Surgical Volume Trends Within and Beyond Wait Time Priority Areas

Introduction

Reducing wait times for surgery and other health services is a prominent policy issue in Canada and many other countries. When the first ministers met in the fall of 2004, they listed timely access to quality care at the top of their collective agenda.\(^1\),\(^2\) Together, they agreed to focus on better management of wait times and on reducing waits that are longer than medically acceptable. Specifically, the first ministers committed to achieving “meaningful reductions in wait times in priority areas such as cancer, heart, diagnostic imaging, joint replacements, and sight restoration by March 31, 2007, recognizing the different starting points, priorities, and strategies across jurisdictions.”\(^1\)

Governments’ plans to improve access and reduce wait times include a range of strategies. Some efforts focus on wellness and disease prevention, hoping to reduce the number of people who will be sick enough to need care. Others try to increase the efficiency of the surgical process so more procedures can be done within available resources. Yet other initiatives try to improve understanding of who will benefit most from care, to capture and prioritize wait lists to ensure that the most urgent cases receive care most quickly, or to track and report wait times to inform patients and providers.

Another strategy being pursued in several parts of the country is to increase the number of procedures being done. Proponents say that this is an important way to reduce the number of patients waiting for care. Others have questioned whether it is possible to increase the number of procedures in a limited number of priority areas without crowding out other types of care.

This Analysis in Brief explores trends in the numbers of people who receive surgeries that fall within first ministers’ wait time priority areas (cancer, heart, joint replacement, and sight restoration operations), as well as trends in the numbers of people who have surgery for other health problems.
The Fine Print

Appendix 1 provides more information on data sources, methodology and data limitations. However, a few points are worth highlighting to provide context for interpreting the findings:

Data sources. Hospitalization statistics come from the Canadian Institute for Health Information’s databases, as well as data collected by Alberta Health and Wellness and Manitoba Health. While these data sets capture the majority of surgical hospitalizations that occur outside of Quebec, some gaps are noted in Appendix 1.

Quebec data not available. To evaluate recent trends, we looked at procedures performed in jurisdictions for which we had access to inpatient and day surgery data for the last five years (2001–2002 to 2005–2006). Quebec data for 2005–2006 were not yet available to CIHI so this analysis does not include results for that province.

Provincial/territorial reporting. All analysis is based on where patients live, not where they received surgery. Data from Prince Edward Island and the three territories are included in the overall totals; however, because of small volumes and significant outflow of residents for wait time priority surgeries, we do not report specific results for these jurisdictions.

Focus on change in surgical rates. While the analysis looks at changes in the absolute numbers of surgeries, it also examines changes in age-standardized surgical rates. Looking at a change in rates accounts for population growth and aging. It also allows for comparable analysis across jurisdictions, even if they start from different points.

What is a surgery? There are a number of approaches available to identify surgical patients, which give similar but not identical results. In this analysis, priority area surgeries were identified by a combination of diagnosis and intervention codes, which led patients to be assigned to a surgical Case Mix Group (CMG) or qualifying Day Procedure Group (DPG). To enhance comparability, adjustments were applied to address the variable reporting standards for day surgery (see Appendix 1). Despite these efforts, some variation in the day surgery definitions persists across jurisdictions.

What about diagnostic imaging? While this analysis focuses on changes in surgical procedures, a December 2006 CIHI release also examined what we know about trends in the use of magnetic resonance imaging (MRI) and computed tomography (CT) scanners, another priority area identified by first ministers. Medical Imaging Technologies in Canada, 2006—Supply, Utilization and Sources of Operating Funds drew on CIHI survey information as well as data from Statistics Canada. The report noted that the number of MRI and CT scanners in Canada increased significantly over the previous three years (increasing 34% for MRI and 14% for CT), along with an increase in the overall number of exams and a decline in access problems reported by patients.3
The “Big Four”: First Ministers’ Surgical Priority Areas

Dozens of types of surgery exist, but recent pan-Canadian efforts to reduce surgical wait times have focused primarily on four areas: cancer, heart, joint replacement and sight restoration. In this analysis, we have focused on the following high-volume procedures within each priority area:

- **Cancer:** Surgical cases where the patient’s most responsible diagnosis was listed as cancer
- **Heart:** Revascularization procedures, which include bypass surgery and angioplasty
- **Joint replacement:** Hip and knee replacements
- **Sight restoration:** Cataract surgery

Thousands of Canadians receive operations in the four priority areas each year. For example, over 17,000 Canadians outside of Quebec have bypass surgery and almost 230,000 have cataract surgery. After excluding surgeries related to trauma, pregnancy and newborns, as well as minor skin and other procedures often performed in clinics, priority area procedures accounted for about one in five (19%) surgical cases in 2005–2006 (see Figure 1).

**Figure 1. Surgical Procedures in Wait Time Priority Areas as a Proportion of the Total, 2005–2006**

Notes: Excludes Quebec. Total surgical procedures exclude those for trauma, pregnancy and childbirth, newborns and mental health. Includes only qualifying day procedures (see Appendix 1 for definitions). Includes cataract and orthopedic procedures from the Pan Am Clinic in Manitoba.

