diseases were higher for Registered Indians than for Non-Aboriginal peoples
- Ischemic heart disease mortality rates were not found to be different for residents of Inuit Nunangat[‡] and Canadians overall
- Cerebrovascular disease mortality rates were higher for residents of Inuit Nunangat compared to Canada overall

What do these indicators measure?

These indicators measure the number of deaths of individuals in which the underlying cause of death is AMI or cerebrovascular diseases, per 100,000 population that would be observed in the population if it had the same age composition as the reference or “standard” population.

For Registered Indians, the indicator is the number of deaths of individuals 25 years and older in which the underlying cause of death is ischemic heart disease or cerebrovascular disease, per 100,000 population that would be observed in the population if it had the same age composition as the reference or “standard” population. Data for Registered Indians are an average from 1991 to 2001 in order to provide more stability in numbers.

These indicators also measure the number of deaths of individuals living in Inuit Nunangat in which the underlying cause of death is AMI or cerebrovascular diseases, per 100,000 population. The rates for Inuit Nunangat are also age-standardized to the 2001 total population age structure of Inuit Nunangat.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

What are cardiovascular diseases?¹

CVD refer to more than one disease of the circulatory system (which includes the heart and blood vessels). Two major causes of CVD include AMI and stroke. AMI, commonly known as a heart attack, is a result of a complete blockage of an artery in the heart which may eventually lead to tissue damage in the heart from lack of oxygen. Stroke generally refers to a similar problem with the blood vessels of the brain.

Ischemic heart disease is a condition where the heart muscle is damaged or works inefficiently because of the absence or relative deficiency of its blood supply. It can cause a heart attack, angina (chest pain), and sudden death.

Cerebrovascular disease is a broad term that includes strokes and disorders of brain blood vessels. Acute stroke is the most common of these cerebrovascular conditions.

What are the limitations of these indicators?

In Canada, as in many other developed countries, mortality rates for AMI and cerebrovascular diseases have been on the decline for decades. It is not known how much of this decline in mortality rate is due to a decreased incidence of these diseases or improved treatment, in terms of better medical interventions and pharmaceutical treatments for those who developed them.

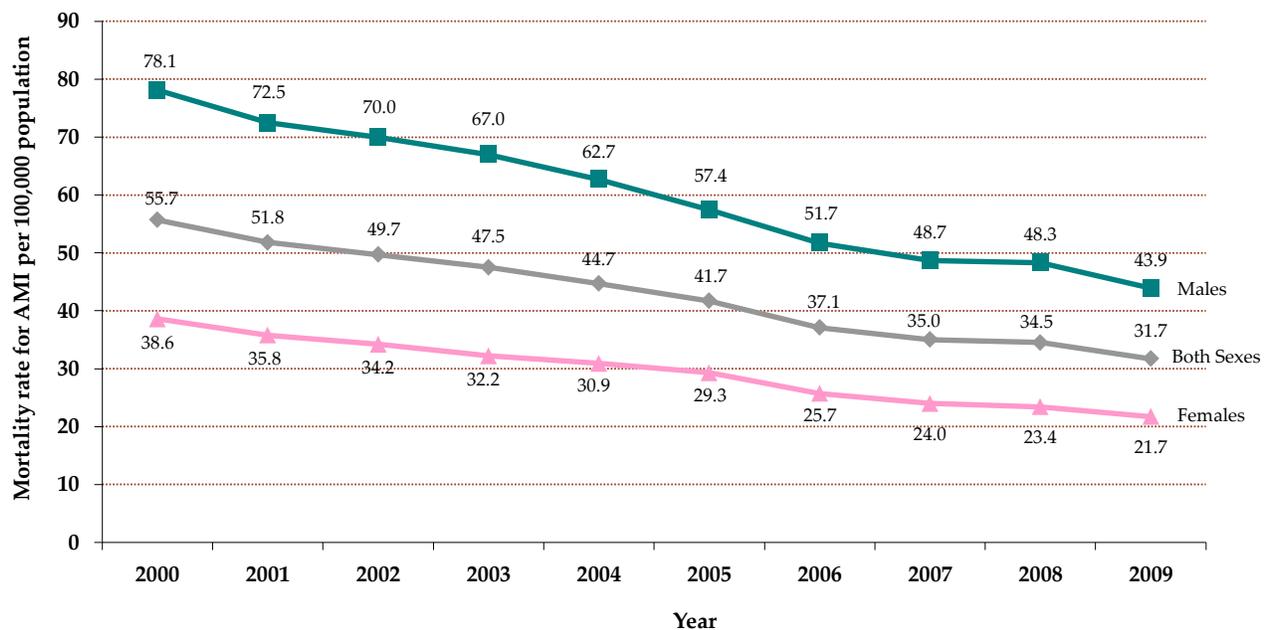
The use of age-standardized mortality rates improves comparability over time by correcting for the increasing age of the population, but may underestimate the actual rates and the true burden on the health care system.

While vital statistics data specific to Inuit are not consistently collected in administrative databases across the country, a method has been developed which allows the use of geographic identifiers to inform the health of Inuit in Canada. Because a high proportion of residents of Inuit Nunangat are Inuit (approximately 82%), health indicators for residents of Inuit Nunangat can serve as a proxy for Inuit-specific health indicators. It should be noted that because these data also include non-Inuit residents of these regions, who tend to have better health outcomes than the Inuit population living in the same area, caution should be used when interpreting these results. While this information is not Inuit-specific, it can be used to infer the health of Inuit in Canada.

Mortality rate for AMI is decreasing

In 2009, the overall AMI mortality rate in Canada was 31.7 deaths per 100,000 population, with 43.9 deaths per 100,000 males and 21.7 deaths per 100,000 females. Mortality (and generally, prevalence and incidence of AMI) has always been higher in males, but over time the difference between sexes has been lessening. AMI mortality rates have steadily decreased since 2000.

Figure 40 Mortality Rate for Acute Myocardial Infarction (AMI)
Per 100,000 population, by sex (age-standardized), Canada, 2000-09



Source: Statistics Canada. Vital Statistics — Death Database.

Notes: Age-standardized to the 1991 Canadian population.
For additional exclusions/limitations, see Annex 2.

Ischemic heart disease mortality rates for Registered Indians were higher than for Non-Aboriginal Canadians

In 1991-2001, the mortality rates for ischemic heart disease of Registered Indians were 155.0 deaths per 100,000 males and 74.8 deaths per 100,000 females, which were higher than the rates for Non-Aboriginal Canadian males (123.2 deaths per 100,000 males) and females (48.8 deaths per 100,000 females).²

Table 8 Mortality Rate for Ischemic Heart Disease
For Registered Indians and Non-Aboriginal Canadians aged 25 years and older (per 100,000 person-years), by sex (age-standardized), 1991-2001

	Males		Females	
	Registered Indian	Non-Aboriginal Canadian	Registered Indian	Non-Aboriginal Canadian
Ischemic Heart Disease	155.0	123.2	74.8	48.8

Source: Tjepkema, M., Wilkins, R., Senécal, S., Guimond, E., Penney, C. (2009). Mortality of Métis and Registered Indian adults in Canada: An 11-year follow-up study. *Health Reports* (Statistics Canada, Catalogue 82-003-X), 20(4): 1-21. Available from: <http://www.statcan.gc.ca/pub/82-003-x/2009004/article/11034-eng.htm>.

Notes: Age-standardized using the 1991 to 2001 total Aboriginal population structure (person-years at risk). Registered Indians refer to Registered First Nations. These mortality statistics are estimates. Rates for Canadians that are shown in this table will differ from Canadian mortality rates (on the same conditions) that are displayed elsewhere in *Healthy Canadians 2012*; thus, these data should not be compared with each other. For additional limitations, please consult the published article noted above.

Ischemic heart disease mortality rates were not found to be statistically different for residents of Inuit Nunangat[‡] and Canadians overall

In 2004/08, no differences were found between the ischemic heart disease mortality rates for residents of Inuit Nunangat and Canadians overall.

Table 9 Mortality Rate for Ischemic Heart Disease
For Residents of Inuit Nunangat[‡] and all Canadians (per 100,000 population), by sex (age-standardized), 2004/08

	Males		Females	
	Inuit Nunangat	Canada Overall	Inuit Nunangat	Canada Overall
Ischemic Heart Disease	33.6	31.6	10.1	12.6

Sources: Statistics Canada. Table 102-0704 - Mortality, by selected causes of death (ICD-10) and sex, five-year average, Canada and Inuit regions, every 5 years, CANSIM (database). Vital Statistics — Death Database and Demography Division (population estimates).

Notes: Age-standardized to the 2001 total population age structure of Inuit Nunangat.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Numbers and rates on this table are based on the summation of five consecutive years of deaths data.

These mortality statistics are estimates. Rates for Canadians that are shown in this table will differ from Canadian mortality rates (on the same conditions) that are displayed elsewhere in *Healthy Canadians 2012*; thus, these data should not be compared with each other.

For additional limitations, see Annex 2.

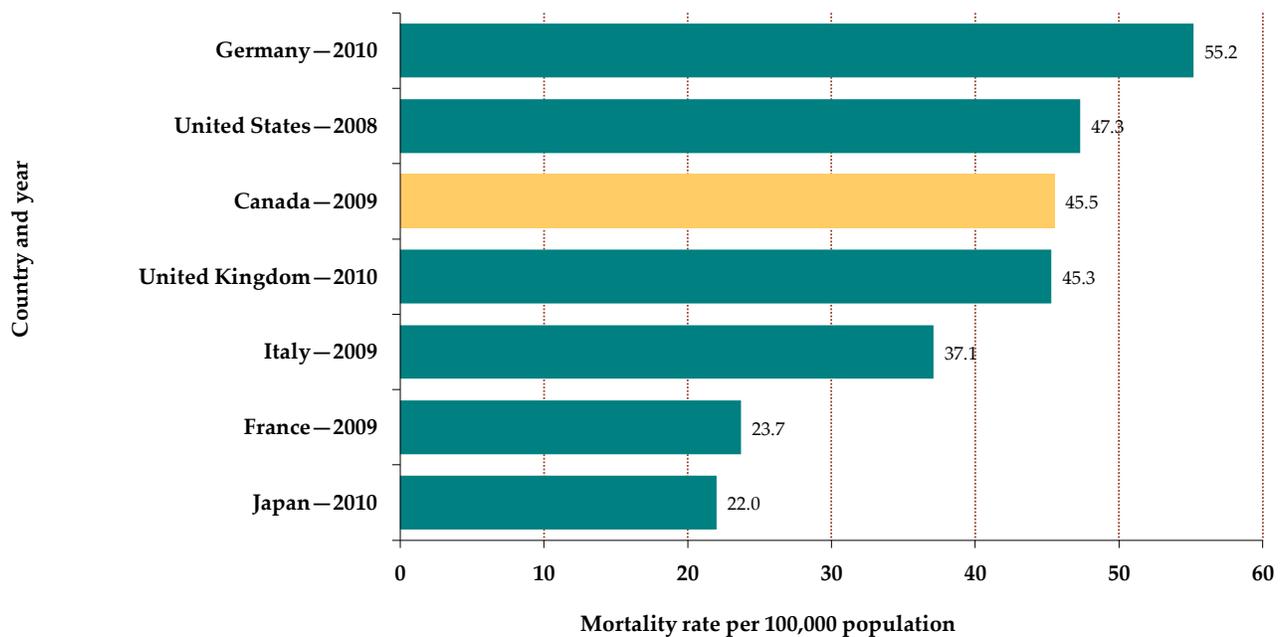
[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Canada has the third highest mortality rate for AMI among G7 countries

Reference years for the Organisation for Economic Co-operation and Development (OECD) data differ according to the country in question. In order to allow comparisons among OECD countries, data presented in OECD charts have been age-standardized to the 2010 total OECD population. Because data reported by Statistics Canada (presented in Figure 40, *Mortality Rate for Acute Myocardial Infarction*) are age-standardized to the 1991 Canadian population, data are not directly comparable between Canadian and international graphs and may vary.

Canada had the third highest rate of AMI mortality among G7 countries (45.5 deaths per 100,000 population), behind Germany and the United States.

Figure 41 Mortality Rate for Acute Myocardial Infarction (AMI)
 Per 100,000 population, both sexes (age-standardized), selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

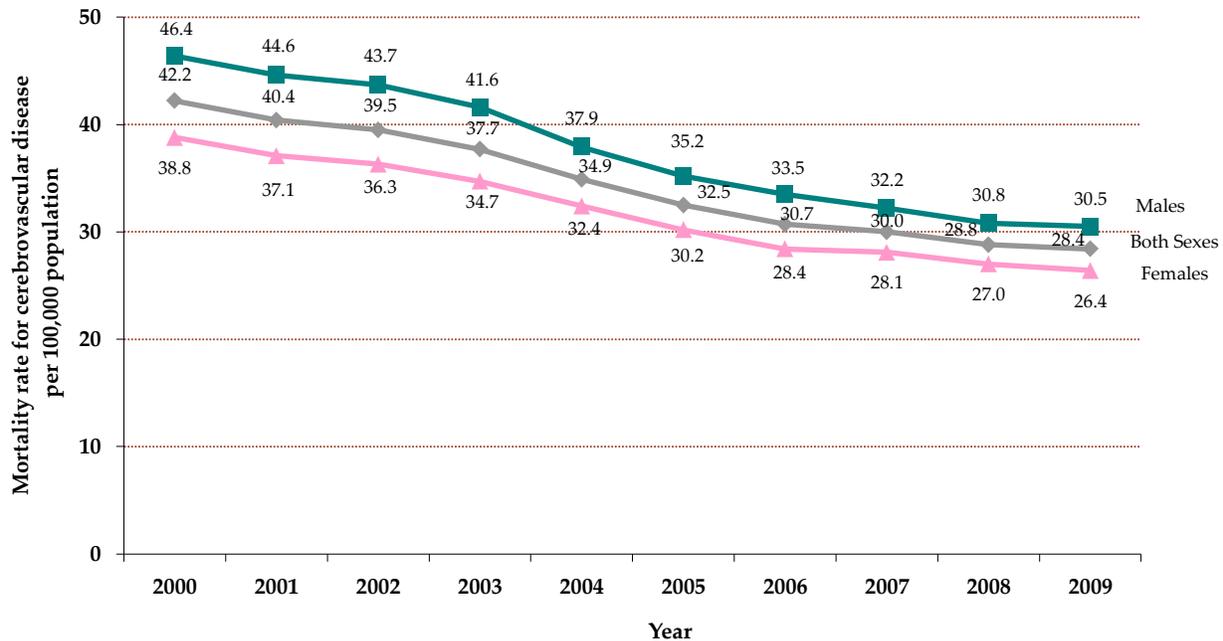
Notes: Data are for selected years.

Data are not comparable to Canadian trend data for the indicator *Mortality rate for acute myocardial infarction (AMI)* because OECD data are age-standardized to the 2010 total OECD population rather than the 1991 Canadian population. For additional exclusions/limitations, see Annex 2.

Mortality rate for cerebrovascular diseases is decreasing

In 2009, the overall mortality rate for cerebrovascular diseases in Canada was 28.4 deaths per 100,000 population, with 30.5 deaths per 100,000 males and 26.4 deaths per 100,000 females.

Figure 42 Mortality Rate for Cerebrovascular Diseases
Per 100,000 population, by sex (age-standardized), Canada, 2000-09



Source: Statistics Canada. Vital Statistics — Death Database.

Notes: Age-standardized to the 1991 Canadian population.
For additional exclusions/limitations, see Annex 2.

Cerebrovascular disease mortality rates for Registered Indians were higher than for Non-Aboriginal Canadians

The mortality rates for cerebrovascular disease of Registered Indians in 1991-2001 were 35.4 deaths per 100,000 males and 40.9 deaths per 100,000 females, higher than the rates for Non-Aboriginal Canadian males (28.2 deaths per 100,000 males) and females (21.4 deaths per 100,000 females).²

Table 10 Mortality Rate for Cerebrovascular Diseases
For Registered Indians and Non-Aboriginal Canadians aged 25 years and older (per 100,000 person-years), by sex (age-standardized), 1991-2001

	Males		Females	
	Registered Indian	Non-Aboriginal Canadian	Registered Indian	Non-Aboriginal Canadian
Cerebrovascular Disease	35.4	28.2	40.9	21.4

Source: Tjepkema, M., Wilkins, R., Senécal, S., Guimond, E., Penney, C. (2009). Mortality of Métis and Registered Indian adults in Canada: An 11-year follow-up study. *Health Reports* (Statistics Canada, Catalogue 82-003-X). 20(4): 1-21. Available from: <http://www.statcan.gc.ca/pub/82-003-x/2009004/article/11034-eng.htm>.

Notes: Age-standardized using the 1991 to 2001 total Aboriginal population structure (person-years at risk). Registered Indians refer to Registered First Nations. These mortality statistics are estimates. Rates for Canadians that are shown in this table will differ from Canadian mortality rates (on the same conditions) that are displayed elsewhere in *Healthy Canadians 2012*; thus, these data should not be compared with each other. For additional limitations, please consult the published article noted above.

Cerebrovascular disease mortality rates are higher for male residents of Inuit Nunangat[‡] compared to all Canadian males

In 2004/08, male residents of Inuit Nunangat had a higher mortality rate for cerebrovascular disease compared to all Canadian males. There was no difference in the mortality rate for cerebrovascular disease between female residents of Inuit Nunangat and all Canadian females.

Table 11 Mortality Rate for Cerebrovascular Diseases
For Residents of Inuit Nunangat[‡] and all Canadians (per 100,000 population), by sex (age-standardized), 2004/08

	Males		Females	
	Inuit Nunangat	Canada Overall	Inuit Nunangat	Canada Overall
Cerebrovascular Disease	14.9	7.6	8.5	6.2

Sources: Statistics Canada. Table 102-0704 - Mortality, by selected causes of death (ICD-10) and sex, five-year average, Canada and Inuit regions, every 5 years, CANSIM (database). Vital Statistics — Death Database and Demography Division (population estimates).

Notes: Age-standardized to the 2001 total population age structure of Inuit Nunangat.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Numbers and rates on this table are based on the summation of five consecutive years of deaths data.

These mortality statistics are estimates. Rates for Canadians that are shown in this table will differ from Canadian mortality rates (on the same conditions) that are displayed elsewhere in *Healthy Canadians 2012*; thus, these data should not be compared with each other.

For additional limitations, see Annex 2.

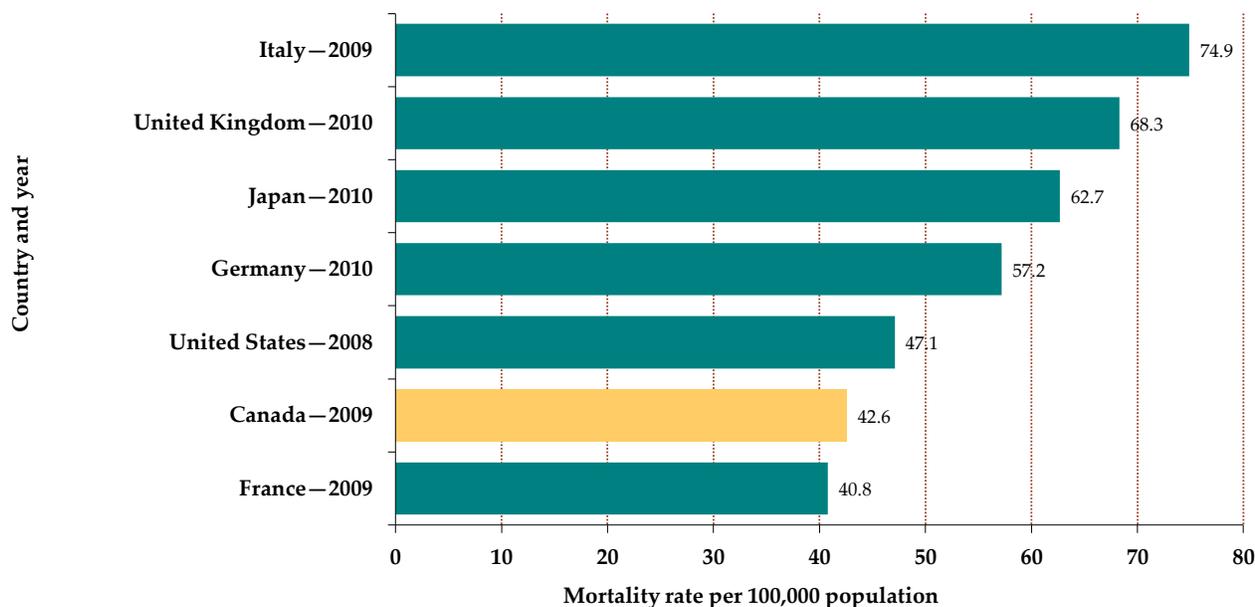
[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Canadians have the second lowest mortality rate for cerebrovascular diseases among G7 countries

Reference years for the Organisation for Economic Co-operation and Development (OECD) data differ according to the country in question. In order to allow comparisons among OECD countries, data presented in OECD charts have been age-standardized to the 2010 total OECD population. Because data reported by Statistics Canada (presented in Figure 42, *Mortality Rate for Cerebrovascular Diseases*) are age-standardized to the 1991 Canadian population, data are not directly comparable between Canadian and international graphs and may vary.

Canada had the second lowest cerebrovascular disease mortality rate in the G7 countries, with 42.6 deaths per 100,000 population, behind France.

Figure 43 Mortality Rate for Cerebrovascular Diseases
Per 100,000 population, both sexes (age-standardized), selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

Notes: Data are for selected years.

Data are not comparable to Canadian trend data for the indicator *Mortality rate for cerebrovascular diseases* because OECD data are age-standardized to the 2010 total OECD population rather than the 1991 Canadian population. For additional exclusions/limitations, see Annex 2.

What these results mean for you

Cardiovascular diseases, including AMI and cerebrovascular diseases, are a major cause of death in Canada, accounting for about one third of all deaths.¹ CVD are chronic, lifelong diseases caused by interactions among genetic predisposition, health behaviours, and the environment. Fortunately, treatment can relieve symptoms, improve the quality of life, and reduce the possibility of early death.³

More importantly, however, CVD can be prevented by not smoking,^{4, 5} regular physical activity,^{6, 7} healthy nutrition,^{8, 9} healthy weight,¹⁰ early recognition and treatment of high blood pressure^{11, 12} and high cholesterol,¹³ along with effective stress management.¹⁴

In Canada, as in many countries, mortality rates for AMI and cerebrovascular diseases have been declining for decades. It is not known how much of this decline is due to a change in the underlying incidence of these diseases, which would reflect an improvement in survival brought on by improved treatment and diagnostic tools.

Optimal prevention of CVD requires the use of primary, secondary and tertiary prevention strategies. Primary prevention, by risk factor modification (e.g., develop healthy eating habits, regular physical activity, etc.), can reduce disease incidence; secondary prevention, through early identification and management of the disease states (e.g., management of high blood pressure, cholesterol, etc.), can increase survival; tertiary prevention, through the rehabilitation from established disease, can further reduce disability and suffering, enhancing quality of life.

Benefits of cardiovascular health

- Better health
- Stronger heart and lungs
- Decreased fatigue to accomplish a particular task
- Improved blood flow through the arteries
- Decreased odds of other serious illnesses

Risk factors associated with AMI and cerebrovascular diseases

- Smoking
- Physical inactivity
- Diet high in saturated and trans fats
- Diet high in sodium
- High blood cholesterol
- High blood pressure
- Obesity
- Diabetes
- Excessive alcohol drinking
- Stress
- A family history of heart disease

Things you can do to prevent heart disease

- Avoid smoking and/or alcohol abuse
- Enjoy a balanced diet by including a variety of foods and choosing lower-fat alternatives
- Engage in regular physical activity
- Manage your stress effectively
- Maintain a healthy body weight

- Speak to your health care provider about other ways to improve your heart health (e.g., early detection and treatment of high blood pressure, diabetes and/or monitoring your blood cholesterol level, etc.)
- To learn more about prevention of CVD, visit the [Public Health Agency of Canada's website](#)

References

- ¹ Public Health Agency of Canada. (2010). *Cardiovascular Disease. Six Types of Cardiovascular Disease*. Available from: <http://www.phac-aspc.gc.ca/cd-mc/cvd-mcv/cvd-mcv-eng.php>.
- ² Tjepkema, M., Wilkins, R., Senécal, S., Guimond, E., Penney, C. (2009). Mortality of Métis and Registered Indian adults in Canada: An 11-year follow-up study. *Health Reports*. Ottawa: Statistics Canada. Catalogue No. 82-003-X. 20(4): 1-21. Available from: <http://www.statcan.gc.ca/pub/82-003-x/2009004/article/11034-eng.htm>.
- ³ Public Health Agency of Canada. (2009). *2009 Tracking heart disease and stroke in Canada*. Available from: <http://www.phac-aspc.gc.ca/publicat/2009/cvd-avc/pdf/cvd-avs-2009-eng.pdf>.
- ⁴ Lakier, J.B. (1992). Smoking and cardiovascular disease. *The American Journal of Medicine*. 93(Suppl. 1): 8S-12S. Available from: <http://www.sciencedirect.com/science/article/pii/000293439290620Q>.
- ⁵ Critchley, J.A., Capewell, S. (2003). Mortality risk reduction associated with smoking cessation in patients with coronary heart disease. *Journal of the American Medical Association*. 290(1): 86-97. Available from: <http://jama.ama-assn.org/cgi/reprint/290/1/86>.
- ⁶ Warren, T.Y., Barry, V., Hooker, S.P., Sui, X., Church, T.S., Blair, S.N. (2010). Sedentary behaviors increase risk of cardiovascular disease mortality in men. *Medicine and Science in Sports and Exercise*. 42(5): 879-885. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2857522/>.
- ⁷ Warburton, D.E.R., Nichol, C.W., Bredin, S.D. (2006). Health benefits of physical activity: the evidence. *Canadian Medical Association Journal*. 174(6): 801-809. Available from: <http://www.cmaj.ca/cgi/reprint/174/6/801>.
- ⁸ van't Veer, P., Jansen, M.C.J.F., Klerk, M., Kok, F.J. (2000). Fruits and vegetables in the prevention of cancer and cardiovascular disease. *Public Health Nutrition*. 3(1): 103-107. Available from: <http://journals.cambridge.org/action/displayFulltext?type=1&fid=626024&jid=&volumeId=&issueId=01&aid=555840&bodyId=&membershipNumber=&societyETOCSession>.
- ⁹ Mente, A., de Koning, L., Shannon, H.S., Anand, S.S. (2009). A systematic review of the evidence supporting a causal link between dietary factors and coronary heart disease. *Archives of Internal Medicine*. 169(7): 659-669. Available from: <http://archinte.ama-assn.org/cgi/reprint/169/7/659>.
- ¹⁰ Lee, C.M.Y., Huxley, R.R., Wildman, R.P., Woodward, M. (2008). Indices of abdominal obesity are better discriminators of cardiovascular risk factors than BMI: a meta-analysis. *Journal of Clinical Epidemiology*. 61: 646-653. Available from: <http://www.sciencedirect.com/science/article/pii/S0895435607003228>.
- ¹¹ Lewington, S., Clarke, R., Qizilbash, N., Peto, R., Collins, R. (2002). Age-specific relevance of usual blood pressure to vascular mortality: a meta-analysis of individual data for one million adults in 61 prospective studies. *The Lancet*. 360: 1903-1913. Available from: <http://www.sciencedirect.com/science/article/pii/S0140673602119118>.
- ¹² Liszka, H.A., Mainous, A.G., King, D.E., Everett, C.J., Egan, B.M. (2005). Prehypertension and cardiovascular morbidity. *Annals of Family Medicine*. 3(4): 294-299. Available from: <http://annfammed.org/cgi/reprint/3/4/294>.
- ¹³ Barter, P., Gotto, A.M., LaRosa, J.C., Maroni, J., Szarek, M., Grundy, S.M., Kastelein, J.J.P., Bittner, V., Fruchart, J.-C. (2007). HDL cholesterol, very low levels of LDL cholesterol, and cardiovascular events. *The New England Journal of Medicine*. 357: 1301-1310. Available from: <http://content.nejm.org/cgi/reprint/357/13/1301.pdf>.
- ¹⁴ Straus, S.E., Majumdar, S.R., McAlister, F.A. (2002). New evidence for stroke prevention: scientific review. *Journal of the American Medical Association*. 288(11): 1388-1395. Available from: <http://jama.jamanetwork.com/article.aspx?articleid=195305>.

33. SELF-REPORTED CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

Key Messages

- Chronic obstructive pulmonary disease (COPD) is a major cause of morbidity and mortality
- COPD is a chronic lung disease characterized by shortness of breath, cough and mucus (sputum) production, and includes chronic bronchitis and emphysema¹
- It progresses slowly over a period of several years
- It usually does not appear in people younger than the age of 55 years, although changes to the lungs begin many years earlier
- In 2011, about 4% of Canadians aged 35 years and older reported suffering from COPD

What does this indicator measure?

This indicator measures the percentage of Canadian adults of 35 years and older who reported that they had been diagnosed by a health professional as having COPD. COPD is a term that includes chronic bronchitis and emphysema.

COPD can be prevented. If you are a smoker, the best thing you can do to reduce or eliminate your risk or slow the progression of the disease is to stop smoking.

What are the limitations of this indicator?

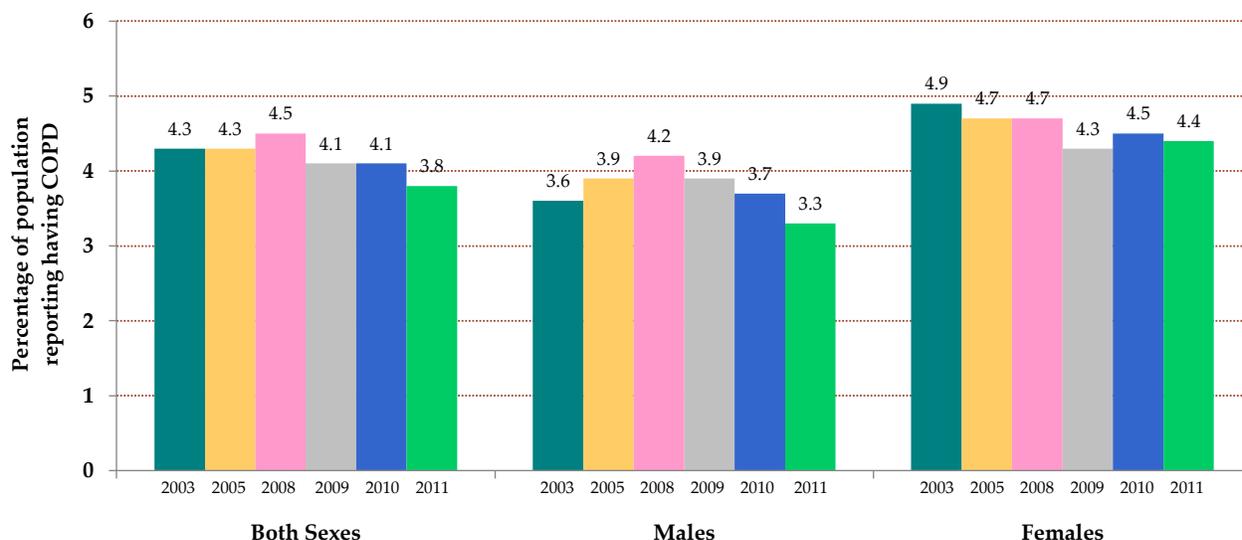
Although this indicator appears to refer to a diagnosis made by a health professional, it is based on the respondents' self-report and is influenced by their ability to remember or comprehend the health professional's diagnosis. In this case, self-reported data are never as accurate as they would be if they came from an actual clinical database.² Research has indicated that for COPD, self-reported prevalence may underestimate the prevalence based on clinical measures of lung function by as much as 50%.³

Work is underway to develop prevalence estimates using administrative data through the Canadian Chronic Disease Surveillance System.

Few Canadians reported being diagnosed with COPD

In 2011, 3.8% of Canadians aged 35 years and older reported that they had been diagnosed by a health professional as having COPD. Rates for males and females were 3.3% and 4.4%, respectively.

Figure 44 Chronic Obstructive Pulmonary Disease (COPD)
Percentage of population aged 35 years and older who reported having COPD, by sex, (age-standardized), Canada, 2003-11

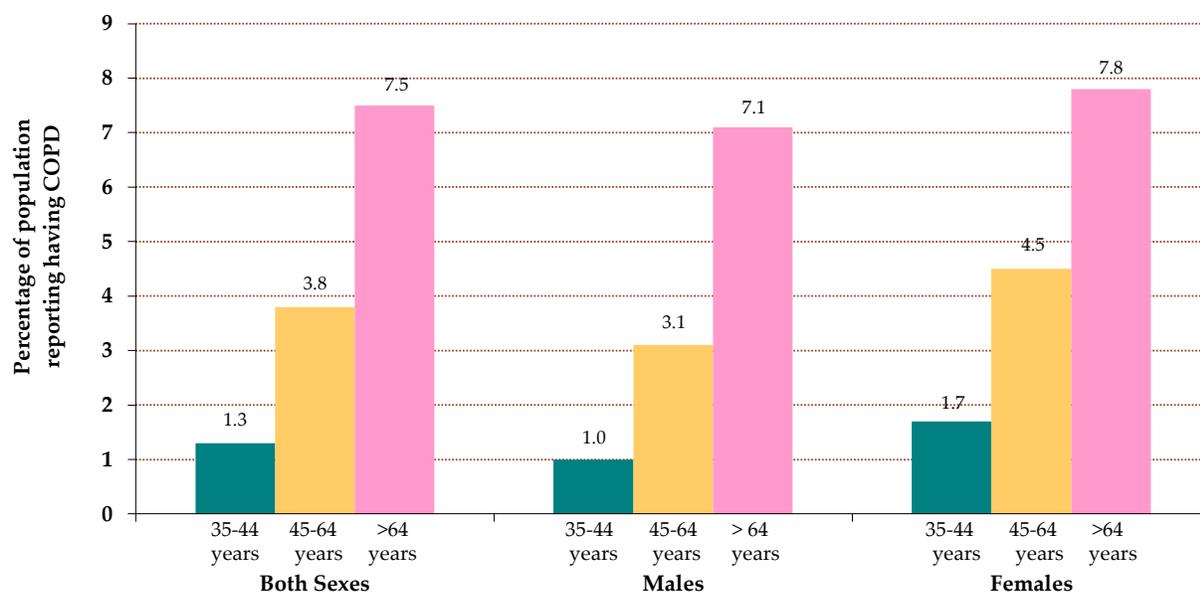


Source: Statistics Canada. Canadian Community Health Survey, 2003-11.

Notes: Includes household population aged 35 years and older who reported that they had been diagnosed by a health professional as having COPD. COPD includes two main diseases: chronic bronchitis and emphysema. Age-standardized to the 1991 Canadian population. For additional exclusions/limitations, see Annex 2.

As people age, they are more likely to report having been diagnosed with COPD.

Figure 45 Chronic Obstructive Pulmonary Disease (COPD)
 Percentage of population aged 35 years and older who reported having COPD,
 by sex and age group, (age-standardized), Canada, 2011



Source: Statistics Canada. Canadian Community Health Survey, 2011.

Notes: Includes household population aged 35 years and older who reported that they had been diagnosed by a health professional as having COPD. COPD includes two main diseases: chronic bronchitis and emphysema. Age-standardized to the 1991 Canadian population. For additional exclusions/limitations, see Annex 2.

What these results mean for you

Chronic obstructive pulmonary disease (COPD) is a chronic disease characterized by shortness of breath, cough and mucus (sputum) production. It slowly progresses over several years and, as severity increases, leads to a further reduction in airflow and possibly premature death.¹ It becomes such a debilitating disease that the activity levels of individuals are limited, reducing their quality of life.

Unlike most other leading causes of death and disability, COPD is projected to increase around the world as the population ages.^{4,5} Furthermore, some researchers suggest that the rates of COPD mortality and morbidity are rising faster among females than males, and this may be linked to an increase in tobacco exposure or to greater susceptibility among females.^{6,7,8}

Benefits of healthy lungs

Your lungs are the main structures of the respiratory system allowing the exchange of gases between the atmospheric air and your body. The function of the lungs is to supply the body with oxygen (carried through the blood) and dispose of carbon dioxide and other waste gases. This process is called respiration.

Healthy lungs offer the following benefits:

- More efficient and faster gas exchange between the atmospheric air and the body through the alveoli
- Greater capacity to perform daily chores and activities, reducing the feeling of not having enough air (feeling winded)
- Less fatigue during physical activity
- Smaller amount of mucus or sputum formed in the respiratory system

Risk factors for COPD¹

- Smoking is the principal risk factor in 80% to 90% of cases
- Second-hand smoke exposure may also play an important role, as well as biomass fuel smoke in less-developed countries⁹
- Occupational exposure to various dusts, chemicals, vapours and fumes is a factor for many people
- Exposure to indoor air pollutants such as dust and animal hair can trigger symptoms in those with COPD
- Outdoor air pollution is associated with increased symptoms among those with COPD, including shortness of breath; however, it plays a smaller role than indoor air pollutants
- Repeated episodes of respiratory tract infections during childhood could lead to reduced levels of respiratory function, which may predispose a person to COPD
- A genetic deficiency of the serine protease alpha-1-antitrypsin, an enzyme which protects lung tissue from damage, is also associated with an increased risk of COPD

Things you can do to prevent getting COPD

- Do not smoke
- If you smoke, get help quitting since smoking is the main cause of lung disease
- Avoid second-hand smoke
- Protect yourself from hazards at work, especially if the work environment contains dust, chemicals, vapours and fumes; wear a protective mask
- On days with poor air quality, staying inside and avoiding vigorous outdoor exercise may help reduce symptoms and the risk of COPD exacerbation
- Speak with a health care provider for more information on COPD
- More information is available at Health Canada's [*Air Pollution and Heart and Lung Disease*](#)
- For more information on COPD, visit the [Public Health Agency of Canada](#) website or the [Canadian Lung Association](#) website

References

- ¹ Public Health Agency of Canada. (2007). *Life and Breath: Respiratory Disease in Canada*. Available from: <http://www.phac-aspc.gc.ca/publicat/2007/lbrdc-vsmrc/index-eng.php>.
- ² Bhandari, A., Wagner, T. (2006). Self-reported utilization of health care services: improving measurement and accuracy. *Medical Care Research and Review*. 63(2): 217-235.
- ³ Buist, A.S., McBurnie, M.A., Vollmer, W.M., Gillespie, S., Burney, P., Mannino, D.M., Menezes, A.M.D., Sullivan, S.D., Lee, T.A., Weiss, K.B., Jensen, R.L., Marks, G.B., Gulsvik, A., Nizankowska-Mogilnicka, E., on

- behalf of the BOLD Collaborative Research Group. (2007). International variation in the prevalence of COPD (The BOLD Study): a population-based prevalence study. *The Lancet*. 370: 741-750. Available from: <http://www.sciencedirect.com/science/article/pii/S0140673607613774>.
- ⁴ Halbert, R.J., Natoli, J.L., Gano, A., Badamgarav, E., Buist, A.S., Mannino, D.M. (2006). Global burden of COPD: systematic review and meta-analysis. *European Respiratory Journal*. 28(3): 523-532. Available from: <http://www.ersj.org.uk/cgi/reprint/28/3/523>.
- ⁵ Mannino, D.M., Buist, A.S. (2007). Global burden of COPD: risk factors, prevalence, and future trends. *The Lancet*. 370: 765-773. Available from: <http://www.sciencedirect.com/science/article/pii/S0140673607613804>.
- ⁶ Mannino, D.M., Homa, D.M., Akinbami, L.J., Ford, E.S., Redd, S.C. (2002). Chronic obstructive pulmonary disease surveillance-United States, 1971-2000. *Respiratory Care*. 47: 1184-1199.
- ⁷ Prescott, E., Bjerg, A.M., Andersen, P.K., Lange, P., Vestbo, J. (1997). Gender difference in smoking effects on lung function and risk of hospitalization for COPD: results from a Danish longitudinal population study. *European Respiratory Journal*. 10: 822-827. Available from: <http://erj.ersjournals.com/cgi/reprint/10/4/822>.
- ⁸ Kennedy, S.M., Chambers, R., Du, W., Dimich-Ward, H. (2007). Environmental and occupational exposures: do they affect chronic obstructive pulmonary disease differently in women and men? *Proceedings of the American Thoracic Society*. 4: 692-694. Available from: <http://www.atsjournals.org/doi/full/10.1513/pats.200707-094SD>.
- ⁹ Hu, G., Zhou, Y., Tian, J., Yao, W., Li, J., Li, B., Ran, P. (2010). Risk of COPD from exposure to biomass smoke: a metaanalysis. *Chest*. 138(1): 20-31. Available from: <http://journal.publications.chestnet.org/data/Journals/CHEST/22087/082114.pdf>.

34. SELF-REPORTED ASTHMA

Key Messages

- Asthma is a respiratory condition that includes coughing, shortness of breath, chest tightness and wheezing
- Asthma affects many children and adults worldwide
- Some environmental factors may increase the risk of asthma
- It is important to get the right medicine to control your asthma and to take it as directed
- While among children, more boys than girls experience asthma,¹ the reverse is true among adults: in 2011, women (9.9%) were more likely than men (7.6%) to report that they suffered from asthma
- In 2008/10, the asthma rate was higher for First Nations female adults (13.1%) than for male adults (6.7%)
- In 2006, Inuit living in Inuit Nunangat[‡] (6%) were less likely to have asthma than Inuit living elsewhere in Canada (14%)

What does this indicator measure?

This indicator measures the percentage of Canadians aged 12 years and older who reported that they had been diagnosed by a health professional as having asthma.

It also measures the percentage of First Nations adults aged 18 years and older living in First Nations communities* who reported that they had been diagnosed by a health professional as having asthma.

Similarly, it measures the percentage of Inuit aged 18 years and older who reported that they had been diagnosed by a health professional as having asthma.

Who gets asthma?
Asthma affects over three million Canadians. While asthma is not contagious, it can be caused by both hereditary (inherited) and environmental factors.

What are the limitations of this indicator?

Some asthma symptoms are not unique to asthma but are shared by other diseases such as bronchiolitis in children and chronic obstructive pulmonary disease (COPD) in adults.² Asthma is also variable over time so any or all of the symptoms may not be present at any particular point in time.³

Furthermore, even though this indicator appears to refer to a diagnosis made by a health professional, it is based on the respondents' self-report and is influenced by their ability to remember or comprehend the health professional's diagnosis. In this case, self-reported data are never as accurate as they would be if they came from an actual clinical database.⁴

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

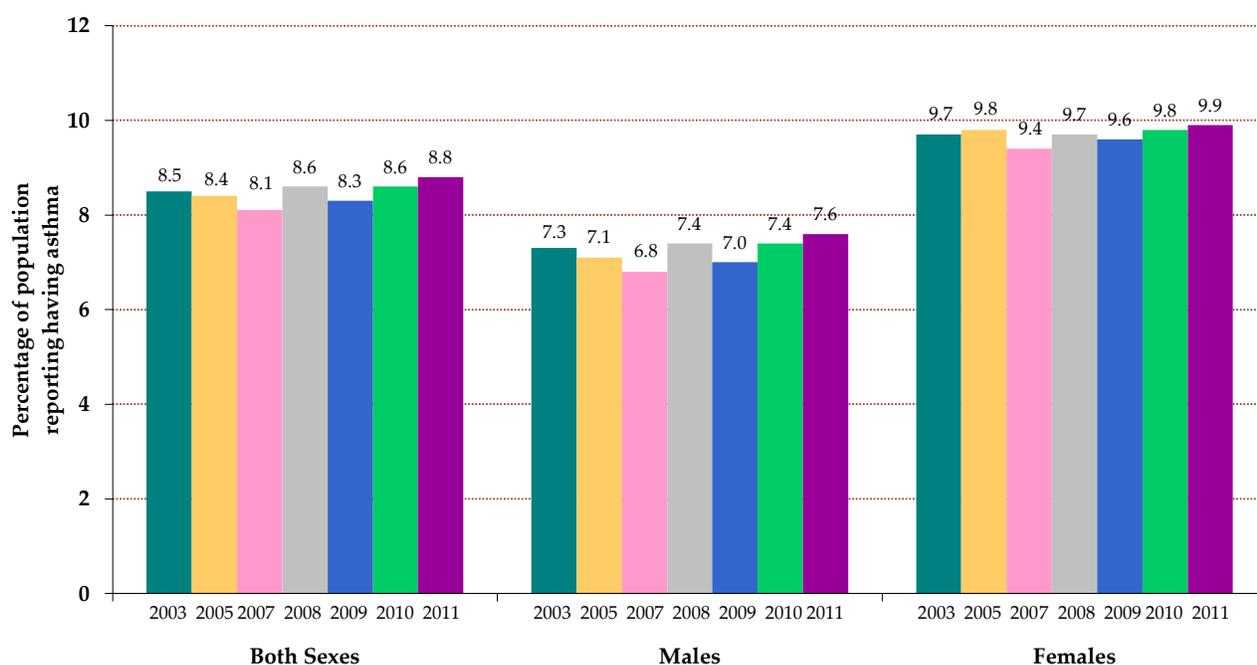
* First Nations living on reserve and in northern First Nations communities.

Work is underway to develop prevalence estimates using administrative data through the Canadian Chronic Disease Surveillance System.

Canadian females are more likely than males to report that they suffer from asthma

In 2011, 8.8% of Canadians aged 12 years and older reported having been diagnosed with asthma by a health professional. Overall, a greater percentage of females (9.9%) than males (7.6%) reported that they had asthma.

Figure 46 Self-Reported Asthma
Percentage of population aged 12 years and older who reported having asthma, by sex (age-standardized), Canada, 2003-11



Source: Statistics Canada. Canadian Community Health Survey, 2003-11.

Notes: Population aged 12 years and older who reported that they had been diagnosed by a health professional as having asthma.

Age-standardized to the 1991 Canadian population.

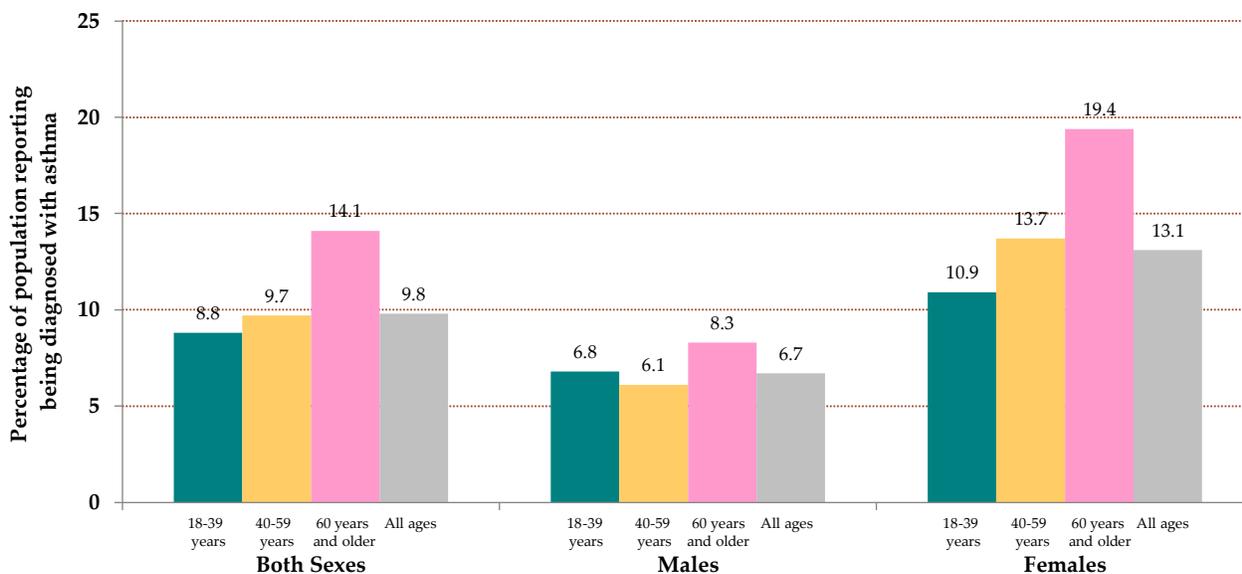
For additional exclusions/limitations, see Annex 2.

The asthma rate is higher for First Nations adults than that for the total Canadian population

For the 2008/10 period, 9.8% of First Nations adults aged 18 years and older living in First Nations communities* reported having been diagnosed with asthma. This was higher than the 2008 figure of 8.3% for the total population of Canada.⁵

The percentage for First Nations women was about double that for men – 13.1% compared with 6.7%. The highest reports of asthma came from women aged 60 years and older at 19.4%.

