Overuse of Tests and Treatments in Canada

Progress Report

November 2022

Choosing Wisely Canada™

Canadian Institute for Health Information

Institut canadien d'information sur la santé

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Canadian Institute for Health Information
495 Richmond Road, Suite 600
Ottawa, Ontario K2A 4H6

Phone: 613-241-7860
Fax: 613-241-8120
www.cihi.ca
copyright@cihi.ca

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- **Dr. Jennifer Blake,** Professor, Dalla Lana School of Public Health, University of Toronto
- **Dr. Eric Bohm,** Professor of Surgery, Rady Faculty of Health Sciences, University of Manitoba; Director, Health Systems Performance, George & Fay Yee Centre for Healthcare Innovation
- **Dr. Jeannie Callum,** Director of Transfusion Medicine, Kingston Health Sciences Centre and Department of Pathology and Molecular Medicine, Queen's University
- **Dr. Lucas Chartier,** Chief Patient Safety Officer (interim), Medical Director, Quality & Safety, Deputy Medical Director of Emergency Department, University Health Network
- **Dr. Shawn Dowling,** Emergency Physician
- **Dr. Barbara Farrell,** Pharmacist, Geriatric Day Hospital, Bruyère Continuing Care; Senior Scientist, Bruyère Research Institute; Assistant Professor, Department of Family Medicine, University of Ottawa
- **Dr. Jeremy Friedman,** Associate Paediatrician-in-Chief, Department of Paediatrics, SickKids; Professor, Department of Paediatrics, University of Toronto
- **Dr. Sid Feldman,** Chief, Department of Family and Community Medicine, Baycrest Health Sciences; Associate Professor, Department of Family and Community Medicine, University of Toronto
- **Dr. Allan Grill,** Chief of Family Medicine, Markham Stouffville Hospital; Lead Physician, Markham Family Health Team
- **Dr. Amanda Hall,** Assistant Professor, Primary Healthcare Research Unit, Faculty of Medicine, Memorial University of Newfoundland
- **Dr. Kyle Kirkham,** Director, Anesthesia Preadmission Clinic, Women's College Hospital; Lecturer, Faculty of Medicine, University of Toronto
- **Dr. Carina Lundby,** Pharmacist, Bruyère Research Institute, University of Ottawa
- **Dr. Jerome Leis,** Medical Director, Infection Prevention and Control, Staff Physician, Infectious Diseases, Sunnybrook Health Sciences Centre; Associate Professor, Temerty Faculty of Medicine, University of Toronto

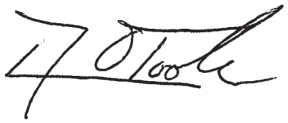
- **Dr. Yulia Lin**, Division Head, Transfusion Medicine & Tissue Bank, Precision Diagnostics and Therapeutics Program, Sunnybrook Health Sciences Centre; Physician Lead, Transfusion, Choosing Wisely Canada
- **Dr. Barbara Liu**, Executive Director, Regional Geriatric Program of Toronto, Sunnybrook Health Sciences Centre; Division Director, Geriatric Medicine, University of Toronto; Professor, Department of Medicine, University of Toronto
- **Dr. Olivia Ostrow**, Staff Physician, Pediatric Emergency Medicine, Medical Safety Leader, The Hospital for Sick Children; Associate Director, Centre for Quality Improvement and Patient Safety; Assistant Professor, University of Toronto
- **Dr. Andrea M. Patey**, Senior Research Associate, Ottawa Hospital Research Institute; Adjunct Professor, School of Epidemiology and Public Health, University of Ottawa; Adjunct Professor, School of Rehabilitation Sciences, Queen's University
- **Christine Peters,** Provincial Quality Improvement Lead, Quality and Learning, Shared Health/Soins Communs, Manitoba; Choosing Wisely Coordinator, Manitoba
- **Dr. Patrick B. Quail**, Medical Leader, Supportive Living Calgary Zone, Alberta Health Services; Family physician and attending physician to residents in the nursing home and supportive living sectors; Medical Director, Intercare Corporate Group Inc.
- **Dr. Shannon Ruzycki,** General Internist and Clinical Assistant Professor, Department of Medicine, Department of Community Health Sciences, and Cumming School of Medicine, University of Calgary
- **Dr. Christine Soong,** Associate Professor, General Internal Medicine, University of Toronto; Medical Director, Quality and Safety, Sinai Health; Hospital Medicine Division Head, Sinai Health and the Department of Family and Community Medicine, University of Toronto
- **Dr. Bryan Tordon,** Transfusion Medicine Fellow, University of Toronto
- **Dr. Justin Turner,** Senior Lecturer, Monash University; Principal Investigator and Scientific Director, SaferMedsNL; Co-Director, Canadian Deprescribing Network
- **Dr. Jennifer Watt,** Geriatrician, St. Michael's Hospital; Assistant Professor, University of Toronto; Scientist, Li Ka Shing Knowledge Institute
- **Dr. Jason R. Werle,** Clinical Professor, Chief, Section of Orthopaedic Surgery, Cumming School of Medicine, University of Calgary; Senior Medical Director, Bone & Joint Health Strategic Clinical Network, Alberta Health Services

Please note that the analyses and conclusions in this report do not necessarily reflect the opinions of the individuals mentioned above.

In addition, this report benefited from assistance provided by representatives from the health regions, the provincial and territorial ministries of health, and CWC's provincial and territorial hubs.

Foreword

The last few years have highlighted the critical importance of actionable health system data to inform decisions and have renewed the focus on effective stewardship of limited health system resources. This new joint report from CIHI and CWC — a follow-up to our 2017 *Unnecessary Care in Canada* report[1] — provides updated and expanded information on the overuse of tests and treatments in Canada. Looking at trends over time, we see that Canada has made progress on reducing low-value care in several areas through collaborative efforts by clinicians, patients, administrators, researchers and policy-makers. However, slower progress in other areas and variation among jurisdictions point to opportunities for continued improvement. We hope this report helps to advance our collective understanding of the issue of overused health care in Canada and provides ideas for how we can work together to make a meaningful impact on reducing the overuse of tests and treatments and improving quality of care for Canadians.



David O'Toole
President and CEO
Canadian Institute for Health Information

Dr. Wendy Levinson
Chair, Choosing Wisely Canada
Professor of Medicine, University of Toronto

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Choosing Wisely Canada™

Executive summary

The overuse of tests and treatments that offer little to no benefit to patients — and may even cause harm — represents low-value health care. The first joint report from the Canadian Institute for Health Information and Choosing Wisely Canada, *Unnecessary Care in Canada* (2017),[1] measured the extent to which 8 common tests and treatments are overused, according to recommendations developed by national clinician societies. It also highlighted opportunities for reducing overuse.

This follow-up report expands on that work, examining the overuse of 12 selected tests and treatments by looking at trends and variation in use over time across the country. It shows how much progress Canada's health care systems have made in reducing low-value care in 12 areas. It also provides information and ideas that may inform continued improvements in care delivery for Canadians and support the sustainability of Canada's health care resources.

This report found that overuse of

8 of the 12

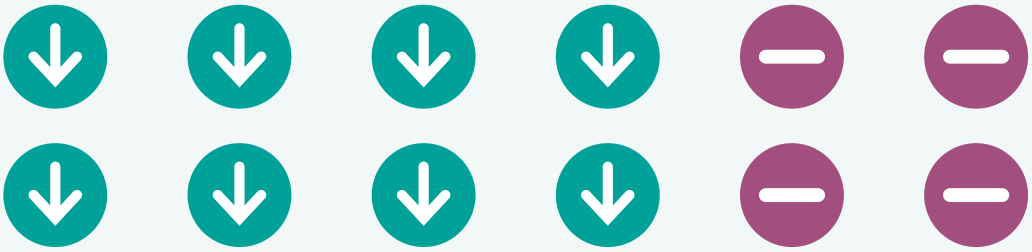
selected tests and treatments declined by

10% or more

between 2014–2015 and 2019–2020.

Overuse remains an issue, and further reductions in low-value care are both possible and necessary.

To achieve widespread change, we need system-level changes in addition to continued efforts from front-line clinicians and patients.



Key findings

Across Nova Scotia, Ontario, Manitoba, Alberta and British Columbia

24% to 31%

of patients with lower-back pain without red flags (certain worrisome symptoms) received diagnostic imaging.

42%

of Canadians with a cervix age 18 to 24

reported receiving a Pap test in the previous 3 years.

The total volume of antibiotics, measured by the World Health Organization's standardized defined daily dose, was **13 per 1,000 population per day** (Manitoba, Saskatchewan and British Columbia).

1 in 12 older adults

used benzodiazepines and other sedative–hypnotics regularly (all provinces except Quebec).

1 in 5 long-term care residents

were taking antipsychotics without a diagnosis of psychosis (Newfoundland and Labrador, Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia and Yukon).

Daily physical restraints in long-term care occurred in fewer than 1 in 20 residents

(Newfoundland and Labrador, Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia and Yukon).

Note

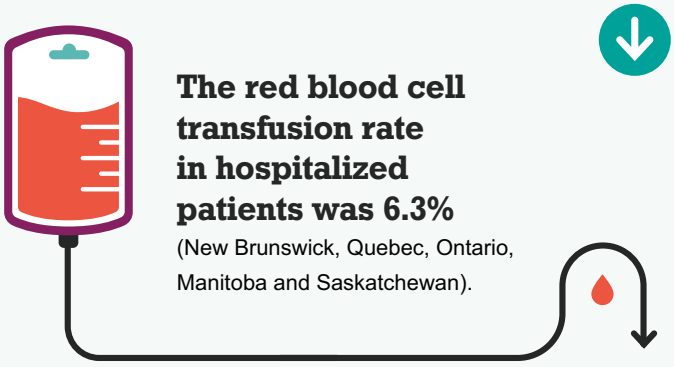
The arrows reflect the trends in the rates over their respective reporting periods. Changes less than 10% are indicated as stable.

3 in 10 children who visited the emergency department
for asthma or bronchiolitis received a chest X-ray (Ontario, Alberta and Yukon).

The rate of diagnostic imaging for adults who visited emergency departments for **minor head trauma without red flags was 1 in 3 patients** (Ontario, Alberta and Yukon).

The rate of knee arthroscopies in **adults age 60 and older was 99 per 100,000** across Canada, except Quebec, even though most are inappropriate regardless of the diagnosis.

The Caesarean section rate among low-risk deliveries was 1 in 6 (Canada, except Quebec).



The red blood cell transfusion rate in hospitalized patients was 6.3% (New Brunswick, Quebec, Ontario, Manitoba and Saskatchewan).

1 in 5 patients who had low-risk surgery had a preoperative test (Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia).

Introduction

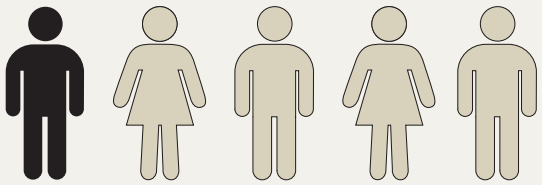
In 2017, the Canadian Institute for Health Information (CIHI) and Choosing Wisely Canada (CWC) released a joint report called *Unnecessary Care in Canada*, which measured the extent of overuse of 8 common tests and treatments. The overuse of health care, or low-value care, offers little to no benefit to patients and can even cause harm, including side effects, unnecessary exposure to radiation, a cascade of more testing, stress and anxiety, among other things. For Canada's health systems, overused tests and treatments can increase wait times for people who need care, take up patients' and clinicians' time and waste limited health resources.

This follow-up report comes as the limits of Canada's health care systems are being tested by COVID-19 and the sustainability of health care is worrying Canadians. Clinicians and patients are more aware of the problem of low-value tests and treatments, but despite some successful initiatives to reduce it, overuse remains an issue. The efforts of front-line clinicians and patients need system-level changes to bring about more widespread reductions in overuse. This report is designed to show decision-makers and clinicians the size and scope of the issue to help them accelerate work on reducing overuse and free up limited resources to reinvest in higher-value care.

Public awareness and attitudes around overuse

CWC asked Canadians to share their perceptions and attitudes toward overused health care through a 2022 Ipsos Reid survey.[2] Here are a few key findings from the survey.

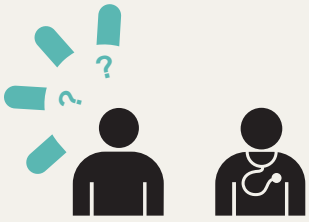
Overuse of tests and treatments



In 2022, about **1 in 5 (19%)** Canadians reported that a test or treatment they did not feel was necessary for their health had been recommended to them. This has declined compared with **25% in 2019 and 30% in 2017.**

Among this group, **more than half (55%)** asked their doctor why they thought the test was necessary.

Comfort in speaking with their health care provider



86% of Canadians feel comfortable asking whether a treatment or test is necessary.

Those who were more likely to say they are **not comfortable** include **younger adults (age 18 to 34)** and people from households with an **annual income of less than $40,000**.

About this report

This report examines the overuse of 12 tests and treatments related to CWC recommendations developed by national clinician societies. The measures we developed look at trends and variation in use over time across jurisdictions. Factors such as hospital peer group and patient characteristics were also analyzed. While eliminating overuse may not always be indicated or possible, and there are no established Canadian benchmarks for these 12 measures, lower rates are desirable. **Rates that decrease over time are interpreted as favourable, and changes of less than 10% are interpreted as stable.** This report also provides examples of actions that have been taken to reduce the overuse of these 12 tests and treatments. These actions may help explain trends and give clinicians, decision-makers and policy-makers ideas for making further reductions.

About the measures

Of the 12 measures in this report, 11 were developed by CIHI using administrative data from acute care hospitalizations, emergency departments, physician billings, prescription drug claims and long-term care resident assessments. 5 measures were reported in the 2017 *Unnecessary Care in Canada* report; several of the other measures are based on CIHI indicators. The Canadian Partnership Against Cancer led the analysis on cervical cancer screening, based on data from the Canadian Community Health Survey.

For each measure that CIHI analyzed, we looked at trends in use from 2014–2015 to 2019–2020 or 2015–2016 to 2019–2020, how use varied among jurisdictions and what factors might have influenced rates. Not all provinces and territories collect all of this data, so we compare available data from those jurisdictions that do to show differences and draw cross-jurisdictional lessons. We also tried to identify whether socio-demographic variables such as age, sex and income were factors in the overuse of tests and treatments.

For more information on the data and methodologies, please refer to the methodology notes. More detailed analyses for each measure are available in the companion data tables.

Impact of the COVID-19 pandemic

Where available, data from the first year of the COVID-19 pandemic (2020–2021) is included in this report and the companion data tables. 2020–2021 data was not part of the trend analysis for the 12 measures because it is not fully understood how COVID-19 has changed the provision and use of health services, and it remains to be seen whether these changes will persist over time.

Community Care

Diagnostic imaging for lower-back pain

Key finding

Status in 2019–2020

Trend

Across Nova Scotia, Ontario, Manitoba, Alberta and British Columbia

24% to 31%

of patients with lower-back pain without red flags (certain worrisome symptoms) received diagnostic imaging.

Collectively, rates were stable between 2015–2016 and 2019–2020 — they declined in Nova Scotia and Alberta and remained stable in Ontario, Manitoba and British Columbia.

Why is it important?

Diagnostic imaging for uncomplicated lower-back pain without red flags,[i] including X-rays, computed tomography (CT) and magnetic resonance imaging (MRI), rarely shows the cause of pain and can expose patients to unnecessary radiation and lead to more avoidable tests and surgery.[3]

Most people's lower-back pain goes away in about a month with or without imaging.[4]

i. Red flags include when serious conditions are suspected, such as epidural abscess or hematoma, osteomyelitis, cancer, infection, cauda equina syndrome, compression fracture, or severe or progressive neurological deficit.

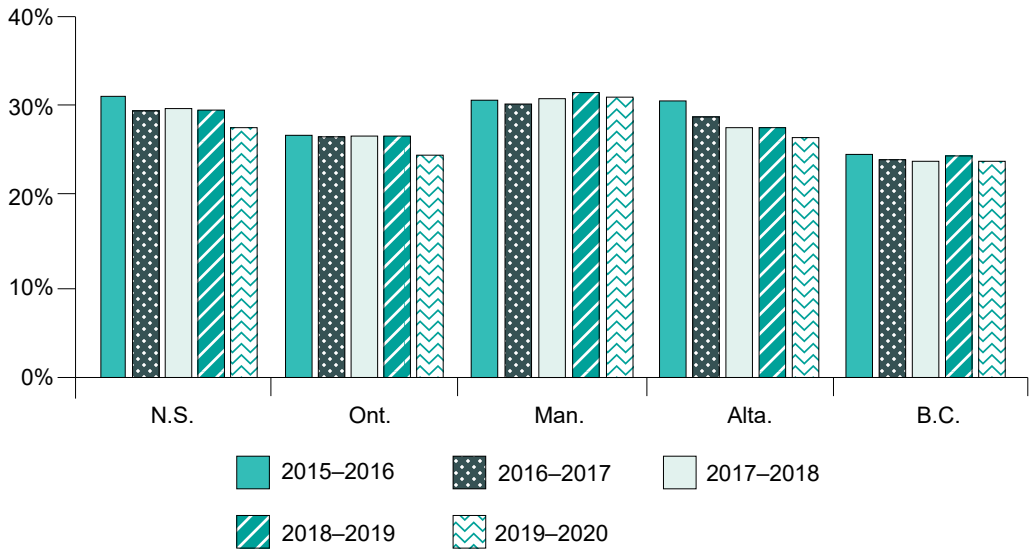
This is the Choosing Wisely Canada recommendation from the College of Family Physicians of Canada and the Canadian Association of Radiologists:

Don’t do imaging for lower-back pain unless red flags are present.[5, 6]

Overall trend and provincial variation

This analysis examined how many patients got diagnostic imaging within 6 months of their initial visit to a family physician for lower-back pain, even when there were no red flags denoting that imaging might be necessary. The trends for imaging rates in patients with uncomplicated lower-back pain varied by province. Between 2015–2016 and 2019–2020, the diagnostic imaging rate dropped more than 13% in Alberta and 11% in Nova Scotia, while remaining stable in the 3 other provinces. Overall, the number of diagnostic imaging tests (X-rays, CTs and MRIs) was reduced by approximately 22,000 for 2019–2020 compared with 2015–2016. In 2019–2020 alone, up to 1 in 3 patients with uncomplicated lower-back pain across reporting provinces — about 181,000 patients — received imaging. Some of the variation may be due to how provinces report and fund diagnostic imaging.

Figure 1 Diagnostic imaging rate for lower-back pain without red flags, by province, 2015–2016 to 2019–2020

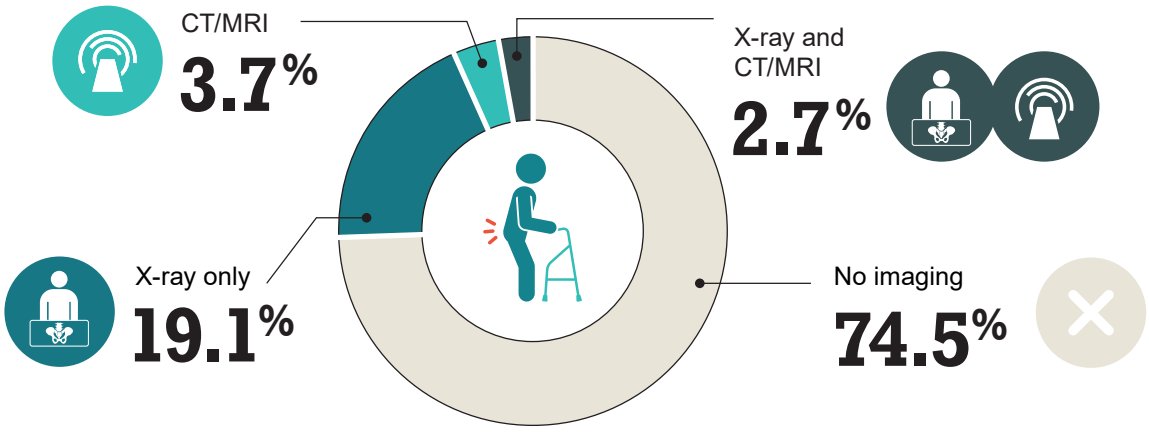


Notes
Caution is needed when interpreting provincial variation due to differences in how the provinces report and fund diagnostic imaging. The diagnostic imaging rate was adjusted for a patient's age and sex.
Sources
National Physician Database, Discharge Abstract Database and National Ambulatory Care Reporting System, 2014–2015 to 2020–2021, Canadian Institute for Health Information.

