

November 21, 2013



## Analysis in Brief

# Benchmarking Canada's Health System: International Comparisons

## Health System Performance

### Executive Summary

There is increasing interest in comparing Canada's health system internationally. Enhancing accountability and promoting benchmarking and mutual learning are among the reasons for looking at how health system performance varies across countries. Although there are methodological challenges in terms of having consistent and comparable data, there is value in understanding how Canadian results compare internationally.

The Organisation for Economic Co-operation and Development (OECD) is a comprehensive and reliable source of international health care data. Every two years, the OECD releases *Health at a Glance*, a report that compares member countries on a number of key health indicators. The objective of this Analysis in Brief is to focus on the Canadian results for a selection of OECD indicators and to identify specific areas where Canada performs well and where it can improve.

Key findings include the following:

- There is no consistent pattern to Canada's results. For many indicators, Canada's results are within the band of average performers (between the 25th and 75th percentiles). Canada's performance varies from among the best to among the worst. Results for other OECD countries also vary, but no country outperforms Canada across all indicators.
- Relative to other OECD countries, Canada performs well on several indicators, including potentially avoidable hospital admissions for diabetes and asthma, overall stroke mortality, smoking rates, and fruit and vegetable consumption.
- Canada does not perform well on diabetes and obesity rates, or on most patient safety indicators, particularly obstetric trauma and foreign bodies left in during a procedure. While the patient safety results may be partially explained by differences in data collection, there is a clear opportunity for improvement.

### Our Vision

Better data. Better decisions.  
Healthier Canadians.

### Our Mandate

To lead the development and maintenance of comprehensive and integrated health information that enables sound policy and effective health system management that improve health and health care.

### Our Values

Respect, Integrity, Collaboration,  
Excellence, Innovation

#### Federal Identity Program

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- Canada performs well on many cancer screening and care indicators. However, overall cancer mortality is only average—primarily due to Canada’s high lung cancer mortality rates relative to those of other OECD countries, especially in women. High lung cancer mortality rates can be partially explained by high smoking rates before the 1990s. These rates have been dropping, giving hope that Canada’s lung cancer mortality rate will improve in the future.

## Introduction

There is increasing interest in cross-country comparisons of the performance of health systems. Although there are methodological challenges in terms of having consistent and comparable data across countries, there is much to be gained from understanding how Canada’s results compare with what is being achieved by other countries. International comparisons can help Canadians understand how well the health system is working and where improvements can be made.

No two countries’ health care systems are identical, as they have been developed based on different histories, institutions, populations, economies and cultures. These differences will have an impact on what citizens value in a health system and on the resources that are available for health care.<sup>1</sup> Countries also differ in their social determinants of health, demographics, social support and environmental factors, which, in turn, also have significant impacts on health and on what can be achieved by a health system.<sup>1</sup>

Despite differences between countries and populations, we can gain insight by comparing countries on a range of health indicators. International comparisons can help identify health system performance issues and determine the extent to which other countries also experience these.<sup>2</sup> When problems are identified, countries can look to high performers for insight into possible responses. In addition, by using an international perspective, comparisons can inform benchmarks and targets for national and/or provincial governments.

### ***Why Are Canada’s OECD Numbers Different From Those in CIHI and Statistics Canada Reports?***

The Canadian Institute for Health Information (CIHI), in collaboration with Statistics Canada, reports a number of health indicators on a regular basis. These indicators were developed to maximize data comparability across Canada, whereas the OECD’s methodology was developed to compare health care systems internationally, that is, across many countries. Consequently, the numbers produced in other CIHI reports may differ from those presented by the OECD due to differences in methodologies. The following are some examples of these differences:

- CIHI’s indicators are standardized by age and sex using data from the 1991 Canadian Census of Population, whereas the OECD’s indicators are standardized using the 2010 population of all OECD countries combined.
- CIHI adjusts some indicator results on the basis of risk. For example, CIHI’s *30-day acute myocardial infarction in-hospital mortality* indicator adjusts for comorbidities, such as cancer, diabetes, renal failure and heart failure, which result in a higher risk of death. The OECD methodology does not adjust for comorbidities.

An understanding of whom best to compare ourselves with is needed to fully embrace the benefits of international comparisons. When comparing Canadian results internationally, we will examine Canada’s performance among all 34 OECD countries (Appendix A), with a focus on countries that are more similar to Canada. Canada’s health system is often compared with those in Australia, France, Germany, the Netherlands, New Zealand, Sweden, the United States and the United Kingdom.<sup>i</sup> These peer OECD countries, like Canada, have larger and more developed economies and comparable levels of resources to devote to health.

i. Based on a scan of 26 international studies, compiled by CIHI.

**Table 1: Health System Descriptors, Peer Countries, 2012 (or Nearest Year)**

	Canada	Australia	France	Germany	Netherlands	New Zealand	Sweden	United Kingdom	United States	OECD Average (Range)
<b>Population</b>										
<b>Total Population (Millions of People)</b>	<b>34.9</b>	22.7	63.2	81.8	16.7	4.4	9.4	62.2	311.6	36.5 (0.32–311.6)
<b>Percentage of Population Older Than Age 65</b>	<b>14.7%</b>	13.7%	17.1%	20.7%	15.9%	13.3%	19.3%	16.2%	13.2%	15.4% (6.1–23.3)
<b>Percentage of Population in Urban Area</b>	<b>56.1%</b>	57.3%	34.7%	56.9%	85.0%	44.5%	21.6%	70.8%	42.2%	48.3% (0.0–85.0)
<b>Income Inequality (Gini Coefficient)</b>	<b>0.32</b>	0.33	0.30	0.29	0.29	0.32	0.27	0.34	0.38	0.31 (0.24–0.50)
<b>Spending</b>										
<b>Current Health Spending (Excluding Capital) (% of GDP)</b>	<b>10.6%</b>	8.5%	11.2%	11.0%	11.1%	10.3%	8.9%	9.1%	17.0%	9.1% (5.8–17.0)
<b>Out-of-Pocket Health Care Spending per Capita (\$US, PPP-Adjusted)</b>	<b>\$667</b>	\$733	\$307	\$538	\$298	\$348	\$636	N/A	\$987	\$588 (229–1,455)
<b>Health Care Activities</b>										
<b>Hospital Discharges (All Causes, per 100,000 Population)</b>	<b>8,249</b>	15,945	16,853	24,417	12,201	14,654	16,251	13,640	12,549	15,650 (5,051–27,347)
<b>Hospital Average Length of Stay (All Causes, Days)</b>	<b>7.7</b>	5.0	5.6	9.3	5.3	8.3	6.0	7.3	4.8	7.2 (3.9–16.4)
<b>Acute Care Beds (per 1,000 Population)</b>	<b>1.7</b>	3.4	3.4	5.3	3.3	2.6	2.0	2.4	2.6	3.4 (1.6–8.0)
<b>Doctor Consultations per Capita</b>	<b>7.4</b>	6.9	6.8	9.7	6.6	3.7	3.0	5.0	4.1	6.8 (2.7–13.2)
<b>Non-Medical Determinants</b>										
<b>Percentage Daily Smokers (Self-Reported)</b>	<b>16%</b>	15%	23%	22%	21%	17%	13%	20%	15%	21% (13–32)
<b>Obesity Prevalence (Self-Reported)</b>	<b>18%</b>	N/A	13%	15%	11%	N/A	11%	N/A	29%	15% (2–29)

**Notes**

PPP: Purchasing power parity.

N/A: Not available.

The Gini coefficient is a standard measure of income inequality that ranges from 0 (when everyone has identical incomes) to 1 (when all income goes to one person).

Obesity is defined as body mass index (BMI) greater than 30.

**Sources**

Organisation for Economic Co-operation and Development. *OECD Health Data 2013*. Paris, France: OECD; 2013. <http://stats.oecd.org>.

Organisation for Economic Co-operation and Development. *OECD Factbook 2013: Economic, Environmental and Social Statistics*. Paris, France: OECD; 2013. [http://www.oecd-ilibrary.org/economics/oecd-factbook-2013\\_factbook-2013-en](http://www.oecd-ilibrary.org/economics/oecd-factbook-2013_factbook-2013-en).

When comparing OECD countries, differences in indicator results can be caused by a number of factors, including differences in<sup>3</sup>

- Data collection (methods of collection and coding), data quality (missing data and coverage) and how recent the data is. To minimize these differences, the most recent data and data from similar collection systems was used where possible.

- Demographic characteristics, such as age structure and rural/urban distribution. For example, Canada has a younger population than many OECD countries. To reduce this type of variability, many indicator results were adjusted to account for age differences.
- Health systems, including health system centralization, funding and types of services provided.<sup>4</sup> These differences cannot be adjusted for in the indicator calculations. For instance, Canada has one of the highest out-of-pocket expenditure rates per person among peer countries, after the United States and Australia. In Canada, the greatest contributors to this expense are pharmaceuticals and dental care.<sup>5</sup> Canada is one of only a few peer countries that cover less than 75% of pharmaceuticals and have limited public dental coverage. Factors such as these should be considered when comparing indicator results internationally to help understand reasons for variations in performance.

## How to Interpret the Performance Profiles

The performance profiles (figures 1 to 4) for each dimension (group of indicators) illustrate where Canada's results are positioned in relation to the average and to the 25th and 75th percentiles for the OECD countries on each indicator. The vertical scale is a standardized score, representing the relative distance from the OECD average (0.0) for each indicator. For example, a standardized score of 1.5 would represent a result that is three times further away from the OECD average than a score of 0.5. Indicators above the OECD average line denote better performance, and those below the average line indicate poorer performance than the OECD average. The shaded band indicates the distance between the 75th and 25th percentiles, so a point above this area indicates that Canada is in the top quarter of all OECD countries. Using standardized scores allows results from indicators with different scales to be shown in a single figure.

These graphs indicate Canada's relative performance compared with that of other countries, but it does not indicate high absolute performance according to benchmarks or guidelines, so caution is required when interpreting the figures. For example, Canada performs well on youth physical activity compared with other countries, with 14% of girls and 25% of boys age 15 reporting 60 or more minutes of moderate to vigorous physical activity per day. However, the *Canadian Physical Activity Guidelines* for youth age 12 to 17 states that **all** youth should accumulate 60 minutes of moderate to vigorous physical activity daily.<sup>6</sup> Thus the majority of Canadian youth are not getting the recommended amount of physical activity per day.

Indicators were reported by gender when there was a difference in relative performance in males and females or when overall values were unavailable (that is, for non-medical determinants of health in youth). Complete descriptions of the indicators are listed in Appendix B.

## Methods

The OECD is an international organization founded in 1961 that is committed to improving the economic and social well-being of people around the world.<sup>7</sup> It collects a variety of indicators on health system performance from its 34 member countries. Canadian data for these indicators comes primarily from CIHI and Statistics Canada.

To improve international comparability, the most recent data for the period 2009 to 2012 was used for each indicator. Variables were accessed from tables downloaded in August 2013 from the OECD's StatsExtract website.<sup>ii</sup> For some measures, data was unavailable online. For these variables, we used supporting data tables that the OECD supplied to us. For more information about the methodology and the comparability of results from different countries, refer to CIHI's report *Learning From the Best: Benchmarking Canada's Health System*<sup>2</sup> and the OECD's methodology document *OECD Health Data Definitions, Sources and Methods*.<sup>8</sup>

The objective of this Analysis in Brief is to focus on the Canadian results for a selection of OECD indicators and to identify specific areas where Canada performs well and where performance could be improved. This report presents performance profiles for four dimensions in the OECD's health system framework: Health Status, Non-Medical Determinants of Health, Access to Care and Quality of Care. These dimensions were

ii. Available at [http://stats.oecd.org/index.aspx?DataSetCode=HEALTH\\_STAT](http://stats.oecd.org/index.aspx?DataSetCode=HEALTH_STAT).