Figure 47 Self-Reported Asthma
Percentage of First Nations adults living in First Nations communities,* aged 18 years and older, who reported having asthma, by sex and age group, 2008/10



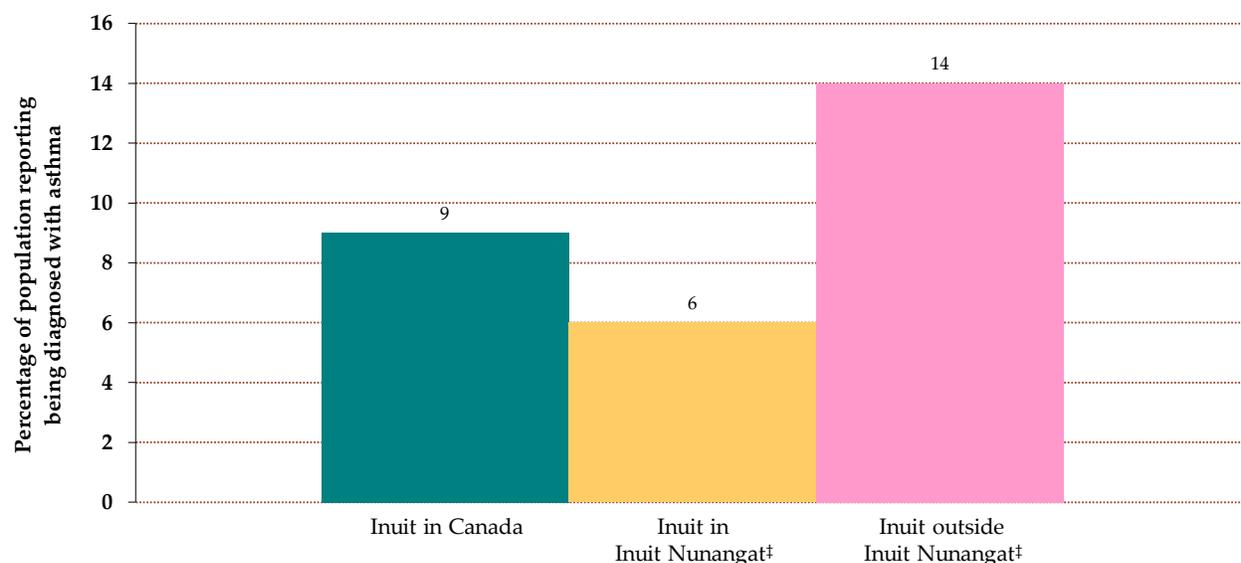
Source: First Nations Information Governance Centre. First Nations Regional Health Survey (RHS), 2008/10.
 Notes: * First Nations living on reserve and in northern First Nations communities.
 Population aged 18 years and older who reported that they had been diagnosed by a health professional as having asthma.
 For additional exclusions/limitations, see Annex 2.

* First Nations living on reserve and in northern First Nations communities.

Inuit living in Inuit Nunangat[‡] less likely than Inuit living elsewhere to have asthma

Among Inuit aged 15 years and older in Canada, 9% reported having been diagnosed with asthma. Inuit adults living outside Inuit Nunangat were more likely than those living in Inuit Nunangat to have been diagnosed (14% compared with 6%).

Figure 48 Self-Reported Asthma
Percentage of Inuit aged 15 years and older who reported having asthma, both sexes, by region, 2006



Source: Statistics Canada. Aboriginal Peoples Survey, 2006: "Inuit Health and Social Conditions: Supporting Data Tables." Catalogue no. 89-637-X, No. 002.

Notes: Population aged 15 years and older who reported that they were diagnosed with asthma.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).
For additional exclusions/limitations, see Annex 2.

What these results mean for you

Health professionals define asthma as a chronic inflammatory disease of the airways that is characterized by coughing, shortness of breath, chest tightness and wheezing. Asthma symptoms and attacks (episodes of severe shortness of breath) usually occur after exercise or exposure to allergens, viral respiratory infections, irritant fumes or gases. These exposures cause an inflammation of the airway wall and an abnormal narrowing of the airways, which lead to asthma symptoms.⁶

A family history or genetic predisposition to develop allergies and allergic disorders⁶ is a significant risk factor for developing asthma. Other risk factors include exposure of susceptible children in early life to

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

airborne allergens, frequent respiratory infections early in life,^{7,8} low birth weight,⁹ obesity^{10,11} and respiratory distress syndrome.¹²

There is also sufficient evidence to conclude that there is an association between environmental tobacco smoke and the development of asthma in younger children. In addition, maternal smoking during and following pregnancy is associated with an increased risk of asthma in early life. For adults, the risk of asthma and environmental tobacco smoke exposures in the workplace are strongly related.¹³

There is a growing body of literature that suggests that exposure to certain environmental factors, such as the presence from before birth and onward of a dog or other pet in the home^{14,15} and attendance at day care during the first year of life¹⁶ may protect against the development of allergic asthma in childhood.¹⁷ Other protective factors include breastfeeding,^{18,19,20} food of plant origin,²¹ immunisations^{21,22,23} and farm-reared children.²²

Importance of breathing properly

- Provides you with more energy
- Helps you cope with and overcome stress
- Improves blood circulation and relieves congestion
- Increases the supply of oxygen and nutrients to cells throughout the body and the release of carbon dioxide (CO₂) and other gases

Problems related to asthma

- Missing days of school or work because of asthma symptoms
- Sleep deprivation and impairment of daytime cognitive performance
- Limitations in your daily and physical activities
- Higher risk of developing mood and anxiety disorders, such as depression
- Higher risk of developing chronic obstructive pulmonary disease as an adult
- Death

Things you can do to prevent and manage your asthma symptoms

- Learn how to use medications properly
- Work with a Certified Respiratory Educator to learn about asthma control
- Warm up before playing sports or exercising to relax the airways
- Know your asthma triggers and avoid them
- Make a written asthma management plan in consultation with your physician and/or asthma educator
- More information is available at Health Canada's [*Air Pollution and Heart and Lung Disease*](#)
- For more helpful tips on preventing and managing asthma symptoms, please visit the [Public Health Agency of Canada's website](#) on asthma

References

- ¹ Public Health Agency of Canada. (2007). *Life and Breath: Respiratory Disease in Canada*. Available from: <http://www.phac-aspc.gc.ca/publicat/2007/lbrdc-vsmrc/index-eng.php>.
- ² Baker, D., Marks, G., Poulos, L., Williamson, M. (2004). Review of proposed National Health Priority Area asthma indicators and data sources. Available from: http://www.asthmonitoring.org/PDF/review_asthma_ind_final.pdf.
- ³ Phelan, P.D., Robertson, C.F., Olinsky, A. (2002). The Melbourne Asthma Study: 1964-1999. *Journal of Allergy and Clinical Immunology*. 109(2): 189-194. Available from: <http://www.sciencedirect.com/science/article/B6WH4-45V7WVK-2/2/ebb8e36702ff3b26e5c08abf88a0b9e4>.
- ⁴ Bhandari, A., Wagner, T. (2006). Self-reported utilization of health care services: improving measurement and accuracy. *Medical Care Research and Review*. 63(2): 217-235.
- ⁵ Data for the total population of Canada are from the 2008 Canadian Community Health Survey (CCHS). These estimates have been standardized to the age distribution of the 2008 First Nations population living in First Nations communities aged 18 years and older.
- ⁶ Public Health Agency of Canada. (2008). *Asthma*. Available from: <http://www.phac-aspc.gc.ca/cd-mc/crd-mrc/asthma-asthme-eng.php>.
- ⁷ von Mutius, E., Illi, S., Hirsch, T., Leupold, W., Keil, U., Weiland, S.K. (1999). Frequency of infections and risk of asthma, atopy and airway hyperresponsiveness in children. *European Respiratory Journal*. 14: 4-11. Available from: <http://erj.ersjournals.com/content/14/1/4.long>.
- ⁸ Calvani, M. Jr., Alessandri, C., Bonci, E. (2002). Fever episodes in early life and the development of atopy in children with asthma. *European Respiratory Journal*. 20: 391-396. Available from: <http://erj.ersjournals.com/cgi/content/abstract/20/2/391>.
- ⁹ Potera, C. (2003). Low birth weight linked to asthma. *Environmental Health Perspectives*. 111(3): 146-149.
- ¹⁰ Beuther, D.A., Weiss, S.T., Sutherland, E.R. (2006). Obesity and asthma. *American Journal of Respiratory and Critical Care Medicine*. 174: 112-119.
- ¹¹ Camargo, C.A. Jr., Weiss, S.T., Zhang, S., Willett, W.C., Speizer, F.E. (1999). Prospective study of body mass index, weight change, and risk of adult-onset asthma in women. *Archives of Internal Medicine*. 159: 2582-2588. Available from: <http://archinte.ama-assn.org/cgi/reprint/159/21/2582>.
- ¹² Smith, G.C.S., Wood, A.M., White, I.R., Pell, J.P., Cameron, A.D., Dobbie, R. (2004). Neonatal respiratory morbidity at term and the risk of childhood asthma. *Archive of Disease in Childhood*. 89: 956-960. Available from: <http://adc.bmj.com/content/89/10/956.abstract>.
- ¹³ Gilmour, I., Jaakkola, M.S., London, S.J., Nel, A.E., Rogers, C.A. (2006). How exposure to environmental tobacco smoke, outdoor air pollutants, and increased pollen burdens influences the incidence of asthma. *Environmental Health Perspectives*. 114(4): 627-633. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1440792/>.
- ¹⁴ Lau, S., Illi, S., Sommerfeld, C., Niggemann, B., Bergman, R., von Mutius, E., Wahn, U., & the Multicentre Allergy Study Group. (2000). Early exposure to house-dust mite and cat allergens and development of childhood asthma: a cohort study. *The Lancet*. 356: 1392-1397. Available from: <http://www.sciencedirect.com/science/article/pii/S0140673600028427>.
- ¹⁵ Reijonen, T.M., Kotaniemi-Syrjanen, A., Korhonen, K., Korppi, M. (2000). Predictors of asthma three years after hospital admission for wheezing in infancy. *Pediatrics*. 106: 1406-1412. Available from: <http://pediatrics.aappublications.org/cgi/content/abstract/106/6/1406>.
- ¹⁶ Celedón, J.C., Lintonjua, A.A., Ryan, L., Weiss, S.T., Gold, D.R. (2002). Day care attendance, respiratory tract illnesses, wheezing, asthma, and total serum IgE level in early childhood. *Archives of Pediatrics & Adolescent Medicine*. 156(3): 241-245. Available from: <http://archpedi.ama-assn.org/cgi/reprint/156/3/241.pdf>.
- ¹⁷ Weiss, S.T. (2002). Eat Dirt – The Hygiene Hypothesis and allergic diseases. *The New England Journal of Medicine*. 347(12): 930-931. Available from: <http://content.nejm.org/cgi/content/full/347/12/930>.

- ¹⁸ Bateman, E.D., Hurd, S.S., Barnes, P.J., Bousquet, J., Drazen, J.M., FitzGerald, M., Gibson, P., Ohta, K., O'Byrne, P., Pedersen, S.E., Pizzichini, E., Sullivan, S.D., Wenzel, S.E., Zar, H.J. (2008). Global strategy for asthma management and prevention: GINA executive summary. *European Respiratory Journal*. 31(1): 143-178. Available from: <http://erj.ersjournals.com/content/31/1/143.long>.
- ¹⁹ Akobeng, A.K., Heller, R.F. (2007). Assessing the population impact of low rates of breast feeding on asthma, coeliac disease and obesity: the use of a new statistical method. *Archives of Disease in Childhood*. 92(6): 483-485. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2066141/>.
- ²⁰ Ong, K.K., Forouhi, N. (2007). Communicating the benefits of breast feeding. *Archives of Disease in Childhood*. 92(6): 471-472. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2066153/>.
- ²¹ Asher, M.I., Stewart, A.W., Mallol, J., Montefort, S., Lai, C.K.W., Ait-Khaled, N., Odhiambo, J., and the ISAAC Phase One Study Group. (2010). Which population level environmental factors are associated with asthma, rhinoconjunctivitis and eczema? Review of the ecological analyses of ISAAC Phase One. *Respiratory Research*. 11: 8. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2831000/pdf/1465-9921-11-8.pdf>.
- ²² Apter, A.J., Szeffler, S.J. (2006). Advances in adult and pediatric asthma. *Journal of Allergy and Clinical Immunology*. 117(3): 512-518. Available from: <http://www.sciencedirect.com/science/article/pii/S0091674906001709#>.
- ²³ Anderson, M., Carroll, W. (2009). Virus vaccines and children with asthma. *Current Opinion in Allergy and Clinical Immunology*. 9(1): 44-49.

35. SELF-REPORTED TEENAGE SMOKING

36. SELF-REPORTED ADULT SMOKING

Key Messages

- Smoking is the leading cause of premature mortality in the developed world
- It is linked to higher risk of developing several types of cancer
- Over the past decade, smoking rates have decreased in Canada for teenagers and all Canadians
- Smoking prevalence remains much higher among First Nations people and Inuit than in the general population

What do these indicators measure?

These indicators measure the proportion of the population aged 12 to 19 years (for teenagers), and 12 years and older (for the Canadian population) who reported they were current (daily or occasional) smokers at the time of the interview. In the Canadian Community Health Survey (CCHS), current smokers included daily and occasional smokers; occasional smokers are individuals who did not smoke daily.

For First Nations people living in First Nations communities,* this indicator measures the percentage of the population aged 12 to 17 years (for youth) and 18 years and older (for adults) who reported that they were daily or occasional smokers. Data for First Nations people living in First Nations communities are drawn from the 2008/10 First Nations Regional Health Survey (RHS).

For Inuit, this indicator measures the percentage of the population aged 15 years and older who reported they were daily or occasional smokers. Data for Inuit are drawn from the 2006 Aboriginal Peoples Survey.

Smoking is the leading cause of preventable death in the world.

What are the limitations of these indicators?

The validity of self-reported smoking is often questioned because of the common belief that smokers underestimate the amount of cigarettes smoked or deny smoking altogether to conform to the *perceived social norm* of "not smoking." However, a recent Canadian study shows that smoking prevalence based on self-reported data from the Canadian Community Health Survey (CCHS) closely matches estimates from measured urinary cotinine concentration data, a validated marker of smoking, from the Canadian Health Measure Survey (CHMS).¹

The accuracy of self-report versus actual smoking rates may be influenced by the data collection method. Research suggests that interviewer-administered questionnaires (or face-to-face interviews) yielded

* First Nations living on reserve and in northern First Nations communities.

higher accuracy of self-report versus actual smoking rates than did self-administered questionnaires or phone interviews.² Data for the CCHS used a mixed methodology of phone or in person interviews.

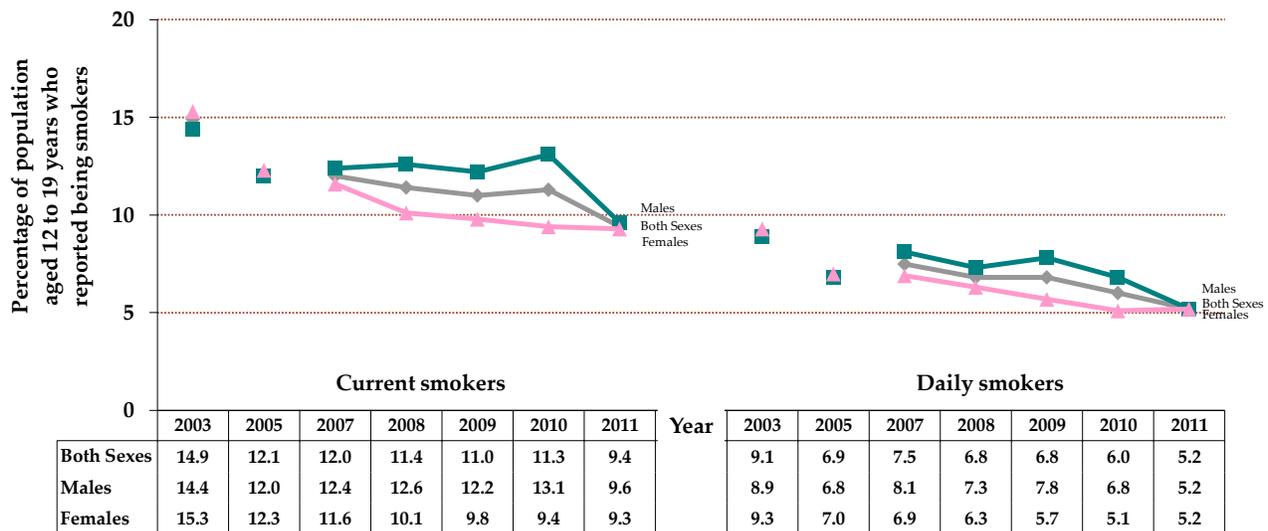
For the Aboriginal Peoples Survey (APS), the survey was conducted using personal interviews in Inuit regions. Telephone interviews were conducted with Inuit living elsewhere in Canada. The First Nations Regional Health Survey data were collected through personal interviews.

Also of note is the fact that the prevalence of smoking for the Canadian population is presented in two categories: current and daily smokers where current smokers include both daily and occasional smokers. Smoking prevalence for First Nations and Inuit are presented in two mutually exclusive categories: daily and occasional smokers.

Teenage smoking rates are declining overall

In 2011, 9.4% of Canadian teenagers reported being current smokers, a decline from 14.9% in 2003. The percentage of teenage males who were current smokers has decreased to 9.6% in 2011 from 14.4% in 2003. The percentage of teenage females who were current smokers has decreased to 9.3% in 2011 from 15.3% in 2003. Also in 2011, 5.2% of Canadian teenagers reported being daily smokers, a decrease from 9.1% in 2003. The percentage of male and females daily smokers decreased to 5.2% in 2011, from 8.9% for males in 2003 and from 9.3% in females in 2003.

Figure 49 Self-Reported Teenage Smoking Rates
Percentage of population aged 12 to 19 years, by current and daily smokers, by sex, Canada, 2003-11



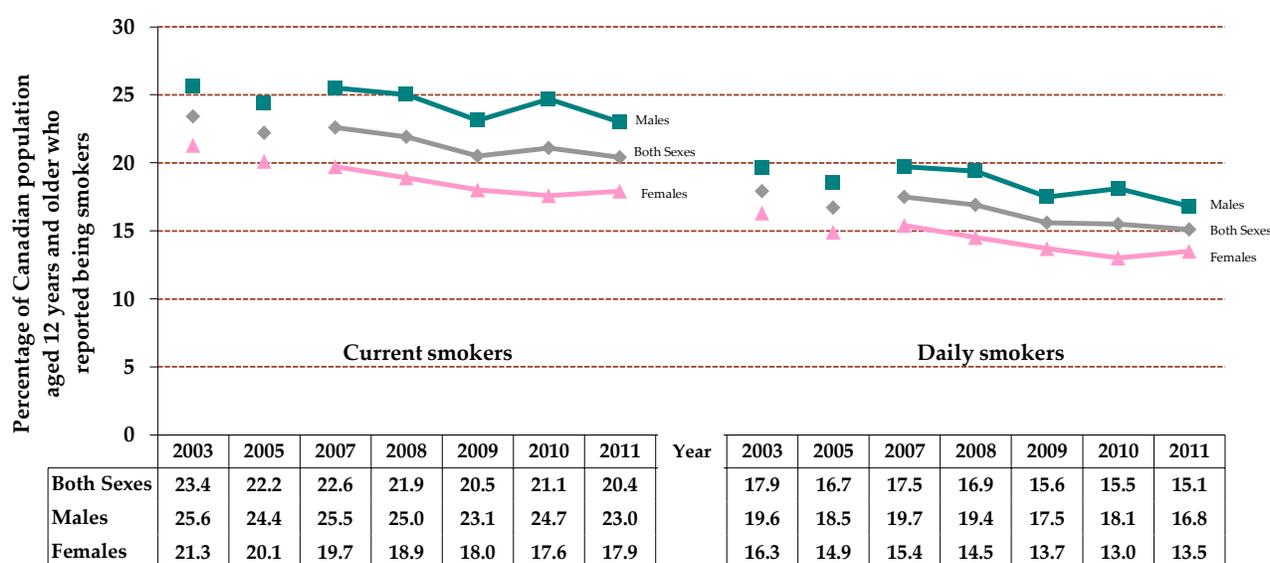
Source: Statistics Canada. Canadian Community Health Survey, 2003-11.
Notes: Current smokers include daily smokers and occasional smokers.
For additional exclusions/limitations, see Annex 2.

Canadian smoking rates are declining

In 2011, 20.4% of Canadians aged 12 years and older reported being current smokers, a decline from 23.4% in 2003. In 2011, 23.0% of males 12 years and older were current smokers, a decrease from 25.6% in 2003. Also in 2011, female current smokers decreased to 17.9% from 21.3% in 2003.

In 2011, 15.1% of Canadians aged 12 years and older reported being daily smokers, a decrease from 17.9% in 2003. Male daily smokers decreased to 16.8% in 2011 from 19.6% in 2003. Female daily smokers decreased to 13.5% in 2011 from 16.3% in 2003.

Figure 50 Self-Reported Smoking Rates for All Canadians
 Percentage of population aged 12 years and older, by current and daily smokers, by sex (age-standardized), Canada, 2003-11



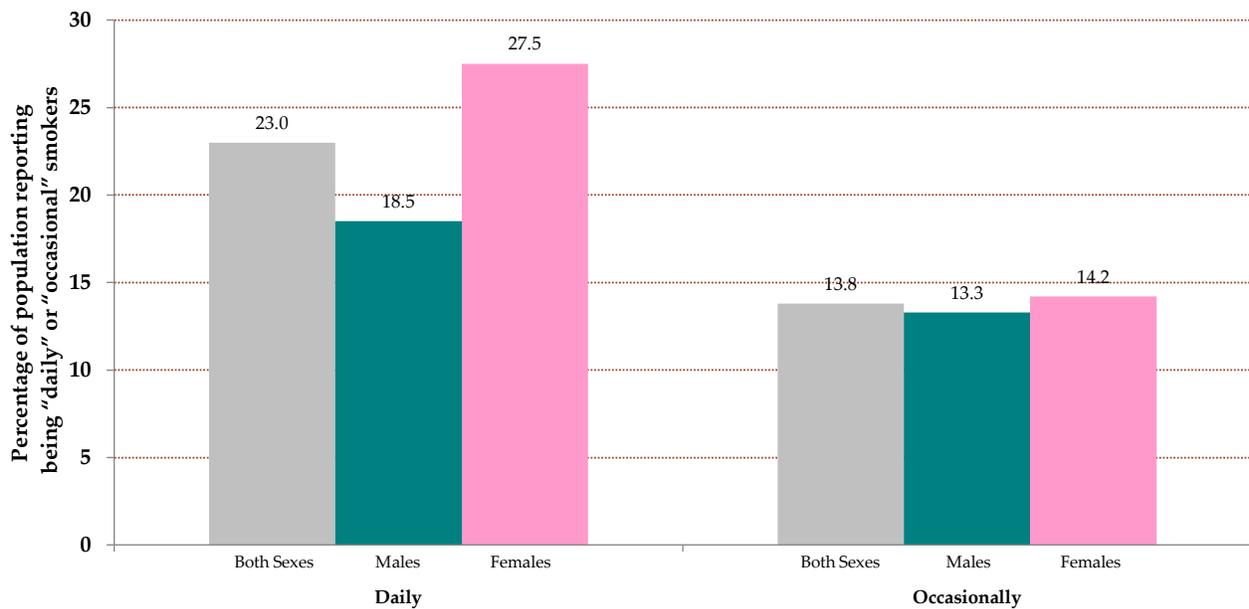
Source: Statistics Canada. Canadian Community Health Survey, 2003-11.

Notes: Current smokers include daily smokers and occasional smokers.
 Age-standardized to the 1991 Canadian population.
 For additional exclusions/limitations, see Annex 2.

A large proportion of First Nations youth smoke on a daily basis

Almost one-quarter (23.0%) of First Nations youth aged 12 to 17 years living in First Nations communities* reported smoking daily. Another 13.8% say they smoke occasionally. First Nations female youth reported higher rates of daily smoking (27.5%) compared to male youth (18.5%).

Figure 51 Self-Reported Smoking Rates
Percentage of First Nations youth living in First Nations communities,* aged 12 to 17 years, by daily or occasional smokers, by sex, 2008/10



Source: First Nations Information Governance Centre. First Nations Regional Health Survey (RHS), 2008/10.
 Notes: * First Nations living on reserve and in northern First Nations communities.
 Population aged 12 to 17 years who reported that they are smoking “daily” or “occasionally.”
 For additional exclusions/limitations, see Annex 2.

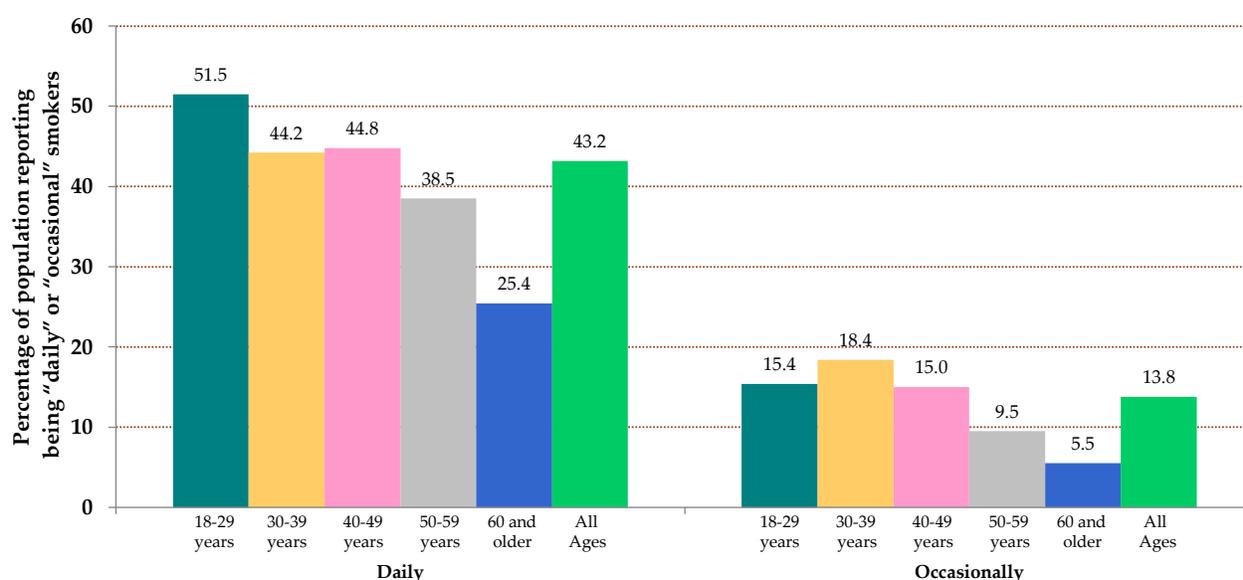
* First Nations living on reserve and in northern First Nations communities.

Over four in 10 First Nations adults smoke daily, about the same as in 2002/03

For 2008/10, 43.2% of First Nations adults aged 18 years and older living in First Nations communities* were daily smokers – more than double the proportion rate for the total Canadian population (19.0%).³ An additional 13.8% of First Nations adults smoked occasionally compared to 5.4% of those in the total population of Canada.³ Daily and occasional smoking figures for First Nations adults living in First Nations communities were about the same as those for 2002/03.

First Nations young adults aged 18 to 29 years were more likely than those aged 60 years and older to smoke daily. Across all age groups, there were no significant differences between the prevalence of male and female daily or occasional smokers.

Figure 52 Self-Reported Smoking Rates
Percentage of First Nations adults living in First Nations communities,* aged 18 years and older, by daily or occasional smokers, both sexes, by age group, 2008/10



Source: First Nations Information Governance Centre. First Nations Regional Health Survey (RHS), 2008/10.

Notes: * First Nations living on reserve and in northern First Nations communities.

Population aged 18 years and older who reported that they are smoking "daily" or "occasionally."

For additional exclusions/limitations, see Annex 2.

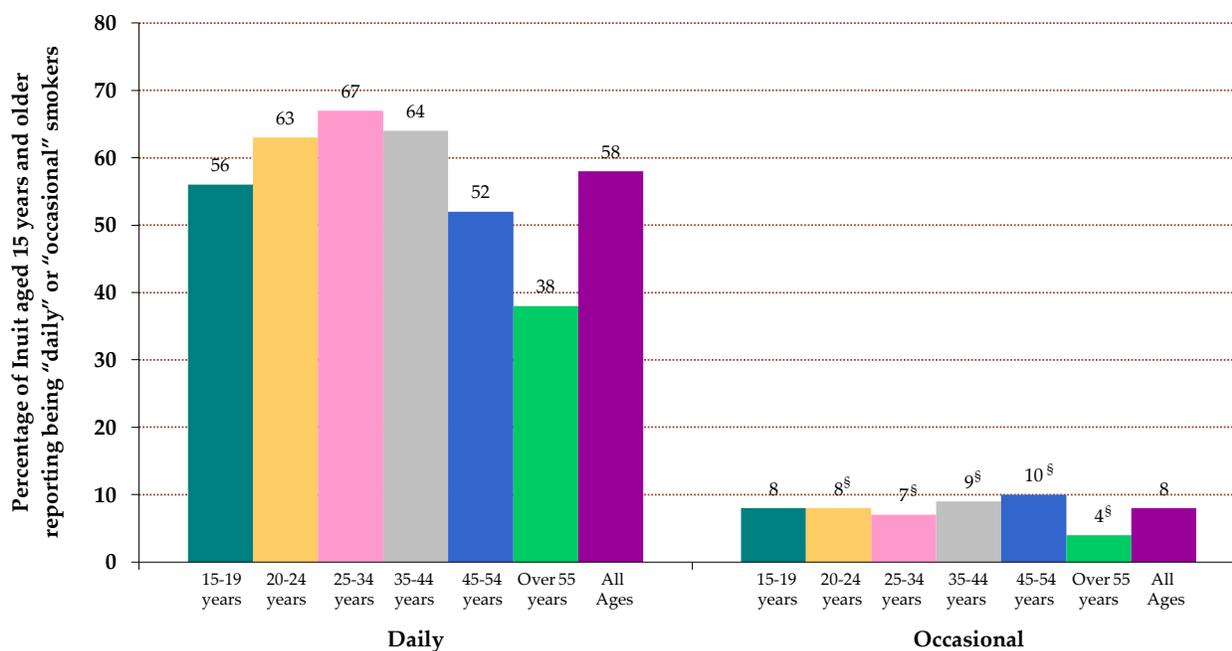
* First Nations living on reserve and in northern First Nations communities.

More than half of Inuit adults are daily smokers

In 2006, 58% of Inuit aged 15 years and older in Canada reported they were daily smokers and an additional 8% reported smoking occasionally. The daily smoking rate for Inuit adults was more than three times the rate of 17% for the total Canadian population.⁴

Older Inuit (those aged 55 years and older) were less likely to smoke on a daily basis than were those in all other age groups. For example, among those aged 25 to 34 years, 67% were daily smokers compared to 38% of those aged 55 years and older.

Figure 53 Self-Reported Smoking Rates
 Percentage of Inuit aged 15 years and older, by daily or occasional smokers, both sexes, by age group, Canada, 2006



Source: Statistics Canada. Aboriginal Peoples Survey, 2006: *"Inuit Health and Social Conditions: Supporting Data Tables."* Catalogue no. 89-637-X, No. 002.

Notes: Population aged 15 years and older who reported that they are "daily" or "occasional" smokers.
[§]Since the variability of these data points are relatively high, they should be used with caution.
 For additional exclusions/limitations, see Annex 2.

What does smoking mean for you

The effects of smoking on your health

Smoking is the leading cause of preventable death in the world.⁵ In Canada, it was estimated that in 2002, more than 37,000 people died from smoking-related causes.⁶

The evidence linking smoking to disease and the health benefits of smoking cessation have been extensively documented.⁷ Smoking harms nearly every organ of the body and reduces the health of

smokers in general. For example, compared to non-smokers, smokers increase their risk of dying from chronic obstructive lung diseases (such as chronic bronchitis and emphysema) by 12 times for males and 13 times for females.⁷

Smoking has long been associated with several types of cancer including lung, larynx and pharynx cancers.⁸ Compared to non-smokers, smokers are at an increased risk of developing lung cancer by 23 times in men and 13 times in women.⁷ The risk of lung cancer increases sharply with the amount smoked,⁹ the number of years one has smoked,¹⁰ and the earlier one had started smoking.¹¹ Lung cancer risk also increases with the age of the smoker.¹⁰

Smoking has also been causally associated with heart disease.⁷ Smoking increases the risk of developing all major forms of cardiovascular disease. Coronary heart disease and stroke are the primary types of cardiovascular disease caused by smoking. For instance, smokers are up to 4 times more likely to suffer a sudden cardiac death than are non-smokers.^{12, 13} Furthermore, strong evidence suggests that smokers increase their risk of stroke by up to 90% versus non-smokers.¹⁴

Benefits of smoking cessation

- Decreased risk of tobacco-related morbidity
- Longer life expectancy
- Improved lung function
- Visit Health Canada's website for more information on the [health benefits of quitting](#)

Health risks associated with smoking

- Lung cancer
- Heart and vascular diseases
- Chronic obstructive pulmonary disease
- Increased risk of developing bronchitis, pneumonia and asthma
- Cancer of the larynx and pharynx

Things you can do to stop smoking

- Set a date to stop smoking
- Get support from family and friends
- If possible, quit at the same time as a friend
- Join a quit-smoking support group (available in many municipalities)
- Talk to your health care provider and/or your pharmacist about quitting
- Consider using nicotine replacement therapy (such as the patch, gum or inhaler) or other medications to help you quit
- Visit Health Canada's website for more information on the [health benefits of quitting](#)
- Contact the pan-Canadian toll free Quitline at 1-866-366-3667 or the [Healthy Canadians](#) website for support from trained quit smoking specialists who can help you develop a quit smoking plan, answer questions and provide referrals to services in your community

Things you can do to deal with cravings

- Delay lighting up when you get the urge to smoke
- Distract yourself with thoughts and activities that take your mind off smoking until the cravings and urges stop
- Drink water to occupy your hands and mouth
- Experiment with deep breathing to help you stay focussed and relaxed
- Start exercising

References

- ¹ Wong, S.L., Shields, M., Leatherdale, S., Malaisson, E., Hammond, D. (2012). Assessment of validity of self-reported smoking status. *Health Reports*. Ottawa: Statistics Canada. Catalogue No. 82-003-X. 23(1): 1-6. Available from: <http://www.statcan.gc.ca/pub/82-003-x/2012001/article/11625-eng.pdf>.
- ² Patrick, D.L., Cheadle, A., Thompson, D.C., Diehr, P., Koepsell, T., Kinne, S. (1994). The validity of self-reported smoking: a review and meta-analysis. *American Journal of Public Health*. 84(7): 1086-1093. Available from: <http://ajph.aphapublications.org/cgi/reprint/84/7/1086>.
- ³ Data for the total population of Canada are from the 2008 Canadian Community Health Survey (CCHS). These estimates have been standardized to the age distribution of the 2008 First Nations population living in First Nations communities aged 18 years and older.
- ⁴ Data for the total population of Canada are from the 2005 Canadian Community Health Survey (CCHS).
- ⁵ Peto, R., Lopez, A.D., Boreham, J., Thun, M., Heath, C. Jr., Doll, R. (1996). Mortality from smoking worldwide. *British Medical Journal*. 52(1): 12-21. Available from: <http://bmb.oxfordjournals.org/cgi/reprint/52/1/12>.
- ⁶ Rehm, J., Baliunas, D., Brochu, S., Fischer, B., Gnam, W., Patra, J., Popova, S., Sarnocinska-Hart, A., Taylor, B. (2006). *The costs of substance abuse in Canada 2002*. Available from: http://www.risqtoxico.ca/documents/2006_Brochu_ReportCost.pdf.
- ⁷ U.S. Department of Health and Human Services. (2004). *The Health Consequences of Smoking: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2004. Available from: http://www.cdc.gov/tobacco/data_statistics/sgr/2004/complete_report/index.htm.
- ⁸ Gandini, S., Botteri, E., Iodice, S., Boniol, M., Lowenfels, A.B., Maisonneuve, P., Boyle, P. (2008). Tobacco smoking and cancer: a meta-analysis. *International Journal of Cancer*. 122: 155-164. Available from: <http://onlinelibrary.wiley.com/doi/10.1002/ijc.23033/pdf>.
- ⁹ Flanders, W.D., Lally, C.A., Zhu, B.P., Henley, S.J., Thun, M.J. (2003). Lung cancer mortality in relations to age, duration of smoking, and daily cigarette consumption: results from Cancer Prevention Study II. *Cancer Research*. 63(19): 6556-6562. Available from: <http://cancerres.aacrjournals.org/content/63/19/6556.full.pdf>.
- ¹⁰ Knoke, J.D., Shanks, T.G., Vaughn, J.W., Thun, M.J., Burns, D.M. (2004). Lung cancer mortality is related to age in addition to duration and intensity of cigarette smoking: an analysis of CPS-I data. *Cancer Epidemiology, Biomarkers & Prevention*. 13(6): 949-957. Available from: <http://cebpa.aacrjournals.org/content/13/6/949.full.pdf>.
- ¹¹ National Cancer Institute. (1997). *Smoking and tobacco control monographs: Monograph No. 9: Cigars: Health Effects and Trends*. Bethesda, MD: US Department of Health and Human Services, National Institutes of Health, National Cancer Institute. Pages 105-160. Available from: <http://cancercontrol.cancer.gov/brp/tcrb/monographs/9/>.
- ¹² U.S. Department of Health and Human Services. (1983). *The Health Consequences of Smoking: Cardiovascular Disease. A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for

Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health. Page 128.

- ¹³ Albert, C.M., Chae, C.U., Grodstein, F., Rose, L.M., Rexrode, K.M., Ruskin, J.N., Stampfer, M.J., Manson, J.A.E. (2003). Prospective study on sudden cardiac death among women in the United States. *Circulation*. 107: 2096-2101. Available from: <http://circ.ahajournals.org/content/107/16/2096.full.pdf>.
- ¹⁴ Thun, M.J., Day-Lally, C.A., Calle, E.E., Flanders, W.D., Heath, C.W. Jr. (1995). Excess mortality among cigarette smokers: changes in a 20-year interval. *American Journal of Public Health*. 85(9): 1223–1230. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1615570/pdf/amjph00447-0041.pdf>.

37. SELF-REPORTED ARTHRITIS

Key Messages

- Arthritis is a term used to describe more than 100 rheumatic diseases and conditions that affect joints and their surrounding tissues, causing pain, swelling and stiffness which often lead to disability
- Symptoms can vary in severity and location, depending on the type of arthritis
- In 2011, in the general Canadian population aged 15 years and older, arthritis is more common among women (17.6%) compared to men (10.6%) – results are age-standardized
- In 2008/10, among First Nations adults aged 18 years and older, 24.1% of females and 15.9% of males reported being diagnosed with arthritis
- In 2006, rate of arthritis/rheumatism is highest among Inuit aged 15 years and older living outside Inuit Nunangat[‡] (20%) compared to those living in Inuit Nunangat (10%)

What does this indicator measure?

This indicator measures the percentage of Canadians aged 15 years and older, who reported that they had been diagnosed by a health professional as having arthritis.

It also measures the percentage of First Nations adults aged 18 years and older living in First Nations communities* who reported that they had been diagnosed by a health professional as having arthritis.

Similarly, it measures the percentage of Inuit aged 15 years and older who reported that they had been diagnosed by a health professional as having arthritis/rheumatism.

What are the limitations of this indicator?

Although this indicator appears to refer to a diagnosis made by a health professional, it is based on the respondents' self-report and is influenced by their ability to remember or comprehend the health professional's diagnosis. Self-reported data are not always as accurate as they would be if they came from an actual clinical database.¹

Arthritis is a general term used to describe over one hundred rheumatic diseases and conditions that affect the joints and their surrounding tissues, as well as other connective tissues.

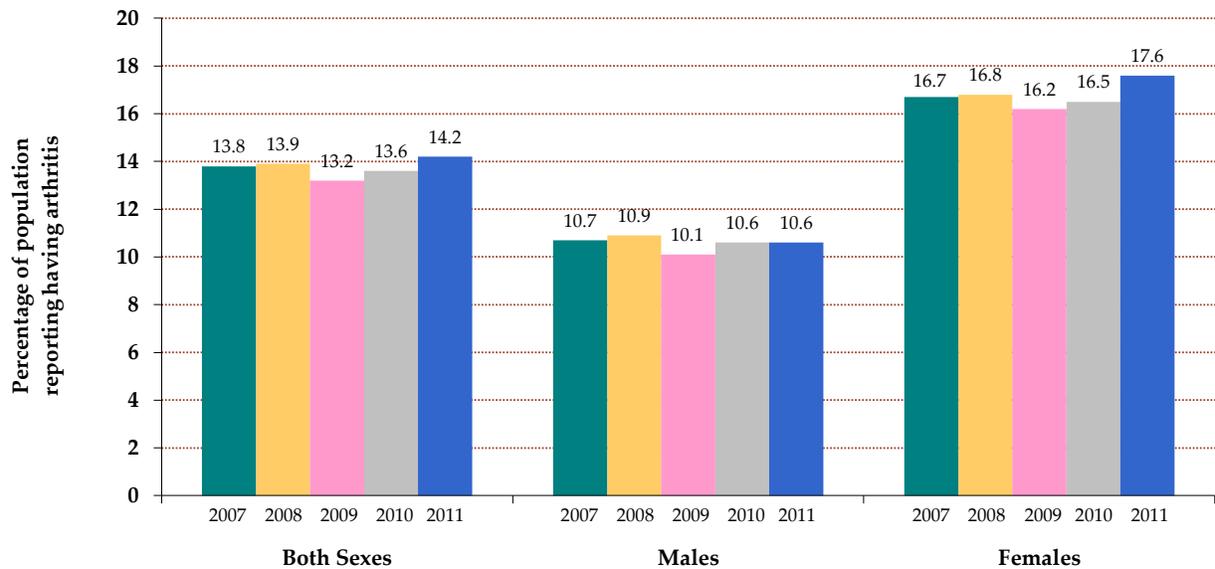
[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

* First Nations living on reserve and in northern First Nations communities.

More women than men suffer from arthritis

In 2011, 14.2% of Canadians reported that they had been diagnosed by a health professional as having arthritis. Also in 2011, more females (17.6%) than males (10.6%) reported being diagnosed with arthritis.

Figure 54 Self-Reported Arthritis
Percentage of population aged 15 years and older who reported having arthritis, by sex (age-standardized), Canada, 2007-11



Source: Statistics Canada. Canadian Community Health Survey, 2007-11.

Notes: Includes household population aged 15 years and older who reported that they had been diagnosed by a health professional as having arthritis.

Since the wording of the question on arthritis changed in 2007, earlier data are not comparable and therefore not included.

Age-standardized to the 1991 Canadian population.

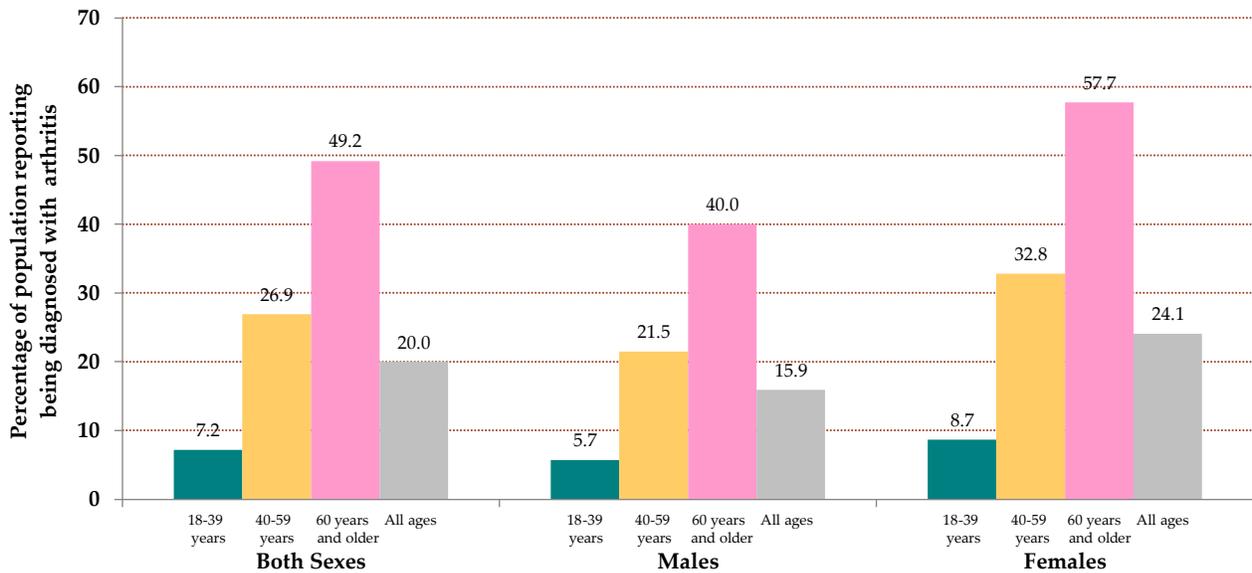
For additional exclusions/limitations, see Annex 2.

Two in 10 First Nations adults report being diagnosed with arthritis

Among First Nations adults aged 18 years and older living in First Nations communities,* 20.0% reported that they had been diagnosed with arthritis. Women, especially those in the oldest age group, were more likely than their male counterparts to have been diagnosed.

Figure 55 Self-Reported Arthritis

Percentage of First Nations adults living in First Nations communities,* aged 18 years and older, who reported having arthritis, by sex and age group, 2008/10



Source: First Nations Information Governance Centre. First Nations Regional Health Survey (RHS), 2008/10.

Notes: * First Nations living on reserve and in northern First Nations communities.

Population aged 18 years and older who reported that they had been diagnosed by a health professional as having arthritis.

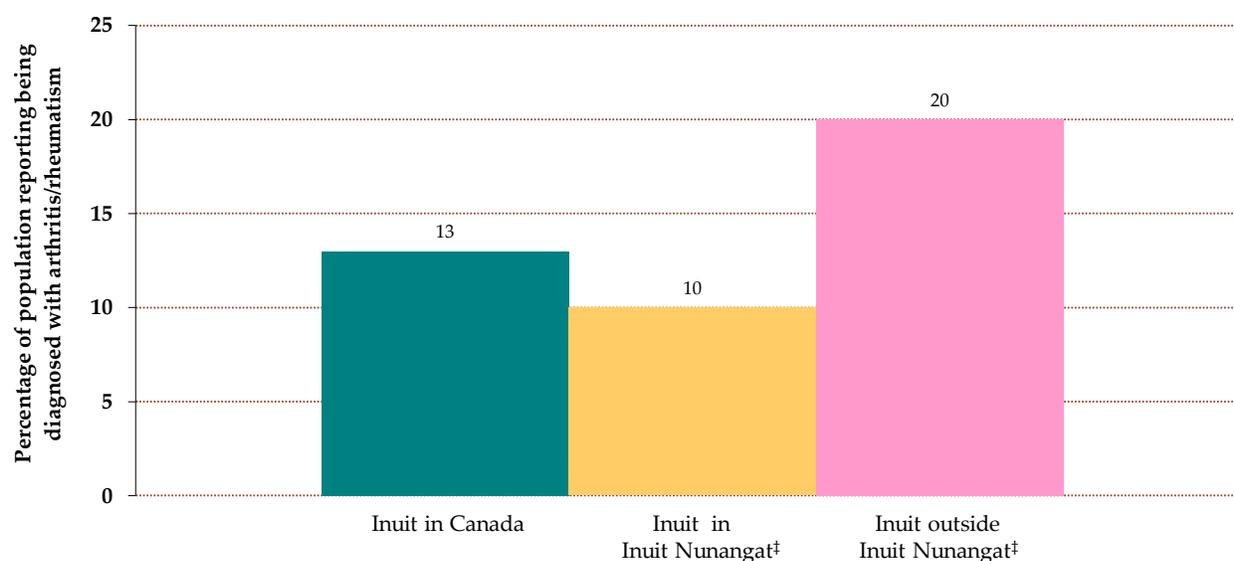
For additional exclusions/limitations, see Annex 2.

* First Nations living on reserve and in northern First Nations communities.

Rate of arthritis among Inuit highest for those living outside Inuit Nunangat[‡]

In 2006, 13% of Inuit aged 15 years and older in Canada reported having been diagnosed with arthritis or rheumatism. Inuit adults living outside Inuit Nunangat were more likely than those living in Inuit Nunangat to have been diagnosed (20% compared to 10%).

Figure 56 Self-Reported Arthritis/Rheumatism
Percentage of Inuit aged 15 years and older who reported being diagnosed with arthritis/rheumatism, both sexes, by region, 2006



Source: Statistics Canada. Aboriginal Peoples Survey, 2006: "Inuit Health and Social Conditions: Supporting Data Tables." Catalogue no. 89-637-X, No. 002.

Notes: Population aged 15 years and older who reported that they were diagnosed with arthritis/rheumatism.
[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).
 For additional exclusions/limitations, see Annex 2.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

What these results mean for you

Arthritis is a general term used to describe over one hundred rheumatic diseases and conditions affecting joints and their surrounding tissues, as well as other connective tissues. Generally, arthritis is characterized by inflammation, pain and stiffness in and around one or several joints. The effects are often mild but in some cases may be debilitating. The pattern, severity and location of symptoms greatly differ depending on the specific form of the disease. The most familiar types of arthritis include: (1) Osteoarthritis; (2) Rheumatoid Arthritis; (3) Systemic Lupus Erythematosus; (4) Gout; and (5) Childhood Arthritis (or Juvenile Arthritis).

The Public Health Agency of Canada estimated that in 2007-08, over 4.2 million Canadians aged 15 years and older reported to have arthritis and on the basis of current projections, the number could increase to 6.7 million by 2031 due to the aging of the population.² Although arthritis is most common among seniors, people of all ages, including children and young adults, can also develop it.

There is currently no known cure for arthritis; however, improvements in the understanding of its causes continue to lead to improved medications and treatments.