Sources: Discharge Abstract Database, National Ambulatory Care Reporting System, CIHI; special tabulations provided by Alberta Health and Wellness and Manitoba Health.

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i. In addition to surgeries for cancer treatment, this definition also includes some advanced diagnostic procedures and reconstructive surgery provided to patients with cancer.
Changes in Data Collection and Effect on Surgical Rates

Over the time frame for this analysis, some jurisdictions experienced major changes to hospital data collection, including:

- **Shift in the classification systems used:** The International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Canada (ICD-10-CA) and the Canadian Classification of Health Interventions (CCI)—systems of coding diagnoses and interventions—came into effect beginning in 2001. By April 1, 2004, they had been adopted by all provinces and territories included in this analysis. These changes, as well as new and revised coding standards introduced with the ICD-10-CA/CCI classifications systems, may affect trends and comparability of some rates. This change affects data from Alberta, Saskatchewan, Ontario, the Northwest Territories and Nunavut (all 2002), New Brunswick (2003) and Manitoba (2004). For more information, see www.cihi.ca/coding.

- **Change in the database to which hospitalization information was submitted:** In 2003–2004, Ontario began collecting day surgery data through the National Ambulatory Care Reporting System (NACRS). In the following year, Manitoba began submitting data to the Discharge Abstract Database (DAD). In both provinces, definitions for surgical cases were tightened and a decline in surgical volume was observed in the year of transition. In 2003, New Brunswick adopted a new definition for day surgery, which redefined the types of procedures included in this category. As a result, a decline in day surgery volume was observed.

All provinces followed a consistent approach in both classification systems and database submission for 2004–2005 and 2005–2006, which is the time frame of interest for much of the analysis in this document.

Five-Year Trends

The number of procedures in three of the four priority areas has increased substantially in recent years. While specific types of surgery are more common in some parts of the country than in others, rates of cataract, cardiac revascularization and joint replacement surgery increased in almost all jurisdictions included in the analysis. Trends for cancer surgery did not mirror the rapid growth in these three priority areas. While the actual number of cancer surgeries has increased marginally, rates are lower than they were five years ago when adjusted for population growth and aging.

- **Knee replacements:** Overall, knee replacements were the fastest-growing priority area surgery, with a 69% increase in the number of cases since 2001–2002 (53% growth after adjusting for population growth and aging). Rates rose in all jurisdictions, with increases (adjusted for population growth and aging) ranging from 32% to 75% across the provinces. As a result, about 14,300 more procedures were performed outside of Quebec last year than were performed five years ago.

- **Hip replacements:** Almost 6,900 more hip replacements were done in 2005–2006 than in 2001–2002. This represents an increase of 45% in the number of cases (31% after adjusting for population growth and aging). Changes in provincial rates over the five-year period ranged from 16% to 52%, after population growth and aging were taken into account.ii

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ii. There were some changes to hip replacement definitions between the Canadian Classification of Diagnostic, Therapeutic and Surgical Procedures/Ninth Revision of the International Classification of Diseases–Clinical Modification (CCP/ICD-9-CM) and CCI classification systems. See Appendix 1 for more information.
Analysis in Brief

- **Cataract surgery**: There was a 30% increase in the number of cataract surgeries, or 18% after adjusting for population growth and aging. This is lower than the growth rate for joint replacements, but cataract surgery is a more common procedure. Accordingly, it accounts for a larger number of additional cases—over 52,000 more patients treated in 2005–2006 than in 2001–2002. Among the wait time priority areas, cataract surgery accounted for the largest surgical case increase in all provinces.

- **Cardiac revascularization**: Growth rates for cardiac revascularization, including bypass surgery and angioplasty, were lower than those for joint replacements and cataract surgery, but there were still substantial increases (25% more cases, or 12% after adjusting for population growth and aging). The number of procedures increased by more than 10,700 over the five-year period. Trends for specific procedures vary within this category. Cardiac bypass rates are down while angioplasty rates are growing. This reflects international trends in cardiac care.

- **Cancer surgery**: The number of cancer surgery cases grew by 5% between 2001–2002 and 2005–2006, but after adjusting for population growth and aging, cancer surgery rates declined by 5%. Flat or declining rates were observed in most parts of the country. Cancer surgery trends are complex to unravel, as a wide variety of procedures for several different types of cancer are involved and many different clinicians perform these procedures. A more detailed analysis by type of cancer would be required to fully understand the trends. However, some of the trends that may influence overall cancer surgery volumes include:

  - **Changes in location of care**: Some procedures may no longer be performed in a day surgery setting. Procedures performed in hospital clinics or physician offices are not captured in the data sets used in this analysis. In addition, tighter definitions of surgery in some provinces may have broadened the cases to which this trend might apply.

  - **Imaging technology as an alternative to surgery**: For some cancers there has been a move away from invasive surgical diagnostic procedures performed in the operating room to less invasive image-guided procedures performed in the radiology suite. For example, ultrasound exams have replaced invasive diagnostic procedures for some urological cancer patients.

