January 23, 2014

International Comparisons: A Focus on Quality of Care

Executive Summary

Quality of health care services is a concern for many countries in the world, including Canada. Although each country is unique, policy-makers, practitioners and service users may benefit from international comparisons, which are an insightful tool that can help establish priorities for improvement, set goals and motivate stakeholders to act.

The Organisation for Economic Co-operation and Development (OECD) is a reliable source of international data on various areas of economic and social well-being, including health care. It collects data for indicators of quality of care for more than 30 countries. These indicators are used in this report to provide an in-depth look at Canada’s health system compared with health systems in other OECD countries. An accompanying interactive web display takes the analysis one step further, comparing results for Canada’s provinces with those of OECD countries.

Key findings include the following:

- Canada performs well on several measures of effectiveness of care, such as avoidable admissions, influenza vaccinations in seniors and cancer care for selected cancers.
- Canada falls behind most other OECD countries on measures of patient safety in the acute care setting. Though this result may be partially explained by Canada’s thorough reporting of adverse events, there is clear opportunity for improvement.
- International comparisons are valuable for enhancing quality of care. The indicators have been evolving and improving; however, the comparability of data, populations and cultures must be considered before drawing conclusions. Despite this, international comparisons can direct priority-setting and point to areas where funds and efforts can be allocated to improve overall care and, in turn, the health of the population.
Introduction

The OECD is a comprehensive and reliable source of international data on various economic and social areas, including health care. It has developed indicators that can be used to compare policies from various countries, learn from good performers and coordinate benchmarking activities between countries. In 2001, the OECD initiated a project to develop a set of quality of care indicators that could be compared internationally. As of 2013, this list had grown to include more than 30 indicators that measure the effectiveness, safety and patient-centredness of health care. Many of these indicators are reported in the OECD’s biennial report, Health at a Glance; the latest edition of this report was released in November 2013. At the same time, the Canadian Institute for Health Information (CIHI) released International Comparisons: Benchmarking Canada’s Health System, which focused on Canada’s performance relative to that of OECD countries on four groups of indicators (health status, non-medical determinants of health, access to care and quality of care).

This report provides an in-depth analysis of a smaller set of quality of care indicators collected by the OECD. These comparisons can help us to understand and determine benchmarks and targets (what Canada might be able to achieve) and to identify best performers (which countries have the best results and what they are achieving).

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

CIHI, in collaboration with Statistics Canada, reports a number of quality of care 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 results 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.

International comparisons can enhance accountability and promote benchmarking and mutual learning, though there are some important considerations when comparing indicators from different countries. No two health systems are identical, and variation in indicator results can be due to differences in three major areas: data, populations and health systems.

- Variation in indicator results can arise from data collection (method of collection and coding), data quality (missing data, coverage) and the data years available. In order to minimize these differences, where possible, the most recent data collected by similar systems was used. Specific cautions are presented in this report alongside indicator results.
- Differences in populations, such as the age and sex distributions of the population, may also result in indicator variation. To reduce this type of variability, certain indicator results are age- and sex-standardized.
- At the health system level, variability can be attributed to a number of factors, including health system centralization, funding, stewardship and services provided. Issues affecting the comparability of quality of care measures across countries are documented in the OECD’s Health at a Glance.

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i. This report used the OECD’s quality of care framework and indicators that were developed based on this framework.

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Quality of Care: An Overview

When asked about the most important feature of their health care system, an overwhelming majority of Canadians rate quality of care as one of the most important dimensions of performance, together with access to care. The OECD defines quality of care as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.” Quality of care encompasses effectiveness, safety and patient-centredness.

Quality of care is a concern for many countries regardless of their funding system or structure. International studies have identified several factors that lead to high quality of care. These include committed leadership, performance measurement, efficient learning strategies and continuous improvement. The World Health Organization notes that quality of care improvements are the responsibility of policy-makers, health care providers and service users. The best results occur when these three groups work together to develop and implement strategies that improve health care delivery.

In Canada, following the 2003 First Ministers’ Accord on Healthcare Renewal, governments have explored quality and safety in health care at many levels of the health care system. CIHI plays a national role in collecting data, developing measures and conducting analyses on quality and safety topics. Also at the national level, the Canadian Patient Safety Institute and Accreditation Canada lead country-wide work on quality and patient safety. Provincial and territorial governments have established provincial quality councils, health and welfare commissions and other organizations that guide patient safety and quality work. Additionally, quality and patient safety are priorities for health regions, hospitals and health care organizations.

Methodology

Sources and methods: To improve inter-country comparability, the most recent data for the period 2009 to 2012 was used for each indicator. Data was downloaded from the OECD’s StatsExtract website or taken directly from Health at a Glance 2013. 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, as well as OECD Health Data Definitions, Sources and Methods. Detailed information on Canadian data sources can be found in the interactive web display.

OECD countries and peer countries: When comparing Canadian results internationally, we examined Canada’s performance among all 34 OECD countries but focused on countries that are most similar to Canada. Based on a scan of 26 international studies, we determined that the most relevant peer comparators are Australia, France, Germany, the Netherlands, New Zealand, Sweden, the United Kingdom and the United States. These peer OECD countries, like Canada, have larger and more developed economies, comparable levels of resources to devote to health and comparable data collection systems.

