

# How different is cancer control across Canada? Comparing performance indicators for prevention, screening, diagnosis, and treatment

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## ABSTRACT

Meaningful performance measures are an important part of the toolkit for health system improvement. The Canadian Partnership Against Cancer has been reporting on pan-Canadian cancer system performance indicators since 2009—work that has led to the availability of standardized measures that can help to shed light on the extent of variation and opportunities for quality improvement across the country. Those measures include a core set of system indicators ranging from prevention and screening, through diagnosis and treatment, to survivorship and end-of-life care.

Key indicators were calculated and graphed, showing the range from worst to best result for the provinces and territories included in the data. There were often significant differences in cancer system performance between provinces and territories. For example, smoking prevalence rates ranged from 14% to 62%. The 90th percentile wait times from an abnormal breast screen to resolution (without biopsy) ranged from 4 weeks to 8 weeks. The percentage of breast cancer resections that used breast-conserving surgery rather than mastectomy ranged from 38% to 75%. Clinical trial participation rates for adults ranged from 0.2% to 6.6%.

Variations in performance indicators between Canadian jurisdictions suggest potential differences in the planning and delivery of cancer control services and in clinical practice patterns and patient outcomes. Understanding sources of variation can help to identify opportunities for improvements in the quality and outcomes of cancer control service delivery in each province and territory.

**Key Words** Performance indicators

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## INTRODUCTION

Meaningful performance measures are an important part of the toolkit for health system improvement. A number of provinces had developed capacities for the development and publication of cancer system performance indicators, but until recently, there was no process for the regular production and publication of standardized, pan-Canadian performance indicators spanning the entire continuum of cancer control. That situation changed when the Canadian Partnership Against Cancer began reporting on pan-Canadian cancer system performance indicators in 2009—work that has led to the availability of standardized measures that can help to shed light on the extent of interjurisdictional variation and to provide best-practice

benchmarks that can be used to improve performance across the country.

The indicators that measure performance across the cancer control continuum include prevention, screening, and early detection; diagnosis; treatment; follow-up and survivorship care; and palliative and end-of-life care. Beyond the dimensions of the cancer journey, system performance indicators have addressed cross-cutting themes, including patient-centred care, appropriateness and sustainability, and disparities and equity. Indicators have also reported on clinical research activity.

Indicator results are reported for a number of categories, including sociodemographic (age, sex, geography, income, education level, immigrant status, etc.), time-dependent (secular trends), and geographic (by province

and territory). The provincial and territorial comparisons of performance results can help to identify opportunities for improvements in policy, service planning and delivery, or clinical practice. They also identify high performers, which could point to best- or leading-practice jurisdictions that can be presented as benchmarks for others.

## METHODS

Performance indicators were selected using a consultative process that included input from clinicians, researchers, policymakers, and administrators from across the country. Indicator definitions and methodologies were developed with input from provincial cancer registries, cancer epidemiologists, and other health-system data experts. Sources of data for the indicators presented here included provincial cancer registries and associated datasets, the Canadian Cancer Registry, the Canadian Community Health Survey, provincial breast cancer screening databases, provincial wait-times databases, provincial Ambulatory Oncology Patient Satisfaction Survey data, the Canadian Institute for Health Information's Discharge Abstract Database, and provincial clinical trial registries. Data were collected from various sources using a set of standardized specifications and methods to ensure comparability across jurisdictions. Data for some indicators were often available for only a subset of provinces and territories, but no indicator was reported unless a minimum of 5 jurisdictions were represented.

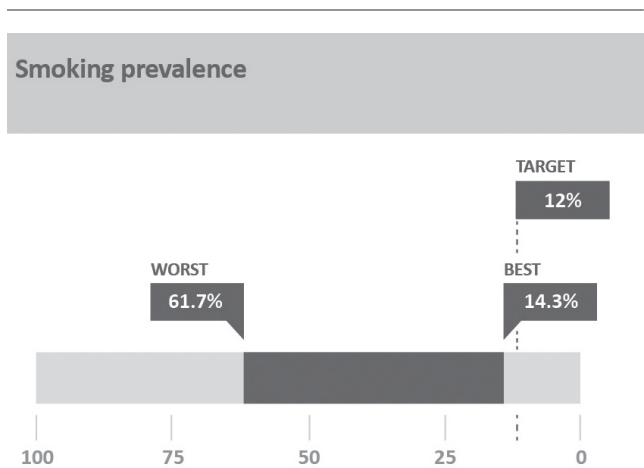
Results from nine indicators were selected for inclusion, being a representative set of measures that span the cancer control continuum:

- Smoking prevalence
- Colorectal cancer screening rates
- Wait times from an abnormal breast screen to diagnosis (no biopsy)
- Removal and examination of 12 or more lymph nodes in colon resections
- Radiation therapy wait times
- Rate of breast-conserving surgeries in breast cancer resections
- Rate of breast cancer mastectomies performed as day surgery
- Clinical trial participation rate (for adults)
- Patient satisfaction with emotional support

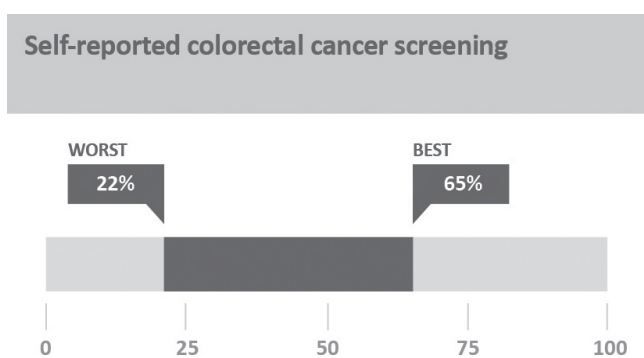
## RESULTS

The daily plus occasional smoking prevalence rate for people 12 years of age and older ranges from a low of 14.3% to a high of 61.7% (Figure 1). No province or territory has met the smoking prevalence target rate of 12% established in the Federal Tobacco Control Strategy<sup>1</sup>.

The colorectal cancer screening rate, defined as the percentage of people between the ages of 50 and 74 who, in 2012, reported having had either or both of a fecal test in the preceding 2 years or a sigmoidoscopy or colonoscopy in the past 5 years, ranged from a low of 22% to a high of 65% (Figure 2). At the time of measurement, provinces were at different stages of program implementation, which



**FIGURE 1** Percentage of the population 12 or more years of age reporting daily or occasional smoking, 2014 reporting year. Source: Statistics Canada, Canadian Community Health Survey.



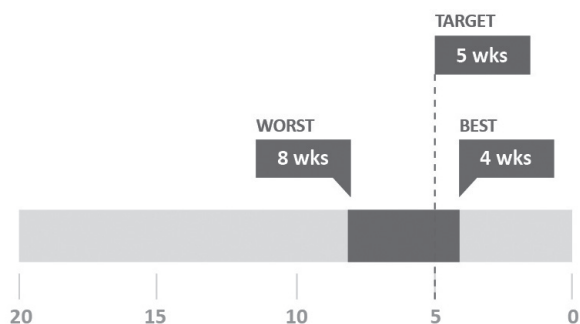
**FIGURE 2** Percentage of the population 50–74 years of age who reported having had any or all of a fecal test in the preceding 2 years or sigmoidoscopy or colonoscopy in the preceding 5 years for any reason, 2014 reporting year. Source: Statistics Canada, Canadian Community Health Survey.

contributed to the variation. Regular screening by fecal test for those 50 years of age and older, followed by colonoscopy for those with an abnormal result, can reduce mortality from colorectal cancer<sup>2</sup>.

In most provinces, wait times from an abnormal breast screen result to resolution continue to be longer than the national target (the target being 90% resolved within 5 weeks for patients not requiring a biopsy)<sup>3</sup>. The 90th percentile wait time in people not requiring a biopsy ranges from 4 weeks to 8 weeks (Figure 3). In contrast, wait times for radiation therapy from ready-to-treat to start of treatment have met the target in all provinces, with the 90th percentile wait time ranging from 19 days to 27 days compared with a national target of 28 days (Figure 4)<sup>4</sup>.

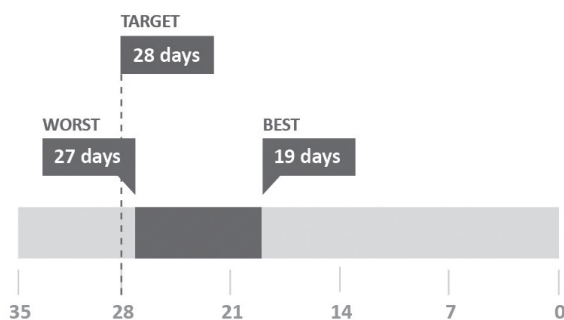
The percentage of colon resections in which a minimum of 12 lymph nodes were removed and examined in concordance with evidence-based guidelines ranged from 69% to 81% (Figure 5). Assessment of at least 12 lymph nodes is important for accurate staging and treatment planning and is associated with improved survival<sup>5</sup>.