Benefits of healthy joints

- Better overall health
- Greater mobility, allowing for greater independence
- Less pain
- Less fatigue when performing a specific task

Known risk factors associated with the two most common forms of arthritis³

Osteoarthritis

- Aging
- Sex: female
- Genetic factors
- Joint deformity and laxity
- Bone abnormalities, diseases (for example Paget's disease)
- Joint injuries/trauma, fractures
- Joint surgery
- Physical inactivity
- Obesity
- Occupational stress, repetitive movements

Rheumatoid Arthritis

- Sex: female
- Hormones
- Genetic factors
- Ethnicity
- Infectious agents
- Environment
- Diet
- Smoking

Things you can do to prevent some types of arthritis

There are steps that can be taken to reduce the risk of developing some types of arthritis, i.e., osteoarthritis and gout. For osteoarthritis, maintaining a healthy body weight and healthy joints and

muscles through physical activity while protecting joints from injuries or overuse may reduce the risk of developing this type of arthritis. For gout, a healthy body weight, daily exercise and a reduced intake of purine rich foods and drinks (such as red meat, certain types of seafood and alcohol) can reduce the risk of developing this condition.

Things you can do to manage arthritis

Although there is no cure for arthritis, much can be done to reduce the impacts by:

- Educating yourself about self-management, pain management and the disease itself
- Recognizing the symptoms early, which could help with obtaining a diagnosis and expedite treatment
- Being physically active
- Achieving/maintaining a healthy body weight
- Taking medication(s) which aim to reduce pain, maintain joint function and limit disease progression
- Participating in physical and/or occupational therapies
- Consider surgery if the symptoms persist or get worse despite optimal medicinal and rehabilitative therapies
- Protecting your joints and avoiding high-impact loads
- Using assistive devices as necessary
- To learn more about [arthritis](#), please visit the Public Health Agency of Canada's website

References

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- ¹ Bhandari, A., Wagner, T. (2006). Self-reported utilization of health care services: improving measurement and accuracy. *Medical Care Research and Review*. 63(2): 217-235.
 - ² Public Health Agency of Canada. (2010). *Life with arthritis in Canada: a personal and public health challenge*. Available from: <http://www.phac-aspc.gc.ca/cd-mc/arthritis-arthritis/lwaic-vaaac-10/5-eng.php>.
 - ³ Marks, R., Allegrante, J.P. (2007). Prevalence and impact of arthritis: opportunity for prevention. *Health Education Journal*. 66: 3-21. Available from: <http://hej.sagepub.com/content/66/1/3.full.pdf+html>.

38. SELF-REPORTED OSTEOPOROSIS

Key Messages

- Osteoporosis is a bone disease where bone loss occurs more rapidly than normal resulting in an increased risk of bone fracture
- There are usually no warning signs until a fracture occurs
- In 2008-09, in the general Canadian population aged 45 years and older, osteoporosis is more common among women (16.2%) compared to men (3.2%)
- In 2008/10, among First Nations adults aged 45 years and older, women (13.5%) were more likely than men (3.0%) to report being diagnosed with osteoporosis
- There are ways to help prevent, delay and treat this condition

What does this indicator measure?

This indicator measures the percentage of Canadians aged 45 years and older who reported having been diagnosed with osteoporosis by a health professional in 2008-09.

It also measures the percentage of First Nations adults aged 45 years and older living in First Nations communities* who reported that they had been diagnosed by a health professional as having osteoporosis.

What are the limitations of this indicator?

Although this indicator appears to refer to a diagnosis made by a health professional, it is based on the respondents' self-report and is influenced by their ability to remember or comprehend the health professional's diagnosis. Self-reported data are not always as accurate as they would be if they came from an actual clinical database.¹

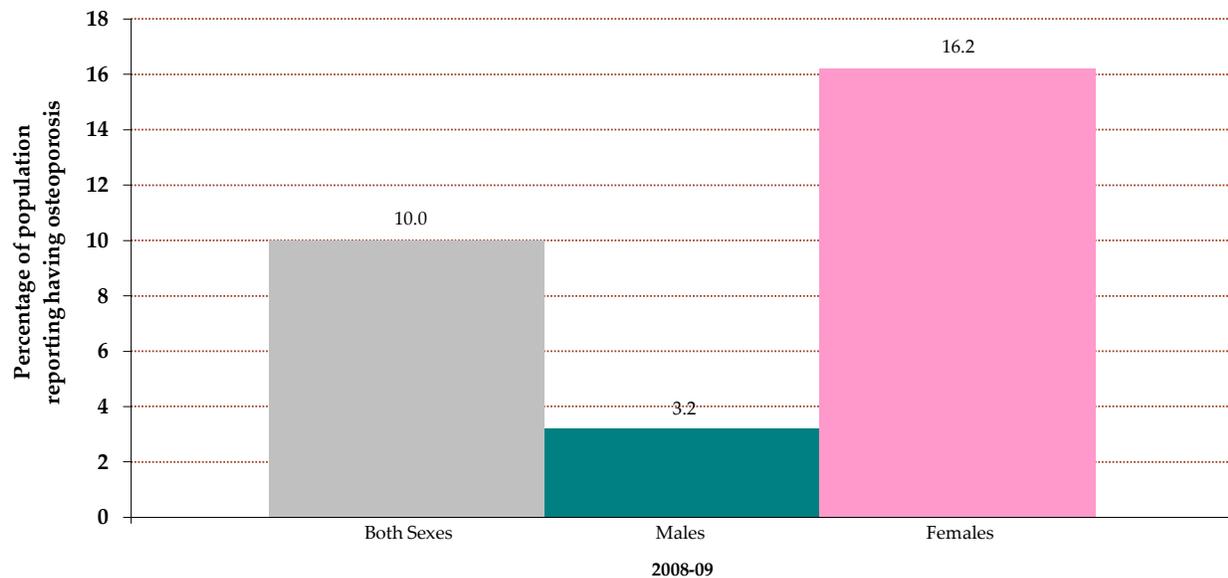
Osteoporosis is a bone disease where bone loss occurs more rapidly than normal which leads to an increased risk of bone fracture.

* First Nations living on reserve and in northern First Nations communities.

More women than men suffer from osteoporosis

In 2008-09, 10.0% of Canadians aged 45 years and older reported having been diagnosed with osteoporosis by a health professional. More women (16.2%) than men (3.2%) reported having been diagnosed with osteoporosis.

Figure 57 Self-Reported Osteoporosis
Percentage of population aged 45 years and older who reported having osteoporosis, by sex, (not age-standardized), Canada, 2008-09



Source: Statistics Canada. Canadian Community Health Survey, Healthy Aging 2008-09.

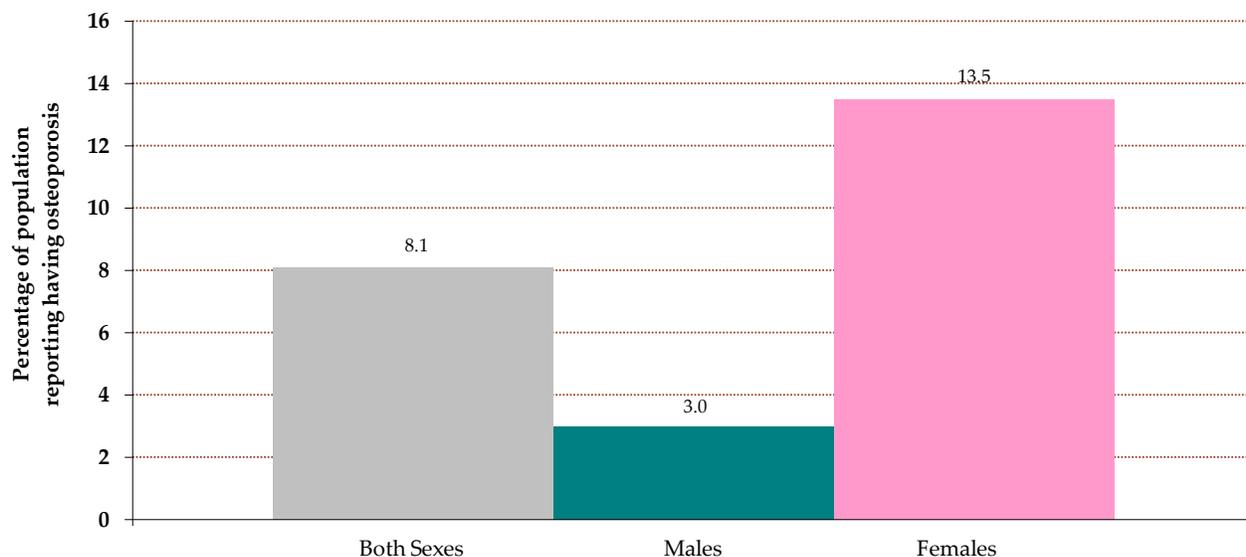
Notes: Includes household population aged 45 years and older who had been diagnosed by a health professional as having osteoporosis.

For additional exclusions/limitations, see Annex 2.

First Nations women more likely than men to report being diagnosed with osteoporosis

For the 2008/10 period, 8.1% of First Nations adults aged 45 years and older living in First Nations communities* reported having been diagnosed with osteoporosis. The figure for First Nations women (13.5%) was higher than that for First Nations men (3.0%).

Figure 58 Self-Reported Osteoporosis
Percentage of First Nations adults living in First Nations communities,* aged 45 years and older, who reported having osteoporosis, by sex, 2008/10



Source: First Nations Information Governance Centre. First Nations Regional Health Survey (RHS), 2008/10.

Notes: * First Nations living on reserve and in northern First Nations communities.

Population aged 45 years and older who reported that they had been diagnosed by a health professional as having osteoporosis.

For additional exclusions/limitations, see Annex 2.

* First Nations living on reserve and in northern First Nations communities.

What these results mean for you

Osteoporosis develops when not enough new bone is formed (bone formation) or too much existing bone is broken down (bone resorption), or both. There are no symptoms associated with osteoporosis until a fracture occurs. Osteoporotic fractures occur in situations where healthy people would not normally break a bone and therefore regarded as a fragility fracture. The most common sites for a fragility fracture are the wrist, upper arm, spine, pelvis and hip.

Hormonal factors strongly affect the rate of bone resorption; a lack of estrogen in women (for example, as a result of menopause) is associated with a rapid reduction in bone mineral density while in men, a decrease in testosterone levels has a comparable but less pronounced effect. In addition to hormonal factors, calcium metabolism plays a significant role in bone turnover. A deficiency in calcium and vitamin D (which supports the body's ability to absorb calcium) leads to impaired bone formation. Other factors that may contribute to osteoporosis are addressed below.

Benefits of strong, healthy bones

- Stronger support system for the body
- Better posture, strength and balance
- Greater resistance to sustain shocks and blows, resulting in fewer fractures
- Better protection from trauma for several organs (e.g., brain, heart, lungs)
- Large storage site for vitamins and minerals, including calcium and vitamin D
- Stronger points of attachment for muscles

Risk factors for osteoporosis²

Several factors play a role in the development of osteoporosis and the more risk factors you have, the greater your risk. Since bone loss occurs without symptoms, determining if you have osteoporosis requires a bone mineral density test. Your doctor may want you to have a bone mineral density test if you have any of the following risk factors:

Older Adults (age \geq 50 years):

- All women and men over 65 years of age
- Menopausal women, and men age 50-64 years with clinical risk factors for fracture:
 - Fragility fracture (breaking a bone as a result of a minor accident) after age 40 years
 - Prolonged use of glucocorticoids or other high-risk medications associated with rapid bone loss and/or fracture
 - Having a parent who had a hip fracture
 - Having a spine fracture or low bone mass identified on x-ray
 - Being a smoker
 - High alcohol intake (\geq 3 units per day on a consistent basis)
 - Low body weight ($<$ 60 kg or 132 lbs) or major weight loss (present weight $>$ 10% below your body weight at age 25)
 - Having rheumatoid arthritis or other disorders strongly associated with rapid bone loss and/or fracture

Younger Adults (age < 50 years):

- Fragility fracture
- Prolonged use of glucocorticoids or other high-risk medications associated with bone loss and/or fracture
- Hypogonadism or premature menopause
- Primary hyperparathyroidism or other disorders strongly associated with rapid bone loss and/or fracture

Things you can do to optimize your bone health

- Be active every day, regular weight-bearing aerobic exercise and/or resistance training are beneficial to bone development and maintenance
- Do not smoke
- Drink alcohol moderately (no more than two units daily)
- Maintain a healthy body weight
- Eat a well-balanced diet and ensure adequate calcium and vitamin D intake:
 - Dietary sources of calcium include dairy products, dark green leafy vegetables, fish products containing bones, meat alternatives such as lentils, beans, and nuts and calcium fortified foods
 - The main source of vitamin D is from sunlight while dietary sources of vitamin D, such as fatty fish, egg yolks, fish liver oils and vitamin D fortified foods contain small amounts of vitamin D
 - For individuals who are unable to obtain enough calcium and vitamin D through natural sources, supplements are often recommended

For additional information, refer to:

- [Canada's physical activity guides](#)
- [Canada's Food Guide](#)
- Health Canada's updated [dietary reference intakes for vitamin D and calcium](#)

References

- ¹ Bhandari, A., Wagner, T. (2006). Self-reported utilization of health care services: improving measurement and accuracy. *Medical Care Research and Review*. 63(2): 217-235.
- ² Papaioannou, A., Morin, S., Cheung, A.M., Atkinson, S., Brown, J.P., Feldman, S., Hanley, D.A., Hodsmann, A., Jamal, S.A., Kaiser, S.M., Kvern, B., Siminoski, K., Leslie, W.D., for the Scientific Advisory Council of Osteoporosis Canada. (2010). 2010 clinical practice guidelines for the diagnosis and management of osteoporosis in Canada: summary. *Canadian Medical Association Journal*. doi: 10.1503/cmaj.100771. Available from: <http://www.cmaj.ca/content/early/2010/10/12/cmaj.100771.full.pdf+html>.

39. RATE OF REPORTED INFECTIONS FOR CHLAMYDIA

Key Messages

- Chlamydia is the most common bacterial sexually transmitted infection (STI) in Canada; it is caused by the bacterium *Chlamydia trachomatis*
- Chlamydia is known as the “silent disease,” it is estimated that more than 70% of infected females and 50% of infected males have no symptoms of their infection
- When left untreated, chlamydia can lead to health problems and infertility
- Genital chlamydia infections can be diagnosed through urine testing or swabs; swabs can also be used to diagnose chlamydia infections at other sites (e.g., eye, throat)
- There are effective antibiotics available to treat the infection
- The reported rate of chlamydia has been steadily increasing in Canada since 1997

What does this indicator measure?

This indicator measures the rate of reported chlamydia infections per 100,000 population, of newly-diagnosed infections, by calendar year.

Chlamydia trachomatis infections are reportable by laboratories and physicians to local public health authorities in all provinces and territories. A confirmed case is defined as laboratory confirmation of infection - detection of *Chlamydia trachomatis* by appropriate laboratory techniques in genitourinary or extra genital specimens.

What are the limitations of this indicator?

Since many infected individuals are asymptomatic and may not seek testing, reported cases more than likely underestimate the true incidence of chlamydial infections in the Canadian population. Cases with symptoms compatible with a chlamydial infection may be treated without undergoing a laboratory test or people who are sexual partners/contacts of someone who has been diagnosed as having chlamydia through laboratory testing may be treated without being tested and therefore would not be reported as a case. The surveillance system captures only those who are diagnosed through laboratory testing and reported to public health authorities.

The Public Health Agency of Canada publishes provincial/territorial data [by sex, and national data by age and sex](#). Although the Public Health Agency of Canada verifies reportable disease data with the provinces and territories, updates may be made by the provinces/territories after verification that cause small discrepancies between national and provincial/territorial numbers. Provinces and territories always have the most up-to-date data for their respective jurisdictions. Minor variations in data may occur when comparing indicator data with other federal and provincial/territorial publications because of reporting delays, different cut-off dates and date of access to Statistics Canada’s population estimates.

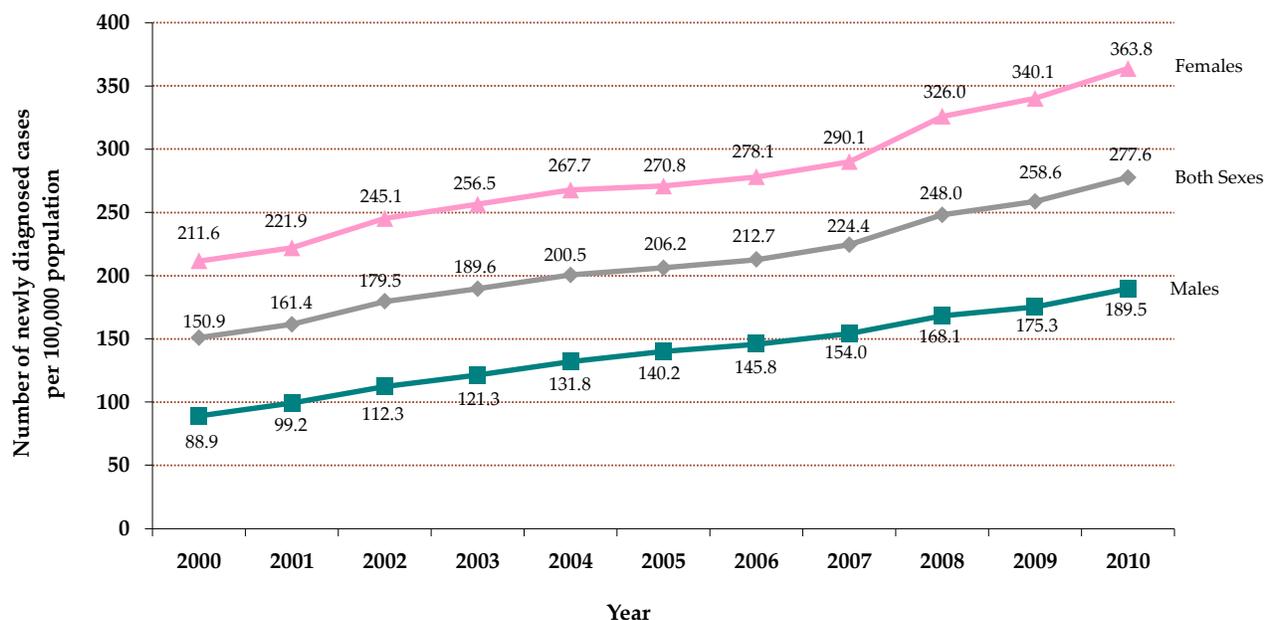
The introduction of more sensitive, non-invasive urine-based testing for chlamydia, starting in the late 1990s, likely contributed to the observed increase in reported rates of chlamydia in Canada. The increased sensitivity (ability to accurately identify those with an infection) of the tests would have led to a greater proportion of infections being diagnosed (by a reduction in the false-negative test rate), and the

ability to test urine specimens would have increased the acceptability of chlamydia testing for patients, leading to more chlamydia tests being performed, particularly in males.

The rates of reported chlamydia infections are on the rise

The rate of reported chlamydia infections was 277.6 cases per 100,000 population in 2010, an increase from 150.9 cases per 100,000 population in 2000. The 2010 rates for females and males were 363.8 cases per 100,000 females and 189.5 cases per 100,000 males, respectively.

Figure 59 Rate of Reported *Chlamydia trachomatis* Infections
Canada, 2000-10



Source: Public Health Agency of Canada. Centre for Communicable Diseases and Infection Control, 2012.

Notes: Minor variations in data will occur when comparing data with other federal and provincial/territorial publications because of reporting delays, different cut-off dates and date of access to Statistics Canada's population estimates. For additional exclusions/limitations, see Annex 2.

What these results mean for you

After being in decline for many years, rates of chlamydia infection have risen steadily since 1997. There are several reasons that could explain the increase in infection rates. These rising rates could be an indication that people are not consistently using safer sex methods. The increasing rates may also be at least partially caused by improved case finding. The introduction of a urine-based test in the late 1990s would have increased the acceptability of chlamydia testing for patients, particularly males, leading to more chlamydia tests being performed. Also, the increased sensitivity of lab tests now being used would result in a greater proportion of infections being diagnosed.¹

It is possible to have more than one STI at a time. The sexual practices which put someone at risk for chlamydia also put them at risk for other STIs such as gonorrhea and HIV. Having an STI such as chlamydia can increase the risk of acquisition and transmission of HIV infection.^{2, 3, 4}

Any sexually active person can be infected with chlamydia, if exposed. The greater the number of sex partners you have, the greater your risk of infection. It is also important to remember that you can be re-infected with chlamydia after being treated, as your body does not produce any long-term protection against re-infection as it can with some other infectious diseases. Considering the increasing reported rate of chlamydia in the past decade, and the fact that a significant portion of infected individuals have no symptoms and may be unaware of their infection, those with recent unprotected sexual exposure may wish to consult a health care provider for testing.

Problems associated with untreated chlamydia

As noted above, the majority of infected people have no symptoms of a chlamydia infection, and therefore may not know they have an infection unless they get tested. If symptoms do occur, they usually appear two to three weeks after infection, but it can take longer for symptoms to appear.

Symptoms of infection can include:

For women:

- A vaginal discharge
- A burning sensation when urinating
- Pain in the lower abdomen, sometimes with fever and chills
- Pain during sex
- Vaginal bleeding between periods and/or after intercourse

For men:

- A discharge from the penis
- A burning sensation when urinating
- Burning or itching at the opening of the penis
- Pain and/or swelling in the testicles

Symptoms of anal infection include rectal pain, bleeding and discharge. Those infected through oral sex generally have few symptoms.

Up to approximately 40 percent of women with untreated chlamydia may go on to develop pelvic inflammatory disease (PID). PID effects include abdominal pain, fever, internal abscesses and long-lasting pelvic pain; effects also include scarring of the fallopian tubes, which can cause infertility and increase the chance of potentially life-threatening ectopic (or tubal) pregnancies.

Men can develop scarring within the structures of their reproductive tract, which may lead to infertility. Although rare, both sexes are at risk of a type of arthritis known as reactive arthritis—an inflammation and swelling of the joints.

If a pregnant woman has chlamydia, her baby may be born prematurely, have eye infections or develop pneumonia.

Even without symptoms, chlamydia can be transmitted and can lead to serious health problems and possible infertility, especially in women. Anyone at high risk should therefore seek testing.

High risk behaviours associated with chlamydia

- Engaging in unprotected sexual intercourse (vaginal, anal or oral)
- Sexual contact with person(s) with chlamydia or a known STI
- Having a new sexual partner or more than two sexual partners in the past year
- Individuals who have had a series of one-partner relationships over time
- Not using a barrier method of contraception (i.e., condom)
- Anonymous sexual partnering

Any sexually active person can be infected with chlamydia, if exposed. The high rate of infection among youth and young adults (15 to 24 years) means that this age group is at high risk of being exposed if they are sexually active. As chlamydia can be transmitted by oral or anal sex, those who engage in these sexual activities are also at risk of infection.

Things you can do to prevent or manage chlamydia

- Consistent use of safe sex practices including the use of a latex or polyurethane condom when engaging in vaginal, anal or oral sex. Although no form of protection is 100% effective, when used properly a condom can significantly reduce the risk of HIV and other sexually transmitted infections; use a water-based lubricant to reduce the risk of condom breakage and not Vaseline® or oil-based products as they weaken the effectiveness of latex condoms
- If you are pregnant or planning to become pregnant, seek testing for chlamydia or talk with a health care professional about being tested
- The only way to be 100% sure you are protected against chlamydia is to abstain from sexual contact, or to be in a long-term mutually monogamous relationship with a partner who has been tested and is known to be uninfected
- If you have engaged in a high-risk behaviour, get tested to protect your health and to avoid infecting others
- Speak with a health care professional for more information on the prevention of chlamydia and other sexually transmitted infections and how to get tested
- If you are infected, all partners with whom you have had sexual contact within 60 days prior to symptom onset or date of specimen collection (if you do not have symptoms) should be notified and told to speak with a health care professional
- If you are infected with chlamydia, speak with your doctor about treatment options
- More information about [chlamydia](#) is available at Health Canada's website
- More [statistics on chlamydia](#) are available at the Public Health Agency of Canada's website

References

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- ¹ Rekart, M.L., Brunham, R.C. (2008). Epidemiology of chlamydial infection: are we losing ground? *Sexually Transmitted Infections*. 84: 87-91. Available from: <http://sti.bmj.com/content/84/2/87.full.pdf+html>.
- ² Low, N., Broutet, N., Adu-Sarkodie, Y., Barton, P., Hossain, M., Hawkes, S. (2006). Global control of sexually transmitted infections. *The Lancet*. 368: 2001-2016. Available from: <http://www.sciencedirect.com/science/article/pii/S0140673606694828>.

- ³ Cohen, M.S., Hoffman, I.F., Royce, R.A., Kazembe, P., Dyer, J.R., Costello Daly, C., Zimba, D., Vernazza, P.L., Maida, M., Fiscus, S.A., Eron, J.J. Jr., and the AIDSCAP Malawi Research Group. (1997). Reduction of concentration of HIV-1 in semen after treatment of urethritis: implications for prevention of sexual transmission of HIV-1. *The Lancet*. 349(9069): 1868-1873. Available from: <http://www.sciencedirect.com/science/article/pii/S0140673697021909>.
- ⁴ Fleming, D.T., Wasserheit, J.N. (1999). From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. *Sexually Transmitted Infections*. 75(1): 3-17. Available from: <http://sti.bmj.com/content/75/1/3.long>.

40. PREVALENCE RATE OF HUMAN IMMUNODEFICIENCY VIRUS (HIV)

Key Messages

- The Human Immunodeficiency Virus (HIV) attacks the immune system, resulting in a chronic, progressive illness that leaves people vulnerable to infections and cancers
- The constellation of diseases affecting an HIV-infected person is known as Acquired Immunodeficiency Syndrome (AIDS)
- On average, it takes more than 10 years to progress from an untreated HIV infection to AIDS
- The total number of Canadians infected with HIV continues to rise
- Globally, an estimated 33.4 million people were living with HIV in 2008. That same year, 2.7 million people were newly infected with HIV and 2.0 million people died due to AIDS

What does this indicator measure?

This indicator measures the estimated number of people living with HIV in Canada for a particular year, including new and previous cases.

As part of its mandate to monitor HIV/AIDS trends in Canada, the Public Health Agency of Canada (PHAC) generates periodic national estimates of HIV prevalence and incidence. Incidence, or the number of new infections in a one-year period, is calculated using a range of data sources, including surveillance data on number of people diagnosed with HIV in Canada, site-specific cross-sectional studies, and modelling techniques.

What are the limitations of this indicator?

Not all people infected with HIV are aware of their HIV status; in fact, an estimated 26% of HIV-positive individuals in Canada have not tested and been diagnosed for HIV. For this reason, it is impossible to have an exact, accurate figure of total new infections.

For more information on HIV data for Canada, see the Public Health Agency of Canada's [surveillance report](#) and [estimate report](#).

The total number of Canadians infected with HIV continues to rise

HIV/AIDS in Canada continues to be cause for concern. The number of people living with HIV (including AIDS) is still rising, from an estimated 57,000 in 2005 to 65,000 in 2008 (a 14% increase). The increase in the number of people living with HIV is due to two factors—treatments have improved the survival of HIV-infected persons and new infections continue to occur. In 2008, 3,300 (range: 2,300-4,300) new infections occurred in Canada.

Table 12 HIV Infections

Estimated number of prevalent HIV infections and associated ranges of uncertainty in Canada at the end of 2005 and 2008 by exposure category (data are rounded)

	2005			2008		
	Point	Range	Percentage	Point	Range	Percentage
Exposure category						
MSM	27,700	22,400-33,000	48%	31,330	25,400-37,200	48%
MSM-IDU	1,820	1,200-2,400	3%	2,030	1,400-2,700	3%
IDU	10,100	8,100-12,100	18%	11,180	9,000-13,400	17%
Heterosexual/ non endemic country	9,050	7,000-11,100	16%	10,710	8,300-13,100	17%
Heterosexual/ endemic country	7,860	5,800-9,900	14%	9,250	6,800-11,700	14%
Others	470	280-660	1%	500	300-700	1%

Source: Public Health Agency of Canada. *Estimates of HIV Prevalence and Incidence in Canada, 2005 and 2008*.

Notes: MSM (men who have sex with men); IDU (persons who inject drugs); Heterosexual/non-endemic (heterosexual contact with a person who is either HIV-infected or at risk for HIV or heterosexual as the only identified risk); Heterosexual/endemic (origin in a country where HIV is endemic); Others (recipients of blood transfusion or clotting factor, perinatal and occupational transmission).
For additional exclusions/limitations, see Annex 2.

What these results mean for you

In order to be infected, HIV must enter one's bloodstream. It then begins its attack on the immune system, resulting in a chronic, progressive illness that leaves people vulnerable to opportunistic infections and cancers. Once these infections take hold, the individual may be diagnosed with AIDS.¹

On average, it takes more than 10 years to progress from an untreated HIV infection to AIDS. According to the Joint United Nations Programme on HIV/AIDS (UNAIDS), AIDS is a deadly condition that has already killed more than 25 million people around the world.² There is no cure for it and currently no vaccine against HIV infection.¹ HIV/AIDS can affect anyone in society, regardless of their age, gender, sexual orientation or socio-economic status. However, stigma, discrimination, and violation of human

rights make socially and economically marginalized groups and populations even more vulnerable to infection.

To prevent infection, a number of options appear to be successful, including adolescents acquiring more knowledge about safe sex practices,³ minimizing or eliminating needle-sharing or sexual risk-taking among injection drug users,^{4,5} men who have sex with men,⁶ women,⁷ Aboriginal peoples,⁸ prison inmates, and people from countries where HIV is endemic. In addition, in people who are infected with HIV, being aware of their status is essential as high-risk sexual behaviour is markedly lower in HIV positive persons who are aware of their infection status than in HIV positive persons who are unaware of their status.^{9,10}

A vaccine or cure for HIV infection does not currently exist, although there are treatment options that can significantly improve an infected individual's chances of survival and decrease the likelihood of infections.^{11,12} In recent years, however, resistance to some HIV medications has been occurring. To address this, testing is recommended to identify the specific medications to which the individual is resistant;¹³ this tailored approach to treatment may benefit patients as they can receive treatment for the particular HIV strains with which they may be infected.

Problems associated with untreated HIV infection

- Increased morbidity
- Increased disabilities and loss of function
- Psychosocial issues such as depression and stigma
- AIDS
- Death

Risk behaviours associated with HIV infection

- Engaging in unprotected sexual intercourse (vaginal, anal or oral)
- Sharing needles or equipment for injecting drugs
- Using unsterilized needles for tattooing, skin piercing or acupuncture
- Pregnancy, delivery and breast feeding (i.e., from an HIV-infected mother to her infant)
- Occupational exposure in health care settings

Populations at risk of HIV infection

- Men who have sex with men
- Injection drug users
- Aboriginal Peoples
- Prison inmates
- Youth at risk
- Women at risk
- People from countries where HIV is endemic

Things you can do to prevent or manage HIV infection

- Practice safe sex
- Use a latex or polyurethane condom when engaging in vaginal, anal or oral sex (although no form of protection is 100% effective, when used properly a condom can significantly reduce the risk of HIV and other sexually transmitted infections; use a water-based lubricant to reduce the risk of condom breakage and not Vaseline® or oil-based products as they weaken the effectiveness of latex condoms)
- Never share needles or other drug use equipment
- If you are getting a tattoo, body piercing or acupuncture, ensure that the equipment being used is sterile (the safest way to get a tattoo or piercing is to go to a professional)
- Take precautions to prevent exposure to HIV if you work in an environment where you may come into contact with someone else's blood or with needles (e.g., a health care facility); wear protective medical gloves and handle used needles with care
- Ensure that you are not infected with other [sexually transmitted infections](#) that may increase your susceptibility to HIV
- Talk with your doctor about being tested if you are pregnant and concerned about HIV (early treatment with medication can prevent the transmission of HIV from mother to baby before birth; pre- and post-test counselling are also important)
- The only way to be 100% safe against HIV infection is to not engage in sexual or other activities where body fluids (blood, semen or vaginal fluids) are exchanged; if you have engaged in risky behaviours, get tested to protect your health and to avoid infecting others
- Speak with a health care provider for more information on [HIV/AIDS and how to get tested](#)
- If you are infected with HIV, speak with your doctor about treatment options
- The Public Health Agency of Canada provides more information about [HIV/AIDS](#)

References

- ¹ Public Health Agency of Canada. (2008). *What is HIV/AIDS?* Available from: <http://www.phac-aspc.gc.ca/aids-sida/info/index-eng.php>.
- ² Joint United Nations Programme on HIV/AIDS, *2010 Report on the Global AIDS Epidemic*. Available from: http://www.unaids.org/en/KnowledgeCentre/HIVData/GlobalReport/2008/2008_Global_report.asp.
- ³ Mullen, P.D., Ramírez, G., Strouse, D., Hedges, L.V., Sogolow, E. (2002). Meta-analysis of the effects of behavioural HIV prevention interventions on the sexual risk behaviour of sexually experienced adolescents in controlled studies in the United States. *Journal of Acquired Immune Deficiency Syndromes*. 30: S94-S105. Available from: http://journals.lww.com/jaids/Abstract/2002/07011/Meta_analysis_of_the_Effects_of_Behavioral_HIV.9.aspx.
- ⁴ Semaan, S., Des Jarlais, D.C., Sogolow, E., Johnson, W.D., Hedges, L.V., Ramirez, G., Flores, S.A., Norman, L., Sweat, M.D., Needle, R. (2002). A meta-analysis of the effect of HIV prevention interventions on the sex behaviors of drug users in the United States. *Journal of Acquired Immune Deficiency Syndromes*. 30: S73-S93. Available from: http://journals.lww.com/jaids/Abstract/2002/07011/A_Meta_analysis_of_the_Effect_of_HIV_Prevention.8.aspx.
- ⁵ Stratthdee, S.A., Hallett, T.B., Bobrova, N., Rhodes, T., Booth, R., Abdool, R., Hankins, C.A. (2010). HIV and risk environment for injecting drug users: the past, present, and future. *The Lancet*. 376: 268-284. Available from: <http://www.sciencedirect.com/science/article/pii/S014067361060743X>.

- ⁶ Jaffe, H.W., Valdiserri, R.O., De Cock, K.M. (2007). The reemerging HIV/AIDS epidemic in men who have sex with men. *Journal of the American Medical Association*. 298(20): 2412-2414. Available from: <http://jama.ama-assn.org/cgi/reprint/298/20/2412>.
- ⁷ Jewkes, R. (2010). Gender inequities must be addressed in HIV prevention. *Science*. 329: 145-147. Available from: <http://www.sciencemag.org/cgi/reprint/329/5988/145.pdf>.
- ⁸ Larkin, J., Flicker, S., Koleszar-Green, R., Mintz, S., Dagnino, M., Mitchell, C. (2007). HIV risk, systemic inequities, and Aboriginal youth. *Canadian Journal of Public Health*. 98(3): 179-182. Available from: <http://journal.cpha.ca/index.php/cjph/article/viewFile/811/811>.
- ⁹ Marks, G., Crepaz, N., Senterfitt, J.W., Janssen, R.S. (2005). Meta-analysis of high-risk sexual behavior in persons aware and unaware they are infected with HIV in the United States—Implication for HIV Prevention Programs. *Epidemiology and Social Science*. 39(4): 446-453. Available from: http://journals.lww.com/jaids/Fulltext/2005/08010/Meta_Analysis_of_High_Risk_Sexual_Behavior_in.13.aspx.
- ¹⁰ Crepaz, N., Lyles, C.M., Wolitski, R.J., Passin, W.F., Rama, S.M., Herbst, J.H., Purcell, D.W., Malow, R.M., Stall, R., for the HIV/AIDS Prevention Research Synthesis (PRS) Team. (2006). Do prevention interventions reduce HIV risk behaviours among people living with HIV? A meta-analytical review of controlled trials. *AIDS*. 20: 143-157.
- ¹¹ Murphy, E.L., Collier, A.C., Kalish, L.A., Assman, S.F., Para, M.F., Flanigan, T.P., Kumar, P.N., Mintz, L., Wallach, F.R., Nemo, G.J. (2001). Highly active antiretroviral therapy decreases mortality and morbidity in patients with advanced HIV disease. *Annals of Internal Medicine*. 135(1): 17-26. Available from: <http://www.annals.org/content/135/1/17.full.pdf+html>.
- ¹² Vlahov, D., Galai, N., Safaeian, M., Galea, S., Kirk, G.D., Lucas, G.M., Sterling, T.R. (2005). Effectiveness of highly active antiretroviral therapy among injection drug users with late-stage human immunodeficiency virus infection. *American Journal of Epidemiology*. 161(11): 999-1012. Available from: <http://aje.oxfordjournals.org/cgi/reprint/161/11/999>.
- ¹³ Little, S.J., Holte, S., Routy, J.P., Daar, E.S., Markowitz, M., Collier, A.C., Koup, R.A., Mellors, J.W., Connick, E., Conway, B., Kilby, M., Wang, L., Whitcomb, J.M., Hellman, N.S., Richman, D.D. (2002). Antiretroviral-drug resistance among patients recently infected with HIV. *The New England Journal of Medicine*. 347(6): 385-394. Available from: <http://www.nejm.org/doi/pdf/10.1056/NEJMoa013552>.

41. INCIDENCE RATE FOR VEROTOXIGENIC *E. COLI* O157

Key Messages

- Verotoxigenic *E. coli*, or VTEC, is an infectious disease which affects the digestive system, and the most commonly referred type is *E. coli* O157
- Infections with VTEC result in cases of sporadic and outbreak-associated disease in humans
- The national incidence of VTEC has been slightly decreasing since 2001, after a large waterborne outbreak in 2000

What does this indicator measure?

This indicator measures the incidence rate of diagnosed Verotoxigenic *E. coli* O157 cases per 100,000 population in Canada, from 2000 to 2011.

What are the limitations of this indicator?

The surveillance data used to calculate this indicator were developed from various provincial and national databases. Each system has [inherent limitations](#); therefore interpretation of data should be done with caution.

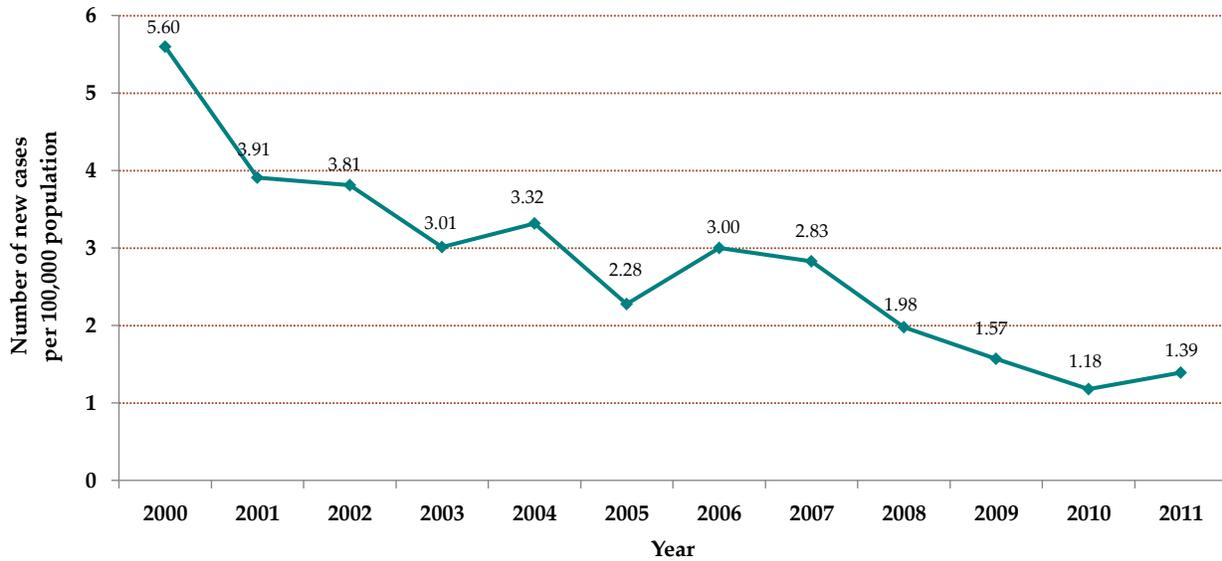
What is a food-borne illness?

Food contaminated by bacteria (such as *E. coli*), viruses and parasites can make you sick. Often called food poisoning, many people may have had food-borne illness and not even known it. Symptoms can start soon after eating the contaminated food, but they can also occur up to a month or later. More information about [food-borne illnesses](#) such as *E. coli* can be found in the Canadian Food Inspection Agency's website.

The number of reported *E. coli* O157 cases is slightly decreasing since 2001

A lower number of reported cases of verotoxigenic *E. coli* O157 were observed after 2000. A large number of cases were reported in 2000 due to a waterborne outbreak of *E. coli* in Walkerton, Ontario.

Figure 60 Incidence Rate for Verotoxigenic *E. coli* O157
Per 100,000 population, Canada, 2000-11



Source: Public Health Agency of Canada. *National Enteric Surveillance Program (NESP) Annual Summary*.
 Notes: Provinces/territories update their reportable disease data frequently, even after the Public Health Agency of Canada finalizes the data for a given period, so provinces/territories will always have the most up-to-date data for their respective jurisdictions.
 Minor variations in data will occur when comparing data with other federal and provincial/territorial publications because of reporting delays, different cut-off dates and date of access to Statistics Canada’s population estimates. Values are laboratory-based identifications and should not be confused with incidence of disease. For additional exclusions/limitations, see Annex 2.

What these results mean for you

E. coli bacteria are found naturally in the intestines of cattle, poultry and other animals. Despite precautions, *E. coli* bacteria can sometimes contaminate the surface of meat when animals are slaughtered. In highly processed or ground meat, the mechanical process can spread the bacteria through the meat. Raw fruits and vegetables can also become contaminated with pathogens while in the field by improperly composted manure, contaminated water, wildlife, and poor hygienic practices of farm workers.

E. coli infections are generally caused by eating contaminated food, drinking contaminated water, or coming into direct contact with someone who is sick or with animals that carry the bacteria. Infections can be caused by improperly cooked beef; raw fruits and uncooked vegetables, including sprouts; unpasteurized (raw) milk and (raw) milk products, including raw milk cheese; unpasteurized apple juice/cider; and direct contact with animals at petting zoos or farms. If people become infected with these

bacteria, this can result in serious illness. Some of the symptoms, such as severe abdominal cramping and diarrhea that may contain blood, can develop within hours and up to 10 days after ingesting the bacteria. Others infected with the bacteria may not get sick or show symptoms but may still carry the bacteria and spread the infection to others. Other complications from *E. coli* infection include increased risk of high blood pressure¹ and increased risk of kidney damage.^{1,2,3}

Proper hygiene such as hand-washing,⁴ safe food handling and preparation practices are key to preventing food-borne illness.⁵ If you think you are infected with *E. coli* bacteria or any other gastrointestinal illness, do not prepare food for other people. It is also a good idea to keep pets away from food storage and preparation areas.

Benefits of sanitary practices

- Decreased risk of infection
- Decreased risk of spreading the pathogen to others
- Decreased risk of *E. coli*-associated morbidity
- Decreased risk of *E. coli*-associated death

Health risks associated with VTEC infection

- Abdominal cramping
- Diarrhea, including bloody diarrhea
- Increased risk of high blood pressure
- Increased risk of kidney damage
- Death

Things you can do to prevent or manage VTEC infection

- Practise proper personal hygiene: frequent hand-washing with soap and water, as well as disposal of soiled diapers and human waste, and prevention of contamination of food and beverages
- Wash counters and utensils with hot soapy water after they have come in contact with raw meat
- Refrigerate food items at or below 4°C to slow down most bacterial growth. Freezing at or below -18°C will stop it completely
- Keep raw food away from ready-to-eat food while shopping, storing and preparing foods
- Cook meat to a safe internal temperature (at least 60°C) to destroy *E. coli* bacteria
- Visit the [Canadian Food Inspection Agency's website](#) for safe internal cooking temperature for different meat
- See your doctor when you are not feeling well and suspect that you may suffer from food-borne infections

Things that community, industry and/or government can do to prevent VTEC infection

- Routinely and properly test water meant for community consumption, and treat accordingly
- Implement and maintain food preparation and safety standards at all levels (i.e., from farm to fork)

- Provide individuals, communities, and industries with the necessary knowledge and resources to reduce the risk of infection with VTEC

References

- ¹ Clark, W.F., Kortas, C., Suri, R.S., Moist, L.M., Salvadori, M., Weir, M.A., Garg, A.X. (2008). Excessive fluid intake as a novel cause of proteinuria. *Canadian Medical Association Journal*. 178(2): 173-175.
- ² Richards, A. (2005). The Walkerton Health Study. *The Canadian Nurse*. 101(5): 16-21.
- ³ Garg, A.X., Salvadori, M., Moist, L.M., Suri, R.S., Clark, W.F. (2009). Renal prognosis of toxigenic *Escherichia coli* infection. *Kidney International*. 75: S38-S41.
- ⁴ Aiello, A.E., Coulborn, R.M., Perez, V., Larson, E.L. (2008). Effect of hand hygiene on infectious disease risk in the community setting: a meta-analysis. *American Journal of Public Health*. 98(8): 1372-1381. Available from: <http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2007.124610>.
- ⁵ Public Health Agency of Canada. (2010). *Verotoxic E. coli*. Available from: <http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/diseases/ecol-eng.php>.

42. INCIDENCE OF ANTIMICROBIAL RESISTANCE

Key Messages

- Antimicrobial resistance occurs when an antimicrobial substance or agent is no longer effective in killing or inhibiting the growth of a particular microorganism
- Organisms such as bacteria, viruses, fungi and parasites are becoming resistant to the drugs used to fight them
- Increasing resistance to antibiotics makes treatment of bacterial infections more difficult, leaving fewer antibiotics to prevent and treat infectious diseases
- Antimicrobial resistance leads to lingering infections which in turn lead to higher medical costs, longer hospital stays, and higher morbidity and mortality
- Methicillin-resistant *staphylococcus aureus* (MRSA) is one of the resistant organisms being monitored in Canadian hospitals and its rate of occurrence, used in this report as indicator for the overall antimicrobial resistance, had steadily increased from 2000 to 2009, and since then, has been decreasing
- Canadians can help prevent the spread of antimicrobial resistance simply by general hygienic measures such as washing hands, and making sure to follow scrupulously their doctor's prescription

What does this indicator measure?

This indicator measures the rate of detection of MRSA in infected and colonized (i.e., non-infected) patients per year and per every 1,000 patients admitted in a large Canadian acute care hospital. It is also usually expressed as the number of patients (infected and colonized) diagnosed with *staphylococcus aureus* resistant to methicillin treatment over the total number of days that every single patient spent during hospitalization over the surveillance year.

N.B. The Canadian Nosocomial Infections Surveillance Program (source of these data) does conduct surveillance on other resistant organisms such as vancomycin-resistant *E. coli*, *clostridium difficile*, and *Carbapenem-resistant* gram-negative bacteria (since 2009).

What are the limitations of this indicator?

The surveillance program from which the incidence rates of MRSA are generated is primarily conducted in large acute care hospitals; therefore, the resulted statistics are not representative of small or community hospitals.

What is methicillin-resistant *staphylococcus aureus*?

Staphylococcus aureus (Staph) is a type of bacteria that is commonly found on the skin and in the noses of healthy people. Some Staph bacteria are easily treatable while others are not. Staph bacteria that are resistant to the antibiotic methicillin are known as Methicillin-resistant *Staphylococcus aureus* or MRSA. If left untreated, MRSA infections may develop into serious, life-threatening complications such as infection of the bloodstream, bones and/or lungs (e.g., pneumonia).

How is MRSA spread?

At any given time, between 20 and 30 per cent of the general population carry Staph bacteria on their hands or in their noses, but are not ill. Some of these bacteria may be MRSA, while others are not antibiotic resistant. You may have MRSA and not get sick, but still spread it to others than can become ill.

MRSA is usually spread through direct physical contact or through contact with objects contaminated with infected bodily fluids. If you pick up the bacteria on your hands through physical contact with an infected person or from a contaminated surface, you can spread it to others if you don't clean your hands properly. You can also infect yourself through an open wound on your own body.

MRSA has been shown to spread easily in healthcare settings. It has been estimated that 30 to 40% of endemic institutional antibiotic resistance is caused by the unwashed hands of hospital personnel.¹ It has also been documented that health care workers and other caregivers neglect to wash their hands before and after patient contact, and that physicians were among the least compliant toward this sanitary act.² For instance, a 2007 Brazilian research reported that only 2.9% of doctors recognized that sanitary measures (such as hand washing, cleaning instruments, etc.) were important strategies for preventing the emergence of resistance.³

Antimicrobial resistance in humans has also been associated with drugs given to animals either for disease prevention and treatment or growth promotion.