Other findings

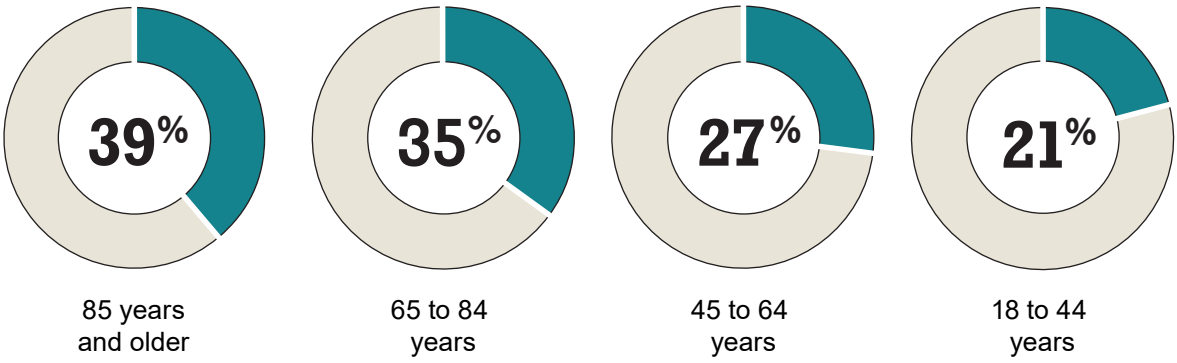
X-rays were the most common type of diagnostic imaging performed, with almost 22% of patients with uncomplicated lower-back pain receiving one. A small segment of patients (less than 3%) got a CT or MRI in addition to an X-ray.

Distribution of diagnostic imaging for lower-back pain without red flags, 2019–2020



Older patients were more likely to receive imaging for lower-back pain. This is likely because their primary care providers worry more about potentially missing a serious problem in older patients, even those without red flags.

Diagnostic imaging rate for lower-back pain without red flags, by age group, 2019–2020



Diagnostic imaging for lower-back pain in the first 6 months of COVID-19

Across Nova Scotia, Ontario, Manitoba, Alberta and British Columbia, the rates of imaging declined between 3% and 16% between April and September 2020, relative to the same period in 2019. That drop likely reflects restricted access to health care in the early months of COVID-19.

Taking action on overuse

Unnecessary imaging may result from patient requests, a belief that imaging will reassure the patient or from not having enough time to explain why imaging isn't necessary.[3] There has not been a coordinated national effort to decrease imaging for lower-back pain, but jurisdictions across Canada are trying different approaches such as clinical decision-support tools and education to reduce overuse. Here are a few approaches to reducing lower-back pain imaging in Canada.

In action

Rapid Access Clinics for Low Back Pain in Ontario

In 2018, Ontario introduced Rapid Access Clinics for Low Back Pain,[7] where primary care providers can send patients with lower-back pain to a multidisciplinary team for timely care. Rather than waiting more than 6 months to be assessed by a spine surgeon — with the great majority receiving an MRI while they waited — patients are assessed by specially trained providers in less than 4 weeks, on average. A study found that in more than 30% of cases, an MRI was not needed and only 10% of patients were candidates for surgery. In addition to reducing imaging overuse, the clinics also provide education and evidence-based self-management plans, which help improve patient experience and outcomes.[8]

Spine Pathway Program in Saskatchewan

Similar to Ontario's clinics, Saskatchewan's Spine Pathway Program ensures that patients experiencing back pain get the care they need quickly. The program is designed around an evidence-based care pathway that starts in primary care. If there's no improvement, the patient is referred to a Spine Pathway Clinic in Regina or Saskatoon. From there, only those who would benefit from surgery are referred to surgeons. Imaging is typically not warranted until the final step in the pathway, which helps cut down overuse.[9]

Additional tools and resources

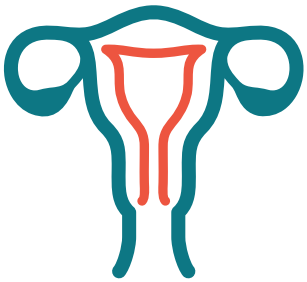
- Centre for Effective Practice: Clinically Organized Relevant Exam (CORE) Back Tool
- CWC's patient pamphlet: Imaging Tests for Low Back Pain: When you need them—and when you don't

Check out other initiatives that are happening across Canada to reduce unnecessary lower-back pain imaging.

Cervical screening

Key finding

Status in 2017



42%

of people in Canada with a cervix age 18 to 24
reported receiving a Pap test in the previous 3 years.

Trend

In 2008, this rate was 65%, meaning there has been a decline in routine Pap tests in this age group.[ii]

Why is it important?

Pap tests are used to look for abnormal cells that can cause cervical cancer and are generally only recommended for those age 25 to 69.

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ii. This included individuals with a cervix age 18 to 24 for all jurisdictions to align with the CWC recommendation developed by the College of Family Physicians of Canada. Individuals with a cervix who had undergone a hysterectomy were excluded from the analysis. Recommendations for cervical cancer screening varied by jurisdiction, with some jurisdictions starting at age 21 and others at age 25 in selected years (e.g., Alberta and British Columbia updated their screening guidelines in 2016 to start screening at the age of 25).10

Outside that age bracket, cervical cancer is rare and screening for it can result in false positives, leading to further testing and treatments that may cause harm.

This is the Choosing Wisely Canada recommendation of the College of Family Physicians:

Don't screen with Pap smears if under 25 years of age[iii] or over 69 years of age.[5]

Provincial and territorial guidelines are relatively consistent with the national guideline from the Canadian Task Force on Preventive Health Care that recommends stopping screening by age 69 if patients have had 3 consecutive negative Pap tests over the past 10 years. However, some jurisdictions still begin screening as early as age 21 and it is sometimes done more or less often than the recommendation of every 3 years.[10]

iii. The Nurse Practitioner Association of Canada makes the same recommendation. A similar recommendation also exists from the Society of Obstetricians and Gynaecologists of Canada and the Canadian Association of Pathologists, in which the recommendation is not to screen those younger than 21.

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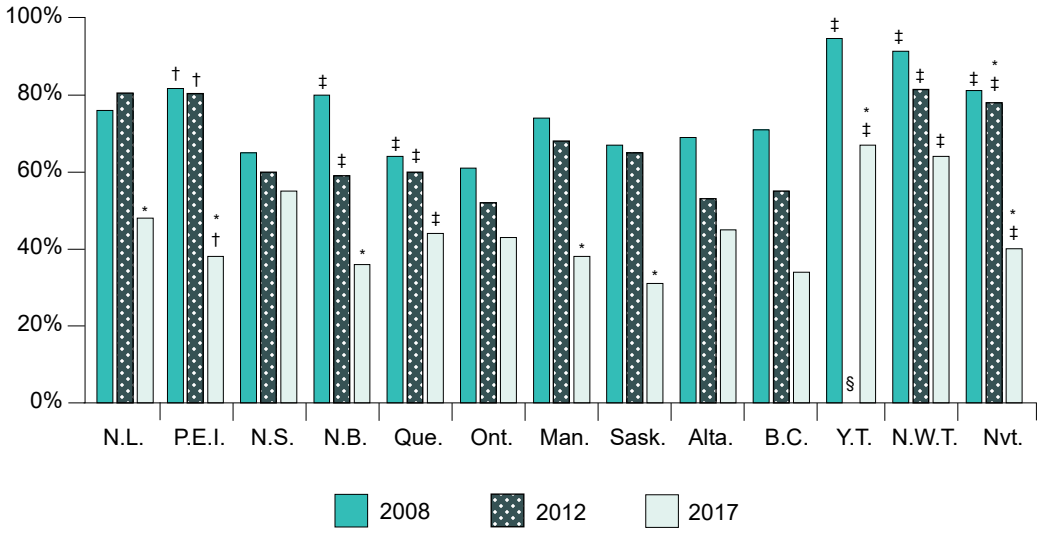
Provincial and territorial variation

Figure 2 **Percentage of individuals with a cervix age 18 to 24 reporting having had a Pap test within the past 3 years, by jurisdiction, 2008 to 2017**



Notes

* Interpret with caution owing to large variability in the estimate.

† An organized program has existed since 2001 in Prince Edward Island but screening remains primarily opportunistic.

‡ An organized cervical cancer screening program was not available this year.

§ 2012 data for Yukon was suppressed due to small numbers.

This included individuals with a cervix age 18 to 24 for all jurisdictions to align with the CWC recommendation developed by the College of Family Physicians of Canada. Individuals with a cervix who had undergone a hysterectomy were excluded from the analysis. Recommendations for cervical cancer screening varied by jurisdiction, with some starting at age 21 and others at age 25 in selected years (e.g., Alberta and British Columbia updated their screening guidelines in 2016 to start screening at the age of 25).

Sources

Statistics Canada, Canadian Community Health Survey, 2008, 2012 and 2017. 2 years were combined for Yukon, the Northwest Territories and Nunavut in 2017 (2017 and 2018).

In 2017, provincial rates of cervical screening for those age 18 to 24 ranged from 31% in Saskatchewan to 55% in Nova Scotia. Variations may be due, in part, to changes in cervical screening guidelines during this time period and because each jurisdiction has its own guidelines for when to start and frequency of cervical screening.

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Calls to action from Canada's Action Plan to Eliminate Cervical Cancer

As best practices in cervical screening evolve, educational efforts and campaigns will be critical in supporting the reduction of low-benefit practices and the uptake of beneficial practices. *The Action Plan for the Elimination of Cervical Cancer in Canada 2020–2030* identifies key priorities, targets and actions needed to eliminate cervical cancer by 2040.

The 3 pillars of the action plan are as follows:

1. Improve HPV immunization rates.
2. Implement HPV primary screening.
3. Improve follow-up of abnormal screening results.

The plan calls for

- Implementing organized cervical screening programs across Canada using human papillomavirus (HPV) testing as the primary screening tool;
- Ensuring by 2030 that no less than 80% of eligible individuals in any identifiable group are up to date with cervical screening;
- Implementing HPV self-sampling in cervical screening programs; and
- Collecting and reporting aggregate data and using it to improve cervical screening programs.

The action plan includes priorities and actions specific to First Nations, Inuit and Métis Peoples, determined through collaboration with First Nations, Inuit and Métis communities, organizations and governments. Across immunization, cervical screening and clinical follow-up of individuals with abnormal cervical screens, the following priorities have been identified:

- Having culturally appropriate care closer to home;
- Having people-specific, self-determined cancer care; and
- Having First Nations-, Inuit- and Métis-governed research and data systems.

Check out initiatives that are happening across Canada to reduce cervical screening outside of guidelines.

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From Pap tests to HPV primary screening

Countries around the world are replacing Pap tests with HPV tests as the first line for cervical cancer screening, which can detect potential disease sooner. Because the HPV test is more sensitive and accurate, screening can start at age 25 or 30 (depending on the jurisdiction) and be repeated every 5 years instead of every 3 years, reducing harm from over-screening and saving health care dollars. As more young people are vaccinated against HPV through school-based HPV vaccination programs, there will be fewer instances of HPV in the population and fewer people testing positive for HPV in the future. It's also possible to self-sample for HPV, which could make HPV screening easier to access for groups that face barriers to screening, such as poor access to primary care or lack of culturally safe screening.

> Shifting from Pap tests to HPV tests is crucial to advancing the goals of Canada's Action Plan to Eliminate Cervical Cancer and achieving equity of access to cervical screening. There is significant momentum in cancer agencies and programs to make the shift to HPV primary testing and move Canada closer to ensuring that 90% of eligible people can be screened with an HPV test by 2030. Self-sampling options for HPV will be an important strategy to consider, as it will enable more people in more locations, including rural and remote communities or people without a primary care provider, to access cervical screening.
>
> **Erika Nicholson**
> Vice-President, Cancer Control
> Canadian Partnership Against Cancer

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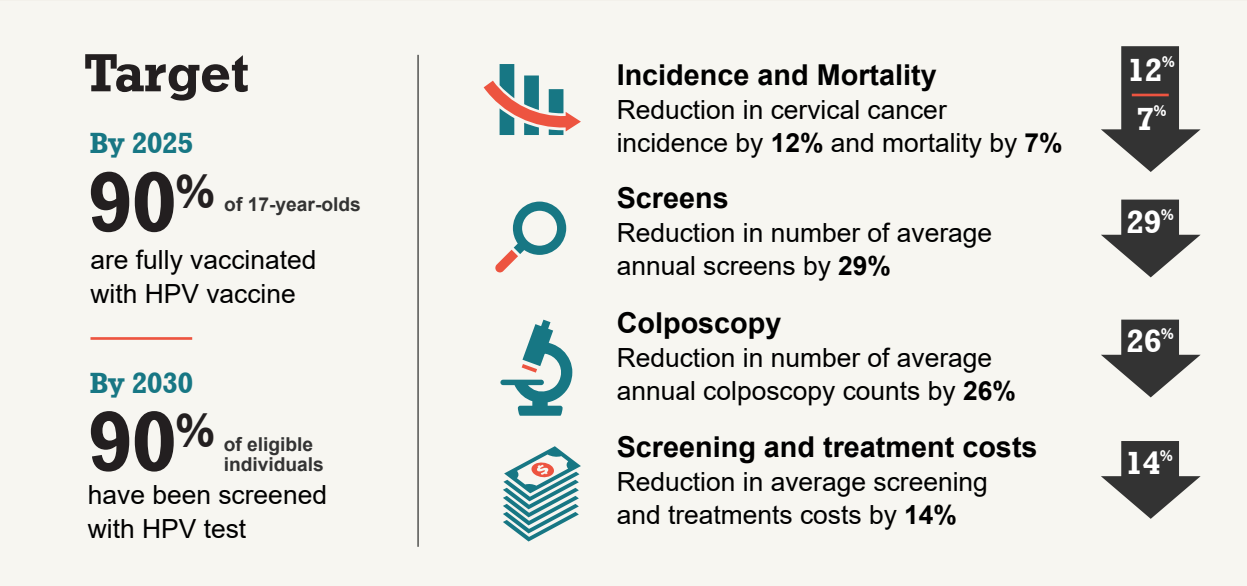
If HPV primary screening was standard practice that started at age 25 and repeated every 5 years:



Notes

We assumed 90% screening participation by 2030 for the HPV scenario (Pan-Canadian Cervical Cancer Screening Network target), while the current rate for Pap testing was assumed constant at 76.6%. The HPV screening program was assumed to start in 2025 and screen people every 5 years (compared with every 3 years with Pap testing). HPV screening would start at age 25 (versus age 21 for Pap testing). We assumed that 90% of 17-year-old individuals would be vaccinated by 2025 (the Public Health Agency of Canada target). The current average rate is 70%. These assumptions are based on ideal hypothetical scenarios.
A colposcopy is a diagnostic procedure that involves visual examination of the cervix and vaginal wall for signs of disease with a magnifying instrument called a colposcope.

Cervical cancer will be eliminated only if everyone in Canada has equitable access to the highest quality of prevention and care, including HPV primary screening. Addressing inequities in under-served populations, such as those living in rural or remote areas, people with low income, and sexual and gender minority groups, as well as First Nations, Inuit and Métis Peoples, is critical. The actions required to achieve this are delivering culturally safe cervical screening services (such as self-sampling for HPV primary screening), codeveloping, adapting and implementing appropriate interventions to facilitate screening participation and enhancing cervical screening as a priority.

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Antibiotics dispensed in the community

Key finding

Status in 2019–2020

The total volume of antibiotics, measured by the World Health Organization's standardized defined daily dose (DDD),[iv] was **13 per 1,000 population per day** across Manitoba, Saskatchewan and British Columbia.

The OECD average is 17 DDD per 1,000 population per day.

Trend

The volume of antibiotics dispensed in the community went down by 11% between 2015–2016 and 2019–2020.

On any given day, roughly 100,000 people across those 3 provinces are taking an antibiotic. Furthermore, almost 1 in 3 people in those provinces took at least one course of antibiotics.

iv. DDD is a measure developed by the World Health Organization to allow comparisons of the rates at which medications are used around the world. It's an average of effective daily maintenance doses for a medication, which can vary among jurisdictions. A DDD of 10 per 1,000 population per day for a particular antibiotic, for example, means 10 people out of every 1,000 (or 1%) are taking it on any given day at an effective dose for treating a bacterial infection.[11] Comparing that to the rates of use in other jurisdictions helps us understand whether a medication is being overused.

Why is it important?

The overuse of antibiotics is a particular concern because it contributes to antibiotic resistance, where bacteria change with exposure to antibiotics, making the drugs less effective or not effective at all.[12] This can happen naturally over time but the unnecessary or inappropriate use of antibiotics (such as for viral infections) contributes to it.[12]

More than 90% of antibiotics are prescribed in the community[13] and many clinician societies in Canada have recommendations on the inappropriate use of antibiotics for specific conditions, including ear infections in children, urinary tract infections in older people and respiratory infections, among others.[v]

This analysis focuses on the total volume of antibiotics dispensed in the community, which is a validated indicator of quality in primary care, reported on internationally by the Organisation for Economic Co-operation and Development (OECD).[14]

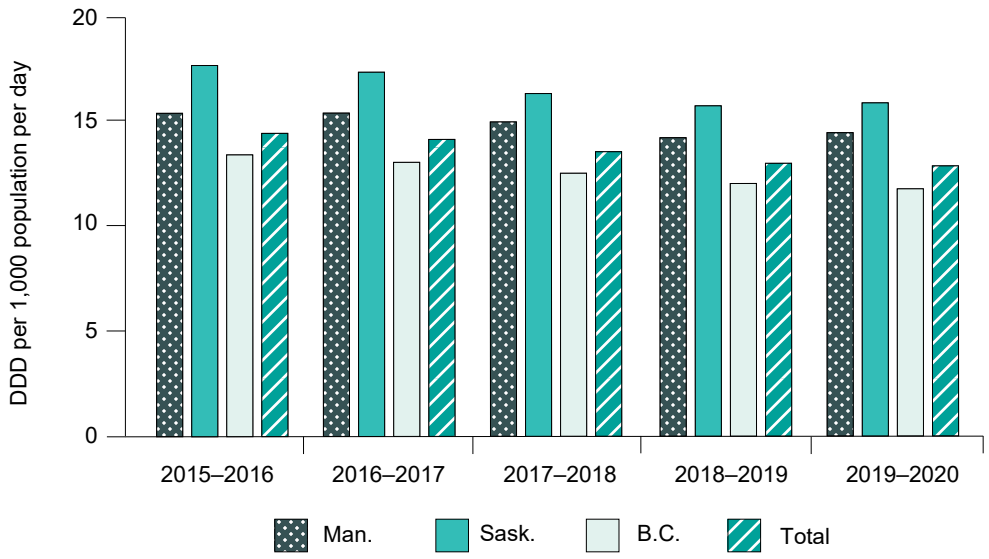
v. These societies include the Canadian Association of Emergency Physicians, Canadian Society of Otolaryngology - Head & Neck Surgery, Pediatric Otolaryngology Subspecialty Interest Group, Canadian Thoracic Society, Canadian Dermatology Association, Canadian Nurses Association, College of Family Physicians of Canada, Canadian Society of Allergy and Clinical Immunology, and Association of Medical Microbiology and Infectious Disease Canada.

Overall trend and provincial variation

CIHI has access to data on all prescriptions dispensed in community pharmacies in Manitoba, Saskatchewan and British Columbia. Between 2015–2016 and 2019–2020, there was an 11% reduction in the total volume of antibiotics dispensed (a decrease from 15 DDD to 13 DDD per 1,000 population per day) in these provinces. This is equivalent to about 172,900 fewer prescriptions dispensed in 2019–2020 compared with 2015–2016.

Use in Manitoba and Saskatchewan was consistently higher than in British Columbia, which had the lowest rates of antibiotic use among Canadian provinces in a recent report.[15] That's likely due at least in part to British Columbia's antimicrobial stewardship program, launched in 2005. It works with prescribers to reduce the overuse and misuse of antibiotics.[16]

Figure 3 **Total volume of antibiotics dispensed for system use, by province, defined daily dose per 1,000 population per day, 2015–2016 to 2019–2020**

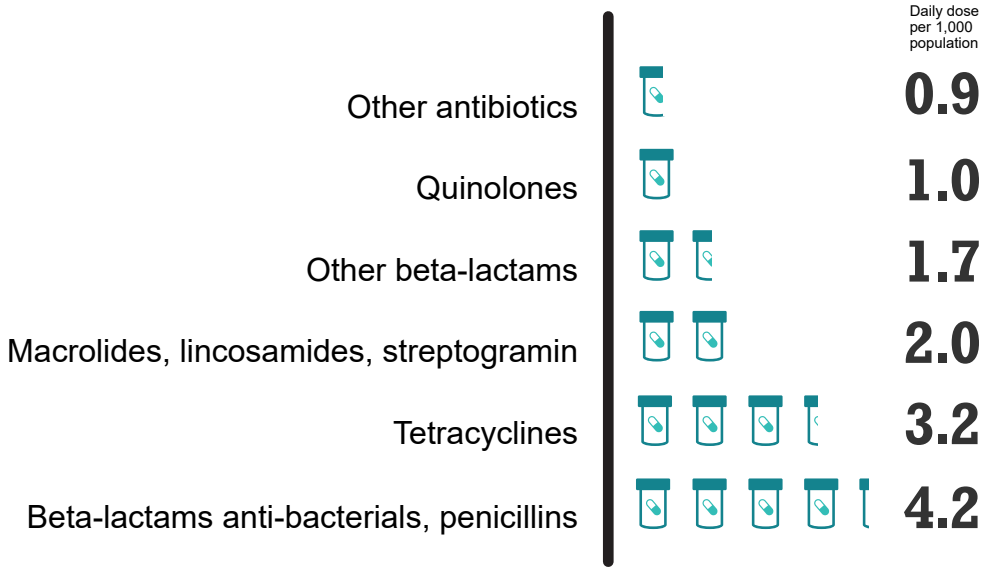


Notes
DDD: Defined daily dose.
The total volume of antibiotics dispensed for system use was standardized by age.
Sources
National Prescription Drug Utilization Information System, 2015–2016 to 2019–2020, Canadian Institute for Health Information; and Statistics Canada, Table 17-10-0005-01, Population estimates on July 1st, by age and sex.