### Breast cancer diagnosis wait time without tissue biopsy (90th percentile)



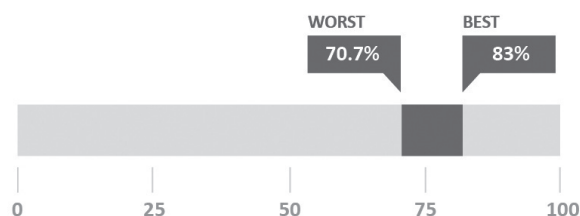
**FIGURE 3** Median and 90th percentile wait times for resolution of an abnormal breast screen without tissue biopsy for asymptomatic women 50–69 years of age, 2013 screening year. Source: provincial breast cancer screening programs.

### Radiation therapy wait time (90th percentile)



**FIGURE 4** 90th percentile wait times from ready to treat to start of radiation therapy, 2014 treatment year. Source: provincial cancer agencies and programs.

### Removal and examination of 12 or more lymph nodes in colon resections



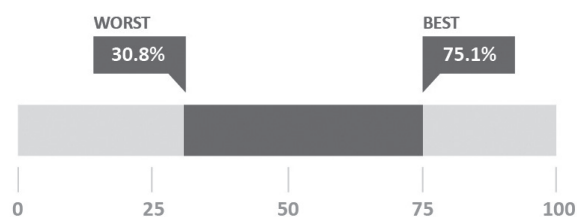
**FIGURE 5** Percentage of colon resections with 12 or more lymph nodes removed and examined, 2009–2012 diagnosis years. Source: provincial cancer agencies and programs.

The percentage of breast cancer resections that used breast-conserving surgery rather than mastectomy ranged from 31% to 75% (Figure 6). Of all mastectomies, those performed as day surgery (compared with inpatient procedures) ranged from less than 2% to 39% (Figure 7). Breast-conserving surgery is less invasive than mastectomy and is associated with lesser morbidity, improved cosmetic appearance, and better psychological outcomes. When followed by radiation therapy, breast conservation yields survival outcomes comparable to those achieved with mastectomy<sup>6</sup>.

Clinical trial activity varies widely across the country. The derived percentage of adult cancer patients participating in clinical trials ranged from 0.2% to 6.6% (Figure 8). Evidence suggests that cancer centres with active clinical trial programs have better patient outcomes, such as improved survival<sup>7</sup>.

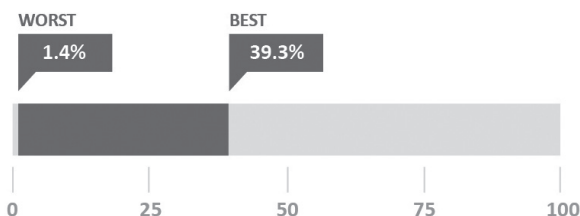
Finally, in standardized patient satisfaction surveys completed by patients after an outpatient visit to a cancer treatment centre, the domain of highest dissatisfaction is emotional support (Figure 9). The percentage of patients reporting a positive assessment of the support they received to deal with emotional and psychosocial

### Breast cancer resection that were breast-conserving surgeries

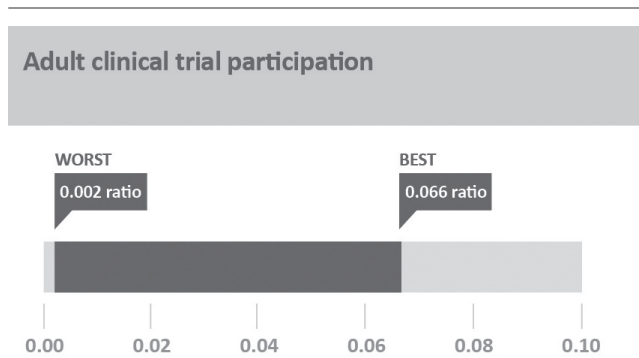


**FIGURE 6** Percentage of breast cancer resections that were breast-conserving surgeries, 2009–2010 to 2013–2014 fiscal years combined. Source: Canadian Institute for Health Information, Discharge Abstract Database.

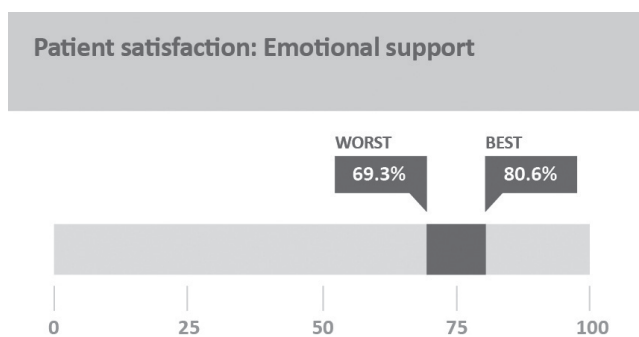
### Breast cancer mastectomies done as day surgery



**FIGURE 7** Percentage of breast cancer mastectomies performed as day surgery, 2008–2009 to 2013–2014 fiscal years combined. Source: Canadian Institute for Health Information, Discharge Abstract Database.