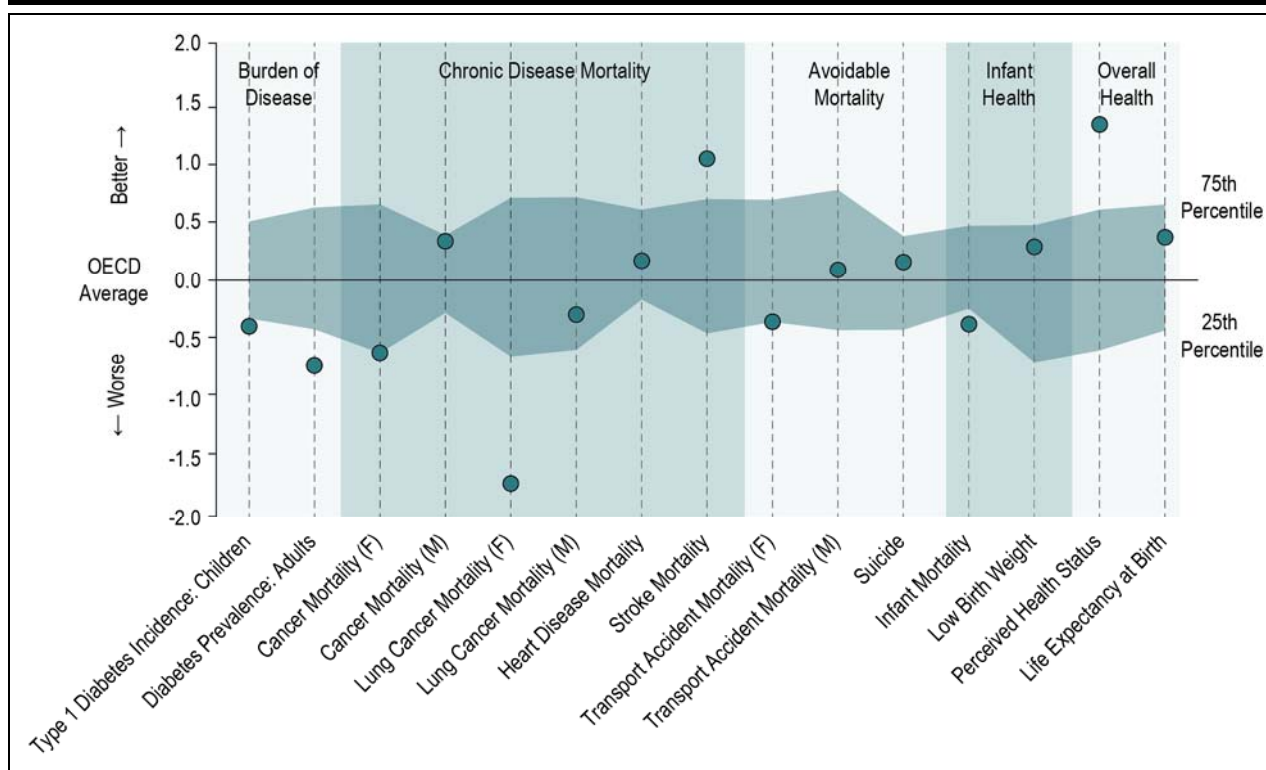
chosen because they contain directional indicators. That is, we can state that higher values (as in the case of life expectancy) or lower values (as in the case of mortality) reflect better performance. Also, for these dimensions, Canada's results are available and reported for all indicators presented.

This report includes an In Focus section that highlights the fact that many of the indicators are interconnected and demonstrate a variety of measures of health system performance. It further explores Canada's performance on lung cancer mortality in detail, linking other indicators to provide insight into lung cancer in Canada.

## Health Status

Measures of health status range from measures of infant health, like low birth weight, to measures of chronic disease mortality, such as deaths due to cancer. Many factors influence the health status of a country, including health care features and social determinants of health (like education, income inequalities and living conditions). Overall, the measures reported in this dimension give a general picture of the health of Canadians.

Figure 1: Health Status Performance Profile, Canada



### Notes

F: Females; M: Males.

**Diabetes Prevalence/Incidence:** Rates in different countries were estimated by the International Diabetes Federation and were derived from country-level data sources. Diabetes prevalence includes both type 1 and type 2 diabetes.

**Infant Mortality:** Some of the international variation in infant and neonatal mortality rates may be due to variations among countries' practices for registering premature infants.<sup>9</sup>

**Perceived Health Status:** Due to differences in survey design, Canada's scores (as well as those for Chile, the United States, New Zealand and Australia) are biased upward.

### Sources

Organisation for Economic Co-operation and Development. *OECD Health Data 2013*. Paris, France: OECD; 2013. <http://stats.oecd.org>.

International Diabetes Federation. *IDF Diabetes Atlas 2011*. Brussels, Belgium: IDF; 2011. <http://www.idf.org>.



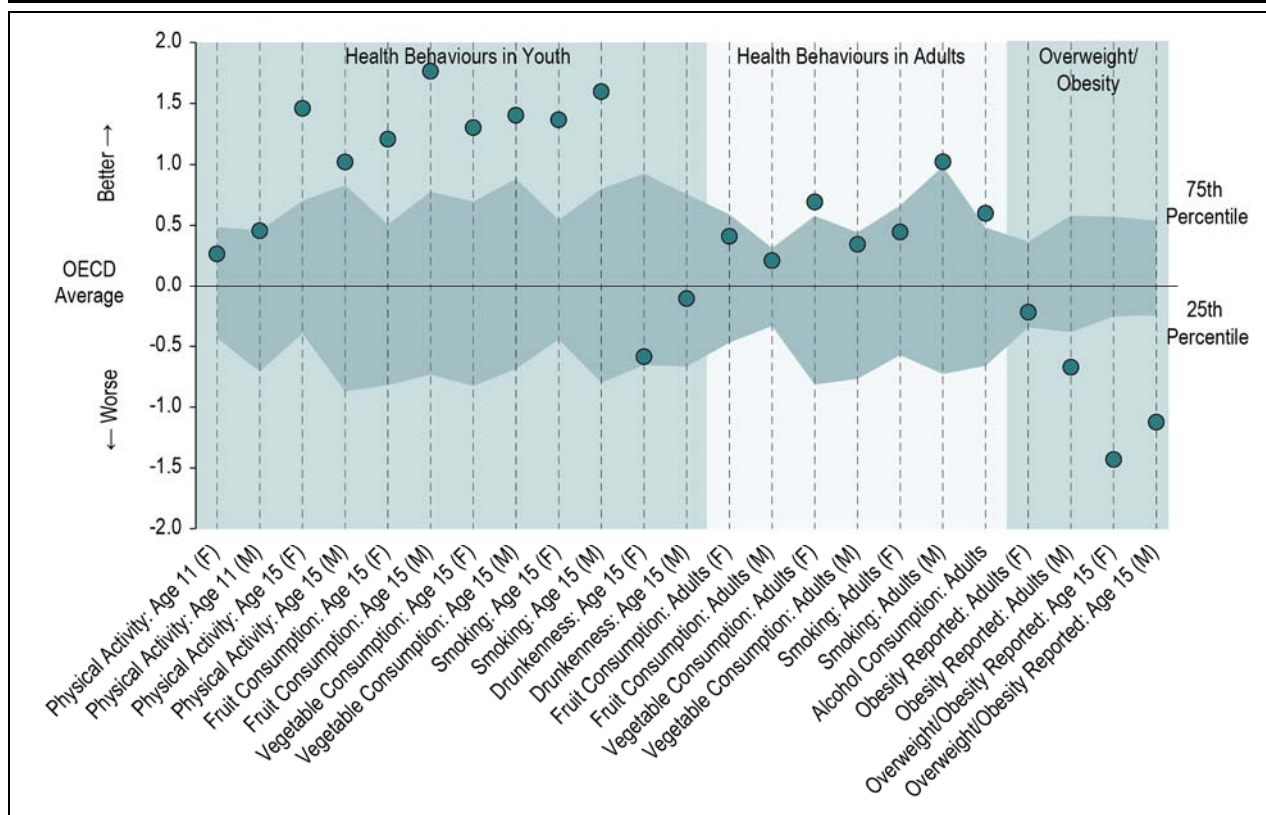
- Canada **performs well** on stroke mortality and perceived health status:
  - Canada has lower overall *stroke mortality*<sup>iii</sup> rates than most OECD countries (43 per 100,000 people) and the lowest rate among peer countries. Despite Canada's lower rates of overall stroke mortality, *in-hospital mortality* among patients with ischemic stroke is higher than in other OECD countries (reported in the Quality of Care dimension). While the reasons for the differences in Canada's relative performance on these measures are unclear, one hypothesis is that a larger proportion of minor strokes are treated in the community in Canada. Other reports highlight opportunities for improving Canada's stroke care, as the majority of patients are not arriving at the hospital and being treated on time.<sup>10</sup> Specialized stroke units within hospitals are one mechanism that experts have suggested to help further improve stroke mortality rates.<sup>10</sup>
  - Canadians appear to have higher *perceived health status* than people in other OECD countries, with nearly 9 out of 10 Canadians reporting their health as "good," "very good" or "excellent." An important consideration is that the surveys used in Canada are different from those used in most other countries. Canada, together with four other OECD countries (Chile, New Zealand, Australia and the United States) uses a five-point scale with three options for positive responses (good, very good and excellent), while other countries have two (good and very good). The difference in the scales seems to bias the results upward. Results from four of the five countries that use three positive categories are in the top OECD results. Canada is in the middle of the five countries that have similar survey designs.
- Canada **performs poorly** on lung cancer mortality, infant mortality and diabetes prevalence:
  - *Lung cancer mortality* in Canada, with 58 deaths per 100,000 population, is higher than the OECD average of 43 per 100,000. All peer countries with the exception of the Netherlands (also with 58 deaths per 100,000) outperform Canada on this indicator, including Australia (38 per 100,000), France (43 per 100,000) and Germany (41 per 100,000). Canada's results are especially poor on lung cancer mortality in women; this gender difference is explored further in the In Focus section of this report.
  - Canada's relative performance on *infant mortality* falls below the OECD average; Canada's rates have not changed over the past 10 years. There is some evidence that births with very low birth weight and very early gestation age are more likely to be registered in Canada (as well as in the United States) than in other OECD countries.<sup>9</sup> When these births are excluded, Canada's relative performance is similar to that of other OECD countries.<sup>9</sup> Infant mortality is of particular concern in the Northwest Territories and in Nunavut, where rates are three times higher than the Canadian average.<sup>11</sup>
  - *Diabetes (types 1 and 2) prevalence* in Canada is among the highest in all OECD countries (8.7%) and all peer countries other than the United States (9.6%) and New Zealand (8.8%). Undiagnosed diabetes is a common problem in most countries, including Canada, with an additional 1% of Canadians having undiagnosed diabetes.<sup>12</sup> Diabetes prevalence has nearly doubled in Canada since 2000.<sup>13</sup> Diabetes is more common within certain populations; for example, the prevalence of diabetes in First Nations individuals living on reserve in Canada is three times higher than in the non-Aboriginal population.<sup>12</sup>

## Non-Medical Determinants of Health

Non-medical determinants of health are those that are outside the direct control of the health system. They cover the behavioural, economic, social, lifestyle and environmental factors that have a significant impact on the health of individuals. It is estimated that non-medical determinants are the primary cause of half of all diseases.<sup>14</sup> The OECD reports on five of these factors: smoking rates, physical activity (in youth only), fruit and vegetable consumption, prevalence of obesity and overweight, and alcohol consumption. Given the importance of these factors in influencing disease risk, measuring these indicators among youth can provide an indication of the future of chronic diseases.

iii. This rate captures deaths from specific cerebrovascular diseases, including hemorrhagic and ischemic stroke, cerebral atherosclerosis, occlusion and stenosis of cerebral and precerebral arteries, and other specified cerebrovascular conditions.

