THE 2011 CANCER SYSTEM PERFORMANCE REPORT

SCREENING COLLABORATION TREATMENT
PREVENTION DIAGNOSIS SYSTEM
PATIENT EXPERIENCE QUALITY IMPROVEMENT
MEASUREMENT PROCESS REPORTING
CANCER HEALTH PERFORMANCE RESEARCH
CANADIAN PARTNERSHIP AGAINST CANCER

CANADIAN PARTNERSHIP AGAINST CANCER
PARTENARIAT CANADIEN CONTRE LE CANCER

Aussi offert en français sous le titre:
Rapport de 2011 sur le rendement du système de lutte contre le cancer.

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Executive Summary

BACKGROUND

The Canadian Partnership Against Cancer (the Partnership) was established to accelerate action on cancer control for all Canadians. One of the core enabling functions of this mandate is assessing and reporting on the performance of the cancer system across the country. This has involved working closely with national and provincial partners to identify performance indicators, collect and analyze required data, and produce results and interpretations on key performance domains. These domains span the cancer control continuum including prevention, screening, diagnosis, treatment, research, patient experience, and long-term outcomes. The *2011 Cancer System Performance Report* (the *Report*) is the third annual report on system-wide performance indicators.

This *Report* builds on the first two (published in 2009 and 2010) by updating a number of indicators with more recent data and introducing a number of new indicators in the domains of Prevention, Screening, Treatment and Long-Term Outcomes. For several of the treatment practice pattern indicators, an additional year of data means moving closer to identifying trends. As in previous reports, the performance results are compared, where appropriate, by province/territory, age and sex, geography (urban/rural/remote/very remote) and socio-economic status or SES (measured by income and/or education), in addition to temporal or secular trends over time. There are new relationships examined such as relative survival by SES.

The *Report's* organization and formatting has been somewhat modified this year to enhance readability and create more consistency in the layout of the figures, text and discussion. A new chapter titled *Developmental and Interim Indicators* has been added this year to report on indicators that require further development or that are placeholders for more definitive indicators that will be developed in the future. Also this year, a new chapter has been added, *Patient Experience*, which replaces the *Supportive Care and Survivorship* chapter from previous reports to signal the intent to expand the scope of the domain and increase the focus on developing indicators assessing patient-centred care.

RESULTS

In *Prevention*, indicators included rates of smoking prevalence, cessation and second-hand smoke exposure; alcohol consumption and alcohol abstinence; fruit and vegetable consumption; physical activity; adult and adolescent obesity; and HPV vaccination uptake. The performance data on smoking have indicated falling smoking rates and decreasing second-hand smoke exposure, which are both positive findings. On the other hand, alcohol consumption has increased and perhaps more worryingly, the percentage of Canadians considered overweight or obese continues to rise, even though physical activity and fruit and vegetable consumption are improving. Data available on HPV vaccination show variations in uptake between provinces.

In *Screening*, participation rates for Pap tests were reasonably consistent across provinces with differences generally within 10%. Self-reported participation rates for colorectal cancer continue to vary substantially by province (22% to 52%), reflecting differences in the date each of the provincial programs started.

In *Diagnosis*, the percentage of incident cases for which stage data are available in the provincial cancer registries continues to increase with six of nine provinces at or above 90% for the top four cancer sites. On wait times from positive mammogram to diagnosis resolution in breast cancer, there is still substantial interprovincial variation with the percentage of cases diagnosed within the target timeframes ranging from 38% to 84%.

In *Treatment*, an additional year of data was added in this year's *Report* allowing for preliminary trend analysis for the indicators measuring treatment rates relative to evidence-based guidelines. For radiation therapy wait times, seven of ten provinces had achieved the target of 90% of patients starting radiation therapy within four weeks of being ready to treat. The 90th percentile wait time had dropped for most provinces between 2008 and 2010. In radiation therapy capacity, the number of linear accelerators per capita in 2010 was increasing in several provinces and overall relative to 2009. Meanwhile, the radiation therapy utilization rate, while relatively consistent across provinces (29% to 34%) continues to show a trend of declining treatment rates by patient age. Differences persisted between provinces in guideline treatment rates, and there were age- and/or sex-related trends in all but one of the five guideline treatment indicators reported on.

In *Research*, provincial clinical trial participation rates for adults ranged between 1% and 8%, while the pediatric clinical trial accrual rate dropped between 2009 and 2010 for seven of the eight provinces submitting data.

In *Patient Experience*, patient satisfaction with coordination and continuity of care ranged from 50% to 90% with "provider awareness of medical history" scoring the lowest in all provinces and "knowing who was in charge for each therapy" scoring the highest in most provinces. According to vital statistics data, approximately 70% of cancer deaths overall occurred in hospital while provincial rates varied from 50% to 90%, although data comparability issues persist.

In *Long-Term Outcomes*, the age-standardized incidence and mortality trends identified in previous reports persist: from 1995 to 2007, overall cancer incidence rates were steady for men but rising for women, and overall cancer mortality rates were falling substantially for men and less markedly for women. These patterns are largely attributable to lung cancer where incidence and mortality between 1992 and 2007 have dropped by 20% for men but increased by 8% for women. Relative survival by socio-economic status measured for urban Canada shows clear differences by household income with a gap of 12% in five-year survival between highest and lowest income quintile. Age and sex patterns in five-year conditional survival vary by disease site with age being a factor in lung but not in colorectal.

MOVING FORWARD

Looking ahead, system performance measurement and reporting will move from its "opportunistic" beginnings to a more deliberate, systematic approach. Some of the key planned directions for 2012 and beyond include working with partners to build on existing information resources to expand the availability of indicators in relatively under-measured domains, particularly patient experience and the concept of patient-centred care; researching and developing indicators that assess system efficiency; developing and incorporating evidence-based performance targets and incorporating them into the reporting; more closely assessing the impacts of key determinants of health (e.g., socio-economic status) and issues related to special populations (e.g., rural and remote communities, new immigrants, etc.); and conducting exploratory studies to better explain variations and other patterns in the performance results.

Plans are also in place to develop several categories of reports including: System Performance Reports limited to measures for which there are clearly established targets, standards or norms; Reports on Emerging Trends and Developmental Measures that would contain new and exploratory indicators as well as new trends requiring further investigation; and thematic reports that will focus on specific disease sites, modalities (e.g., diagnosis, systemic therapy, surgery, etc.) and/or sub-populations, to provide a deeper understanding in focused domains and inform quality improvements.

Finally, efforts will be made to expand the dissemination and reach of system performance information and to improve access and usability.

Introduction

i. ABOUT THE PARTNERSHIP

The Canadian Partnership Against Cancer (the Partnership) is an independent organization funded by Health Canada to accelerate action on cancer control for all Canadians. The Partnership is a group of cancer experts, charitable organizations, governments, patients and survivors, determined to bring positive change to the cancer control domain. We work together to stimulate the generation of new knowledge and to accelerate the implementation of existing knowledge about cancer control across Canada.

The Partnership strives to improve cancer control in Canada by being a catalyst for a coordinated approach that will:

- reduce the expected number of cancer cases;
- enhance the quality of life for those affected by cancer;
- lessen the likelihood of Canadians dying from cancer; and
- increase the effectiveness and efficiency of the cancer control domain.

In support of its vision, one of the Partnership's key mandates is to measure and report on the quality of cancer control and health care. The Partnership has identified System Performance Analysis and Reporting as one of its core enabling functions for its new five-year mandate (2012 to 2017), and as such, has developed a multi-faceted plan for advancing the understanding of system performance in Canada.

ii. WHY REPORT ON CANCER SYSTEM PERFORMANCE?

Evidence-based planning, management and policy development has for some time now been the standard for advancing Canada's health care system. While each province and territory is responsible for planning and funding cancer service delivery within its jurisdiction, national collaboration promotes the sharing of best practices, which in turn allows for the achievement of significant advances in quality across the country. Furthermore, understanding how Canada's performance compares to that of other developed countries helps identify benchmarks for further system improvement.