Other findings

There were patterns in the types of antibiotics used that are similar to those reported by the Public Health Agency of Canada.[15]

Total volume of antibiotics dispensed for system use, by category, defined daily dose per 1,000 population per day, 2019–2020



The most commonly used antibiotics were beta-lactam antibacterials and penicillins (amoxicillin in particular), followed by tetracyclines.

International comparisons

The total volume of antibiotics prescribed for system use in Manitoba, Saskatchewan and British Columbia was lower in 2019–2020 than the OECD average for 30 countries, which was 17 DDD per 1,000 population per day. Among participating countries, there was a nearly four-fold difference between the lowest and highest total volumes of antibiotic use reported. Among Canada's peer countries, Australia was almost double the OECD average at 32 DDD per 1,000 population per day, whereas Sweden, Germany and the United Kingdom reported volumes of 9 DDD, 11 DDD and 16 DDD per 1,000 population per day, respectively.[14]

Antibiotics dispensed in the community in the first year of COVID-19

There was a 28% decline in antibiotics dispensed in the community in Canada between 2019–2020 and 2020–2021, particularly among children younger than 10, whose antibiotic use dropped by 69%. That drop can likely be explained by both reduced exposure to respiratory viruses and fewer visits to family physicians due to public health restrictions.[17] Preliminary results from the Public Health Agency of Canada found a similar decrease in antibiotic prescribing in the first 8 months of the COVID-19 pandemic.[18] An Ontario study found that reduced antibiotic use was linked to fewer prescriptions for respiratory conditions.[19]

Taking action on overuse

While many national and regional efforts are underway to promote the judicious use of antibiotics, international comparisons suggest that further reductions are possible in Canada. National programs, such as Using Antibiotics Wisely, have developed education resources and tools to raise awareness about appropriate use. Many jurisdictions paired education with active interventions such as conducting audits when antibiotics are prescribed and sharing the results with practitioners to encourage using antibiotics only when necessary.[20] Here are a few examples of antibiotic stewardship.

Mass education on antibiotic use in British Columbia and Alberta

Among Canadian jurisdictions, British Columbia has had the most success in reducing antibiotic use, with consistently lower rates. The Do Bugs Need Drugs? program in British Columbia and Alberta includes education for prescribers and offers educational outreach to the public through schools, daycares and community care facilities and through campaigns ranging from transit ads to social media.[21]

Audit and feedback in Ontario

In December 2018, the highest-prescribing primary care providers in Ontario were sent a letter comparing their antibiotic prescribing rates to provincial norms, as well as information on how to limit overuse. Compared with high-volume prescribers who were not sent a letter, there was an 8.1% reduction in prolonged-duration prescriptions and a 6.1% reduction in antibiotic drug costs (both were statistically significant).[20]

Academic detailing in Newfoundland and Labrador

In 2018, Quality of Care NL launched an academic detailing program to provide face-to-face education in the eastern region of the province.[22, 23] A clinician lead provided primary care practices with a report card detailing their individual prescribing practices, followed by education on optimizing antibiotic use. This program was paired with continuing medical education credits to encourage participation from providers. In 2020, the face-to-face sessions were replaced with videos to analyze the report cards and participate in self-reflection on personal prescribing patterns.[24, 25]

Additional tools and resources

Using Antibiotics Wisely

Using Antibiotics Wisely is a national campaign that encourages conversations about unnecessary antibiotic use in different practice settings. The primary care campaign works with the College of Family Physicians of Canada to engage family physicians through continuing medical education and has partnered with the Canadian Primary Care Sentinel Surveillance Network in providing prescriber-feedback reports.

Tools include[13]

- Practice recommendations;
- Posters for waiting rooms;
- Delayed prescription pads (these tell patients to wait a few days to see whether they feel better and to start antibiotics only if they don't);
- Information on the overuse of antibiotics for patients; and
- The Cold Standard, a toolkit on how to care for ambulatory patients with respiratory tract infections.

Check out other antimicrobial stewardship efforts that are happening across the country.

Chronic use of benzodiazepines and other sedative–hypnotics in older adults

Key finding

Status in 2019–2020

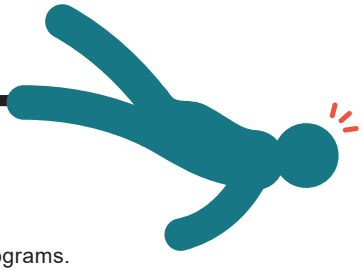
1 in 12 older adults
used benzodiazepines and other sedative–hypnotics[vi] regularly (all provinces except Quebec).

Trend

The chronic use rate of benzodiazepines and other sedative–hypnotics declined by 16% between 2014–2015 and 2019–2020.

Why is it important?

Benzodiazepines and other sedative–hypnotics are commonly prescribed for anxiety, agitation, delirium, insomnia and seizures. However, older adults (people age 65 and older) can be more sensitive to the effects of these medications, putting them at higher risk of falls, hip fractures and traffic accidents, which could lead to hospitalization and even death.[26]



vi. This number is based on drugs dispensed in community pharmacies, covered by public drug programs.

Community Care

Increasingly, treating insomnia, anxiety and other issues with behavioural interventions and cognitive behavioural therapy is seen as a better approach than prescribing these medications.[27]

If behavioural interventions don't work and older adults still require benzodiazepines and other sedative–hypnotics, they should be prescribed for as short a time as possible.[28]

This is the Choosing Wisely Canada recommendation of the Canadian Academy of Geriatric Psychiatry, the Canadian Society of Hospital Medicine, the Canadian Psychiatric Association and the Canadian Geriatrics Society:

Don't use benzodiazepines or other sedative–hypnotics in older adults as the first choice for insomnia,[vii] agitation or delirium.[29–31]

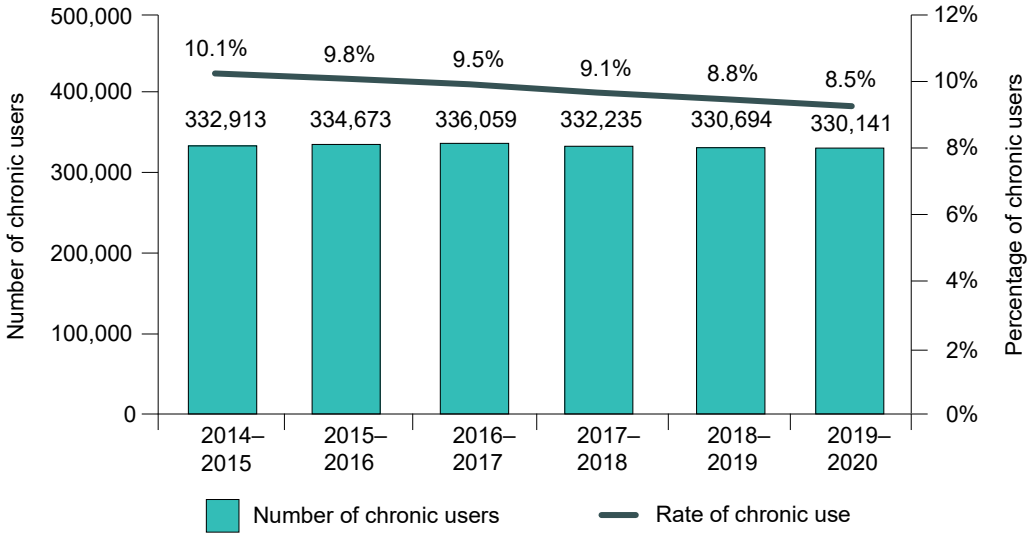
The Canadian Pharmacists Association and Canadian Society of Hospital Pharmacists made similar recommendations.[32]

Overall trend and provincial variation

The rate of older adults with chronic use of benzodiazepines and other sedative–hypnotics[viii, ix] decreased 16% from 2014–2015 to 2019–2020. This means that about 2,800 fewer older adults in all Canadian provinces (except Quebec) used benzodiazepines and other sedative–hypnotics chronically in 2019–2020 compared with 2014–2015.

vii. The recommendation by the Canadian Psychiatric Association does not include agitation or delirium.
viii. This figure is based on older adults who had more than a 30-day supply of a benzodiazepine or other sedative–hypnotic within the quarter of interest, and the quarter immediately prior.
ix. All benzodiazepine and sedative–hypnotic drug use is included and could not be limited to use for insomnia, agitation and delirium.

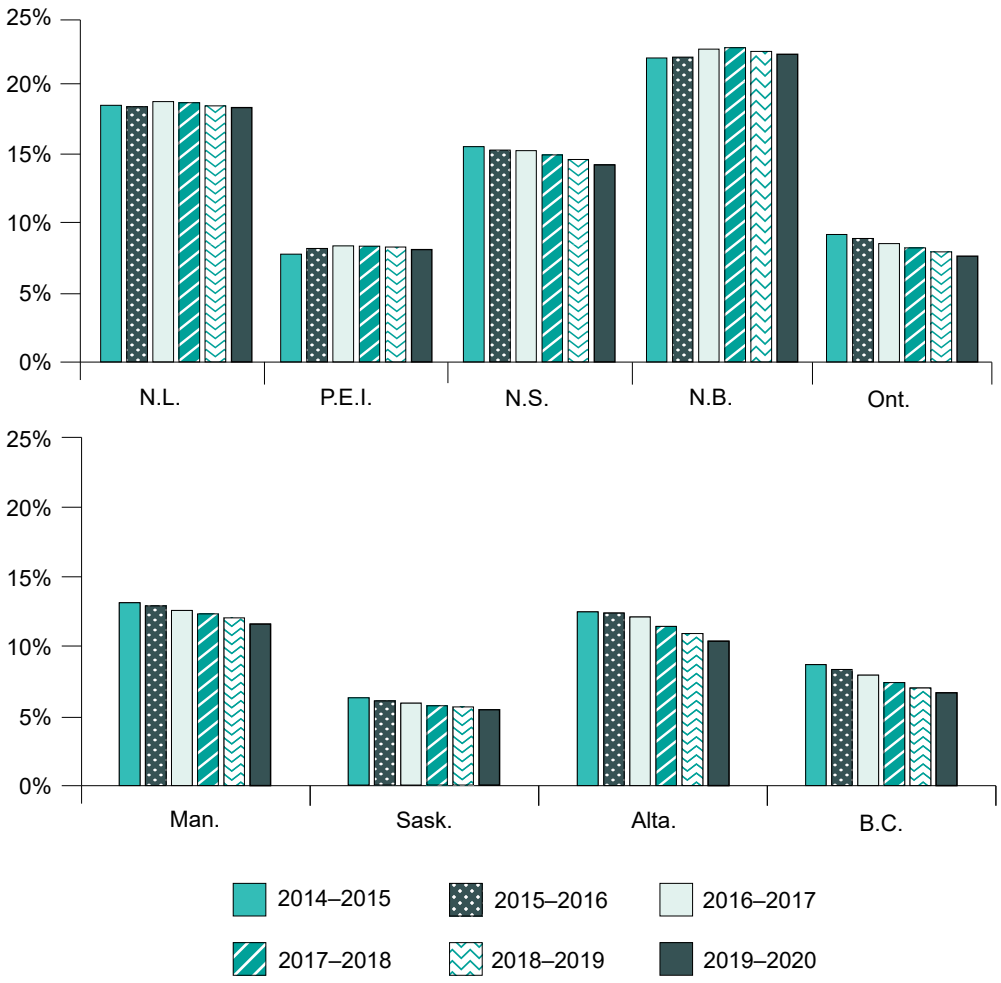
Figure 4 **Total number and percentage of older adults with chronic use of benzodiazepines and other sedative–hypnotics, selected provinces, 2014–2015 to 2019–2020**



Notes
The percentage of older adults with chronic use was standardized by age.
The study population was older adults with at least one drug claim in the selected period.
This analysis included all provinces except Quebec.
All benzodiazepine and sedative–hypnotic drug use was included and could not be limited to use for insomnia, agitation and delirium.
Source
National Prescription Drug Utilization Information System, 2013–2014 to 2019–2020, Canadian Institute for Health Information.

The rates of chronic use of benzodiazepines and other sedative–hypnotics declined across most provinces and territories between 2014–2015 and 2019–2020, but because public drug programs differ, comparisons between jurisdictions should be done cautiously. Newfoundland and Labrador, Nova Scotia and New Brunswick provide coverage to smaller proportions of older adults than other jurisdictions, so their rates may not be representative of everyone 65 and older in those provinces. Regardless, differences in physician prescribing practices and the socio-demographic profile of patients among jurisdictions also likely affect the rates of chronic use reported.

Figure 5 Percentage of older adults with chronic use of benzodiazepines and other sedative–hypnotics, by province, 2014–2015 to 2019–2020

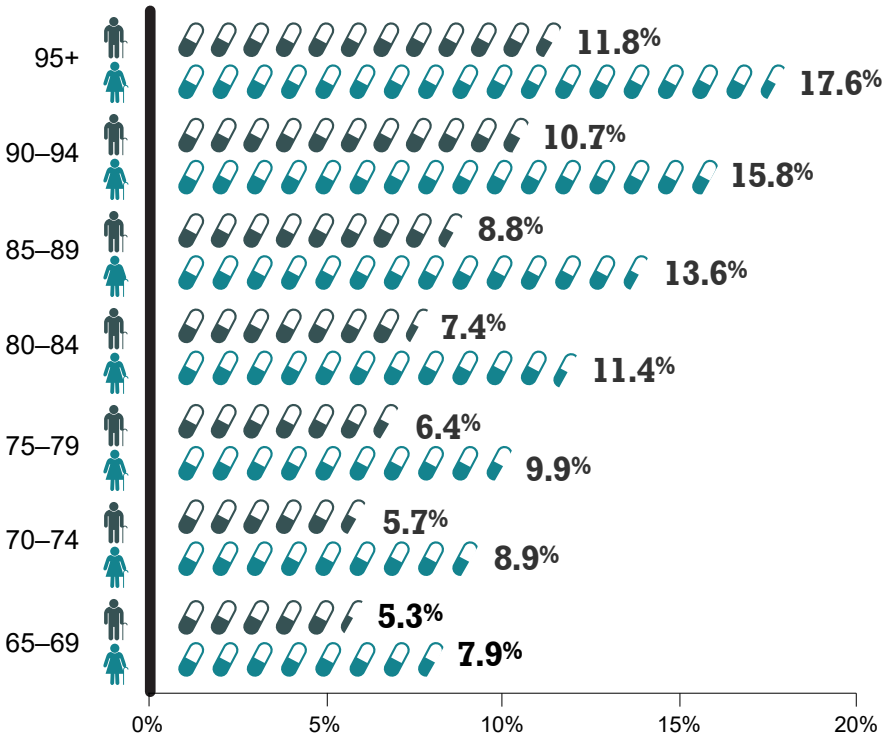


Notes
Public drug programs in Newfoundland and Labrador, Nova Scotia and New Brunswick provide coverage to smaller populations of older adults than other jurisdictions, so data on use may not capture their total 65-and-older population.
The percentage of older adults with chronic use was standardized by age.
The study population was older adults with at least one drug claim in the selected period.
Source
National Prescription Drug Utilization Information System, 2013–2014 to 2019–2020, Canadian Institute for Health Information.

Other findings

Some groups were more likely than others to use benzodiazepines and other sedative–hypnotics regularly. Chronic use was higher in women and increased with age among men and women. In 2019–2020, more women (10%) chronically used a benzodiazepine or other sedative–hypnotic than men (6%). That's in line with previous research showing women have a greater chance of receiving an inappropriate medication, even after accounting for differences in clinical, socio-economic and personal characteristics.[33, 34]

Percentage of older adults with chronic use of benzodiazepines and other sedative–hypnotics by age and sex, 2019–2020



Note
The study population was older adults with at least one drug claim in the selected period.

Chronic use of benzodiazepines and sedative–hypnotics was more likely among older adults from the lowest-income neighbourhoods. In Ontario, which has a public drug program for older adults, 26% of those who regularly used benzodiazepines and other sedative–hypnotics resided in the lowest-income neighbourhoods, compared with 16% in the highest-income neighbourhoods.

In 2019–2020, the top 5 benzodiazepines and other sedative–hypnotics taken by older adults with chronic use (trazodone, lorazepam, zopiclone, clonazepam and low-dose quetiapine) accounted for 84% of use. Between 2014–2015 and 2019–2020, the use of trazodone and quetiapine increased while use of the rest decreased or remained stable. Similar findings were observed in a previous study from Ontario.[35]

Chronic use of benzodiazepines and other sedative–hypnotics in the first year of COVID-19

The rate of chronic use decreased slightly in 2020–2021, during COVID-19, compared with 2019–2020 (8.1% versus 8.5%), possibly because access to primary health care was limited.

Taking action on overuse

The risks of using benzodiazepines and other sedative–hypnotics for older adults may outweigh their potential benefits.[26, 36] While rates of sedative use are declining, the number of older adults using them remains stable and lower rates in some provinces show further reductions are possible. The reasons for the decline are likely multi-faceted and may include increased awareness about the harms of sedatives, medication reviews, efforts to reduce the number of medications individuals take, audits and the provision of feedback to prescribers and, perhaps, replacement by other medications such as trazodone. There are also public awareness campaigns about the risks of these medications. Here are a few examples of efforts to reduce benzodiazepines.

In action

EMPOWER trial

The EMPOWER cluster-randomized trial engaged patients at their pharmacy when they were renewing prescriptions for benzodiazepines and other sedative–hypnotics.[37] In the intervention group, patients were given a pamphlet by the pharmacist on the harm versus benefits of benzodiazepines and other sedative–hypnotics, with a tool for tapering off using them. 27% of people given the pamphlets discontinued using sedatives compared with 5% in the group that was not given the pamphlet. This study showed that patients who are given direct information about risks and benefits may choose to stop taking medications with a risk of harm.

MD Snapshot-Prescribing Profile in Alberta

The MD Snapshot-Prescribing Profile developed by the College of Physicians & Surgeons of Alberta provides physicians with a personalized report of how many benzodiazepines they have prescribed to their patients.[38] More than half of physicians involved indicated they planned to make changes to their prescribing based on the profile and two-thirds of respondents found the information in the prescribing profile useful.

Increasing public awareness in Newfoundland and Labrador

SaferMedsNL is a provincial campaign that brings together patient advocates, health professionals and academics to raise public awareness about the risks of sedative–hypnotic drugs.[39]

Additional tools and resources

- Bruyère Research Institute: Benzodiazepine and Z-Drug (BZRA) Deprescribing Algorithm
- CWC: A toolkit for de-prescribing benzodiazepines and other sedative–hypnotics in primary care
- CWC: A toolkit for reducing inappropriate use of benzodiazepines and sedative–hypnotics among older adults in hospitals
- Centre for Effective Practice: Managing benzodiazepine use in older adults

Check out what other benzodiazepine improvement efforts are happening across the country.

Physical restraints and antipsychotics in long-term care

Key finding

Status in 2019–2020

Daily physical restraints were used in fewer than 1 in 20 residents in long-term care across
Newfoundland and Labrador, Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia and Yukon.

Trend

The use of daily physical restraints in long-term care dropped by 47% between 2014–2015 and 2019–2020.

Status in 2019–2020

Trend

Potentially inappropriate use of antipsychotics in long-term care residents dropped by 26% between 2014–2015 and 2019–2020.

1 in 5 long-term care residents
were taking antipsychotics without a diagnosis of psychosis across Newfoundland and Labrador, Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia and Yukon.

Why is it important?