Figure 2: Non-Medical Determinants of Health Performance Profile, Canada



#### Notes

F: Females; M: Males.

**Obesity Reported: Adults:** Obesity rates are based on self-reported height and weight. Self-reported rates, rather than measured ones, were used because measured rates of adult obesity are available for only a limited number of countries.

**Overweight/Obesity Reported: Age 15:** Obesity rates are based on self-reported height and weight. Self-reported rates, rather than measured ones, were used because measured rates of obesity are available for only a limited number of countries and include children and youth of various ages. Self-reported rates are from the Health Behaviour in School-Aged Children (HBSC) study.

**Health Behaviours in Youth:** These measures are based on self-reported data from the HBSC study.

**Smoking: Adults:** Smoking rates are based on self-report; some variation exists in the measurement of smoking habits in health interview surveys across OECD countries.

#### Sources

Organisation for Economic Co-operation and Development. *OECD Health Data 2013*. Paris, France: OECD; 2013. <http://stats.oecd.org>.

Currie C, et al., ed. *Social Determinants of Health and Well-Being Among Young People*. Copenhagen, Denmark: WHO Regional Office for Europe; 2012. <http://www.hbsc.org/>.

- Canada **performs well** on most measures of health behaviours in youth and adults:
  - Among peer countries, Canada is a high performer in nearly all *self-reported health behaviours* in youth, including physical activity, smoking, and fruit and vegetable consumption. Only the United States commonly has better results.
  - The percentage of Canadians who are *daily smokers* (16%) is lower than in most OECD countries and similar to that in several peer countries, including Sweden (13%), Australia (15%) and the United States (15%). Twenty years ago, Canada was not performing as well compared with other OECD countries, and this improvement in smoking rates is expected to result in lowered mortality rates for lung cancer in the near future.
  - Among non-medical determinants of health, *alcohol consumption* is the leading contributor to disease burden in North America.<sup>15</sup> Canada performs above average on alcohol consumption in adults. Excessive alcohol consumption is associated with many social and developmental issues, as well as several chronic conditions such as cardiovascular diseases and some cancers.<sup>15</sup> In children, alcohol consumption is measured by drunkenness, that is, if they have been drunk at least twice by age 15.

Despite Canada's high performance on alcohol consumption in adults, its performance on this measure in children is lower than the OECD average, especially in girls. Canada is one of the few countries in the OECD with higher self-reported rates of drunkenness in girls than in boys by age 15. Successful campaigns that have been shown to reduce alcohol consumption across the world include setting age restrictions for purchasing alcohol, enacting drinking and driving regulations, and providing accessible and affordable treatment for people with alcohol-use disorders.<sup>15</sup>

- Canada's *fruit and vegetable consumption* is above that of most OECD countries, especially in youth. Fruit and vegetable consumption in 15-year-old boys and girls is among the best of the countries included in the indicator. Fruit and vegetable consumption in youth has been shown to reduce the risk of future chronic diseases and is often predictive of eating habits later in life. *Canada's Food Guide* recommends that children age 14 to 18 eat 7 to 8 servings of fruits and vegetables a day; this increases to 7 to 10 servings daily for adults.<sup>16</sup> Studies have shown that socio-economic position, preference and home availability of healthy snack choices, such as fruits and vegetables, have a substantial impact on the eating habits of youth.<sup>17</sup> Several municipalities and school boards in Canada have banned sugary drinks like soda from school vending machines to improve the health of youth.<sup>18</sup> In 2009, the European Commission started a program that provides young pupils with free fruits and vegetables, which successfully increased students' fruit and vegetable consumption.<sup>19</sup>
- Canada **performs poorly** on overweight and obesity measures across ages and genders:
  - Globally, *obesity* has doubled since 1980. Obesity is responsible for nearly half of all the burden of diabetes and a quarter of all ischemic heart disease diagnoses and certain cancers, such as esophageal, breast and colon cancers.<sup>20, 21</sup> In adults, Canada has among the highest obesity rates (17.7%) across the peer countries, second to only the United States (28.5%). This could be one contributing factor to Canada's poor performance in diabetes prevalence. These rates are based on self-reported height and weight, which tends to result in underestimates of body mass index. When estimates are based on actual measures of height and weight, approximately 25% of Canadians are considered obese, also worse than the OECD average of 23%. Successful international policies for obesity prevention include making regular physical activity and healthier diet options available, and encouraging the food industry to reduce the fat and sugar in its foods.<sup>20</sup> Obesity screening by physicians has also been recommended in some countries to prompt a dialogue on recommended lifestyle and nutritional changes.<sup>22</sup>
  - Canada also performs below the OECD average on the percentage of children who are considered *overweight or obese*, with 17% of girls and 24% of boys age 15 having a body mass index above a set of age- and sex-specific cut-offs. In a comparison of peer countries, Canada's performance is among the worst, along with the United States. Measured values of body mass index for children show very similar results, with one-quarter of children age 5 to 17 being recorded as overweight or obese. Though many strategies exist for reducing obesity in children, they are most often targeted to children between the ages of 6 and 11, and very few are implemented in the home setting, where children spend most of their time.<sup>23</sup> Research suggests that programs should focus on increasing physical activity to prevent and treat obesity in children.<sup>24</sup>

The findings may at first appear counterintuitive: Canada performs well on most health-related activities such as fruit and vegetable consumption and physical activity, yet it has one of the highest obesity rates of all OECD countries. A deeper look into these indicators may help explain Canada's contradictory performance ratings. For example, *Canada's Food Guide* recommends eating **seven to eight** servings of fruits and vegetables per day; however, the fruit and vegetable consumption indicators measure the percentage of people who eat **at least one** fruit or vegetable per day. It is possible that Canadians are not eating the recommended amount of fruits and vegetables to improve the quality of their diet.<sup>16</sup> A similar story is behind the physical activity indicators: while the proportion of children who report getting the recommended amount of activity is higher in Canada than in most OECD countries, the majority of Canadian children are still not meeting the *Canadian Physical Activity*

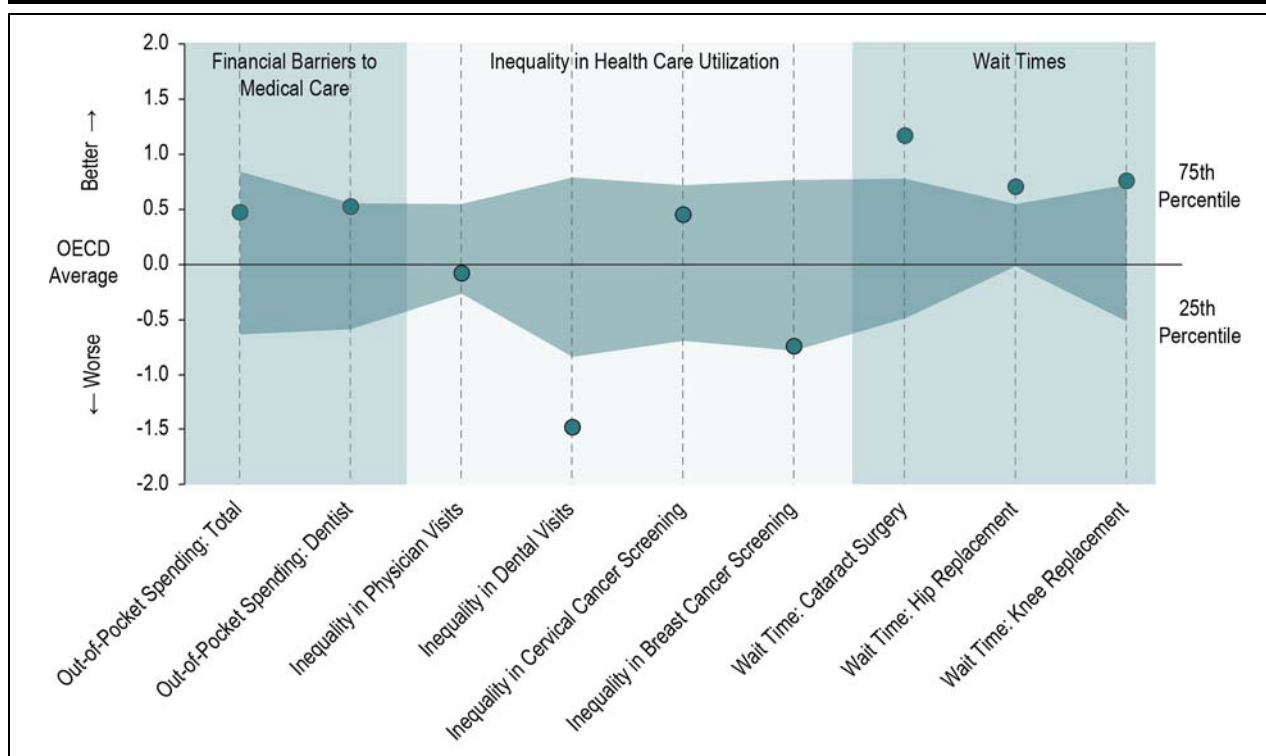


Guidelines recommendation of 60 minutes per day.<sup>1</sup> In addition, it is important to consider sedentary behaviours, such as watching television or playing video games, which have been shown to be highly predictive of obesity rates in children and adults.<sup>25</sup>

## Access to Care

Access to care indicators reflect the availability of the right care, where and when it is needed. It is a complex concept that is difficult to measure and compare across countries. A measure of access to care that is of particular concern in Canada is wait times. In 2004, Canada's first ministers agreed to reduce wait times in five clinical areas: cancer, heart, diagnostic imaging, sight restoration and joint replacement.<sup>26</sup> Since then, there have been reductions in wait times in all five areas. In addition to wait times, the OECD's measures of access to care also examine out-of-pocket expenditures and inequalities by income in health care utilization; though not access measures per se, they signal potential financial barriers if appropriate protection mechanisms are not in place.

Figure 3: Access to Care Performance Profile, Canada



### Notes

**Inequality in Health Care Utilization:** Data for the income inequality indicators comes from national health interview or household surveys conducted between 2005 and 2009 and relies on self-report. Canada's result is based on the 2007–2008 Canadian Community Health Survey. All data from reporting countries has been included, regardless of reporting year (data from four countries is older than Canada's). Differences exist in the survey questions, age ranges of respondents and measures used to determine income groups. Caution is therefore needed when interpreting inequalities in health care utilization across countries. Inequality in physician visits was measured with the horizontal inequity index (concentration index) for the probability of a doctor visit in the past 12 months and was adjusted for need. Inequality in cancer screening and dental visits was measured by the difference in rates between the highest and lowest income quintiles.

**Wait Times:** These indicators are based on administrative data for seven countries (Australia, Canada, Estonia, Finland, New Zealand, Portugal and the United Kingdom). As they are new indicators this year, there may be more inconsistencies in the way individual countries report results.

### Sources

Organisation for Economic Co-operation and Development. *OECD Health Data 2013*. Paris, France: OECD; 2013. <http://stats.oecd.org>.