For interprovincial system performance comparisons to be meaningful, a coordinated strategy is required to ensure standardized definitions, methodologies and interpretations. The Partnership's System Performance Analysis and Reporting initiative constitutes a national effort to identify the aspects of the cancer control system that need to be measured, define and collect valid and comparable data needed for the measurement, and present results in an integrated report that allows for synthesis of results and interpretation of patterns in a manner designed to inform quality improvement strategies.

iii. A COLLABORATIVE APPROACH FOR SYSTEM PERFORMANCE MEASUREMENT

The indicators presented in this *Report* are the result of a collaborative effort with a number of partners at the national and provincial/territorial level. The work was also informed by consultations with a broad range of experts and knowledge leaders from across the cancer care landscape.

At the national level, the Partnership works closely with Statistics Canada as the survey administrator and data steward for the Canadian Community Health Survey (CCHS) from which information on health status, health care utilization and health determinants for the Canadian population was used. Statistics Canada also houses the Canadian Cancer Registry (CCR), which was used for generating of key measures of long-term outcome such as cancer incidence, mortality and survival, based on data submissions from the 13 provincial and territorial cancer registries. The Partnership is also working with the Canadian Institute for Health Information (CIHI) to develop standardized indicators on cancer surgery.

At the provincial level, cancer agencies or their equivalents have provided detailed data on screening, diagnosis, treatment and patient experience, towards the calculation of many indicators in this report. The richness of these provincial datasets was further enhanced by establishing complex data linkages allowing for development of indicators measuring treatment rates relative to evidence-based guidelines.

The production of this *Report* was overseen by the System Performance Technical Working Group and Strategic Advisory Group, comprising representatives from all ten provinces. A list of the members of the two groups is provided on the inside cover.

iv. ABOUT THE *2011 REPORT*

This 2011 *Report* is the Partnership's third report on the performance of the Canadian cancer system. The first two reports were produced in 2009 and 2010. As in the previous reports, this year's is organized along the dimensions of the cancer control continuum: Prevention, Screening, Diagnosis, Treatment, Research, Patient Experience (previously Supportive Care and Survivorship), and Long-Term Outcomes.

A chapter titled Developmental and Interim Indicators has been added this year and includes indicators that are still under development and require some additional refinement or validation before they can be included as performance indicators. This chapter also includes indicators that are not the preferred measures of performance for the specific domain but that are still useful to show until better indicators become available. Interim indicators are also included because they are used internationally and allow for inter-jurisdictional comparisons.

There are a number of new indicators included for the first time in this *Report*. They are:

- Prevention:
  - Zero Alcohol Consumption Rate
  - Exposure to Second-Hand Smoke
  - Fruit and Vegetable Consumption

    - Adolescent Obesity
    - HPV Vaccination Uptake
- Screening:
    - Cervical Cancer Screening Participation Rates (based on actual data from provincial programs)
- Treatment:
    - Adjuvant Chemotherapy for Non–Small Cell Lung Cancer
- Long-Term Outcomes:
    - Conditional Survival
    - Survival by Socio-Economic Status (SES)

As in prior years, in addition to provincial and territorial comparisons, many of the indicators are examined by patient/population age group, sex, geography (urban, rural, remote, very remote) and socio-economic status (SES), which is measured by income and/or education of either the individual or the household depending on the indicator. Also, wherever multi-year data are available, time trends are shown.

The chapter content organization is new this year. An introduction prefaces each chapter, providing background, setting context and describing data sources and other relevant information on the set of indicators included in the chapter. The indicator results are provided graphically in charts and/or tables, and the discussion of the results is organized into the following categories (although not all categories are included for all indicators):

- **What are we measuring?** Describes the indicators presented.
- **Why are we measuring this?** Provides the rationale for including the indicator and relevant information on burden of disease or implication of cancer control activity being assessed.
- **What do the results show?** Describes the results highlighting notable patterns or trends and providing some interpretation, where helpful.
- **What is happening internationally?** Provides a sampling of contextual performance levels from other comparable jurisdictions or norms gleaned from relevant studies.
- **What is being done?** Highlights some of the key activities planned or currently under way aimed at improving performance for the domain being measured. This includes work being carried out by the Partnership and its partners in the system.
- **What should you be aware of about data and measurement?** Highlights any known data or indicator calculation issues that are relevant to interpreting the indicator results. As in previous reports, a Technical Appendix, which provides full details on indicator data and methodologies, is provided towards the end of the *Report*.

The table on the next page lists the indicators by cancer continuum dimension and highlights those that are new for 2011.

CANCER CONTROL CONTINUUM	INDICATOR	DATA BASE			UPDATED	EXPANDED IN 2011	NEW IN 2011
		CCHS	CCR	Cancer Agencies/ Equivalent			
Prevention	Smoking prevalence	●			●		
	Smoking cessation	●			●		
	Second-hand smoke	●					●
	Alcohol consumption	●				●	
	Fruit and vegetable consumption	●					●
	Physical activity	●			●		
	Adult overweight and obesity	●			●		
	Adolescent overweight and obesity	●					●
	HPV vaccination uptake			● (screening network)			●
Screening	Cervical screening rates (in organized programs)			● (screening network)			●
	Colorectal screening rates and program availability	●		● (screening network)	●		
Diagnosis	Capture of stage data			●	●		
	Wait times: abnormal breast screen to resolution			●	●		
Treatment	Radiation therapy wait times: ready to treat to treatment			●	●		
	LINAC capacity and utilization			●	●		
	Radiation therapy utilization			●	●		
	Neoadjuvant radiation therapy for stage II and III rectal cancer			●	●		
	Adjuvant radiation therapy for stage I and II breast cancer			●	●		
	Adjuvant chemotherapy for stage III colon cancer			●	●		
	Adjuvant chemotherapy for stage II and IIIA NSCLC			●			●
	Removal and examination of 12 or more lymph nodes in colon resections			●	●		
Research	Adult clinical trial participation ratio			●		●	
	Pediatric clinical trial participation ratio			● (C17)	●		
Patient Experience	Patient satisfaction			●		●	
	Place of death		●		●		
Long-term Outcomes	Age-standardized incidence rates		●		●		
	Age-standardized mortality rates		●		●		
	Relative survival		●			●	
	Conditional survival		●				●
Developmental and Interim	PET capacity and utilization			●	●		
	Radiation therapy utilization			●		●	
	Screening for distress			●	●		

Prevention Indicators

This chapter builds on the prevention indicators presented in the *2010 System Performance Report* by adding three new indicators: second-hand smoke exposure, fruit and vegetable consumption and HPV vaccination uptake, and updating a number of others with more recent data. A new look at alcohol consumption and physical activity has been provided that examines patterns in non-drinkers and focuses on leisure-time physical activity. This *2011 Report* also includes updated smoking prevalence and smoking cessation rates.

MANY CANCERS CAN BE PREVENTED THROUGH HEALTHY BEHAVIOURS.

Prevention is an effective long-term strategy to reduce the burden of cancer. The World Cancer Research Fund (WCRF) estimates that approximately one-third of cancers can be prevented by not smoking and that another third of cancers can be prevented through a combination of healthy food and nutrition, including limiting alcohol consumption, participating in regular physical activity and maintaining a healthy body weight.[1]

NATIONAL TARGETS SET THE STANDARD FOR HEALTHY LIVING.

Prevention targets, where they exist, are set at the federal, provincial or municipal level. The following are examples of pan-Canadian prevention targets or guidelines:

- The Canadian Healthy Living Strategy has set a series of targets related to eating healthy foods, being physically active, and having a healthy body weight. Targets are set at a 20% improvement by 2015, from a 2003 baseline measured by the Canadian Community Health Survey (CCHS).[2]
- The Federal Tobacco Control Strategy has developed targets for smoking prevalence, smoking quits and second-hand smoke exposure.[3] These targets aim to reduce smoking prevalence from 19% in 2006 to 12% by 2011, to reduce the percentage of people exposed to second-hand smoke from 28% in 2006 to 20% in 2011, and to increase the number of adults who quit smoking by 1.5 million.[3] These targets use the Canadian Tobacco Use Monitoring Survey (CTUMS) as the underlying data source.
- No targets exist for alcohol consumption, although there are commonly accepted low-risk drinking guidelines. Currently the guideline recommends no more than 1 drink a day for women and 2 drinks a day for men. This guideline is presently being reviewed with respect to cancer risk.[4]

THE PARTNERSHIP, WORKING WITH ITS PARTNERS, IS SUPPORTING AND PROMOTING A BROAD RANGE OF CANCER PREVENTION INITIATIVES.