As of September 2013, the member countries of the OECD were the following:

<table>
<thead>
<tr>
<th>Australia*</th>
<th>Czech Republic</th>
<th>Germany*</th>
<th>Israel</th>
<th>Mexico</th>
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<td>Austria</td>
<td>Denmark</td>
<td>Greece</td>
<td>Italy</td>
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<td>Slovak Republic</td>
<td>Turkey</td>
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<td>Belgium</td>
<td>Estonia</td>
<td>Hungary</td>
<td>Japan</td>
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<td>Iceland</td>
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<td>United States*</td>
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<td>Chile</td>
<td>France*</td>
<td>Ireland</td>
<td>Luxembourg</td>
<td>Poland</td>
<td>Sweden*</td>
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Note
* Referred to collectively in this report as peer countries.
Canada’s results on quality of care indicators show areas where performance is among the best of the OECD countries and others where there is a need for improvement (Figure 1). Presented quality of care indicators are directional; that is, we can state that higher values (as in the case of influenza vaccinations) or lower values (as in the case of mortality) reflect better performance. Indicators in the figure are standardized such that points above the OECD average line denote better performance and those below the average line indicate poorer performance than the OECD average. Indicators have been grouped into five categories: care in the community; patient experience; cancer care; patient safety; and acute care outcomes. Overall, Canada performs well for care in the community and cancer care. Results are generally poor for patient experience and patient safety indicators. Results are mixed for acute care outcomes.

**Figure 1: 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.

The vertical scale is a standardized score, representing the relative distance (standard deviation) from the OECD average (0.0) for each indicator. 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. For more information on interpreting the performance profile, see *International Comparisons: Benchmarking Canada’s Health Care System*.[14]

**Source**


The following sections will provide more detail on Canada’s performance in each category of indicators, starting with care provided in the community.

Care in the Community

Most care provided to Canadians is delivered outside of the hospital, in the community. Though most OECD quality of care indicators are captured at the hospital level, some measure quality of care in the community. These contain measures of prevention and treatment, including immunizations for influenza in seniors and hospital admissions for conditions that can potentially be treated in the community. Overall, Canada does well compared with other OECD countries on these indicators, performing in the top quarter for three of the four indicators.

Influenza Vaccinations: 65+

Influenza is a viral infection that spreads easily through populations. Each year, about 10% to 25% of Canadians will have influenza.\(^{15}\) The virus can cause severe complications and death in high-risk individuals (mostly people older than 65).\(^{16}\)

Vaccination is one of the most effective ways to prevent influenza; it can reduce illness and complications in seniors by 60% and reduce deaths by 80%.\(^{15,16}\) Influenza vaccines are regularly updated to address changing influenza strains, so immunizations are required annually. After vaccination, the immune system produces antibodies against the virus in the vaccine, which will prevent or decrease the severity of infection if exposed.\(^{15}\)

The average number of seniors who reported having an influenza vaccination in the past 12 months in all OECD countries was 50% (Figure 2). Canada performed in the top quarter of countries, with 64% of people age 65 and older being vaccinated in 2012. Mexico, Korea and the Netherlands had the highest rates of influenza vaccinations among the senior population.

OECD Definition and Comparability

**Influenza vaccination:** The influenza vaccination rate refers to the percentage of adults age 65 and older who received an influenza vaccination within the past year. Some countries’ rates are based on self-reported survey data, while others’ are based on program data, both of which are susceptible to different types of errors and biases.

**Asthma and COPD admissions:** The rates are defined as the number of hospital discharges for asthma or COPD (respectively) of people age 15 and older, per 100,000 population, adjusted for age and sex to take into account differences in the population structure of each country. Differences in coding practices among countries, such as differences in disease classification systems (for example, ICD-10-CA and ICD-9-CM), may affect the comparability of data.

**Diabetes admissions:** The rates are defined as the number of hospital discharges for diabetes of people age 15 and older, per 100,000 population, adjusted for age and sex to take into account differences in the population structure of each country. Differences in coding practices among countries may affect the comparability of data.
Canada and its seven peer countries performed above the OECD average, with Canada falling in the middle of the peers. It is important to note that some countries, like the Netherlands, have vaccination programs that focus mainly on the senior population, so their performance on this indicator might be higher than that of other countries, like Canada, that immunize all ages.\textsuperscript{15, 17}

**Figure 2: Percentage of the Population Age 65 and Older That Received an Influenza Vaccination Within the Past 12 Months, OECD Countries, 2011 (or Nearest Year)**

![Percentage of the Population Age 65 and Older That Received an Influenza Vaccination Within the Past 12 Months, OECD Countries, 2011 (or Nearest Year)](image)

Source


Strategies for improving influenza vaccination rates in seniors include public awareness of influenza as a risk factor for hospitalization and death, dispelling concerns that the vaccine can cause illness or is ineffective, and increasing vaccination accessibility.\textsuperscript{18} Factors shown to increase the likelihood of a senior receiving the vaccine include being male, being Caucasian, being older than age 85, being married and having higher educational levels.\textsuperscript{19, 20} These determinants can help public health professionals develop directed campaigns to increase overall vaccination uptake.