Restraints are measures used to control the physical or behavioural activity of people or parts of their bodies.[40] There are 3 types of restraints: physical, chemical (psychoactive medications like antipsychotics) and environmental.[40]

Physical restraints limit a client's movement, such as a chair that prevents a person from standing up, a seatbelt at mealtime or a bed rail. They are sometimes used to prevent falls but also to manage behaviour in long-term care residents, even though there is limited evidence they work.[41] There are also physical and psychological risks associated with using physical restraints, including worsening delirium or agitation and even death.[41]

Antipsychotic medications are sometimes used to manage behavioural symptoms associated with dementia but they can have harmful side effects — including drowsiness, increased confusion and physical changes — that alarm residents and their loved ones.[32]

In many cases, behavioural interventions (which can include doing physical or mental exercises, engaging socially or learning ways to compensate) can help to address symptoms[42] and reduce the need for medication.

This is the Choosing Wisely Canada recommendation from the Canadian Nurses Association and the Canadian Gerontological Nursing Association:

Don’t use restraints with older persons unless all other alternatives have been explored.[43]

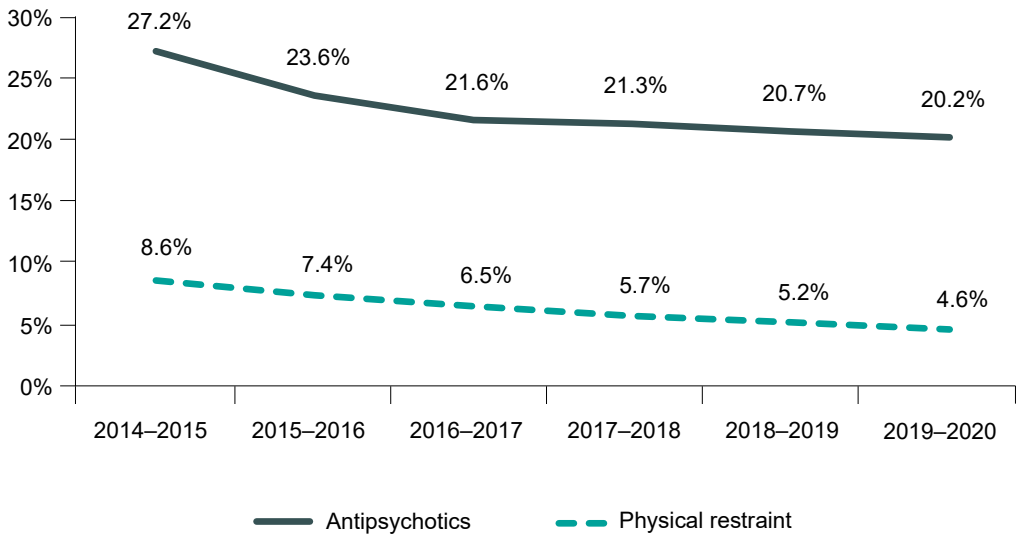
CIHI reports on numerous quality indicators in long-term care. This discussion focuses on daily physical restraints and the potentially inappropriate use of antipsychotics in residents without a diagnosis of psychosis.[x]

Overall trend, and provincial and territorial variation

Both daily physical restraint and potentially inappropriate antipsychotic use declined in long-term care residents, although from 2016–2017 onward there is a gradual plateau in the decline. The rate of daily physical restraint use dropped from 8.6% in 2014–2015 to 4.6% in 2019–2020, which is equivalent to 18,000 fewer residents in daily physical restraints in 2019–2020 compared with 2014–2015. The rate of antipsychotic use without a diagnosis of psychosis dropped from 27% in 2014–2015 to 20% in 2019–2020, which is equivalent to 37,500 fewer residents using antipsychotics in 2019–2020 compared with 2014–2015. Public reporting of performance indicators in long-term care can encourage efforts to improve quality and might have helped reduce the use of restraints.[25, 26]

x. CIHI data does not capture environmental restraints, which are used to control mobility.

Figure 6 **Daily physical restraint use and antipsychotics in long-term care residents, selected provinces/territories, 2014–2015 to 2019–2020**



Notes
Restraint analysis excluded residents who were comatose or quadriplegic.
The restraint use rate was standardized by a facility-level long-form scale on activities of daily living.
Antipsychotic analysis excluded residents who had end-stage disease, were receiving hospice or palliative care, and had a diagnosis of schizophrenia or Huntington chorea, and those experiencing hallucinations or delusion.
The antipsychotic use rate was standardized by facility-level Case Mix Index to a standard population, then was risk-adjusted for individual covariates (motor agitation, a moderate or impaired decision-making problem, a long-term memory problem, Cognitive Performance Scale, a combination of Alzheimer disease and other dementia, and/or age younger than 65).
Source
Continuing Care Reporting System, 2014–2015 to 2019–2020, Canadian Institute for Health Information.

Daily use of physical restraints varied across jurisdictions, with the highest rates in Newfoundland and Labrador (11.1%) and the lowest in Ontario (3.3%) in 2019–2020. Rates in Ontario, Saskatchewan, Alberta and British Columbia showed a linear decline over the 6-year period while rates in Newfoundland and Labrador and Yukon peaked in 2016–2017, then started to decline.

Figure 7 Percentage of daily physical restraint use in long-term care residents by jurisdiction, 2014–2015 to 2019–2020

Notes

* 2019–2020 results for Saskatchewan are not displayed because the province transitioned from the Resident Assessment Instrument–Minimum Data Set 2.0 to the interRAI Long-Term Care Facilities assessment instrument that year.

Data from Manitoba's Winnipeg Regional Health Authority and Nova Scotia's Central Zone, as well as a small portion of Saskatchewan's data (2019–2020), was included in the overall rate but not displayed for provincial rate reporting.

Restraint analysis excluded residents who were comatose or quadriplegic.

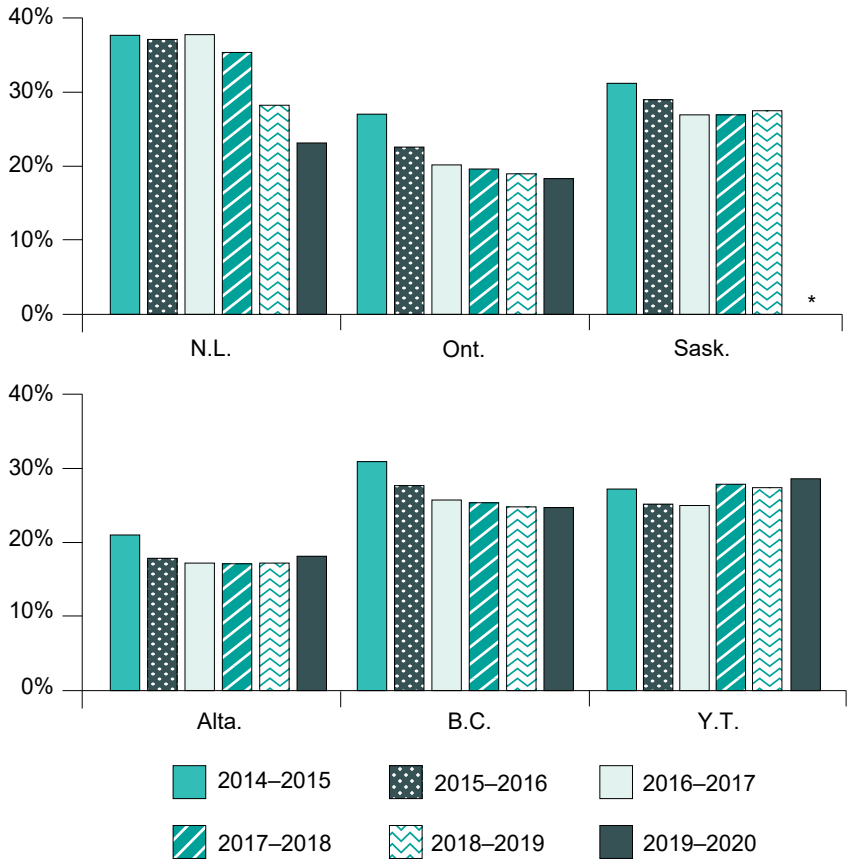
The restraint use rate was standardized by a facility-level long-form scale on activities of daily living to a standard population.

Source

Continuing Care Reporting System, 2014–2015 to 2019–2020, Canadian Institute for Health Information.

Rates of antipsychotic use in long-term care residents without psychosis decreased across provinces between 2014–2015 and 2019–2020, although the decline was not always linear. The rate ranged from 18% in Alberta to 29% in Yukon in 2019–2020.

Figure 8 **Percentage of antipsychotic use in residents without a diagnosis of psychosis, by jurisdiction, 2014–2015 to 2019–2020**



Notes

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Antipsychotic analysis excluded residents who had end-stage disease, were receiving hospice or palliative care, and had a diagnosis of schizophrenia or Huntington chorea, or those experiencing hallucinations or delusion.

The antipsychotic use rate was standardized by facility-level Case Mix Index to a standard population, then was risk-adjusted for individual covariates (motor agitation, a moderate or impaired decision-making problem, a long-term memory problem, Cognitive Performance Scale, combination Alzheimer disease and other dementia, and/or age younger than 65).

Source

Continuing Care Reporting System, 2014–2015 to 2019–2020, Canadian Institute for Health Information.

There are many factors contributing to trends and variations in the rates of daily physical restraints and antipsychotics without psychosis:

- In some jurisdictions, small numbers of long-term care residents can make trends less stable.
- Trends and variations may be influenced by changes in policies and procedures, how different jurisdictions provide services and the changing characteristics of residents in long-term care homes.
- Public reporting by various organizations may contribute to the decline in these measures as well.

Visit CIHI's Your Health System interactive web tool to explore the latest data on rates of daily physical restraint use and potentially inappropriate antipsychotics in residents without a diagnosis of psychosis at the regional and facility level.

Other findings

Higher rates of daily physical restraint use and antipsychotic use without a diagnosis of psychosis were associated with residents who had

- More symptoms of depression;
- Higher levels of cognitive impairment;
- Lower rates of social engagement in the long-term care home; and/or
- More responsive behaviours and/or personal expressions.

The rate of daily physical restraint use was higher for residents who needed more support with activities of daily living, potentially because physical restraints (such as seatbelts) are used to prevent injuries.

The rate of potentially inappropriate antipsychotic use in residents without psychosis declined with age. Results from 2019–2020 show that residents without a diagnosis of psychosis who used antipsychotics remained on them for more than 10 months (based on CIHI pharmaceutical data).

Daily physical restraints and antipsychotics may be used for different purposes, but a small number of residents (1.5%) received both types of restraints, while 21.4% of residents received one or the other.

The most common antipsychotic medications among long-term care residents without psychosis were quetiapine and risperidone, representing more than 70% of prescriptions. See the data tables for more information.

Physical restraint and antipsychotic use in long-term care residents in the first year of COVID-19

From 2019–2020 to 2020–2021, rates of daily physical restraint use dropped slightly in Newfoundland and Labrador, Alberta and British Columbia, and decreased by more than 15% in Ontario.

Rates of antipsychotic use increased slightly in Ontario, Alberta and British Columbia in 2020–2021 compared with 2019–2020, while they decreased slightly in Newfoundland and Labrador.

Overall, rates for these 2 measures were higher in 2020–2021 than in 2019–2020, but this should be interpreted with care due to the inclusion of Saskatchewan and New Brunswick, which used the interRAI Long-Term Care Facilities (interRAI LTCF) assessment instrument.[x]

xi. Results for 2020–2021 in New Brunswick and Saskatchewan were based on data collected using the interRAI LTCF assessment instrument, while other jurisdictions used the RAI-MDS 2.0. New Brunswick and most of Saskatchewan were not included in the 2019–2020 reporting.

Taking action on overuse

Antipsychotic use was on a steady decline in the years leading up to the pandemic, partly due to major efforts to address behavioural and psychological symptoms of dementia by non-pharmacological means. Despite these efforts, variation in rates among jurisdictions suggests there is still room for improvement. Strategies that have contributed to reductions in the rates include a mix of large-scale and local quality improvement efforts, such as mass media public awareness campaigns, public reporting of performance indicators, best practice guidelines and educational programs — particularly in nursing training.[44–48] Here are a few efforts in Canada to decrease the potentially inappropriate use of antipsychotics.

In action

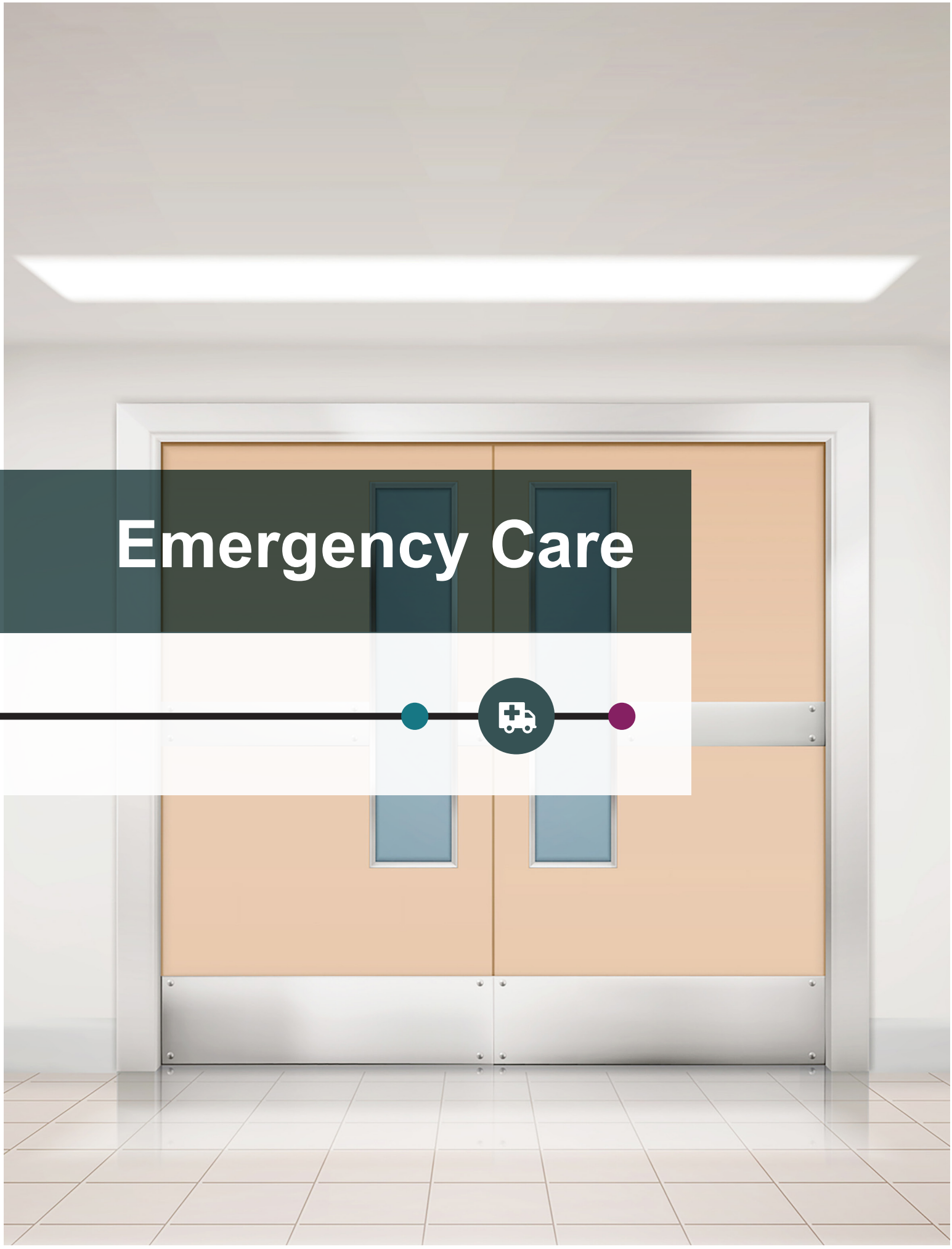
Appropriate Use of Antipsychotics

Healthcare Excellence Canada's **Appropriate Use of Antipsychotics** program was designed to find alternatives to antipsychotics for managing responsive behaviour and to encourage to the appropriate use of medications.[47] Interprofessional teams work with residents and families to review care plans, and antipsychotics are appropriately discontinued or reduced if they're no longer needed. This approach started through a national collaborative, and continued with provincial collaboratives in New Brunswick, Newfoundland and Labrador, Prince Edward Island and Quebec, supporting more than 300 long-term care homes. In New Brunswick, for example, a 2-year study in 58 nursing homes demonstrated a reduction of more than 50% in the use of antipsychotics.[46]

Additional tools and resources

- CWC: Choosing Wisely in Long-Term Care resource guide
- Bruyère Research Institute: Antipsychotic (AP) Deprescribing Algorithm
- Healthcare Excellence Canada: It has developed resources for people living with dementia, their families and care partners, for health care leaders and for prescribers

Check out what other antipsychotic improvement efforts are happening across the country.

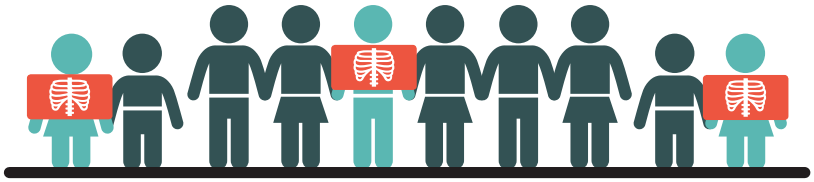


Emergency Care

Chest X-rays for asthma and bronchiolitis in emergency departments

Key finding

Status in 2019–2020



3 in 10 children who visited the emergency department

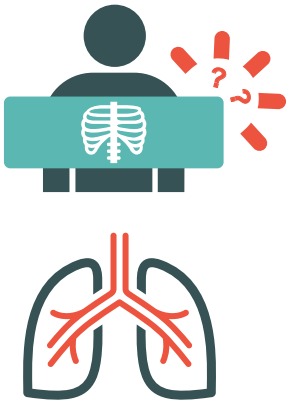
for asthma or bronchiolitis received a chest X-ray (Ontario, Alberta and Yukon).

Trend

Rates of chest X-rays for children with asthma or bronchiolitis were generally stable between 2014–2015 and 2019–2020 in Ontario, Alberta and Yukon.

Why is it important?

With asthma and bronchiolitis, airways in the lungs become inflamed. However, in typical cases, chest X-rays rarely help with diagnosis, treatment or outcomes, they always expose patients to radiation and they can result in incorrect diagnoses and the unnecessary use of antibiotics.[49, 50]



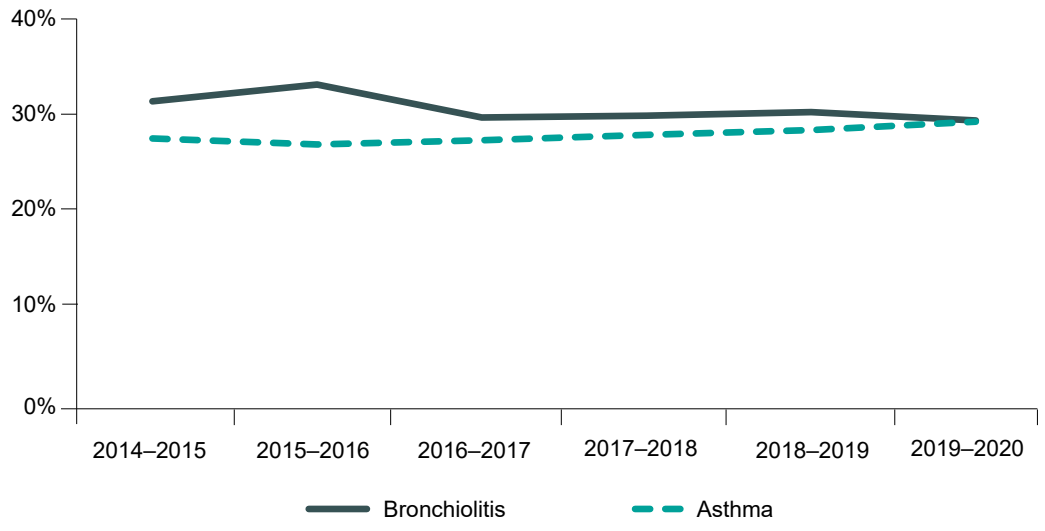
That's the source of the United States' Society of Hospital Medicine (Pediatric Committee) recommendation:

Don't order chest radiographs in children with uncomplicated asthma or bronchiolitis.[51]

Overall trend, and provincial and territorial variation

Between 2014–2015 and 2019–2020, chest X-ray rates were generally stable at about 30% for bronchiolitis (in infants younger than 1 year) and asthma (in children age 3 to 17 years). In 2019–2020, this represented about 8,200 potentially unnecessary chest X-rays.