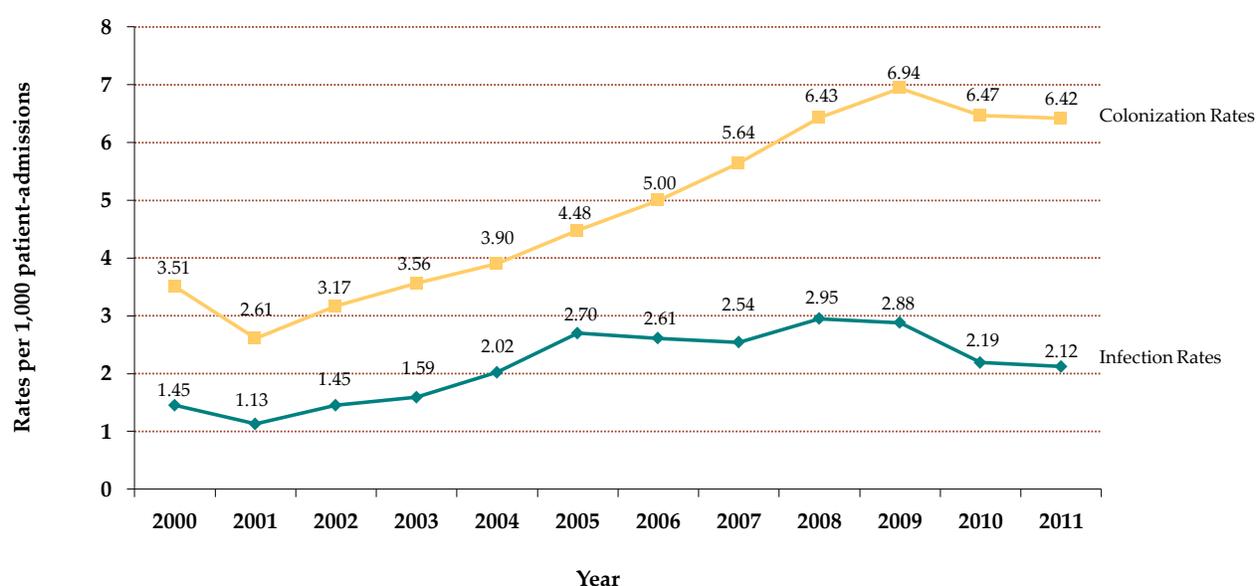
Who gets MRSA?

People with weakened immune systems and chronic conditions are more susceptible to MRSA infection. Outbreaks are more common in healthcare settings because some patients already have a weakened immune system.

Infection and Colonization rates are slightly decreasing since 2009

Over a six-year period (2000-2005), the infection rate for methicillin-resistant *staphylococcus aureus* (MRSA) almost doubled as it went from 1.45 to 2.70 per 1,000 patient-admissions. From 2005 to 2009, it remained relatively unchanged before dropping significantly to 2.12 per 1,000 patient-admissions in 2011. Unlike the infection rate, the rate of colonization with MRSA steadily increased from 2001 to 2009 since it went from 2.61 to 6.94 per 1,000 patient-admissions, and then decreased to 6.42 per 1,000 patient-admissions in 2011.

Figure 61 Incidence of Antimicrobial Resistance: Methicillin-Resistant *Staphylococcus Aureus* (MRSA) Canada, 2000-11



Source: Public Health Agency of Canada. Canadian Nosocomial Infection Surveillance Program (CNISP).

Notes: Provinces/territories update their reportable disease data frequently, even after the Public Health Agency of Canada finalizes the data for a given period, so provinces/territories will always have the most up-to-date data for their respective jurisdictions.

These values include substantial variations. For details, see Annex 2.

What these results mean for you

Antimicrobial resistance threatens our ability to fight bacterial infections affecting humans and animals, leading to significant economic and public health consequences. Antibiotic-resistant infections are associated with longer hospital stays, higher rates of sickness and death, and higher medical costs.^{4,5}

Why was there an increase in the rates of MRSA?

There are a number of reasons:

- MRSA screening techniques have become more effective over time

- More hospitals started actively screening for MRSA
- We also know that the misuse of antibiotics in both hospital and community settings can cause infections like MRSA to become more virulent and more difficult to contain and treat
- If antibiotics are prescribed to treat infections unnecessarily or when individuals do not complete their prescriptions, infections can develop a resistance to antibiotics

Benefits of implementing an antimicrobial stewardship program

- Prevent or slow the emergence of antimicrobial resistance
- Optimize selection, dose and duration of treatment
- Reduce adverse drug events including secondary infection
- Reduce morbidity and mortality
- Reduce length of stay
- Reduce health care expenditure

Reasons and/or problems associated with poor prescribing practices by health professionals

- Doctors should not prescribe antibiotics for the treatment of colds, flu and other viral infections, because antibiotics don't work on viruses
- Overuse and/or over-prescription of antibiotics is one of the main factors in the emergence and dissemination of antibiotic resistance
- Desire of the physician to give the best possible treatment regardless of cost or subsequent effects
- Failure to consider alternative treatments
- Inappropriate use of diagnostic laboratory results

Problems associated with not following your prescription

- Not taking all of a prescription may lead to the strongest germs surviving
- May become sicker after germs have become resistant to antibiotics

Things you can do to prevent antimicrobial resistance

- Only use antimicrobial and antiviral drugs, whether for humans or animals, when needed
- Don't take antibiotics to treat colds, flu and other viral infections
- Take drugs as directed by your doctor or pharmacist. Do not stop taking a drug part way through; while symptoms may have disappeared, the bacteria may not be all gone, and the surviving bacteria can recover and become stronger and more resistant to the antibiotic
- Don't share prescription drugs with anyone
- Do not flush out-of-date or unused medication down the toilet, pour it down the sink or in the garbage
- Avoid the use of antibacterial soap and "bacteria-fighting" household cleaning products. These are no more effective than regular soap and can kill good bacteria. Cleaning with soap and water, and disinfecting with water and vinegar, is sufficient
- Wash your hands regularly with soap and water for at least 20 seconds

- Keep vaccinations up-to-date
- Store, handle and prepare food safely
- Speak with your health care provider about antimicrobial resistance
- For more information on antimicrobial resistance, visit the [Public Health Agency of Canada's website](#)

References

- ¹ Weinstein, R.A. (2001). Controlling antimicrobial resistance in hospitals: infection control and use of antibiotics. *Emerging Infectious Diseases*. 7: 188-192. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2631704/pdf/11294703.pdf>.
- ² Conly, J. (2002). Antimicrobial resistance in Canada. *Canadian Medical Association Journal*. 167(8): 885-891. Available from: <http://www.cmaj.ca/cgi/reprint/167/8/885>.
- ³ Guerra, C.M., Pereira, C.A.P., Neves Neto, A.R., Cardo, D.M., Correa, L. (2007). Physicians' perceptions, beliefs, attitudes, and knowledge concerning antimicrobial resistance in a Brazilian teaching hospital. *Infection Control and Hospital Epidemiology*. 28: 1411-1414.
- ⁴ Cosgrove, S.E. (2006). The relationship between antimicrobial resistance and patient outcomes: mortality, length of hospital stay, and health care costs. *Clinical Infectious Diseases*. 42: S82-S89. Available from: http://cid.oxfordjournals.org/content/42/Supplement_2/S82.full.pdf+html.
- ⁵ Holmberg, S.D., Solomon, S.L., Blake, P.A. (1987). Health and economic impacts of antimicrobial resistance. *Reviews of Infectious Diseases*. 9: 1065-1078. Available from: <http://www.jstor.org/stable/4454251>.

43. BLOOD CHOLESTEROL LEVELS

Key Messages

- Cholesterol plays an important role in the human body
- Cholesterol can be “good” (HDL-cholesterol) or “bad” (LDL-cholesterol)
- For better health, HDL-cholesterol level should be over 1.0 mmol/L for men and over 1.3 mmol/L for women; LDL-cholesterol level should be below 3.5 mmol/L, and the ratio total cholesterol/HDL must be below 5.0
- In 2009-11, 74% of Canadians were within a healthy range for HDL-cholesterol; 76% of Canadians were within a healthy range for LDL-cholesterol; and 85% of Canadians were within the healthy range for the ratio total cholesterol/HDL

A mmol . . .
 . . . is a unit used to measure the concentration of substances in the blood.

What does this indicator measure?

This indicator measures the percentage of Canadian adults aged between 6 and 79 years who had healthy levels of HDL-cholesterol, LDL-cholesterol, and in the ratio of total cholesterol/HDL.

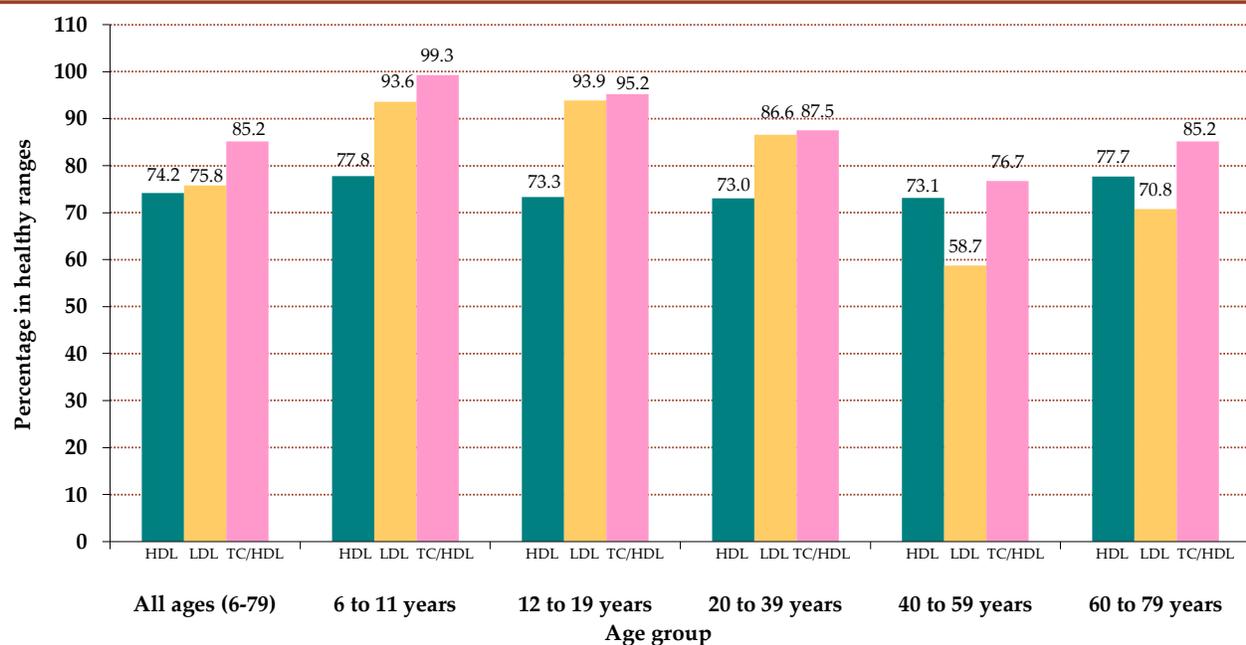
<p>HDL-cholesterol is considered “good” because it is transported away from the arteries to the liver where it is converted to bile. A level of HDL-cholesterol higher than 1.0 mmol/L for men and 1.3 mmol/L for women prevents coronary heart disease.</p>	<p>LDL-cholesterol is considered “bad” because it is transported into the arteries where it can settle as plaque, resulting in a diminished blood flow and oxygen supply. Blocked arteries can lead to angina, heart attacks or strokes. Low levels of LDL-cholesterol are best.</p>
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The ratio total cholesterol/HDL is often used to predict cardiovascular risk and is believed to be a better measure of risk for cardiovascular disease compared to either total cholesterol or LDL-cholesterol alone.^{1,2} It is measured by calculating the total level of cholesterol (HDL, LDL and VLDL cholesterol), divided by the level of HDL. A ratio of total cholesterol/HDL must be below 5.0 to be in the healthy range.

Most Canadians are within a healthy range for HDL-cholesterol, LDL-cholesterol, and the ratio total cholesterol/HDL

Cholesterol levels for HDL, LDL, and for the ratio total cholesterol/HDL were reported to be within a healthy range for 74.2% (HDL), 75.8% (LDL), and 85.2% (ratio total cholesterol/HDL) of Canadians aged between 6 and 79 years. A lower percentage of Canadians between the ages of 40-59 and 60-79 years had LDL-cholesterol levels within a healthy range compared to Canadians in younger age categories (6-11 years, 12-19 years, and 20-39 years). The percentage of Canadians with a healthy ratio of total cholesterol/HDL also varied with age, ranging from 99.3% for the age group 6-11 years down to 76.7% in the 40-59 year age group.

Figure 62 Blood Cholesterol Levels
Percentage of population aged 6 to 79 years, within a healthy range for HDL-cholesterol, LDL-cholesterol, and total cholesterol/HDL ratio, by age group, Canada, 2009-11



Source: Statistics Canada. Canadian Health Measures Survey, 2009-11.

Notes: Includes household population aged 6 to 79 years old.

HDL levels must be above 1.0 mmol/L for men, and above 1.3 mmol/L for women to be in the healthy category.

LDL levels must be below 3.5 mmol/L to be in the healthy category.

The ratio of total cholesterol to HDL cholesterol (TC/HDL) must be below 5.0 to be in the healthy category.

For additional exclusions/limitations, see Annex 2.

What these results mean for you

Blood cholesterol is a lipid that occurs naturally in your body and is essential for proper functioning. It is a major part of all cell membranes and is used by the body to synthesize steroid hormones such as estrogen and testosterone, as well as converted to bile salts to help digest the foods you consume.

There are two sources of cholesterol in the body: about 15-20% is found in foods (such as meat, fish, poultry, egg yolks and milk products), and 80-85% is synthesized by your liver. Eating high cholesterol

foods can affect your blood cholesterol, but it is the consumption of food containing saturated and trans fat that has the greatest impact on your cholesterol levels.

It is well documented that unhealthy blood cholesterol levels are detrimental to a person's health. For example, a low level of HDL-cholesterol is a risk factor for cardiovascular disease,^{3,4} whereas a high level of LDL-cholesterol is a major risk factor for cardiovascular disease and stroke.^{5,6} Other research shows that a high ratio of total cholesterol/HDL is a superior measure of risk for cardiovascular disease compared to either total cholesterol or LDL-cholesterol alone.^{1,2}

Several strategies can be taken to improve your cholesterol levels. A diet low in cholesterol, saturated and/or trans fats has been shown to lower the level of LDL-cholesterol in the blood.⁷ Furthermore, research shows that a diet rich in monounsaturated and polyunsaturated fats, eating plenty of fruits and vegetables, and limiting the consumption of meat, can lower LDL-cholesterol, and may lower mortality rates from heart disease.^{8,9} Diets high in sources of soluble or viscous fibres are also associated with lower cholesterol.^{10,11} In addition, exercise is a potent agent to improve cholesterol levels since it increases HDL-cholesterol and decreases LDL-cholesterol.^{12,13,14} Finally, medication therapies can be prescribed to decrease LDL-cholesterol.¹⁵

Benefits associated with healthy cholesterol levels

- Better health
- Prevention of disease, including cardiovascular diseases
- Better control of blood pressure

Health problems associated with unhealthy cholesterol levels

- Coronary heart disease
- Stroke
- Hypertension
- Diabetes
- Obesity

Things you can do to maintain healthy levels of cholesterol

- Choose monounsaturated and polyunsaturated fats including canola, olive and soybean oil
- Choose foods that are low in saturated and trans fats
- Eat foods that are naturally high in fibre
- Consume two portions of fish each week, such as char, herring, mackerel, salmon, sardines and trout
- Drink alcohol in moderation
- Exercise regularly
- Do not smoke
- Maintain a healthy weight
- Speak with your health care provider to learn more about how you can maintain or reach healthy levels of cholesterol
- Consult [*Canada's Food Guide*](#)

- For more information on [cholesterol and its effect on health](#), you can visit the Public Health Agency of Canada's website

References

- ¹ Wilson, P.W.F., D'Agostino, R.B., Levy, D., Belanger, A.M., Silbershatz, H., Kannel, W.B. (1998). Prediction of coronary heart disease using risk factor categories. *Circulation*. 97: 1837-1847. Available from: <http://circ.ahajournals.org/content/97/18/1837.full.pdf+html>.
- ² Kinoshian, B., Glick, H., Garland, G. (1994). Cholesterol and coronary heart disease: predicting risks by levels and ratios. *Annals of Internal Medicine*. 121: 641-647. Available from: <http://annals.org/article.aspx?articleid=708129>.
- ³ Barter, P., Gotto, A.M., LaRosa, J.C., Maroni, J., Szarek, M., Grundy, S.M., Kastelein, J.J.P., Bittner, V., Fruchart, J.-C. (2007). HDL cholesterol, very low levels of LDL cholesterol, and cardiovascular events. *The New England Journal of Medicine*. 357: 1301-1310. Available from: <http://content.nejm.org/cgi/reprint/357/13/1301.pdf>.
- ⁴ de Goma, E.M., Leeper, N.J., Heidenreich, P.A. (2008). Clinical significance of high-density lipoprotein cholesterol in patients with low low-density lipoprotein cholesterol. *Journal of the American College of Cardiology*. 51: 49-55. Available from: <http://www.sciencedirect.com/science/article/pii/S0735109707032809>.
- ⁵ Briel, M., Ferreira-Gonzalez, I., You, J.J., Karanickolas, P.J., Akl, E.A., Wu, P., Blehacz, B., Bassler, D., Wei, X., Sharman, A., Whitt, I., Alves da Silva, S., Khalid, Z., Nordmann, A.J., Zhou, Q., Walter, S.D., Vale, N., Bhatnagar, N., O'Regan, C., Mills, E.J., Bucher, H.C., Montori, V.M., Guyatt, G.H. (2009). Association between change in high density lipoprotein cholesterol and cardiovascular disease morbidity and mortality: systematic review and meta-regression analysis. *British Medical Journal*. 338: 1-8. Available from: <http://www.bmj.com/content/338/bmj.b92.pdf%2Bhtml>.
- ⁶ Hu, F.B., Manson, J.E., Willett, W.C. (2001). Types of dietary fat and risk of coronary heart disease: a critical review. *Journal of the American College of Nutrition*. 20(1): 5-19. Available from: <http://www.jacn.org/cgi/reprint/20/1/5>.
- ⁷ Dietschy, J.M. (1998). Dietary fatty acids and the regulation of plasma low density lipoprotein cholesterol concentrations. *Journal of Nutrition*. 128: 444S-448S. Available from: <http://jn.nutrition.org/cgi/reprint/128/2/444S>.
- ⁸ Kris-Etherton, P.M., Pearson, T.A., Wan, Y., Hargrove, R.L., Moriarty, K., Fishell, V., Etherton, T.D. (1999). High-monounsaturated fatty acid diets lower both plasma cholesterol and triacylglycerol concentrations. *American Journal of Clinical Nutrition*. 70: 1009-1015. Available from: <http://www.ajcn.org/cgi/reprint/70/6/1009>.
- ⁹ Katan, M.B., Zock, P.L., Mensink, R.P. (1995). Dietary oils, serum lipoproteins, and coronary heart disease. *American Journal of Clinical Nutrition*. 61(supplement): 1368S-1373S. Available from: <http://ajcn.nutrition.org/content/61/6/1368S.full.pdf+html>.
- ¹⁰ Brown, L., Rosner, B., Willett, W.W., Sacks, F.M. (1999). Cholesterol-lowering effects of dietary fiber: a meta-analysis. *American Journal of Clinical Nutrition*. 69: 30-42. Available from: <http://www.ajcn.org/cgi/reprint/69/1/30>.
- ¹¹ Anderson, J.W., Baird, P., Davis, R.H. Jr., Ferreri, S., Knudtson, M., Koraym, A., Waters, V., Williams, C.L. (2009). Health benefits of dietary fiber. *Nutrition Reviews*. 67(4): 188-205. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/j.1753-4887.2009.00189.x/pdf>.
- ¹² Halverstadt, A., Phares, D.A., Wilund, K.R., Goldberg, A.P., Hagberg, J.M. (2007). Endurance exercise training raises high-density lipoprotein cholesterol and lowers small low-density lipoprotein and very low-density lipoprotein independent of body fat phenotypes in older men and women. *Metabolism Clinical and Experimental*. 56: 444-450. Available from: <http://www.sciencedirect.com/science/article/pii/S0026049506003842>.
- ¹³ Leon, A.S., Sanchez, O.A. (2001). Response of blood lipids to exercise training alone or combined with dietary intervention. *Medicine and Science in Sports and Exercise*. 33: S502-S515.

- ¹⁴ Leon, A.S., Sanchez, O.A. (2001). Meta-analysis of the effects of aerobic exercise training on blood lipids. *Circulation*. 104 (Suppl. II): 414-415.
- ¹⁵ Treasure, C.B., Klein, J.L., Weintraub, W.S., Talley, J.D., Stillabower, M.E., Kosinski, A.S., Zhang, J., Boccuzzi, S.J., Cedarholm, J.C., Alexander, R.W. (1995). Beneficial effects of cholesterol-lowering therapy on the coronary endothelium in patients with coronary artery disease. *The New England Journal of Medicine*. 332(8): 481-487. Available from: <http://www.nejm.org/doi/pdf/10.1056/NEJM199502233320801>.

44. DIAGNOSED HIGH BLOOD PRESSURE

Key Messages

- High blood pressure is an important risk factor for cardiovascular diseases
- High blood pressure can be controlled by medication and/or lifestyle modification, based on your doctor's recommendations
- About 17% of Canadians with high blood pressure are unaware that they have this condition
- The percentage of Canadians who have been diagnosed with high blood pressure increased from 15.0% in fiscal year 2000/01 to 19.8% in fiscal year 2008/09
- In 2008/10, a higher percentage of First Nations adults reported high blood pressure compared to the total Canadian population
- In 2006, among Inuit aged 15 years and older, 12% reported that they had been diagnosed as having high blood pressure

What does this indicator measure?

This indicator measures the percentage of Canadians aged 20 years and older who have been diagnosed with high blood pressure.

It also measures the percentage of First Nations adults aged 18 years and older living in First Nations communities* who reported that they had been diagnosed by a health professional as having high blood pressure.

Similarly, it measures the percentage of Inuit population aged 15 years and older who reported that they had been diagnosed by a health professional as having high blood pressure.

Prevalence rate . . .

. . . refers to the number of people with the condition at the specified point in time divided by 100 (often expressed as a percentage).

	Blood Pressure	
	<u>Systolic blood pressure</u>	<u>Diastolic blood pressure</u>
Normal blood pressure	<120 mm Hg	<80 mm Hg
Pre-hypertension	120-139 mm Hg	80-89 mm Hg
High blood pressure (hypertension)	≥140 mm Hg	≥90 mm Hg
High blood pressure among individuals with diabetes	≥130 mm Hg	≥80 mm Hg

Systolic blood pressure (the highest or top number) is the pressure in the artery when the heart contracts.

Diastolic blood pressure (the lowest or bottom number) is the pressure in the artery when the heart relaxes between beats.

* First Nations living on reserve and in northern First Nations communities.

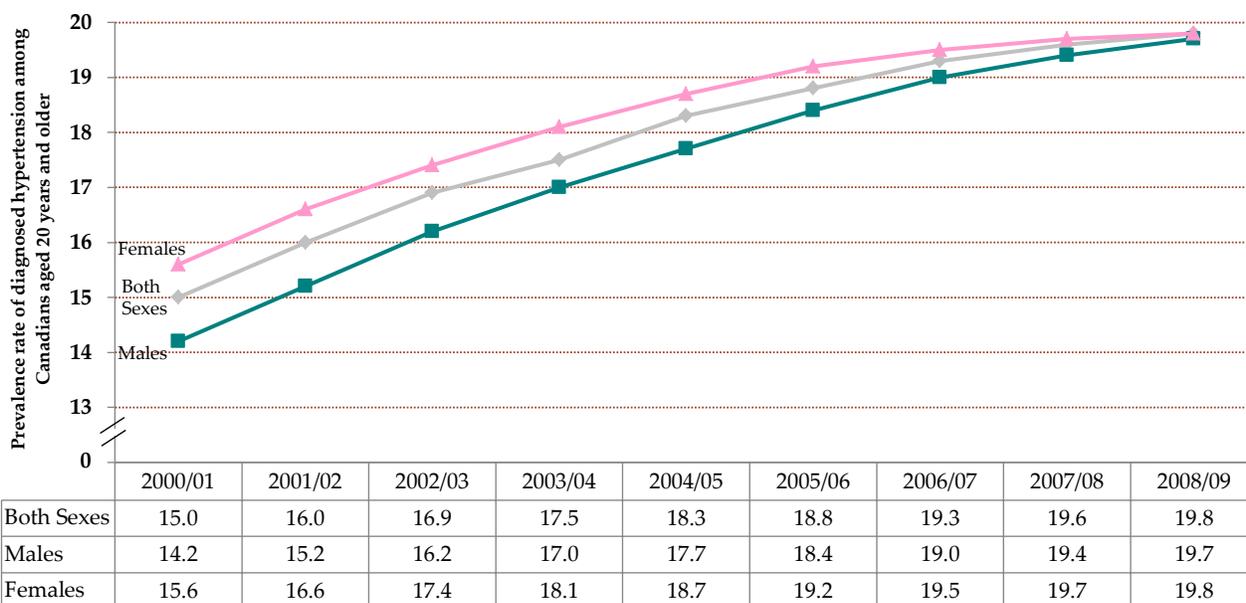
What are the limitations of this indicator?

Approximately 17% of adults who have high blood pressure are unaware of their condition, because most individuals do not have any signs or symptoms until other serious problems arise.¹ Therefore, the number of Canadians with high blood pressure is possibly underestimated. Also, since this indicator uses administrative health databases as its source, misclassification is possible². Furthermore, data for the Canadian population are coming from administrative health databases, while the First Nations and Inuit data are self-reported.

High blood pressure is on the rise in Canada

In 2008/09, the year for which the most recent data were available, 19.8% of Canadians aged 20 years and older had diagnosed high blood pressure, an increase from 15.0% in 2000/01.^{2,3} Prevalence rates for males and females also increased, from 14.2% for males and 15.6% for females in 2000/01, to 19.7% for males and 19.8% for females in 2008/09. The true prevalence of diagnosed high blood pressure is likely higher as some people with high blood pressure are unaware of their condition.

Figure 63 Diagnosed High Blood Pressure
Prevalence rate of diagnosed hypertension among Canadians aged 20 years and older, by sex (age-standardized), Canada, 2000/01 to 2008/09



Source: Public Health Agency of Canada. Canadian Chronic Disease Surveillance System.

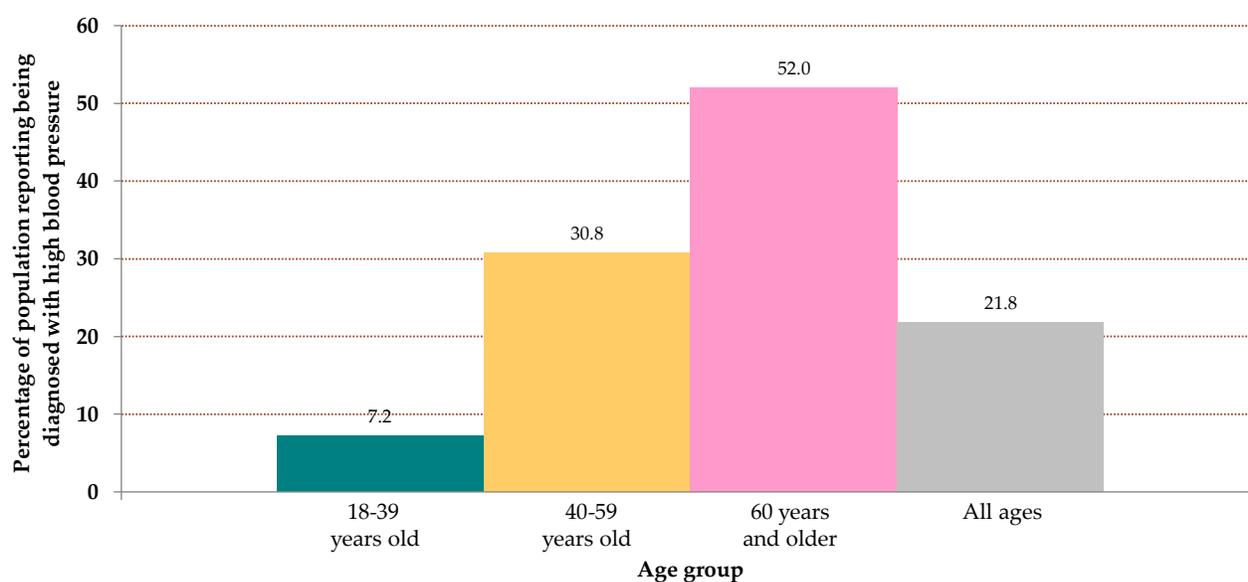
Notes: Cases of pregnancy-induced hypertension are excluded as this condition usually resolves after pregnancy. Age-standardized to the 1991 Canadian population.

A higher percentage of First Nations adult report high blood pressure compared to the total Canadian population

Just over two in 10 (21.8%) First Nations adults living in First Nations communities* reported having been diagnosed with high blood pressure. This is higher than the 13.5% figure for the total Canadian population the same age.⁴

Among First Nations people living in First Nations communities, the percentage rose steadily with age from 7.2% for those aged 18 to 39 years to 52.0% for those aged 60 years and older.

Figure 64 Self-Reported High Blood Pressure
Percentage of First Nations adults living in First Nations communities,* aged 18 years and older, who reported being diagnosed with high blood pressure, both sexes, by age group, 2008/10



Source: First Nations Information Governance Centre. First Nations Regional Health Survey (RHS), 2008/10.

Notes: * First Nations living on reserve and in northern First Nations communities.

Population aged 18 years and older who reported that they had been diagnosed by a health professional as having high blood pressure.

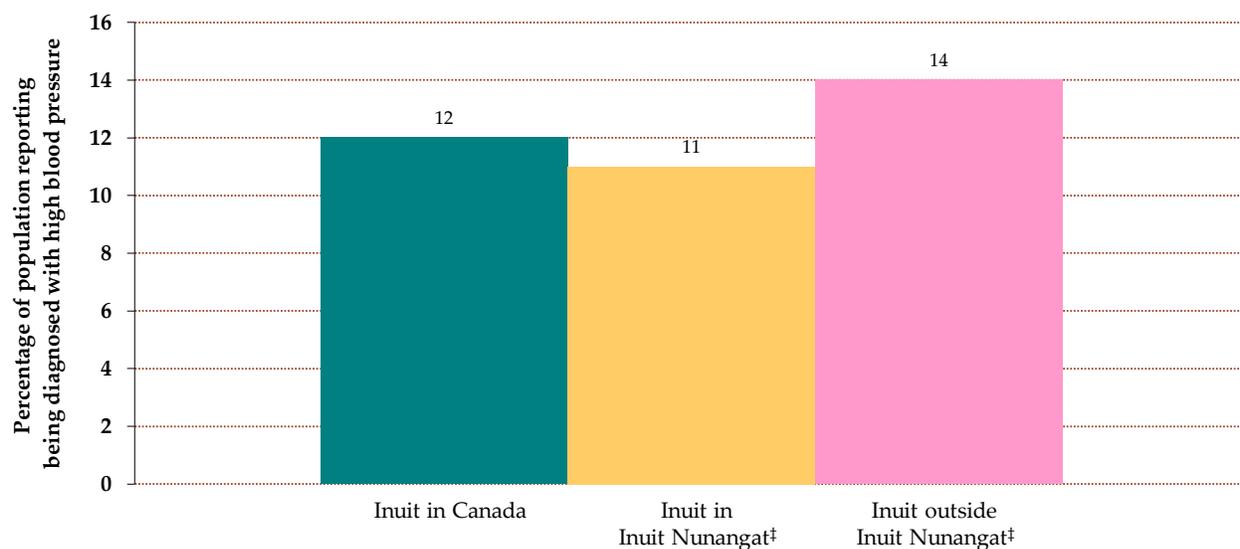
For additional exclusions/limitations, see Annex 2.

* First Nations living on reserve and in northern First Nations communities.

No difference in high blood pressure rate between Inuit in Inuit Nunangat[‡] and those living outside this region

In 2006, 12% of Inuit aged 15 years and older in Canada reported having been diagnosed with high blood pressure. The figures for Inuit adults living in Inuit Nunangat and those living outside were not significantly different – 11% and 14% respectively.

Figure 65 Self-Reported High Blood Pressure
Percentage of Inuit aged 15 years and older who reported being diagnosed with high blood pressure, both sexes, by region, 2006



Source: Statistics Canada. Aboriginal Peoples Survey, 2006: *“Inuit Health and Social Conditions: Supporting Data Tables.”* Catalogue no. 89-637-X, No. 002.

Notes: Population aged 15 years and older who reported that they were diagnosed with high blood pressure.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

For additional exclusions/limitations, see Annex 2.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

What these results mean for you

Blood pressure (BP) is the pressure exerted by circulating blood upon the walls of blood vessels. Systolic BP is the pressure in the arteries when the blood is ejected by the contraction of the heart, while diastolic BP is the pressure in the arteries when the heart relaxes between beats. During each heartbeat, maximum (systolic) and minimum (diastolic) pressures vary; in addition, BP normally varies throughout the day. However, when either systolic or diastolic BP remains consistently high for an extended time period, an individual is considered to have high blood pressure, which is also known as hypertension. Elevated high blood pressure for a long period of time increases the strains and risks to your heart and blood vessels.

Although most people do not report health symptoms related to this condition, it can cause headache, dizziness, vision problems, or shortness of breath in some individuals. This is why high blood pressure is referred to as “a silent killer.”

High blood pressure is a serious risk factor for several diseases. Research shows that each increase of 20 mm Hg in systolic and/or 10 mm Hg in diastolic BP is associated with more than a twofold increase in cardiovascular and stroke death rates.⁵ Furthermore, when compared to normal BP below 120/80 mm Hg, values of 130-139/80-89 mm Hg are also associated with a twofold increase in the risk of cardiovascular diseases.⁶

BP tends to rise with age, and having a family history of high blood pressure may also have an effect on your BP later in life.⁷ However, it can be reduced with medication and/or lifestyle modifications. For example, it is well established that proper diet, adequate levels of physical activity, loss of excess body weight, alcohol and sodium restriction, and relaxation can have a significant positive effect on BP and health.^{8, 9, 10} In fact, even a small reduction of only 5 mm Hg in an individual’s systolic BP would result in a 14% reduction in mortality due to stroke, a 9% reduction in mortality due to coronary heart disease, and a 7% decrease in all-cause mortality.¹¹ Two recent meta-analyses also showed that decreasing systolic BP by 10 mm Hg and/or diastolic BP by 5 mm Hg could lead to a 30 to 41% risk reduction in the number of subsequent strokes,^{12, 13} and a 22 to 25% risk reduction for cardiovascular disease events.¹²

Benefits associated with normal blood pressure

- Prevention of cardiovascular diseases
- Lower stress on your heart and your blood vessels at rest and during exercise

Health problems associated with high blood pressure

- Damage to the walls of your arteries, causing tears or bulges (aneurysms) in the arteries of the brain, the heart, and other organs and body tissues
- Atherosclerosis or hardening of your arteries
- Coronary heart disease
- Stroke
- Enlarged heart and eventually heart failure
- Kidney disease
- Early death

Things you can do to maintain a healthy blood pressure

- Have your blood pressure checked regularly (at least once every two years) because when it is high it does not always present symptoms; high blood pressure is only diagnosed after BP has been taken on several occasions by a qualified health professional
- Eat a high fibre diet
- Eat foods low in saturated and trans fat
- Eat more fruits and vegetables
- Eat less salt, but remember that most salt that people consume is found in processed foods, not in the salt added at the table or in cooking
- If you drink, drink in moderation
- Be physically active 30 to 60 minutes most days of the week. Consult the [Physical Activity Guidelines](#) for more information
- Maintain a healthy weight
- Do not smoke
- Manage your stress by practicing relaxation techniques
- Speak with your health care provider to learn more about how you can maintain or reach a healthy blood pressure
- Consult [Canada's Food Guide](#)
- For more information on [blood pressure](#) and its effect on health, visit the Public Health Agency of Canada's website

References

- ¹ Wilkins, K., Campbell, N.R.C., Joffres, M.R., McAlister, F.A., Nichol, M., Quach, S., Johansen, H.L., Tremblay, M.S. (2010). Blood pressure in Canadian adults. *Health Reports*. 21(1): 1-11. Available from: <http://www.statcan.gc.ca/pub/82-003-x/2010001/article/11118-eng.pdf>.
- ² Public Health Agency of Canada. (2010). Report from the Canadian Chronic Disease Surveillance System: Hypertension in Canada, 2010. Available from: <http://www.phac-aspc.gc.ca/cd-mc/cvd-mcv/ccdss-snsmc-2010/index-eng.php>.
- ³ Robitaille, C., Dai, S., Waters, C., Loukine, L., Bancej, C., Quach, S., Ellison, J., Campbell, N., Tu, K., Reimer, K., Walker, R., Smith, M., Blais, C., Quan, H. (2012). Diagnosed hypertension in Canada: incidence, prevalence and associated mortality. *Canadian Medical Association Journal*. 184(1): E49-E56. Available from: <http://www.cmaj.ca/content/184/1/E49.full.pdf+html>.
- ⁴ Data for the total population of Canada are from the 2008 Canadian Community Health Survey (CCHS). These estimates have been standardized to the age distribution of the 2008 First Nations population living in First Nations communities aged 18 years and older.
- ⁵ Lewington, S., Clarke, R., Qizilbash, N., Peto, R., Collins, R. (2002). Age-specific relevance of usual blood pressure to vascular mortality: a meta-analysis of individual data for one million adults in 61 prospective studies. *The Lancet*. 360: 1903-1913. Available from: <http://www.sciencedirect.com/science/article/pii/S0140673602119118>.
- ⁶ Liszka, H.A., Mainous, A.G., King, D.E., Everett, C.J., Egan, B.M. (2005). Prehypertension and cardiovascular morbidity. *Annals of Family Medicine*. 3(4): 294-299. Available from: <http://annfammed.org/content/3/4/294.full.pdf+html>.
- ⁷ Goldstein, I.B., Shapiro, D., Guthrie, D. (2006). Ambulatory blood pressure and family history of hypertension in healthy men and women. *American Journal of Hypertension*. 19(5): 486-491. Available from: <http://ajh.oxfordjournals.org/content/19/5/486.full.pdf+html>.

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- ⁸ Dickinson, H.O., Mason, J.M., Nicolson, D.J., Campbell, F., Beyer, F.R., Cook, J.V., Williams, B., Ford, G.A. (2006). Lifestyle interventions to reduce raised blood pressure: a systematic review of randomized controlled trials. *Journal of Hypertension*. 24(2): 215-233.
- ⁹ Neter, J.E., Stam, B.E., Kok, F.J., Grobbee, D.E., Geleijnse, J.M. (2003). Influence of weight reduction on blood pressure: a meta-analysis of randomized controlled trials. *Hypertension*. 42: 878-884. Available from: <http://hyper.ahajournals.org/cgi/reprint/42/5/878>.
- ¹⁰ Whelton, S.P., Chin, A., Xin, X., He, J. (2002). Effect of aerobic exercise on blood pressure: a meta-analysis of randomized, controlled trials. *Annals of Internal Medicine*. 136: 493-503. Available from: <http://www.annals.org/content/136/7/493.full.pdf+html>.
- ¹¹ Stamler, R. (1991). Implications of the INTERSALT study. *Hypertension*. 17(1): I16-I20.
- ¹² Law, M.R., Morris, J.K., Wald, N.J. (2009). Use of blood pressure lowering drugs in the prevention of cardiovascular disease: meta-analysis of 147 randomised trials in the context of expectations from prospective epidemiological studies. *British Medical Journal*. 338(191): b1665. Available from: <http://www.bmj.com/content/338/bmj.b1665.pdf%2Bhtml>.
- ¹³ Lawes, C.M.M., Bennett, D.A., Feigin, V.L., Rodgers, A. (2004). Blood pressure and stroke: an overview of published reviews. *Stroke*. 35: 776-785. Available from: <http://stroke.ahajournals.org/cgi/reprint/01.STR.0000116869.64771.5Av1>.

45. SELF-REPORTED STRESS

Key Messages

- Stress can affect some people more than others
- It can be either good or bad
- Prolonged stress can have major consequences on your health, including your mental health
- Most Canadians do not report perceiving that most days in their life were “quite a bit” or “extremely” stressful
- In 2011, females (25.4%) reported being slightly more stressed than males (22.3%)

What does this indicator measure?

This indicator measures the percentage of the population aged 15 years and older who reported perceiving that most days in their life were “quite a bit” or “extremely” stressful.

What are the limitations of this indicator?

Self-reported stress is influenced by an individual’s perception of a stressor. While stressors such as death and disease will increase the perceived stress level for all individuals, many minor stressors such as the hassles and uplifts of everyday life have also been found to be strong predictors of psychological symptoms. Research on stress shows that relatively small, every day stressors can have a significant impact on mental health.^{1,2} Hence, data on this indicator may vary among the population depending on things such as one’s particular coping skills, position in the social structure, socio-economic status, as well as social support.

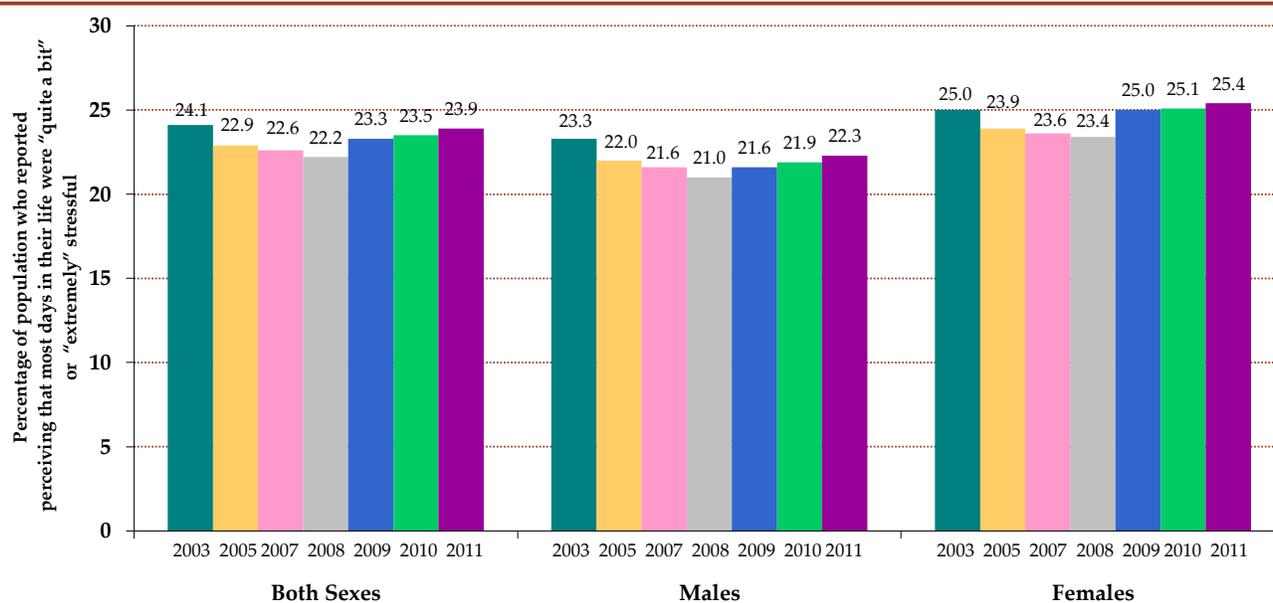
There are two main types of stress:

- (1) **eustress** prepares you to meet certain challenges and thus is productive;
- (2) **distress** is harmful and may lower resistance to infection by temporarily inhibiting certain components of the immune system.

The majority of Canadians do not report being stressed

In 2011, 23.9% of Canadians aged 15 years and older reported perceiving that most days in their life were “quite a bit” or “extremely” stressful. Also in 2011, more females than males reported perceiving that most days of their life were “quite a bit” or “extremely” stressful (25.4% for females versus 22.3% for males).

Figure 66 Self-Reported Stress
Percentage of population aged 15 years and older who reported perceiving that most days in their life were “quite a bit” or “extremely” stressful, by sex (age-standardized), Canada, 2003-11



Source: Statistics Canada. Canadian Community Health Survey, 2003-11.

Notes: Based on household population aged 15 years and older who reported perceiving that most days in their life were “quite a bit” or “extremely” stressful.
Age-standardized to the 1991 Canadian population.
For additional exclusions/limitations, see Annex 2.

What these results mean for you

Stress is the normal physiological response to events that make you feel threatened or upset your homeostasis (i.e., the co-ordinated control of physiological regulatory processes that restore and maintain normal body equilibrium). When sensing danger — whether real or imagined — the body's defences kick into a rapid, automatic process known as the “fight-or-flight” reaction or the stress response. During this response, the nervous system reacts by releasing stress hormones including the catecholamines epinephrine and norepinephrine as well as cortisol. These hormones rouse the body for immediate action by increasing your heart and breathing rates, blood pressure, muscle strength and endurance, and sharpening your senses and focus, as well as stop your digestion process, all of which prepare you to fight or run away from the perceived danger. This stress response is the body's way of protecting itself by staying focused, energetic and alert. In emergency situations, it can be lifesaving. It can also help you rise to meet life's challenges.

However, after a certain period of time is reached, stress starts causing major damage to your health, mood, productivity, sleep patterns, quality of life and lifestyle.^{3,4,5,6,7} Long-term exposure to stress can lead to serious health problems because it disrupts nearly every system in your body. It can suppress the immune system,⁸ raise blood pressure,⁹ increase the risk of heart attack^{8,10} and stroke,¹¹ cause atherosclerosis,¹² contribute to infertility,¹³ and speed up the aging process.^{8,14}

There are several ways to decrease your stress level. For example, it is now well established that physical activity can play a key role in stress management.^{15,16} In addition, flexibility and yoga exercises have been shown to be helpful.¹⁷ Other effective relaxation techniques include listening to music,^{18,19} laughter,²⁰ breathing exercises²¹ and meditation.²² Having a pet may also be beneficial in reducing anxiety, stress and blood pressure.²³

Benefits of maintaining a low stress level

- Better health
- More energy
- Ability to cope with life's challenges
- Improved mood

Health problems associated with high level of stress (the term associated includes both conditions which are caused by stress and conditions which are exacerbated by stress)

- Depression
- Obsessive-compulsive or anxiety disorders
- Insomnia
- Migraine headaches
- Hair loss
- Diabetes
- Heart disease, hypertension, stroke and atherosclerosis
- Hyperthyroidism
- Suppression of the immune system leading to a decreased capacity to fight infections
- Severe weight-gain or weight-loss
- Sexual dysfunction
- Tooth and gum disease
- Digestive problems
- Ulcers
- Cancer
- Asthma
- Rheumatoid arthritis

Things you can do to reduce your stress level

- Exercise daily
- Practice yoga
- Listen to relaxing music
- Limit your alcohol and coffee consumption

- Schedule breaks throughout the day
- Experiment with stress management techniques
- Take deep breaths when you feel stressed
- Laugh
- Increase your social support by doing activities with your friends and/or family
- Get a pet
- Make time for yourself
- Do things that you like

References

- ¹ Almeida, D.M. (2005). Resilience and vulnerability to daily stressors assessed via diary methods. *Current Directions in Psychological Science*. 14: 64-68.
- ² McIntyre, K.P., Korn, J.H., Matsuo, H. (2008). Sweating the small stuff: how different types of hassles result in the experience of stress. *Stress and Health*. 24: 383-392. Available from: <http://onlinelibrary.wiley.com/doi/10.1002/smi.1190/pdf>.
- ³ Hammen, C. (2005). Stress and depression. *Annual Review of Clinical Psychology*. 1: 293-319. Available from: <http://arjournals.annualreviews.org/doi/pdf/10.1146/annurev.clinpsy.1.102803.143938>.
- ⁴ Cohen, S., Janicki-Deverts, D., Miller, G.E. (2007). Psychological stress and disease. *Journal of the American Medical Association*. 298(14): 1685-1687. Available from: <http://jama.ama-assn.org/cgi/reprint/298/14/1685>.
- ⁵ Kalimo, R., Tenkanen, L., Härmä, M., Poppius, E., Heinsalmi, P. (2000). Job stress and sleep disorders: findings from the Helsinki Heart Study. *Stress Medicine*. 16: 65-75. Available from: [http://onlinelibrary.wiley.com/doi/10.1002/\(SICI\)1099-1700\(200003\)16:2%3C65::AID-SMI834%3E3.0.CO;2-8/pdf](http://onlinelibrary.wiley.com/doi/10.1002/(SICI)1099-1700(200003)16:2%3C65::AID-SMI834%3E3.0.CO;2-8/pdf).
- ⁶ Kouvonen, A., Kivimäki, M., Elovainio, M., Virtanen, M., Linna, A., Vahtera, J. (2005). Job strain and leisure-time physical activity in female and male public sector employees. *Preventive Medicine*. 41: 532-539. Available from: <http://www.sciencedirect.com/science/article/pii/S0091743505000101>.
- ⁷ Kouvonen, A., Kivimäki, M., Virtanen, M., Pentti, J., Vahtera, J. (2005). Work stress, smoking status, and smoking intensity: an observational study of 46,190 employees. *Journal of Epidemiology & Community Health*. 59: 63-69. Available from: <http://jech.bmj.com/content/59/1/63.full.pdf+html>.
- ⁸ McEwen, B.S. (1998). Protective and damaging effects of stress mediators. *The New England Journal of Medicine*. 338: 171-179.
- ⁹ Brady, S.S., Matthews, K.A. (2006). Chronic stress influences ambulatory blood pressure in adolescents. *Annals of Behavioral Medicine*. 31(1): 80-88. Available from: <http://www.springerlink.com/content/x651880406747811/fulltext.pdf>.
- ¹⁰ Kivimäki, M., Virtanen, M., Elovainio, M., Kouvonen, A., Väänänen, A., Vahtera, J. (2006). Work stress in the etiology of coronary heart disease: a meta-analysis. *Scandinavian Journal of Work, Environment and Health*. 32(6): 431-442. Available from: http://www.sjweh.fi/show_abstract.php?abstract_id=1049.
- ¹¹ Belkic, K.L., Landsbergis, P.A., Schnall, P.L., Baker, D. (2004). Is job strain a major source of cardiovascular disease risk? *Scandinavian Journal of Work, Environment and Health*. 30(2): 85-128. Available from: http://www.sjweh.fi/show_abstract.php?abstract_id=769.
- ¹² Hintsanen, M., Kivimäki, M., Elovainio, M., Pulkki-Räback, L., Keskivaara, P., Juonala, M., Raitakari, O.T., Keltikangas-Järvinen, L. (2005). Job strain and early atherosclerosis: the cardiovascular risk in young Finns study. *Psychosomatic Medicine*. 67: 740-747. Available from: <http://www.psychosomaticmedicine.org/cgi/reprint/67/5/740>.