The Partnership's Primary Prevention portfolio has been working with a variety of partners from across Canada to support the implementation of new prevention strategies and promote the adoption of existing initiatives. A major initiative, also funded by the Public Health Agency of Canada and the Heart and Stroke Foundation, is the Coalitions Linking Action and Science for Prevention (CLASP), which aims to improve the health of Canadians by bringing together multi-sectoral organizations from various provinces and territories, and forming coalitions to integrate cancer prevention with strategies to prevent other chronic diseases.[5]

The report "Environmental Scan of Primary Prevention Activities in Canada: Part 1—Policies and Legislation",[6] published by the Partnership's Primary Prevention Action Group, provides an overview of policies and legislation relating to risk factors for cancer introduced in Canada at the federal, provincial and municipal levels over the period 1997 to 2007. It provides a baseline for the comprehensive and up-to-date Prevention Policies Directory available online.[7]

MOST DATA ON PREVENTION ORIGINATE FROM POPULATION SURVEYS, PARTICULARLY THE CCHS.

Data in the prevention section of this *Report* were mostly sourced from the Canadian Community Health Survey (CCHS). This cross-sectional survey has been administered annually since 2007. From 2001 to 2005, CCHS data were collected every two years over a one-year period from approximately 130,000 respondents; starting in 2007, CCHS data were collected every year from approximately 65,000 respondents. During both periods, approximately half of the interviews were conducted by using computer-assisted personal interviewing and the other half were conducted over the phone using computer-assisted telephone interviewing. Excluded from the sampling frame are individuals living on Indian Reserves and on Crown Lands, institutional residents, full-time members of the Canadian Forces, and residents of certain remote regions.[8] With every survey cycle, a set of questions is asked, with additional questions that are optional or fluctuate between cycles. CCHS provides a rich source of data for tracking Canadian's health behaviours over time. When comparing rates with other countries, however, it is important to interpret the data with caution as indicator definitions, sample population and data collection methods can be dissimilar and affect the results.

The following is a summary of the Prevention Indicator results as measured in this *Report*.

PREVENTION INDICATOR	SUMMARY OF NATIONAL SITUATION (2009*)	TRENDS SINCE 2003*
Prevention of smoking prevalence	20% of Canadians ≥12 years old were smoking.	Smoking prevalence has gradually decreased from 23%.
Promotion of smoking cessation	18% of recent adult smokers reported quitting in the past two years.	The percentage of recent smokers who have quit has fallen from 22%.
Prevention of second-hand smoke exposure	Public exposure was reported to be 10%. Vehicle and home exposure were lower at 7% and 6% respectively.	Second-hand smoke exposure has been decreasing, particularly public exposure.
Prevention of alcohol consumption—Low-risk drinking guidelines	In 2005, 9% of Canadians were exceeding the low-risk drinking guidelines.	The percentage of adults exceeding the low-risk drinking guidelines has increased slightly across age groups.
Prevention of alcohol consumption—No alcohol	19% of Canadians were abstaining from alcohol consumption in the previous year.	The percentage of adults who have abstained from alcohol in the previous year has remained the same.
Promotion of fruit & vegetable intake	46% of Canadians ≥12 years old were getting at least five servings of fruits or vegetables a day.	The percentage of Canadians ≥12 years old getting at least five servings of fruits or vegetables a day has been increasing since 2003 when 41% were consuming more than five servings.
Promotion of physical activity	26% of Canadians reported being active or very active in their leisure time.	There has been a slight increase of 2%.
Prevention of adult obesity	52% of adult Canadians were classified as overweight or obese.	The percentage of adults classified as overweight or obese has increased by 3%.
Prevention of adolescent obesity	20% of adolescents were classified as overweight or obese.	The percentage of adolescents classified as overweight or obese has remained steady at 19% since 2005 (data not available prior to 2005).
Promotion of HPV vaccination uptake	The implementation of school-based organized vaccination programs has begun in all provinces and territories since 2007. For 2008/2009, uptake rates ranged from 52% to 87%.	The first provincial HPV vaccine programs were implemented in 2007.

* unless otherwise specified

SMOKING PREVALENCE

WHAT ARE WE MEASURING?

This indicator is defined as the percentage of the population age 12 years and older reporting daily or occasional smoking in the previous year.

WHY ARE WE MEASURING THIS?

- It has been well established that tobacco use is a major preventable cause of cancer in Canada and accounts for 85% of all lung cancers.[9-10]
- Tobacco also contributes to a number of other cancers. The World Cancer Research Fund (WCRF) estimates that one-third of all cancers could be prevented from the elimination of tobacco use.[1]
- Reporting on tobacco use patterns across the country allows for monitoring of progress in controlling its use and helps identify opportunities to improve prevention efforts.
- A current goal of the Federal Tobacco Control Strategy led by Health Canada is to reduce overall smoking prevalence, as reported in the Canadian Tobacco Use Monitoring Survey (CTUMS), from 19% in 2006 to 12% by 2011.[3]

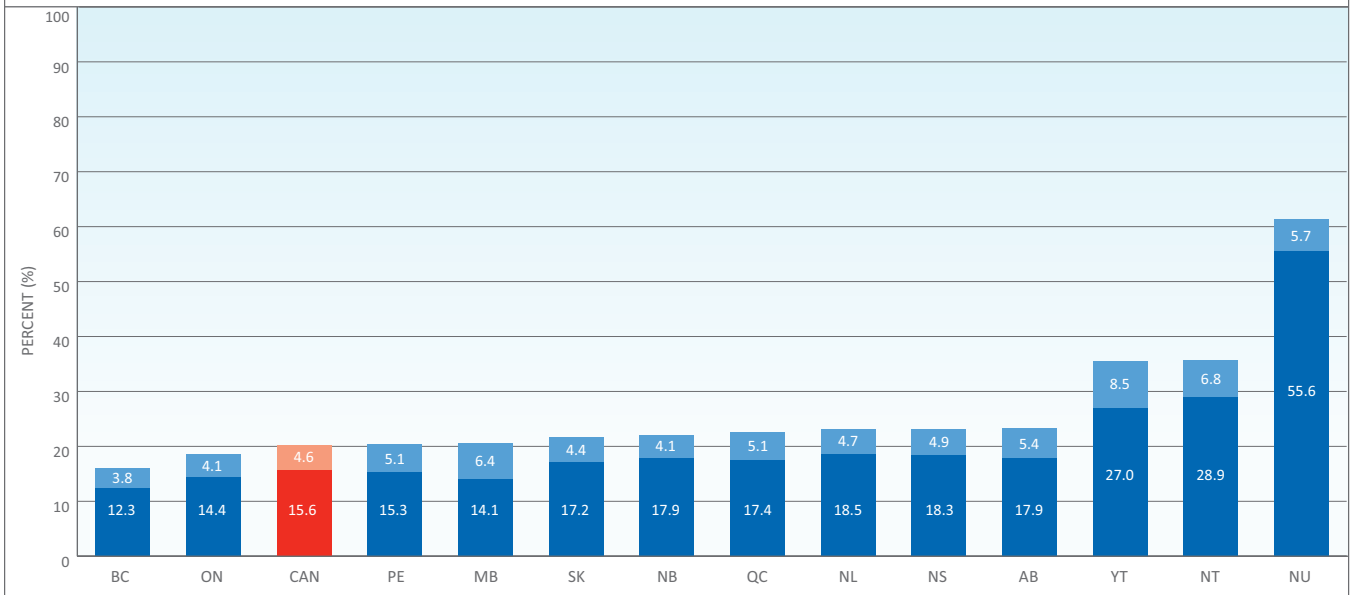
WHAT DO THE RESULTS SHOW?