**Hospital Admissions for Diabetes, Asthma and Chronic Obstructive Pulmonary Disease**

Evidence shows that some of the 2.8 million annual hospitalizations\textsuperscript{21} in Canada could be prevented or avoided. Researchers have identified several conditions for which managing symptoms through regular monitoring, drug therapies, healthy lifestyles and regular visits with primary health care providers can help prevent a hospitalization. These conditions include chronic diseases like diabetes, asthma and chronic obstructive pulmonary disease (COPD); they affect at least 4% (COPD), 9% (asthma) and 11% (diabetes) of Canadians (the population age range varies in each estimate).\textsuperscript{22–24} On any given day, 6% of patients in acute care facilities are hospitalized with such a condition.\textsuperscript{25}
Canada performs well on two of three indicators of *avoidable admissions* (asthma and diabetes). Canada ranks among the top of all OECD countries (Figure 3) and the peer countries, despite having among the highest type 1 and type 2 diabetes prevalence rates of all OECD countries. This good performance may suggest that primary health care providers are appropriately managing these chronic conditions within the community, thus avoiding hospital admissions. This, however, is likely just part of the story. Though Canada does have lower *avoidable admissions*, there are also lower admissions *overall*. Canada has the second-lowest number of hospital admissions per population among 20 countries with available data. Overall admission rates are correlated with avoidable admissions for all three conditions, potentially helping to explain Canada’s good performance on these two indicators. Figure 4 illustrates this correlation for COPD.

Figure 3: Avoidable Admissions for Asthma and Diabetes, OECD Countries, 2011 (or Nearest Year)

<table>
<thead>
<tr>
<th>Country</th>
<th>Asthma Admissions per 100,000</th>
<th>Diabetes Admissions per 100,000</th>
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Note: Rates are age–sex-standardized to the 2010 OECD population.

Traditionally, high avoidable admission rates were thought to reflect insufficient care provided in the community. Though this may be partially true,26 research indicates that socio-economic and lifestyle factors also have a large impact on these admissions.25, 27 Smoking has been shown to be a major contributor to avoidable admissions, with smokers being twice as likely to have an avoidable admission as non-smokers.25 In recent years, Canada has had one of the lowest smoking rates among all OECD countries, which may have contributed to its low avoidable admission rates. Other non-medical determinants of health, such as obesity and physical activity, also influence rates of avoidable admissions.
Canadians with multiple chronic conditions have up to four times the risk of an avoidable admission, compared with those with no conditions; therefore, improvements in managing multiple chronic conditions may lead to reductions in avoidable admissions. In Canada, more than one in three individuals with one chronic condition have been diagnosed with another condition. This rate is even higher among individuals with diabetes and COPD. This can be explained by the overlapping risk factors (such as hypertension) among chronic diseases. There is evidence that interdisciplinary teams of providers, such as nurses, pharmacists, physicians and dietitians, are important in caring for those with multiple conditions. This interdisciplinary collaboration has been shown to improve patient outcomes. Countries like the U.K. identify patients at high risk of short-term hospitalization and provide these individuals with more intensive primary and ambulatory care to avoid admission. CIHI, in partnership with Health Quality Ontario, recently developed a tool to help predict who would be high hospital users in Canada.

**OECD Definition and Comparability**

The OECD’s patient experience indicators were developed to monitor and measure patient experience across countries. No single survey or study on patient experience has been conducted across all OECD countries. The Commonwealth Fund’s International Health Policy Survey 2010 was used as the data source for most countries. The survey has some limitations, such as a small sample size and a low response rate. Other national surveys were also used. Since there is no unique data source, data derived from different sources may not be fully comparable. For example, The Commonwealth Fund’s data refers to patient experience with a regular doctor, while other national surveys asked about patient experience with any doctor (not necessarily a regular doctor).
Patient Experience

The OECD’s patient experience indicators measure people’s perceptions of encounters with their physicians. Canada is only slightly below the OECD average for all four indicators of patient experience, with more than 80% of respondents reporting positive patient experiences with their regular care providers (Figure 5). Almost 90% of Canadians report that their doctor provides easy-to-understand explanations, and about 80% of respondents believe that their doctor spent enough time with them during a consultation. Variation among countries on these indicators is much smaller than for most other indicators. CIHI is adding to Canada’s understanding of patient experience by developing a standardized survey that will measure quality from the perspective of acute care hospital patients across Canada. Information from this survey will provide more direction for patient care improvements and help hospitals learn from high performers.

Figure 5: Rates of Positive Patient Experience Responses, OECD Countries, 2010 (or Nearest Year)

![Bar chart showing rates of positive patient experience responses for OECD countries.]

Notes
Categories used in The Commonwealth Fund’s survey were “always,” “often,” “sometimes” and “rarely or never.” Rates are age–sex-standardized to the 2010 OECD population.

Sources
The Commonwealth Fund’s International Health Policy Survey 2010, except Luxembourg data, which is from a 2011 national survey based on an OECD pilot questionnaire.

Cancer Care

Cancer is the leading cause of death in Canada, accounting for 30% of all deaths. Many cancer deaths are preventable. In fact, of all cancer cases in Canada, one-third are caused by modifiable risk factors and one-third could be cured if detected earlier. In the quality of care section of Health at a Glance 2013, the OECD included only three types of cancer: breast, cervical and colorectal. All three are amenable to early detection and treatment.

iii. Other cancers not included in these indicators may also be highly amenable to early detection and screening. For example, recent evidence shows that computed tomography (CT) scans help detect lung cancer in selected populations.
For each type of cancer, the OECD collects three measures of quality of care: screening (for breast and cervical cancers only), survival and mortality rates. Canada performs well on cancer screening rates, with nearly three-quarters of women in the target age groups having been screened for cervical (73%) and breast (72%) cancers. Based on existing evidence, population-wide screening is advocated for breast cancer and cervical cancer. Screening policies vary substantially among countries, as the health care infrastructure in many countries that have fewer resources could not support such programs. Nearly all Canadian provinces and territories have organized screening programs for both cancers.

Canada performs well on survival indicators, though there is also wide variation among cancer types. Canada’s mortality rates vary significantly, from good relative results in cervical cancer to poorer performance in breast and colorectal cancers.