- ¹³ Campagne, D.M. (2006). Should fertilization treatment start with reducing stress? *Human Reproduction*. 21(7): 1651–1658. Available from: <http://humrep.oxfordjournals.org/cgi/reprint/21/7/1651>.
- ¹⁴ Epel, E.S., Blackburn, E.H., Lin, J., Dhabbar, F.S., Adler, N.E., Morrow, J.D., Cawthon, R.M. (2004). Accelerated telomere shortening in response to life stress. *Proceedings of the National Academy of Sciences of the United States of America*. 101: 17312-17315. Available from: <http://www.pnas.org/content/101/49/17312.full.pdf+html>.
- ¹⁵ Dunn, A.L., Trivedi, M.H., O’Neal, H.A. (2001). Physical activity dose-response effects on outcomes of depression and anxiety. *Medicine and Science in Sports and Exercise*. 33: S587-S597.
- ¹⁶ Hassmén, P., Koivula, N., Uutela, A. (2000). Physical exercise and psychological well-being: a population study in Finland. *Preventive Medicine*. 30: 17–25. Available from: <http://www.sciencedirect.com/science/article/pii/S009174359905972>.
- ¹⁷ Michalsen, A., Grossman, P., Acil, A., Langhorst, J., Lüdtke, R., Esch, T., Stefano, G.B., Dobos, G.J. (2005). Rapid stress reduction and anxiolysis among distressed women as a consequence of a three-month intensive yoga program. *Medical Science Monitor*. 11(12): CR555-561. Available from: <http://www.yoga-vidya.de/fileadmin/yv/Yogatherapie/Artikel/StressreduktionYoga.pdf>.
- ¹⁸ Smith, C., Hancock, H., Blake-Mortimer, J., Eckert, K. (2007). A randomised comparative trial of yoga and relaxation to reduce stress and anxiety. *Complementary Therapies in Medicine*. 15: 77-83. Available from: <http://www.sciencedirect.com/science/article/pii/S0965229906000434>.
- ¹⁹ Labbé, E., Schmidt, N., Babin, J., Pharr, M. (2007). Coping with stress: the effectiveness of different types of music. *Applied Psychophysiology and Feedback*. 32: 163-168. Available from: <http://www.springerlink.com/content/j521ur30881238g7/fulltext.pdf>.
- ²⁰ Bennett, M.P., Zeller, J.M., Rosenberg, L., McCann, J. (2003). The effect of mirthful laughter on stress and natural killer cell activity. *Alternative Therapies in Health and Medicine*. 9(2): 38-45. Available from: http://digitalcommons.wku.edu/cgi/viewcontent.cgi?article=1008&context=nurs_fac_pub.
- ²¹ Kimura, H., Nagao, F., Tanaka, Y., Sakai, S., Ohnishi, T., Okumara, K. (2005). Beneficial effects of the Nishino Breathing Method on immune activity and stress level. *The Journal of Alternative and Complementary Medicine*. 11(2): 285-291. Available from: <http://www.liebertonline.com/doi/pdf/10.1089/acm.2005.11.285>.
- ²² Koszycki, D., Bengler, M., Shlik, J., Bradwejn, J. (2007). Randomized trial of a meditation-based stress reduction program and cognitive behaviour therapy in generalized social anxiety disorder. *Behaviour Research and Therapy*. 45: 2518-2526. Available from: <http://www.sciencedirect.com/science/article/pii/S0005796707001003>.
- ²³ Allen, K., Blascovich, J., Mendes, W.B. (2002). Cardiovascular reactivity and the presence of pets, friends, and spouses: the truth about cats and dogs. *Psychosomatic Medicine*. 64: 727-739. Available from: <http://www.psychosomaticmedicine.org/cgi/content/abstract/64/5/727>.

46. DIABETES

Key Messages

- In fiscal year 2008/09, more than 2.3 million Canadians had diagnosed type 1 and type 2 diabetes, and by 2018-19, about 3.7 million Canadians will be living with it
- Type 2 diabetes is often associated with obesity, a poor diet and lack of exercise
- In 2008/09, among the Canadian population, males (6.2%) are more likely than females (5.1%) to have diabetes (age-standardized rates)
- In 2008/10, the self-reported diabetes rate for First Nations adults living in First Nations communities* is more than three times higher than for the total Canadian population¹
- In 2006, Inuit diabetes rate is comparable to that for the total Canadian population

What does this indicator measure?

This indicator measures the prevalence and incidence rates of diagnosed diabetes among Canadians aged 1 year and older who are insured by their provincial/territorial health care plan, per 100 population (for prevalence) and per 1,000 population (for incidence).

It also measures the percentage of First Nations adults aged 18 years and older living in First Nations communities who reported that they had been diagnosed by a health professional as having diabetes.

Similarly, it measures the percentage of Inuit aged 15 years and older who reported that they had been diagnosed by a health professional as having diabetes.

Prevalence rate . . .

. . . refers to the number of people with the condition at the specified point in time divided by 100 (often expressed as a percentage).

Incidence rate . . .

. . . refers to the number of *new* cases identified with the condition at the specified point in time divided by 1,000.

Type 1 diabetes, once known as "juvenile diabetes" or also referred to as "insulin-dependent diabetes mellitus," is an autoimmune disease in which the body's immune system attacks and destroys the insulin-producing cells of the pancreas, thereby leaving the individual dependent on an external source of insulin for life. Type 1 diabetes typically arises in people under the age of 40, most often in children and youth.²

Type 2 diabetes is a metabolic disorder that occurs when the pancreas does not produce enough insulin and when the body does not properly use the insulin it makes. The risk of type 2 diabetes is higher among people who are overweight or obese, physically inactive and of certain ethnic populations. While the onset of type 2 diabetes typically occurs in adults over the age of 40, it can occur at younger ages, and is seen even in children and youth.²

* First Nations living on reserve and in northern First Nations communities.

What are the limitations of this indicator?

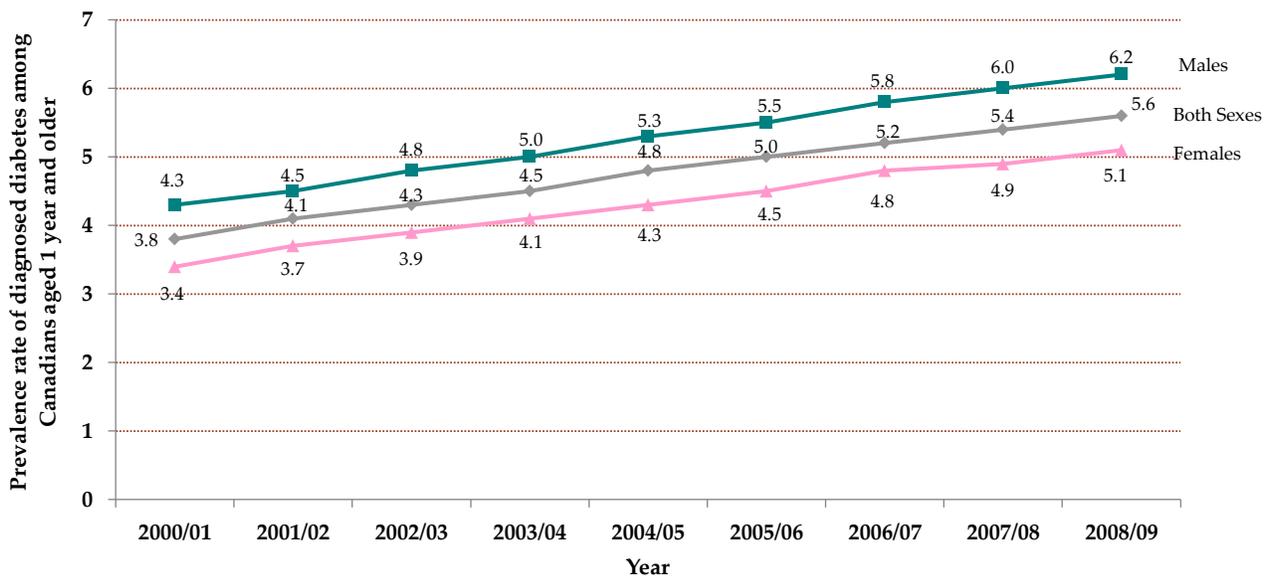
Many people who have type 2 diabetes display no symptoms.³ Therefore, some people have not been diagnosed with diabetes but, in fact, have the disease.

Two different sources of data are used for diabetes. The Canadian population data are coming from administrative health databases, while the First Nations and Inuit data are self-reported.

Canadian males are more likely to be diagnosed with diabetes

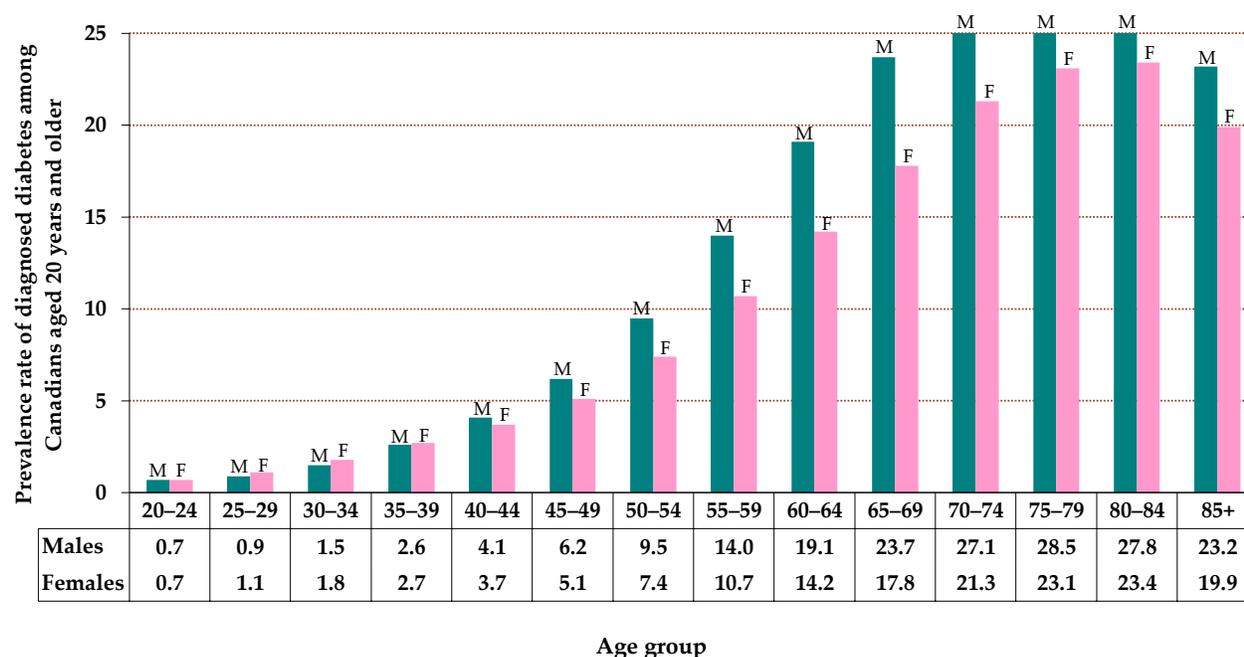
In 2008/09, the year for which the most recent data were available, 5.6% of Canadians had diagnosed diabetes, an increase from 3.8% in 2000/01 (all age-standardized rates). Prevalence rates for males and females also increased, from 4.3% for males and 3.4% for females in 2000/01, to 6.2% for males and 5.1% for females in 2008/09. Rates increased with age for both sexes, peaking in the 75 to 79 age group then decreasing in the oldest age groups.

Figure 67 Prevalence of Diabetes
 Prevalence rate of diagnosed diabetes among Canadians aged 1 year and older, by sex (age-standardized), Canada, 2000/01 to 2008/09



Source: Public Health Agency of Canada. Canadian Chronic Disease Surveillance System.
 Notes: Type 1 and type 2 diabetes are included in the database. However, cases of gestational diabetes are excluded as this is a temporary condition that usually resolves after pregnancy.
 Age-standardized to the 1991 Canadian population.
 For additional exclusions/limitations, see Annex 2.

Figure 68 Prevalence of Diabetes
Prevalence rate of diagnosed diabetes among Canadians aged 20 years and older, by sex and selected age group, Canada, 2008/09

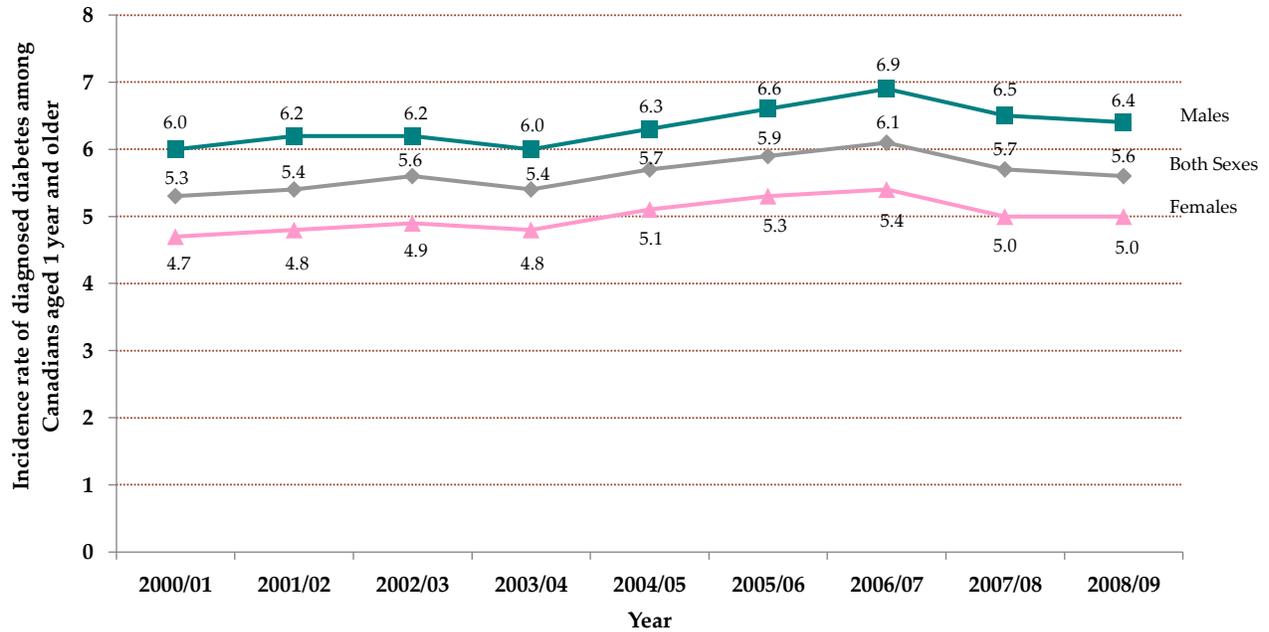


Source: Public Health Agency of Canada. Canadian Chronic Disease Surveillance System.

Notes: Type 1 and type 2 diabetes are included in the database. However, cases of gestational diabetes are excluded as this is a temporary condition that usually resolves after pregnancy.
 Age-standardized to the 1991 Canadian population.
 For additional exclusions/limitations, see Annex 2.

In 2008/09, age-standardized incidence rates for diabetes were 6.4 cases per 1,000 males and 5.0 cases per 1,000 females, with an average of 5.6 cases per 1,000 population overall. These rates represent increases from the rates in 2000/01 (6.0 cases per 1,000 males, 4.7 cases per 1,000 females, and 5.3 cases per 1,000 population overall).

Figure 69 Incidence of Diabetes
Incidence rate of diagnosed diabetes among Canadians aged 1 year and older, by sex (age-standardized), Canada, 2000/01 to 2008/09



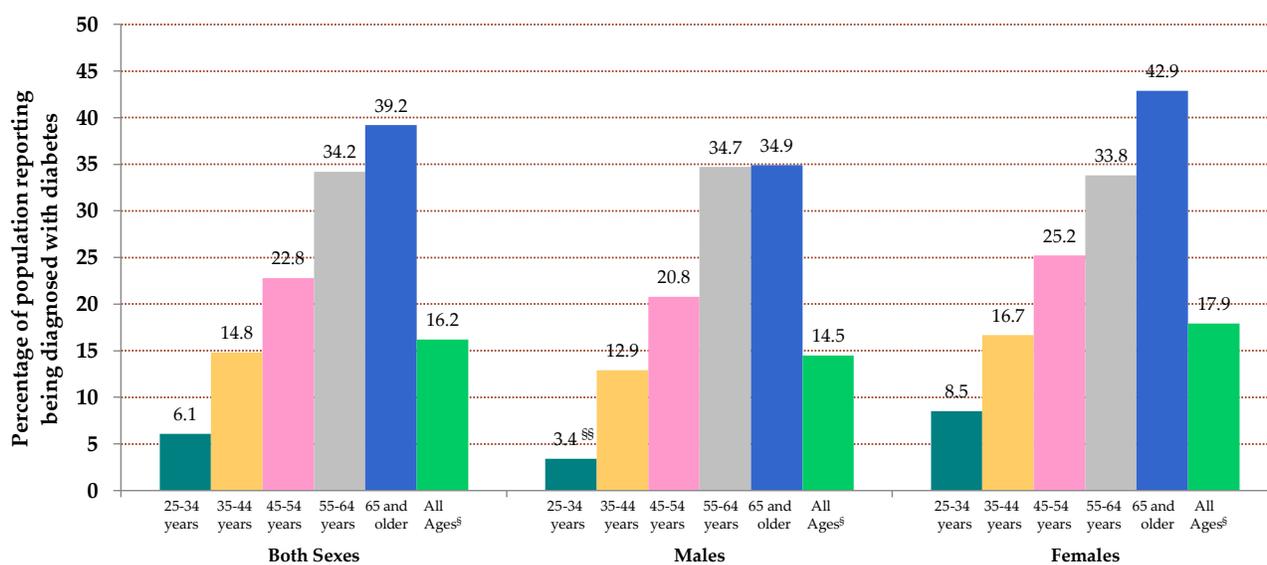
Source: Public Health Agency of Canada. Canadian Chronic Disease Surveillance System.
 Notes: Type 1 and type 2 diabetes are included in the database. However, cases of gestational diabetes are excluded as this is a temporary condition that usually resolves after pregnancy.
 Age-standardized to the 1991 Canadian population.
 For additional exclusions/limitations, see Annex 2.

The diabetes rate for First Nations adults is more than three times that for the total Canadian population

In 2008/10, 16.2% of First Nations adults aged 18 years and older, living in First Nations communities* reported being diagnosed with diabetes. This is more than three times higher than the rate of 4.7% for the total Canadian population.¹ The 2008/10 percentage for First Nations people is about the same as that for the 2002/03 period.

First Nations women (17.9%) were more likely than their male counterparts (14.5%) to report having been diagnosed with diabetes.

Figure 70 Self-Reported Diabetes
Percentage of First Nations adults living in First Nations communities,* aged 18 years and older, who reported being diagnosed with diabetes, by sex and age group, 2008/10



Source: First Nations Information Governance Centre. First Nations Regional Health Survey (RHS), 2008/10.

Notes: * First Nations living on reserve and in northern First Nations communities.

[§] Population aged 18 to 24 years are not shown in the figure as estimates were not reliable. However, data for this population are included in the "All Ages" category.

^{§§} The value for males aged 25 to 34 years has a high variability; therefore, it should be used with caution.

Population aged 18 years and older who reported that they had been diagnosed by a health professional as having diabetes.

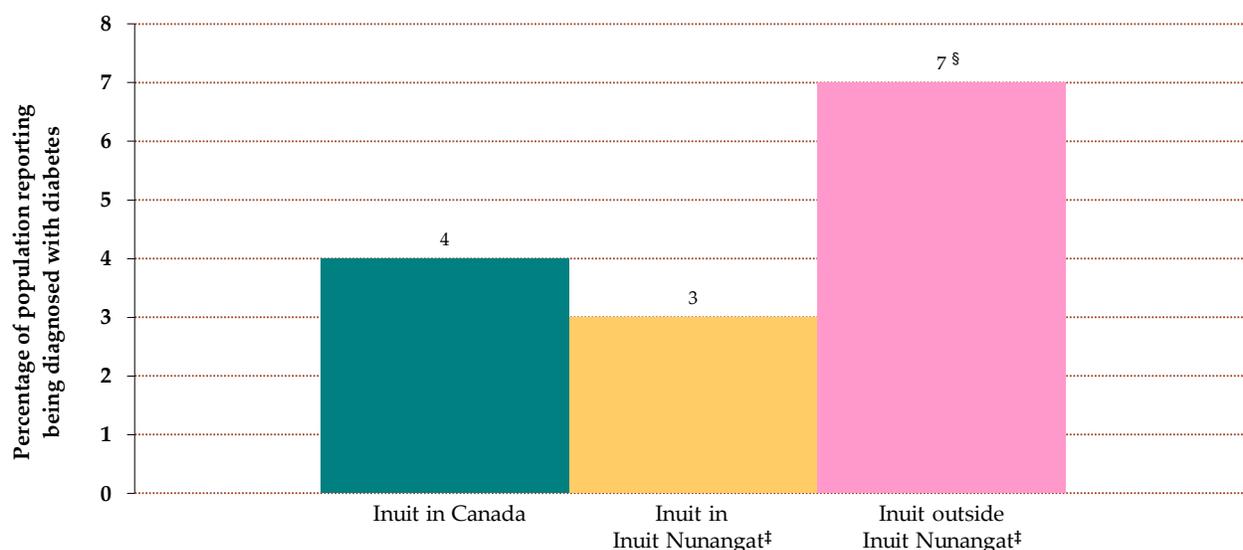
For additional exclusions/limitations, see Annex 2.

* First Nations living on reserve and in northern First Nations communities.

Inuit diabetes rate comparable to that for total Canadian population

In 2006, 4% of Inuit aged 15 years and older in Canada reported having been diagnosed with diabetes, about the same percentage as for the total Canadian population the same age. While 3% of those living in Inuit Nunangat[‡] reported a diagnosis of diabetes, the figure for Inuit living outside Inuit Nunangat was higher at 7%.

Figure 71 Self-Reported Diabetes
Percentage of Inuit aged 15 years and older who reported being diagnosed with diabetes, both sexes, by region, 2006



Source: Statistics Canada. Aboriginal Peoples Survey, 2006: "Inuit Health and Social Conditions: Supporting Data Tables." Catalogue no. 89-637-X, No. 002.

Notes: Population aged 15 years and older who reported that they were diagnosed with diabetes.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

[§] Since the variability of this data point is relatively high, it should be used with caution.

For additional exclusions/limitations, see Annex 2.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

What these results mean for you

Diabetes is a chronic condition that stems from the body's inability to sufficiently produce and/or properly use insulin which the body needs to use sugar as an energy source. Symptoms of diabetes include unusual thirst, frequent urination, weight change (gain or loss), extreme fatigue or lack of energy, blurred vision, frequent or recurring infections, cuts and bruises that are slow to heal and tingling or numbness in the hands or feet.³

There are two types of diabetes. Type 1 diabetes occurs when the beta cells of the pancreas are destroyed by the immune system and no longer produce insulin. Individuals with type 1 diabetes rely on an external supply of insulin for their body to function. Type 1 diabetes usually develops in childhood or adolescence and there is no known way to prevent it.²

Type 2 diabetes represents more than 90% of all cases in the general population in Canada. It occurs when the body does not make enough insulin and/or does not respond well to the insulin it produces. People are usually diagnosed with type 2 diabetes after the age of 40, although it is now being seen in younger adults, as well as children and adolescents.^{2,4}

Many health problems are related to diabetes such as heart and kidney disease, loss of vision, erectile dysfunction in men, depression, and even death.^{2,5,6}

Several factors contribute to a person's risk of developing diabetes. Scientists do not know exactly what causes type 1 diabetes but they believe that both genetic factors and environmental factors may be involved.^{2,3} Studies suggest that half of the risk of type 2 diabetes can be attributed to behavioural/lifestyle factors and the other half to genetics.^{2,3,4,7} Today, type 2 diabetes is mainly due to the growing obesity epidemic.⁸ Other risk factors that contribute to developing type 2 diabetes include pre-diabetes,^{3,9} being overweight,^{4,8} aging,^{2,10} physical inactivity,^{4,11,12} having high blood pressure and/or high cholesterol⁸ and belonging to certain high-risk ethnic populations (e.g., Aboriginal, African, Hispanic, Asian).^{3,13}

Research suggests that males are more likely to suffer from diabetes due to sedentary lifestyles and a higher risk of obesity.⁴ Fathers are also more likely to transfer the risk of type 1 diabetes to their children while mothers are more likely to transfer the risk of type 2 diabetes.¹⁴

Benefits of healthy blood sugar levels

- Allows your body to get the energy it needs
- Reduces the risk of type 2 diabetes, hypoglycaemia (low blood sugar level) and hyperglycaemia (high blood sugar level)
- Reduces the risk of health problems such as cardiovascular disease, kidney disease, eye disease, nerve damage, lower limb complications and amputations, and depression

Health problems related to diabetes

- Heart disease
- Kidney disease

- Loss of vision and blindness
- Erectile dysfunction
- Nerve damage
- Reduced ability to fight infections
- Lower limb complications and amputations
- Complication during pregnancy
- Oral disease
- Depression
- Stress
- Premature death

Things you can do to reduce your risk of developing diabetes or help you to manage your diabetes

- Attain a healthy weight
- Eat a healthy, balanced diet
- Be screened or tested regularly
- Engage in regular physical activity
- Quit smoking if you smoke
- Control your blood sugar level as recommended by your physician, with oral medication or insulin injection
- Take medication to control cholesterol and blood pressure, if they are prescribed by your physician
- For more helpful tips on preventing and managing diabetes symptoms, please visit the [Public Health Agency of Canada's website](#)

References

- ¹ Data for the total population of Canada are from the 2008 Canadian Community Health Survey (CCHS). These estimates have been standardized to the age distribution of the 2008 First Nations population aged 18 years and older living in First Nations communities. Therefore, Canadian data used for this comparison with First Nations data should not be compared to values obtained for the Canadian population presented in Figure 67. Furthermore, the age group for the Canadian population used for this comparison with the First Nations population is of 18 years and older, while the Canadian data presented in Figure 67 is for the population aged 1 year and older.
- ² Public Health Agency of Canada. (2011). *Diabetes in Canada: facts and figures from a public health perspective*. Available from: <http://www.phac-aspc.gc.ca/cd-mc/publications/diabetes-diabete/facts-figures-faits-chiffres-2011/index-eng.php>.
- ³ Public Health Agency of Canada. (2009). *Diabetes - Symptoms*. Available from: <http://www.phac-aspc.gc.ca/cd-mc/diabetes-diabete/symptoms-symptomes-eng.php>.
- ⁴ Hussain, A., Claussen, B., Ramachandran, A., Williams, R. (2006). Prevention of type 2 diabetes: a review. *Diabetes Research and Clinical Practice*. 76: 317-326. Available from: <http://www.sciencedirect.com/science/article/pii/S0168822706004268>.
- ⁵ Colagiuri, R. (2004). Integrating psycho-social issues into national diabetes programmes. *Diabetes Voice*. 49: 31-33. Available from: http://www.idf.org/sites/default/files/attachments/article_271_en.pdf.
- ⁶ Grey, M. (2000). Coping and Diabetes. *Diabetes Spectrum*. 13(3): 167. Available from: <http://journal.diabetes.org/diabetesspectrum/00v13n3/pg167.htm>.

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- ⁷ Eriksson, J., Lindström, J., Tuomiletho, J. (2001). Potential for the prevention of type 2 diabetes. *British Medical Bulletin*. 60: 183-199. Available from: <http://bmb.oxfordjournals.org/cgi/content/full/60/1/183>.
- ⁸ Laaksonen, M.A., Knekt, P., Rissanen, H., Härkänen, T., Virtala, E., Maniemi, J., Aromaa, A., Heliövaara, M., Reunamen, A. (2010). The relative importance of modifiable potential risk factors of type 2 diabetes: a meta-analysis of two cohorts. *European Journal of Epidemiology*. 25: 115-124. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/20012885>.
- ⁹ Narayan, K.M.V., Imperatore, G., Benjamin, S.M., Engelgau, M.M. (2002). Targeting people with pre-diabetes. *British Medical Journal*. 325: 403-404. Available from: <http://www.bmj.com/cgi/content/full/325/7361/403>.
- ¹⁰ Chau, D., Edeman, S.V. (2001). Clinical management of diabetes in the elderly. *Clinical Diabetes*. 19(4): 172-175.
- ¹¹ Hamilton, M.T., Hamilton, D.G., Zderic, T.W. (2007). Role of low energy expenditure and sitting in obesity, metabolic syndrome, type 2 diabetes, and cardiovascular disease. *Diabetes*. 56: 2655-2667. Available from: <http://diabetes.diabetesjournals.org/content/56/11/2655.full.pdf+html>.
- ¹² LaMonte, M.J., Blair, S.N., Church, T.S. (2005). Physical activity and diabetes prevention. *Journal of Applied Physiology*. 99: 1205-1213. Available from: <http://jap.physiology.org/cgi/reprint/99/3/1205>.
- ¹³ Oldroyd, J., Banerjee, M., Heald, A., Cruickshank, K. (2005). Diabetes and ethnic minorities. *Postgraduate Medical Journal*. 81: 486-490. Available from: <http://pmj.bmj.com/content/81/958/486.full>.
- ¹⁴ Gale, E.A.M., Gillespie, K.M. (2001). Diabetes and gender. *Diabetologia*. 44: 3-15. Available from: <http://www.springerlink.com/content/bv0k0pev28qq9ea3/>.

47. BODY MASS INDEX (BMI)

Key Messages

- Being overweight or obese is associated with increased risks to health
- More than half of Canadian adults (50.4%) were either overweight or obese in 2011 according to the 2011 Canadian Community Health Survey (CCHS)[§]
- More adult males (58.2%) than females (42.5%) were either overweight or obese in 2011 according to the 2011 CCHS
- According to the 2008/10 First Nations Regional Health Survey, almost three quarters of First Nations adults living in First Nations communities* are either overweight or obese in 2008/10

What does this indicator measure?

This indicator measures the percentage of Canadian adults aged 18 years and older, excluding pregnant women, who reported a weight and height corresponding to a body mass index (BMI) in specified categories ranging from underweight to obese.

It also measures the percentage of First Nations adults aged 18 years and older living in First Nations communities who reported a weight and height corresponding to a body mass index (BMI) in specified categories ranging from underweight to obese.

Underweight	BMI of less than 18.5
Normal weight	BMI of 18.5 to 24.9
Overweight	BMI of 25.0 to 29.9
Obese (Classes I to III)	BMI of 30.0 +

Body mass index (BMI) . . .
 . . . is calculated as a person's weight (in kilograms) divided by height (in metres) squared.
 For example, the BMI for a person who weighs 75 kilograms and is 1.65 metres tall is 27.5 (overweight).

Visit Health Canada's website to [calculate your BMI](#).

What are the limitations of this indicator?

Self-reported weight and height often lead to an underestimation of the prevalence of overweight and obesity in the population.¹ For example, based on the Canadian Health Measures Survey (CHMS) cycle 2 (2009-2011) measured weight and height data, 60.3% of Canadians aged 18 to 79 years are overweight or obese,² compared to 50.4% based on reported height and weight data from the 2011 CCHS. The indicator is designed to assess and monitor the weight status of the population. Individuals interested in applying the BMI classification scheme to assess their own weight status should be aware that it may underestimate or overestimate health risks, depending on their age, body composition, lifestyle or ethnicity.³ As well, BMI is only one part of a health risk assessment. To further clarify risk, other factors need to be considered.⁴

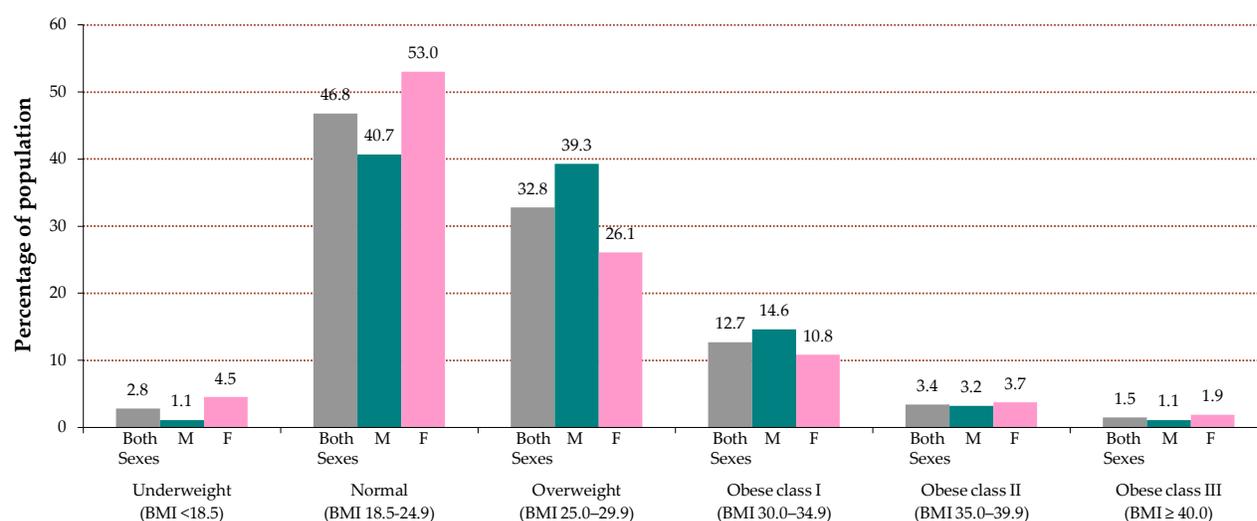
[§] This prevalence was based on self-reported weight and height data which underestimates the true prevalence of overweight and obesity in the population. Also see Reference #1.

* First Nations living on reserve and in northern First Nations communities.

Obesity continues to increase among Canadians

In 2011, 46.8% of Canadians reported a weight and height corresponding to a BMI in the “normal weight” category. While more females than males were “underweight”, more males than females were “overweight” and “obese” (class I). Meanwhile, females were more likely than males to be in the highest class of obesity (class III).⁵

Figure 72 Self-Reported Body Mass Index (BMI) (All Categories)
Percentage of population aged 18 years and older who reported weight and height corresponding to a BMI in specified categories, by sex (age-standardized), Canada, 2011



Source: Statistics Canada. Canadian Community Health Survey, 2011.

Notes: Includes household population 18 years and older who reported their weight and height.

Data exclude pregnant women and persons measuring less than 91.4 centimetres (three feet) or greater than 210.8 centimetres (six feet, 11 inches) in height.

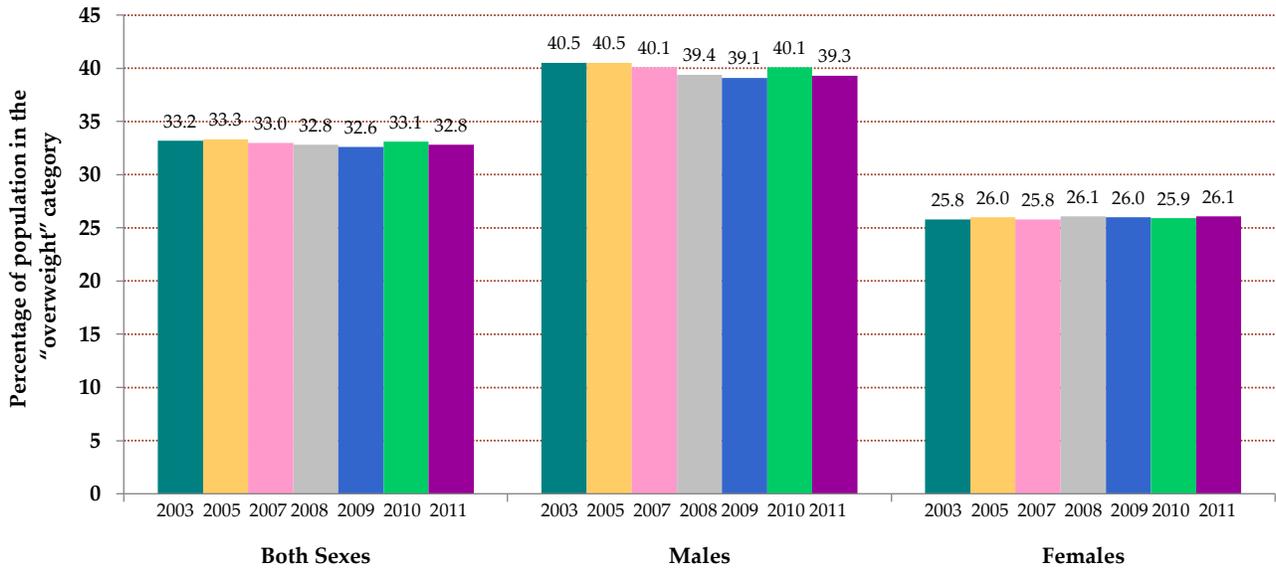
Figures for obese classes I, II and III may not sum up to the totals in the graph *Self-reported body mass index (obese category)* due to rounding.

Age-standardized to the 1991 Canadian population.

For additional exclusions/limitations, see Annex 2.

In 2011, 32.8% of Canadians reported a weight and height corresponding to a BMI in the “overweight” category. Rates for males and females were 39.3% and 26.1%, respectively. Rates for males were higher than those of females.⁶

Figure 73 Self-Reported Body Mass Index (BMI) (Overweight Category)
Percentage of population aged 18 years and older who reported weight and height corresponding to a BMI in the overweight category (BMI 25.0-29.9), by sex (age-standardized), Canada, 2003-11



Source: Statistics Canada. Canadian Community Health Survey, 2003-11.

Notes: Includes household population 18 years and older who reported their weight and height.

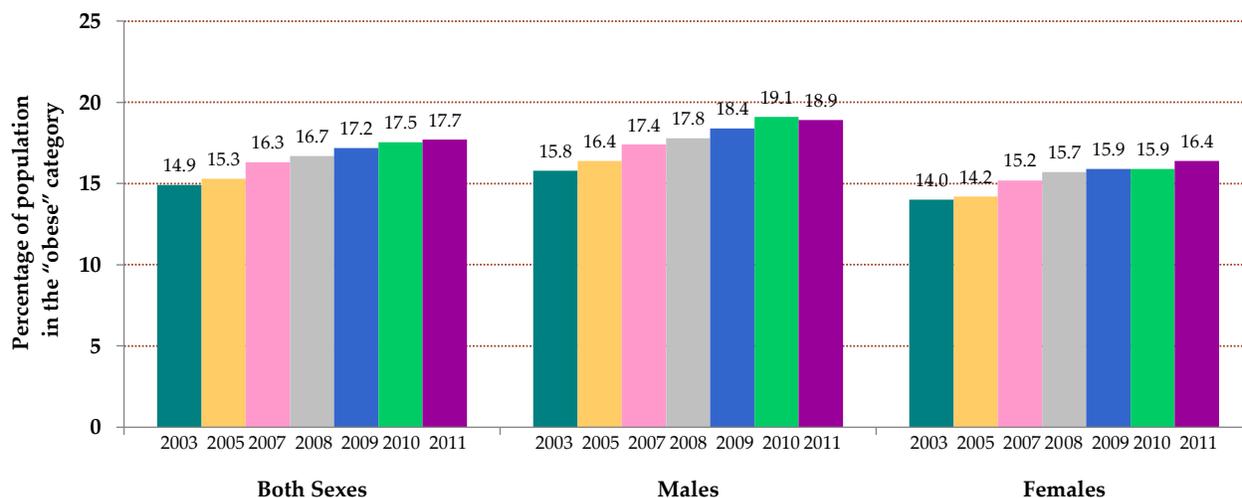
Data exclude pregnant women and persons measuring less than 91.4 centimetres (three feet) or greater than 210.8 centimetres (six feet, 11 inches) in height.

Age-standardized to the 1991 Canadian population.

For additional exclusions/limitations, see Annex 2.

Also in 2011, 17.7% of Canadians reported a weight and height corresponding to a BMI in the “obese” categories, an increase from 14.9% in 2003. The obesity rate increased for both males and females from 2003 to 2011. Higher rates of obesity were observed in males (18.9%) than in females (16.4%).⁷

Figure 74 Self-Reported Body Mass Index (BMI) (Obese Category)
Percentage of population aged 18 years and older who reported weight and height corresponding to a BMI in the obese category (BMI \geq 30.0), by sex (age-standardized), Canada, 2003-11



Source: Statistics Canada. Canadian Community Health Survey, 2003-11.

Notes: Includes household population 18 years and older who reported their weight and height.

Data exclude pregnant women and persons measuring less than 91.4 centimetres (three feet) or greater than 210.8 centimetres (six feet, 11 inches) in height.

Totals for the obese category may not equal the sum of obese classes I, II and III in the graph *Self-reported body mass index (all categories)* due to rounding.

Age-standardized to the 1991 Canadian population.

For additional exclusions/limitations, see Annex 2.

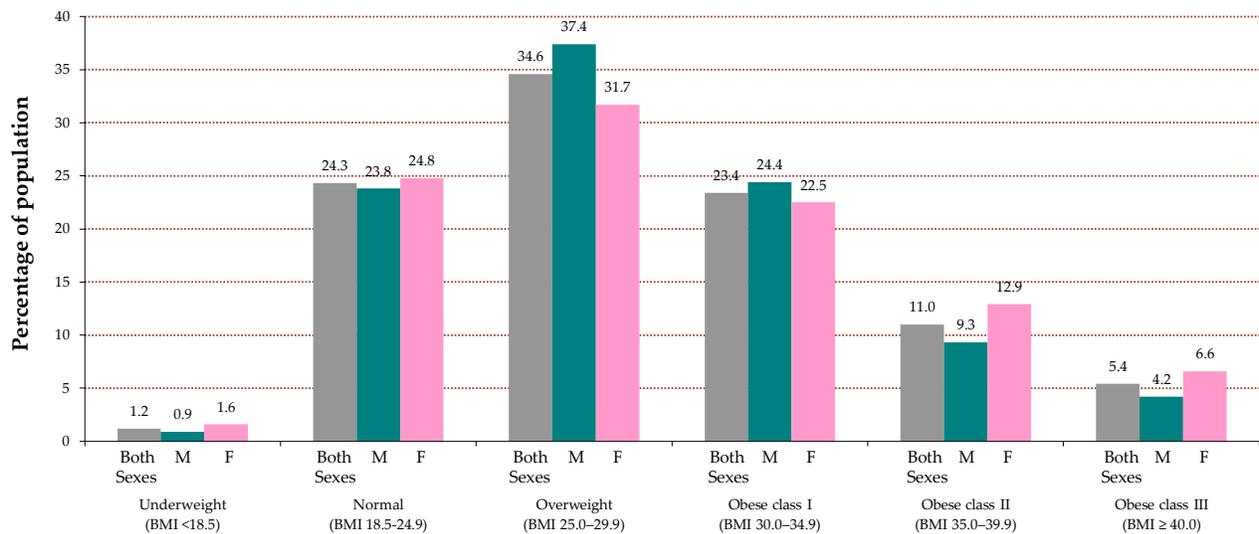
Nearly four in 10 First Nations adults are obese

In 2008/10, 24.3% of First Nations adults living in First Nations communities* aged 18 years and older reported a weight and height corresponding to a BMI in the normal weight category, and 1.2% reported a weight and height corresponding to a BMI in the underweight category. Another 34.6% reported a BMI weight and height corresponding to a BMI in the overweight category. The remaining 39.9% had a weight and height that put them in the obese category, compared to 16.3% for the total Canadian population in 2008.⁸

A closer look at the obese category shows that just over one third (34.4%) of First Nations adults living in First Nations communities reported a weight and height corresponding to a BMI in obese classes I and II (BMI 30.0–39.9). Another 5.4% reported a weight and height corresponding to a BMI in the obese class III (BMI 40.0 and greater).

While First Nations men were more likely than women to be in the overweight category, there was a larger percentage of First Nations women in the obese class II and III categories.

Figure 75 Self-Reported Body Mass Index (BMI) (All Categories)
Percentage of First Nations adults living in First Nations communities,* aged 18 years and older, who reported weight and height corresponding to a BMI in specified categories, by sex, 2008/10



Source: First Nations Information Governance Centre. First Nations Regional Health Survey (RHS), 2008/10.

Notes: * First Nations living on reserve and in northern First Nations communities.

Population 18 years and older who reported their weight and height.

Data exclude pregnant women and persons measuring less than 91.4 centimetres (three feet) or greater than 210.8 centimetres (six feet, 11 inches) in height.

For additional exclusions/limitations, see Annex 2.

* First Nations living on reserve and in northern First Nations communities.

What these results mean for you

A review of the literature shows that achieving and maintaining a healthy weight can lead to health benefits,^{9, 10, 11} whereas weight gain is generally associated with increased risks for health (such as type 2 diabetes, coronary heart disease, some cancers, kidney failure, osteoarthritis and other joint problems).^{12, 13}

Benefits of maintaining a healthy weight

- Better overall health
- Lower risk of diseases, including cardiovascular diseases
- More energy
- Feeling better
- Continued independent living in old age

Health problems associated with weight

Underweight

- Anaemia
- Osteoporosis and fractures
- Hair loss
- Amenorrhea (loss of menses for women)
- Arrhythmia (irregular heart beat)
- Weakened immune system
- Higher rate of infertility

Overweight and obese

- Premature aging and death
- Cardiovascular conditions such as heart disease, high blood pressure and stroke
- Diabetes
- Certain cancers
- Arthritis and Osteoarthritis
- Other chronic diseases

Things you can do to maintain or achieve a healthy weight

- Be active at least 2.5 hours a week to achieve health benefits
- Limit foods and beverages high in calories, fat, sugar and salt (sodium)
- Eat fruits and vegetables at all meals and as snacks
- When eating out, order smaller portions or share with a friend
- Speak with a health care provider for more information
- To learn more about [physical activity](#), visit the Public Health Agency of Canada's website
- To learn more about [healthy eating](#), please visit the *Healthy Canadians'* website
- To learn more about how to use the [nutrition information](#) on pre-packaged foods to make informed choices, visit the *Healthy Canadians'* website
- To learn more about [obesity](#), visit the Public Health Agency of Canada website

References

- ¹ Shields, M., Gorber, S.C., Janssen, I., Tremblay, M.S. (2011). Bias in self-reported estimates of obesity in Canadian health surveys: An update on correction equations for adults. *Health Reports*. Ottawa: Statistics Canada. Catalogue No. 82-003-X. Available from: <http://www.statcan.gc.ca/pub/82-003-x/2011003/article/11533-eng.pdf>.
- ² Statistics Canada. (2012). Canadian Health Measures Survey, Cycle 2. *Distribution of the household population aged 18 to 79, by body mass index norms based on direct measures, by age and sex, Canada, 2009 to 2011*. Ottawa: Statistics Canada. Catalogue No. 82-626-X. Available from: <http://www.statcan.gc.ca/pub/82-626-x/2012001/t029-eng.htm>.
- ³ The standard BMI is not considered to be an appropriate indicator for individuals younger than 18 years of age as they have different growth rates and may not have reached full growth. In addition, in individuals who are very lean, muscular or who have not reached full growth, BMI can overestimate potential health risks. In addition, BMI does not consider bone density, and it may not provide an accurate assessment of health risks among adults over 65 years as well as members of certain ethnic and racial groups. BMI does not consider lifestyle factors, such as smoking habits, healthy eating and level of physical activity. For instance, BMI can overestimate the risk of an overweight individual who has a healthy lifestyle. BMI measures body weight at a given time and may not accurately represent the risk for people who have experienced sudden weight change which may suggest the presence of additional health problems.
- ⁴ Health Canada. (2003). *Canadian Guidelines for Body Weight Classification in Adults*. Available from: http://www.hc-sc.gc.ca/fn-an/nutrition/weights-poids/guide-ld-adult/weight_book_tc-livres_des_poids_tm-eng.php.
- ⁵ The data cited here include the household population 18 years and older who reported their weight and height. Data exclude pregnant women and persons measuring less than 91.4 centimetres (three feet) or greater than 210.8 centimetres (six feet, 11 inches) in height. Results should be treated with caution because a proportion of the difference may be explained by the mode used to collect the data from the respondent (i.e., by phone or in person). Figures for obese classes I, II and III may not sum up to the totals in the graph *Self-reported body mass index (obese category)* due to rounding. Age-standardized to the 1991 Canadian population.
- ⁶ These data include the household population 18 years and older who reported their weight and height. Data exclude pregnant women and persons measuring less than 91.4 centimetres (three feet) or greater than 210.8 centimetres (six feet, 11 inches) in height. Results should be treated with caution because a proportion of the difference may be explained by the mode used to collect the data from the respondent (i.e., by phone or in person). Age-standardized to the 1991 Canadian population.
- ⁷ Includes household population 18 years and older who reported their weight and height. Data exclude pregnant women and persons measuring less than 91.4 centimetres (three feet) or greater than 210.8 centimetres (six feet, 11 inches) in height. Results should be treated with caution because a proportion of the difference may be explained by the mode used to collect the data from the respondent (i.e., by phone or in person). Totals for the obese category may not equal the sum of obese classes I, II and III in the graph *Self-reported body mass index (all categories)* due to rounding. Age-standardized to the 1991 Canadian population.
- ⁸ Data for the total population of Canada are from the 2008 Canadian Community Health Survey (CCHS). These estimates have been standardized to the age distribution of the 2008 First Nations population living in First Nations communities aged 18 years and older.
- ⁹ Neter, J.E., Stam, B.E., Kok, F.J., Grobbee, D.E., Geleijnse, J.M. (2003). Influence of weight reduction on blood pressure: a meta-analysis of randomized controlled trials. *Hypertension*. 42: 878-884. Available from: <http://hyper.ahajournals.org/cgi/reprint/42/5/878>.
- ¹⁰ Datillo, A.M., Kris-Etherton, P.M. (1992). Effects of weight reduction on blood lipids and lipoproteins: a meta-analysis. *American Journal of Clinical Nutrition*. 56: 320-328. Available from: <http://www.ajcn.org/cgi/reprint/56/2/320>.