- ***There was variation by province/territory in the percentage of Canadians over the age of 12 who reported daily or occasional smoking (Figure 1).***
  - The percentage of the population age 12 years and older reporting daily or occasional smoking in each province and territory in 2009 ranged from 16% in British Columbia to 61% in Nunavut, with a national average of 20%. The highest reported smoking rates were in Canada's three territories.
- ***There was variation by age and sex in the percentage of Canadians over the age of 12 who reported daily or occasional smoking (Figure 2).***
  - Males were more likely than females to report being daily or occasional smokers.
  - The highest percentage of daily smokers was among those age 45–64 at 19%, and the lowest was among those age 12–19 at 7%. Meanwhile, the highest percentage of occasional smokers was among those age 20–34 at 8%, and the lowest percentage of occasional smokers was among those age 65 years and older at 2% (data not shown).
- ***There was variation by household income, household education and geography in the percentage of Canadians over the age of 12 who reported daily or occasional smoking (Figure 3).***
  - There are strong associations between socio-economic status (SES) and tobacco use. The lowest income quintile had the highest percentage of daily or occasional smokers at 26% compared to 15% in the highest income quintile. When looking at highest household education level attained, the highest percentage of daily or occasional smokers was among those with less than some secondary school and secondary school graduates, while the lowest percentage was among those with a post-secondary education. Finally, a higher percentage of people residing in rural or remote areas reported being daily or occasional smokers compared to urban dwellers (23% to 25% versus 19%).

FIGURE 1

Percentage of population (age ≥ 12) reporting daily or occasional smoking

BY PROVINCE/TERRITORY–CCHS 2009

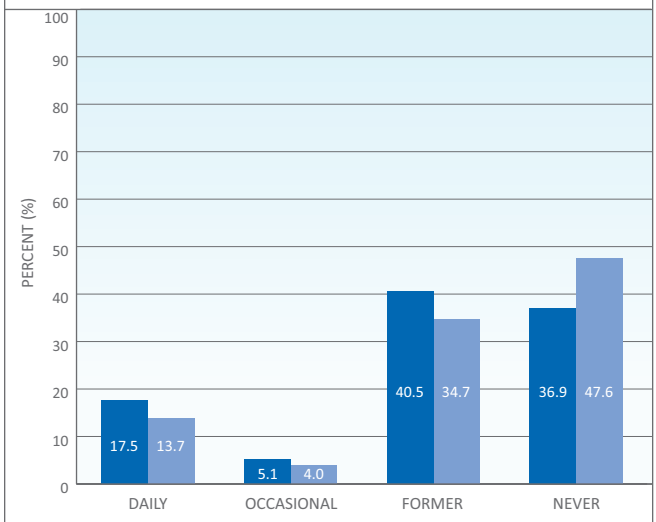


Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 2

Percentage of population (age ≥ 12) by smoking classification

BY SEX–CCHS 2009

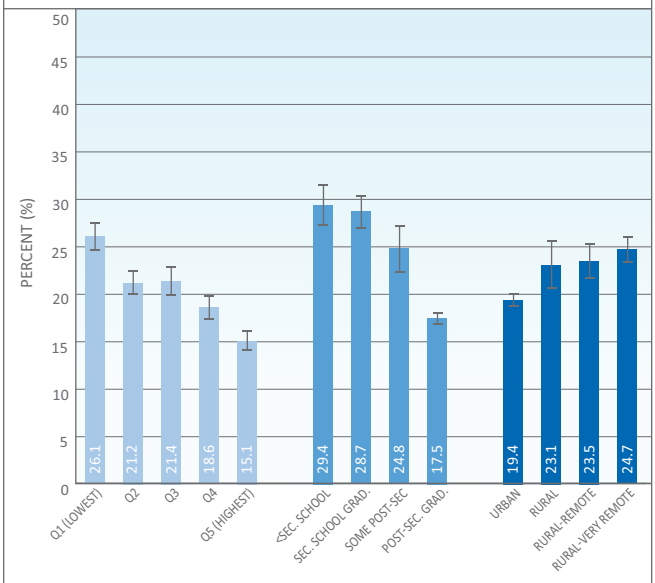


Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 3

Percentage of population (age ≥ 12) reporting daily or occasional smoking

BY INCOME QUINTILE, HOUSEHOLD EDUCATION AND GEOGRAPHY, CANADA–CCHS 2009



95% confidence intervals are indicated on figure

Data source: Statistics Canada, Canadian Community Health Survey

WHAT IS HAPPENING INTERNATIONALLY?

- The percentage of the adult population that smokes in Canada is similar to that in other developed countries.
  - In the US, according to 2010 data from the Behavioural Risk Factor Surveillance System (BRFSS), a weighted percentage of 17.2% of respondents age 18 years and older reported everyday and some day smoking.[11]
  - According to data from the 2009 General Lifestyle Survey, 21% of the adult population (age 16 years and older) of Great Britain were cigarette smokers.[12]
  - The prevalence of smoking among adults age 18 years and older in Australia in 2007/2008 was 19% according to survey data.[13]

WHAT IS BEING DONE?

- Funding of the Federal Tobacco Control Strategy, which aims to reduce tobacco-related disease and death through smoking prevention and cessation as well as protection and product regulation, has been extended from March 31, 2011 to March 31, 2012.[3]
- Four CLASP initiatives address tobacco control. These projects take place in a variety of settings: in primary care practices, in First Nations communities and in schools. Of note is the Youth Excel initiative, which has developed a set of indicators on tobacco use and creates collaboration opportunities among researchers, policy-makers, practitioners and communities to assess and guide policies and programs focused on risk factors including tobacco use.[5]

WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- Detailed calculation methodology is provided in the Technical Appendix (see page 147).

SMOKING CESSATION

WHAT ARE WE MEASURING?

This indicator measures the percentage of recent smokers (who have been daily or occasional smokers in the past two years) age 20 years and older who reported having quit smoking in the previous two years and were currently non-smokers.

WHY ARE WE MEASURING THIS?

- International models have shown that the most immediate impact on cancer mortality can be achieved by getting tobacco users to quit.[1] Research has shown that, if cessation occurs before middle age, the risk of developing lung cancer attributed to smoking tobacco is cut by over 90%.[14] Benefits of smoking cessation exist regardless of age when quitting. The cumulative risk of death from lung cancer up to age 75 for men who smoke is 15.9%; by quitting at age 50, the cumulative risk is reduced to 6%.[14]
- The current goal of the Federal Tobacco Control Strategy, is to increase the number of adult Canadians who have quit smoking to 1.5 million.[3] This target uses the Canadian Tobacco Use Monitoring Survey (CTUMS) as its source.
- Reporting on smoking cessation rates across the country allows for monitoring of progress in controlling tobacco use, and comparison of smoking prevalence and cessation rates allows for better assessment of the impact of prevention efforts and identifying opportunities for focus.

WHAT DO THE RESULTS SHOW?

- ***There was variation by province in the percentage of recent smokers who reported quitting smoking in the previous 2 years (Figure 4).***
  - The percentage of recent smokers who reported quitting in the previous two years (measured in 2009) ranged from 9% in Nunavut to 23% in British Columbia, with a national average of 18%.
- ***There was variation by age, but not sex, in the percentage of recent smokers who reported quitting smoking in the previous 2 years (Figure 5).***
  - The quit rate was highest among those age 20–34 at 21%, followed by those age 65 and older at 20%. The percentage was lowest among those age 45–64 at 15%.
- ***The highest smoking cessation rates are in the higher income and education segments, and in people living in urban areas (Figure 6).***
  - Generally speaking, as household income increased, so too did the cessation rates. The rates were lowest among the lowest income quintile at 14% and highest among the highest income quintile at 23% of smokers.
  - As household education increased, so too did smoking quits. Among those with less than a secondary school education, only 12% reported quitting compared with 20% among those with a post-secondary degree. Given that cessation rates are lower but smoking prevalence is highest in the lower income/education groups, the SES differences in smoking continue to increase.
  - Finally, a higher percentage of urban dwellers reported quitting smoking in the previous two years at 19% compared with 13% to 15% among those living in rural and remote communities.

WHAT IS HAPPENING INTERNATIONALLY?