  - **Age-standardized rates of new cancer cases are not increasing**: Declining rates of new cancer cases may contribute to a reduced rate of cancer surgery if the indications for surgery remain the same. Data published by the Canadian Cancer Society and the National Cancer Institute of Canada show that between 2001 and 2005, rates of new cancer cases (after adjusting for population growth and aging) were relatively stable. The report notes that, “changes in population size and age structure have been the major determinants of the increasing burden of cancer among Canadians.”

More detailed information on changes in rates of wait time priority surgeries by province can be found in Appendix 2, figures A to H.
Figure 2. Trends in Age-Standardized Surgery Rates, 2001–2002 to 2005–2006

Notes: Excludes Quebec. Total surgical procedures exclude those for trauma, pregnancy and childbirth, newborns and mental health. Includes only qualifying day procedures (see Appendix 1 for definitions). There were some changes to hip replacement definitions between the CCP/ICD-9-CM and CCI classification systems. See Appendix 1 for more information.

Sources: Discharge Abstract Database, National Ambulatory Care Reporting System, CIHI; special tabulations provided by Alberta Health and Wellness and Manitoba Health.

One-Year Trend

Many more patients received procedures in wait time priority areas in 2005–2006 than in any of the four years before, but changes did not occur at a steady pace over this period. For example, joint replacements and cataract surgery grew at an increasing rate. For hip and knee replacements, over 40% of the total growth (adjusted for population growth and aging) in the five years occurred between 2004–2005 and 2005–2006. For cataract surgery, over 50% of the five-year growth in age-adjusted rates occurred in the last year. Cardiac revascularization procedures did not experience the same type of spike in 2005–2006, but saw modest growth in each of the five years. Cancer surgery rates rose slightly between 2004–2005 and 2005–2006 (up 2%).

Across all wait time priority areas, almost 42,000 more surgeries were performed outside of Quebec than in the previous year. Table 1 highlights the average annual increase in both age-standardized rates and actual surgical cases for each priority area, comparing the average annual results for the first four years (2001–2002 to 2004–2005) to those of 2005–2006.
Table 1. Average Annual Growth in Procedures by Wait Time Priority Area

<table>
<thead>
<tr>
<th>Priority Area</th>
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<th>Average Annual Increase in Rates (Adjusted for Population Growth and Aging)</th>
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<tr>
<td></td>
<td>Years 1–4</td>
<td>Year 5</td>
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<td>Knee Replacement</td>
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<td>Cataract Surgery</td>
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<td>Revascularization</td>
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<td>2,300</td>
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<tr>
<td>Cancer Surgery</td>
<td>100</td>
<td>6,200</td>
</tr>
<tr>
<td>All Priority Area Procedures</td>
<td>16,600</td>
<td>41,500</td>
</tr>
</tbody>
</table>

Notes: Excludes Quebec. Total surgical procedures exclude those for trauma, pregnancy and childbirth, newborns and mental health. Includes only qualifying day procedures (see Appendix 1 for definitions). All figures rounded to the nearest hundred. There were some changes to hip replacement definitions between the CCP/ICD-9-CM and CCI classification systems. See Appendix 1 for more information. Year-five data include cataract procedures from the Pan Am Clinic in Manitoba.

Sources: Discharge Abstract Database, National Ambulatory Care Reporting System, CIHI; special tabulations provided by Alberta Health and Wellness and Manitoba Health.
Trends for Procedures Beyond the “Big Four”

While the volume of priority area procedures increased substantially, some have asked whether this growth came at the expense of other types of surgery. This is a difficult question to evaluate, partly because there are many factors that affect surgical rates.

What Might Influence Surgical Rates?

Several factors may influence changes in surgical rates, whether within wait times priority areas or beyond. They include:

• **Shifts in available resources.** This could include a shift in human resources (for example, gain or loss of skilled labour including surgeons, anesthetists and specialized nurses) or a change in availability of physical resources (for example, operating rooms, surgical equipment or hospital beds). For example, Severe Acute Respiratory Syndrome (SARS) influenced the availability of resources in 2003, particularly in Ontario.

• **Changing indications for surgery.** Over time, there may be changes in the understanding of which patients benefit from surgery or in practice patterns. For example, while total knee replacement rates have increased for all age groups, rates grew much more quickly than the average for those aged 45 to 54, suggesting a shift in the types of patients receiving surgery.5

• **Substitution of other types of care for surgery.** For example, sophisticated imaging or improved pharmaceutical treatment might replace surgery for some patients.

• **Shift of procedures to other settings.** For example, shifts to clinics or physician offices would mean that they would no longer be included in hospital surgery counts.