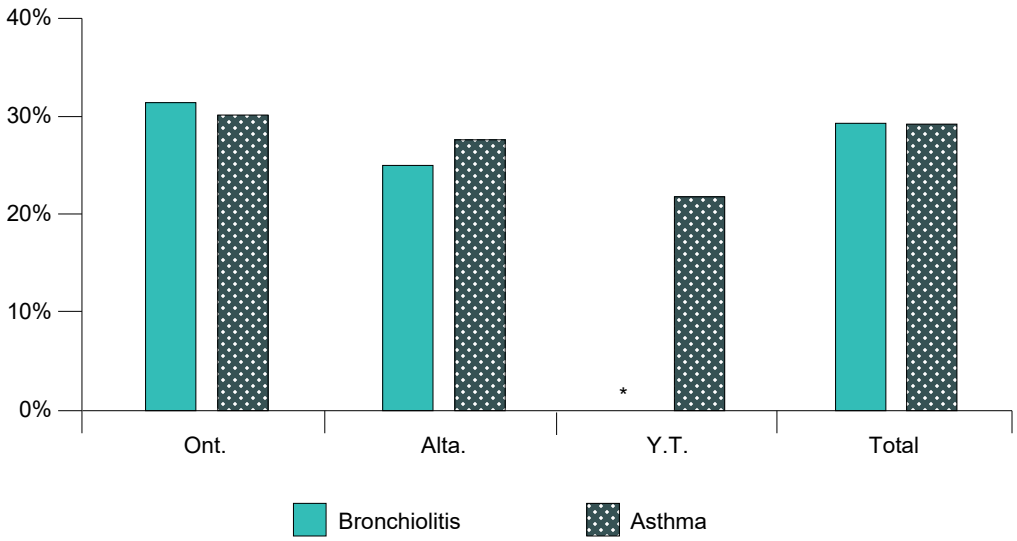
Figure 9 **Chest X-ray rate in children visiting the emergency department for asthma and bronchiolitis, selected provinces/territories, 2014–2015 to 2019–2020**



Notes
The imaging rate for bronchiolitis was adjusted for patient sex and triage level.
The imaging rate for asthma was adjusted for patient age, sex and triage level.
Source
National Ambulatory Care Reporting System, 2013–2014 to 2019–2020, Canadian Institute for Health Information.

The rate of X-ray use varied — Ontario's rates were higher than those in Alberta and Yukon for asthma and higher than Alberta's rate for bronchiolitis.

Figure 10 Chest X-ray rate in children visiting the emergency department for asthma and bronchiolitis by jurisdiction, 2019–2020



Notes

* The imaging rate for bronchiolitis in Yukon is not shown due to low volumes.

The imaging rate for bronchiolitis was adjusted for patient sex and triage level.

The imaging rate for asthma was adjusted for patient age, sex and triage level.

Source

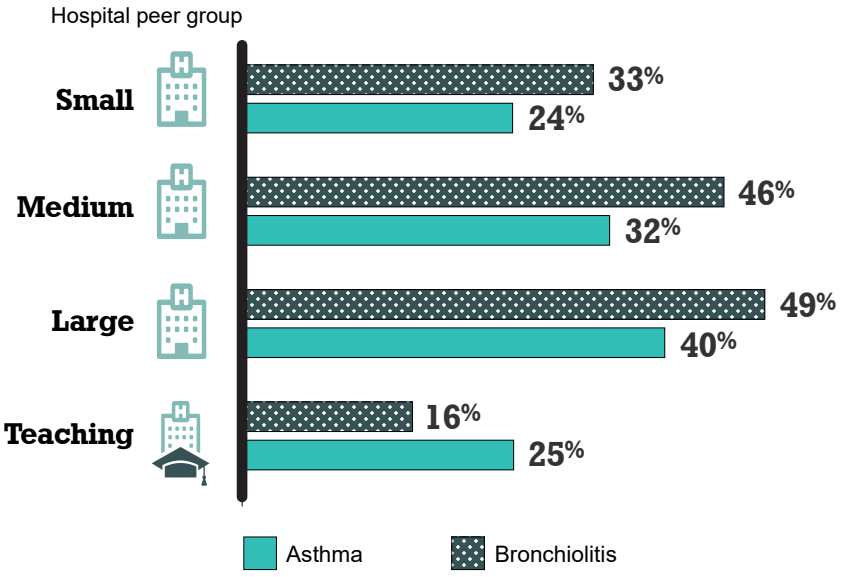
National Ambulatory Care Reporting System, 2018–2019 to 2019–2020, Canadian Institute for Health Information.

Other findings

The chest X-ray rates for asthma and bronchiolitis varied:

- Children age 13 to 17 were more likely to receive an X-ray for asthma than those age 3 to 12.
- Children from urban areas were more likely to receive an X-ray for asthma than rural children.
- The rate of chest X-rays for asthma and bronchiolitis was higher for children judged to be sicker on arrival at hospital (those classified as resuscitation and emergent).
- Children with either asthma or bronchiolitis who were admitted to acute care or transferred to a non-acute care facility, another emergency department, a clinic or a supportive living home were more likely to have a chest X-ray than those discharged home.
- Asthma and bronchiolitis patients seen at teaching hospitals had the lowest X-ray rates compared with community hospitals of any size.

Chest X-ray rate in children visiting the emergency department for asthma and bronchiolitis, by hospital peer group, 2019–2020



Detailed information on chest X-ray rates by patient and clinical characteristics is in the companion data tables.

Chest X-ray use for asthma and bronchiolitis in children in the first year of COVID-19

Emergency department visits for children with asthma and infants with bronchiolitis dropped steeply during 2020–2021. The visit volume for bronchiolitis dropped by 94% in 2020–2021 compared with 2019–2020 while the visit volume for asthma dropped 73%. The greatest declines for bronchiolitis patients were for higher-urgency emergency department visits (those classified as urgent, emergent and resuscitation at triage). As CIHI reported in the impact of COVID-19 on Canada's health care systems, public health measures and less community transmission of many respiratory viruses contributed to the drop in emergency department visits, particularly for children and youth.[17, 52] However, the chest X-ray rate for asthma and bronchiolitis rose 10% and 39%, respectively, during the first year of the pandemic. This may have been due in part to shifts in who sought emergency department care and, for bronchiolitis in particular, it may reflect the use of chest X-rays to distinguish viral bronchiolitis from COVID-19 infection.[53]

Taking action on overuse

Chest X-rays are generally not needed for children presenting to the emergency department with uncomplicated asthma or bronchiolitis. Targeted quality improvement strategies — such as clinical leadership, focused educational strategies, educational materials, and audit and feedback — can be effective in reducing unnecessary chest X-rays for asthma and bronchiolitis.[49] Here are a few examples of ways to reduce unnecessary chest X-rays in children.

In action

Implementing guidelines in the U.K.

The National Institute for Health and Care Excellence (NICE) in the U.K. implemented a quality improvement project to reduce inappropriate use of chest X-rays in children with bronchiolitis.[54] To support bronchiolitis guidelines, NICE offered education, including raising awareness of appropriate and inappropriate management of bronchiolitis for both clinicians and nursing staff. Chest X-rays for bronchiolitis were reduced from 20% to 4% in a comparison of winter 2014–2015 and winter 2015–2016 pre- and post-implementation of the NICE bronchiolitis guideline.

Value in Inpatient Pediatrics Network Quality Collaborative for Improving Hospital Compliance with AAP [American Academy of Pediatrics] Bronchiolitis Guideline

Holding monthly webinars, and conducting audits and providing feedback in 21 American hospitals helped to reduce unnecessary care in hospitalized children under the age of 2 with bronchiolitis. Chest X-rays decreased by 44% in a comparison of January, February and March data from 2013 and 2014.[55]

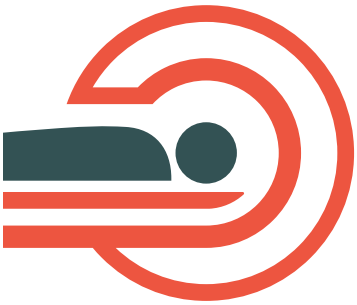
Practice guidance

- ***British Medical Journal*: Avoid doing chest X-rays in infants with typical bronchiolitis**
  This 2021 article provides guidance on avoiding chest X-rays for typical bronchiolitis and potential quality improvement strategies for eliminating their use, including clinician education and family engagement.[49]
- **Alberta Health Services knowledge topic**
  Alberta Health Services has a clinical education resource on bronchiolitis management in emergency and inpatient departments. It includes best practice and evidence-informed clinical guidance on avoiding chest X-rays for bronchiolitis and supportive clinical management considerations.[56, 57]

Diagnostic imaging for minor head trauma in emergency departments

Key finding

Status in 2019–2020



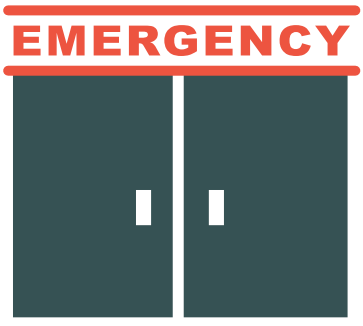
The rate of diagnostic imaging for adults who visited emergency departments for **minor head trauma without red flags[xii] was 1 in 3 patients** (Ontario, Alberta and Yukon).

Trend

Diagnostic imaging rates for minor head trauma remained stable between 2014–2015 and 2019–2020 in Ontario, Alberta and Yukon.

Why is it important?

Minor head trauma rarely results in serious brain injury and diagnostic imaging does not help to improve outcomes in patients who have no red flags.[58] However, CT scans expose patients to radiation, and may increase wait times for them and for patients who actually need scans.[1, 59] They are also expensive.[60]



xii. Red flags include Glasgow Coma Scale less than 13; Glasgow Coma Scale less than 15 at 2 hours post-injury; a patient age 65 or older; an obvious open skull fracture; a suspected open or depressed skull fracture; any sign of basilar skull fracture (e.g., hemotympanum, raccoon eyes, Battle sign, cerebrospinal fluid otorhinorrhea); retrograde amnesia to an event lasting 30 minutes or longer after the event; a "dangerous" mechanism (e.g., a pedestrian struck by a motor vehicle, an occupant ejected from a motor vehicle, a fall from higher than 3 feet or down more than 5 stairs); and Coumadin use or a bleeding disorder.

This is the Choosing Wisely Canada recommendation of the Canadian Association of Emergency Physicians:

Don’t order CT head scans in adults and children who have suffered minor head injuries unless positive for a validated head injury clinical decision rule.[61]

The Canadian Association of Radiologists has a similar recommendation:

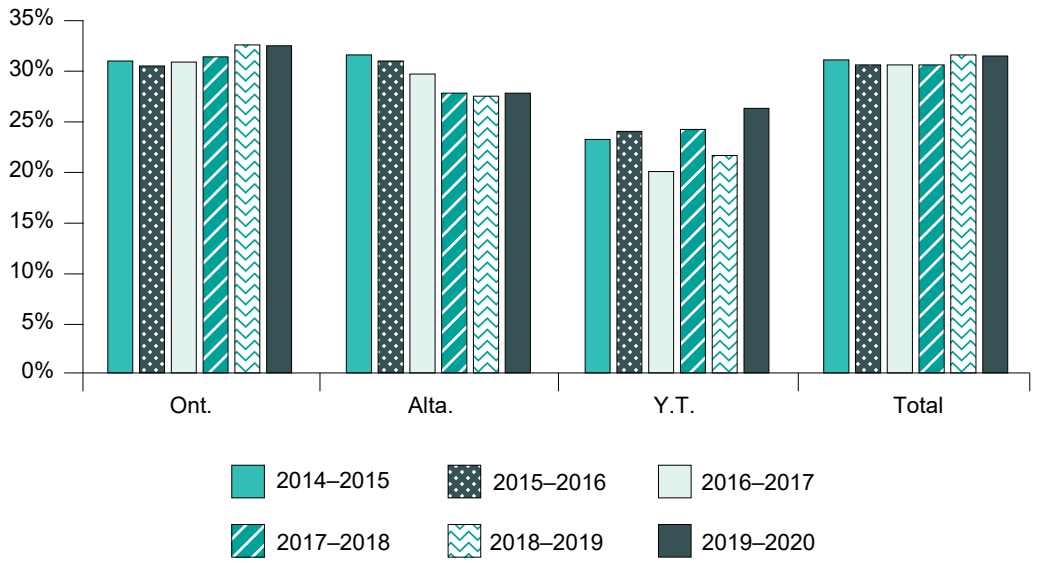
Don’t do imaging for minor head trauma unless red flags are present.[6]

Children and adults have different red flags. This analysis covers *adults only*.

Overall trend, and provincial and territorial variation

This analysis measures diagnostic imaging for adults who visited emergency departments for minor head trauma without red flags. Diagnostic imaging rates for minor head trauma in Alberta and Ontario were similar in 2014–2015 but have diverged over time. Rates in Alberta show a small but consistent decrease while rates in Ontario remained stable between 2014–2015 and 2019–2020. Rates in Yukon fluctuated but increased slightly over the period.

Figure 11 **Diagnostic imaging rate for minor head trauma, by jurisdiction, 2014–2015 to 2019–2020**



Note
The diagnostic imaging rate was adjusted for a patient's age, sex and triage level.
Source
Discharge Abstract Database and National Ambulatory Care Reporting System, 2013–2014 to 2019–2020, Canadian Institute for Health Information.

Other findings

From 2014–2015 to 2019–2020, emergency department visits for minor head trauma increased by almost 16%. Nearly 1 in 3 (32%) adults age 18 to 64 who visited emergency departments in Ontario, Alberta and Yukon in 2019–2020 for minor head trauma (without red flags) received diagnostic imaging. For almost all (99%), that was a CT scan, which translates to about 17,300 potentially unnecessary scans in 1 year.

Some patients were more likely to have diagnostic imaging: people who were older, male patients and those who lived in urban areas. More information can be found in the data tables.

People who were seen in teaching hospitals or large community hospitals had a higher diagnostic imaging rate (36% to 39%) than those seen at small or medium community hospitals (10% to 27%), perhaps because larger hospitals may have more imaging machines and treat more severe cases. The joint CIHI and CWC 2017 report *Unnecessary Care in Canada* found that emergency departments that saw more trauma cases were likely to have higher rates of potentially low-value head scans.[1]

Diagnostic imaging use for minor head trauma in the first year of COVID-19

Fewer adults visited the emergency department for minor head trauma without red flags during 2020–2021, and those who did tended to have more severe injuries and were more likely to receive diagnostic imaging. Adults with mild injuries likely avoided going to the emergency department and, as CIHI reported in the Impact of COVID-19 on Canada's health care systems, public health measures — including the cancellation of sports and stay-at-home orders — meant fewer head injuries overall.[52] Similar results were found in an Ontario study.[62]

Taking action on overuse

Imaging for minor head trauma (without red flags) continues to be commonly performed even though it does not improve patient clinical outcomes. Further efforts are needed to lower these imaging rates across the country. Here are a few examples of local initiatives aimed at reducing unnecessary CT use — initiatives that have the potential to be scaled up to produce provincial-level change.

In action

Implementing checklists in Ontario

The **Checklist for Head Injury Management Evaluation Study** is based on the Canadian CT Head Rule (a validated clinical decision rule to determine the need for head CTs in adult emergency department patients with minor head injuries). The checklist was developed and implemented in the emergency department of University Health Network in Toronto.[63] Because patient expectations are an important factor in overusing CT scans, the team also created a patient handout adapted from CWC's materials. The intervention reduced head CT use by 14% at 3 months and by 8% at 16 months.

Increasing patient awareness in Alberta

A **targeted patient-education infographic** was posted in 2 emergency department waiting rooms in Calgary and was found to increase patient understanding of the risks and appropriate use of CTs for minor head trauma.[64] In a survey on whether the infographic influenced patient beliefs about CT risks and benefits, 87% of respondents stated they better understood when a CT scan is appropriate, 93% felt they better understood the risks and 76% understood that their doctor can often rule out serious illness without a CT scan.

Hospital Care

Knee arthroscopy in adults age 60 and older

Key finding

Status in 2019–2020

The rate of knee arthroscopies in **adults age 60 and older was 99 per 100,000** across Canada, except Quebec, even though most are inappropriate regardless of the diagnosis.

Trend

The rate of knee arthroscopies dropped by 46% between 2014–2015 and 2019–2020.

Why is it important?

Arthroscopic repair of acute ligament, cartilage and meniscal injuries is often appropriate in younger patients, but offers limited benefits for degenerative conditions such as osteoarthritis and degenerative meniscal tears that affect older people.

For most people older than 60, the benefits of knee arthroscopy don't last and are no better than options such as exercise therapy, injections and medication.[65]

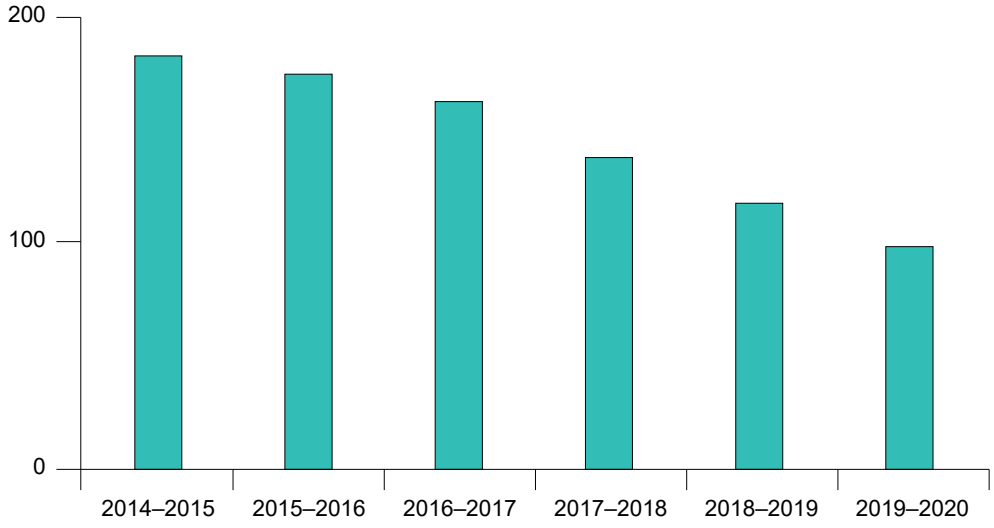
This is the Choosing Wisely Canada recommendation of the Canadian Orthopaedic Association, the Canadian Arthroplasty Society and the Arthroscopy Association of Canada:

Don’t use arthroscopic debridement as a primary treatment in the management of osteoarthritis of the knee.[66]

Overall trend, and provincial and territorial variation

This analysis measures knee arthroscopy in adults age 60 and older regardless of the diagnosis. The rate of knee arthroscopies dropped by almost half (46%) between 2014–2015 and 2019–2020, which means that 3,800 fewer knee arthroscopies were performed in 2019–2020 compared with 2014–2015.

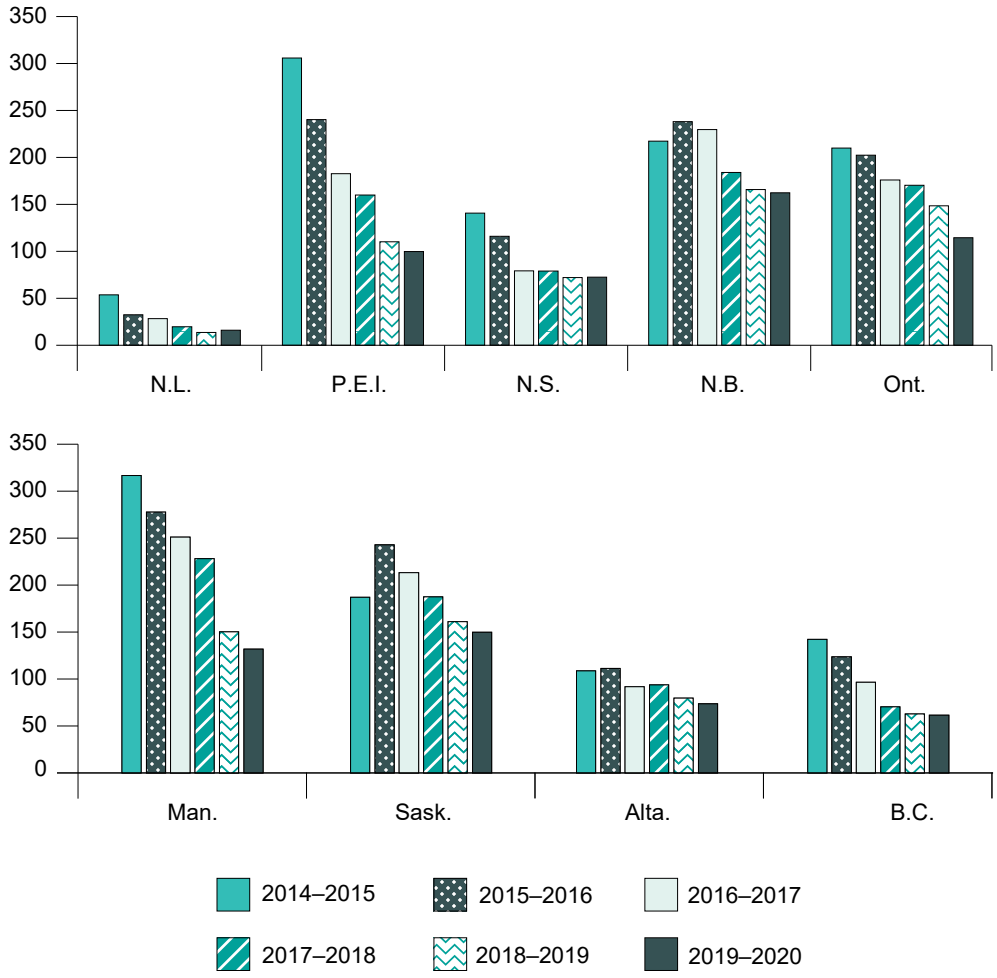
Figure 12 **Rate of knee arthroscopy for adults age 60 and older per 100,000 population, selected provinces/territories, 2014–2015 to 2019–2020**



Notes
The rate of knee arthroscopy was age-standardized using the 2011 Canadian population. Territorial results are not shown independently due to low volumes but are included in the overall rate.
Sources
Discharge Abstract Database and National Ambulatory Care Reporting System, 2014–2015 to 2019–2020, Canadian Institute for Health Information; and Statistics Canada, Table 17-10-0005-01, Population estimates on July 1st, by age and sex.