Devaux M, de Looper M. *Income-Related Inequalities in Health Service Utilisation in 19 OECD Countries, 2008–2009*. Paris, France: OECD; 2012.

OECD Health Working Papers, No. 58. <http://dx.doi.org/10.1787/5k95xd6stnxt-en>.

- Canada **performs well** on cataract and joint replacement surgery wait time indicators:
  - Long *wait times* for health services are an important health policy issue in many OECD countries. Long waits may lead to patient dissatisfaction and potential negative short- and long-term health outcomes. Canada performs better than the six other countries<sup>iv</sup> that have comparable wait time data for three types of elective surgery. Wait times for cataract surgery, hip replacement and knee replacement are in the top three of all participating countries, with median waits of 46, 87 and 106 days, respectively. Canada's better results may reflect the fact that these three indicators fall within the priority procedures set by the first ministers in 2004.<sup>26</sup> Unlike in most other countries, wait times in Canada have not been shortening since 2008; in fact, median wait times in 2011 were longer for both knee and hip replacements. However, larger decreases were seen between 2004 and 2008. When interpreting these results, it is important to consider that the indicators capture the time between specialist assessment and treatment and do not include the wait time to see a specialist. International surveys suggest that Canada has among the longest wait times for specialist services, with 41% of Canadians who need an appointment with a specialist waiting more than two months, compared with 9% of Americans and 7% of Germans.<sup>27</sup>
- Canada **performs poorly** on income inequality in dental visits:
  - The rate of *inequality for dental visits* in Canada is higher than in most OECD countries, with low-income individuals being nearly half as likely to visit a dentist as those with higher incomes.<sup>v</sup> Of Canadians in the poorest income group, less than half (47%) had visited a dentist in the previous 12 months, compared with almost four out of five (79%) in the highest income group. Though these differences may in part reflect differences in individual preferences and expectations, they point to possible barriers to access that are experienced disproportionately by people with lower incomes. This result is not surprising, since most dental care is covered out of pocket or by private insurance that is often not held by lower-income Canadians.<sup>28</sup>

## Quality of Care

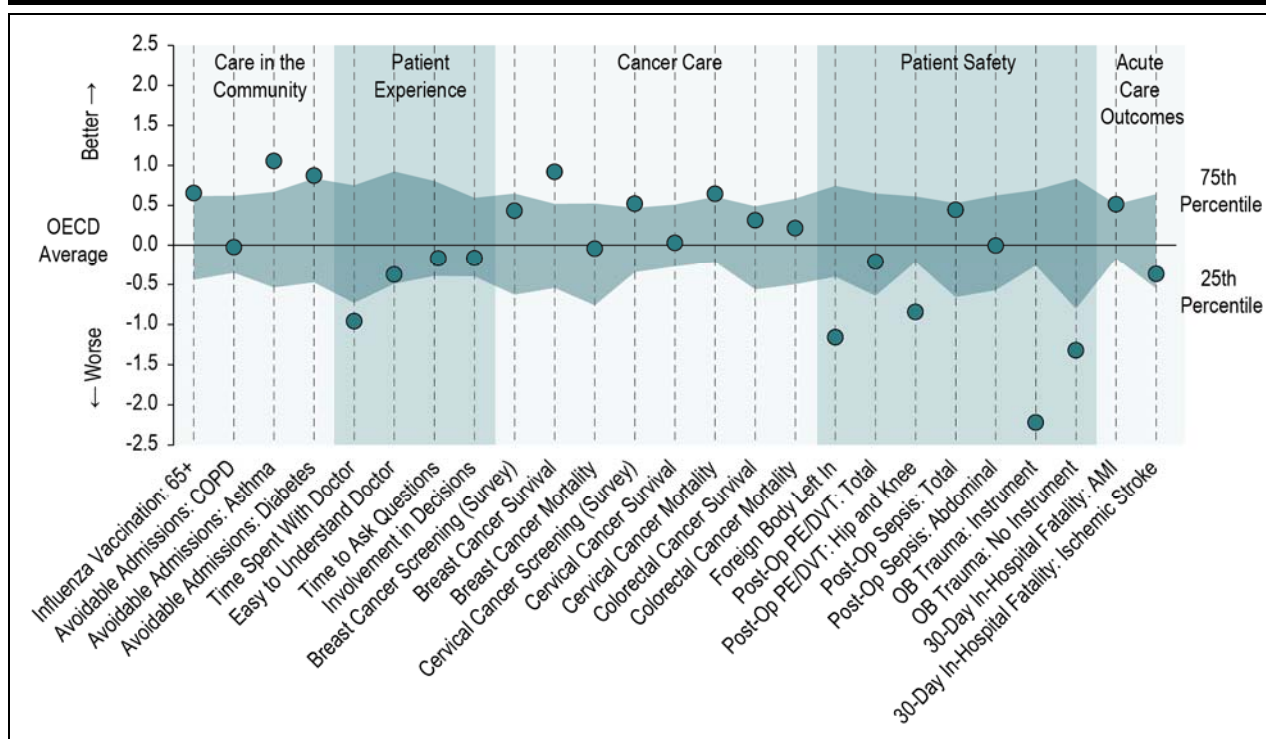
Quality of care is a broad category of indicators that reflect the effectiveness, safety and efficiency of care. Examples include patient experience measures, as well as the percentage of people receiving effective and beneficial procedures, such as influenza vaccinations and screening for certain cancers. Even in countries like Canada and its peers, where health systems are well developed and resourced, quality is still a concern.<sup>29</sup> Expected outcomes are not always attained, and there are often large variations in standards of health care delivery between countries.<sup>29</sup>

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iv. The six other countries that provide median wait time data for these measures are Australia, Estonia, Finland, New Zealand, Portugal and the United Kingdom.

v. Dental inequality data is available for 16 countries, and cancer screening inequality data is available for 15 countries. For many countries, including Canada, data is older than 2009.

Figure 4: Quality of Care Performance Profile, Canada



#### Notes

COPD: Chronic obstructive pulmonary disease.

Post-op: Post-operative.

PE/DVT: Pulmonary embolism/deep vein thrombosis.

OB: Obstetric.

AMI: Acute myocardial infarction.

**Cancer Screening:** Results are limited to self-reported survey data.

**30-Day In-Hospital Fatality: AML/Stroke:** Ideally, rates would be based on individual patients; however, only some countries have the ability to track patients across hospitals and capture deaths occurring outside of a hospital. As a result, rates are based on hospital admissions. Differences in practices in discharging and transferring patients may influence the findings.

**Patient Experience:** Data for the patient experience indicators for most countries comes from The Commonwealth Fund's International Health Policy Survey, 2010. Other national surveys were used to report data for Australia, the Czech Republic, Israel, Luxembourg and New Zealand. Differences exist in sample sizes, representativeness and response rates. Caution is needed when interpreting patient experience outcomes across countries.

#### Sources

Organisation for Economic Co-operation and Development. *OECD Health Data 2013*. Paris, France: OECD; 2013. <http://stats.oecd.org>.

The Commonwealth Fund's International Health Policy Survey, 2010 and other national sources.

Canada's overall results are mixed for this dimension, ranging from among the best to among the worst.

- Canada **performs well** on avoidable admissions, breast cancer screening and breast cancer survival:
  - *Avoidable admissions* represent hospitalizations that may have been preventable. They make up a substantial proportion of total hospitalizations and are commonly considered to reflect inadequate care in the community. Admission rates for diabetes and asthma in Canada are among the lowest for OECD countries; however, admission rates for chronic obstructive pulmonary disease (COPD) are near the OECD average. Canada's relatively good performance may be due to appropriate management of these conditions in the community, thereby avoiding the need for hospitalizations; however, it could also reflect the fact that Canada has lower hospitalization rates in general (8 discharges per 100 population) than most OECD countries (OECD average of 15 per 100).
  - The *cancer survival* indicators measure the likelihood of a cancer patient surviving for five years after diagnosis, compared with a member of the general population. Canada performs well on five-year relative survival for breast cancer, having the best rates among peer countries. This could be due, in

part, to early detection and effective treatment. Canada has among the best self-reported *screening rates* for breast cancer, which may lead to earlier detection and better prognoses. However, despite Canada's good performance, inequalities still exist in breast cancer screening rates. Although the OECD doesn't collect indicators for cancer treatment, there have been considerable advances in treatment for a variety of cancer types, which could also contribute to Canada's high survival rates.<sup>30, 31</sup>

- Canada **performs poorly** on patient experience measures and several indicators of patient safety, including obstetric trauma and foreign bodies left in:
  - Nearly all patients in OECD countries report positive *patient experiences*, including Canadians. However, the majority of OECD countries report better results than Canada on these indicators. For example, 81% of Canadians reported that their doctor spent enough time in consultation with them, ranking Canada below the OECD average (87%). Canada's relative performance is also below the OECD average for three other patient experience indicators, though the differences between countries are small. Canada performed 1 percentage point below OECD countries on *easy to understand doctor* (90%), *time to ask questions* (88%) and *involvement in decisions* (85%). In some countries, such as the United Kingdom, patient experience measures are used to provide financial incentives to health care providers who deliver patient-centred care.<sup>32</sup>
  - Canada's performance is among the worst for *foreign bodies left in after surgery*. These foreign bodies mostly include sponges or parts of medical devices left in the patient after a procedure.<sup>33</sup> Nearly all peer countries outperform Canada, with the exception of New Zealand and Australia. The Surgical Safety Checklist is an example of a surgical safety tool that has been recommended for use in all operating rooms in Canada. This list would remind operating room staff to perform a final count of equipment, such as sponges and instruments, to ensure that no foreign bodies are retained. The Canadian Patient Safety Institute's Safer Healthcare Now! program provides resources for health care organizations to guide their surgical safety improvement efforts through the use of the checklist.<sup>34</sup>
  - Canada performed poorly on a new OECD indicator, *post-operative pulmonary embolism and deep vein thrombosis*, or venous thromboembolism (VTE), in hip and knee replacements. VTE is one of the most common and preventable complications of hospitalization, and having protocols to avoid it is a Required Organizational Practice (an essential practice that organizations must have in place) for hospital accreditation.<sup>35</sup> Canada's rates for this incident were the third-highest among OECD countries, after New Zealand's and Australia's. This patient safety indicator is especially important, as rates of hip and knee replacements are on the rise in Canada. From 2010 to 2012, the number of hip and knee replacements in Canada increased by 15%, at a cost of more than \$100 million to the health care system.<sup>36</sup> It is important to note that these measures depend on the accurate recording of diagnoses and procedures in hospital records. The coding standards that CIHI developed and that are mandated by provincial ministries of health, together with practices in most Canadian hospitals, may lead to more complete recording and reporting of some of these events relative to other countries. Improvement resources to minimize VTE are available to health care organizations across Canada through the Canadian Patient Safety Institute.<sup>34</sup>
  - Canada performs poorly on both of the OECD's indicators of *obstetric trauma*, with 17% of instrument-assisted vaginal deliveries and 3% of deliveries without an instrument resulting in a laceration, or tear, to a woman's perineum during childbirth. In Canada, both of these rates are higher than in all peer countries (with the exception of Sweden, which reports tears in 4% of deliveries without an instrument). Trauma rates for instrument-assisted deliveries in Canada are nearly six times higher than for deliveries without the use of an instrument. Assisted delivery rates vary substantially across jurisdictions.<sup>37</sup> The rate of instrument-assisted deliveries in Canada is approximately 20% higher for rural women than for urban women.<sup>38</sup> Factors that have been shown to decrease rates of obstetric trauma include training programs for perineal protection and continuous monitoring during labour.<sup>39, 40</sup> Similar to other patient safety indicators, Canada's poor performance on this indicator may also be due to its robust data collection methods.