**FIGURE 8** Ratio of adult patients enrolled in clinical trials to number of incident cases, by province, 2014 enrolment year. Source: provincial cancer agencies and programs.



**FIGURE 9** Percentage of patients reporting negative rating for emotional support in the ambulatory oncology patient satisfaction survey (2011 to 2015) Source: Ambulatory Oncology Patient Satisfaction Survey

symptoms such as anxiety and depression ranged from 69% to a high of 81%.

## DISCUSSION AND CONCLUSIONS

The performance indicator results presented here point to significant variations in cancer control practices and outcomes in a number of areas across the country. Some of the more notable variations are found in programs such as colorectal cancer screening that are still in the early implementation phases. But others are in areas in which alternatives in treatment modalities are available, such as the use of breast-conserving surgery compared with mastectomy or the use of day-surgery compared with inpatient mastectomies. Those variations might not yield substantial differences in disease management outcomes, but could have implications for quality of life and extent of patient-centred care.

Other interjurisdictional variations reported here relate to long-standing and complex aspects of cancer control that often require concerted, multi-sectorial efforts to address effectively. This latter category includes clinical trial participation rates, for which the solution includes funding and infrastructure investments as well as better

interjurisdictional coordination. It also includes wait times from an abnormal breast screen to resolution of diagnosis, because of the need for better coordination and integration between screening programs and the downstream resources that include multidiscipline diagnostic and, ultimately, treatment services.

As with cancer system measures in general, no consistency is evident in the relative positioning of jurisdictions within the range of results. That observation suggests that every province or territory is a leader in some aspect of cancer control and can therefore model potential best practices to jurisdictions with a current lower performance. That modelling is the key objective of this kind of reporting, which is meant not just to identify gaps in performance, but also to identify Canadian benchmarks representing leading or promising practices that can be adapted more broadly, thus raising the quality bar across the country.

More information about the Canadian Partnership Against Cancer's system performance initiative, reports, and indicators can be found at <http://systemperformance.ca>.

## Limitations

Because of data collection limitations, not all provinces and territories are represented in all indicators. Findings might therefore not always be generalizable to the country as a whole. Smoking prevalence and screening indicators are based on self-reported survey data collected from a random sample of people in all 10 provinces and 3 territories. Patient satisfaction data are obtained from the Ambulatory Oncology Patient Satisfaction Survey, which is implemented in 7 of 10 provinces. All other indicators are derived from administrative datasets maintained at the provincial or national level (or both) and include anywhere from 6 to 10 provinces, depending on the indicator.

## CONFLICT OF INTEREST DISCLOSURES

We have read and understood *Current Oncology's* policy on disclosing conflicts of interest, and we declare that we have none.

## AUTHOR AFFILIATIONS

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## REFERENCES

1. Health Canada. Federal tobacco control strategy (FTCS) [Web page]. Ottawa, ON: Health Canada; 2007. [Available at: <http://hc-sc.gc.ca/hc-ps/tobac-tabac/res/news-nouvelles/ftcs-sflt-eng.php>; cited 19 January 2017]
2. Hewitson P, Glasziou P, Watson E, Towler B, Irwig L. Cochrane systematic review of colorectal cancer screening using the fecal occult blood test (Hemoccult): an update. *Am J Gastroenterol* 2008;103:1541–9.
3. Health Canada, Working Group on the Integration of Screening and Diagnosis. *Waiting for a Diagnosis After an Abnormal Breast Screen in Canada*. Ottawa, ON: Health Canada; 2000.
4. Health Canada. First Ministers' Meeting on the Future of Health Care: A 10-Year Plan to Strengthen Health Care [Web resource, archived]. Ottawa, ON: Health Canada; 2004. [Available at: <http://www.hc-sc.gc.ca/hcs-sss/delivery-prestation/fptcollab/2004-fmm-rpm/bg-fi-eng.php>; cited 19 January 2017]

5. Lykke J, Roikjaer O, Jess P on behalf of the Danish Colorectal Cancer Group. The relation between lymph node status and survival in stage I–III colon cancer: results from a prospective nationwide cohort study. *Colorectal Dis* 2013;15:559–65.
6. Darby S, McGale P, Correa C, *et al.* on behalf of the Early Breast Cancer Trialists' Collaborative Group. Effect of radiotherapy after breast-conserving surgery on 10-year recurrence and 15-year breast cancer death: meta-analysis of individual patient data for 10,801 women in 17 randomised trials. *Lancet* 2011;378:1707–16.
7. Selby P, Autier P. The impact of the process of clinical research on health service outcomes. *Ann Oncol* 2011;22 (suppl 7):vii5–9.