- In 2009, 51% of high school smokers in the US reported attempting to stop smoking during the previous year.[15]
- As in Canada, education appeared to also be correlated with smoking quits in the US. From 1998 to 2008, persons with an undergraduate degree and persons with a graduate degree had quit attempt ratios above 60%.[16] Those with a graduate degree were the only group with an increasing trend in cessation.

WHAT IS BEING DONE?

- Please see “What is being done?” in the Smoking Prevalence Indicator section.

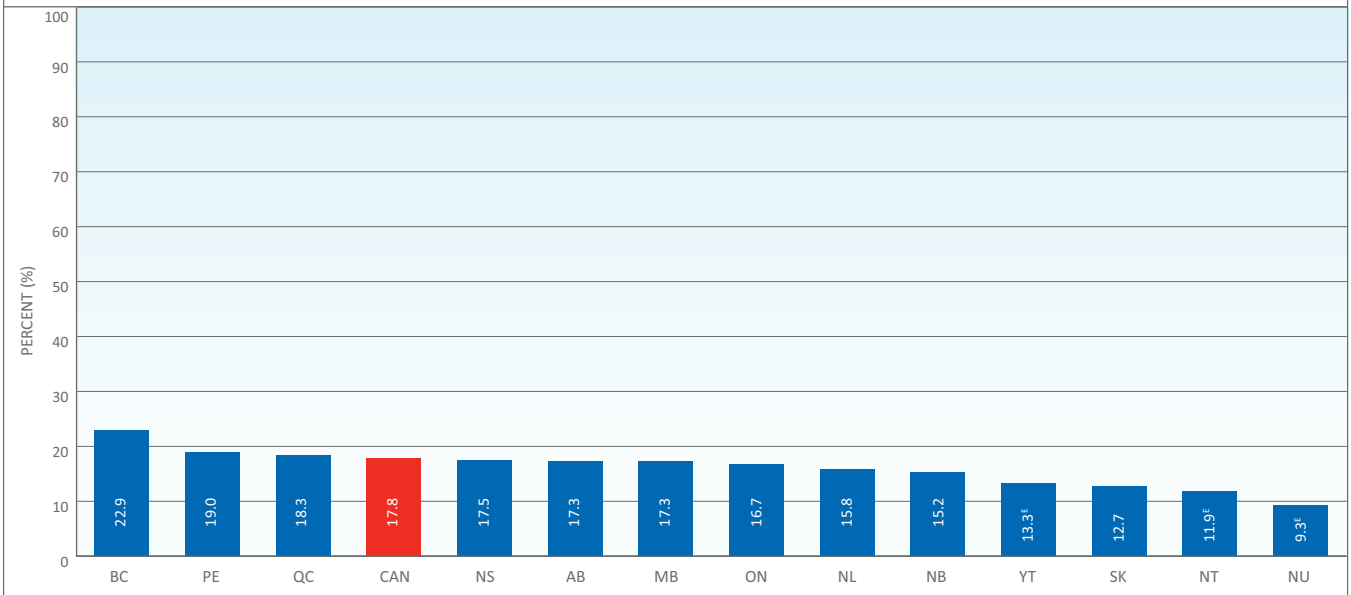
WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- Detailed calculation methodology is provided in the Technical Appendix (see page 147).

FIGURE 4

Percentage of recent smokers* who have quit smoking in the last 2 years

BY PROVINCE/TERRITORY–CCHS 2009

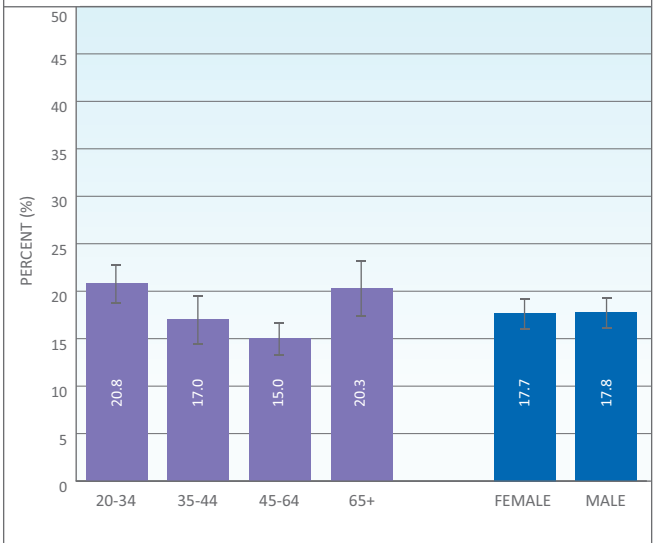


*Recent smokers defined as adults who have smoked in the last 2 years.
E Interpret with caution; coefficient of variation between 16.6% and 33.3%
Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 5

Percentage of recent smokers* who have quit smoking in the last 2 years

BY AGE AND SEX, CANADA–CCHS 2009

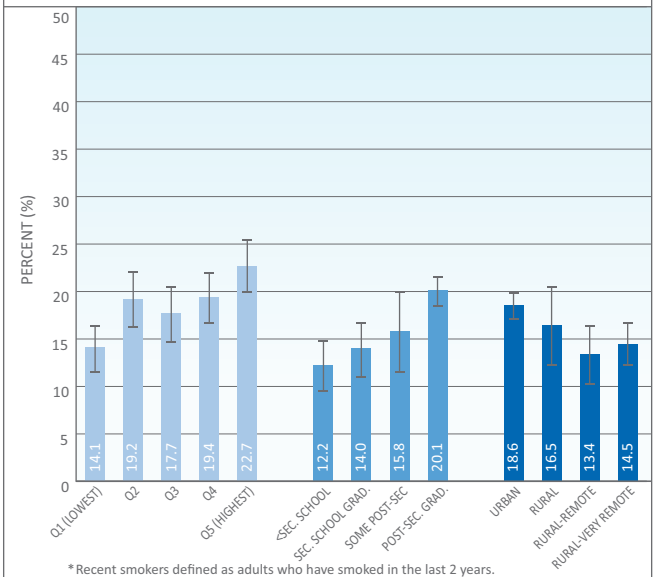


*Recent smokers defined as adults who have smoked in the last 2 years.
95% confidence intervals are indicated on figure
Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 6

Percentage of recent smokers* who have quit smoking in the last 2 years

BY INCOME QUINTILE, HOUSEHOLD EDUCATION AND GEOGRAPHY, CANADA–CCHS 2009



*Recent smokers defined as adults who have smoked in the last 2 years.
95% confidence intervals are indicated on figure
Data source: Statistics Canada, Canadian Community Health Survey

SECOND-HAND SMOKE EXPOSURE

WHAT ARE WE MEASURING?

This indicator is defined as the percentage of non-smokers age 12 years and older who reported being exposed to smoke in the home, in a vehicle, or in a public place every day or almost every day over the previous year. Second-hand smoke exposure is included for the first time in this *2011 Report*.

WHY ARE WE MEASURING THIS?

- According to the *2006 US Surgeon General Report*, more than 50 epidemiologic studies have addressed the association between second-hand smoke exposure and the risk of lung cancer among lifetime non-smokers.[17] Pooled evidence from these studies suggests a 20% to 30% increase in the risk of lung cancer from second-hand smoke exposure associated with living with a smoker.[17]
- Statistics in the United States suggest that second-hand smoke exposure is responsible for 3,400 lung cancer deaths per year among adult non-smokers.[18]
- The current goal of the Federal Tobacco Control Strategy is to reduce the prevalence of Canadians exposed daily to second-hand smoke from 28% in 2006 to 20% by 2011.[3]