## In Focus: Bringing It All Together—Lung Cancer Mortality

This report presents a wide range of indicators that measure diverse dimensions of health and health system performance. Many relate to each other and can be used to explain Canada's overall performance and highlight areas for improvement. This In Focus section explores Canada's performance in lung cancer mortality, linking other indicators to provide insight into the future of lung cancer in Canada. <sup>41-46</sup>

### The Burden of Cancer in Canada

Cancer is the leading cause of death in Canada, accounting for 30% of all deaths.<sup>41</sup> Each day, 500 Canadians will be diagnosed with cancer and 200 will die from it.<sup>41</sup> Cancer is a heterogeneous group of conditions with different causes and clinical outcomes.<sup>47</sup> Some cancers are highly amenable to medical treatment (such as testicular and thyroid cancers), while others have a strong preventive component, such as lung and throat cancers. Of all cancer deaths in Canada, one-third could potentially be prevented and another one-third could be cured if detected earlier.<sup>48, 49</sup>

Canada ranks in the middle of OECD countries when it comes to overall cancer mortality, with rates falling just below the OECD average. The overall average score includes high performance in mortality for cervical, colorectal and prostate cancers but is offset by mortality for lung cancer that is higher than in most other countries. Most countries, including the United States, Sweden, Australia and Germany, perform better than Canada in lung cancer mortality. A large majority of lung cancer deaths are attributable to smoking,<sup>50</sup> so looking at Canada's smoking rates provides important context for Canada's poor performance on lung cancer mortality.

### *Lung Cancer in Canada*

An estimated 188,000 Canadians will be diagnosed with cancer in 2013, more than 1 in 10 of whom will be diagnosed with lung cancer.<sup>41</sup> The incidence of lung cancer in Canada was 56 per 100,000, higher than in most other countries.<sup>42, 43</sup> Rates are higher in males (60 per 100,000) than in females (47 per 100,000); however, since the 1980s, lung cancer incidence rates have been steadily declining in men but have been on the rise in women.<sup>41</sup> Lung cancer is frequently diagnosed at a late stage, and consequently survival is lower than for most cancers (the five-year relative survival rate for lung cancer is 15%).<sup>44, 45</sup> Though not reported in the OECD's *Health at a Glance*, five-year survival rates have been shown to be higher in Canada than in other countries.<sup>46</sup>

### Smoking in Canada: Major Improvements Made

Tobacco remains the leading cause of preventable disease and death in Canada. More than three-quarters of all lung cancers and 17% of all deaths in Canada can be attributed to smoking.<sup>50, 51</sup> Globally, tobacco is estimated to have caused 100 million deaths in the 20th century and is forecast to lead to 1 billion deaths in the 21st century if the current trend continues.<sup>52</sup> Canada's performance on smoking rates in youth and adults is among the best in the OECD countries. In 2011, 16% of Canadian adults were daily smokers, similar to rates in the United States (15%) and Australia (15%), all of which were lower than the OECD average of 21%.

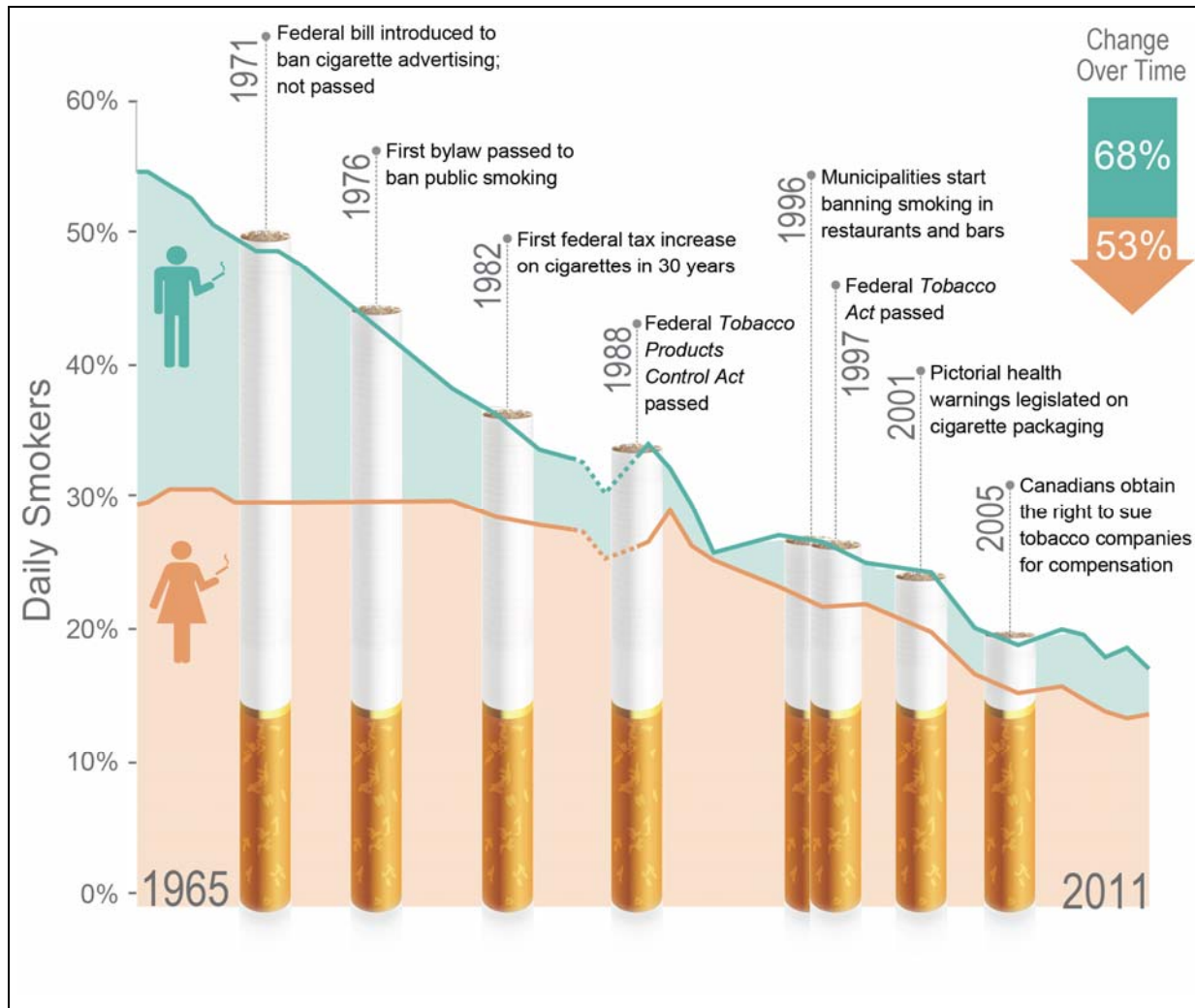
Smoking rates in Canada have not always been low. Since the mid-1960s, the percentage of men who smoke daily has decreased dramatically, and current smoking rates are less than half those in 1965 (Figure 5). Smoking in women began to decrease nearly a decade later in the mid-1970s and has also declined by about 50%. Overall smoking rates in women have always been lower than those in men; however, the gap between genders has narrowed over time. Recent evidence shows that rates in women age 15 to 19 are now similar to rates in men that age.<sup>53</sup> There also remains a disparity in smoking rates by income, with rates in the lowest income group being double those of the highest income group.<sup>54</sup>

Several public tobacco control policies and campaigns have helped contribute to the decline in Canada's smoking rates over the past four decades, and Canada was an early leader in tobacco control. In the early 1990s, the legal age to buy cigarettes was raised from 16 to 18.<sup>55</sup> Currently, the legal age to buy cigarettes is 18 or 19, depending on the province or territory.<sup>56</sup> In 1997, the *Tobacco Act* prohibited the display or marketing of cigarettes and ensured consistency in labelling and access to tobacco products.<sup>57</sup> In 2001, Canada was the



first country to implement pictorial health warnings on cigarette packages; these were required to cover half of the front and back of the packaging. Public smoking bans were enforced provincially beginning in 2004, and by 2010, legislation to limit public smoking was consistent across jurisdictions.<sup>57</sup> Cessation programs such as helplines and web-based programs exist throughout the country, although access to these programs has been shown to vary across populations in Canada (for example, there is reduced access among First Nations in Canada).<sup>58</sup>

Figure 5: Smoking Rates in Men and Women Age 15 and Older, Canada, 1965 to 2011



#### Note

Canada's data source changed between 1985 and 1988; data is therefore not directly comparable. See the OECD's methodological notes for more information.

#### Sources

Organisation for Economic Co-operation and Development. *OECD Health Data 2013*. Paris, France: OECD; 2013. <http://stats.oecd.org>.  
 National Collaborating Centre for Healthy Public Policy. <http://www.ncchpp.ca/timeline.html>. Accessed September 11, 2013.

## **Mortality From Lung Cancer in Canada: The Effects of Smoking**

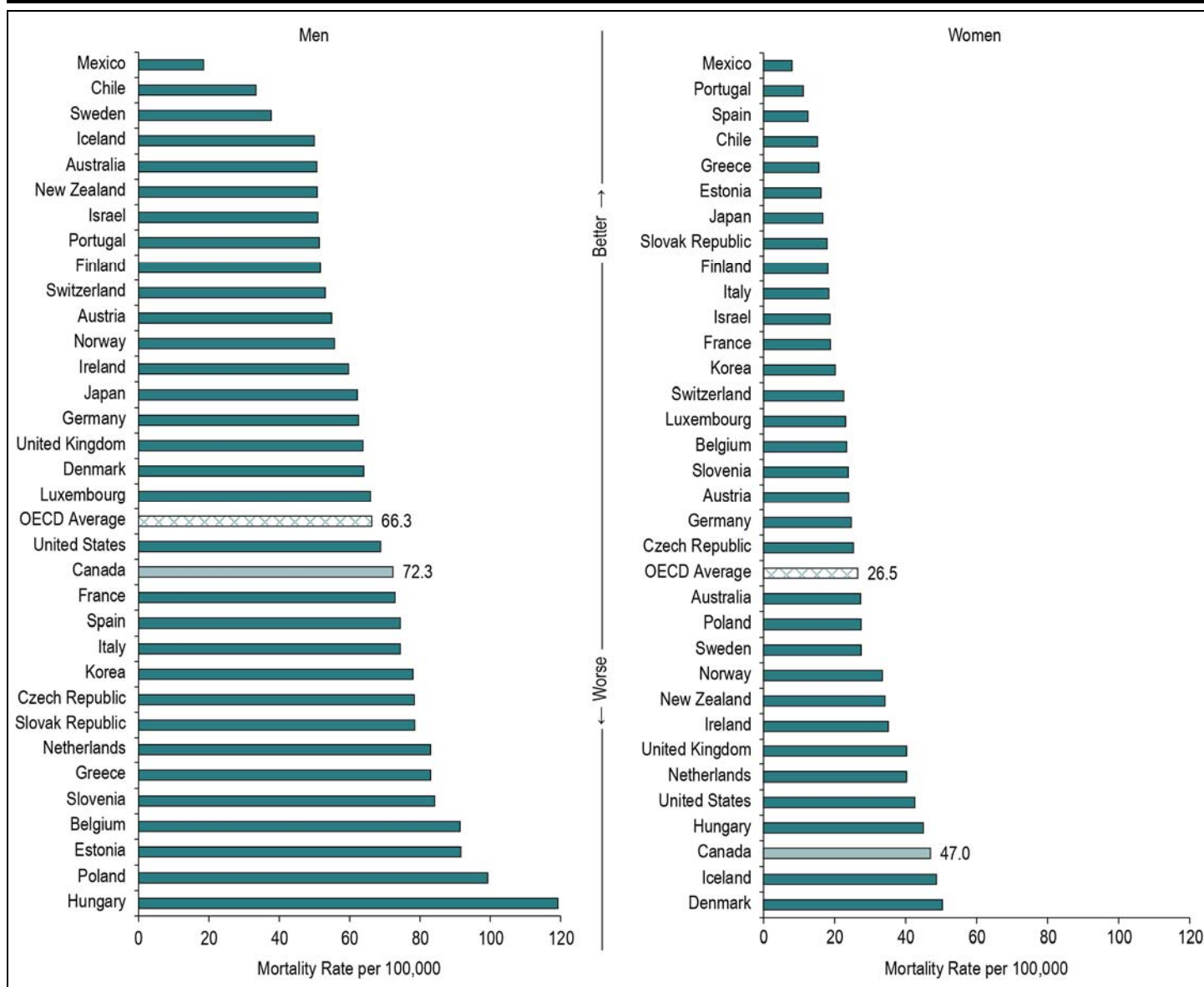
Despite low smoking rates, Canada's lung cancer mortality rates are among the highest in the OECD countries, especially among women. Only Hungary and the Netherlands have more lung cancer deaths per population than Canada. Lung cancer is the second most common cancer among Canadians and the leading cause of death out of all cancers. In fact, more people die from lung cancer than from prostate, breast and colorectal cancers combined.<sup>59</sup> In 2009, lung cancer was responsible for 19,110 deaths, or 8% of all of Canada's mortality.<sup>60</sup>