Breast Cancer: Screening, Survival and Mortality

Breast cancer is the most frequently diagnosed cancer in Canadian women, representing one-quarter of all newly diagnosed cancer cases. There is no single trigger for or cause of breast cancer. Age is an important risk factor, with most cases occurring in women age 50 to 69.\(^{33}\)

Canada’s breast cancer incidence rate (83 per 100,000 women) is much higher than the OECD average (72 per 100,000). In other OECD countries, rates range from 27.2 per 100,000 in Mexico to 109.4 per 100,000 in Belgium.\(^{36}\) Breast cancer incidence rates have been relatively stable since the 1990s, though the absolute number of newly diagnosed breast cancer cases in Canada has been on the rise, mainly due to population growth.\(^{37}\) Incidence rates in Canada have been shown to be linked to use of hormone replacement therapy.\(^{38}\) Other evidence suggests that mammography helps detect new cases of cancer that would otherwise be detected at a later time, leading to higher estimated rates of breast cancer.\(^{39}\)

Nearly three out of four (72%) women age 50 to 69 in Canada reported being screened for breast cancer in the previous two years, higher than the OECD average (66%) but lower than the rates in most peer countries with available data (other than Germany, at 68%) (Figure 6). In other OECD countries, screening rates ranged from 36% in Japan to 86% in the Netherlands. Despite Canada’s relatively good results on screening, significant disparities by income exist. The percentage of high-income women age 50 to 69 being screened was 10 percentage points higher than that of low-income women the same age. This income disparity is less obvious in countries like Denmark and New Zealand.

OECD Definition and Comparability

Screening rates (breast and cervical cancers) reflect the proportion of eligible women who were screened. In the OECD’s indicators, the target populations were women age 50 to 69 (for mammography) and women age 20 to 69 (for cervical cancer screening). Limitations exist in country comparability due to differences in data collection, as some data is based on surveys and other data on encounters. Rates are based on the specific screening recommendations in each country. Most countries have a recommended screening frequency of one or two years. Canada’s results are based on screening within the last two years for breast cancer and the last three years for cervical cancer. Survey data is presented in this report (whereas Health at a Glance presents survey and program data).

Survival (breast, cervical and colorectal cancers) reflects the likelihood of a cancer patient surviving five years after diagnosis, compared with a member of the general population. Relative survival captures the excess mortality that can be attributed to the diagnosis. This indicator covers all people age 15 to 99. Survival was age-standardized using the International Cancer Survival Standard population to remove the effect of different population structures across countries. Different methods used to calculate cancer survival (period and cohort analyses) may affect data comparability, as may the fact that reference periods vary across countries.

Mortality rates (breast, cervical and colorectal cancers) reflect the number of deaths due to cancer. The rates were directly age-standardized to the 2010 OECD population to remove the effects of different population structures across countries.
Early detection, combined with effective treatment, continues to be the best option available for increasing survival from breast cancer. The goal is to find breast cancer early, when it is less developed and less likely to have spread to other parts of the body. In 2010, a total of 80% of breast cancer cases were diagnosed at an early stage of disease (I or II). Women age 50 to 69 who receive a mammogram have a reduced relative likelihood of death, compared with women who are not screened.

**Figure 6: Breast Cancer Screening in Women Age 50 to 69, Self-Reported, OECD Countries, 2011 (or Nearest Year)**

Note
Based on survey data. Results from the OECD’s *Health at a Glance* may differ because the OECD presents both program and survey data.

Source

**Five-year relative survival** measures the likelihood of a cancer patient surviving five years after diagnosis, compared with a member of the general population. For breast cancer, five-year survival was more than 80% in most OECD countries. According to the latest data, survival in Canada was 88%, second-highest among OECD countries. International differences in breast cancer survival are partially explained by differences in the stage of disease at diagnosis. Survival may also be influenced by non-medical determinants of health, such as diet and physical activity, as well as access to care. In 2011, eight out of nine reporting provinces achieved the target of 90% of women treated with radiotherapy within the national wait time benchmark (28 days). In addition, the majority of women are receiving the recommended adjuvant radiation therapy for stage I and II breast cancer, though there are still provincial variations in the percentage of women receiving this treatment.
Breast cancer is the cause of 14% of all cancer deaths in women.\textsuperscript{33} Canada’s performance on breast cancer mortality is at the OECD average, with 27 deaths per 100,000 women. Among peer countries, Canada’s rates are similar to those in both the U.S. and Australia (both at 25 deaths per 100,000). Mortality rates have been declining over the past three decades (by nearly 40% since 1986), and the greatest decrease has happened in recent years.\textsuperscript{45} Similar trends have been observed in other OECD countries.\textsuperscript{36} This is likely explained by increased early detection and the use of more effective adjuvant therapies after breast cancer surgery.\textsuperscript{45}

**Cervical Cancer Screening, Survival and Mortality**

In 2012, an estimated 1,350 new cases of cervical cancer were diagnosed in Canada, and there were about 390 deaths.\textsuperscript{45} Studies have shown that screening using the Papanicolaou (Pap) smear test has led to significant reductions in deaths due to cervical cancer.\textsuperscript{46} This test can detect precancerous and cancerous lesions early. Canada has among the highest rates of cervical cancer screening of all OECD countries, with 73% of women age 20 to 69 having received the test within the past three years.

Canada’s high screening rates may help explain Canada’s good performance on cervical cancer mortality compared with that of other OECD countries (Figure 7). Canada’s cervical cancer mortality rate is nearly half that of the OECD average; Canada is in the top 5 of 32 OECD countries and the highest performer (tied with Australia and the Netherlands) of the peer countries. In the past decade, rates have decreased from 2.6 deaths per 100,000 women in 2001 to 2.0 per 100,000 women in 2009. Cervical cancer survival, however, is just below the OECD average (66.3%), with 66% of women surviving five years after diagnosis.