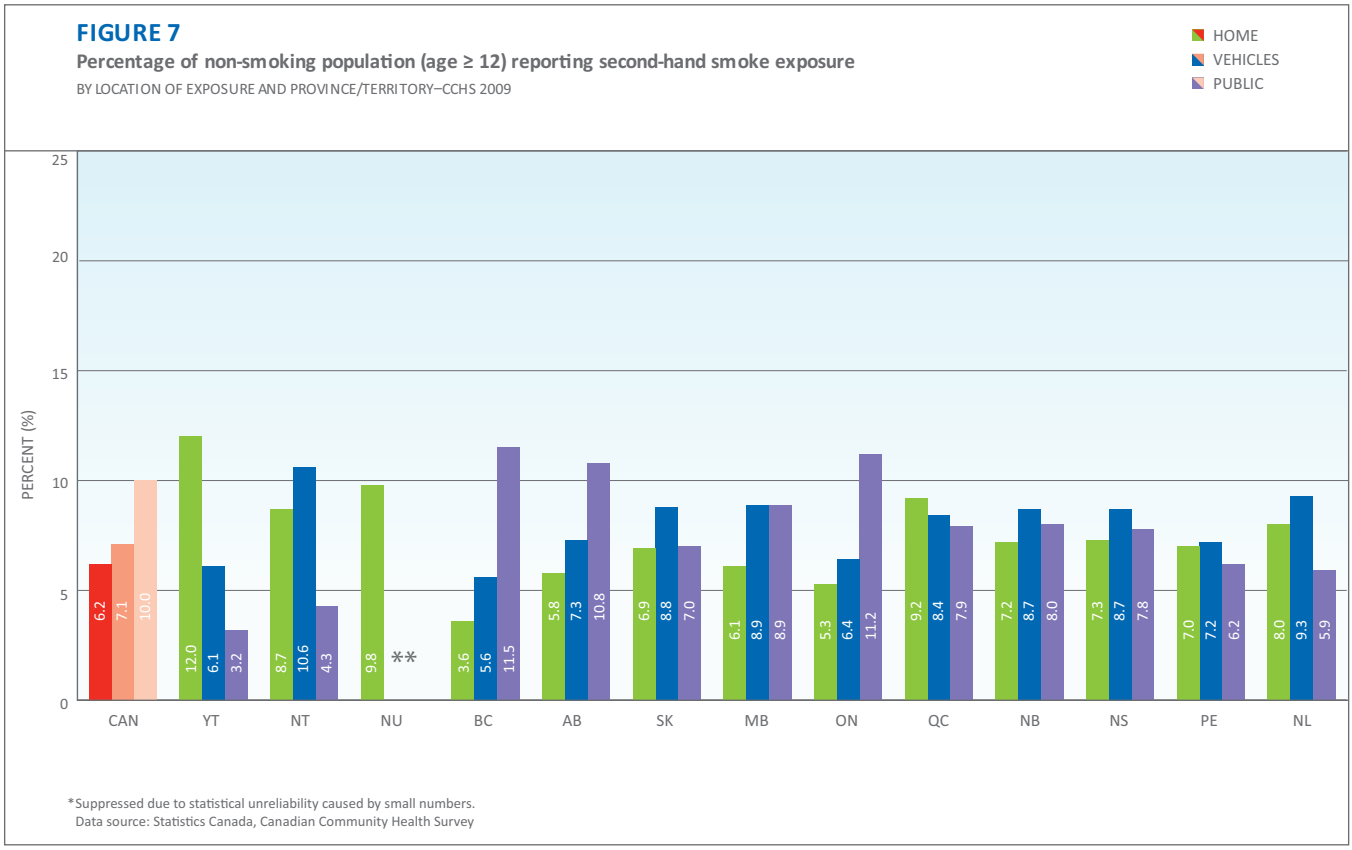
WHAT DO THE RESULTS SHOW?

- ***Although it has decreased between 2003 and 2009, there is a good deal of variation across provinces and age groups in the percentage of the non-smoking population over the age of 12 reporting second-hand smoke exposure in the home, vehicle or public space.***
  - Figure 7 shows the percentage exposed in the home is particularly high in the territories compared with other provinces (e.g., 12% in Yukon compared to 4% in British Columbia), while the percentage exposed in public spaces is highest in Alberta, British Columbia and Ontario (around 12% in British Columbia and Ontario compared to 3% in Yukon).
  - Figure 8 shows that the decrease in the percentage of non-smokers exposed to second-hand smoke has been most marked in public spaces (a decrease to 10% in 2009 from 20% in 2003). These findings likely reflect the impact of public smoking bylaws introduced over the last eight years in many communities across Canada. Exposure at home and in vehicles decreased from about 11% in 2003 to about 7% in 2009.
  - Figure 9 shows that exposure of non-smokers to second-hand smoke either in the home, vehicle or public space appears to be greatest among those age 16–19 (14%, 18% and 21%, respectively) and lowest among those over age 65 (3%, 2% and 4%, respectively).

FIGURE 7

Percentage of non-smoking population (age ≥ 12) reporting second-hand smoke exposure

BY LOCATION OF EXPOSURE AND PROVINCE/TERRITORY–CCHS 2009

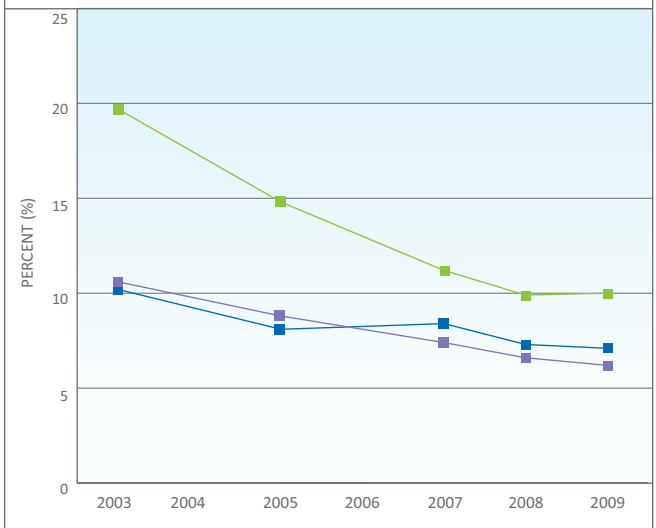


*Suppressed due to statistical unreliability caused by small numbers.
Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 8

Percentage of non-smoking population (age ≥ 12) reporting second-hand smoke exposure

BY LOCATION OF EXPOSURE, CANADA–CCHS 2003 to 2009

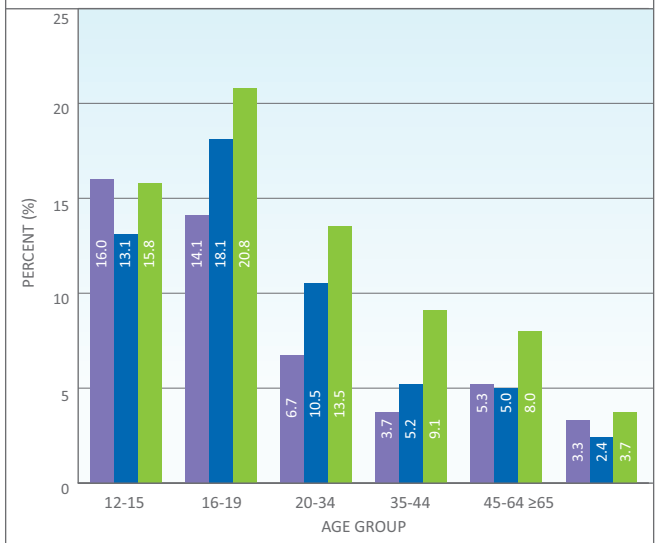


Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 9

Percentage of non-smoking population (age ≥ 12) reporting second-hand smoke exposure

BY LOCATION OF EXPOSURE AND AGE, CANADA–CCHS 2009



Data Source: Statistics Canada, Canadian Community Health Survey

WHAT IS HAPPENING INTERNATIONALLY?

- In the United States, the National Health and Nutrition Examination Survey (NHANES) is a survey of a sample of the entire population that is based on in-person interviews supplemented by physical measures. It measures participants' levels of serum cotinine, which is the primary nicotine metabolite.[19]
  - Of all non-smokers in the population (children and adults included), 40.4% were exposed to second-hand smoke in 2007/2008, with 53.6% of young children (age 3–11) exposed and 36.7% of adults 20 and over.
  - Whereas only 5.4% of adult non-smokers age 20 years and older in the US lived with someone who smoked inside of their home, 18.2% among children non-smokers lived with someone who smoked.

WHAT IS BEING DONE?