As with many carcinogens, there is a lag between exposure to smoking and the development of cancer. Research has shown that the lag time between exposure to smoking and the development of lung cancer ranges from 20 to 30 years.<sup>61</sup> Consequently, current lung cancer mortality rates are more reflective of smoking rates from 1990 than of current smoking rates. If we look back three decades, we can see that smoking rates were much higher in Canada than they are now, partially explaining why Canada's current mortality rates are so high. In 1990, nearly twice as many people smoked on a daily basis. Given the pathological development time of lung cancer, we can expect to see the effects of these decreases in smoking on lung cancer development and mortality in the near future.

## **Mortality From Lung Cancer in Canada: Gender Differences**

In all OECD countries, men have higher lung cancer mortality rates than women. Research suggests that this is primarily because of higher smoking rates in men, but other factors such as genetic differences, the presence of other illnesses and health behaviours also play a role.<sup>61</sup> Lung cancer develops differently in women than in men; research suggests that women tend to develop the disease at a younger age.<sup>61</sup> Women who have never smoked are also at a greater risk for developing lung cancer than men who have never smoked. This could be due to both genetic factors and increased exposure to second-hand smoke.<sup>61</sup> Five percent of Canadians reported exposure to second-hand smoke in the home in 2012.<sup>62</sup>

**Figure 6: Lung Cancer Mortality Rates per 100,000 Population, by Gender, OECD Countries, 2012 (or Nearest Year)**



**Note**

Mortality rates are age-standardized to the 2010 OECD population.

**Source**

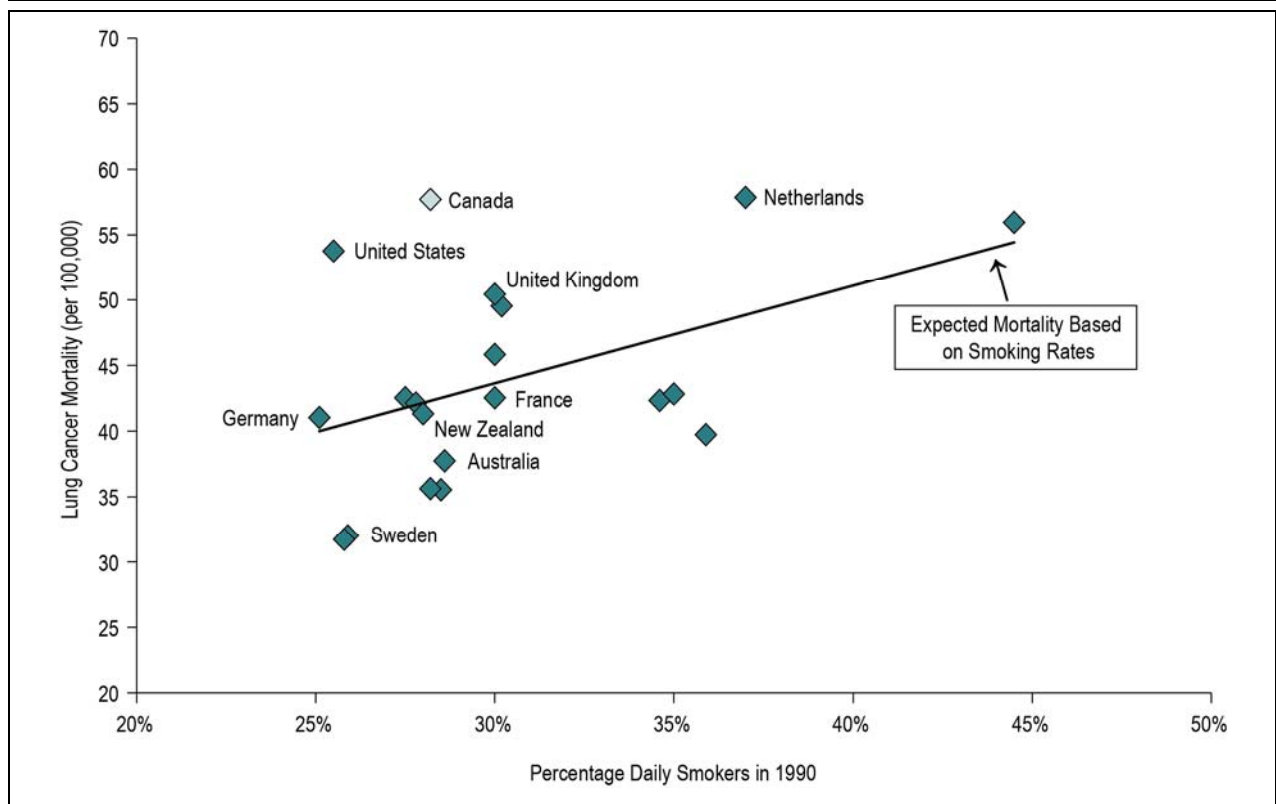
Organisation for Economic Co-operation and Development. *OECD Health Data 2013*. Paris, France: OECD; 2013. <http://stats.oecd.org>.

Though rates of lung cancer mortality for women were lower than those for men (47 versus 72 per 100,000 individuals), relative to other countries, Canada's performance on cancer mortality for men is better than for women (Figure 6). If we look back over the last 30 years, Canada's smoking rate among men has been consistently lower than the OECD's, while for women the smoking rate was at times higher than the OECD average. This may help explain why Canada's result for lung cancer mortality in men ranks better than its result for women, compared with the OECD average, even though lung cancer mortality is higher for Canadian men than women.

Historical smoking rates may serve to explain differences in lung cancer mortality rates between men and women; however, rates for both genders appear even higher than what is explained by smoking rates alone (Figure 7). Other risk factors for lung cancer also affect these mortality rates. The second leading cause of lung cancer is radon, a radioactive gas that is produced from rocks and soils.<sup>63</sup> Canada has low radon exposure

rates compared with other countries; the highest rates are reported in Mexico and the Czech Republic.<sup>64</sup> Another leading environmental cause of cancer is asbestos,<sup>65</sup> a group of fibrous materials used in insulation, fireproofing and building materials. Canada is one of the world's largest producers of asbestos,<sup>66</sup> with usage peaking in the 1960s and again in the 1980s.<sup>67</sup> Occupational risk factors, such as exposure to polycyclic aromatic hydrocarbons from coal mining, have also been shown to be carcinogenic after long-term exposures.<sup>65</sup> In addition to smoking, these environmental and occupational factors may help explain Canada's high mortality rates.

**Figure 7: Current Lung Cancer Mortality Rates per 100,000 Population (2012 or Nearest Year) and Historical Smoking Rates per 100 Population (1990 or Nearest Year) Among OECD Countries**



**Notes**

Only the peer countries are labelled.  
Mortality rates are age-standardized to the 2010 OECD population. Expected rates do not control for other risk factors for lung cancer.

**Source**

Organisation for Economic Co-operation and Development. *OECD Health Data 2013*. Paris, France: OECD; 2013. <http://stats.oecd.org>.

## A Promising Road Ahead: The Power of Prevention

Many factors may help to reduce lung cancer mortality rates in Canada, including early detection, effective treatment and prevention. Canada was an early leader in lung cancer prevention through a variety of tobacco control policies and campaigns. Given their effectiveness in reducing smoking in Canada, and the time frame in which lung cancer develops, we can expect to see a reduction in lung cancer mortality in the near future. The Canadian Partnership Against Cancer estimates that if Canada's smoking rates were reduced by half, 33,000 deaths from lung cancer would be avoided by 2030.<sup>68</sup> The younger a person starts smoking, the greater his or her risk of developing lung cancer and the harder it is to quit.<sup>69</sup> Canada's youth smoking rate is among the lowest in the OECD, with 8% of children smoking, on par with the United States (also 8%). These reductions in smoking will likely become apparent in future lung cancer development, and Canada's below-average performance in mortality is expected to improve.

Preventing lung cancer by reducing smoking involves a variety of policies, campaigns and research. The success of this multi-faceted approach may be instructive for future strategies to address other risk factors where Canada's results show room for improvement. For example, Canada's childhood obesity rates are among the highest in the OECD and are on the rise. The use of a multi-faceted approach could reverse this trend and would serve to improve Canada's future performance on a variety of diseases, including cancer, type 2 diabetes and cardiovascular disease.

## Conclusions

There is immense value in international comparisons, despite potential data and methodological limitations when comparing health performance indicators across countries. A comparison of Canada's performance with that of OECD countries and our peer countries reveals considerable variation in results, and no individual country has better performance than Canada across all indicators. For indicators where Canada has significant room for improvement, Canada can look to the top performers for shared learning and novel policy initiatives.

The indicators presented in this report cover a range of dimensions of health system performance, many of which are closely related and interlinked. Long wait times, for example, can influence quality of care results such as patient experiences and acute care outcomes. Non-medical determinants of health are highly related to overall health status and health care outcomes, emphasizing the importance of prevention and broader governmental action; Canada's current lung cancer mortality rates, for example, reflect historical smoking rates. Disease risk factors in children are of special concern, as they can likely foreshadow health system utilization for years to come. Looking to other countries for strategies that reduce the prevalence of overweight and obesity in children could decrease the burden of future chronic diseases in Canada and in turn improve the health of Canadians.

## Acknowledgements

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## Appendix A: Member States of the OECD

- Australia\*
- Austria
- Belgium
- Canada
- Chile
- Czech Republic
- Denmark
- Estonia
- Finland
- France\*
- Germany\*
- Greece
- Hungary
- Iceland
- Ireland
- Israel
- Italy
- Japan
- Korea
- Luxembourg
- Mexico
- Netherlands\*
- New Zealand\*
- Norway
- Poland
- Portugal
- Slovak Republic
- Slovenia
- Spain
- Sweden\*
- Switzerland
- Turkey
- United Kingdom\*
- United States\*

### Note

\* Referred to collectively in this report as peer countries.