![Figure 7: Cervical Cancer Screening (Percentage of Women Age 20 to 69 Screened) and Mortality Rate (per 100,000 Women), OECD Countries, 2011 (or Nearest Year)](image)

**Note**

Screening rates are based on survey data. Results from the OECD’s *Health at a Glance* may differ because the OECD presents both program and survey data.

**Source**

Unlike most cancers, the cause of virtually all cases of cervical cancer has been established: the human papillomavirus (HPV). In Canada, the HPV vaccine is approved for women age 9 to 45, though it is recommended for women age 9 to 26, and most provinces include HPV vaccination as part of their immunization programs. The vaccine protects against four HPV types that are responsible for nearly three-quarters of all cervical cancers. Because it does not protect against all strains of the virus, screening is still recommended for women who have received the vaccine. Internationally, the vaccine has been approved in most other countries. In order to reduce HPV transmission, the vaccine has also been approved for men in several countries, including Canada, Australia and the U.S. With increased vaccine uptake, cervical cancer mortality rates may decline even further in the near future.

Colorectal Cancer Survival and Mortality

Colorectal cancer was the third most common cancer in the Canadian population in 2012, accounting for 13% of newly diagnosed cancer cases and 12% of all cancer deaths. The OECD collects two colorectal cancer indicators: mortality and five-year survival. Survival is higher in women than men in nearly all countries. Though the reason for this difference is not well understood, it is thought to be related to hormonal factors such as estrogen (added through hormone replacement therapy or oral contraceptives). Incidence and death rates are higher in men.

Canada performs better than the OECD average for both colorectal cancer indicators. Colorectal cancer incidence has been on the decline, so we can expect to see an eventual improvement in mortality rates. This decrease in new cases reflects improvements in and promotion of colorectal screening, which can identify precancerous cells that can be treated before cancer develops. According to data from the Canadian Partnership Against Cancer, screening rates have risen by six percentage points since 2009 (from 44% to 50% in 2011).

Regular colorectal cancer screening has the potential to save lives. Currently, the OECD has not developed an indicator of colorectal screening. The Canadian Task Force on Preventive Health Care has released colorectal screening guidelines and recommendations. By 2013, population-based screening programs for colorectal cancer had been established or piloted in many Canadian provinces. The identified risk factors for colorectal cancer include older age, family history, a diet high in red meat and low in fruit and vegetables, obesity, lack of physical activity, alcohol consumption and smoking.

OECD Definition and Comparability

Post-operative and procedural complications: All post-operative and procedural complications are defined as the proportion of discharges with one of these incidents among the total number of discharges (all medical and surgical discharges or surgical discharges only). Some exclusion criteria include pregnancy, childbirth and puerperium cases, and hospital discharges with a length of stay less than 24 hours (or two to three days, depending on the indicator). Limitations exist in country comparability due to differences in reporting, coding and calculation of the rates. For example, events may be recorded less completely in countries where clinicians—rather than professional coders—report adverse events. Adjustment of rates by the average number of secondary diagnoses improves inter-country comparability, but caution is still required when interpreting these results. Additionally, most patient safety indicators are calculated based on very small sample sizes (and therefore are especially sensitive to annual variation).

Obstetric trauma: Two obstetric trauma indicators measure the percentage of vaginal deliveries (with or without instrument assistance) with third- and fourth-degree obstetric trauma. Limitations exist when comparing country data due to differences in coding practices and data sources. For example, some countries report obstetric trauma rates based on administrative hospital data, and others report based on the obstetric register. Given that advanced maternal age is a strong determinant of obstetric trauma, age-standardizing would help improve the comparability of these indicators.
Patient Safety

Patient safety is a fundamental component of quality of care—first, do no harm. In the 2000s, the topic of patient safety became a major concern of policy-makers worldwide, including in Canada. Since then, many countries have started collecting data on patients who are harmed by medical care. Despite this, evidence suggests that health care services in Canada and abroad do not consistently achieve desired levels of patient safety. Countries face similar challenges, such as public reporting, building trust, creating a culture of learning and improving organizational transparency. Learning about other countries’ approaches to attaining safe health care would benefit many countries, including Canada.

The OECD is at an early stage in collecting patient safety indicators, which were first reported in 2009. Since then, technical specifications have continually been refined to improve international comparability of procedures, diagnostic codes and coding practices. The OECD’s Health at Glance is in its third round of reporting and now includes seven patient safety indicators: five post-operative and procedural complications and two obstetric trauma indicators. These indicators have been shown to be accurate at capturing patient safety incidents, thus they are useful instruments for further investigation and learning. However, under-coded data can lead to erroneous results, falsely making a country appear to have higher relative performance.

Country participation, data availability and data quality remain challenges for these indicators. Currently, around 20 out of 34 countries participate in this benchmarking. Results show large variability across countries. This variation can be caused by health care performance issues. However, it is also important to be mindful of differences in the maturity of patient safety coding and collection methodologies, as well as the culture of public reporting and organizational transparency. Despite the concerns with the accuracy of these patient safety measures, the data suggests that many patients in Canada and worldwide have been affected by these potentially avoidable events.