• **Changes in the prevalence of the underlying disease(s).** For example, an increase in osteoarthritis rates might lead to more need for joint replacement surgery.
Five-Year Trends

Overall, the number of surgical cases outside of the four priority areas increased during the past five years at about the same pace as the population grew. Within this overall trend, however, there were important shifts from inpatient to day surgery. After adjustments were made for population growth and aging, the rate of inpatient surgery outside of priority areas fell by 12% between 2001–2002 and 2005–2006. In contrast, the rate of qualifying day surgery cases in these areas grew by 3%. Because day surgery cases are more common than inpatient surgeries in the priority areas, these two trends offset each other. Figure 3 illustrates the five-year trend for all priority areas combined (cancer, heart, cataract and joint replacement), as well as the trends for inpatient and day surgery cases beyond the wait time priority areas. While the overall number of surgeries in priority areas has grown in recent years, it is not clear what impact this has had on actual wait times because we do not yet have comparable data to track trends in how long patients across the country waited for surgery.

Figure 3. Trends in Procedure Rates Within and Outside of Wait Time Priority Areas, 2001–2002 to 2005–2006

Notes: Excludes Quebec. Total surgical procedures exclude those for trauma, pregnancy and childbirth, newborns and mental health. Includes only qualifying day procedures (see Appendix 1 for definitions).

Sources: Discharge Abstract Database, National Ambulatory Care Reporting System, CIHI; special tabulations provided by Alberta Health and Wellness and Manitoba Health.
One-Year Trend

Looking at the one-year trend in surgical rates outside of priority areas may provide some insight into what happened elsewhere when priority area volumes spiked.iii Specifically, the number of priority area surgeries increased by over 9% (7% when adjusted for population growth and aging), or 41,500 cases, between 2004–2005 and 2005–2006. Over the same time frame, the number of surgeries outside priority areas increased by 4% (or 2%, after adjusting for population growth and aging). Virtually all of the growth came from an increased number of day surgery cases.

While overall surgical rates outside of the wait time priority areas grew between 2004–2005 and 2005–2006, there was some variation by type of surgery. For example, rates of orthopedic surgery other than hip and knee replacements, and cardiac surgery other than revascularization procedures, grew at about the same pace as the population grew. However, the number of eye procedures other than cataract surgery performed grew almost 3% after adjusting for population growth and aging.

The overall rate of surgery beyond the wait time priority areas was maintained or increased in all jurisdictions, even after population growth and aging was considered. That said, the rate at which procedures (both within and outside of priority areas) grew varied by jurisdiction. Figure 4 outlines the growth in surgical rates by province between 2004–2005 and 2005–2006. In addition, when drilling down, trends may vary for specific regions, facilities or types of procedures.

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iii. In both 2004–2005 and 2005–2006, common classification systems (ICD-10-CA and CCI) had been adopted by all provinces and territories included in this analysis, removing one potential source of variation in surgical rates.

Notes: Excludes Quebec. Total surgical procedures exclude those for trauma, pregnancy and childbirth, newborns and mental health. Includes only qualifying day procedures (see Appendix 1 for definitions).

Sources: Discharge Abstract Database, National Ambulatory Care Reporting System, CIHI; special tabulations provided by Alberta Health and Wellness and Manitoba Health.

For More Information

This Analysis in Brief is part of CIHI’s ongoing program of work related to access to care, including wait times. This area was identified as a priority through consultations leading up to the development of CIHI’s Strategic Directions—2005–2006 to 2007–2008. Specific topics for analysis were selected based on subsequent focused consultations on priorities for better information about access to care.

Copies of this Analysis in Brief are available free of charge in both official languages on the CIHI website at www.cihi.ca. You can also find:

- Presentation slides with highlights from this analysis that you can use to share the results with others.
- Related reports, such as Waiting for Health Care in Canada: What We Know and What We Don’t Know and the Health Care in Canada series.
Acknowledgements

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About CIHI

The Canadian Institute for Health Information (CIHI) collects and analyzes information on health and health care in Canada and makes it publicly available. Canada’s federal, provincial and territorial governments created CIHI as a not-for-profit, independent organization dedicated to forging a common approach to Canadian health information. CIHI’s goal: to provide timely, accurate and comparable information. CIHI’s data and reports inform health policies, support the effective delivery of health services and raise awareness among Canadians of the factors that contribute to good health. For more information, visit our website at www.cihi.ca.
References


Appendix 1.

Data Sources and Methodology

Data Sources and Limitations

Inpatient hospitalization statistics were obtained from CIHI’s Discharge Abstract Database (DAD). This database captures administrative, clinical and demographic information on inpatient events from acute care hospitals in Canada. Quebec hospitals do not participate in the DAD. As CIHI did not have 2005–2006 inpatient or day surgery hospitalization data from Quebec available at the time of this analysis, results for the province are not included in this Analysis in Brief. Information on joint replacements from an Alberta non-DAD facility was provided by Alberta Health and Wellness.

Day surgery statistics were sourced from the DAD, the National Ambulatory Care Reporting System (NACRS) and data provided directly by Alberta Health and Wellness and Manitoba Health. The NACRS data holding captures administrative, clinical and demographic information on ambulatory care events from participating Canadian hospitals. The DAD was the source of day surgery data for the following provinces/territories for the 2001–2002 to 2005–2006 data years: British Columbia, New Brunswick, P.E.I., Newfoundland and Labrador, Yukon, the Northwest Territories, Nunavut and most Nova Scotia facilities. Alberta day surgery data for this period were obtained from Alberta Health and Wellness. Ontario day surgery data were obtained from the DAD for 2001–2002 to 2002–2003 and from the NACRS for 2003–2004 to 2005–2006. Selected Nova Scotia facilities also reported day surgery in NACRS over the same time frame. Manitoba day surgery data were obtained from Manitoba Health for 2001–2002 to 2003–2004, and from the DAD for 2004–2005 to 2005–2006.