Rates of knee arthroscopy in adults 60 and older declined across all jurisdictions but varied substantially among them. In 2019–2020, the rate was lowest in Newfoundland and Labrador at 16 per 100,000, and highest in New Brunswick at 162 per 100,000. The variations may reflect differences in the number of providers and their training as well as standardized care pathways and what's insured.

Figure 13 Rate of knee arthroscopy for adults age 60 and older per 100,000 population by province, 2014–2015 to 2019–2020



Notes

The rate of knee arthroscopy was age-standardized using the 2011 Canadian population.

Territorial results are not shown independently due to low volumes but are included in the overall rate.

Sources

Discharge Abstract Database and National Ambulatory Care Reporting System, 2014–2015 to 2019–2020, Canadian Institute for Health Information; and Statistics Canada, Table 17-10-0005-01, Population estimates on July 1st, by age and sex.

Other findings

In 2019–2020, of adults age 60 and older who underwent knee arthroscopy,

- 76% were between ages 60 and 69;
- More than half (52%) were male; and
- 77% lived in urban areas.

The largest proportion (25%) of people who received a knee arthroscopy resided in the highest-income neighbourhoods while 14% were from the lowest-income neighbourhoods.

Knee arthroscopies in adults age 60 and older in the first year of COVID-19

There was a sharp drop in knee arthroscopies in every jurisdiction (except Quebec) during the early months of the pandemic due to delays and cancellations of elective surgery.

Taking action on overuse

Current Canadian guidelines advise against knee arthroscopy to treat osteoarthritis.[67] While there has been a substantial decrease in knee arthroscopies in adults age 60 and older, further reductions are possible as this procedure is rarely necessary for this age group. Reductions in knee arthroscopies may be related to surgeons changing their practice over time based on strong evidence that the procedure is not indicated.[68] More recently, policy changes in some provinces reducing or eliminating payments for surgeons may have contributed to further reductions of knee arthroscopies in practice.

In action

Knowledge to action: 2 decades of evidence at work

The original randomized controlled trials showing the limited benefit of knee arthroscopy were conducted more than 2 decades ago[69] and studies since concur. In addition to this growing body of evidence, calls to end the practice include a 2017 position statement from the Arthroscopy Association of Canada and a 2018 CWC recommendation. Governments have tried to discourage the procedure by changing fee schedules — in 2019, for example, Ontario's Ministry of Health ended coverage for knee arthroscopies under the Ontario Health Insurance Plan for most patients with arthritis.[70]

Caesarean section in low-risk deliveries

Key finding

Status in 2019–2020

The Caesarean section rate among low-risk deliveries was

1 in 6

(Canada, except Quebec).

Trend

The Caesarean section rate for low-risk deliveries across Canada (except Quebec) remained stable between 2015–2016 and 2019–2020.

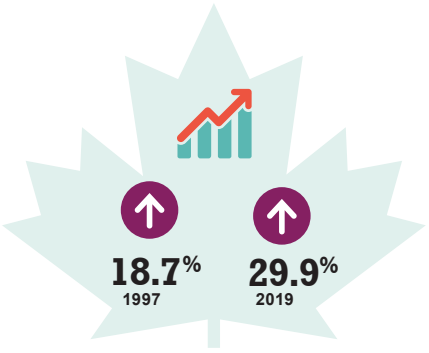
Why is it important?

C-sections can help to avoid maternal or fetal injury or death in complicated births, but when they are not warranted they increase maternal death and illness (such as hemorrhage requiring hysterectomy or uterine rupture) compared with vaginal deliveries.[71] They can also increase risks for mothers and newborns in subsequent pregnancies.[72] Most low-risk births can be done through vaginal delivery without complications.

This is the Choosing Wisely Canada recommendation of the Society of Obstetricians and Gynaecologists of Canada:

Don’t do a caesarean delivery for the sole indication of failure of progress in labour in the latent phase of labour for a woman at term with a singleton fetus and cephalic presentation.[75]

This analysis measures the rate of deliveries via C-section among singleton (a delivery with 1 baby), term, cephalic (head in the proper position) pregnancies for low-risk first-time mothers in spontaneous labour.[76] In 2019–2020, low-risk deliveries by first-time mothers accounted for 16% (about 44,000) of all births in Canada except Quebec. CIHI reports on the C-section rate in low-risk deliveries because it is an indicator of whether mothers and babies are receiving appropriate care for ensuring better outcomes. Efforts to decrease the rate of C-section in this low-risk population may lead to an overall decrease in C-section rates.

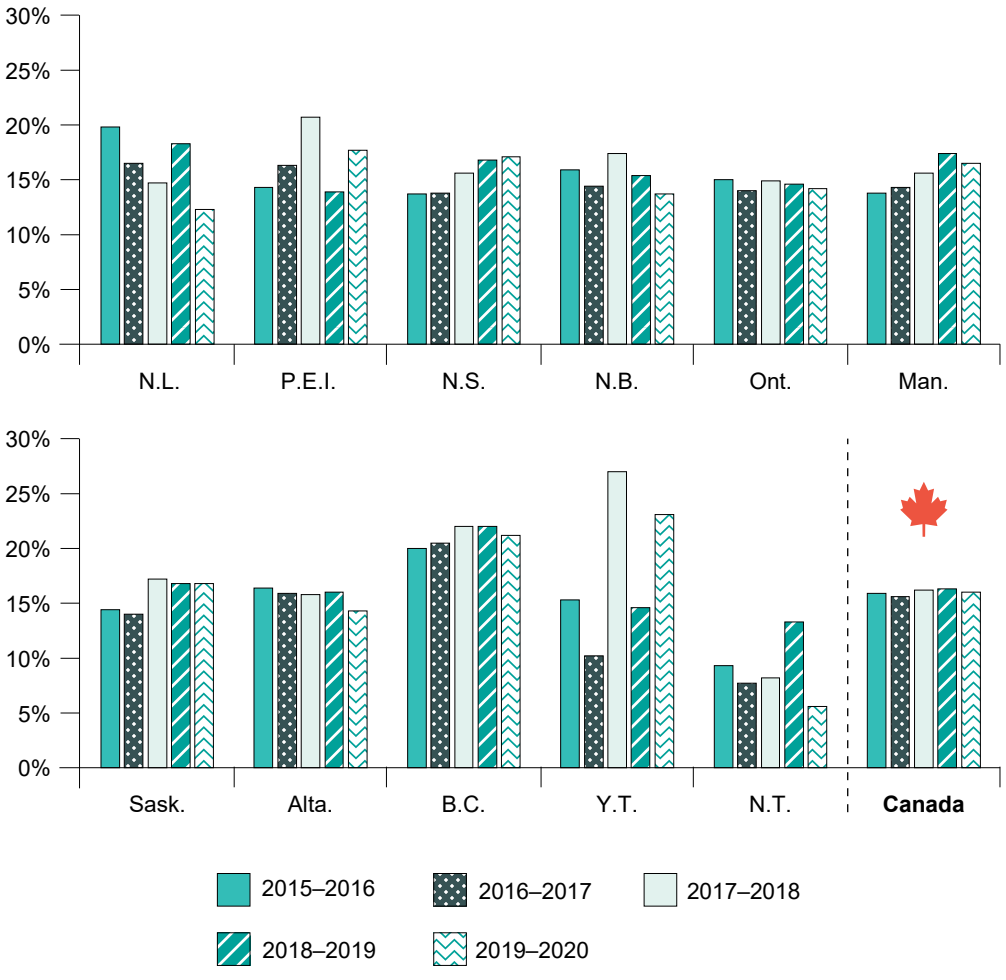


Overall, C-section rates have been increasing steadily in Canada, from 18.7% in 1997 to 29.9% in 2019.[73] This mirrors a global trend, as seen in the OECD Data tool on Caesarean sections.[74]

Overall trend, and provincial and territorial variation

The C-section rate among low-risk deliveries was stable at around 16% between 2015–2016 and 2019–2020 despite increases in Nova Scotia, Manitoba and Saskatchewan, with more than 7,000 C-sections for low-risk deliveries in 2019–2020. Rates were consistently highest in British Columbia. These variations may reflect differences in clinical practice but should be interpreted with caution in Prince Edward Island, the Northwest Territories and Yukon, where populations are small and fewer procedures are performed in a given year (data submission from Nunavut was incomplete).

Figure 14 **Caesarean section rate in low-risk deliveries, by jurisdiction, 2015–2016 to 2019–2020**



Note
The C-section rate was adjusted for patient age.
Source
Discharge Abstract Database, 2015–2016 to 2019–2020, Canadian Institute for Health Information.

Other findings

Clinician practice plays a role in who gets a C-section in low-risk deliveries, as do several patient characteristics, including maternal age, the first stage of labour lasting more than 18 hours and fetal distress.

Visit CIHI's Your Health System interactive web tool to explore rates of low-risk C-sections by region, city and hospital.

- The C-section rate increased with age. In 2019–2020, it was 23% for women age 35 and older, compared with 7% for those 19 and younger and 16% for those age 20 to 34. The C-section rate was mainly driven by women age 20 to 34, who represent almost 84% of the low-risk deliveries.
- 40% of women with low-risk pregnancies giving birth for the first time and experiencing prolonged labour had a C-section. Deliveries with prolonged labour accounted for less than 5% of low-risk births.
- About one-third of low-risk deliveries had fetal distress, defined as fetal stressor complicated by fetal heart rate anomaly, meconium in amniotic fluid or fetal asphyxia. The low-risk deliveries with fetal distress had a higher C-section rate (32% in 2019–2020).

A study showed that continuous electronic fetal monitoring, which led to more instances of detected fetal distress, was independently associated with an increased risk for primary C-section in low-risk deliveries.[77]

Low-risk C-sections in the first year of COVID-19

The rate of C-sections for low-risk deliveries increased by 10% between 2019–2020 and 2020–2021. There was a 7% decrease in the volume of low-risk deliveries but a 3% increase in the volume of C-sections for low-risk deliveries.

Taking action on overuse

There is notable variation across Canada in C-section rates for low-risk deliveries and overall rates have generally remained stable over time — which both suggest room for improvement. Audit and feedback systems, the use of evidence-based decision tools and the engagement of patients and families are examples of initiatives that can help to reduce C-section rates.[78] Here are a few examples of efforts to reduce C-sections when not clinically indicated.

Quality of Care, Management of Obstetrical Risk and Mode of Delivery program in Quebec

Known by its acronym QUARISMA, this cluster-randomized controlled trial of a multi-faceted 1.5-year intervention at 32 hospitals in Quebec found a significant but small reduction in the C-section rate for women with low-risk pregnancies. The intervention included audits of C-section indications, feedback to health professionals on their rates of doing the procedure and the introduction of best practices.[79]

Better Outcomes Registry & Network Ontario

The Better Outcomes Registry & Network (BORN) Ontario is Ontario's perinatal, newborn and child registry. Its role is to facilitate quality care for families across the province.[80] BORN Ontario helps health providers such as doctors, nurses and midwives track care for pregnant individuals and newborns on the Maternal Newborn Dashboard, which allows comparison with the rest of the province and established standards. The implementation of BORN Ontario's Maternal Newborn Dashboard was associated with a significant decline in the rate of elective repeat Caesarean delivery in low-risk women prior to 39 weeks.[81]

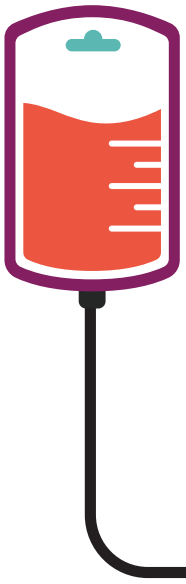
California Maternity Quality Care Collaborative

The California Maternal Quality Care Collaborative uses research, quality improvement toolkits, state-wide outreach collaboratives and its Maternal Data Center (providing hospitals with access to timely benchmarking data) to improve health outcomes for mothers and infants.[82, 83] In 2016, it published a Toolkit to Support Vaginal Birth and Reduce Primary Caesareans, which contributed to a decline in the C-section rate from 26.0% in 2014 to 22.8% in 2019.[84]

Red blood cell transfusion in hospitalized patients

Key finding

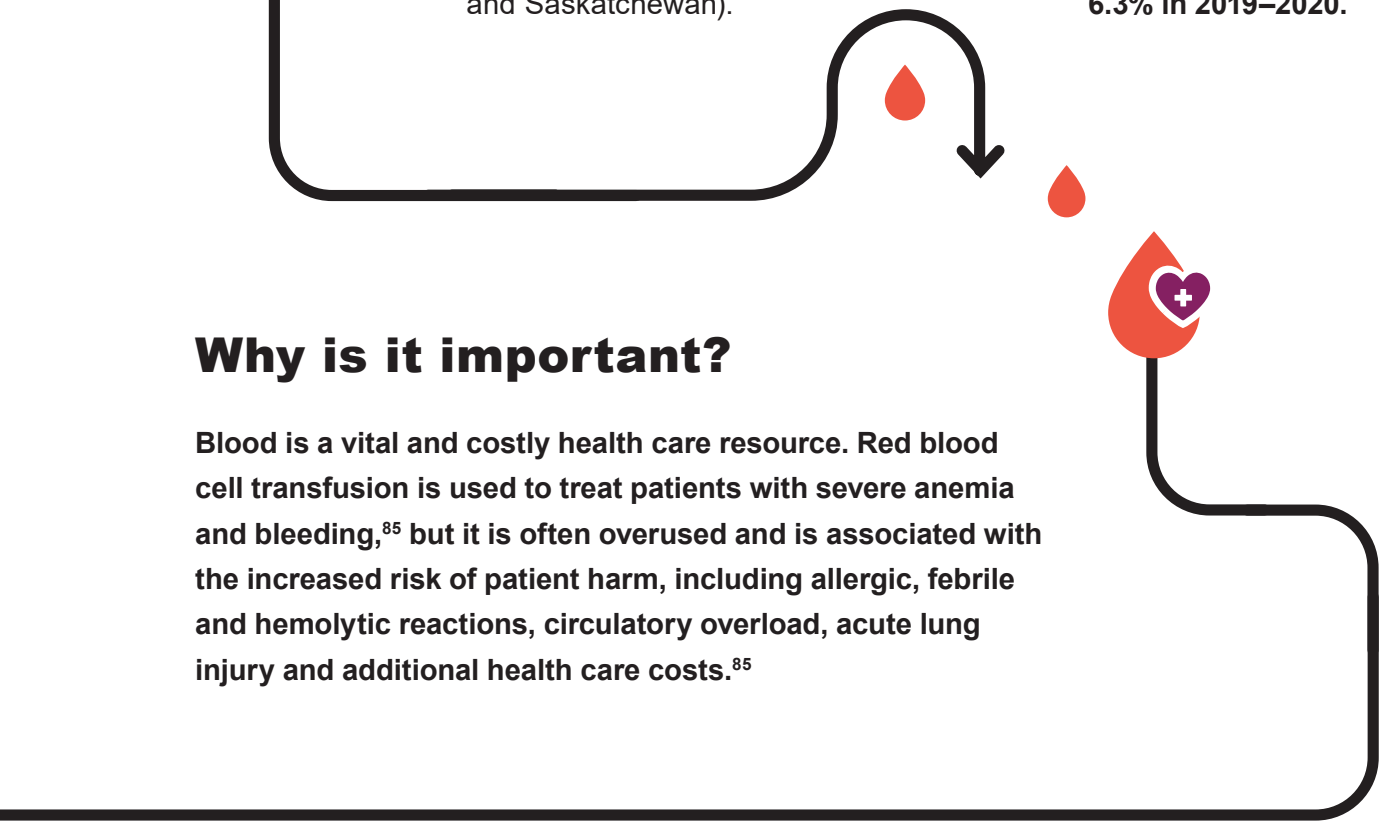
Status in 2019–2020



The red blood cell transfusion rate in hospitalized patients was 6.3%
(New Brunswick, Quebec, Ontario, Manitoba and Saskatchewan).

Trend

The red blood cell transfusion rate in hospitalized patients gradually declined by 11%, from 7.1% in 2014–2015 to 6.3% in 2019–2020.



Why is it important?

Blood is a vital and costly health care resource. Red blood cell transfusion is used to treat patients with severe anemia and bleeding,[85] but it is often overused and is associated with the increased risk of patient harm, including allergic, febrile and hemolytic reactions, circulatory overload, acute lung injury and additional health care costs.[85]

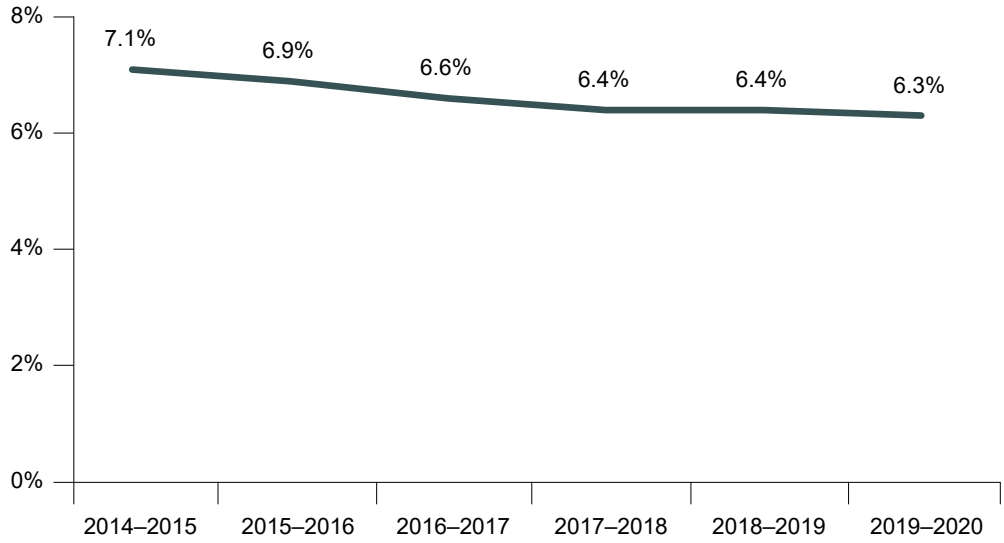
This is the Choosing Wisely Canada recommendation of the Canadian Society of Internal Medicine:

Don’t transfuse red blood cells for arbitrary hemoglobin or hematocrit thresholds in the absence of symptoms, active coronary disease, heart failure or stroke.[86]

Overall trend and provincial variation

The red blood cell transfusion rate in adults hospitalized for medical, surgical and obstetric reasons gradually declined from 7.1% in 2014–2015 to 6.3% in 2019–2020. This is equivalent to 9,800 fewer red blood cell transfusions in 2019–2020 compared with 2014–2015. During the same period, hospitalizations rose by 4%.