Post-Operative and Procedural Complications

Certain patient safety indicators reflect events that should never happen. One such indicator is retained foreign bodies after surgery or a procedure, which counts the number of surgical discharges with a retained surgical item or unretrieved device fragment following a procedure (that is, sponges or parts of medical devices left in the patient after surgery). These foreign objects may cause internal hemorrhaging, infections and other complications, including death. Canada falls in the bottom quarter of the 20 OECD countries with available data, with 8.6 events per 100,000 hospital discharges, compared with the OECD average of 5.0 per 100,000 (Figure 8). Canada performs below nearly all of its peer countries, with the exception of New Zealand and Australia. Countries with comparable data collection systems, such as the U.S. and Sweden, leave half as many foreign objects in their patients per 100,000 discharges. Despite the fact that these rates are low, around 165 of these preventable events occur each year in Canada. The likelihood of these events increases when surgical teams are fatigued or distracted due to lengthy, late or multiple procedures. Research suggests that initiatives such as using a surgical team checklist can reduce the number of these patient safety incidents. For example, introducing bar-coded sponges has been shown to prevent nearly all (95%) retained surgical sponges. The Canadian Patient Safety Institute’s Safer Healthcare Now! program provides resources for health care organizations to guide their safety improvement initiatives. Its Surgical Safety Checklist is an example of an evidence-based protocol that is recommended for use in all operating rooms in Canada.
Venous thromboembolism (VTE), which consists of pulmonary embolism (PE) and deep vein thrombosis (DVT), is one of the most common complications encountered by hospitalized patients, and there is strong evidence that the use of best practices can substantially reduce the number of VTE cases. The post-operative pulmonary embolism or deep vein thrombosis indicator captures cases of blood clots blocking the main lung artery and its branches (PE) or a large vein (DVT) following surgery. Canada performs poorly on this indicator for all surgical procedures, ranking below the OECD average. In 2013, the OECD included an additional indicator that focused on post-operative PE or DVT following hip and knee replacement surgery. Patients in most OECD countries are at a lower risk of VTE during these joint replacements; however, the opposite is true in Canada. Canada performs worse for joint replacements than for surgical procedures overall and is in the bottom quarter of all peer countries. These patient safety incidents are especially important as rates of hip and knee replacements are on the rise in Canada.

 Preventing VTE is a Required Organizational Practice (an essential practice that organizations must have in place) for hospital accreditation. Post-operative VTE is common and is a cause of substantial morbidity and mortality, but it can often be prevented through risk assessment and simple mechanical (external pneumatic
compression, gradient elastic stockings) or pharmacological (low-dose heparin, warfarin) preventive treatments. However, studies have shown that a large number of patients still do not receive any form of these preventive therapies. Strategies like computer reminders and checklists can reinforce behavioural changes and improve consistency and adherence to evidence-based best practices.

There are two OECD indicators of post-operative sepsis: one measures occurrence of sepsis (an inflammatory response to the presence of an infection) following any surgery, and another focuses on sepsis following abdominal surgery specifically. Canada’s performance on the overall post-operative sepsis indicator is above the OECD average, representing Canada’s best result among all patient safety indicators reported in Health at a Glance 2013. Countries like Germany and the U.S. have similar results as Canada. Canada’s performance on sepsis in abdominal surgery is close to the OECD average, and rates of sepsis in abdominal surgery are nearly three times higher than those in all surgical procedures combined. The appropriate use of preventive antibiotics, sterile surgical techniques and proper post-operative care help prevent these patient safety incidents.

Obstetric Trauma

Almost 371,000 babies were born in Canadian hospitals in 2010–2011, one-fifth of whom were born by Caesarean delivery. The remaining 80% were delivered vaginally. Quality of care for vaginal delivery is measured by two indicators: obstetric trauma with instrument and obstetric trauma without instrument. Since there are methodological concerns with these indicators and differences in how data is collected across countries, they are meant to highlight potential areas where more research can be focused rather than to drive immediate policy changes.

Obstetric trauma indicators count tears to a women’s perineum during childbirth resulting in severe trauma (classified as third- and fourth-degree lacerations). Such tears require surgical repair and are often associated with chronic complications. It is important to note, however, that these indicators do not account for episiotomy or advanced maternal age. Trauma occurs in deliveries with the use of instruments and without, but it is much more common when an instrument is used. In Canada, 17% of vaginal deliveries were performed with the use of an instrument, where the health care provider used forceps or other medical instruments to aid in the delivery (called "instrument-assisted vaginal delivery"). The rest (83% of all vaginal deliveries) were performed without the use of any instrument (termed “vaginal delivery without instrument assistance”).

Canada’s performance on both obstetric indicators is below that of other OECD countries: 3 women out of 100 experience a third- or fourth-degree tear when their baby is delivered without instrument assistance (Figure 9). This result is twice the OECD average (1.6 per 100 births) and five times higher than France’s rate, one of Canada’s peer countries. In instrument-assisted vaginal deliveries, trauma occurred in nearly one out of five patients, tied with Denmark for the worst rate among 20 countries. This rate is nearly three times the OECD average. Canada’s high rate may be due to many factors, including stricter follow-up procedures after childbirth, which allows more of these incidents to be coded. Canada’s good coding practices and culture of reporting can provide some insights into our relative performance among other countries. To better assess a country’s performance in this area, other indicators, such as the rate of intact perineum, that take into account both obstetric trauma and episiotomy rates should be used. Indicators should also control for age and parity, since both of these affect a woman’s risk of obstetric trauma. These indicators are not currently presented in the OECD’s Health at a Glance. Despite these caveats, the absolute rates of these incidents are high, and obstetric trauma represents an important patient safety concern across the country.