In all cases, data are based on the fiscal year of discharge. For example, the 2005–2006 inpatient and day surgery hospitalization statistics are based on discharges (including deaths and transfers) occurring between April 1, 2005, and March 31, 2006. The terms “hospitalization” and “discharge” are used interchangeably in this document.

While these data sets capture the majority of inpatient or day surgery hospitalizations for the years in question, the following gaps should be noted:

- The Queen Elizabeth Hospital in P.E.I., the province’s largest acute facility, did not submit day surgery data in 2001–2002.
- In 2004–2005, 623 acute and day surgery abstracts from the Northwest Territories were identified by CIHI as potential duplicates and have been removed from this analysis.
• In 2005–2006, the Medicine Hat Regional Hospital in Alberta did not submit any discharge abstract information for two periods of the fiscal year. An estimated 1,800 abstracts are missing. This hospital is located in Palliser Health Region and is a major care provider, performing about 80% of joint replacements in this region. Two other Alberta facilities had incomplete submissions, with an estimated 600 abstracts missing.

• The Kensington Eye Institute in Toronto, Ontario opened on January 9, 2006. Data from this institution were not received by CIHI in 2005–2006. Based on the projected volume of 6,700 cataract surgeries annually, an estimated 1,400 cataract procedures may be missing from Ontario 2005–2006 data.

• In each year of the study, a Manitoba facility that does not report to the DAD performed approximately 1,500 cataract surgeries, as well as a small number of procedures outside of wait time priority areas. Data from this facility are not included in the analysis.

• The Pan Am Clinic in Winnipeg opened in 1979 and provided outpatient surgical services for the period covered in this analysis. It is now part of the Winnipeg Regional Health Authority. However, it did not submit day surgery abstracts to the DAD until April 1, 2006. Complete data for the Clinic are not available for all years, so Pan Am Clinic volume is excluded from all five-year analyses. Data for cataract surgery and minor orthopedic procedures is available for 2004–2005 and 2005–2006, so this portion of Pan Am clinic data is included only in analysis of changes between 2004–2005 and 2005–2006. In 2005–2006, the Pan Am Clinic performed 957 cataract surgeries (approximately 10% of the provincial total) and 2,350 minor orthopedic procedures.

• Approximately 3% of day surgery patients treated in Alberta facilities were from out of province. Because of data limitations, these patients could not be added back to their home province statistics. Similarly, patients from other provinces who received care in a Quebec facility could not be identified.

Over the time frame for this analysis, some jurisdictions experienced major changes to hospital data collection: a shift in the classification system used, a change in the database to which hospitalization information was submitted, or both.

The ICD-10-CA and CCI systems of coding diagnoses and interventions came into effect beginning in 2001. By April 1, 2004, they had been adopted by all provinces and territories included in this analysis. These changes, as well as new and revised coding standards introduced with the ICD-10-CA/CCI classifications systems, may affect trends and the comparability of some rates. Some specific cautions regarding hip replacement rates are noted at the end of this appendix.

In 2003–2004, Ontario began collecting day surgery data through NACRS. In the following year, Manitoba began submitting data to the DAD. In both provinces, definitions for surgical cases were tightened and a decline in surgical volume was observed in the year of transition.
Methodology

This analysis focuses on inpatient and day surgery discharges (discharges, transfers or deaths) from an acute care hospital in Canada between 2001–2002 and 2005–2006. Data from Quebec for 2005–2006 were not available to CIHI at the time that this analysis was prepared and so data on patients treated in that province have not been included in the analysis.

Most results are reported for Canada as a whole. Provincial data are based on where patients reside, not where they were treated. Hospitalization rates are age-standardized (or adjusted for age). Age-standardization is a statistical technique used to remove the effect of the difference in the age distribution of two or more populations when comparing rates across different populations or the same population over time. The 1991 Canadian population is used for the standard population in adjusting hospitalization rates for age. Fiscal-year provincial and territorial population estimates as of October 1 provided by Statistics Canada were used in the calculation of age-standardized hospitalization rates.

To identify patients with a surgical intervention, intervention codes reported on discharge abstracts were compared to a list of surgical interventions identified by experts during the construction of CIHI’s Case Mix Groups and Day Procedure Groups (CMGs and DPGs). Other approaches may be used to identify these patients. For example, cases might be identified based on their most responsible provider being a surgeon, the presence of certain intervention codes or whether a procedure was performed in a designated operating room. As a result, surgical counts and rates reported here may differ from those reported elsewhere. Because a consistent approach would facilitate the understanding and comparison of surgical data, CIHI will work with external partners to achieve a standardized approach in the future.