## Appendix B: Indicator Names and Definitions

**Table B1: Indicator Labels and Descriptions**

Indicator Label	Indicator Description
<b>Health Status</b>	
Type 1 Diabetes Incidence: Children	Estimated number of new cases of type 1 diabetes among children age 0–14 years, per 100,000
Diabetes Prevalence: Adults	Estimated percentage of adults age 20–79 with diabetes mellitus (type 1 and type 2)*
Cancer Mortality (F)	Number of deaths due to cancer per 100,000 population; reported separately for males and females <sup>†</sup>
Cancer Mortality (M)	
Lung Cancer Mortality (F)	Number of deaths due to lung cancer per 100,000 population; reported separately for males and females <sup>†</sup>
Lung Cancer Mortality (M)	
Heart Disease Mortality	Number of deaths due to ischemic heart disease per 100,000 population <sup>†</sup>
Stroke Mortality	Number of deaths due to cerebrovascular diseases per 100,000 population <sup>†</sup>
Transport Accident Mortality (F)	Number of deaths due to transport accidents per 100,000 population; reported separately for males and females <sup>†</sup>
Transport Accident Mortality (M)	
Suicide	Number of deaths due to suicide per 100,000 population <sup>†</sup>
Infant Mortality	Deaths of children younger than 1 year per 1,000 live births
Low Birth Weight	Number of live births weighing less than 2,500 grams as a percentage of total number of live births
Perceived Health Status	Percentage of adults who report their health to be “good” or better
Life Expectancy at Birth	Average number of years that a person can be expected to live, assuming that age-specific mortality levels remain constant
<b>Non-Medical Determinants of Health</b>	
Physical Activity: Age 11 (F)	Percentage of 11-year-olds who report at least one hour of moderate to vigorous physical activity daily; reported separately for males and females
Physical Activity: Age 11 (M)	
Physical Activity: Age 15 (F)	Percentage of 15-year-olds who report at least one hour of moderate to vigorous physical activity daily; reported separately for males and females
Physical Activity: Age 15 (M)	
Fruit Consumption: Age 15 (F)	Percentage of 15-year-olds who report eating fruit at least every day or more than once a day; reported separately for males and females
Fruit Consumption: Age 15 (M)	
Vegetable Consumption: Age 15 (F)	Percentage of 15-year-olds who report eating vegetables at least every day or more than once a day; reported separately for males and females
Vegetable Consumption: Age 15 (M)	
Smoking: Age 15 (F)	Percentage of 15-year-olds who report smoking at least once per week; reported separately for males and females
Smoking: Age 15 (M)	
Drunkenness: Age 15 (F)	Percentage of 15-year-olds who report having been drunk twice or more in their lives; reported separately for males and females
Drunkenness: Age 15 (M)	
Fruit Consumption: Adults (F)	Percentage of the population age 15+ who report eating fruit at least once per day; reported separately for males and females
Fruit Consumption: Adults (M)	
Vegetable Consumption: Adults (F)	Percentage of the population age 15+ who report eating vegetables at least once per day; reported separately for males and females
Vegetable Consumption: Adults (M)	
Smoking: Adults (F)	Percentage of the population age 15+ who report that they are daily smokers; reported separately for males and females
Smoking: Adults (M)	
Alcohol Consumption: Adults	Average annual alcohol consumption in litres per capita (age 15+)
Obesity Reported: Adults (F)	Percentage of adults who are obese (body mass index higher than 30 kg/m <sup>2</sup> ), self-report; reported separately for males and females
Obesity Reported: Adults (M)	

(cont'd on next page)

**Table B1: Indicator Labels and Descriptions (cont'd)**

Indicator Label	Indicator Description
Non-Medical Determinants of Health (cont'd)	
Overweight/Obesity Reported: Age 15 (F)	Percentage of 15-year-olds who are overweight or obese (based on self-reported height and weight using the International Obesity Task Force BMI cut-points); reported separately for males and females
Overweight/Obesity Reported: Age 15 (M)	
Access to Care	
Out-of-Pocket Spending: Total	Out-of-pocket spending on health care as a percentage of total household spending
Out-of-Pocket Spending: Dentist	Out-of-pocket dental expenditure as a percentage of total dental expenditure
Inequality in Physician Visits	Horizontal inequity index for the probability of a doctor visit (0 = no difference in probability based on income); index is adjusted for need
Inequality in Dental Visits	Difference in the probability of a dental visit between the lowest and highest income quintiles
Inequality in Cervical Cancer Screening	Difference in cervical cancer screening in the past three years between the lowest and highest income quintiles (among women age 20–69)
Inequality in Breast Cancer Screening	Difference in breast cancer screening in the past two years between the lowest and highest income quintiles (among women age 50–69)
Wait Time: Cataract Surgery	Median wait time (in days) from specialist assessment to cataract surgery
Wait Time: Hip Replacement	Median wait time (in days) from specialist assessment to hip replacement
Wait Time: Knee Replacement	Median wait time (in days) from specialist assessment to knee replacement
Quality of Care	
Influenza Vaccination: 65+	Percentage of adults age 65+ who received an influenza vaccination within the past year
Avoidable Admissions: COPD	Number of hospital discharges for chronic obstructive pulmonary disease, people age 15+, per 100,000 population <sup>‡</sup>
Avoidable Admissions: Asthma	Number of hospital discharges for asthma, people age 15+, per 100,000 population <sup>‡</sup>
Avoidable Admissions: Diabetes	Number of hospital discharges for diabetes, people age 15+, per 100,000 population <sup>‡</sup>
Time Spent With Doctor	Percentage of adults who report that their regular doctor spent enough time with them <sup>‡</sup>
Easy to Understand Doctor	Percentage of adults who report that their regular doctor explains things in a way that is easy to understand <sup>‡</sup>
Time to Ask Questions	Percentage of adults who report that their regular doctor gave them an opportunity to ask questions or raise concerns <sup>‡</sup>
Involvement in Decisions	Percentage of adults who report that their regular doctor involved them as much as they wanted in decisions about their care and treatment <sup>‡</sup>
Breast Cancer Screening (Survey)	Percentage of women age 50–69 who report having had a mammogram within the last two years (or according to the specific screening frequency recommended in each country)
Breast Cancer Survival	Five-year relative survival rate for breast cancer <sup>§</sup>
Breast Cancer Mortality	Number of deaths due to breast cancer, per 100,000 females <sup>†</sup>
Cervical Cancer Screening (Survey)	Percentage of women age 20–69 who report having had a Papanicolaou (Pap) smear test within the last three years (or according to the specific screening frequency recommended in each country)
Cervical Cancer Survival	Five-year relative survival rate for cervical cancer <sup>§</sup>
Cervical Cancer Mortality	Number of deaths due to cervical cancer, per 100,000 females <sup>†</sup>
Colorectal Cancer Survival	Five-year relative survival rate for colorectal cancer <sup>§</sup>
Colorectal Cancer Mortality	Number of deaths due to colorectal cancer, per 100,000 population <sup>†</sup>
Foreign Body Left In	Rate of a foreign body left inside the patient's body during a procedure, per 100,000 medical and surgical discharges (age 15+)**
Post-Op PE/DVT: Total	Rate of post-operative pulmonary embolism or deep vein thrombosis, per 100,000 surgical discharges (age 15+)**

(cont'd on next page)

**Table B1: Indicator Labels and Descriptions (cont'd)**

Indicator Label	Indicator Description
<b>Quality of Care (cont'd)</b>	
Post-Op PE/DVT: Hip and Knee	Rate of post-operative pulmonary embolism or deep vein thrombosis, per 100,000 discharges for hip and knee replacement (age 15+)**
Post-Op Sepsis: Total	Rate of post-operative sepsis, per 100,000 surgical discharges (age 15+)**
Post-Op Sepsis: Abdominal	Rate of post-operative sepsis, per 100,000 discharges for abdominal surgery (age 15+)**
OB Trauma: Instrument	Percentage of vaginal deliveries with third- or fourth-degree obstetric trauma; reported separately for instrument-assisted vaginal deliveries and vaginal deliveries without instrument assistance
OB Trauma: No Instrument	
30-Day In-Hospital Fatality: AMI	Percentage of patients (age 45+) who die in hospital within 30 days of being admitted with a primary diagnosis of acute myocardial infarction <sup>††</sup>
30-Day In-Hospital Fatality: Ischemic Stroke	Percentage of patients (age 45+) who die in hospital within 30 days of being admitted with a primary diagnosis of ischemic stroke <sup>‡‡</sup>

**Notes**

\* Age-standardized to world standard population.

† Age-standardized to 2010 OECD population.

‡ Age–sex-standardized to 2010 OECD population.

§ Age-standardized to International Cancer Survival Standards population.

\*\* Adjusted for the average number of secondary diagnoses.

†† Age–sex-standardized to 2010 OECD population age 45+ admitted to hospital for AMI.

‡‡ Age–sex-standardized to 2010 OECD population age 45+ admitted to hospital for stroke.

## References

1. Canadian Institute for Health Information. *Learning From the Best: Benchmarking Canada's Health Care System*. Ottawa, ON: CIHI; 2011.
2. McPake B., Mills A. What can we learn from international comparisons of health systems and health system reform. *Bulletin of the World Health Organization*. 2000;78(6):811-818.
3. Australian Institute of Health and Welfare. *A Working Guide to International Comparisons of Health*. Canberra, Australia: AIHW; 2012.
4. Hines S., Joshi M.S. Variation in quality of care within health systems. *Jt Comm J Qual Patient Saf*. 2008;34(6):326-332.
5. Canadian Institute for Health Information. *Exploring the 70/30 Split: How Canada's Health Care System Is Financed*. Ottawa, ON: CIHI; 2005.
6. Canadian Society of Exercise Physiology. Canadian Physical Activity Guidelines. [http://www.csep.ca/CMFiles/Guidelines/CSEP\\_PAGuidelines\\_youth\\_en.pdf](http://www.csep.ca/CMFiles/Guidelines/CSEP_PAGuidelines_youth_en.pdf). Updated 2013. Accessed June 25, 2013.
7. Organisation for Economic Cooperation and Development. About the OECD. <http://www.oecd.org/about/>. Updated 2013. Accessed June 24, 2013.
8. Organisation for Economic Cooperation and Development. *OECD Health Data*. Paris, France: OECD; 2013.
9. Joseph K.S. et al. Influence of definition based versus pragmatic birth registration on international comparisons of perinatal and infant mortality: population based retrospective study. *BMJ*. 2012;334
10. Canadian Stroke Network. *The Quality of Stroke Care in Canada*. Ottawa, ON: CSN; 2011.
11. Statistics Canada. Infant Mortality rates, by province and territory. <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/health21a-eng.htm>. Updated 2012. Accessed August 15, 2013.
12. Public Health Agency of Canada. *Diabetes in Canada: Facts and Figures From a Public Health Perspective*. Ottawa, ON: PHAC; 2011. <http://www.phac-aspc.gc.ca/cd-mc/publications/diabetes-diabete/facts-figures-faits-chiffres-2011/chap6-eng.php>.
13. Canadian Diabetes Association and Diabetes Quebec. *Diabetes: Canada at the Tipping Point*. Toronto, ON: CDA; 2011.
14. Tarlov A.R. Public Policy Frameworks for Improving Population Health. *Annals of the New York Academy of Sciences*. 1999;896:281-293.
15. World Health Organization. Alcohol. [http://www.who.int/topics/alcohol\\_drinking/en/](http://www.who.int/topics/alcohol_drinking/en/). Updated 2013.
16. Her Majesty the Queen in Right of Canada represented by the Minister of Health Canada. *Canada's Food Guide*. 2011.
17. Rasmussen M. et al. Determinants of Fruit and Vegetable Consumption among Children and Adolescents: A Review of the Literature. Part 1: Quantitative Studies. *International Journal of Behavioural Nutrition and Physical Activity*. 2006;3(22)