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- ¹¹ Harrington, M., Gibson, S., Cottrell, R.C. (2009). A review and meta-analysis of the effect of weight loss on all-cause mortality risk. *Nutrition Research Reviews*. 22: 93-108. Available from: <http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=5877688>.
- ¹² Spencer, E.A., Appleby, P.N., Davey, G.K., Key, T.J. (2002). Validity of self-reported height and weight in 4808 EPIC–Oxford participants. *Public Health Nutrition*. 5: 561-565. Available from: <http://journals.cambridge.org/action/displayFulltext?type=1&fid=627568&jid=PHN&volumeId=5&issueId=04&aid=566220>.
- ¹³ Must, A., Spadano, J., Coakley, E.H., Field, A.E., Colditz, G., Dietz, W.H. (1999). The disease burden associated with overweight and obesity. *Journal of the American Medical Association*. 282(16): 1523-1529. Available from: <http://jama.ama-assn.org/cgi/reprint/282/16/1523>.

48. SELF-REPORTED PHYSICAL ACTIVITY

Key Messages

- Physical activity has many health benefits
- It is linked to a lower incidence of morbidity and mortality for several diseases
- A little more than half the Canadian population was physically active in 2011
- Males were more active than females

What does this indicator measure?

This indicator measures the percentage of the population aged 12 years and older who reported themselves as being “physically active.”¹

What are the limitations of this indicator?

Self-reported physical activity levels are shown to provide different estimates of physical activity levels as compared to direct measures. In a review of the literature on the subject of self-reported versus direct measurements, Prince et al. (2008) concluded that “self-report measures of physical activity were both higher and lower than directly measured levels of physical activity, which poses a problem for both reliance on self-report measures and for attempts to correct for self-report–direct measure differences.”²

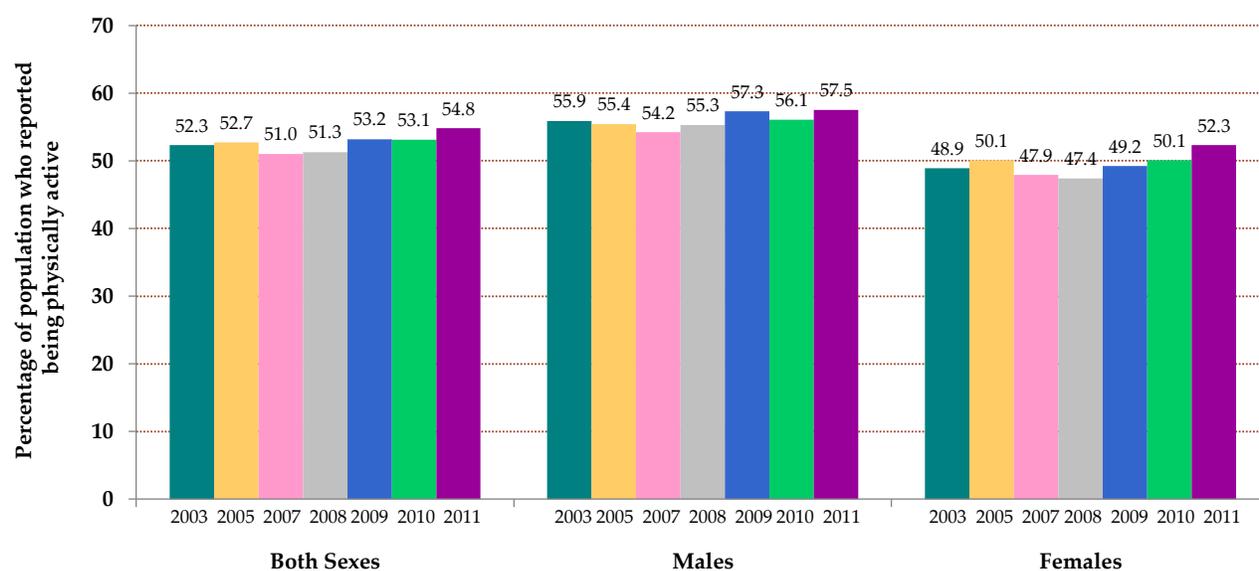
This indicator only captures activity levels in *leisure* time.

About \$6.8 billion, or 3.7% of the total health care costs in Canada, were attributable to physical inactivity in 2009.³

Physical activity levels are increasing

In 2011, 54.8% of Canadians reported being “active” or “moderately active,” an increase from 52.3% in 2003 and 53.1% in 2010. The rate for females was higher in 2011 (52.3%) than in 2003 (48.9%) and 2010 (50.1%). Males continued to report higher rates (57.5%) of “active” or “moderately active” physical activity levels in 2011 compared to females (52.3%).

Figure 76 Self-Reported Physical Activity
Percentage of population aged 12 years and older who reported being “physically active,” by sex (age-standardized), Canada, 2003-11



Source: Statistics Canada. Canadian Community Health Survey, 2003-11.

Notes: Results should be treated with caution because self-reported physical activity may overestimate or underestimate the true prevalence of activity in the population.

Includes household population aged 12 years and older reporting level of physical activity, based on their responses to questions about frequency, duration and intensity of their leisure-time physical activity.

“Physically active” includes individuals reporting either active or moderately active levels of physical activity.

Age-standardized to the 1991 Canadian population.

For additional exclusions/limitations, see Annex 2.

What these results mean for you

Being physically active is important for maintaining physical fitness and can have positive effects on your health⁴ and on life expectancy.^{5,6}

Regular physical activity has been shown to improve body composition, by reducing abdominal adiposity and improving weight control.^{7,8,9} A recent meta-analysis conducted on 55 studies found that the combination of physical activity and diet provided greater weight-loss than diet alone.¹⁰

There is strong evidence demonstrating that physical activity can lower cardiovascular morbidity and mortality risk.^{11,12,13} For example, a 50% reduction in the risk of death due to cardiovascular disease has

been shown for fit and/or active individuals.¹⁴ Research shows that physical activity is also effective in patients with cardiovascular disease and in reducing the risk of premature death for those patients.¹⁵

There is increasing research evidence showing that regular physical activity is beneficial in preventing the onset of type 2 diabetes.^{16, 17, 18} For those already suffering from diabetes, physical activity has been shown to improve glucose homeostasis, as well as reduce mortality risk due to diabetes.¹⁸

Moreover, research indicates that physical activity may play an important role in the prevention of specific cancers, in particular breast and colon cancer.^{19, 20, 21, 22, 23, 24, 25} It is also known to have a moderate effect on reducing the incidence of prostate and lung cancer.²¹ Even after cancer has been diagnosed in a patient, physical activity has been found to decrease the risk of death from cancer,^{26, 27} as well as improve the overall quality of life and health status of cancer patients.^{28, 29, 30} As mentioned previously, physical activity plays a major role in the prevention of obesity, which is a well-known contributor to a wide variety of cancers including breast, colon and prostate cancer.³¹

Physical activity has also been shown to prevent osteoporosis. Weight-bearing exercises and high-impact sports have the greatest effect on bone mineral density.³² It has been demonstrated that physical activity may be an effective secondary preventive strategy for the maintenance of bone health in older women with low bone mineral density.³³ In addition, exercise significantly reduces the risk and number of falls among the elderly.^{34, 35}

There is growing evidence demonstrating that physical activity can be effective in improving mental well-being, largely through mood and self-perceptions.³⁶ Indeed, the scientific literature shows that exercise is an effective treatment for clinical depression and anxiety, and the longer the training program, the more positive the results.³⁷ And in some cases, exercise may have the same effects as any psychotherapeutic interventions.^{37, 38}

Benefits of physical activity

- Improved overall health
- Increased energy
- Control of body weight
- Stronger heart, lungs, muscles and bones
- Improved cardiovascular health
- Increased metabolism to better digest food and to more efficiently expend calories
- Disease prevention
- Reduced risk for several cancers, especially breast and colon cancers
- Improved flexibility, balance and coordination, reducing the risk of falls in older individuals
- Improved mental health, reduced stress and anxiety, improved self-esteem and confidence and increased feelings of well-being
- Increased quality of life
- Continued independent living in old age

Health risks of physical inactivity

- Premature aging and death

- Cardiovascular conditions such as heart disease, high blood pressure and stroke
- Diabetes
- Increased risk of cancer, especially breast and colon cancers
- Increased incidence of arthritis and osteoporosis
- Depression
- Overweight or obesity
- Other chronic diseases

Things you can do to maintain or adopt an active lifestyle

- Take any opportunity you have to be active: take the stairs instead of the elevator; walk or cycle to work; take a walk with your kids and/or pets
- If you want to be physically active with other people, join a club
- Decrease screen time (televisions, computers, cell phones and handheld gaming consoles) and replace it with some physical activity
- Always consider safety and security before undertaking any type of physical activity
- For more information about the specific health benefits physical activity may have for you, please consult your health care provider
- Follow the appropriate physical activity guideline for your age group. For more information about specific recommendations appropriate for your age, visit the [Canadian Society for Exercise Physiology website](#)

References

- ¹ The “physically active” category included those people reporting either active or moderately active levels of physical activity. Energy expenditure (EE) is calculated using the frequency and duration per session of the physical activity, as well as the metabolic equivalent (MET) value of the activity. MET is a value of metabolic energy cost expressed as a multiple of the resting metabolic rate. Persons whose total EE (based on reported frequency and durations of the various physical activity indicators) was between 1.5 and 2.9 kcal/kg/day were considered “moderately active,” while those with total EE that was 3.0 kcal/kg/day or over were considered “active.” Persons whose total EE was less than 1.5 kcal/kg/day were considered “inactive.” A full explanation of the derivation of the Physical Activity Index is available at: http://www23.statcan.gc.ca/imdb-bmdi/pub/document/3226_D2_T9_V3-eng.pdf.
- ² Prince, S.A., Adamo, K.B., Hamel, M.E., Hardt, J., Connor Gorber, S., Tremblay, M. (2008). A comparison of direct versus self-report measures for assessing physical activity in adults: a systematic review. *International Journal of Behavioral Nutrition and Physical Activity*. 5: 56. Available from: <http://www.ijbnpa.org/content/pdf/1479-5868-5-56.pdf>.
- ³ Janssen, I. (2012). Health care costs of physical inactivity in Canada adults. *Applied Physiology, Nutrition and Metabolism*. 37: 803-806. Available from: <http://www.nrcresearchpress.com/doi/pdf/10.1139/h2012-061>.
- ⁴ Warburton, D.E.R., Nichol, C.W., Bredin, S.D. (2006). Health benefits of physical activity: the evidence. *Canadian Medical Association Journal*. 174(6): 801-809. Available from: <http://www.cmaj.ca/cgi/reprint/174/6/801>.
- ⁵ Gremeaux, V., Gayda, M., Lepers, R., Sosner, P., Juneau, M., Nigam, A. (2012). Exercise and longevity. *Maturitas*. 73(4): 312-317. Available from: <http://dx.doi.org/10.1016/j.maturitas.2012.09.012>.

- ⁶ Moore, S.C., Patel, A.V., Matthews, C.E., Berrington de Gonzalez, A., Park, Y., Katki, H.A., Linet, M.S., Weiderpass, E., Visvanathan, K., Helzlsouer, K.J., Thun, M., Gapstur, S.M., Hartge, P., Lee, I.-M. (2012). Leisure time physical activity of moderate to vigorous intensity and mortality: a large pooled cohort analysis. *PLoS Medicine*. 9(11): e1001335. doi:10.1371/journal.pmed.1001335. Available from: <http://www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.1001335>.
- ⁷ Seidell, J.C., Cigolini, M., Deslypere, J.-P., Charzewska, J., Ellsinger, B.-M., Cruz, A. (1991). Body fat distribution in relation to physical activity and smoking habits in 38-year-old European men. The European Fat Distribution Study. *American Journal of Epidemiology*. 133: 257-265. Available from: <http://aje.oxfordjournals.org/content/133/3/257.full.pdf>.
- ⁸ Tremblay, A., Després, J.-P., Leblanc, C., Craig, C.L., Ferris, B., Stephens, T., Bouchard, C. (1990). Effect of intensity of physical activity on body fatness and fat distribution. *The American Journal of Clinical Nutrition*. 51(2): 153-157. Available from: <http://www.ajcn.org/content/51/2/153.abstract>.
- ⁹ Slattery, M.L., McDonald, A., Bild, D.E., Caan, B.J., Hilner, J.E., Jacobs, D.R. Jr., Liu, K. (1992). Associations of body fat and its distribution with dietary intake, physical activity, alcohol, and smoking in blacks and whites. *The American Journal of Clinical Nutrition*. 55(5): 943-949. Available from: <http://www.ajcn.org/content/55/5/943.long>.
- ¹⁰ Curioni, C.C., Lourenço, P.M. (2005). Long-term weight loss after diet and exercise: a systematic review. *International Journal of Obesity*. 29: 1168-1174. Available from: <http://www.nature.com/ijo/journal/v29/n10/pdf/0803015a.pdf>.
- ¹¹ Fletcher, G.F., Balady, G., Blair, S.N., Blumenthal, J., Caspersen, C., Chaitman, B., Epstein, S., Sivarajan Froelicher, E.S., Froelicher, V.F., Pina, I.L., Pollock, M.L. (1996). Statement on exercise: benefits and recommendations for physical activity programs for all Americans. *Circulation*. 94: 857-862. Available from: <http://circ.ahajournals.org/content/94/4/857.long>.
- ¹² Paffenbarger, R. (2000). Physical exercise to reduce cardiovascular disease risk. *Proceedings of the Nutrition Society*. 59: 421-422. Available from: <http://journals.cambridge.org/action/displayFulltext?type=1&fid=797300&jid=&volumeId=&issueId=03&aid=797288&bodyId=&membershipNumber=&societyETOCSession>.
- ¹³ Warren, T.Y., Barry, V., Hooker, S.P., Sui, X., Church, T.S., Blair, S.N. (2010). Sedentary behaviors increase risk of cardiovascular disease mortality in men. *Medicine and Science in Sports and Exercise*. 42(5): 879-885.
- ¹⁴ Myers, J., Kaykha, A., George, S., Abella, J., Zaheer, N., Lear, S., Yamazaki, T., Froelicher, V. (2004). Fitness versus physical activity patterns in predicting mortality in men. *American Journal of Medicine*. 117: 912-918. Available from: <http://www.cardiology.org/recentpapers/VETSpdf/Myers%20Fitness%20vs.%20Activity%20and%20Mortality.pdf>.
- ¹⁵ Taylor, R.S., Brown, A., Ebrahim, S., Jolliffe, J., Noorani, H., Rees, K., Skidmore, B., Stone, J.A., Thompson, D.R., Oldridge, N. (2004). Exercise-based rehabilitation for patients with coronary heart disease: systematic review and meta-analysis of randomized controlled trials. *American Journal of Medicine*. 116: 682-692. Available from: <http://www.sciencedirect.com/science/article/pii/S0002934304001238>.
- ¹⁶ Hussain, A., Claussen, B., Ramachandran, A., Williams, R. (2006). Prevention of type 2 diabetes: a review. *Diabetes Research and Clinical Practice*. 76: 317-326. Available from: <http://www.sciencedirect.com/science/article/pii/S0168822706004268>.
- ¹⁷ Hamilton, M.T., Hamilton, D.G., Zderic, T.W. (2007). Role of low energy expenditure and sitting in obesity, metabolic syndrome, type 2 diabetes, and cardiovascular disease. *Diabetes*. 56: 2655-2667. Available from: <http://diabetes.diabetesjournals.org/content/56/11/2655.full.pdf+html>.
- ¹⁸ LaMonte, M.J., Blair, S.N., Church, T.S. (2005). Physical activity and diabetes prevention. *Journal of Applied Physiology*. 99: 1205-1213. Available from: <http://jap.physiology.org/cgi/reprint/99/3/1205>.

- ¹⁹ Kruk, J., Aboul-Enein, H.Y. (2006). Physical activity in the prevention of cancer. *Asian Pacific Journal of Cancer Prevention*. 7: 11-21.
- ²⁰ Hardman, A.E. (2001). Physical activity and cancer risk. *Proceedings of the Nutrition Society*. 60: 107-113.
- ²¹ McTiernan, A. (2008). Mechanisms linking physical activity with cancer. *Nature Reviews Cancer*. 8: 205-211. Available from: <http://www.nature.com/nrc/journal/v8/n3/pdf/nrc2325.pdf>.
- ²² Lee, I.M. (2003). Physical activity and cancer prevention — data from epidemiologic studies. *Medicine and Science in Sports and Exercise*. 35: 1823-1827.
- ²³ Sesso, H.D., Paffenbarger, R.S. Jr., Lee, I.M. (1998). Physical activity and breast cancer risk in the College Alumni Health Study (United States). *Cancer Causes and Control*. 9: 433-439. Available from: <http://www.springerlink.com/content/j5235u8j807007m5/>.
- ²⁴ Thune, I., Furberg, A.S. (2001). Physical activity and cancer risk: dose-response and cancer, all sites and site-specific. *Medicine and Science in Sports and Exercise*. 33: S530-550.
- ²⁵ Kampert, J.B., Blair, S.N., Barlow, C.E., Kohl, H.W. III. (1996). Physical activity, physical fitness, and all-cause and cancer mortality: a prospective study of men and women. *Annals of Epidemiology*. 6: 452-457. Available from: <http://www.sciencedirect.com/science/article/pii/S1047279796000592>.
- ²⁶ Holmes, M.D., Chen, W.Y., Feskanich, D., Kroenke, C.H., Colditz, G.A. (2005). Physical activity and survival after breast cancer diagnosis. *Journal of the American Medical Association*. 293(20): 2479-2486. Available from: <http://jama.jamanetwork.com/article.aspx?articleid=200955>.
- ²⁷ Haydon, A.M.M., MacInnis, R.J., English, D.R., Giles, G.G. (2006). Effect of physical activity and body size on survival after diagnosis with colorectal cancer. *Gut*. 55(1): 62-67. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1856365/pdf/62.pdf>.
- ²⁸ Adamsen, L., Midtgaard, J., Rorth, M., Borregaard, N., Andersen, C., Quist, M., Møller, T., Zacho, M., Madsen, J.K., Knutsen, L. (2003). Feasibility, physical capacity, and health benefits of a multidimensional exercise program for cancer patients undergoing chemotherapy. *Support Care Cancer*. 11(11): 707-716. Available from: <http://www.springerlink.com/content/ee88ybfu0hdppva3/fulltext.pdf>.
- ²⁹ Galvão, D.A., Newton, R.U. (2005). Review of exercise intervention studies in cancer patients. *Journal of Clinical Oncology*. 23(4): 899-909. Available from: <http://jco.ascopubs.org/content/23/4/899.long>.
- ³⁰ McKenzie, D.C., Kalda, A.L. (2003). Effect of upper extremity exercise on secondary lymphedema in breast cancer patients: a pilot study. *Journal of Clinical Oncology*. 21(3): 463-466. Available from: <http://jco.ascopubs.org/content/21/3/463.long>.
- ³¹ Public Health Agency of Canada. (2009). *Obesity in Canada: Snapshot*. Available from: <http://www.phac-aspc.gc.ca/publicat/2009/oc/pdf/oc-eng.pdf>.
- ³² Warburton, D.E., Gledhill, N., Quinney, A. (2001). The effects of changes in musculoskeletal fitness on health. *Canadian Journal of Applied Physiology*. 26: 161-216.
- ³³ Liu-Ambrose, T.Y.L., Khan, K.M., Eng, J.J., Heinonen, A., McKay, H.A. (2004). Both resistance and agility training increase cortical bone density in 75- to 85-year-old women with low bone mass: a 6-month randomized controlled trial. *Journal of Clinical Densitometry*. 7(4): 390-398. Available from: <http://www.sciencedirect.com/science/article/pii/S10946950060022X>.
- ³⁴ Carter, N.D., Khan, K.M., Petit, M.A., Heinonen, A., Waterman, C., Donaldson, M.G., Janssen, P.A., Mallinson, A., Riddell, L., Kruse, K., Prior, J.C., Flicker, L., McKay, H.A. (2001). Results of a 10 week community based strength and balance training programme to reduce fall risk factors: a randomised controlled trial in 65–75 year old women with osteoporosis. *British Journal of Sports Medicine*. 35: 348-351. Available from: <http://bjsm.bmj.com/content/35/5/348.full.pdf+html>.
- ³⁵ Liu-Ambrose, T., Khan, K.M., Eng, J.J., Janssen, P.A., Lord, S.R., McKay, H.A. (2004). Resistance and agility training reduce fall risk in women aged 75 to 85 with low bone mass: a 6-month randomized, controlled trial. *Journal of the American Geriatrics Society*. 52: 657-665.

- ³⁶ Fox, K.R. (1999). The influence of physical activity on mental well-being. *Public Health Nutrition*. 2: 411-418.
- ³⁷ Scully, D., Kremer, J., Meade, M.M., Graham, R., Dudgeon, K. (1998). Physical exercise and psychological well being: a critical review. *British Journal of Sports Medicine*. 32: 111-120. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1756084/pdf/v032p00111.pdf>.
- ³⁸ Babyak, M., Blumenthal, J., Herman, S., Khatri, P., Doraiswamy, M., Moore, K., Craighead, W.E., Baldewicz, T.T., Krishana, K.R. (2000). Exercise treatment for major depression: maintenance of therapeutic benefit at 10 months. *Psychosomatic Medicine*. 62(5): 633-638. Available from: <http://www.psychosomaticmedicine.org/content/62/5/633.full.pdf+html>.

49. PERCEIVED HEALTH

Key Messages

- Self-reported health is an important predictor of morbidity and mortality
- It is known to correlate highly with other health status measures
- About 62% of Canadians rated their health as either “excellent” or “very good” in 2011
- Ratings of perceived health have increased since 2003
- In 2008/10, First Nations men (46.4%) were more likely than their female counterparts (41.7%) to report “excellent” or “very good” health
- Younger Inuit were more likely to report “excellent” or “very good” health in 2006

What does this indicator measure?

This indicator measures the percentage of the population aged 12 years and older who rated their overall health as either “excellent” or “very good.”

It also measures the percentage of First Nations adults aged 18 years and older living in First Nations communities* who rated their overall health as either “excellent” or “very good.”

Similarly, it measures the percentage of Inuit aged 15 years and older who rated their overall health as either “excellent” or “very good.”

What are the limitations of this indicator?

Studies indicate that self-reported health can predict the incidence of chronic diseases, loss of ability to function and, ultimately, survival, especially among older individuals.¹ However, the predictive value of self-reported health on mortality may not be uniform across all population groups, as variations have been noted in the strength or significance of the association by specific age and gender subgroups.²

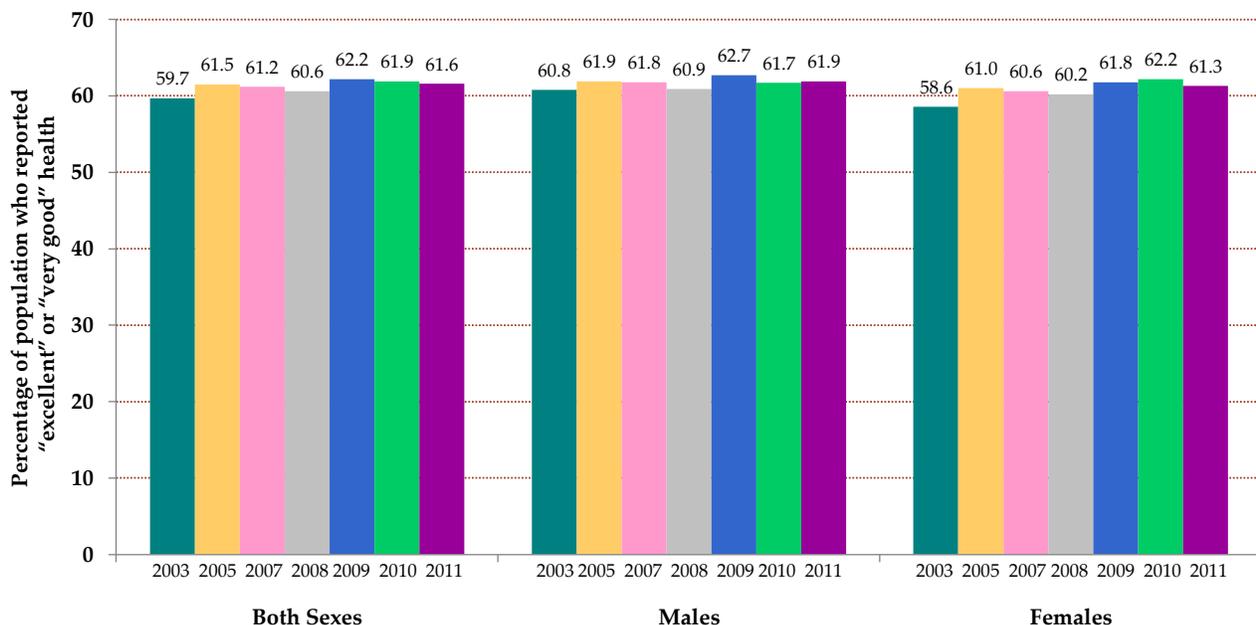
Self-rated health is a good predictor of morbidity and mortality.

* First Nations living on reserve and in northern First Nations communities.

Ratings of perceived health increased since 2003

In 2011, 61.6% of Canadians aged 12 years and older reported their health as “excellent” or “very good,” an increase from 59.7% in 2003. There was also an increase in perceived health for females in 2011 (61.3%) compared to 2003 (58.6%).

Figure 77 Perceived Health
 Percentage of population aged 12 years and older who reported “excellent” or “very good” health, by sex (age-standardized), Canada, 2003-11



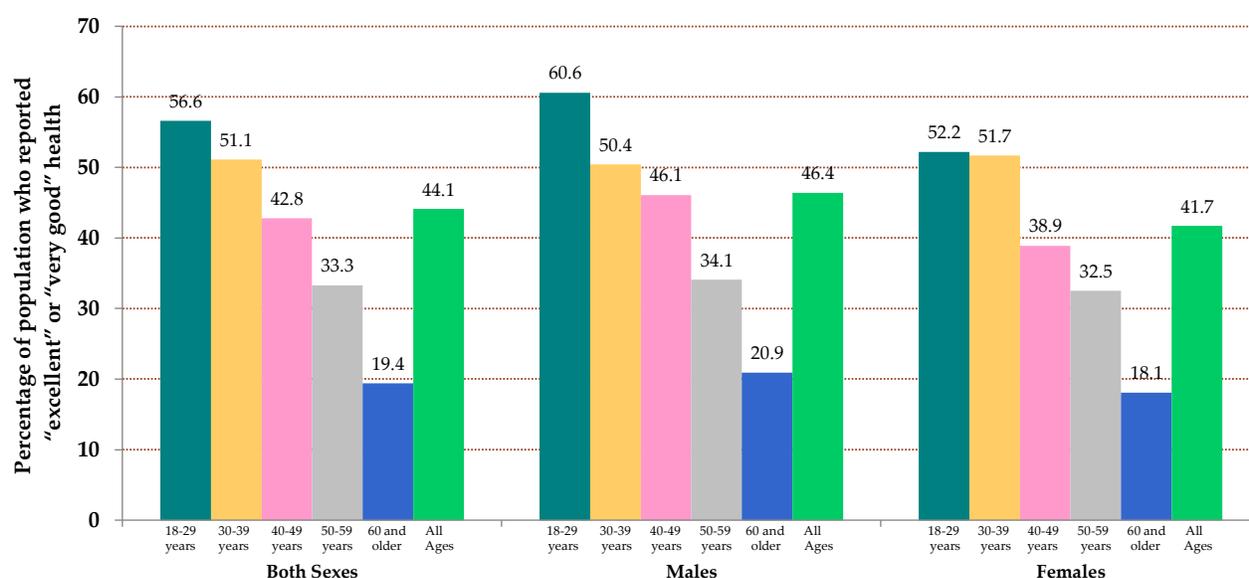
Source: Statistics Canada. Canadian Community Health Survey, 2003-11.

Notes: Based on household population aged 12 years and older who reported that their health was “excellent” or “very good.” Age-standardized to the 1991 Canadian population. For additional exclusions/limitations, see Annex 2.

First Nations men are more likely than their female counterparts to report “excellent” or “very good” health

The percentage of First Nations adults aged 18 years and older living in First Nations communities* reporting “excellent” or “very good” health is 44.1%. It is highest for younger people aged 18 to 29 years (56.6%) and lowest for those aged 60 years and older (19.4%). A larger percentage of First Nations men reported “excellent” or “very good” health compared with their female counterparts – 46.4% for men versus 41.7% for women.

Figure 78 Self-Reported Health Status
Percentage of First Nations adults living in First Nations communities,* aged 18 years and older, who reported “excellent” or “very good” health, by sex and age group, 2008/10



Source: First Nations Information Governance Centre. First Nations Regional Health Survey (RHS), 2008/10.

Notes: * First Nations living on reserve and in northern First Nations communities.

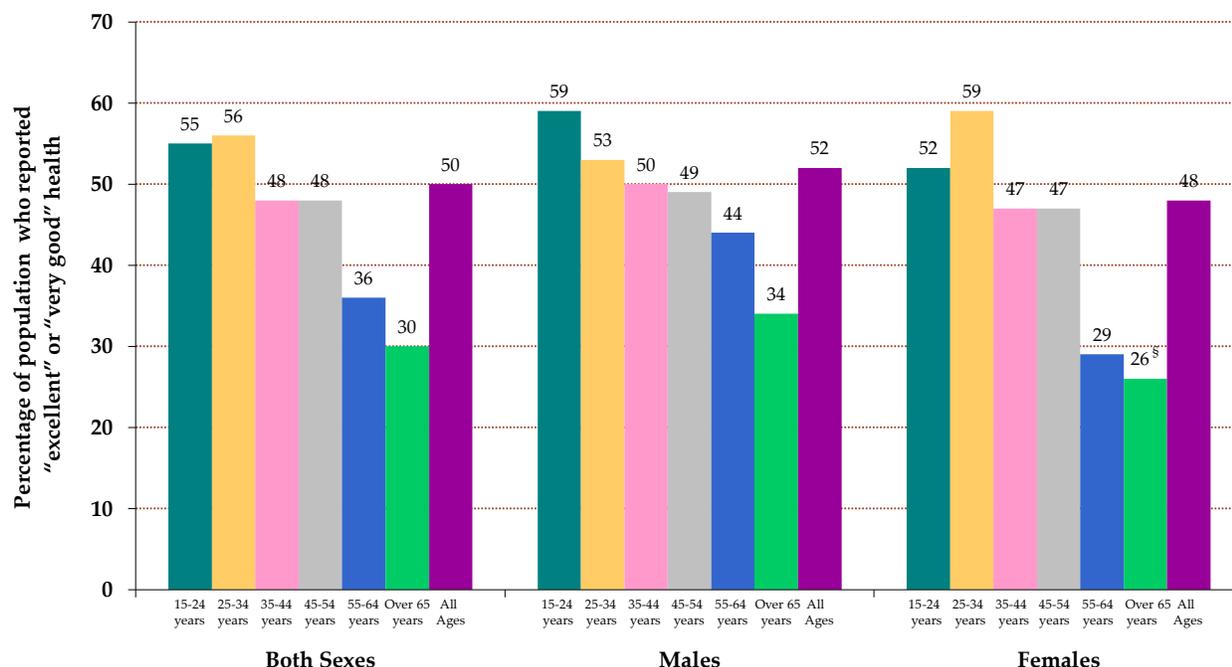
Population aged 18 years and older who reported that their health was “excellent” or “very good.”
 For additional exclusions/limitations, see Annex 2.

* First Nations living on reserve and in northern First Nations communities.

Younger Inuit more likely to report “excellent” or “very good” health

Half (50%) of Inuit in Canada aged 15 years and older reported “excellent” or “very good” self-rated health in 2006. This was highest for those in the youngest age groups and fell to 30% for Inuit aged 65 years and older. Differences between Inuit men and women were not significant.

Figure 79 Self-Reported Health Status
 Percentage of Inuit aged 15 years and older who reported “excellent” or “very good” health, by sex and age group, Canada, 2006



Source: Statistics Canada. Aboriginal Peoples Survey, 2006: “Inuit Health and Social Conditions: Supporting Data Tables.” Catalogue no. 89-637-X, No. 002.

Notes: Population aged 15 years and older who reported that their health was “excellent” or “very good.”

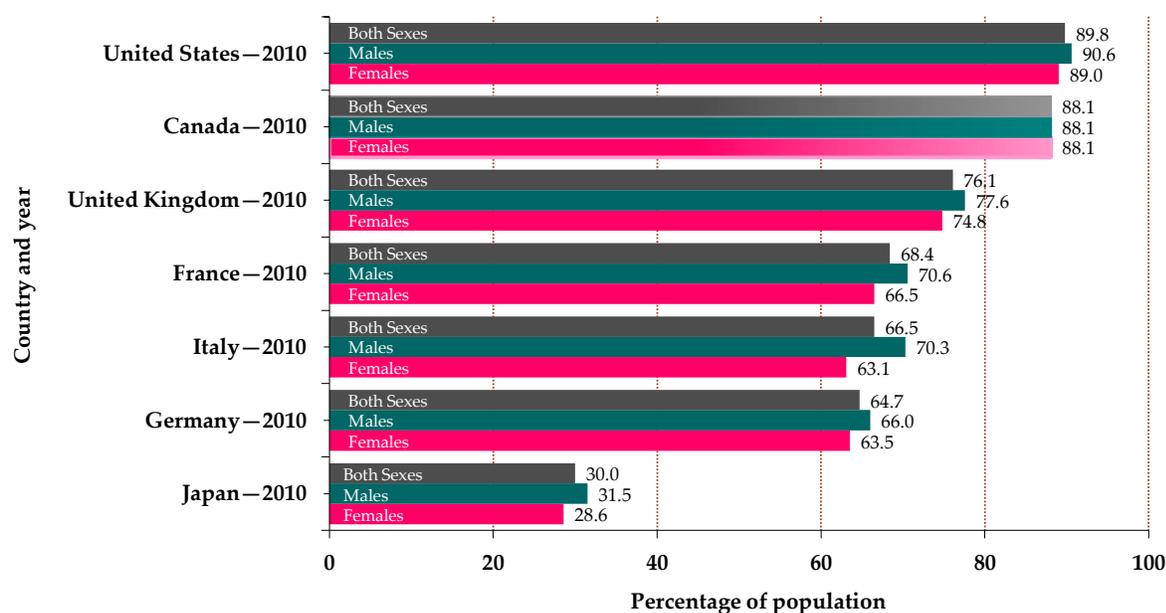
[§] The value for females older than 65 years has a high variability; therefore, it should be used with caution. For additional exclusions/limitations, see Annex 2.

Canada has the second highest perceived health status of all G7 countries

Reference years for the Organisation for Economic Co-operation and Development (OECD) data differ according to the country. Also, OECD data are not age-standardized while Canadian data (presented in Figure 77, *Perceived Health*) are age-standardized to the 1991 Canadian population. Furthermore, the OECD indicator measures the percentage of the population who reported being in “good” or better health, while the Canadian indicator measures the percentage of the population who rated their overall health as either “excellent” or “very good.” OECD data (including the information on Canada) also encompass individuals who are 15 years and older, whereas data in the Canadian graph include individuals who are 12 years and older. Thus, data are not directly comparable between Canadian and international graphs.

Of the G7 countries, Canada had the second highest score for perceived health, with 88.1% of Canadians rating their health as “good” or better, just behind the United States.

Figure 80 Perceived Health Status
Percentage of population who reported being in “good” health or better, by sex, selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

Notes: Data are for selected years.

Data are not comparable to Canadian trend data for the indicator *Perceived health* because OECD data are not age-standardized, while Canadian data are age-standardized to the 1991 Canadian population. In addition, this indicator reports on “good” health or better, which is not the same as the grouping “excellent” or “very good,” that is reported for Canada, and reports on Canadians 15 years and older rather than 12 years and older.

For additional exclusions/limitations, see Annex 2.

What these results mean for you

Self-rated health has been found to be a strong predictor of morbidity and mortality.^{1, 3, 4} It has also been highly correlated with other health status measures.⁵ For instance, strong associations have been found

between a decline in self-reported health status and a decrease in functional capacity and physical activity.^{1,6,7} Elderly people who reported being physically inactive were twice as likely to experience functional deterioration than those who were more active.¹ Furthermore, physical tiredness and poor physical and mental health,^{1,5} use of health care services, number of hospitalizations, increase in the number of chronic conditions, depression and lack of social support have also been linked to lower ratings of self-reported health.^{6,8} Finally, socio-demographic and economic characteristics such as age, income, education and work environment influence self-reported health.^{6,9,10,11}

It should be noted that individuals can sometimes perceive illnesses that are not there. For example, individuals diagnosed with hypochondriasis (people who have a tendency to worry about having a serious illness) are more likely to hold dysfunctional medical and illness-related beliefs than people who do not have these disorders. Contrary to what these individuals might believe, there is no evidence to suggest that they suffer from more illnesses than do people with lower levels of health anxiety.¹² Research also shows that these types of patients use outpatient and inpatient services twice as much and at twice the annual health care cost compared to patients who do not have these disorders.¹³ Therefore, judgement is essential in assessing your health status.

Benefits of being in touch with your health

- Better insight into your health, leading to faster responses to address potential health problems
- Better communication with your health care provider
- Faster diagnosis

Health risks of not being in touch with your health

- Poor perception of actual health status
- Longer time between doctor's visits, leading to less timely diagnoses and increased health-related complications
- Increased morbidity and mortality

Things you can do to be more aware of your health

- Increase your knowledge and awareness of different signs and symptoms of poor health by reading credible articles, taking courses, etc.
- Do not dismiss what your body is telling you
- Speak with your health care provider about methods to improve your ability to detect health-related complications

References

- ¹ Lee, Y. (2000). The predictive value of self-assessed general, physical, and mental health on functional decline and mortality in older adults. *Journal of Epidemiology and Community Health*. 54: 123-129. Available from: <http://jech.bmj.com/content/54/2/123.full.pdf>.

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- ² Grant, M.D., Piotrowski, Z.H., Chappell, R. (1995). Self-reported health and survival in the Longitudinal Study of Aging, 1984-1986. *Journal of Clinical Epidemiology*. 48: 375-387. Available from: <http://www.sciencedirect.com/science/article/pii/089543569400143E>.
- ³ Kaplan, G.A., Goldberg, D.E., Everson, S.A., Cohen, R.D., Salonen, R., Tuomilehto, J., Salonen, J. (1996). Perceived health status and morbidity and mortality: evidence from the Kuopio Ischaemic Heart Disease Risk Factor Study. *International Journal of Epidemiology*. 25(2): 259-265. Available from: <http://ije.oxfordjournals.org/cgi/reprint/25/2/259>.
- ⁴ Burström, B., Fredlund, P. (2001). Self-rated health: is it as good a predictor of subsequent mortality among adults in lower as well as higher social classes? *Journal of Epidemiology and Community Health*. 55: 836-840. Available from: <http://jech.bmj.com/content/55/11/836.full.pdf>.
- ⁵ Singh-Manoux, A., Martikainen, P., Ferrie, J., Zins, M., Marmot, M., Goldberg, M. (2006). What does self rated health measure? Results from the British Whitehall II and French Gazel cohort studies. *Journal of Epidemiology and Community Health*. 60: 364-372. Available from: <http://jech.bmj.com/content/60/4/364.full.pdf>.
- ⁶ Choi, N.G. (2003). Determinants of self-perceived changes in health status among pre- and early-retirement populations. *International Journal of Aging and Human Development*. 56(3): 197-222.
- ⁷ Mishra, G.D., Brown, W.J., Dobson, A.J. (2003). Physical and mental health: changes during menopause transition. *Quality of Life Research*. 12: 405-412. Available from: <http://www.springerlink.com/content/g20p2148w2023655/fulltext.pdf>.
- ⁸ Mulsant, B.H., Ganguli, M., Seaberg, E.C. (1997). The relationship between self-rated health and depressive symptoms in an epidemiological sample of community-dwelling older adults. *Journal of the American Geriatrics Society*. 45: 954-958.
- ⁹ Buckley, N.J., Denton, F.T., Robb, A.L., Spencer, B.G. (2004). The transition from good to poor health: an econometric study of the older population. *Journal of Health Economics*. 23: 1013-1034.
- ¹⁰ Tremblay, S., Ross, N.A., Berthelot, J.-M. (2002). Regional socio-economic context and health. *Supplement to Health Reports*. 13: 1-12. Ottawa: Statistics Canada. Catalogue No. 82-002. Available from: <http://www.statcan.gc.ca/pub/82-003-s/2002001/pdf/82-003-s2002003-eng.pdf>.
- ¹¹ Marmot, M.G., Bosma, H., Hemingway, H., Brunner, E., Stansfeld, S. (1997). Contribution of job control and other risk factors to social variations in coronary heart disease incidence. *The Lancet*. 350: 235-239. Available from: <http://www.sciencedirect.com/science/article/pii/S014067369704244X>.
- ¹² Marcus, D.K., Gurley, J.R., Marchi, M.M., Bauer, C. (2007). Cognitive and perceptual variables in hypochondriasis and health anxiety: a systematic review. *Clinical Psychology Review*. 27: 127-139. Available from: <http://www.sciencedirect.com/science/article/pii/S0272735806001139>.
- ¹³ Barsky, A.J., Orav, E.J., Bates, D.W. (2005). Somatization increases medical utilization and costs independent of psychiatric and medical comorbidity. *Archives of General Psychiatry*. 62: 903-910. Available from: <http://archpsyc.ama-assn.org/cgi/reprint/62/8/903>.

50. LIFE EXPECTANCY

Key Messages

- Life expectancy is the number of years a person may be expected to live
- This indicator concerns quantity rather than quality of life
- Life expectancy has been steadily increasing in Canada, reaching 81.1 years in 2007-09
- In 2007-09, women live longer than men (83.3 years for women compared to 78.8 years for men)
- Life expectancy for those in Inuit Nunangat[‡] remains low, but the gap with the total Canadian population has decreased

What does this indicator measure?

This indicator measures the number of years a person would be expected to live providing that this person would experience, through his(her) life, the age-specific mortality rates observed during a given year or reference period.

This indicator also measures the number of years a person living in Inuit Nunangat would be expected to live as compared to a person living elsewhere in Canada.

What are the limitations of this indicator?

Increases in life expectancy are sometimes associated with increases in the presence of serious disease. Thus, life expectancy on its own does not tell us whether or not an individual's life is lived in good health. As a result, life expectancy is more related to the quantity (number of years) than the quality (good health) of life. Furthermore, life expectancy does not refer to the number of years a particular newborn can actually expect to live. This is because mortality rates are averages for the entire population. The life expectancy of a newborn will vary according to different factors, among which socio-economic factors and health behaviours.

While vital statistics data specific to Inuit are not consistently collected in administrative databases across the country, a method has been developed which allows the use of geographic identifiers to inform the health of Inuit in Canada. Because a high proportion of residents of Inuit Nunangat are Inuit (approximately 82%), health indicators for residents of Inuit Nunangat can serve as a proxy for Inuit-specific health indicators. It should be noted that because these data also include non-Inuit residents of these regions, who tend to have better health outcomes than the Inuit population living in the same area, caution should be used when interpreting these results. While this information is not Inuit-specific, it can be used to infer the health of Inuit in Canada.

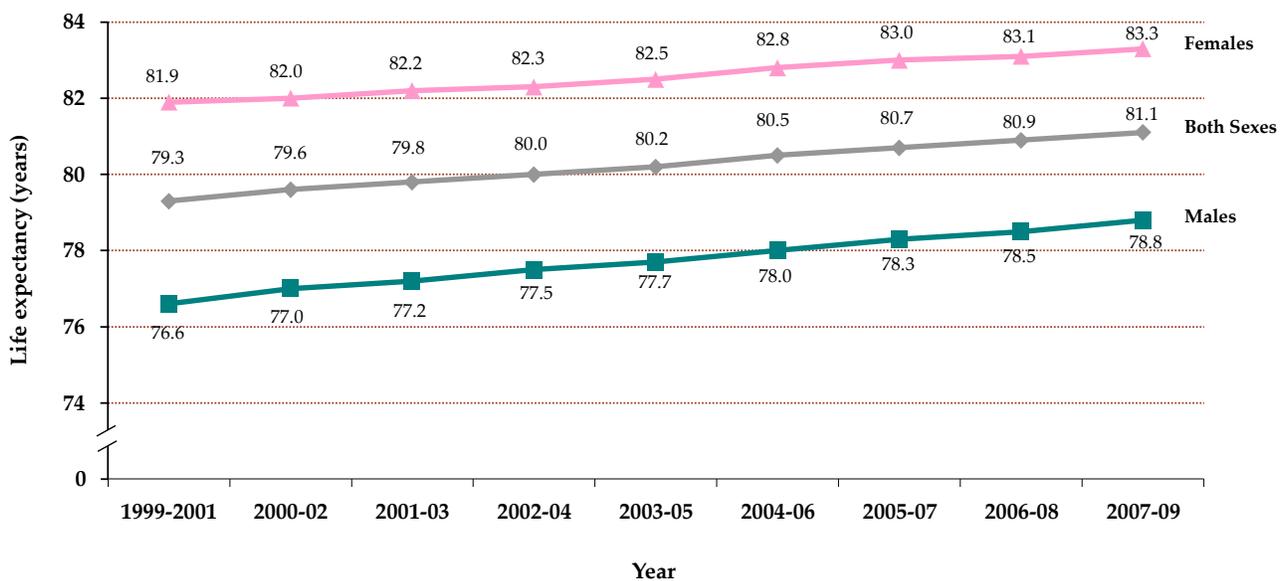
Life expectancy in Inuit Nunangat was estimated using vital statistics death records for 1994 through 2003 and census population counts for 1996 and 2001.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Life expectancy continues to increase

Since 1999-2001, life expectancy continues to increase for males, females and both sexes combined. In 2007-09, life expectancy for Canadians averaged 81.1 years, with males and females averaging 78.8 and 83.3 years, respectively. In 2007-09, males continued to have a lower life expectancy than females. However, the difference between males and females has gotten smaller, from a difference of 5.3 years in 1999-2001 to 4.5 years in 2007-09.

Figure 81 Life Expectancy
Life expectancy at birth, by sex, Canada, 1999-2001 to 2007-09

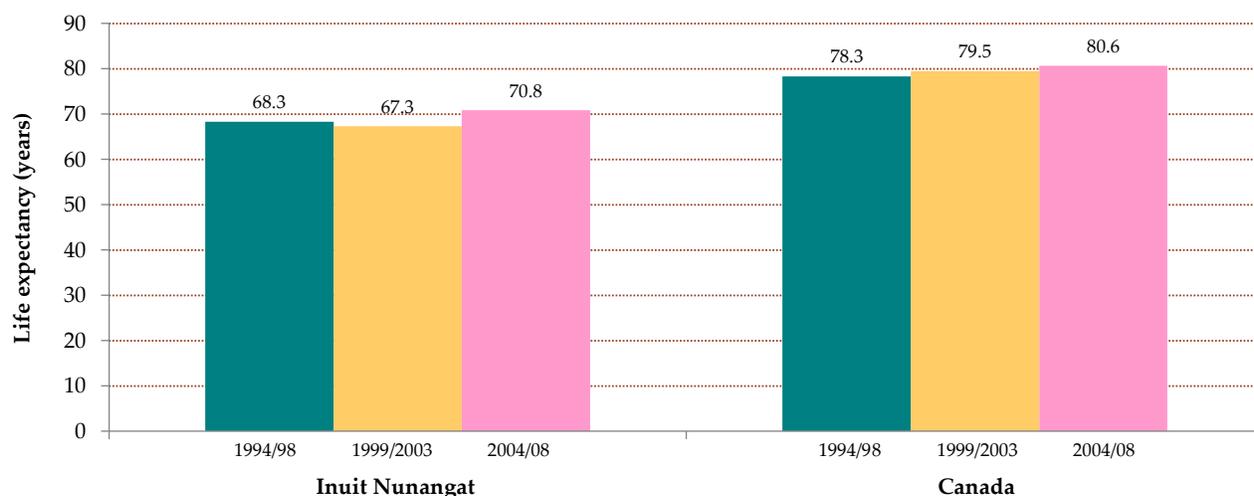


Sources: Statistics Canada. Vital Statistics — Birth and Death Databases and Demography Division (population estimates).
Notes: Statistics Canada uses a new method to calculate life expectancy which presents an average of a three-year period. Non-residents of Canada are excluded from the death and population estimates. For additional exclusions/limitations, see Annex 2.