- Many Canadian jurisdictions have been passing legislation aimed at reducing second-hand smoke exposure. Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, and Newfoundland and Labrador each had a full provincial ban on smoking in public places, as of 2007.[20] Laws prohibiting smoking in cars carrying children have been adopted in British Columbia, Saskatchewan, Manitoba, Ontario, New Brunswick, Prince Edward Island, Nova Scotia, Yukon Territory, and Newfoundland and Labrador.[21] Quebec and Alberta are currently considering such legislation.[22]
- Please see "What is being done?" for the Smoking Prevalence Indicator section.

WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- Detailed calculation methodology is provided in the Technical Appendix (see page 147).

ALCOHOL CONSUMPTION—PERCENTAGE EXCEEDING LOW-RISK GUIDELINES

WHAT ARE WE MEASURING?

This indicator measures the percentage of adults age 18 years and older who report exceeding the low-risk drinking guideline defined as an average of no more than 2 drinks per day for males and an average of no more than 1 drink per day for females.

WHY ARE WE MEASURING THIS?

- Convincing evidence exists that alcohol increases the risk of cancer of the esophagus, mouth, throat (pharynx and larynx), breast, and among men, the colon and rectum. Evidence also suggests that alcohol consumption probably increases the risk of liver cancer in both sexes and colorectal cancer in women.[1]

WHAT DO THE RESULTS SHOW?

- ***As presented in the 2010 System Performance Report, inter-provincial/territorial and SES variation exists in the percentage of adults exceeding the low-risk drinking guidelines.***
  - The percentage of adults exceeding the low-risk drinking guidelines ranged from 7% in Prince Edward Island to 13% in the Yukon, with an overall average of 9% (Figure 10).
  - Figure 11 shows that the percentage of adults who reported exceeding the low-risk drinking guidelines increased with household income (range of 6% in the lowest income quintile to 14% in the highest quintile) and household education (6% among those with less than secondary school to 10% among those with a post-secondary education).
  - There does not appear to be a strong relationship to urban/rural/remote geography in the alcohol consumption rates.

WHAT IS HAPPENING INTERNATIONALLY?

- International jurisdictions define low-risk drinking differently.
  - In Australia, low-risk drinking has been defined as 2 drinks per day for males and for females. Country-level statistics from the 2004/2005 National Health Survey show that 13% of adults age 18 year and older exceeded the low-risk drinking guidelines, which is an almost 5% increase over statistics from 10 years earlier. More males than females exceeded the guidelines (15.2% compared to 11.7%) and risky drinking behaviours peaked in the 45–54 year age group and declined rapidly over age 64.[23]

WHAT IS BEING DONE?

- Considering recent compelling evidence that alcohol is an avoidable risk factor for cancer, drinking guidelines are being reconsidered in several countries, including Canada. In 2011, the first national drinking guidelines are to be released by the Canadian Centre on Substance Abuse, in partnership with Health Canada and provincial and territorial medical officers of health, among other stakeholders. Guidelines also consider risk from different consumption patterns such as 'binge drinking'. The BETTER project, part of the CLASP initiatives, addresses alcohol consumption as a risk factor for chronic disease; it includes clinical chronic disease prevention strategies aimed at reducing alcohol consumption.[5]

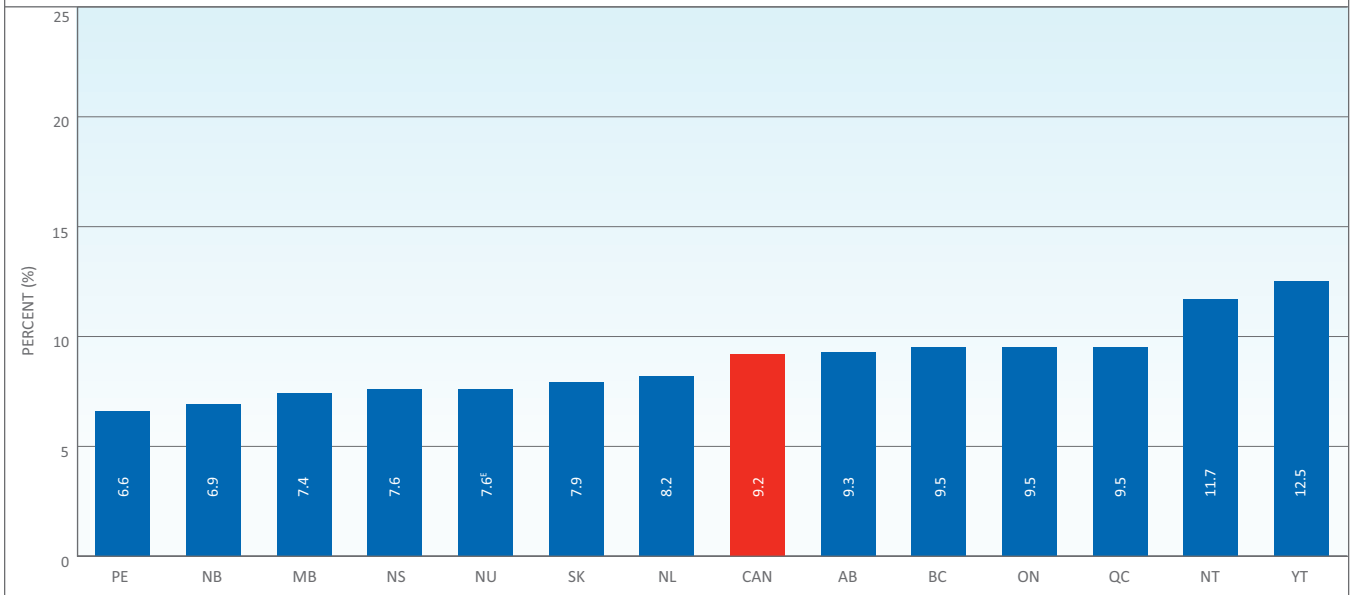
WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- The daily average was calculated based on the total number of drinks the respondent reported consuming in the week prior to the CCHS interview, divided by seven days.
- Detailed calculation methodology is provided in the Technical Appendix (see page 148).

FIGURE 10

Percentage of adults exceeding low-risk drinking guidelines

BY PROVINCE/TERRITORY–CCHS 2005



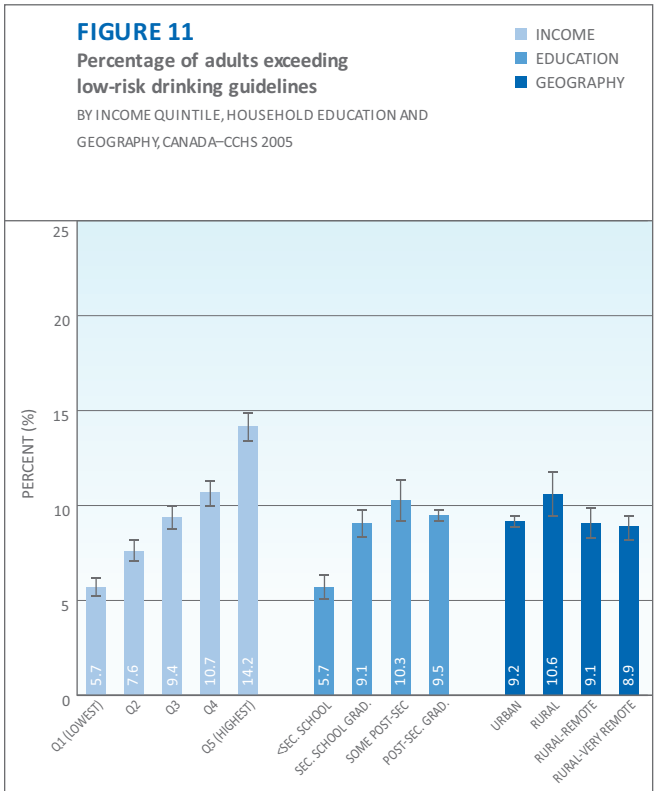
[E] Interpret with caution; coefficient of variation between 16.6% and 33.3%

Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 11

Percentage of adults exceeding low-risk drinking guidelines

BY INCOME QUINTILE, HOUSEHOLD EDUCATION AND GEOGRAPHY, CANADA–CCHS 2005



95% confidence intervals are indicated on figure

Data source: Statistics Canada, Canadian Community Health Survey

ALCOHOL CONSUMPTION—NO ALCOHOL WITHIN 12 MONTHS

WHAT ARE WE MEASURING?