Consequences of perineal tears during childbirth can include longer hospital stays, additional surgical procedures and long-term complications. Several factors are associated with a high risk of obstetric trauma. The type of instrument used for delivery can affect the risk of a tear: risk is heightened when using forceps compared with a vacuum. The weight and position of the baby can also contribute, with large babies...
and irregular positions leading to more tears. Maternal factors, such as having never previously given birth and advanced maternal age, can also increase the risk of these incidents. Many of Canada’s peer countries have models of delivery that include midwives; however, recent research has shown that rates of obstetric trauma are similar for midwife and physician deliveries.

Figure 9: Obstetric Trauma With and Without Instrument, OECD Countries, 2011 (or Nearest Year)

Note
Does not account for episiotomy rates or risk factors (such as maternal age or number of previous deliveries).

Source

While it is not possible to prevent obstetric trauma in all cases, current research identifies some techniques and care standards that can be used during labour to reduce these tears. Multiple studies have shown that an episiotomy (a surgically planned incision made just before delivery) is strongly associated with third- or fourth-degree laceration. Experts recommend that hospitals establish restrictive episiotomy policies, where the risks and benefits of this procedure are evaluated for each patient. Episiotomy rates in Canada are currently 17%, slightly higher than what experts recommend and similar to those in many of Canada’s peer countries. Because of their strong association with obstetric trauma, a more complete understanding of international variations in episiotomy rates would provide a more thorough understanding of Canada’s performance on these selected obstetric care indicators.
Several system- and hospital-level strategies can be implemented to help improve Canada's performance on obstetric quality of care indicators. Training programs for obstetricians and midwives have been shown to lead to significant reductions in perineal trauma in the hospital setting. Continuous support by skilled caregivers such as midwives or nurses during labour is also important to avoid trauma. Four out of five hospitals in Canada already offer one-on-one continuous support during labour.

Guidelines and benchmarks can help physicians and other medical professionals determine the best strategies for delivery to prevent obstetric trauma. The Society of Obstetricians and Gynaecologists of Canada develops guidelines and programs to improve obstetric care in Canadian hospitals. In 2002, the Managing Obstetrical Risk Efficiently program was created to improve patient safety at the hospital level. It is focused on team-building, problem-solving and establishing standardized processes for the delivery of care. The success of this program is still being evaluated, but some early results have been promising. By following guidelines and ensuring that there is appropriate training in vaginal delivery techniques, physicians can make informed decisions on which methods to use and reduce the risk of obstetric trauma.

Acute Care Outcomes

Cardiovascular diseases are the second-largest cause of death in Canada, resulting in nearly 70,000 deaths every year. Of all cardiovascular deaths in 2008, 20% were due to stroke and 23% were due to heart attacks (acute myocardial infarctions or AMIs). The modifiable risk factors for AMI and stroke are similar, including obesity, hypertension and smoking. Mortality for these diseases is an important indicator of quality of care because quick response and prompt treatment are essential for survival and reduced disability.

In-Hospital Fatality: Acute Myocardial Infarction

In-hospital mortality following AMI reflects the number of deaths that occur in hospital within 30 days of being admitted for a heart attack. In Canada, there are approximately 70,000 heart attacks every year, and 16,000 of them result in death.

Canada is among the best performers for the in-hospital fatality following AMI indicator (around the 75th percentile) (Figure 10). In Canada, 5.7 out of 100 patients admitted for AMI die in hospital within 30 days of admission, compared with the OECD average of 7.9 per 100. Among peer countries, rates were lowest in Sweden and New Zealand (4.5 per 100) and highest in Germany (8.9 per 100).

Deaths due to AMI in Canada and other OECD countries have been decreasing over the past 40 years. Decreases in recent years have been attributed to prevention efforts, such as reductions in smoking and an increased use of statins (cholesterol-lowering drugs), as well as improvements in acute care for AMI. Timeliness is an important factor for successful treatment of AMI. In Canada, many people live too far away from a cardiac centre to benefit from time-sensitive care, although local efforts are under way to coordinate care for AMI patients.

Several quality improvement initiatives are recommended to ensure timely access to care. These include processes such as implementing pre-hospital electrocardiography and preferential transport to the appropriate hospital, as well as using standardized care protocols. Cultural attributes associated with high-performing hospitals include having supportive management and clinical leadership, innovative standardized protocols, collaborative teams and timely data feedback on performance.
Other factors, outside of the health care received by the patient, can also influence the results for this indicator. These include the severity of the patient’s condition, existing comorbidities and how quickly the patient seeks medical care after the onset of symptoms. International studies have shown great differences in care-seeking behaviours among AMI patients in different countries. This indicator includes only deaths that occur in hospital; consequently, differences in transfer patterns and lengths of stay can also influence results.

**In-Hospital Fatality: Ischemic Stroke**

In Canada, stroke is a major cause of death and disability, causing approximately 14,000 deaths each year. Of those who survive, two-fifths (40%) are left with a moderate or severe impairment. A stroke occurs when the blood supply to the brain is interrupted, either by a clot (ischemic stroke) or by a rupture of a blood vessel causing uncontrolled bleeding in the brain (hemorrhagic stroke). While the majority of strokes are ischemic (approximately 80%), hemorrhagic strokes are much more likely to be fatal. The OECD focuses on ischemic stroke as an indicator of quality of care.