18. Smith D. *Policies in Schools and School Boards in Canada Which Encourage the Availability of Healthy and/or Local Foods and the Factors That Influence Their Implementation*. Ottawa, ON: The Ottawa Hospital; 2010. <http://www.justfood.ca/foodforall/wp-content/uploads/documents/School%20Food%20Policies%20in%20Canada.pdf>.
19. European Commission. *Report From the Commission to the European Parliament and the Council*. Brussels, Belgium: EU; 2012.
20. World Health Organization. Obesity and overweight. <http://www.who.int/mediacentre/factsheets/fs311/en/>. Updated 2013. Accessed June 24, 2013.
21. National Cancer Institute. Obesity and Cancer Risk. <http://www.cancer.gov/cancertopics/factsheet/Risk/obesity>. Updated 2013. Accessed June 24, 2013.
22. Brill, A. The Long-Term Returns of Obesity Prevention Policies. <http://www.rwjf.org/en/research-publications/find-rwjf-research/2013/04/the-long-term-returns-of-obesity-prevention-programs.html>. Robert Wood Johnson Fund Updated 2013.
23. Flynn M.A. et al. Reducing obesity and related chronic disease risk in children and youth: a synthesis of evidence with 'best practice' recommendations. *Obesity Reviews*. 2006;7(Suppl 1):7-66. [http://publichealth.lacounty.gov/nut/Evidence-basedStrategies/2005%20Obes%20Res\\_Review%20Article.pdf](http://publichealth.lacounty.gov/nut/Evidence-basedStrategies/2005%20Obes%20Res_Review%20Article.pdf).
24. Janssen I. et al. Comparison of overweight and obesity prevalence in school-aged youth from 34 countries and their relationships with physical activity and dietary patterns. *Obesity Reviews*. 2005;6(2):123-132.
25. Sheilds M. and Tremblay M.S. *Sedentary Behaviour and Obesity*. Ottawa, ON: Statistics Canada; 2008.
26. Health Canada. *First Minister's Meeting on the Future of Health Care 2004*. 2004. <http://www.hc-sc.gc.ca/hcs-sss/delivery-prestation/fptcollab/2004-fmm-rpm/index-eng.php>.
27. The Commonwealth Fund. *International Health Policy Survey in Eleven Countries*. New York, USA: 2010. [http://www.commonwealthfund.org/~media/Files/Publications/In%20the%20Literature/2010/Nov/Int%20Survey/PDF\\_2010\\_IHP\\_Survey\\_Chartpack\\_FINAL\\_white\\_bkgd\\_111610\\_ds.pdf](http://www.commonwealthfund.org/~media/Files/Publications/In%20the%20Literature/2010/Nov/Int%20Survey/PDF_2010_IHP_Survey_Chartpack_FINAL_white_bkgd_111610_ds.pdf).
28. Ontario Agency for Health Protection and Promotion (Public Health Ontario). *Report on Access to Dental Care and Oral Health Inequalities in Ontario*. Toronto, ON: Queen's Printer for Ontario; 2012.
29. World Health Organization. *Quality of Care: A Process for Making Strategic Choices in Health Systems*. Geneva, Switzerland: WHO; 2006.
30. Ayoub J.P.M. et al. Advances in the management of metastatic breast cancer: options beyond first-line chemotherapy. *Current Oncology*. 2012;19(2) Accessed June 24, 2013.
31. Goss G.D. et al. Recent advances in the treatment of non-small cell lung cancer. *Anticancer Drugs*. 1996;7(4):363-385. <http://www.cancer.org/cancer/lungcancer-non-smallcell/detailedguide/non-small-cell-lung-cancer-after-lifestyle-changes>. Accessed June 24, 2013.
32. Department of Health. *The Operating Framework for the NHS in England 2012/13*. England: 2011.
33. Chen Q. et al. Detecting patient safety indicators: How valid is "foreign body left during procedure" in the Veterans Health Administration? *J Am Coll Surg*. 2011;212(6):977-983. <http://www.ncbi.nlm.nih.gov/pubmed/21489830>.

34. Canadian Patient Safety Institute. Safer Healthcare Now! <http://www.saferhealthcarenow.ca/EN/Interventions/SafeSurgery/Pages/default.aspx>. Updated 2012. Accessed August 19, 2013.
35. Accreditation Canada. *Required Organizational Practices Handbook*. Ottawa, ON: Accreditation Canada; 2013.
36. Canadian Institute for Health Information. *Wait Times for Priority Procedures in Canada, 2013*. Ottawa, ON: CIHI; 2013.
37. Canadian Institute for Health Information. *Quick Stats: Childbirth Indicators by Place of Residence 2011-2013*. 2013. Accessed August 19, 2013.
38. Canadian Institute for Health Information. *Hospital Births in Canada: A Focus on Women Living in Rural and Remote Areas*. Ottawa, ON: CIHI; 2013.
39. Laine K. et al. Incidence of obstetric anal sphincter injuries after training to protect the perineum: cohort study. *BMJ Open*. 2012;2(e001649)
40. Jander C., Lyrenas S. Third and fourth degree perineal tears. Predictor Factors in a referral hospital. *Acta Obstet Scand*. 2001;80(3):229-234.
41. Canadian Cancer Society. Canadian Cancer Statistics 2013. Updated 2013.
42. Cancer Research UK. Cancer Incidence Worldwide. <http://publications.cancerresearchuk.org/downloads/Product/worldmap.pdf>. Updated 2011. Accessed August 19, 2013.
43. Statistics Canada. New cases and age-standardized rate for ICD-O-3 primary sites of cancer (based on the July 2011 CCR tabulation file), by sex, Canada, provinces and territories. Updated 2013. Accessed August 19, 2013.
44. Leatherman S. and Sutherland K. *Quality of Healthcare in Canada: A Chartbook*. Ottawa, ON: CHSRF; 2010.
45. Walters S. et al. Lung Cancer survival and stage at diagnosis in Australia, Canada, Denmark, Norway, Sweden and the UK: a population-based study, 2004-2007. *Thorax*. 2013;68:551-564.
46. Coleman M.P. et al. Cancer survival in Australia, Canada, Denmark, Norway, Sweden, and the UK, 1995-2007 (the International Cancer Benchmarking Partnership): an analysis of population-based cancer registry data. *Lancet*. 2011;8(377):127-138. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3018568/>.
47. World Health Organization. Cancer. <http://www.who.int/mediacentre/factsheets/fs297/en/>. Updated 2013. Accessed June 24, 2013.
48. World Health Organization. Cancer Prevention. <http://www.who.int/cancer/prevention/en/>. Updated 2013. Accessed June 24, 2013.
49. Worldwide Breast Cancer. Breast Cancer Statistics Worldwide. Updated 2011. Accessed July 5, 2013.
50. Cancer Care Ontario. Facts About Tobacco. Updated 2013. Accessed July 5, 2013.
51. Health Canada. Health Concerns: Smoking and Mortality. Updated 2013. Accessed July 5, 2013.

52. World Health Organization. Tobacco. <http://www.who.int/mediacentre/factsheets/fs339/en/>. Updated 2013. Accessed July 5, 2013.
53. Propel Centre for Population Health Impact. *Tobacco Use in Canada: Patterns and Trends 2013 Edition*. Waterloo, ON: Propel; 2013.
54. Conference Board of Canada. *Profile of Tobacco Smokers in Canada*. Ottawa, ON: Conference Board of Canada; 2013. [http://www.conferenceboard.ca/press/newsrelease/13-04-11/smoking\\_still\\_prevalent\\_in\\_segments\\_of\\_canadian\\_society.aspx](http://www.conferenceboard.ca/press/newsrelease/13-04-11/smoking_still_prevalent_in_segments_of_canadian_society.aspx).
55. Chenier N.M. and Robertson J. Tobacco Smoking. <http://publications.gc.ca/Collection-R/LoPBdP/CIR/8622-e.htm>. Updated 1997. Accessed June 25, 2013.
56. Propel Centre for Population Health Impact. Tobacco Use in Canada Patterns and Trends - 2012 Edition. [http://www.tobaccoreport.ca/2012/ytu\\_soc\\_age15\\_19.cfm](http://www.tobaccoreport.ca/2012/ytu_soc_age15_19.cfm). Updated 2012. Accessed June 25, 2013.
57. Propel Centre for Population Health Impact. *Tobacco Use in Canada: Patterns and Trends Supplement: Tobacco Control Policies in Canada*. Waterloo, ON: Propel; 2013.
58. The Lung Association. *Making Quit Happen: Canada's Challenges to Smoking Cessation*. Ottawa, ON: The Lung Association; May 31, 2008.
59. Canadian Partnership Against Cancer. *Lung Cancer in Canada: A Supplemental System Performance Report*. Toronto, ON: CPAC; May, 2011. <http://www.partnershipagaincancer.ca/wp-content/uploads/Lung-Cancer-in-Canada-A-Supplemental-System-Performance-Report.pdf>.
60. Statistics Canada. *Mortality, Summary List of Causes*. 2009.
61. Brigham and Women's Hospital and Harvard Medical School. *Out of the Shadows: Women and Lung Cancer*. Boston, Mass: Brigham and Women's Hospital; 2010.
62. Statistics Canada. Exposure to second-hand smoke at home, 2012. <http://www.statcan.gc.ca/pub/82-625-x/2011001/article/11460-eng.htm>. Updated 2011. Accessed June 25, 2013.
63. Health Canada. Environmental and Workplace Health: Radon. <http://www.hc-sc.gc.ca/ewh-semt/radiation/radon/index-eng.php>. Updated 2013. Accessed June 25, 2013.
64. World Health Organization. *WHO Handbook on Indoor Radon: A Public Health Perspective*. Geneva, Switzerland: WHO; 2009. [http://whqlibdoc.who.int/publications/2009/9789241547673\\_eng.pdf](http://whqlibdoc.who.int/publications/2009/9789241547673_eng.pdf).
65. Motorykin O. et al. Association of Carcinogenic Polycyclic Aromatic Hydrocarbon Emissions and Smoking with Lung Cancer Mortality Rates on a Global Scale. *Environmental Science and Technology*. 2013;47:3410-3416.
66. The National Conversation on Asia. *Backgrounder: Canada and Asbestos: A Historical Survey of Canadian Asbestos Production*. 2013. [http://www.asiapacific.ca/sites/default/files/2\\_-\\_canada\\_and\\_asbestos\\_final\\_v2\\_sept\\_6\\_0.pdf](http://www.asiapacific.ca/sites/default/files/2_-_canada_and_asbestos_final_v2_sept_6_0.pdf).
67. Marrett L. *Asbestos and Cancer in Ontario and The Occupational Research Centre*. March 3, 2010. <http://occupationalcancer.ca/wp-content/uploads/2010/06/Marrett-L.-Asbestos-and-cancer-in-Ontario-and-the-OCRC.-Asbestos-Think-Tank.-03.03.10.pdf>.

68. Canadian Partnership Against Cancer. *Sustained Action: Toward a Shared Vision*. Toronto, ON: CPAC; 2012. <http://www.partnershipagainstcancer.ca/wp-content/uploads/Sustaining-Action-Toward-a-Shared-Vision-Full-Document.pdf>.
69. National Cancer Institute. Smoking Initiation. [http://progressreport.cancer.gov/doc\\_detail.asp?pid=1&did=2007&chid=71&coid=703&mid](http://progressreport.cancer.gov/doc_detail.asp?pid=1&did=2007&chid=71&coid=703&mid). Updated 2012. Accessed June 24, 2013.