Rates are based on the total number of discharges with a surgical intervention, rather than the total number of interventions. For example, a bilateral knee replacement provided during one admission is counted as one event.

Given that this analysis primarily focuses on surgical procedures for which patients might experience a wait, the following types of patients have been excluded from all analyses:

- Those whose most responsible diagnosis related to pregnancy and childbirth (defined as major clinical category [MCC] 14)
- Those whose most responsible diagnosis related to trauma (defined as MCC 25)
- Newborns (MCC 15)
- Mental Health (MCC 19)
Inpatient surgery was defined as cases which fell within the surgical partition, as defined by the 2004 edition of Case Mix Groups for ICD-10-CA data, and the 2000 edition of Case Mix Groups for ICD-9 and ICD-9-CM data.

There are variations between provinces and territories in what is considered day surgery. For the results presented here, CIHI defined day surgery visits (or discharges) as follows:
- **DAD**: records submitted under an Institution Type of day surgery and grouped to a Day Procedure Group using the 2003 edition of the methodology.
- For Ontario and Nova Scotia facilities submitting to NACRS, the following management information systems (MIS) functional centres were used to identify day procedure patients (in addition to the DPG assignment):
  - 7~34020, 7~34025, 7~34055, 7~260, 7~262, 7~265
  - 7~310 AND Visit to the Emergency Department was scheduled
  - 7~41544
  **Note**: PCI cases were counted regardless of the functional centre to which they were assigned.
- Cases grouped to the following functional centres were excluded to avoid potential duplicates:
  - 7131076, 713104000, 713107000
- In Alberta, day surgery cases were defined as having an Ambulatory Care Classification System (ACCS) code of 1.* to 72.*, and belonging to the following MIS functional centres:
  - 71340, 7134020, 7134025, 713402560, 7134030, 7134055, 71355~
  - 7141550, 7141555 and 7134037
- The Responsibility for Payment field with values of 3 (Other province/territory, resident of Canada) or 8 (Other countries self-pay) was used to identify non-Alberta residents. This represented approximately 3% of total cases.
- To enhance comparability among provinces, some DPGs were removed from the analytic data set in all provinces (see table on following page). The qualifying day procedure screen is applied to adjust for variable reporting standards among provinces for same-day surgery. This screen is similar to the Day Procedure Exclusion List developed by the Ontario Joint Policy and Planning Committee (JPPC). Day procedure cases that pass this screen are defined as “Qualifying Day Procedures.” In Alberta, selected ACCS groups based on similar procedure codes were also removed.
## Qualifying Day Procedures

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<th>ACCS Group:</th>
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<td>Spinal</td>
<td>2</td>
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<tr>
<td>Major Spinal Procedures</td>
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<td>Skin Interventions</td>
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Inpatient and day surgery were assigned to 1 of 10 analytic groups, based on the definitions in the table on the following page. Each case was assigned to only one group, as noted in the table below. Cases were assigned to analytic groups based on the order in which they appear in the table (that is, all cancer surgery cases were identified first). Wait time priority procedures (items b to f in the table below) were counted if a procedure code was captured in any position on the abstract.

<table>
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<tr>
<th>Procedure(s) of Interest</th>
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<th>ICD-9/CCP Selection Criteria</th>
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</thead>
<tbody>
<tr>
<td>a. All cancer surgeries: Any patient in a qualifying CMG or DPG who had a most responsible diagnosis (MRDx) of cancer</td>
<td>C00 to C26 (inclusive) C30 to C44 (inclusive) C45 to C97 (inclusive) Z510, Z511</td>
<td>140 to 208 (inclusive) V580, V581</td>
<td>140 to 208 (inclusive) V580, V581</td>
</tr>
<tr>
<td>b. Coronary artery bypass graft surgery (bypass surgery)</td>
<td>1.IJ.76</td>
<td>48.1</td>
<td>36.1</td>
</tr>
<tr>
<td>c. Hip replacement*</td>
<td>1.VA.53.LA-PN, 1.VA.53.PN-PN</td>
<td>93.51, 93.52, 93.53, 93.59</td>
<td>81.50, 81.51, 81.53</td>
</tr>
<tr>
<td>d. Knee replacement</td>
<td>1.VG.53</td>
<td>93.40, 93.41</td>
<td>81.54, 81.55</td>
</tr>
<tr>
<td>Procedure(s) of Interest</td>
<td>ICD-10/CCI Selection Criteria</td>
<td>ICD-9/CCP Selection Criteria</td>
<td>ICD-9-CM Selection Criteria</td>
</tr>
<tr>
<td>--------------------------</td>
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</tr>
<tr>
<td>e. Cardiac angioplasty</td>
<td>1.IJ.50, 1.IJ.57.GQ, 1.IJ.57.GS (2001–2002 and 2002–2003 only)</td>
<td>48.02, 48.03</td>
<td>36.01, 36.02, 36.05</td>
</tr>
<tr>
<td>f. Cataract surgery</td>
<td>In Manitoba and Alberta, the case was included if any of the diagnoses was the MRDx.</td>
<td>Diagnosis: H25 H26 H28 AND Procedure: 1.CL.89.</td>
<td>Diagnosis: 366. AND Procedure 27.4 27.5</td>
</tr>
<tr>
<td>g. Other cardiac</td>
<td>CMGs 176–194; 201–204; 210–211; 215–218 DPG 22–25, ACCS 18–20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Other orthopedic</td>
<td>CMGs 3, 350–386 DPG 37–49, ACCS 44–54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Other eye</td>
<td>CMGs 50–57 DPG 6–10, ACCS 4–8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. All other qualifying surgical cases</td>
<td>All CMGs in the surgical partition not included in categories g, h or i. DPG 1, 11-20, 26-36, 50-99, ACCS 1, 9-17, 21-43, 55-71</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note that procedure codes may be recorded in any position. Procedures coded as cancelled, previous, out-of-hospital and “abandoned after onset” are excluded.