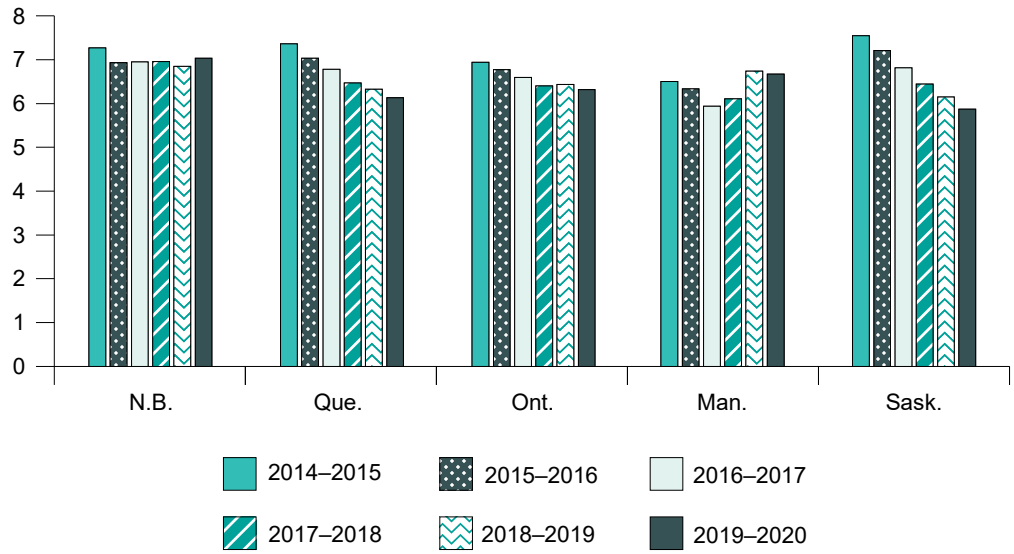
Figure 15 **Red blood cell transfusion rate in acute hospitalizations, selected provinces, 2014–2015 to 2019–2020**



Notes
The red blood cell transfusion rate was adjusted for age, sex, severity index and length of hospital stay.
The red blood cell transfusion indicator was mandatory to report in only 5 provinces (New Brunswick, Quebec, Ontario, Manitoba and Saskatchewan).
Source
Hospital Morbidity Database, 2014–2015 to 2019–2020, Canadian Institute for Health Information.

Quebec and Saskatchewan showed steadily declining rates between 2014–2015 and 2019–2020. There was some variation in the rates among the 5 provinces, with the highest red blood transfusion rate in New Brunswick (7.0%) and the lowest rate in Saskatchewan (5.9%) in 2019–2020.

Figure 16 **Red blood cell transfusion rate in acute hospitalizations, by province, 2014– 2015 to 2019–2020**



Note
The red blood cell transfusion rate was adjusted for age, sex, severity index and length of hospital stay.
Source
Hospital Morbidity Database, 2014–2015 to 2019–2020, Canadian Institute for Health Information.

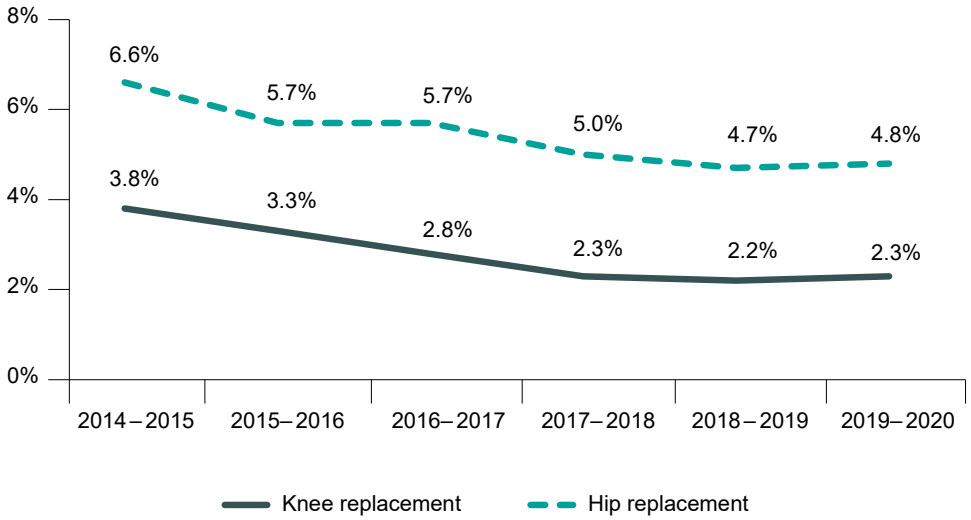
Other findings

Older patients were more likely to receive a red blood cell transfusion and rates were higher for males than females. In 2019–2020, surgical patients had the highest rate of transfusion (9.6%), followed by medical patients (5.9%) and then obstetric patients (1.0%).

Rates of blood transfusion for hip and knee replacements were examined in the 2017 report *Unnecessary Care in Canada*. Orthopedic surgeons were one of several surgical societies that made efforts to reduce transfusion rates, which have declined between 2014–2015 and 2019–2020:

- The transfusion rate for hip replacement patients declined by 27%, from 6.6% to 4.8%.
- In knee replacement patients, the rate declined by 39%, from 3.8% to 2.3%.

Figure 17 Red blood cell transfusion rate in hip and knee replacements, selected provinces, 2014–2015 to 2019–2020



Note
The red blood cell transfusion rate was adjusted for age, sex, severity index, type of procedure, length of hospital stay, anesthetic technique, fixation type, bilateral or unilateral procedure and primary procedure or revision.
Source
Hospital Morbidity Database, 2014–2015 to 2019–2020, Canadian Institute for Health Information.

Red blood cell transfusions in hospitalized patients in the first year of COVID-19

During the first year of COVID-19, the overall hospitalization volume dropped by 12% and the red blood cell transfusion volume dropped by 5%. The impact of COVID-19 on the risk-adjusted transfusion rate was minimal (6.3% in 2019–2020 and 6.4% in 2020–2021).

Taking action on overuse

The largest single category of blood components and products is red blood cells. While there has been a gradual decline in the overall utilization of red blood cells in Canada, there remains significant variation in their use. Implementing guidelines, setting benchmarks for appropriate use and developing tools to support clinical decision-making on transfusions are some interventions that have limited the overuse of red blood cells.[85] Here are a few examples of blood stewardship efforts taking place across the country.

Benchmarking appropriateness through the Using Blood Wisely program

Launched in 2020 by CWC and Canadian Blood Services, Using Blood Wisely is a quality improvement program that helps hospitals compare how they use red blood cell transfusions with national benchmarks for appropriateness.[87] A hospital that meets and maintains benchmarks is designated a Using Blood Wisely Hospital. More than 240 hospitals have participated, and 110 hospitals are designated.

Advancing the science of blood stewardship through the START Study

In this multi-pronged intervention involving 15 hospitals across Canada where sites adopted standardized red blood cell guidelines, staff education and the screening of transfusion orders increased the proportion of clinically appropriate orders and single-unit orders by 12% and 22%, respectively.[88]

Supporting clinical decision-making in Saskatchewan

Saskatchewan has developed clinical decision-making tools, recommendations, guidelines, algorithms and videos to support red blood cell transfusion stewardship.[89, 90]

Check out other initiatives that are happening across Canada to reduce inappropriate red blood cell transfusions.

Preoperative tests for low-risk surgery

Key finding

Status in 2019–2020

1 in 5 patients who had low-risk surgery had a preoperative test

(Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia).

Trend

The pre-op test rate for low-risk surgery declined by 17% between 2015–2016 and 2019–2020.

Why is it important?

Preoperative testing is not useful for patients who are undergoing low-risk, non-cardiac surgery because it does not change how patients are managed or change their outcomes.[91]

However, preoperative tests can expose patients to radiation, increase their anxiety and lead to surgery being delayed by false positives or incidental findings.[92]

This is the Choosing Wisely Canada recommendation of the Canadian Society of Internal Medicine:

Don’t routinely perform preoperative testing (such as chest X-rays, echocardiograms, or cardiac stress tests) for patients undergoing low-risk surgeries.[86]

The Canadian Anesthesiologists’ Society and the Canadian Cardiovascular Society have similar recommendations.[93, 94]

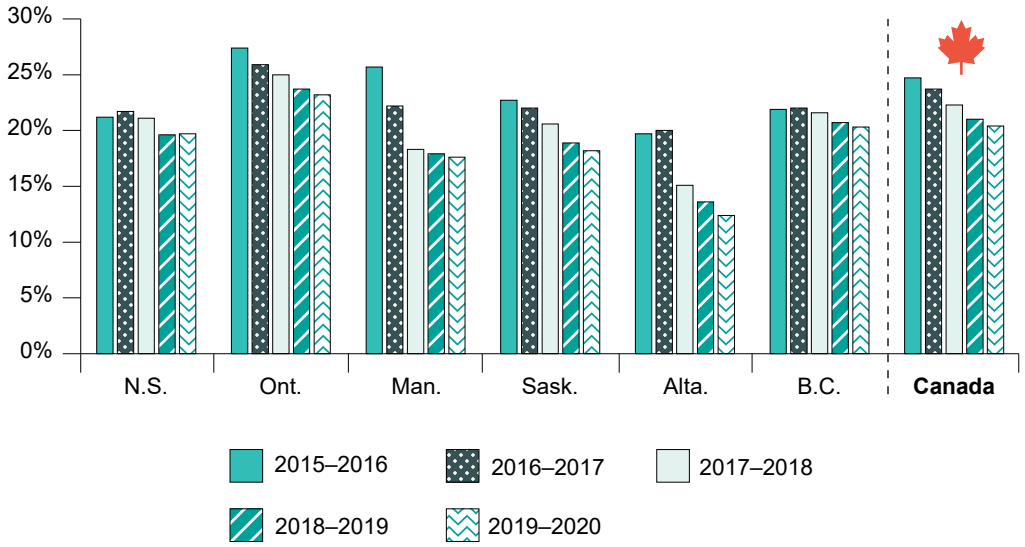
Overall trend and provincial variation

The rate of patients undergoing preoperative testing before low-risk surgery declined from 25% in 2015–2016 to 20% in 2019–2020, which translates to 35,000 fewer preoperative tests in 2019–2020 compared with 2015–2016. The rates vary widely across provinces, from 12% in Alberta to 23% in Ontario in 2019–2020. This could reflect, in part, differences in how provinces report and fund these tests.

For this analysis, preoperative testing is defined as having an electrocardiogram, cardiac stress test, echocardiogram or chest X-ray in the 60 days before low-risk surgery (including endoscopy, ophthalmology and other procedures).

Between 2015–2016 and 2019–2020, the preoperative testing rate declined substantially in Ontario (down 15%), Manitoba (32%), Saskatchewan (20%) and Alberta (37%), but was stable in Nova Scotia and British Columbia. Declines were observed in the 3 provinces that were previously examined in the 2017 report *Unnecessary Care in Canada* (Ontario, Saskatchewan and Alberta).

Figure 18 Preoperative testing rate in low-risk surgeries, by province, 2015–2016 to 2019–2020



Note
The preoperative testing rate was risk-adjusted for age, sex and surgery type.
Sources
National Physician Database, Discharge Abstract Database and National Ambulatory Care Reporting System, 2014–2015 to 2019–2020 Canadian Institute for Health Information.

Other findings

- Males and older patients were more likely to have a preoperative test before low-risk surgery — the rate was 23% in males and 18% in females. The rate ranged from 11% in patients age 18 to 44 to 27% in those 85 and older.
- In 2019–2020, the most common types of low-risk surgery were ophthalmology (40% of procedures), followed by endoscopy (32%). Each had a preoperative testing rate of 15%.
- At 36%, the preoperative testing rate was highest for less common procedures, including orthopedic and urological surgery.

Preoperative tests for low-risk surgeries in the first year of COVID-19

Rates of preoperative testing for low-risk surgery declined between 12% and 27% across provinces during the first year of the COVID-19 pandemic, partly due to delays and cancellations of elective surgery and reduced testing capacity.

Taking action on overuse

While the declining rates between 2015–2016 and 2019–2020 are encouraging, preoperative tests are still commonly performed before low-risk surgeries and continued efforts are needed to further reduce unnecessary preoperative tests. The province-wide implementation of guidelines, such as the initiative described below from Manitoba, may be effective in reducing rates over time thanks to widespread and consistent application.

In action

Improving preoperative practices with Choosing Wisely Manitoba

This is a partnership between Shared Health Manitoba and the George & Fay Yee Centre for Healthcare Innovation. Starting in 2015, a multidisciplinary team did an extensive review of preoperative practices in Manitoba. Using findings to develop consensus among stakeholders, the team removed cues for preoperative testing from various forms, standardized surgical and primary care letters to reflect evidence against testing, added decision-support tools to electronic medical records and provided physician-level performance data as part of an audit and feedback scheme.[95] The initiative resulted in a 38% reduction in preoperative diagnostic testing.

Additional tools and resources

- CWC: Drop the Pre-Op: A toolkit for reducing unnecessary pre-operative testing.

Check out other initiatives that are happening across Canada to reduce unnecessary preoperative testing.

Health equity

"**Health equity** is the absence of unjust, avoidable differences in health care access, quality or outcomes." [96, 97]

More information on equity stratifiers can be found in CIHI's 2018 report In Pursuit of Health Equity: Defining Stratifiers for Measuring Health Inequality.

Advancing health equity is a growing priority in Canada. Part of eliminating unjust differences in the quality of care is to identify and measure inequities so we can act to change them. To do that, we use a number of socio-demographic variables we call equity stratifiers, which are identifying characteristics — age, sex, income and geographic location — of population subgroups that may experience unequal health care.[97]

We have highlighted equity stratifiers in this report where they showed different rates of tests and treatments for certain subpopulations. This is an important exercise, because without careful attention, it's possible that overall improvements in rates could mask inequitable access to high-quality care or to good outcomes for some people. Here are some examples we found of how low-value tests and treatments are provided to people differently:[xiii]

- More older adults who used benzodiazepines and other sedative–hypnotics lived in lower-income neighbourhoods.
- Adults who were older or male, or lived in urban areas were all more likely to have diagnostic imaging when they visited emergency departments for head trauma.
- Adults age 60 and above who had undergone a knee arthroscopy were more likely to reside in the highest-income neighbourhoods.

While this report focuses on the overuse of tests and treatments, the **underuse of health services** is also a problem and more difficult to identify, because administrative data cannot provide information on services not delivered. **Together, overuse and underuse can affect some groups disproportionately with worse patient experiences and health outcomes**.[98, 99]

Making access more equitable will require work on many fronts, but cutting the number of overused tests and treatments frees up funding, equipment, time and health care providers, which could help increase equitable access to health care and improve quality and outcomes for everyone.

xiii. Breakdowns by the available equity stratifiers for each measure can be found in the data tables accompanying this report.

Conclusion

As demand for health care grows and changes, the wise use and management of limited health care resources will help ensure Canadians receive high-quality care today and in the future. Addressing the overuse of tests and treatments such as the ones examined in this report is a central component of good stewardship. To achieve widespread impact, efforts to reduce overuse will have to be multi-faceted and include system-level changes in addition to engaging clinicians and patients.

The first joint report between CIHI and CWC, *Unnecessary Care in Canada* (2017), helped to quantify the extent of overuse of 8 low-value tests and treatments in Canada. This report looked at how the overuse of 12 tests and treatments has changed over time and found that 8 had declined by 10% or more over a 5- to 6-year period up to 2019–2020. Factors that contributed to that success included introducing targeted initiatives, engaging patients, introducing funding incentives and issuing national guidelines as well as redesigning systems and carrying out public reporting on progress.

COVID-19 disrupted everything in health care, including the trends we were tracking for this report. It is too soon to say whether changes caused by COVID-19 will persist or whether pre-pandemic trends will return. The ongoing monitoring of progress, therefore, is critical, and CIHI continues to advance the collection and standardization of health administrative data to measure performance, evaluate improvement methods and identify learning opportunities across health systems. This includes expanding access to physician billing data and taking further steps toward achieving comprehensive, pan-Canadian data from emergency departments, long-term care, home care and prescription drug claims.

The findings and actions highlighted in this report provide important material for discussions among patients, clinicians, researchers and decision-makers about overuse. Together, they show the progress we have achieved in reducing low-value care and point to opportunities for continued improvements in delivering high-quality care for Canadians while supporting the sustainability of our health care systems.

Appendices

Appendix A: Text alternative for figures

Diagnostic imaging for lower-back pain

2019–2020: Across Nova Scotia, Ontario, Manitoba, Alberta and British Columbia, 24% to 31% of patients with lower-back pain without red flags (certain worrisome symptoms) received diagnostic imaging.

Collectively, rates were stable between 2015–2016 and 2019–2020 — they declined in Nova Scotia and Alberta and remained unchanged in Ontario, Manitoba and British Columbia.

Cervical screening

2017: 42% of people in Canada with a cervix age 18 to 24 reported receiving a Pap test in the previous 3 years.

In 2008, this rate was 65%, meaning there has been a decline in routine Pap tests in this age group.

Antibiotics dispensed in the community

2019–2020: The total volume of antibiotics, measured by the World Health Organization's standardized defined daily dose (DDD), was 13 per 1,000 population per day across Manitoba, Saskatchewan and British Columbia. The OECD average is 17 DDD per 1,000 population per day. On any given day, roughly 100,000 people across those 3 provinces are taking an antibiotic. Furthermore almost 1 in 3 people in those provinces took at least one course of antibiotics.

The volume of antibiotics dispensed in the community went down by 11% between 2015–2016 and 2019–2020.

Chronic use of benzodiazepines and other sedative–hypnotics in older adults

2019–2020: 1 in 12 older adults used benzodiazepines and other sedative–hypnotics regularly (all provinces except Quebec).

The chronic use rate of benzodiazepines and other sedative–hypnotics declined by 16% between 2014–2015 and 2019–2020.

Physical restraints and antipsychotics in long-term care

2019–2020: Daily physical restraints were used in fewer than 1 in 20 residents in long-term care across Newfoundland and Labrador, Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia and Yukon.

The use of daily physical restraints in long-term care dropped by 47% between 2014–2015 and 2019–2020.

2019–2020: 1 in 5 long-term care residents were taking antipsychotics without a diagnosis of psychosis across Newfoundland and Labrador, Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia and Yukon.

Potentially inappropriate use of antipsychotics in long-term care residents dropped by 26% between 2014–2015 and 2019–2020.

Chest X-rays for asthma and bronchiolitis in emergency departments

2019–2020: 3 in 10 children who visited the emergency department for asthma or bronchiolitis received a chest X-ray (Ontario, Alberta and Yukon).

Rates of chest X-rays for children with asthma or bronchiolitis were generally stable between 2014–2015 and 2019–2020 in Ontario, Alberta and Yukon.

Diagnostic imaging for minor head trauma in emergency departments

2019–2020: The rate of diagnostic imaging for adults who visited emergency departments for minor head trauma without red flags was 1 in 3 patients (Ontario, Alberta and Yukon).

Diagnostic imaging rates for minor head trauma remained stable between 2014–2015 and 2019–2020 in Ontario, Alberta and Yukon.

Knee arthroscopy in adults age 60 and older

2019–2020: The rate of knee arthroscopies in adults age 60 and older was 99 per 100,000 across Canada, except Quebec, even though most are inappropriate regardless of the diagnosis.

The rate of knee arthroscopies dropped by 46% between 2014–2015 and 2019–2020.

Caesarean section in low-risk deliveries

2019–2020: The Caesarean section rate among low-risk deliveries was 1 in 6 (Canada, except Quebec).

The Caesarean section rate for low-risk deliveries across Canada (except Quebec) remained stable between 2015–2016 and 2019–2020.

Red blood cell transfusion in hospitalized patients

2019–2020: The red blood cell transfusion rate in hospitalized patients was 6.3% (New Brunswick, Quebec, Ontario, Manitoba and Saskatchewan).

The red blood cell transfusion rate in hospitalized patients has gradually declined by 11%, from 7.1% in 2014–2015 to 6.3% in 2019–2020.

Preoperative tests for low-risk surgery

2019–2020: 1 in 5 patients who had low-risk surgery had a preoperative test (Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia).

The pre-op test rate for low-risk surgery declined by 17% between 2015–2016 and 2019–2020.

Figure 1: Diagnostic imaging rate for lower-back pain without red flags, by province, 2015–2016 to 2019–2020

Province	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
Nova Scotia	31.2%	29.6%	29.9%	29.7%	27.7%
Ontario	26.9%	26.7%	26.8%	26.8%	24.7%
Manitoba	30.8%	30.4%	31.0%	31.6%	31.1%
Alberta	30.7%	28.9%	27.7%	27.7%	26.6%
British Columbia	24.8%	24.2%	24.0%	24.6%	24.0%

Notes
Caution is needed when interpreting provincial variation due to differences in how the provinces report and fund diagnostic imaging.
The diagnostic imaging rate was adjusted for a patient's age and sex.
Sources
National Physician Database, Discharge Abstract Database and National Ambulatory Care Reporting System, 2014–2015 to 2020–2021, Canadian Institute for Health Information.