Life expectancy for those in Inuit Nunangat[‡] is low but the gap with the total Canadian population has decreased

For the 2004/08 period, life expectancy for those in Inuit Nunangat (70.8 years) was 9.8 years lower than that for the total population of Canada (80.6 years).

Figure 82 Life Expectancy
Life expectancy at birth in Inuit Nunangat[‡] and Canada overall, both sexes, 1994/98, 1999/2003 and 2004/08



Sources: Statistics Canada. Table 102-0706 - Life expectancy, at birth and at age 65, by sex, five-year average, Canada and Inuit Regions, every 5 years, CANSIM (database). Vital Statistics — Deaths database.

Notes: Estimates in this table are based on the summation of five consecutive years of deaths data and the population estimate for the middle year of the five reference years.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008). Estimates for Canada include deaths and population of Inuit Nunangat. For additional exclusions/limitations, see Annex 2.

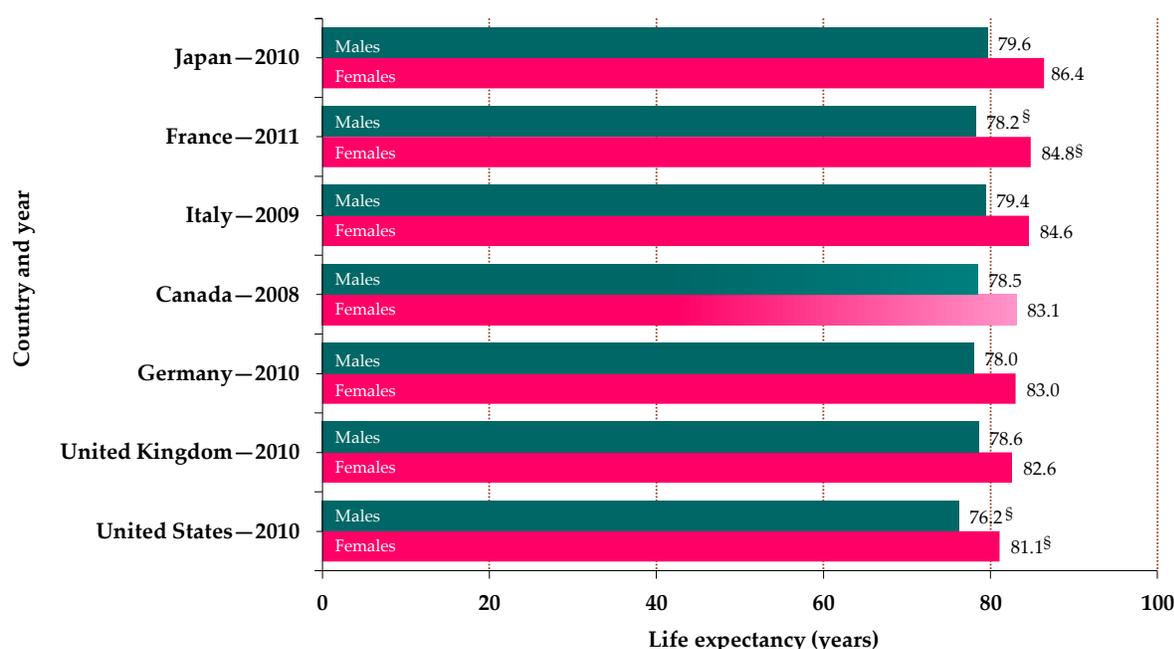
[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Canadians enjoy the fourth longest average life expectancy among G7 countries

Reference years for the Organisation for Economic Co-operation and Development (OECD) data vary according to the country. Caution is therefore required in the interpretation of OECD data.

Of the G7 countries, Canada had the fourth longest average life expectancy (fourth longest for males at 78.5 years and fourth longest for females at 83.1 years).

Figure 83 Life Expectancy at Birth
In years, by sex, selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

Notes: [§] Data for France and the United States are estimates.
For additional exclusions/limitations, see Annex 2.

What these results mean for you

Numerous factors or determinants of health (income and social status, social supports, education, employment and working conditions, access to health services, biology and genetic endowment, child development, physical and social environment, personal health practices and coping skills) can influence a person's longevity and quality of life.¹ For example, a long-time smoker may have a life expectancy that is different from a non-smoker.

Furthermore, several studies have shown that avoiding some health risk factors not only increases the quantity of life (and therefore life expectancy), but also the quantity of *active* life (known as "active life expectancy," "health expectancy," or "disability-free life expectancy").^{2,3} To illustrate this, consider

physical activity which is an important factor affecting active life expectancy. Research shows that older persons who are physically active are more likely to survive to very old age, resulting in a longer life with a lower risk for disability before death.³ In fact, physical activity may be stronger than not smoking as a predictor of quality of life in old age.² Moreover, improvements in four preventable risk factors (smoking, high blood pressure, high blood glucose and adiposity) may increase life expectancy by several years.⁴ It is worth noting that obesity may have a much larger effect on active life expectancy than on life expectancy.⁵

Diet also has a significant influence on mortality and thus on life expectancy. A Mediterranean diet—which is low in saturated fat, high in monounsaturated and/or polyunsaturated fat, high in fruits and vegetables, low in meat and meat products, and moderate in milk and dairy products—is known to decrease mortality rates for coronary heart disease and several types of cancers. As a result, this diet may increase life expectancy.⁶ Doubling the amount of fruits and vegetables consumed each day (from 250 to 500 g) may increase life expectancy by 1.3 years.⁷ Finally, since obesity plays a significant role in the development of disability in later life, any lifestyle changes such as diet and exercise could have an effect on obesity and hence on active life expectancy.^{5,8,9}

People suffering from one or more chronic conditions are more likely to have a reduced active life expectancy. In a study of seniors 65 years and older, those who were free of chronic diseases such as diabetes, asthma, chronic obstructive pulmonary disease, arthritis, hearing problems and/or cancer, were more likely to have an active life expectancy after a 6-year follow-up period.¹⁰

Benefits of aging successfully

- Better health
- Greater independence
- Better quality of life
- Care giving costs are lower, benefiting individuals and society
- Greater capacity to perform physical and social activities

Health risks affecting life expectancy

- Physical inactivity
- Smoking
- Unhealthy diet
- Obesity
- Excessive drinking
- Excessive stress
- Deficiency in personal coping skills

Things you can do to age successfully

- Avoid risky behaviours such as drinking too much alcohol, smoking, eating too much fat, driving too fast
- Take protective measures when engaging in risky behaviours (for example, wear a life jacket when boating, wear a seat belt while driving)

- Increase your physical activity
- Decrease your stress
- Have a good social network of friends and family
- Have regular check-ups with your family doctor
- Focus on what you can change to improve your health and quality of life

References

- ¹ Details on the determinants of health are available at: <http://www.phac-aspc.gc.ca/ph-sp/determinants/index-eng.php>.
- ² Ferrucci, L., Izmirlian, G., Leveille, S., Phillips, C.L., Corti, M.-C., Brock, D.B., Guralnik, J.M. (1999). Smoking, physical activity, and active life expectancy. *American Journal of Epidemiology*. 149: 645-653. Available from: <http://aje.oxfordjournals.org/cgi/reprint/149/7/645>.
- ³ Leveille, S.G., Guralnik, J.M., Ferrucci, L., Langlois, J.A. (1999). Aging successfully until death in old age: opportunity for increasing active life expectancy. *American Journal of Epidemiology*. 149: 654-664. Available from: <http://aje.oxfordjournals.org/cgi/reprint/149/7/654>.
- ⁴ Danaei, G., Rimm, E.B., Oza, S., Kulkarni, S.C., Murray, C.J.L., Ezzati, M. (2010). The promise of prevention: the effects of four preventable risk factors on national life expectancy and life expectancy disparities by race and county in the United States. *Public Library of Science Medicine*. 7(3): e1000248. Available from: <http://www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.1000248>.
- ⁵ Al Snih, S., Ottenbacher, K.J., Markides, K.S., Kuo, Y.-F., Eschbach, K., Goodwin, J.S. (2007). The effect of obesity on disability vs mortality on older Americans. *Archives of Internal Medicine*. 167: 774-780. Available from: <http://archinte.ama-assn.org/cgi/reprint/167/8/774>.
- ⁶ Trichopoulou, A., Vasilipoulou, E. (2000). Mediterranean diet and longevity. *British Journal of Nutrition*. 84: S205-S209. Available from: <http://journals.cambridge.org/action/displayFulltext?type=1&fid=885740&jid=&volumeId=&issueId=S2&aid=85732&bodyId=&membershipNumber=&societyETOCSession>.
- ⁷ Gundgaard, J., Noelsen, J.N., Olsen, J., Sørensen, J. (2003). Increased intake of fruit and vegetables: estimation of impact in terms of life expectancy and healthcare costs. *Public Health Nutrition*. 6(1): 25-30. Available from: <http://journals.cambridge.org/action/displayFulltext?type=1&fid=1382060&jid=&volumeId=&issueId=01&aid=1382052&bodyId=&membershipNumber=&societyETOCSession>.
- ⁸ Alley, D.E., Chang, V.W. (2007). The changing relationship of obesity and disability, 1988-2004. *Journal of the American Medical Association*. 298(17): 2020-2027. Available from: <http://jama.ama-assn.org/cgi/reprint/298/17/2020>.
- ⁹ Reynolds, S.L., Saito, Y., Crimmins, E.M. (2005). The impact of obesity on active life expectancy in older American men and women. *Gerontologist*. 45(4): 438-444. Available from: <http://gerontologist.oxfordjournals.org/content/45/4/438.full.pdf+html>.
- ¹⁰ Strawbridge, W.J., Cohen, R.D., Shema, S.J., Kaplan, G.A. (1996). Successful aging: predictors and associated activities. *American Journal of Epidemiology*. 144(2): 135-141. Available from: <http://aje.oxfordjournals.org/cgi/reprint/144/2/135>.

51. INFANT MORTALITY

Key messages

- Infant mortality is considered the single most comprehensive measure of health in a society
- It reflects the level of health care available to a population, the effectiveness of preventive care, and the attention paid to maternal and child health
- Immaturity is the leading cause of infant death in Canada, followed by congenital anomalies
- Although infant mortality in Canada has decreased dramatically over the last century, disparities in the risk of infant death across subpopulations still remain
- The infant mortality rate in Inuit Nunangat[‡] continues to be high

What does this indicator measure?

This indicator measures the number of live born babies who die in the first year of life, expressed as a rate (per 1,000 live births) for that year.

It also measures the number of infants in Inuit Nunangat who die in the first year of life, expressed as a rate (per 1,000 live births) for that year.

What are the limitations of this indicator?

The infant mortality rate reflects the level of mortality, the health status and health care of a population, the effectiveness of preventive care and the attention paid to maternal and child health, as well as broader social factors such as maternal education, smoking and deprivation. Although infant mortality in Canada has decreased dramatically over the last century, disparities in risk of infant death across subpopulations remain. Immaturity and congenital anomalies are the leading causes of infant death in Canada.

While vital statistics data specific to Inuit are not consistently collected in administrative databases across the country, a method has been developed which allows the use of geographic identifiers to inform the health of Inuit in Canada. Because a high proportion of residents of Inuit Nunangat are Inuit (approximately 82%), health indicators for residents of Inuit Nunangat can serve as a proxy for Inuit-specific health indicators. It should be noted that because these data also include non-Inuit residents of these regions, who tend to have better health outcomes than the Inuit population living in the same area, caution should be used when interpreting these results. While this information is not Inuit-specific, it can be used to infer the health of Inuit in Canada.

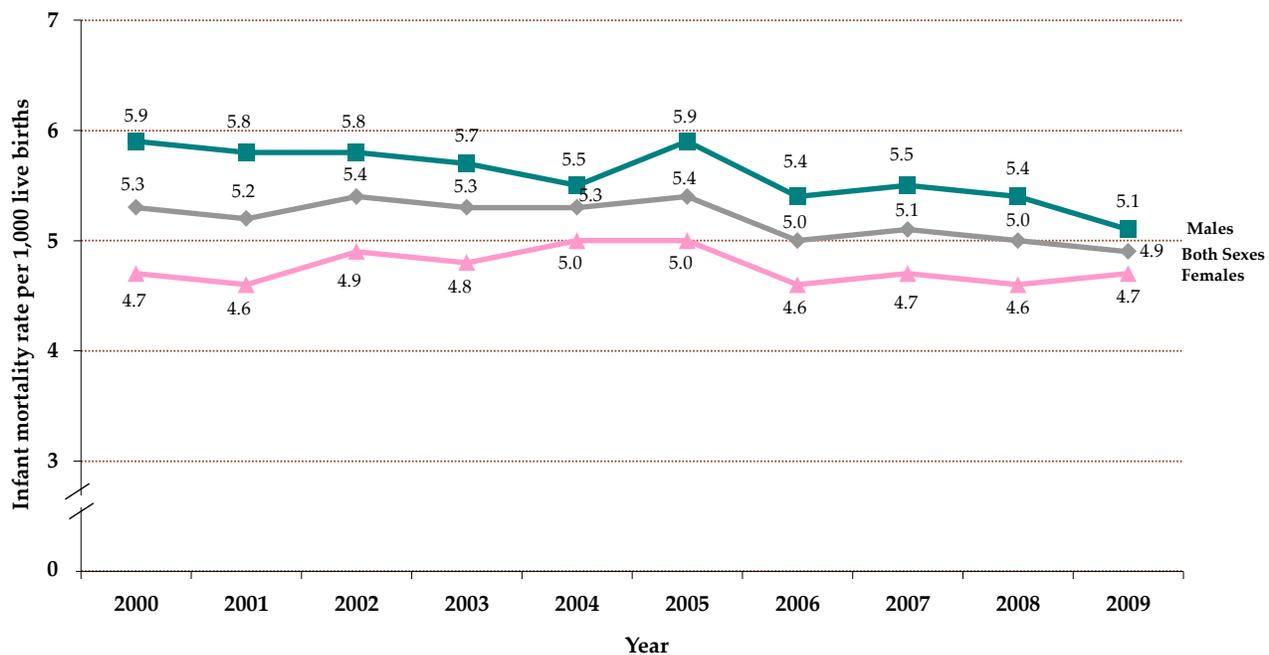
Infant mortality in Inuit Nunangat was estimated using vital statistics death records for 1994 through 2003 and census population counts for 1996 and 2001.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Infant mortality continues to decrease in Canada

In 2009, the infant mortality rate was 4.9 deaths per 1,000 live births. The infant mortality rates for males and females were 5.1 and 4.7 per 1,000 live births, respectively.

Figure 84 Infant Mortality
 Infant mortality rate per 1,000 live births, by sex, Canada, 2000-09



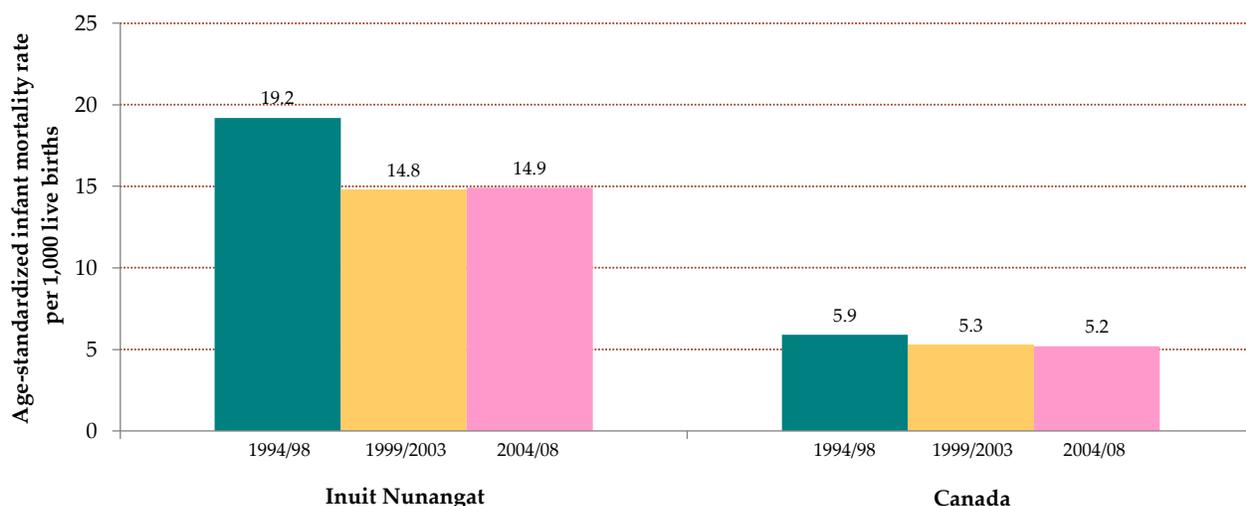
Sources: Statistics Canada. Vital Statistics — Birth and Death Databases.

Notes: For additional exclusions/limitations, see Annex 2.

The infant mortality rate in Inuit Nunangat[‡] continues to be high

While the mortality rate for Inuit Nunangat has not changed significantly in recent years, it has declined for the total population of Canada. For the 2004/08 period, the infant mortality rate for the population of Inuit Nunangat was nearly three times the rate for the total Canadian population – 14.9 deaths per 1,000 live births compared with 5.2 deaths per 1,000 live births.

Figure 85 Infant Mortality
Age-standardized infant mortality rates in Inuit Nunangat[‡] and Canada overall, both sexes, 1994/98, 1999/2003 and 2004/08



Sources: Statistics Canada. Table 102-0702 - Live births and infant mortality, by sex, five-year average, Canada and Inuit Regions, every 5 years, CANSIM (database). Vital Statistics — Birth and death databases.

Notes: Numbers and rates on this graph are based on the summation of five consecutive years of data.

[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Numbers and rates for Canada include deaths and births for Inuit Nunangat.

For additional exclusions/limitations, see Annex 2.

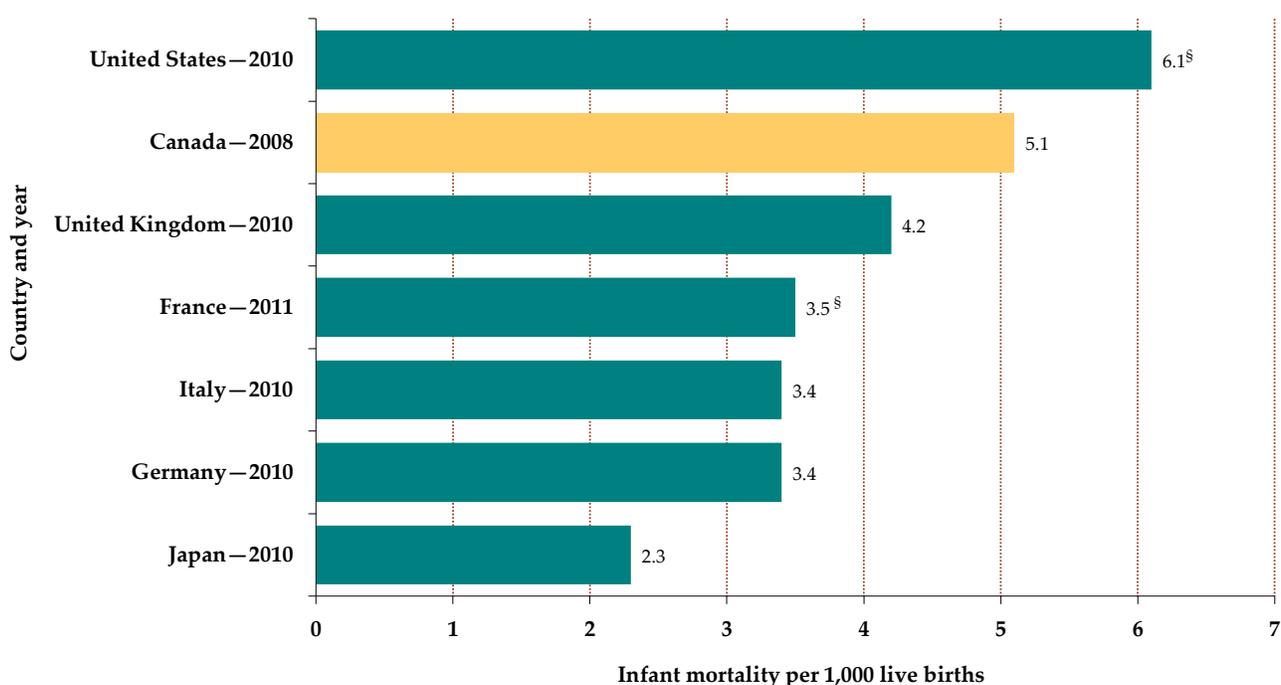
[‡] Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

Canada has the second highest infant mortality rate among G7 countries

Reference years for the Organisation for Economic Co-operation and Development (OECD) data differ according to the country in question. Furthermore, interpretation of international comparisons of infant mortality should be made with caution as there are international variations in the registration of stillbirths and live births.

Internationally, Canada had the second highest infant mortality rate of the G7 countries with 5.1 deaths per 1,000 live births, after the United States. However, international differences in reporting of extremely low birth weight and very early gestation births probably compromise the validity of international rankings of perinatal and infant mortality.¹

Figure 86 Infant Mortality
Deaths per 1,000 live births, both sexes, selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

Notes: Data are for selected years.

[§]Data for the United States and France are estimates.

For additional exclusions/limitations, see Annex 2.

What these results mean for you

It is well known that infant mortality is an important indicator of a nation's health status and well-being.^{2,3,4} Over the last century, infant mortality has decreased substantially in almost all countries as a result of improvements in sanitation, nutrition, infant feeding, and maternal and child health care.

In Canada (excluding Ontario), immaturity, i.e., conditions associated with preterm birth, is the leading cause of infant mortality, accounting for 29.5% of all infant deaths in 2007.⁵ Many factors are associated with the risk of preterm birth, including (but not limited to): smoking, maternal overweight and obesity,⁶ stress, medical treatments, environmental exposures, biological factors and genetics,⁷ and infertility treatments.^{8,9} The rate of preterm birth has been increasing in Canada, and this may be due to increases in obstetric interventions (for example, medically indicated labour induction and/or caesarean delivery), multiple births, older maternal age, and increases in the use of ultrasound-based estimates of gestational age.

To help decrease the risk of infant death, several approaches have been studied and are recommended, including: identifying the risk level of a pregnancy and assessing fetal health such as monitoring fetal movements and heart rates in all high-risk pregnancies where heart disease, diabetes, smoking, alcohol, drug abuse or inadequate nutrition is present;¹⁰ ensuring adequate nutrition¹¹ and maternal social supports;¹² and providing adequate prenatal care (whether to individuals or groups).^{13, 14, 15}

Benefits of a healthy pregnancy

- Reduced risk of preterm birth
- Improved fetal growth
- Reduced risk of infant death
- Healthy baby
- Improved health later in life

Risks factors for pregnancy complications

- Smoking, alcohol and drug use
- Maternal health problems
- Inadequate prenatal care

What you can do to improve your baby's health and to reduce the risk of infant death

- Prior to and during pregnancy:
 - Plan your pregnancy and start your prenatal care early
 - Lead a healthy lifestyle (e.g., eat a healthy diet including folic acid and other vitamins, engage in physical activity, manage stress)
 - Strive for a [healthy weight gain](#)
 - Avoid engaging in risky health behaviours (e.g., smoking, drinking, illicit drug use)
- Speak to your primary health care provider about:
 - vitamin supplementation prior to and during pregnancy (e.g., folic acid)
 - how to reduce the risk of multiple births if you are seeking fertility treatment
 - prenatal care
 - how you can recognize the signs of preterm labour and what to do if it happens to you
 - what you can do to reduce the risk of [Sudden Infant Death Syndrome \(SIDS\)](#)
- Have your children immunized
- Learn about the various [programs available in your community](#) to support and improve maternal and fetal health

References

- ¹ Joseph, K.S., Liu, S., Rouleau, J., Lisonkova, S., Hutcheon, J.A., Sauve, R., Allen, A.C., Kramer, M.S. (2012). Influence of definition based versus pragmatic birth registration on international comparisons of perinatal and infant mortality: population based retrospective study. *British Medical Journal*. 344: e746. Available from: <http://dx.doi.org/10.1136/bmj.e746>.
- ² Euro-Peristat project, with SCPE, Eurocat and Euroneostat. (2010). *The European Perinatal Health Report 2010*. Available from: www.europeristat.com.
- ³ Metzler, M., Kanarek, N., Highsmith, K., Bialek, R., Straw, R., Auston, I., Stanley, J., Klein, R. (2008). Community health status indicators project: the development of a national approach to community health. *Preventing Chronic Disease*. 5(3): 1-8. Available from: http://www.cdc.gov/pcd/issues/2008/jul/pdf/07_0225.pdf.
- ⁴ Singh, G.K., Yu, S.M. (1995). Infant mortality in the United States: trends, differentials, and projections, 1950 through 2010. *American Journal of Public Health*. 85(7): 957-964. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1615523/pdf/amjph00445-0063.pdf>.
- ⁵ Public Health Agency of Canada. (2012). *Perinatal Health Indicators for Canada 2011*. Available at: http://publications.gc.ca/collections/collection_2012/aspc-phac/HP7-1-2011-eng.pdf. See page 34 for details on causes of infant death.
- ⁶ McDonald, S.D., Han, Z., Mulla, S., Beyene, J. (2010). Overweight and obesity in mothers and risk of preterm birth and low birth weight infants: systematic review and meta-analyses. *British Medical Journal*. 341: c3428. Available from: http://www.bmj.com/cgi/content/full/341/jul20_1/c3428.
- ⁷ Lu, M.C., Chen, B. (2004). Racial and ethnic disparities in preterm birth: the role of stressful life events. *American Journal of Obstetrics and Gynecology*. 191(3): 691-699. Available from: <http://www.sciencedirect.com/science/article/pii/S0002937804004132>.
- ⁸ Alexander, G.R., Slay, M. (2002). Prematurity at birth: trends, racial disparities, and epidemiology. *Mental Retardation and Developmental Disabilities Research Reviews*. 8(4): 215-220. Available from: <http://onlinelibrary.wiley.com/doi/10.1002/mrdd.10047/pdf>.
- ⁹ Varner, M.W., Esplin, M.S. (2005). Current understanding of genetic factors in preterm birth. *BJOG: An International Journal of Obstetrics and Gynecology*. 112(Supplement 1): 28-31. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/j.1471-0528.2005.00581.x/pdf>.
- ¹⁰ Gribbin, C., James, D. (2004). Assessing fetal health. *Best Practice and Research Clinical Obstetrics and Gynaecology*. 18(3): 441-424. Available from: <http://www.sciencedirect.com/science/article/pii/S1521693404000306>.
- ¹¹ Godfrey, K.M. (1998). Maternal regulation of fetal development and health in adult life. *European Journal of Obstetrics and Gynecology*. 78: 141-150. Available from: <http://www.sciencedirect.com/science/article/pii/S0301211598000608>.
- ¹² Feldman, P.J., Dunkel-Schetter, C., Sandman, C.A., Wadhwa, P.D. (2000). Maternal social support predicts birth weight and fetal growth in human pregnancy. *Psychosomatic Medicine*. 62: 715-725. Available from: <http://www.psychosomaticmedicine.org/cgi/reprint/62/5/715>.
- ¹³ Canning, P.M., Frizzell, L.M., Courage, M.L. (2009). Birth outcomes associated with prenatal participation in a government support programme for mothers with low incomes. *Child: Care, Health and Development*. 36(2): 225-231. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2214.2009.01045.x/pdf>.
- ¹⁴ Khanani, I., Elam, J., Hearn, R., Jones, C., Maseru, N. (2010). The impact of prenatal WIC participation on infant mortality and racial disparities. *American Journal of Public Health*. 100(S1): S204-S209. Available from: <http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.2009.168922>.
- ¹⁵ Ickovics, J.R., Kershaw, T.S., Westdahl, C., Magriples, U., Massey, Z., Reynolds, H., Schindler-Rising, S. (2007). Group prenatal care and perinatal outcomes. *Obstetrics and Gynecology*. 110: 330-339. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2276878/pdf/nihms-42174.pdf>.

52. LOW BIRTH WEIGHT

Key Messages

- Low birth weight reflects the general health of newborns since weight is a key determinant of infant survival, health and development
- It can result from being born too early and/or inadequate fetal growth, which are associated with increased infant morbidity and mortality
- In 2011, a greater proportion of Canadian females (6.4%) are born with low birth weight, compared to males (5.7%)
- In 2004/08, a higher proportion of low birth weight is observed in Inuit regions compared to the rest of Canada

What does this indicator measure?

This indicator measures the proportion of live births (where birth weight is known) with a birth weight of at least 500 grams to less than 2,500 grams.

This indicator also measures the proportion of live births with a birth weight of at least 500 grams and less than 2,500 grams among those living in Inuit Nunangat.†

This indicator includes babies weighing at least 500 g to less than 2,500 g.

What are the limitations of this indicator?

Birth weight is a key determinant of infant survival, health and development and, therefore, low birth weight is an indicator of the general health of newborns. Low birth weight can result from being born too early (preterm birth) or too small (small-for-gestational age), both of which are associated with increased infant morbidity and mortality. As preterm births and small-for-gestational age births have differing causes and trends, it is important to examine these two components of low birth weight rate separately to better understand and monitor perinatal health in Canada.

Inaccuracies in the rate of preterm birth may occur due to errors in the reporting of gestational age, particularly when it is based on menstrual dates. However, errors have diminished in recent decades because ultrasound, which can more accurately confirm gestational age, has become widely used in Canada. In addition, variations in the ethnic composition of the population may play a role in birth

† Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

weight because some ethnic groups tend to have babies of lower weight even though these infants are otherwise healthy.¹

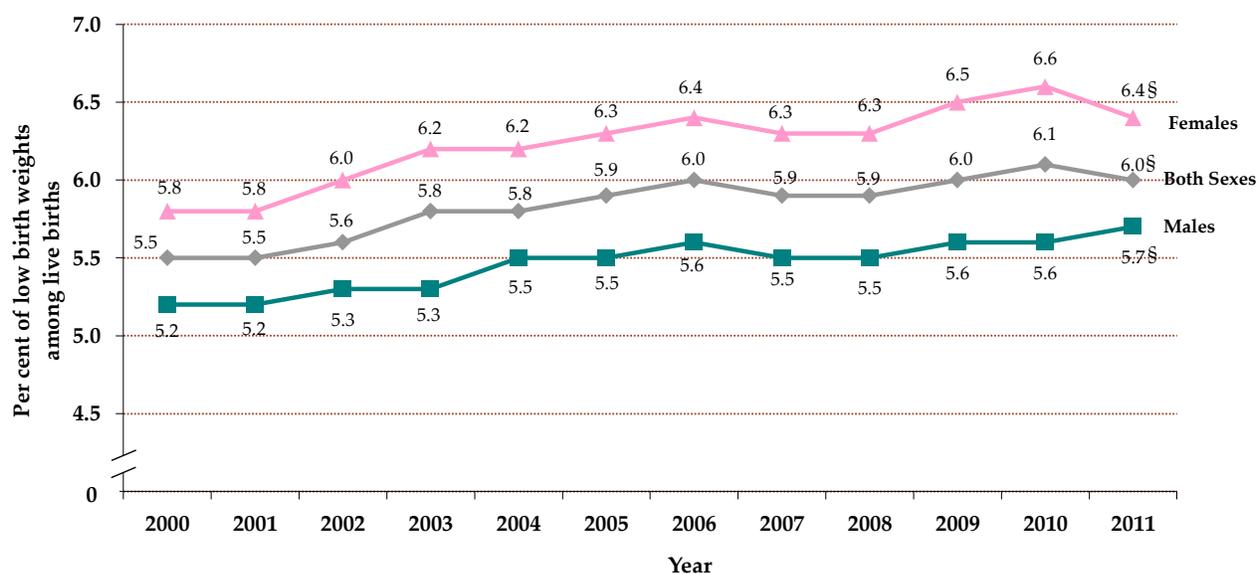
While vital statistics data specific to Inuit are not consistently collected in administrative databases across the country, a method has been developed which allows the use of geographic identifiers to inform the health of Inuit in Canada. Because a high proportion of residents of Inuit Nunangat are Inuit (approximately 82%), health indicators for residents of Inuit Nunangat can serve as a proxy for Inuit-specific health indicators. It should be noted that because these data also include non-Inuit residents of these regions, who tend to have better health outcomes than the Inuit population living in the same area, caution should be used when interpreting these results. While this information is not Inuit-specific, it can be used to infer the health of Inuit in Canada.

Low birth weight in Inuit Nunangat was estimated using vital statistics birth records for 1994 through 2003 and census population counts for 1996 and 2001.

More females than males are born with low birth weight

In 2011, the proportion of live births weighing at least 500 grams but less than 2,500 grams was 6.0%. The low birth weight rates for females and males were 6.4% and 5.7%, respectively.

Figure 87 Low Birth Weight
Proportion of live births with a birth weight of at least 500 g but less than 2,500 g, by sex, Canada, 2000-11



Sources: Statistics Canada. Vital Statistics — Birth and Death Databases.

Notes: Over time, there has been increased registration of live births with birth weight less than 500 grams. To improve comparability of this indicator over an extended time period, low birth weight birth rates are calculated excluding live births with birth weight under 500 grams.

§ Data for 2011 are preliminary.

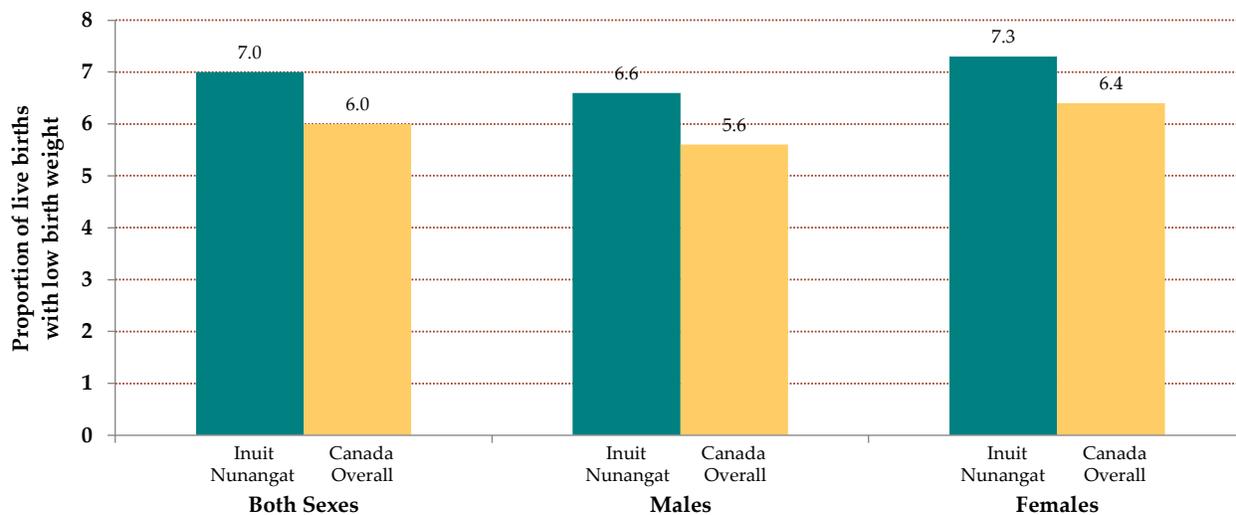
Infants born outside the province/territory of residence of their mothers are included in the rates for the mother's province/territory of residence.

For additional exclusions/limitations, see Annex 2.

Higher proportion of low birth weight in Inuit regions

In 2004/08, the proportion of low birth weight weighing at least 500 grams but less than 2,500 grams in Inuit regions was 7.0%, higher than the 6.0% for Canadians overall. The proportion of low birth weight for male and female residents of Inuit regions were 6.6% and 7.3%, respectively, higher than for overall male (5.6%) and female (6.4%) Canadians.

Figure 88 Low Birth Weight
By sex, five-year average, Inuit Nunangat[‡] and Canada overall, 2004/08



Sources: Statistics Canada. Table 102-0701 - Low birth weight babies (500 to less than 2,500 grams), by sex, five-year average, Canada and Inuit regions, every 5 years, CANSIM (database). Vital Statistics — Birth Database.

Notes: Counts and rates on this graph are based on the summation of five consecutive years of data.

The geographic distribution of live births in this graph is based on the mother's usual place of residence.

Numbers and rates for Canada include births for Inuit Nunangat.

[‡]Inuit Nunangat comprises four regions created through the signing of land claims agreements and from west to east includes the Inuvialuit Region in the Northwest Territories, Nunavut, Nunavik north of the 55th parallel in Quebec and Nunatsiavut in northern Labrador (Inuit Tapiriit Kanatami, 2008).

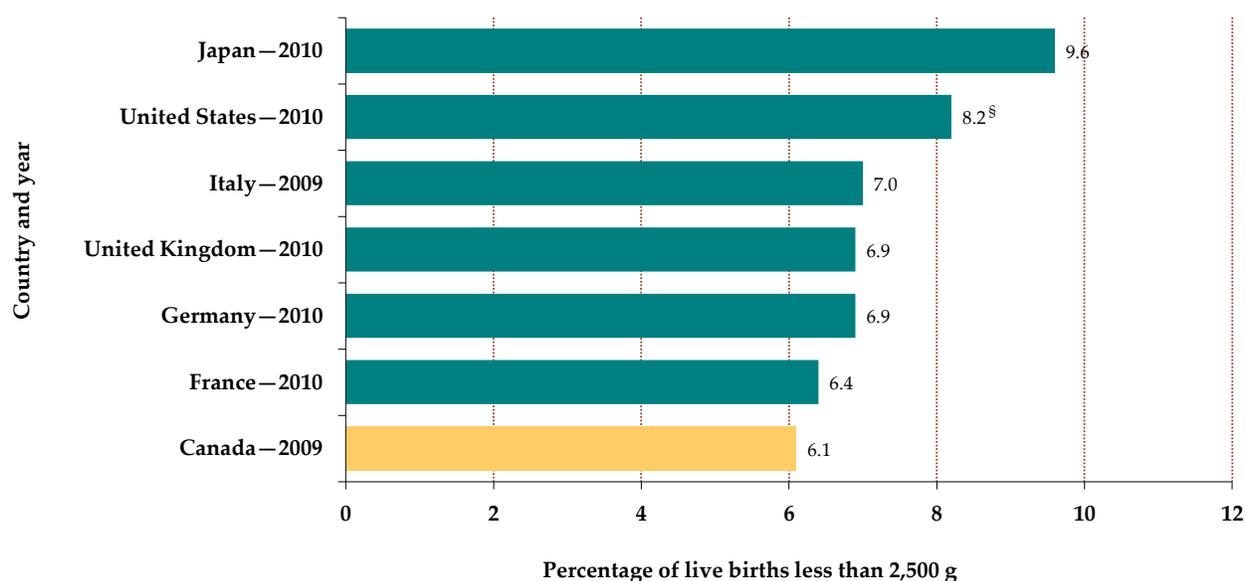
Low birth weight rates are adjusted to show only the rate of viable low birth weights. In this graph, they are calculated as follows: (subtract the number of live births with a birth weight of less than 500 grams from the standard low birth weight birth counts in the same year) and divide by (live birth counts for the same year with a known birth weight greater than 499 grams).

Canada has the lowest rate of births with low birth weight among G7 countries

Reference years for the Organisation for Economic Co-operation and Development (OECD) data vary according to the country. Moreover, international variations exist in the registration of stillbirths and live births. Therefore, interpretation of international comparisons of infant low birth weight should be done with caution. OECD data include all live births weighing less than 2,500 grams, while data in the previous graph on low birth weight in Canada include only live births weighing between 500 grams and 2,499 grams.

Internationally, Canada had the lowest rate of births with low birth weight of the G7 countries, with only 6.1% of live births weighing less than 2,500 grams.

Figure 89 Low Birth Weight
Percentage of live births weighing less than 2,500 g, both sexes, selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

Notes: Data are for selected years.

[§] Data for the United States are an estimate.

Data are not comparable to Canadian trend data for the indicator *Low birth weight* because OECD data are for births weighing less than 2,500 g, while the Canadian indicator is for births with weights greater than or equal to 500 g but less than 2,500 g.

For additional exclusions/limitations, see Annex 2.

What these results mean for you

Low birth weight, including preterm birth and small-for-gestational age, is associated with a number of factors such as poor maternal health and lifestyle (e.g., smoking² and poor diet³), low pre-pregnancy body mass index (BMI),^{4,5} multiple gestation (e.g., twins, triplets),⁶ maternal age,⁷ short inter-pregnancy intervals,^{8,9} previous preterm deliveries¹⁰ and economic circumstances.¹¹ The causes and trends of

preterm births and small-for-gestational age births differ and so these two components of low birth weight should be examined separately to better understand and monitor perinatal health.

Low birth weight is associated with many health risks, including the development of type 2 diabetes,¹² cognitive and learning difficulties,¹³ obesity,¹⁴ ischemic heart disease¹⁵ and hypertension.¹⁶

Benefits of a healthy birth weight

Relative to low birth weight babies, babies born at healthy weights are more likely to:

- Be healthier in their first year of life
- Have fewer health problems as they age
- Have fewer learning problems
- Achieve developmental milestones with fewer difficulties

Risks associated with a low birth weight

- Risk of more health problems during the first year of life
- Risk of chronic health problems later in life
- Potential physical and cognitive disabilities and difficulty in achieving developmental milestones
- Infant death

What you can do to improve your baby's preterm health and to reduce the risk of a preterm birth or a baby that is small for its gestational age

- Prior to and during pregnancy:
 - Plan your pregnancy and start your prenatal care early
 - Lead a healthy lifestyle (e.g., eat a healthy diet including folic acid and other vitamins, engage in physical activity, manage stress)
 - Strive for a [healthy weight gain](#)
 - Avoid engaging in risky health behaviours (e.g., smoking, drinking, illicit drug use)
- Speak to your primary health care provider about:
 - how you can recognize the signs of preterm labour and what to do if it happens to you
 - vitamin supplementation prior to and during pregnancy (e.g., folic acid)
 - how to reduce the risk of multiple births if you are seeking fertility treatment
 - prenatal care
- Learn about the various [programs available in your community](#) to support and improve maternal and fetal health

References

¹ Kierans, W.J., Joseph, K.S., Luo, Z.-C., Platt, R., Wilkins, R., Kramer, M.S. (2008). Does one size fit all? The case for ethnic-specific standards of fetal growth. *BMC Pregnancy and Childbirth*. 8: 1-9. Available from: <http://www.biomedcentral.com/content/pdf/1471-2393-8-1.pdf>.

- ² Jaddoe, V.W.V., Troe, E.J.W.M., Hofman, A., Mackenbach, J.P., Moll, H.A., Steegers, E.A.P., Witteman, J.C.M. (2008). Active and passive maternal smoking during pregnancy and the risks of low birthweight and preterm birth: the Generation R Study. *Paediatric and Perinatal Epidemiology*. 22: 162-171. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/j.1365-3016.2007.00916.x/pdf>.
- ³ Haggarty, P., Campbell, D.M., Duthie, S., Andrews, K., Hoad, G., Piyathilake, C., McNeill, G. (2009). Diet and deprivation in pregnancy. *British Journal of Nutrition*. 102: 1487-1497. Available from: <http://journals.cambridge.org/action/displayFulltext?type=1&fid=6657348&jid=&volumeId=&issueId=10&aid=6657340&bodyId=&membershipNumber=&societyETOCSession>.
- ⁴ Wen, S.W., Goldenberg, R.L., Cutter, G.R., Hoffman, H.J., Cliver, S.P. (1990). Intrauterine growth retardation and preterm delivery: prenatal risk factors in an indigent population. *American Journal of Obstetrics and Gynecology*. 162: 213-218.
- ⁵ Hendler, I., Goldenberg, R.L., Mercer, B.M., Iams, J.D., Meis, P.J., Moawad, A.H., MacPherson, C.A., Caritis, S.N., Miodovnik, M., Menard, K.M., Thurnau, G.R., Sorokin, Y. (2005). The Preterm Prediction Study: association between maternal body mass index (BMI) and spontaneous preterm birth. *American Journal of Obstetrics and Gynecology*. 192: 882-886. Available from: <http://www.sciencedirect.com/science/article/pii/S0002937804010397>.
- ⁶ Lee, Y.M., Cleary-Goldman, J., D'Alton, M.E. (2006). The impact of multiple gestations in late preterm (near-term) births. *Clinics in Perinatology*. 33(4): 777-792. Available from: <http://www.sciencedirect.com/science/article/pii/S0095510806000819>.
- ⁷ Tough, S.C., Newburn-Cook, C., Johnston, D.W., Svenson, L.W., Rose, S., Belik, J. (2005). Delayed childbearing and its impact on population rate changes in lower birth weight, multiple birth, and preterm delivery. *Pediatrics*. 109: 399-403. Available from: <http://pediatrics.aappublications.org/cgi/reprint/109/3/399>.
- ⁸ Zhu, B.P., Rolfs, R.T., Nangle, B.E., Horan, J.M. (1999). Effect of the interval between pregnancies on perinatal outcomes. *The New England Journal of Medicine*. 340(8): 589-594. Available from: <http://www.nejm.org/doi/pdf/10.1056/NEJM199902253400801>.
- ⁹ Fuentes-Afflick, E., Hessel, N.A. (2000). Interpregnancy interval and the risk of premature infants. *Obstetrics and Gynecology*. 95(3): 383-390.
- ¹⁰ Mercer, B.M., Goldenberg, R.L., Moawad, A.H., Meis, P.J., Iams, J.D., Das, A.F., Caritis, S.N., Miodovnik, M., Menard, M.K., Thurnau, G.R., Dombrowski, M.P., Roberts, J.M., McNellis, D., and the National Institute of Child Health Human Development Maternal-Fetal Medicine Units Network. (1999). The preterm prediction study: effect of gestational age and cause of preterm birth on subsequent obstetric outcome. *American Journal of Obstetrics and Gynecology*. 181: 1216-1221. Available from: <http://www.sciencedirect.com/science/article/pii/S0002937899701110>.
- ¹¹ Smith, L.K., Draper, E.S., Manktelow, B.N., Dorling, J.S., Field, D.J. (2007). Socioeconomic inequalities in very preterm birth rates. *Archives of Disease in Childhood: Fetal and Neonatal*. 92(1): F11-F14. Available from: <http://fn.bmj.com/content/92/1/F11.full.pdf+html>.
- ¹² Harder, T., Rodekamp, E., Schellong, K., Dudenhausen, J.W., Plagemann, A. (2007). Birth weight and subsequent risk of type 2 diabetes: a meta-analysis. *American Journal of Epidemiology*. 165(8): 849-857. Available from: <http://aje.oxfordjournals.org/cgi/reprint/165/8/849>.
- ¹³ Hack, M., Flannery, D.J., Schluchter, M., Cartar, L., Borawski, E., Klein, N. (2002). Outcomes in young adulthood for very-low-birth-weight infants. *The New England Journal of Medicine*. 346(3): 149-157. Available from: <http://www.nejm.org/doi/pdf/10.1056/NEJMoa010856>.
- ¹⁴ McMillen, I.C., Robinson, J.S. (2005). Developmental origins of the metabolic syndrome: prediction, plasticity, and programming. *Physiological Reviews*. 85: 571-633. Available from: <http://physrev.physiology.org/cgi/reprint/85/2/571>.
- ¹⁵ Huxley, R., Owen, C.G., Whincup, P.H., Cook, D.G., Rich-Edwards, J., Smith, G.D., Collins, R. (2007). Is birth weight a risk factor for ischemic heart disease in later life? *American Journal of Clinical Nutrition*. 85: 1244-1250. Available from: <http://www.ajcn.org/cgi/reprint/85/5/1244>.

- ¹⁶ Curhan, G.C., Chertow, G.M., Willett, W.C., Spiegelman, D., Colditz, G.A., Manson, J.E., Speizer, F.E., Stampfer, M.J. (1996). Birth weight and adult hypertension and obesity in women. *Circulation*. 94: 1310-1315. Available from: <http://circ.ahajournals.org/cgi/content/full/94/6/1310>.

53. SELF-REPORTED IMMUNIZATION FOR INFLUENZA, AGED 65 PLUS (“FLU SHOT”)

Key Messages

- Influenza (or flu) is a common respiratory illness that affects millions of Canadians every year
- Seniors are at greater risk for more severe and longer-lasting complications
- Immunization is one of the most effective ways to protect against influenza
- In 2011, about two thirds of Canadians aged 65 years and older received the flu shot in the 12 months prior to being surveyed

What does this indicator measure?

This indicator measures the percentage of the adult population aged 65 years and older who reported that they had received a flu shot in the 12 months prior to being surveyed.

What are the limitations of this indicator?