* Efforts were made to keep hip replacement definitions consistent with those used in CIHI’s *Health Indicators* publication. The CCP and ICD9-CM codes for hip replacement both identify total hip replacements and revisions of total hip replacements. They exclude partial hip replacements or revisions of partial hip replacements. The CCI codes include both total and partial hip replacements, as there is no way to distinguish between a total and partial replacement in CCI. As a result, provinces not reporting in CCI may have a small underestimate of hip replacements. Partial hip replacements constitute between 2% and 6% of all hip replacements, depending on the province. All jurisdictions in this analysis followed consistent classification systems for 2004–2005 and 2005–2006, so changes in hip replacement definitions do not affect analysis of one-year analysis trends.
Appendix 2.

Figure A. Trends in Age-Standardized Surgery Rates 2001–2002 to 2005–2006, British Columbia

Notes:
a. Includes provincial residents, regardless of where they were treated (excluding any Quebec hospitalizations and Alberta day surgery).
b. Total surgical procedures exclude those for trauma, pregnancy and childbirth, newborns and mental health.
c. Includes only qualifying day procedures (see Appendix 1 for definitions).

Sources: Discharge Abstract Database, National Ambulatory Care Reporting System, CIHI; special tabulations provided by Alberta Health and Wellness and Manitoba Health.
Notes:

a. Includes provincial residents, regardless of where they were treated (excluding any Quebec hospitalizations).

b. Total surgical procedures exclude those for trauma, pregnancy and childbirth, newborns and mental health.

c. Includes only qualifying day procedures (see Appendix 1 for definitions).

b. The ICD-10-CA and CCI systems of coding diagnoses and procedures came into effect in 2002–2003. New and revised coding standards introduced with the ICD-10-CA/CCI classification systems may affect the comparability of rates. There were some changes to hip replacement definitions with the introduction of ICD-10-CA/CCI. See Appendix 1 for more information. This change may result in a small underestimate of hip replacements in 2001–2002.

e. Excludes day surgery volume from Alberta Cancer Board centres.

f. Three hospitals in Alberta did not submit full periods of data to the 2005–2006 DAD. An estimated 2,400 abstracts are missing. One of these facilities is a major care provider in Palliser Health Region and performs an estimated 80% of total joint replacement surgeries in the region.

g. Includes joint replacement volumes from the Health Resources Group in Calgary.

Sources: Discharge Abstract Database, National Ambulatory Care Reporting System, CIHI; special tabulations provided by Alberta Health and Wellness and Manitoba Health.
Figure C.  Trends in Age-Standardized Surgery Rates 2001–2002 to 2005–2006, Saskatchewan

Notes:

a. Includes provincial residents, regardless of where they were treated (excluding any Quebec hospitalizations and Alberta day surgery).

b. Total surgical procedures exclude those for trauma, pregnancy and childbirth, newborns and mental health.

c. Includes only qualifying day procedures (see Appendix 1 for definitions).

d. The ICD-10-CA and CCI systems of coding diagnoses and procedures came into effect in parts of Saskatchewan in 2001–2002, with the full province adopting them in 2002–2003. New and revised coding standards introduced with the ICD-10-CA/CCI classification systems may affect the comparability of rates. There were some changes to hip replacement definitions with the introduction of ICD-10-CA/CCI. See Appendix 1 for more information. This change may result in a small underestimate of hip replacements in 2001–2002.

Sources: Discharge Abstract Database, National Ambulatory Care Reporting System, CIHI; special tabulations provided by Alberta Health and Wellness and Manitoba Health.
Figure D. Trends in Age-Standardized Surgery Rates 2001–2002 to 2005–2006, Manitoba

Notes:

a. Includes provincial residents, regardless of where they were treated (excluding any Quebec hospitalizations and Alberta day surgery).
b. Total surgical procedures exclude those for trauma, pregnancy and childbirth, newborns and mental health.
c. Includes only qualifying day procedures (see Appendix 1 for definitions).
d. The ICD-10-CA and CCI systems of coding diagnoses and procedures came into effect in 2004–2005. New and revised coding standards introduced with the ICD-10-CA/CCI classification systems may affect the comparability of rates. There were some changes to hip replacement definitions with the introduction of ICD-10-CA/CCI. See Appendix 1 for more information. This change may result in a small underestimate of hip replacements in 2001–2002 to 2003–2004.
e. Manitoba began submitting hospitalization data to the DAD in 2004–2005. Definitions for surgical cases were tightened and a decline in surgical volume was observed in the year of transition.
f. The Pan Am Clinic in Winnipeg opened in 1979 and provided outpatient surgical services for the period covered in this analysis. As complete data for the Clinic is not available for all years, Pan Am Clinic volume is excluded from the graph above. In 2005–2006, the Pan Am Clinic performed 957 cataract surgeries (approximately 10% of provincial total) and 2,350 minor orthopedic procedures.