Figure 2: Percentage of individuals with a cervix age 18 to 24 reporting having had a Pap test within the past 3 years, by jurisdiction, 2008 to 2017

Jurisdiction	2008	2012	2017
Newfoundland and Labrador	76.0%	80.5%	48.0%*
Prince Edward Island	81.7%†	80.4%†	38.0%*†
Nova Scotia	65.0%	60.0%	55.0%
New Brunswick	80.0%‡	59.0%‡	36.0%*
Quebec	64.0%‡	60.0%‡	44.0%‡
Ontario	61.0%	52.0%	43.0%
Manitoba	74.0%	68.0%	38.0%*
Saskatchewan	67.0%	65.0%	31.0%*
Alberta	69.0%	53.0%	45.0%
British Columbia	71.0%	55.0%	34.0%
Yukon	94.7%‡	Not available§	67.0%*‡
Northwest Territories	91.4%‡	81.4%‡	64.0%‡
Nunavut	81.2%‡	78.0%*‡	40.0%*‡

Notes

* Interpret with caution owing to large variability in the estimate.

† An organized program has existed since 2001 in Prince Edward Island but screening remains primarily opportunistic.

‡ An organized cervical cancer screening program was not available this year.

§ 2012 data for Yukon was suppressed due to small numbers.

This included individuals with a cervix age 18 to 24 for all jurisdictions to align with the CWC recommendation developed by the College of Family Physicians of Canada. Individuals with a cervix who had undergone a hysterectomy were excluded from the analysis. Recommendations for cervical cancer screening varied by jurisdiction, with some starting at age 21 and others at age 25 in selected years (e.g., Alberta and British Columbia updated their screening guidelines in 2016 to start screening at the age of 25).

Sources

Statistics Canada, Canadian Community Health Survey, 2008, 2012 and 2017. 2 years were combined for Yukon, the Northwest Territories and Nunavut in 2017 (2017 and 2018).

Figure 3: Total volume of antibiotics dispensed for system use, by province, defined daily dose per 1,000 population per day, 2015–2016 to 2019–2020

Province	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
Manitoba	15.4	15.4	15.0	14.2	14.5
Saskatchewan	17.7	17.4	16.4	15.8	15.9
British Columbia	13.4	13.1	12.5	12.0	11.8
Total	14.5	14.2	13.6	13.0	12.9

Note

The total volume of antibiotics dispensed for system use was standardized by age.

Sources

National Prescription Drug Utilization Information System, 2015–2016 to 2019–2020, Canadian Institute for Health Information; and Statistics Canada, Table 17-10-0005-01, Population estimates on July 1st, by age and sex.

Total volume of antibiotics dispensed for system use by category, defined daily dose per 1,000 population per day, 2019–2020

Antibiotic category	Defined daily doses per 1,000 population per day
Beta-lactam antibacterials, penicillins	4.2
Tetracyclines	3.2
Macrolides, lincosamides, streptogramins	2.0
Other beta-lactams	1.7
Quinolones	1.0
Other antibiotics	0.9

Sources

National Prescription Drug Utilization Information System, 2019–2020, Canadian Institute for Health Information; and Statistics Canada, Table 17-10-0005-01, Population estimates on July 1st, by age and sex.

Figure 4: Total number and percentage of older adults with chronic use of benzodiazepines and other sedative–hypnotics, selected provinces, 2014–2015 to 2019– 2020

Year	Number of older adults with chronic use	Percentage of older adults with chronic use
2014–2015	332,913	10.1%
2015–2016	334,673	9.8%
2016–2017	336,059	9.5%
2017–2018	332,235	9.1%
2018–2019	330,694	8.8%
2019–2020	330,141	8.5%

Notes

The percentage of older adults with chronic use was standardized by age.

The study population was older adults with at least 1 drug claim in the selected period.

This analysis included all provinces, except Quebec.

All benzodiazepine and sedative–hypnotic drug use was included and could not be limited to use for insomnia, agitation and delirium.

Source

National Prescription Drug Utilization Information System, 2013–2014 to 2019–2020, Canadian Institute for Health Information.

Figure 5: Percentage of older adults with chronic use of benzodiazepines and other sedative–hypnotics, by province, 2014–2015 to 2019–2020

Province	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
Newfoundland and Labrador	18.4%	18.3%	18.7%	18.6%	18.4%	18.3%
Prince Edward Island	7.7%	8.1%	8.3%	8.3%	8.2%	8.1%
Nova Scotia	15.5%	15.2%	15.2%	14.9%	14.5%	14.1%
New Brunswick	21.8%	21.9%	22.5%	22.6%	22.3%	22.1%
Ontario	9.2%	8.9%	8.5%	8.2%	7.9%	7.6%
Manitoba	13.1%	12.9%	12.6%	12.3%	12.0%	11.6%
Saskatchewan	6.3%	6.0%	5.9%	5.7%	5.6%	5.4%
Alberta	12.5%	12.4%	121%	11.4%	10.9%	10.4%
British Columbia	8.7%	8.3%	7.9%	7.4%	7.0%	6.7%

Notes

Public drug programs in Newfoundland and Labrador, Nova Scotia and New Brunswick provide coverage to smaller populations of older adults than other jurisdictions, so data on use may not capture their total 65-and-older population.

The percentage of older adults with chronic use was standardized by age.

The study population was older adults with at least 1 drug claim in the selected period.

Source

National Prescription Drug Utilization Information System, 2013–2014 to 2019–2020, Canadian Institute for Health Information.

Figure 6: Daily physical restraint use and antipsychotics in long-term care residents, selected provinces/territories, 2014–2015 to 2019–2020

Year	Daily physical restraint use	Daily antipsychotic use
2014–2015	8.6%	27.2%
2015–2016	7.4%	23.6%
2016–2017	6.5%	21.6%
2017–2018	5.7%	21.3%
2018–2019	5.2%	20.7%
2019–2020	4.6%	20.2%

Notes

Restraint analysis excluded residents who are comatose or quadriplegic.
The restraint use rate was standardized by a facility-level long-form scale on activities of daily living.
Antipsychotic analysis excluded residents who had end-stage disease, were receiving hospice or palliative care, and had a diagnosis of schizophrenia or Huntington chorea, and those experiencing hallucinations or delusion.
The antipsychotic use rate was standardized by facility-level Case Mix Index to a standard population, then was risk-adjusted for individual covariates (motor agitation, a moderate or impaired decision-making problem, a long-term memory problem, Cognitive Performance Scale, combination Alzheimer disease and other dementia, and/or age younger than 65).

Source

Continuing Care Reporting System, 2014–2015 to 2019–2020, Canadian Institute for Health Information.

Figure 7: Percentage of daily physical restraint use in long-term care residents, by jurisdiction, 2014–2015 to 2019–2020

Jurisdiction	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
Newfoundland and Labrador	9.6%	12.1%	14.2%	12.1%	12.4%	11.1%
Ontario	7.4%	6.0%	5.1%	4.5%	3.9%	3.3%
Saskatchewan	12.5%	11.7%	10.1%	8.5%	7.7%	Not available*
Alberta	8.6%	6.9%	6.5%	6.1%	5.7%	5.5%
British Columbia	11.0%	9.6%	8.3%	7.3%	6.9%	6.7%
Yukon	13.0%	17.2%	19.1%	14.2%	11.5%	10.5%

Notes

* 2019–2020 results for Saskatchewan are not displayed because the province transitioned from the Resident Assessment Instrument–Minimum Data Set 2.0 to the interRAI Long-Term Care Facilities assessment instrument that year.
Data from Manitoba's Winnipeg Regional Health Authority and Nova Scotia's Central Zone, as well as a small portion of Saskatchewan's data (2019–2020), was included in the overall rate but not displayed for provincial rate reporting.
Restraint analysis excluded residents who were comatose or quadriplegic.
The restraint use rate was standardized by a facility-level long-form scale on activities of daily living to a standard population.

Source

Continuing Care Reporting System, 2014–2015 to 2019–2020, Canadian Institute for Health Information.

Figure 8: Percentage of antipsychotic use in residents without a diagnosis of psychosis, by jurisdiction, 2014–2015 to 2019–2020

Jurisdiction	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
Newfoundland and Labrador	37.7%	37.1%	37.8%	35.4%	28.2%	23.1%
Ontario	27.0%	22.6%	20.2%	19.6%	19.0%	18.3%
Saskatchewan	31.2%	29.0%	26.9%	26.9%	27.5%	Not available*
Alberta	21.0%	17.9%	17.2%	17.1%	17.2%	18.1%
British Columbia	30.9%	27.7%	25.7%	25.4%	24.8%	24.7%
Yukon	27.2%	25.2%	25.0%	27.9%	27.4%	28.6%

Notes

* 2019–2020 results for Saskatchewan are not displayed because the province transitioned from the Resident Assessment Instrument–Minimum Data Set 2.0 to the interRAI Long-Term Care Facilities assessment instrument that year.

Data from Manitoba's Winnipeg Regional Health Authority and Nova Scotia's Central Zone, as well as a small portion of Saskatchewan's data (2019–2020), was included in the overall rate but not displayed for provincial rate reporting.

Antipsychotic analysis excluded residents who had end-stage disease, were receiving hospice or palliative care, and had a diagnosis of schizophrenia or Huntington chorea, or those experiencing hallucinations or delusion.

The antipsychotic use rate was standardized by facility-level Case Mix Index to a standard population, then was risk-adjusted for individual covariates (motor agitation, a moderate or impaired decision-making problem, a long-term memory problem, Cognitive Performance Scale, combination Alzheimer disease and other dementia, and/or age younger than 65).

Source

Continuing Care Reporting System, 2014–2015 to 2019–2020, Canadian Institute for Health Information.

Figure 9: Chest X-ray rate in children visiting the emergency department for asthma and bronchiolitis, selected provinces/territories, 2014–2015 to 2019–2020

Year	Bronchiolitis	Asthma
2014–2015	31.3%	27.4%
2015–2016	33.1%	26.8%
2016–2017	29.6%	27.2%
2017–2018	29.8%	27.8%
2018–2019	30.2%	28.3%
2019–2020	29.3%	29.2%

Notes

The imaging rate for bronchiolitis was adjusted for patient sex and triage level.

The imaging rate for asthma was adjusted for patient age, sex and triage level.

Source

National Ambulatory Care Reporting System, 2014–2015 to 2019–2020, Canadian Institute for Health Information.

Figure 10: Chest X-ray rate in children visiting the emergency department for asthma and bronchiolitis, by jurisdiction, 2019–2020

Jurisdiction	Bronchiolitis	Asthma
Ontario	31.4%	30.1%
Alberta	25%	27.6%
Yukon	Not reportable*	21.8%
Total	29.3%	29.2%

Notes

* The imaging rate for bronchiolitis in Yukon is not shown due to low volumes.

The imaging rate for bronchiolitis was adjusted for patient sex and triage level.

The imaging rate for asthma was adjusted for patient age, sex and triage level.

Source

National Ambulatory Care Reporting System, 2018–2019 to 2019–2020, Canadian Institute for Health Information.

Figure 11: Diagnostic imaging rate for minor head trauma, by jurisdiction, 2014–2015 to 2019–2020

Jurisdiction	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
Ontario	31.0%	30.5%	30.9%	31.4%	32.6%	32.5%
Alberta	31.6%	31.0%	29.7%	27.8%	27.5%	27.8%
Yukon	23.2%	24.0%	20.0%	24.2%	21.6%	26.3%
Total	31.1%	30.6%	30.6%	30.6%	31.6%	31.5%

Note

The diagnostic imaging rate was adjusted for patient's age, sex and triage level.

Sources

Discharge Abstract Database and National Ambulatory Care Reporting System, 2013–2014 to 2019–2020, Canadian Institute for Health Information.

Figure 12: Rate of knee arthroscopy for adults age 60 and older per 100,000 population, selected provinces/territories, 2014–2015 to 2019–2020

Year	Rate
2014–2015	183
2015–2016	175
2016–2017	162
2017–2018	138
2018–2019	118
2019–2020	99

Note

The rate of knee arthroscopy was age-standardized using the 2011 Canadian population.

Sources

Discharge Abstract Database and National Ambulatory Care Reporting System, 2014–2015 to 2019–2020, Canadian Institute for Health Information; and Statistics Canada, Table 17-10-0005-01, Population estimates on July 1st, by age and sex.

Figure 13: Rate of knee arthroscopy for adults age 60 and older per 100,000 population by province, 2014–2015 to 2019–2020

Jurisdiction	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
Newfoundland and Labrador	54	32	28	20	14	16
Prince Edward Island	306	240	183	160	110	100
Nova Scotia	141	116	79	79	72	72
New Brunswick	217	238	230	184	166	162
Ontario	210	202	176	170	148	115
Manitoba	317	278	251	228	150	132
Saskatchewan	187	243	213	188	161	150
Alberta	109	111	92	94	80	73
British Columbia	142	124	97	70	63	61

Notes

The rate of knee arthroscopy was age-standardized using the 2011 Canadian population.

Territorial results are not shown independently due to low volumes but are included in the overall rate.

Sources

Discharge Abstract Database and National Ambulatory Care Reporting System, 2014–2015 to 2019–2020, Canadian Institute for Health Information; and Statistics Canada, Table 17-10-0005-01, Population estimates on July 1st, by age and sex.

Figure 14: Caesarean section rate in low-risk deliveries by jurisdiction, 2015–2016 to 2019–2020

Jurisdiction	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
Newfoundland and Labrador	19.8%	16.5%	14.7%	18.3%	12.3%
Prince Edward Island	14.3%	16.3%	20.7%	13.9%	17.7%
Nova Scotia	13.7%	13.8%	15.6%	16.8%	17.1%
New Brunswick	15.9%	14.4%	17.4%	15.4%	13.7%
Ontario	15.0%	14.0%	14.9%	14.6%	14.2%
Manitoba	13.8%	14.3%	15.6%	17.4%	16.5%
Saskatchewan	14.4%	14.0%	17.2%	16.8%	16.8%
Alberta	16.4%	15.9%	15.8%	16.0%	14.3%
British Columbia	20.0%	20.5%	22.0%	22.0%	21.2%
Yukon	15.3%	10.2%	27.0%	14.6%	23.1%
Northwest Territories	9.3%	7.7%	8.2%	13.3%	5.6%
Canada	15.9%	15.6%	16.2%	16.3%	16.0%

Note

The C-section rate was adjusted for patient age.

Source

Discharge Abstract Database, 2015–2016 to 2019–2020, Canadian Institute for Health Information.

Figure 15: Red blood cell transfusion rate in acute hospitalizations, selected provinces, 2014–2015 to 2019–2020

Rate	Year
7.1%	2014–2015
6.9%	2015–2016
6.6%	2016–2017
6.4%	2017–2018
6.4%	2018–2019
6.3%	2019–2020

Notes
The red blood cell transfusion rate was adjusted for age, sex, severity index and length of hospital stay.
The red blood cell transfusion indicator was mandatory to report in only 5 provinces (New Brunswick, Quebec, Ontario, Manitoba and Saskatchewan).
Source
Hospital Morbidity Database, 2014–2015 to 2019-2020, Canadian Institute for Health Information.

Figure 16: Red blood cell transfusion rate in acute hospitalizations, by province, 2014–2015 to 2019–2020

Jurisdiction	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
New Brunswick	7.3%	6.9%	6.9%	7.0%	6.8%	7.0%
Quebec	7.4%	7.0%	6.8%	6.5%	6.3%	6.1%
Ontario	6.9%	6.8%	6.6%	6.4%	6.4%	6.3%
Manitoba	6.5%	6.3%	5.9%	6.1%	6.7%	6.7%
Saskatchewan	7.5%	7.2%	6.8%	6.4%	6.1%	5.9%

Note
The red blood cell transfusion rate was adjusted for age, sex, severity index and length of hospital stay.
Source
Hospital Morbidity Database, 2014–2015 to 2019–2020, Canadian Institute for Health Information.

Figure 17: Red blood cell transfusion rate in hip and knee replacements, selected provinces, 2014–2015 to 2019–2020

Surgery type	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
Knee replacement	3.8%	3.3%	2.8%	2.3%	2.2%	2.3%
Hip replacement	6.6%	5.7%	5.7%	5.0%	4.7%	4.8%

Note
The red blood cell transfusion rate was adjusted for age, sex, severity index, type of procedure, length of hospital stay, anesthetic technique, fixation type, bilateral or unilateral procedure and primary procedure or revision.
Source
Hospital Morbidity Database, 2014–2015 to 2019–2020, Canadian Institute for Health Information.

Figure 18: Preoperative testing rate in low-risk surgeries, by province, 2015–2016 to 2019–2020

Province	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020
Nova Scotia	21.2%	21.7%	21.1%	19.6%	19.7%
Ontario	27.4%	25.9%	25.0%	23.7%	23.2%
Manitoba	25.7%	22.2%	18.3%	17.9%	17.6%
Saskatchewan	22.7%	22.0%	20.6%	18.9%	18.2%
Alberta	19.7%	20.0%	15.1%	13.6%	12.4%
British Columbia	21.9%	22.0%	21.6%	20.7%	20.3%
Canada	24.7%	23.7%	22.3%	21.0%	20.4%

Note
The preoperative testing rate was risk-adjusted for age, sex and surgery type.
Sources
National Physician Database, Discharge Abstract Database and National Ambulatory Care Reporting System, 2014–2015 to 2019–2020 Canadian Institute for Health Information.

Appendix B: Technical details

Recommendations were selected reflecting those that could be measured (or approximated) with administrative or survey data. The methodologies were developed in consultation with clinical experts to ensure that the report captured a diverse set of commonly overused low-value tests and treatments of importance to stakeholders.

A limitation of the analysis is that administrative data does not often capture the reasons for a specific test or treatment and does not address conversations between clinicians, patients and families before these were ordered.

Further information on the methodology and limitations can be found in the methodology notes.

Table B1 Summary of data sources and technical specifications, by measure

Recommendation	Data sources	Study period	Jurisdictional coverage	Cohort age
Community care				
Diagnostic imaging for lower-back pain	DAD, NACRS, NPDB	2015–2016 to 2020–2021	Nova Scotia, Ontario, Manitoba, Alberta and British Columbia	18+
Cervical screening	CCHS	2008, 2012, 2017	All provinces and territories	18 to 24
Antibiotics dispensed in the community	NPDUIS	2015–2016 to 2020–2021	Manitoba, Saskatchewan and British Columbia	All ages
Chronic use of benzodiazepines and other sedative–hypnotics in older adults	NPDUIS	2014–2015 to 2020–2021	All provinces, excluding Quebec	65+
Physical restraints in long-term care	CCRS/IRRS	2014–2015 to 2020–2021	Newfoundland and Labrador, Nova Scotia, New Brunswick, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia and Yukon	All ages
Antipsychotics in long-term care	CCRS/IRRS, NPDUIS	2014–2015 to 2020–2021	Newfoundland and Labrador, Nova Scotia, New Brunswick, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia and Yukon	All ages

Recommendation	Data sources	Study period	Jurisdictional coverage	Cohort age
Emergency department care				
Chest X-rays for asthma and bronchiolitis in emergency departments	NACRS	2014–2015 to 2020–2021	Ontario, Alberta and Yukon	Bronchiolitis: 1 month to 1 year Asthma: 3 to 17 years
Diagnostic imaging for minor head trauma in emergency departments	DAD, NACRS	2014–2015 to 2020–2021	Ontario, Alberta and Yukon	18 to 64
Hospital care				
Knee arthroscopy in adults age 60 and older	DAD, NACRS	2014–2015 to 2020–2021	All provinces and territories, excluding Quebec	60+
Caesarean section in low-risk deliveries	DAD	2015–2016 to 2020–2021	All provinces and territories, excluding Quebec	All maternal ages
Red blood cell transfusion in hospitalized patients*	DAD-HMDB	2014–2015 to 2020–2021	New Brunswick, Quebec, Ontario, Manitoba and Saskatchewan	18+
Preoperative tests for low-risk surgeries	DAD, NACRS, NPDB	2015–2016 to 2020–2021	Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta and British Columbia	18+

Notes

* Quebec does not support and is not linked to the Choosing Wisely Canada campaign, as it has launched its own Chantier de pertinence [Workstream on the relevance of care and services], which includes a series of actions that will aim to increase the appropriateness of the use of certain health care services and technologies in order to ensure the quality of care provided to the Quebec population and to promote a better use of resources. However, since the issues of overdiagnosis and overtreatment are of interest to Quebec, and in order to benefit from comparative data in this area, Quebec has agreed to have its data included in this product.

DAD: Discharge Abstract Database.
NACRS: National Ambulatory Care Reporting System.
NPDB: National Physician Database.
CCHS: Canadian Community Health Survey.
NPDUIS: National Prescription Drug Utilization Information System.
CCRS: Continuing Care Reporting System.
IRRS: Integrated interRAI Reporting System.
DAD-HMDB: Discharge Abstract Database–Hospital Morbidity Database.

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info@choosingwiselycanada.org

Canadian Institute for Health Information

Institut canadien d'information sur la santé

cihi.ca

media@cihi.ca

19102-1122