This indicator is based on the respondents’ self-report and is influenced by their ability to remember. Self-reported data are never as accurate as they would be if they came from an actual clinical database.¹

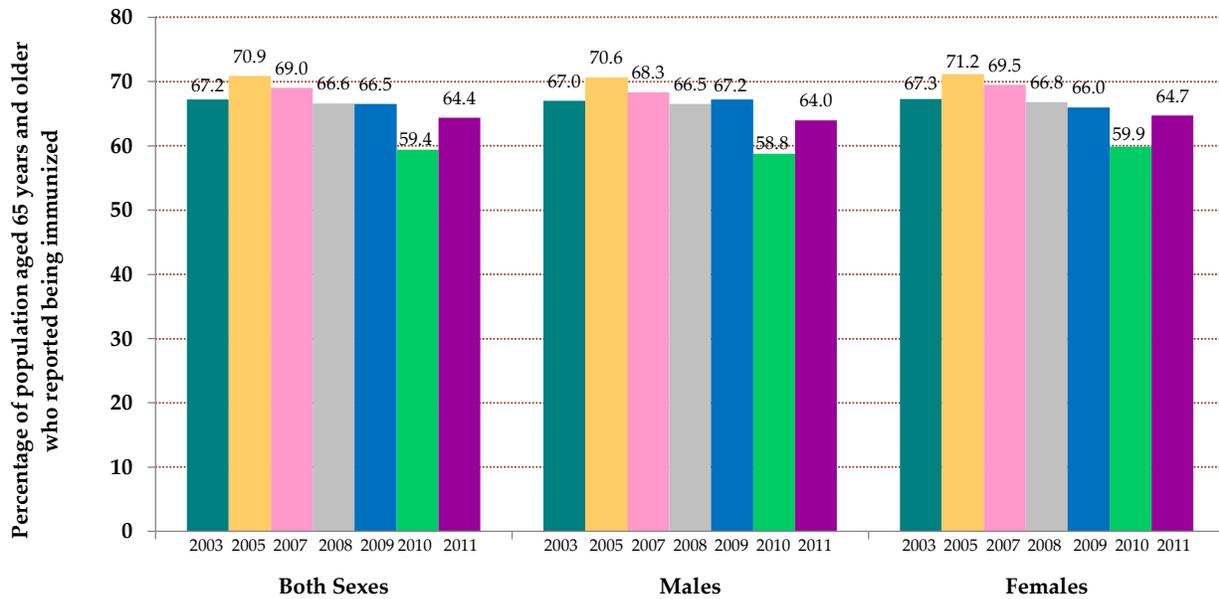
Why get a flu shot?

After you get a flu shot, your immune system produces antibodies against the strains of virus in the vaccine. When you are exposed to the flu virus, these antibodies will help to prevent infection or to reduce the severity of the illness.

About two thirds of Canadians aged 65 years and older received Influenza immunization

In 2011, 64.4% of seniors aged 65 years and older reported having received a flu shot in the 12 months prior to being surveyed, a lower percentage than in 2003, but higher than in 2010. In 2011, the rates were 64.0% and 64.7% for males and females, respectively; both rates were higher in 2011 compared to 2010.

Figure 90 Self-Reported Influenza Immunization
 Percentage of population aged 65 years and older who reported being immunized less than one year ago, by sex, Canada, 2003-11

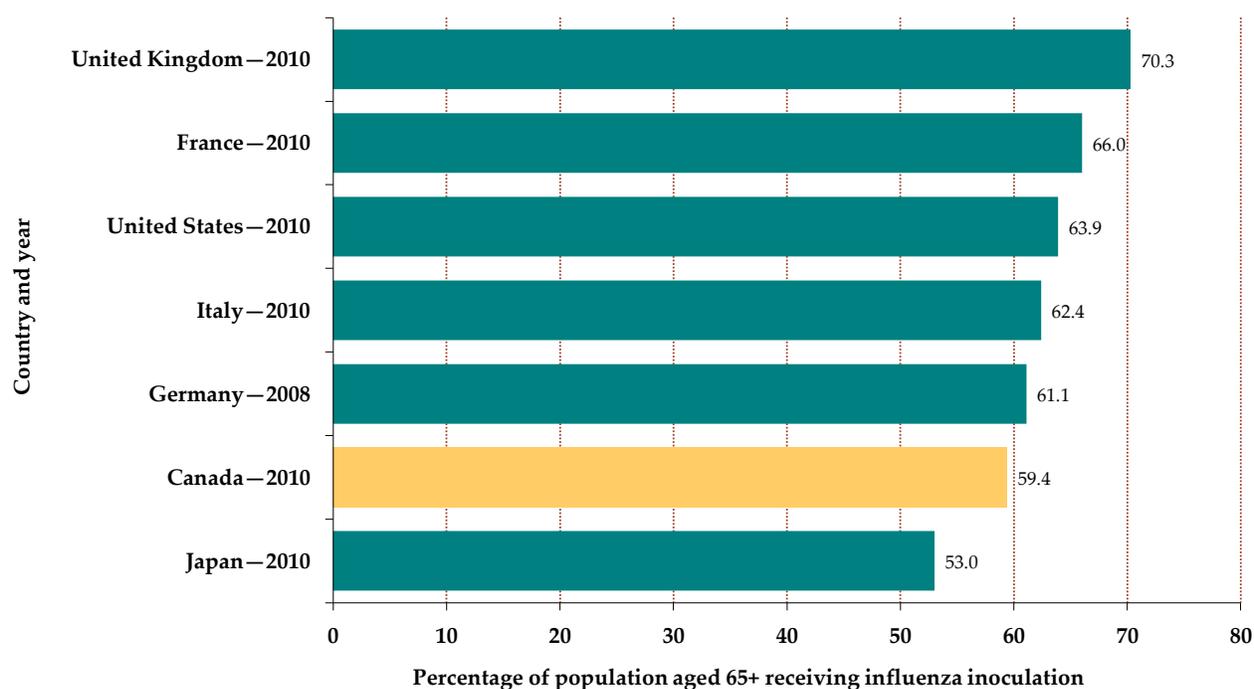


Source: Statistics Canada. Canadian Community Health Survey, 2003-11.
 Notes: Includes household population aged 65 years and older reporting when they had their last influenza immunization ("Flu Shot").
 For additional exclusions/limitations, see Annex 2.

Canadians have the second lowest influenza immunization rate of seniors among G7 countries

In 2010, among G7 countries, Canada had the second lowest percentage (59.4%) of seniors aged 65 years and older who reported having been immunized against influenza in the 12 months prior to being surveyed.

Figure 91 Influenza Immunization
Percentage of population aged 65 years and older who had been immunized during the past 12 months, both sexes, selected countries and years



Source: Organisation for Economic Co-operation and Development. *OECD Health Data 2012*.

Note: For additional exclusions/limitations, see Annex 2.

What these results mean for you

Influenza (or flu) is a common respiratory illness that affects millions of Canadians every year. In Canada, an estimated 10-25% of Canadians could have the flu each year.² Although most people recover within a week, the value of time lost at work, at school, and in household production due to influenza-related illness can be considerable.³ While it may be associated to health risks for some,^{4,5} immunization is one of the most effective ways to protect against influenza.

The groups at higher risk of severe disease or complications following influenza infection include: very young children, people over 65 years old, pregnant women, people with underlying medical conditions such as chronic respiratory disease, heart or kidney disease, diabetes or a weakened immune system due

to cancer, HIV infection, or some other cause.² Although most recover completely, an estimated 4,000 to 8,000 Canadians—mostly seniors—die every year from pneumonia related to flu.

Seniors have the highest rate of hospitalization and death from the flu.⁶ Common complications of the flu for seniors include bacterial infection and pneumonia. Getting the flu shot helps to reduce the risk of serious complications and life-threatening illness.⁷ Research shows that the flu vaccine may be less effective in preventing infection in seniors, although still reducing the risk of severe illness.^{8,9} This means that it is important for all members of the family, health professionals and caregivers to get the flu shot to better protect seniors.⁷

Benefits of getting influenza immunization

- Improve your chances of having a flu-free winter
- Avoid transmitting the virus to others
- Reduce the severity of your symptoms if you do get sick
- Reduce activity limitations due to influenza symptoms

Health risks associated with influenza immunization

- Soreness where the shot was given (common, 50 or more cases per 100 people)¹⁰
- Redness or swelling where the shot was given (common, 10 to 49 cases per 100 people)¹⁰
- Aches and fever within six to 12 hours after receiving the shot (common, > 1 case per 100 people)¹⁰
- Mild ocular and respiratory symptoms (infrequent, 1 to 9 cases per 1,000 people)¹⁰
- Guillain-Barré syndrome (very rare, 1 case per 1,000,000 people)²
- Severe allergic reactions (very rare, < 1 case per 100,000 people)¹¹
- Death (very rare, undefined)¹²

Things you can do to minimize the spread of the influenza virus

- Get an annual flu shot
- Keep your immune system strong—eat well, stay active, sleep well
- Wash your hands frequently
- Cover up when you cough or sneeze
- Keep shared surface areas clean
- If you get sick, stay home!
- Talk to a health professional if you experience severe flu-like symptoms
- For more helpful tips on preventing and managing influenza symptoms, please visit the [Public Health Agency of Canada's website on influenza](#)

References

- ¹ Bhandari, A., Wagner, T. (2006). Self-reported utilization of health care services: improving measurement and accuracy. *Medical Care Research and Review*. 63(2): 217-235.
- ² Health Canada. (2009). *It's Your Health – Influenza (the 'flu')*. Available from: <http://www.hc-sc.gc.ca/hl-vs/iyh-vs/v/diseases-maladies/flu-grippe-eng.php>.

- ³ Mullahy, J. (1999). It'll only hurt a second? Microeconomic determinants of who gets flu shots. *Health Economics*. 8(1): 9-24. Available from: <http://onlinelibrary.wiley.com/doi/10.1002/%28SICI%291099-1050%28199902%298:1%3C9::AID-HEC396%3E3.0.CO;2-X/abstract>.
- ⁴ Centers for Disease Control and Prevention. (2010). *Seasonal Influenza (Flu) - Seasonal Flu Shot*. Available from: <http://www.cdc.gov/flu/about/qa/flushot.htm>.
- ⁵ Fiore, A.E., Shay, D.K., Broder, K., Iskander, J.K., Uyeki, T.M., Mootrey, G., Bresee, J.S., Cox, N.J. (2009). Prevention and control of seasonal influenza with vaccines. *Morbidity and Mortality Weekly Report (MMWR)*. 58: 1-52. Available from: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr58e0724a1.htm>.
- ⁶ Nichol, K.L., Wuorenma, J., von Sternberg, T. (1998). Benefits of influenza vaccination for low-, intermediate-, and high-risk senior citizens. *Archives of Internal Medicine*. 158: 1769-1776. Available from: <http://archinte.jamanetwork.com/article.aspx?articleid=209078>.
- ⁷ Public Health Agency of Canada. (2010). *Take the flu seriously - get the shot! - Influenza Immunization*. Available from: <http://www.phac-aspc.gc.ca/im/iif-vcg/gs-pg-eng.php>.
- ⁸ Simonsen, L., Taylor, R.J., Viboud, C., Miller, M.A., Jackson, L.A. (2007). Mortality benefits of influenza vaccination in elderly people: an ongoing controversy. *The Lancet Infectious Diseases*. 7(10): 658-666. Available from: <http://download.thelancet.com/flatcontentassets/H1N1-flu/vaccination/vaccination-12.pdf>.
- ⁹ Jefferson, T., Rivetti, D., Rivetti, A., Rudin, M., Pietrantonj, C.D., Demicheli, V. (2005). Efficacy and effectiveness of influenza vaccines in elderly people: a systematic review. *The Lancet*. 366(9492): 1165-1174. Available from: <http://download.thelancet.com/pdfs/journals/lancet/PIIS0140673605673394.pdf?id=e16241398b8eb460:-69863000:12b165ce4e9:76c41284581218107>.
- ¹⁰ Ministère de la Santé et des Services sociaux, Québec. (1999). *Injectable Influenza (seasonal flu) Vaccine*. Available from: <http://www.msss.gouv.qc.ca/sujets/santepub/vaccination/index.php?aid=137>.
- ¹¹ Health Canada. (2009). *Misconceptions about Vaccine Safety*. Available from: <http://www.hc-sc.gc.ca/hl-vs/iyh-vsv/med/misconception-eng.php>.
- ¹² Centers for Disease Control and Prevention. (1999). *Seasonal Flu Shot*. Available from: <http://www.cdc.gov/flu/about/qa/flushot.htm>.

IV Health Information—Challenges and Next Steps

In any modern health care system, health information is essential to help stakeholders monitor changes in health system performance and health status. Timely, coordinated and responsive health information facilitates decision-making that ultimately benefits Canadians by improving their health and quality of life.

The federal government has invested significant resources to improve data collection, allowing the health sector to better respond to the needs of Canadians. Federal investments have helped develop the Canadian Institute for Health Information's Health Human Resources Database Development Project, along with Statistics Canada's Canadian Community Health Survey and Canadian Health Measures Survey. In addition, the Government of Canada is investing \$500 million in the continued development of Canada's electronic health record system. Other benefits of these investments include the improvement of data quality, national data standards, and the use of data to foster greater accountability to Canadians.

While investments and progress have been made, gaps in data infrastructure and availability remain. Specifically, data infrastructure varies across the country, affecting the capacity of provinces and territories to collect, analyze and publish data. The Government of Canada continues to work with its partners in order to make improvements to these data systems.

Aboriginal data currently lag behind data on the general Canadian population, and this may impede the federal government's ability to adequately understand and respond to Aboriginal health issues. Challenges exist in the collection and reporting of health information on Aboriginal peoples. As is also true for other groups within Canada, it is difficult to extract health data regarding Aboriginal peoples (or specifically on First Nations, Inuit or Métis) from administrative databases. For Aboriginal health reporting, this challenge is further complicated by overlapping jurisdictional responsibilities for health between federal, provincial/territorial and local governments. Data on First Nations peoples and Inuit are included in many provincial and territorial databases (e.g., vital statistics, notifiable diseases and hospital discharges), but there is no mechanism to identify First Nations, Inuit and Métis individuals.

Without a mechanism to consistently identify and access First Nations and Inuit data collected in vital statistics databases, *Healthy Canadians 2012* relies on work that links the Census Aboriginal identifier with the Canadian Mortality Database to produce mortality statistics. A two-part linkage has been performed to produce age-standardized mortality statistics for the Registered Indian population. This activity provides data for a number of diseases cited in this report. For Inuit, a method has been developed linking geographic identifiers to vital statistics databases to generate data for health indicators. Certain communities in northern Canada have a high proportion of Inuit residents. These communities are organized into four Inuit Regions. Health indicators for residents of these regions serve as a proxy for Inuit-specific health indicators. It should be noted that these data also include non-Inuit residents of these regions, who are thought to have better health outcomes than the Inuit population living in this area. As such, caution should be used when interpreting these results.

Statistics Canada collects First Nations, Inuit, and Metis specific health information in the Aboriginal Peoples Survey (APS). The 2006 APS was used to report on smoking rates and perceived health for Inuit

in this publication. However, the 2006 on reserve component of the APS was not undertaken so it does not provide data for First Nations communities.

In addition, the First Nations and Inuit Health Branch (FNIHB) has contributed over \$11.7 million toward the development of the 2002–03 First Nations Regional Health Survey (RHS), \$12.5 million to the 2008–10 cycle, and has committed to continued support for the next cycle.

Plans for the future

Statistics Canada and CIHI will continue to develop and improve their Health Indicator Framework, which is a valuable instrument for measuring and reporting on health status and health system performance. In addition, the federal government will continue to analyze and interpret indicator data, with the goal of providing practical information to Canadians on health system performance and health status.

ANNEXES

Annex 1: Supplement to Selected Federal Health Services

Health Canada—Helps ensure that Canada’s food supply is safe. Although maintaining safety is a shared responsibility among government, industry and consumers, Health Canada’s role is to establish policies, set standards and provide advice along with information on the safety and nutritional value of food. It promotes the nutritional health and well-being of Canadians by collaboratively defining, promoting and implementing evidence-based nutrition policies and standards. It administers the provisions of the *Food and Drugs Act* that relate to public health, safety and nutrition, and evaluates the safety, quality and effectiveness of veterinary drugs.

Health Canada plays an active role in ensuring that Canadians have access to safe and effective drugs and health products. Before drug products (such as prescription and non-prescription pharmaceuticals, disinfectants and sanitizers with disinfectant claims) are authorized for sale in Canada, Health Canada reviews them to assess their safety, efficacy and quality. The Department strives to maintain a balance between the potential health benefits and risks posed by all drugs and health products, and its highest priority in determining this balance is public safety. To accomplish this, it works with other levels of government, health care professionals, patient and consumer interest groups, and research communities and manufacturers. These efforts help minimize the health risks to Canadians.

Health Canada helps protect the Canadian public by researching, assessing and collaborating in the management of health risks and safety hazards associated with the many consumer products, including pest management products that Canadians use every day. Health Canada is also actively involved in injury prevention by supporting the development of safety standards and guidelines, enforcing legislation by conducting investigations, inspections, seizures and prosecutions, along with testing and conducting research on consumer products. In addition, it provides importers, manufacturers and distributors with hazard and technical information, publishes product advisories, warnings and recalls, and promotes safety as well as the responsible use of products.

The Department works to protect the health of Canadians from environmental risks, by offering information and advice on some of the most common environmental factors that affect human health: air, noise, soil and water pollution, climate change, environmental contaminants, occupational health and safety, pest control, and radiation. Furthermore, it promotes initiatives to reduce and prevent the harm caused by tobacco and the abuse of alcohol and/or other controlled substances.

Furthermore, the department consults with the Canadian public, industry and other interested parties in the development of laws that protect health and safety (such as the previously mentioned *Food and Drugs Act*). It also prepares guidelines and policies in order to help interpret and clarify the legislation surrounding drugs and health products. Health Canada develops and enforces numerous regulations (such as *Food and Drugs Regulations* or *Medical Devices Regulations*) under Government of Canada legislation.

Improving the health of First Nations and Inuit is a shared responsibility among the federal, provincial, and territorial governments and First Nations and Inuit partners. Health Canada delivers or funds a range of health programs and services to First Nations and Inuit to supplement and support the services that provincial, territorial, and regional health authorities provide. Primary health care services are

provided through nursing stations and community health centres in remote and isolated First Nations communities, and home and community care is provided in First Nations and Inuit communities. Disease prevention and health promotion programs, public health, environmental health, and alcohol/drug addiction treatment are also provided on reserve. In addition, Health Canada administers targeted health promotion programs for all Aboriginal people regardless of residence (such as the Aboriginal Diabetes Initiative), and other programs that support the development and implementation of activities to promote healthy lifestyle choices and contribute to the prevention of chronic disease and injuries. The Department's Non-Insured Health Benefits (NIHB) Program provides approximately 897,000 eligible First Nations and Inuit with a limited range of medically necessary health-related goods and services. The NIHB Program provides benefits that are not otherwise insured by private insurance plans, provincial/territorial health or social programs, such as coverage for prescription medication, dental care, vision care, and medical transportation. In 2011-12, resources of approximately \$2.4 billion were made available for federal First Nations and Inuit Health Programs.

Visit Health Canada's website for more information on their [programs and services](#).

Public Health Agency of Canada—Public health involves the organized efforts of society to keep people healthy and to prevent injury, illness and premature death. It includes programs, services and policies that protect and promote the health of all Canadians. In Canada, public health is a responsibility that is shared by the three levels of government in collaboration with the private sector, non-governmental organizations, health professionals and the public.

In September 2004, the Public Health Agency of Canada (the Agency) was created within the federal Health Portfolio to deliver on the Government of Canada's commitment to increase its focus on public health in order to help protect and improve the health and safety of all Canadians and to contribute to strengthening the health care system.

The Agency has the responsibility to:

- contribute to the prevention of disease and injury, and to the promotion of health
- enhance the quality and quantity of surveillance data and expand the knowledge of disease and injury in Canada
- provide federal leadership and accountability in managing public health emergencies
- serve as a central point for sharing Canada's expertise with the rest of the world and for applying international research and development to Canada's public health programs
- strengthen intergovernmental collaboration on public health and facilitate national approaches to public health policy and planning

The work of the Agency's numerous program centres, laboratories and directorates contribute to the Agency's vision: "healthy Canadians and communities in a healthier world."

The **Infectious Disease Prevention and Control Branch** works to prevent, eliminate and control infectious diseases, and to maintain the safety and health security of people both nationally and internationally.

The Branch includes:

- the **Centre for Food-Borne, Environmental and Zoonotic Infectious Diseases** aims to assess and reduce the risk of food-borne, water-borne, environmental and zoonotic disease in Canada, and is responsible for the Travel and Migration Health Program for the Agency
- the **Centre for Immunization and Respiratory Infectious Diseases** has four key objectives: prevent, reduce or eliminate vaccine-preventable and infectious respiratory diseases; reduce the negative impact of emerging and re-emerging respiratory infections; facilitate pandemic preparedness and response activities; and maintain confidence in immunization programs in Canada
- the **Centre for Communicable Diseases and Infection Control** aims to decrease the incidence and transmission of communicable diseases and infections; and improve the health status of those already infected
- the **National Microbiology Laboratory** contributes to infectious disease control at the provincial/territorial, national and international levels. The lab combines four public health service laboratory programs; undertakes research on established, emerging and rare pathogens; and provides internationally recognized leadership, scientific excellence and public health innovation
- the **Laboratory for Food-Borne Zoonoses** focuses on the early mitigation of public health risks for infectious and chronic diseases and illnesses arising from the interaction between humans, animals, and the environment

The **Health Promotion and Chronic Disease Prevention (HPCDP) Branch** of the Agency provides leadership in health promotion and undertakes programs designed to help Canadians stay healthy through all stages of life, to reduce their risks for developing chronic illnesses, and to prevent disease progression for those living with chronic diseases.

HPCDP undertakes health promotional activities to support:

- reduced health inequalities between Canadians
- increased knowledge to help people increase control over their health and the factors that determine health
- public policy that considers the population's health
- effective public health interventions
- supportive environments that promote and encourage good health

Additionally, this branch works with stakeholders at national and international levels and provides accurate information to help understand how chronic diseases can be prevented and treated for use in the development of health policies and programs aimed to prevent and manage chronic diseases in Canada.

The **Health Security Infrastructure Branch (HSIB)** serves as a government focal point for fostering cooperative activities among multiple partners and jurisdictions with the goal of increasing the system capacity to manage public health events of domestic and international concern to Canadians. HSIB will contribute to the health security of Canadians through strengthened public health infrastructure, biosecurity, border health and emergency management.

The Branch consists of four Centres supported by the Office of Business Integration and Planning:

- the Centre for Emergency Preparedness and Response
- the Centre for Biosecurity
- the Centre for Public Health Capacity Development
- the Centre for Surveillance Strategy and Data Management

The Branch serves as Canada's central coordinating point for public health security; monitoring outbreaks and global disease events and serving as Canada's National Focal Point for the International Health Regulations. It plays a leadership role in coordinating and developing health emergency preparedness and response policies, plans and surge capacity for the Public Health Agency of Canada and Health Canada, in support of the Minister of Health's mandate under the *Emergency Management Act*.

The Branch also reduces the risk of communicable disease importation and exportation with respect to humans, conveyances and cargo through the provision of border health services and the administration and enforcement of the *Quarantine Act* and administers and enforces the *Human Pathogens and Toxins Act*, the *Human Pathogens Importation Regulations* and some authorities under the Health of Animals Act and Regulations related to the import of terrestrial animal pathogens.

The Branch serves as the national authority on laboratory biosafety, biosecurity and biocontainment for human pathogens and toxins, and facilitates and coordinates pan-Canadian action on public health surveillance policies, strategies, priorities, and collective initiatives.

Finally, the Branch supports pan-Canadian capacity development of the public health system, public health professionals, and the use of evidence in the identification and management of public health events.

The **Strategic Policy, Planning & International Affairs Branch (SPPIAB)** supports the Agency through a variety of functions related to strategic policy, ministerial services, governance, planning, reporting, and international affairs. Some of SPPIAB activities include:

- providing the Minister of Health, Chief Public Health Officer and Associate Deputy Minister with strategic policy analysis and advice on public health issues
- working with Health Canada to coordinating the Portfolio's international activities and providing policy advice and support on the Portfolio's overall international engagement
- provides strategic advice on collaborative policy development and relations with provincial and territorial governments, Aboriginal, non-government and private sector organizations (e.g. secretariat to the Pan-Canadian Public Health Network)
- managing the Agency's Cabinet and Parliamentary agenda
- providing integration of strategic policy and planning, operational planning, risk management, and Agency governance functions

Visit the Public Health Agency of Canada's website for more information on their [programs and services](#).

Canadian Institutes of Health Research (CIHR)—Responsible for funding health research in Canada by:

- funding more research on targeted priority areas
- building partnerships and collaborations to deliver patient-oriented research and to ensure that the right patient receives the right clinical intervention at the right time
- training the next generation of health researchers
- focusing on knowledge translation, so that the results of research are transformed into policies, practices, procedures, products and services

The Canadian Institutes of Health Research (CIHR) is the Government of Canada’s health research investment agency. CIHR’s mission is to create new scientific knowledge and to enable its translation into improved health, more effective health services and products, and a strengthened Canadian health care system. CIHR consists of 13 institutes (Aboriginal Peoples’ Health; Aging; Cancer Research; Circulatory and Respiratory Health; Gender and Health; Genetics; Health Services and Policy Research; Human Development, Child and Youth Health; Infection and Immunity; Musculoskeletal Health and Arthritis; Neurosciences, Mental Health and Addiction; Nutrition, Metabolism and Diabetes; Population and Public Health). These bring together all partners in the research process—the people who fund research, those who carry it out and those who use its results—to share ideas and focus on what Canadians need—good health and the means to prevent disease and fight it when it happens. Each institute supports a broad spectrum of research in its topic areas and, in consultation with its stakeholders, sets priorities for research in those areas. CIHR provides leadership and support to more than 14,100 health researchers and trainees across Canada.

Visit the [Canadian Institutes of Health Research](#) for more information on research.

Department of National Defence—Provides health care for approximately 100,000 Canadian Forces members (Regular Forces and full-time Reservists) while they are at home or abroad in order to optimize their health and support Canadian Forces operations. A comprehensive range of clinical services is available to individuals through a network of Canadian Forces health care clinics or by purchasing services from the provinces/territories. Public health and health promotion programs are offered at a population-level primarily through Force Health Protection, Canadian Forces Health Services Group. Total health care expenditures were estimated to be \$680 million in 2009-10.

Royal Canadian Mounted Police (RCMP)—Provides a comprehensive range of health care entitlements and benefits to ensure that its members are medically and emotionally fit to perform their duties. Health care entitlements comprise three categories of health care: *Basic*, *Supplemental* and *Occupational*. Due to the RCMP’s national scope and for the sake of consistency in offering appropriate care, Basic health care entitlements are derived from a combination of five public provincial plans (the *Canada Health Act* excludes RCMP regular members from funding under provincial health care plans). Supplemental health care, which is similar to a standard employer/employee health benefit insurance plan, provides at no cost to regular members benefits such as drugs, aids to daily living, ambulance services, hospitalization fees, medical supplies, and therapies. As of August 14, 2012, the number of RCMP (regular members and special constables) covered under RCMP Basic and Supplemental health

care was 19,281. Additionally, RCMP regular and civilian (3,760) members may receive Occupational health care benefits/services arising from a workplace injury or illness. Total health care expenditures were approximately \$81.1 million in 2011-12.

Citizenship and Immigration Canada—Provides, through the Interim Federal Health Program (IFHP), limited, temporary, taxpayer-funded coverage of health-care benefits for protected persons, including resettled refugees; refugee claimants; persons whose claim has been rejected until they leave Canada; persons detained under the *Immigration and Refugee Protection Act*, and certain other groups who are not eligible for provincial or territorial health insurance. The IFHP does not cover services or products that a person may claim under a private insurance plan.

The IFHP provides coverage to eligible beneficiaries, via a contracted claims administrator, through a network of registered health-care providers across Canada. Health-care providers are reimbursed directly for covered services rendered to eligible beneficiaries.

Products and services covered through the IFHP are dependent on the immigration status of the beneficiary. This means that clients receive different services based on the type of coverage they have been granted. The IFHP offers five types of coverage: Health care coverage; Expanded health care coverage; Public health or public safety health care coverage; coverage for detainees; and coverage for the Immigration Medical Examination (IME). This represented approximately 126,000 beneficiaries in 2010-11 and 129,000 beneficiaries in 2011-12. Total IFHP claims reimbursement expenditures were approximately \$77 million in 2010-11 and \$79 million in 2011-12.

Veterans Affairs Canada—Provides financial support for qualified Veterans to access health care, home and community care services.

Correctional Service of Canada—Provides inmates with essential health care services (medical, dental and mental health) as well as reasonable access to non-essential mental health care that will contribute to their rehabilitation and successful reintegration into the community. Health services are provided in 57 federal institutions, which include regional hospitals and mental health treatment centres. Community specialists and diagnostic and hospital services are used as required. Health services were available to approximately 20,475 offenders in 2009-10, resulting in expenditures of \$196 million. This figure includes all health care costs such as salaries, medication, hospitalization, medical tests/examinations, and physician, specialist and dental appointments.

Annex 2: Data Source Exclusions and Limitations

The indicators featured in the *Healthy Canadians—A Federal Report on Comparable Health Indicators 2012* are derived from databases, surveys and surveillance data. The data sources used for each indicator, as well as exclusions and limitations, are presented below. This will help the reader assess the reliability and validity and reliability of the information presented in this report.

Strengths and Limitations of Self-Reported Data

Healthy Canadians—A Federal Report on Comparable Health Indicators 2012 often refers to information that is derived from self-reported data. Self-reported data can be used to provide information on various health-related issues, although they are subject to some known limitations. In a systematic review evaluating the accuracy of self-reported utilization data, researchers showed that self-reported information may be influenced by factors such as a respondent's socio-demographic characteristics, cognitive ability or memory, stigma related to health care utilization, questionnaire design and/or the mode of data collection (e.g., whether respondents were interviewed by phone or in person).¹ In a report on adult obesity in Canada, Statistics Canada noted that variations in the methods used to collect information on weight and height yield different data. For example, self-reported measures of weight and height generate lower overweight and obesity rates than do direct physical measurements.^{2,3}

In *Healthy Canadians 2012*, some indicators that rely on self-reported information may be subject to the limitations of the method of data collection (i.e., interviews conducted by phone or in person). These indicators include *body mass index* and *physical activity*.

Additionally, non-response bias may occur when using self-reported data. If some individuals within a sample have different characteristics and are less likely to answer a survey or a particular survey question, a bias may emerge in the overall responses. For the indicator *Body mass index*, a noticeable change was observed in the pattern of non-responses which may obfuscate actual trends in BMI. However, in *Healthy Canadians 2012*, survey response rates overall are very good, reducing the likelihood of non-response bias and the potential impact of non-responders.

Statistics Canada

Canadian Community Health Survey (CCHS)

Exclusions/Limitations: Persons living on First Nation reserves and on Crown lands, residents of institutions, full-time members of the Canadian Forces and residents of certain remote regions. CCHS coverage is in the range of 98% in the provinces, while in the Territories, it is about 90% in Yukon, 97% in the Northwest Territories and 71% in Nunavut, primarily due to the fact that some remote regions are excluded. In Nunavut, the CCHS collects information in the 10 largest communities: Iqaluit, Rankin Inlet, Cambridge Bay, Kugluktuk are always in the sample, plus one community from Cape Dorset, Pangnirtung, Igloolik or Pond Inlet is selected; as well as one community from Baker Lake or Arviat.

[Details about the Canadian Community Health Survey.](#)

Canadian Health Measures Survey

Exclusions/Limitations: Persons living on Indian Reserves or Crown lands, residents of institutions, full-time members of the Canadian Forces and residents of certain remote regions. Approximately 97% of Canadians will be represented.

[Details about the Canadian Health Measures Surveys.](#)

Survey of Household Spending

Exclusions/Limitations: Persons living on Indian reserves and on Crown lands; official representatives of foreign countries living in Canada and their families; members of religious and other communal colonies; members of the Canadian Forces living in military camps; people living in residences for senior citizens; and people living full-time in institutions (e.g., inmates of penal institutions and chronic care patients living in hospitals and nursing homes). The survey covers about 98% of the population in the 10 provinces and 92% of the population of the three territories.

[Details about the Survey of Household Spending.](#)

Aboriginal Peoples Survey

Exclusions/Limitations: Persons living in Indian settlements or on reserves; and people living in institutions. Although individuals living on reserve were not included in the provinces, Aboriginal people living in the territories were included.

[Details about the Aboriginal Peoples Surveys.](#)

Vital Statistics — Birth Database

Exclusions/Limitations: The actual (survey) population of the Birth Database refers to births to Canadian resident women and non-resident women in Canada, and births to Canadian resident women in some American states.

Since the registration of births is a legal requirement in each Canadian province and territory, reporting is virtually complete. Under-coverage is thought to be minimal but is being monitored. Under-coverage may occur because of late registration which, if not completed soon after birth, is needed for school registration. Statistics Canada does receive late registrations (typically 1,000 to 1,500 cases, five years after the year of the event). Incomplete registration is also a source of under-coverage. For example, some provinces require that a notarized statement be completed when a mother declines to name the father on the application for birth registration. Until the statement is notarized, the application is not registered.

Out-of-country births are incompletely reported. There is no reporting of births to Canadian resident women occurring in countries other than the United States; although there is a reciprocal agreement with the U.S., some states may not report births to Canadian resident women occurring in their state.

The Health Statistics Division continues to monitor developments in the field of assisted reproductive technology and medical technology as they relate to the reporting of extremely low birth weight and/or low gestation babies. There is some inconsistency in the practice of registering these babies even though there is a legal requirement to do so. Statistically, this problem has resulted in alternative indicators for infant mortality being calculated, where the denominator is composed of live births weighing 500 grams or more.

[Details about the Vital Statistics – Birth Database.](#)

Vital Statistics — Death Database

Exclusions/Limitations: The actual (survey) population of the Death Database refers to deaths of Canadian residents and non-residents in Canada, and deaths of Canadian residents in some American states.

Since the registration of deaths is a legal requirement in each Canadian province and territory, reporting is virtually complete. Under-coverage is thought to be minimal but is being monitored. Under-coverage may occur because of late registration but this is much less common than with birth registration. Death registration is necessary for the legal burial or disposal of a body, as well as for settling estate matters, so there is a strong incentive for relatives or officials to complete a registration in a timely manner. Some deaths are registered by local authorities, but the paperwork is not forwarded to provincial or territorial registrars before a cut-off date. These cases for 2000 data represented approximately 200 deaths, 7 years after the year of death (accumulated late records), or less than one-tenth of a percent of the total records.

For out-of-country deaths, only deaths in the United States are regularly reported to Statistics Canada, and of these, Statistics Canada receives abstracted death records from approximately 20 American states. Data from the National Center for Health Statistics (NCHS) in the United States indicate that in 2004, there were 572 deaths of Canadian residents in the United States, compared with 259 death records received by Statistics Canada via the state registrars.

[Details about the Vital Statistics – Death Database.](#)

Canadian Cancer Registry

Exclusions/Limitations: All primary malignant tumours (except squamous cell skin cancer and basal cell skin cancer) are reported to the Canadian Cancer Registry (CCR). Each provincial and territorial cancer registry records all cases of cancer in its population by combining information from sources such as: cancer clinic files and radiotherapy reports; records from in-patient hospitals, out-patient clinics and private hospitals; pathology and other laboratory/autopsy reports; radiology and screening program reports; reports from physicians in private practice; and reports on cancer deaths from Vital Statistics registrars. Periodically, some provincial and territorial cancer registries experience problems in submitting data to Statistics Canada on a timely basis.

To avoid over-coverage, the CCR accepts tumour records only when the reporting provincial and territorial cancer registry is the same as the province or territory of residence of the cancer patient. Each provincial and territorial cancer registry is required to return records for residents of other jurisdictions

to the appropriate provincial and territorial cancer registry. Under-coverage remains a stronger concern than over-coverage because of the following reasons: some provincial and territorial cancer registries do not use, or have had periods in the past where they have not used, death certificates as a source of cancer incidence; differing definitions of what is a cancer among the provincial and territorial cancer registries; differing definitions of what constitutes a malignant neoplasm; some cancers are difficult to diagnose because of their location (or site) in the body; differences among provincial and territorial cancer registries in coding practices, data entry or processing procedures; and failure to report cancer cases treated in a province, territory or country outside of the residence province or territory.

As of 2007, the CCR adopted Surveillance Epidemiology and End Results (SEER) Multiple Primary Histology rules for determining multiple primaries. Some differences in incidence between the years 2006 and 2007 may be attributed to this change. As well, due to technical issues in updating systems to adhere to these new rules, not all registries were able to report according to the new requirements for 2007. This may result in inconsistencies between provinces and territories.

Finally, designed studies are used by the provincial and territorial cancer registries to assess the completeness of case ascertainment (check for under and over-registration of cases). Re-abstraction is used to evaluate accuracy and completeness of reported items.

[Details about the Canadian Cancer Registry.](#)

Canadian Institute for Health Information (CIHI)

Hospital Morbidity Database (HMDB)

Exclusions/Limitations: Visits not resulting in an inpatient admission—such as diagnostic testing, consultations and emergency visits—are excluded from the HMDB population.

[Details about the Hospital Morbidity Database.](#)

Discharge Abstract Database (DAD)

Exclusions/Limitations: Because Quebec does not participate in the DAD, all discharges from Quebec hospitals are not included.

As the coding of discharges has changed over time, care must be taken not to compare between time periods using different coding. Prior to 2001–02, the ICD-9 and ICD-9-CM classifications (International Classification of Diseases) were in use. The ICD-10-CA and Canadian Classification of Health Interventions (CCI) classification systems were first implemented in 2001–02 in British Columbia, Newfoundland and Labrador, Nova Scotia, Prince Edward Island, Yukon and parts of Saskatchewan. Full implementation of ICD-10-CA and CCI (with the exception of Quebec) was achieved in 2004–05 when Manitoba made the transition from ICD-9-CM. The classification scheme change since fiscal year 2001–02 resulted in a number of challenges for users wishing to trend data over time. For more information, see *Coping with the Introduction of ICD-10-CA and CCI: Impact of New Classification Systems on the Assignment of Case Mix Groups/Day Procedure Groups*, which is based on data (for fiscal years 2001–02

and 2002–03) that can be found on CIHI’s website. Appendix C of that report provides the coding classifications that were used by provinces/territories. Users are strongly advised to analyze data with the correct classification scheme.

[Details about the Discharge Abstract Database.](#)

Scott’s Medical Database (SMDB)

Exclusions/Limitations: Residents and non-licensed physicians who requested that their information not be published in the *Canadian Medical Directory* as of December 31 of the reference year.

SMDB includes the number of general/family physicians (family medicine and emergency medicine specialists) and specialist physicians (medical, surgical and laboratory specialists) on December 31 of the reference year, per 100,000 population. The data include active physicians in clinical practice and those not working in a clinical practice. Active physicians are defined as physicians who have an MD degree, are registered with a provincial or territorial medical college and have a valid mailing address. Generally, specialist physicians include certificants of the Royal College of Physicians and Surgeons of Canada (RCPSC) and/or the Collège des médecins du Québec (CMQ) with the exception of Saskatchewan, Newfoundland and Labrador, Nova Scotia, New Brunswick and Yukon, where specialists also include physicians who are licensed as specialists but who are not certified by the RCPSC or the CMQ (that is, non-certified specialists). For all other jurisdictions, non-certified specialists are counted as general practitioners. With the exception of the criteria just noted, all other physicians are counted as family practitioners, including certificants of the College of Family Physicians of Canada. For further methodological information, please see CIHI’s [Supply, Distribution and Migration of Canadian Physicians](#). Physician-to-population rates are useful indicators and are published by a variety of agencies to support health human resource planning. However, due to differences in data collection, processing and reporting methodology, CIHI results may differ from provincial and territorial data. Readers are cautioned to avoid inferences regarding the adequacy of provider resources based on supply ratios alone.

Rates are produced using the most recent Statistics Canada population estimates and may differ slightly from those in previous CIHI publications.

[Details about the Scott’s Medical Database.](#)

Health Personnel Database (HPDB)

Exclusions/Limitations: HPDB includes registered nurses (RNs), licensed practical nurses (LPNs), pharmacists (with the exception of Quebec, Manitoba, Yukon and Nunavut), physiotherapists and occupational therapists (with the exception of Quebec). Rates reflect health professionals registered with active-practising status and who are employed in these health professions. For other health professionals, data reflect personnel regardless of employment status and include the number of active registered dentists, registered dental hygienists, registered dietitians, registered chiropractors, active registered optometrists and active registered psychologists.

Data on RNs for the territories include secondary registrations. Personnel-per-population rates are revised annually using the most recent Statistics Canada population estimates and therefore may differ slightly from previously published figures. Rates may differ from data published by provincial or territorial regulatory authorities due to the CIHI collection, processing and reporting methodology. Please consult *Canada's Health Care Providers, 1997 to 2006: A Reference Guide* and the *HPDB Technical Report* for more detailed methodological notes, data quality issues and profession-specific information.

[Details on the Health Personnel Database.](#)

National Survey of Selected Medical Imaging Equipment

Exclusions/Limitations: Inventories were conducted annually by CIHI from 2003 to 2012, except for 2008. The survey is supplemented by information from provincial ministries of health. Inventories include all computed tomography (CT) and magnetic resonance imaging (MRI) scanners in Canadian health care facilities (both public and private) that were identified as having these types of equipment. While the aim was to have a complete inventory, some scanners might have failed to be captured in the survey or failed to be identified through other means such as the validation process by the provincial/territorial ministries of health. Number of exams was imputed for some scanners.

[Details about the National Survey of Selected Medical Imaging Equipment.](#)

Public Health Agency of Canada (PHAC)

Canadian Chronic Disease Surveillance System (CCDSS) (Diabetes)

Exclusions/Limitations: Persons younger than 1 year of age.

Disclosure of Limitations: The term “diagnosed diabetes”, which excludes individuals living with the disease but who have not yet received a diagnosis of diabetes by a health professional, is used when CCDSS data are reported. The CCDSS summarizes data on residents of Canada who have accessed the Canadian health care system. Diabetes is deemed diagnosed when there is, at minimum, one hospitalization or two physician claims with a diabetes specific code(s) over a two year period. The CCDSS case criterion excludes women with gestational diabetes, and it does not distinguish between type 1 and type 2 diabetes. In all cases, description of diabetes excludes cases of undiagnosed diabetes in the population.

Given that the data reported in the *Healthy Canadians 2012* have been standardized using the 1991 Canadian population, age-standardized figures will underestimate the true prevalence (and burden) of diabetes in the population.

[Details about the 2011 Diabetes in Canada: facts and figures from a public health perspective.](#)

Canadian Chronic Disease Surveillance System (CCDSS) (Hypertension)

Exclusions/Limitations: Persons younger than 20 years of age.

Disclosure of Limitations: The CCDSS summarizes data on residents of Canada who have accessed the Canadian health care system. In the CCDSS, diagnosed hypertension is defined based on a minimum requirement of at least two physician claims within a two-year period, or one inpatient hospital separation abstract listing hypertension as a diagnosis, and uses the International Classification of Diseases (ICD), 9th or 10th Edition hypertension codes.

Given that the data reported in the *Healthy Canadians 2012* have been standardized using the 1991 Canadian population, age-standardized figures will underestimate the true prevalence (and burden) of hypertension in the population.

Laboratory Surveillance Data for Enteric Pathogens in Canada: Annual Summary, 2006

Exclusions/Limitations: E. coli data are based largely on isolations reported to the National Enteric Surveillance Program (NESP) and supplemented with identifications from National Microbiology Laboratory (NML) reference services. Except for serogroup O157, few provinces routinely report fully antigenically characterized verotoxigenic E. coli (VTEC) isolations and, therefore, the represented values are largely those that have been forwarded to the NML.

[Details about the *Laboratory Surveillance Data for Enteric Pathogens in Canada: Annual Summary, 2006*.](#)

Brief Report on Sexually Transmitted Infections in Canada: 2007

Exclusions/Limitations: Currently, some jurisdictions report to PHAC using aggregate case counts instead of case-by-case reporting. Selected variables submitted by all 13 jurisdictions are: age at diagnosis, year of diagnosis, province/territory of diagnosis, and sex. As such, national reporting is limited to analyses of these variables.

A time delay may occur between when a person is tested positive for a sexually transmitted infection (STI) and when the report is received at PHAC. This time lag is referred to as the reporting delay. In cases where there are discrepancies between data reported by PHAC and those reported by individual provinces and territories, provincial/territorial data should be considered to be more accurate as they are the most current. The 2007 data presented in this brief report are also preliminary and subject to change.

The number of reported cases likely underestimates the true burden of infection in a given population for one or more of the following reasons:

- many people who are infected with STIs do not exhibit symptoms
- an infected individual may not interact with the medical system to get tested for a bacterial STI

Observed trends must be interpreted with caution since there are a number of factors that contribute to changes:

- rates based on small numbers are more prone to fluctuation over time
- there may be changes to testing patterns due to improved diagnostic capabilities, improved duplicate removal, and reporting delay

[Details about the *Brief Report on Sexually Transmitted Infections in Canada: 2007*.](#)

HIV and AIDS in Canada: Surveillance Report to December 31, 2008

Exclusions/Limitations: The number of reported AIDS cases and positive HIV test reports at any point in time is not necessarily a true reflection of the total number of people with a diagnosis of AIDS or HIV infection. This is because some individuals with a diagnosis of HIV infection or AIDS are never reported to PHAC, which leads to an under-reporting of cases.

There may be a delay between the time when a person tests positive for HIV or is given a diagnosis of AIDS and the time when the report is received by PHAC. This time lag is referred to as the reporting delay. AIDS cases that are adjusted for reporting delay are usually presented in year-end surveillance reports. However, as outlined in a previous surveillance report, enhanced emphasis on HIV surveillance in a number of provinces has contributed to a growing uncertainty associated with the current methods used to estimate the AIDS reporting delay. PHAC is currently working on an improved process of estimating under and delayed reporting of AIDS diagnoses and expects to publish findings using these methods in upcoming reports.

[Details on *HIV and AIDS in Canada: Surveillance Report to December 31, 2008*.](#)

Canadian Nosocomial Infection Surveillance Program (CNISP)

Exclusions/Limitations: Only tertiary care centres (acute care hospitals) are currently participating in the surveillance program.

Disclosure of Limitations: Over 94% of the hospitals participating in the CNISP are tertiary-care teaching hospitals; therefore, they are only truly representative of the university-affiliated medical centres in the country.

CNISP hospitals have an active Methicillin-resistant *Staphylococcus aureus* (MRSA) surveillance program with screening policies that vary from site to site. Thus, it is likely that the system does miss some cases of MRSA colonization. MRSA colonization is assumed to be present in the absence of clinical signs or symptoms of infection. This diagnostic approach may lead to a misclassification of latent cases of MRSA infection, although this is thought to be relatively insignificant.

While a standardized case definition is used to classify MRSA cases as community- or healthcare-associated, it does still bear some subjectivity, which is also thought to be insignificant.

From 1995 to 2005, isolates recovered from all patients were submitted for further laboratory testing at the National Microbiology Laboratory in Winnipeg, whereas from 2006 to 2008, only “clinical” (i.e., non-screening) isolates recovered from patients suspected to be infected with MRSA were considered.

With the exception of 1995 and 1996, only subsets of geographically representative isolates were considered for further laboratory characterization (i.e., molecular typing). Therefore, it is recommended that readers take this into consideration when comparing annual results.

First Nations Information Governance Centre

First Nations Regional Health Survey (RHS) 2008/10—Adult Survey

Exclusions/Limitations: Individuals under 18 years of age and residents of Nunavut.

Results are limited to participating First Nations living on reserve and in some non-reserve communities in the territories, excluding Nunavut. The Quebec James Bay Cree and the Innu of Labrador did not participate. The sampling was based on the Indian Register, the accuracy of which varies from region to region; however, local sampling frames were based on more up-to-date locally validated counts. Surveys were administered using a computer-assisted interviewing tool; in a few instances however, paper surveys were employed.

Due to differences in the stratification of the RHS 2008/10 data by age and gender, estimates that appear in the *Healthy Canadians 2012* may differ very slightly from those found in the First Nations Information Governance Centre's *First Nations Regional Health Survey 2008/10: National Report on the Adult, Youth and Children Living in First Nations Communities*.

Organisation for Economic Co-operation and Development (OECD)

OECD Health Data 2012

Exclusions/Limitations: All users of cross-national comparisons of health care data are advised that there are still important gaps with respect to international agreements on statistical methods. The same term can refer to very different things among the 34 OECD countries. Despite efforts to develop homogeneity, standardized health statistics is still a goal, not a reality. The statistics contained in *OECD Health Data 2012* reflect the situation at the time of release; they have been refined and improved year after year. The aim of the files and the accompanying sources and methods is to provide an objective working tool. The cooperation and, indeed, the criticism of the various national data providers and users will enable improvements in the future.

[Details on OECD Health Data 2012.](#)

References

- ¹ Bhandari, A., Wagner, T. (2006). Self-reported utilization of health care services: improving measurement and accuracy. *Medical Care Research and Review*. 63(2): 217-235.
- ² Tjepkema, M. (2005). *Nutrition: Findings from the Canadian Community Health Survey—Adult obesity in Canada: Measured height and weight*. Ottawa: Statistics Canada. Catalogue No. 82-620-MWE2005001. Available from: <http://www.statcan.gc.ca/pub/82-620-m/2005001/pdf/4224906-eng.pdf>.
- ³ Statistics Canada. (2012). Canadian Health Measures Survey, Cycle 2. *Distribution of the household population aged 18 to 79, by body mass index norms based on direct measures, by age and sex, Canada, 2009 to 2011*. Ottawa: Statistics Canada. Catalogue No. 82-626-X. Available from: <http://www.statcan.gc.ca/pub/82-626-x/2012001/t029-eng.htm>.