Sources: Discharge Abstract Database, National Ambulatory Care Reporting System, CIHI; special tabulations provided by Alberta Health and Wellness and Manitoba Health.
Figure E. Trends in Age-Standardized Surgery Rates 2001–2002 to 2005–2006, Ontario

Notes:

a. Includes provincial residents, regardless of where they were treated (excluding any Quebec hospitalizations and Alberta day surgery).
b. Total surgical procedures exclude those for trauma, pregnancy and childbirth, newborns and mental health.
c. Includes only qualifying day procedures (see Appendix 1 for definitions).
d. The ICD-10-CA and CCI systems of coding diagnoses and procedures came into effect in 2002–2003. New and revised coding standards introduced with the ICD-10-CA/CCI classification systems may affect the comparability of rates. There were some changes to hip replacement definitions with the introduction of ICD-10-CA/CCI. See Appendix 1 for more information. This change may result in a small underestimate of hip replacements in 2001–2002.
e. Ontario began submitting day surgery data to the NACRS in 2003–2004. Definitions for surgical cases were tightened and a decline in surgical volume was observed in the year of transition.
f. The SARS outbreak affected Ontario utilization in spring and summer of 2003. Analysis by the Institute for Clinical Evaluative Sciences (Utilization of Ontario’s Health System During the 2003 SARS Outbreak) observed a decline in selected inpatient and outpatient procedures in April and May 2003, particularly for elective procedures.
g. The Kensington Eye Institute in Toronto, Ontario opened on January 9, 2006. Data from this institution were not received by CIHI in 2005–2006. Based on the projected volume of 6,700 cataract surgeries annually, an estimated 1,400 cataract procedures may be missing from Ontario 2005–2006 data.

Sources: Discharge Abstract Database, National Ambulatory Care Reporting System, CIHI; special tabulations provided by Alberta Health and Wellness and Manitoba Health.
Figure F. Trends in Age-Standardized Surgery Rates 2001–2002 to 2005–2006, New Brunswick

Notes:

a. Includes provincial residents, regardless of where they were treated (excluding any Quebec hospitalizations and Alberta day surgery).

b. Total surgical procedures exclude those for trauma, pregnancy and childbirth, newborns and mental health.

c. Includes only qualifying day procedures (see Appendix 1 for definitions).

d. The ICD-10-CA and CCI systems of coding diagnoses and procedures came into effect in 2003–2004. New and revised coding standards introduced with the ICD-10-CA/CCI classification systems may affect the comparability of rates. There were some changes to hip replacement definitions with the introduction of ICD-10-CA/CCI. See Appendix 1 for more information. This change may result in a small underestimate of hip replacements in 2001–2002 and 2002–2003.

e. In 2003, New Brunswick adopted a new definition for day surgery, which redefined the types of procedures included in this category. As a result, a decline in day surgery volume was observed.

Sources: Discharge Abstract Database, National Ambulatory Care Reporting System, CIHI; special tabulations provided by Alberta Health and Wellness and Manitoba Health.
Figure G. Trends in Age-Standardized Surgery Rates 2001–2002 to 2005–2006, Nova Scotia

Notes:

a. Includes provincial residents, regardless of where they were treated (excluding any Quebec hospitalizations and Alberta day surgery).

b. Total surgical procedures exclude those for trauma, pregnancy and childbirth, newborns and mental health.

c. Includes only qualifying day procedures (see Appendix 1 for definitions).

d. In October 2003–2004, two Nova Scotia facilities began submitting day surgery data to the NACRS, followed by another facility on April 1, 2005. Definitions for surgical cases were tightened and a decline in surgical volume was observed in the year of transition.

Sources: Discharge Abstract Database, National Ambulatory Care Reporting System, CIHI; special tabulations provided by Alberta Health and Wellness and Manitoba Health.
Figure H. Trends in Age-Standardized Surgery Rates 2001–2002 to 2005–2006, Newfoundland and Labrador

Notes:

a. Includes provincial residents, regardless of where they were treated (excluding any Quebec hospitalizations and Alberta day surgery).
b. Total surgical procedures exclude those for trauma, pregnancy and childbirth, newborns and mental health.
c. Includes only qualifying day procedures (see Appendix 1 for definitions).

Sources: Discharge Abstract Database, National Ambulatory Care Reporting System, CIHI; special tabulations provided by Alberta Health and Wellness and Manitoba Health.