In Canada, mortality rates from stroke have been decreasing; in fact, Canada has one of the lowest rates among the OECD countries. *In-hospital case-fatality rates* have also been decreasing in Canada (9.7 per 100 patients). However, unlike overall stroke mortality, Canada’s case-fatality rate is consistently above the OECD average for ischemic stroke (Figure 10). While the reasons for this discrepancy are unclear, explanations could include Canada having lower stroke incidence and fewer mild cases of stroke being treated in the inpatient hospital setting, meaning that more severe cases are admitted, accompanied by a higher natural mortality rate. Nevertheless, the results indicate that there may be opportunities to improve acute care for stroke.

In-hospital case-fatality following stroke is a measure of quality of acute care, because prompt diagnosis and appropriate treatment are required to improve outcomes. In 2005, Canada launched a national stroke strategy to improve stroke services across the country. As part of this strategy, *Canadian Best Practice Recommendations for Stroke Care* was published to reduce practice variations and close the gap between evidence and practice. A national study of stroke patient care for 2008–2009 looked at how closely stroke care in Canada reflects these best practice guidelines. The authors identified several areas for improvement. For example, stroke units have been shown to reduce death and disability by providing coordinated care from an interprofessional team with expertise in stroke care. In Canada, a quarter (23%) of patients are treated within a stroke unit—less than in many other countries. Even when admitted to a hospital that has a stroke unit, nearly half (47%) of Canadian patients are not treated within the stroke unit. Nordic countries have some of the lowest case-fatality rates for stroke among OECD countries and have been at the forefront of establishing dedicated stroke units.

In another example, evidence indicates that stroke patients aren’t being treated fast enough—when a patient with a stroke arrives at the hospital, neuroimaging (computed tomography [CT] or magnetic resonance imaging [MRI]) is needed to determine the type of stroke and plan appropriate care. Even among patients who arrived at the hospital within the recommended time frame, only two-fifths (40%) received a brain scan within an hour, although most patients did undergo a brain scan during their stay. Acute thrombolysis (breaking down blood clots with strong clot-busting medication) has been shown to improve outcomes for patients with ischemic stroke when provided within the first 4.5 hours after a stroke. However, in Canada, the median arrival time to the hospital is seven hours after symptom onset, putting most patients outside the optimal treatment window. There are opportunities to improve public recognition of the signs of stroke and get patients to hospital faster, and then for emergency departments to have processes in place to rapidly assess and diagnose patients with stroke.
Implementing these best practice guidelines may be challenging given Canada’s dispersed population. Telestroke provides a way for rural and remote health care facilities to connect in real time with stroke specialists. It is used primarily to extend access to acute thrombolytic treatment but can also be used in the post-acute phase to access other experts, such as rehabilitation professionals. Less than 1% of patients received a Telestroke consultation in Canada in 2012; however, several provinces are currently developing or improving their Telestroke services and are being supported through recent start-up grants and a comprehensive Canadian Telestroke Toolkit released as part of the 2013 Telestroke best practices update.

Summary

Examining Canadian performance among OECD member countries highlights Canada’s strengths and weaknesses on key quality of care indicators. Canada performs well compared with other countries on several measures of effectiveness of care, including avoidable admissions, influenza vaccinations, cancer care and certain acute care outcomes. Canada falls behind other countries on measures of patient experience and safety. Table 1 summarizes Canada’s performance on each category of quality of care for the available indicators and provides examples of performance improvement activities mentioned in this report. Strategies to improve Canada’s performance can be made at the health system, hospital and individual levels.
Table 1: Summary of Canada’s Performance on Quality of Care Indicators and Potential Options for Improved Performance

<table>
<thead>
<tr>
<th>Indicator Category</th>
<th>Canada’s Relative Performance*</th>
<th>Examples of Activities to Improve Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care in the Community</td>
<td>Good</td>
<td>• Influenza vaccine promotion campaigns (p. 5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Team-based care delivery (p. 8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Prevention of obesity and other health risk factors (p. 8)</td>
</tr>
<tr>
<td>Patient Experience</td>
<td>Poor</td>
<td>• Improved measurement (p. 9)</td>
</tr>
<tr>
<td>Cancer Care</td>
<td>Good</td>
<td>• Increased screening (p. 10)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• HPV vaccination (p. 13)</td>
</tr>
<tr>
<td>Patient Safety</td>
<td>Poor</td>
<td>• Improved data quality (p. 14)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Surgical Safety Checklist (p. 14)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• VTE prevention (p. 15)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Prevention of surgical site infections (p. 16)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Episiotomy policies (p. 17)</td>
</tr>
<tr>
<td>Acute Care Outcomes</td>
<td>Mixed</td>
<td>• Timely access to care (p. 18)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• AMI care bundle (p. 19)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stroke units (p. 19)</td>
</tr>
</tbody>
</table>

Note
* Performance is classified as “good” if more than three-quarters of indicator results were better than the OECD average, “poor” if more than three-quarters of indicator results were worse than the OECD average and “mixed” if indicator results did not fall into either category.

Conclusions

Quality of care remains an important concern in most health care systems, and Canada is no exception. With limited funds, policy-makers must decide what strategic initiatives would have the greatest impact on health outcomes. Wide variations in quality persist across health systems, and no country outperforms all others in all indicators of quality of care. This report examined available indicators in five categories of quality of care from a Canadian perspective and highlighted areas where improvements could be made.

The indicators presented in this report provide only a snapshot of the multifactorial dimensions of quality of care. High quality care expands past hospital and community care, integrating social, medical and personal care. The indicators have been evolving and improving since their first publication in 2006; however, comparability of data and populations must be considered when drawing conclusions. Indicators can be affected by many factors at the data, population and health system levels. Despite their limitations, they provide important information on quality of care in Canada and can help direct priority-setting to keep up with international progress.

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References