This indicator measures the percentage of adults age 18 years and older who reported consuming no alcohol in the previous year.

WHY ARE WE MEASURING THIS?

- The World Cancer Research Fund (WCRF) states that there is no level of consumption that does not increase the risk of cancer.[1] There may be benefits in avoiding even small amounts of alcohol.

WHAT DO THE RESULTS SHOW?

- ***There was some variation by age, sex and province/territory in the percentage of adults who report drinking no alcohol in the previous year (Figure 12). There was considerable variation in the results by income, education and rurality (Figure 13).***
  - Results for the provinces and territories ranged from 29% in Nunavut to 14% in Quebec, with an overall average of 19%.
  - The percentage of females abstaining from alcohol intake was 23% compared to 15% among males; the percentage abstaining increased with age overall (data not shown).
  - As household income and education increased, alcohol abstinence decreased. There did not appear to be a relationship between abstinence and geography.

WHAT IS HAPPENING INTERNATIONALLY?

- According to a WHO report from 2004, "last year" alcohol abstinence rates across participating countries ranged from a low of 2.5% in Luxembourg to a high of 99.5% in Egypt. The one consistency that appears to transcend countries is the difference in abstention rates between males and females with a higher proportion of women abstaining.[24]
  - In the UK specifically, using data from the 2009 General Lifestyle Survey, 15% of adults abstained from drinking alcohol in the previous year. Abstinence was more common among women (18%) than among men (12%) across all age groups.[12]

WHAT IS BEING DONE?

- Please see "What is being done?" for the Alcohol Consumption—Percentage Exceeding Low-risk Guidelines section.

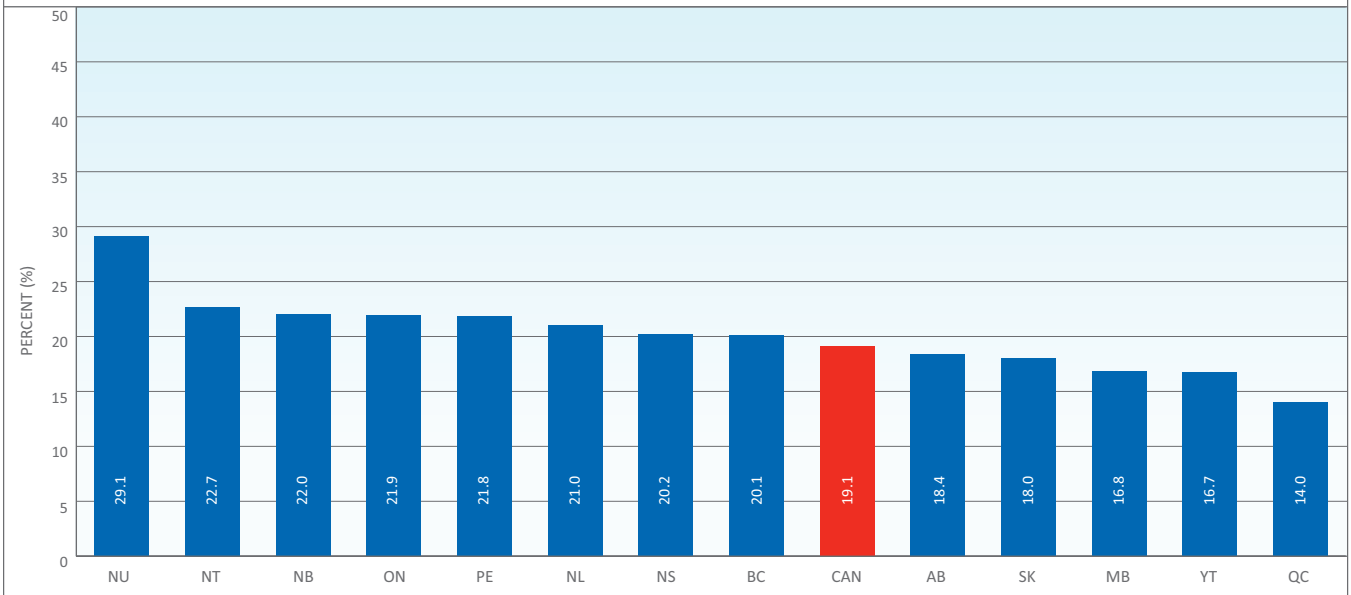
WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- A population-based measure of alcohol abstinence is not necessarily correlated with that of low risk drinking. For instance, a province with a low percentage of the population who abstain from alcohol consumption may not necessarily have a high percentage of the population who exceed the low risk drinking guidelines
- Detailed calculation methodology is provided in the Technical Appendix (see page 148).

FIGURE 12

Percentage of adults who report drinking no alcohol in previous 12 months

BY PROVINCE/TERRITORY–CCHS 2009

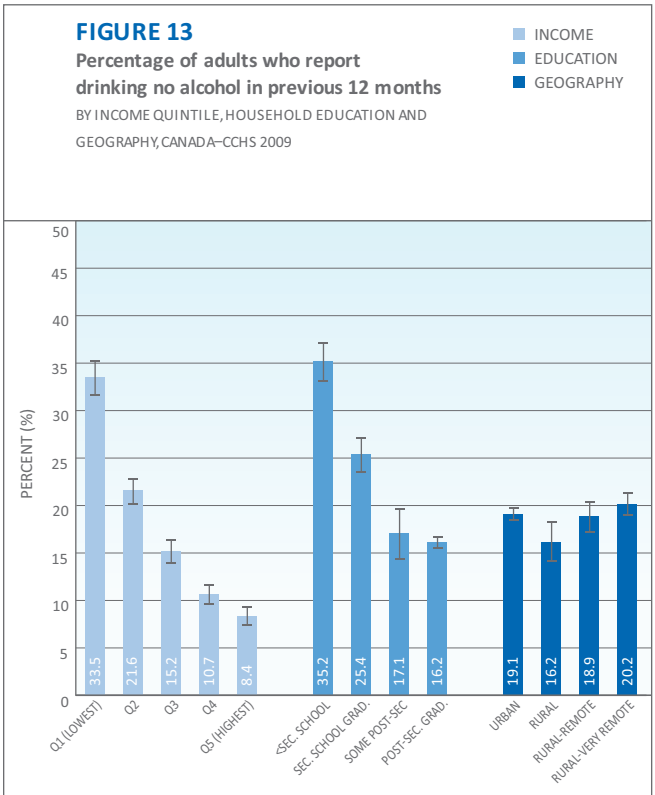


Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 13

Percentage of adults who report drinking no alcohol in previous 12 months

BY INCOME QUINTILE, HOUSEHOLD EDUCATION AND GEOGRAPHY, CANADA–CCHS 2009



95% confidence intervals are indicated on figure

Data source: Statistics Canada, Canadian Community Health Survey

FRUIT AND VEGETABLE CONSUMPTION

WHAT ARE WE MEASURING?

This indicator measures the percentage of the population that reports consuming at least five servings of fruits or vegetables on a daily basis.

WHY ARE WE MEASURING THIS?

- Nutrition is vital to human health and well-being. A diet rich in fruits and vegetables has a number of health benefits, including potentially reducing the risk of certain cancers.[1, 25]
- It is probable that consuming fruits and vegetables decreases the risk of certain cancers including mouth, pharynx, larynx oesophagus and stomach.[1]
- In general, consuming low-energy dense food (including fruits and vegetables) helps to maintain a healthy body weight, which reduces the risk of several cancers (see Overweight and Obesity section).[1]
- A 2003 WHO/FAO report recommends a minimum of 400g of fruits and vegetables per day for the prevention of chronic diseases.[26] This translates into roughly five servings per day.
- The Canadian Healthy Living Strategy has set a target of increasing the proportion of Canadians who make healthy food choices by 20% by 2015.[2]
- Reporting on fruit and vegetable consumption patterns across the country allows for monitoring of progress in encouraging healthy eating and helps identify gaps and at-risk sub-populations.

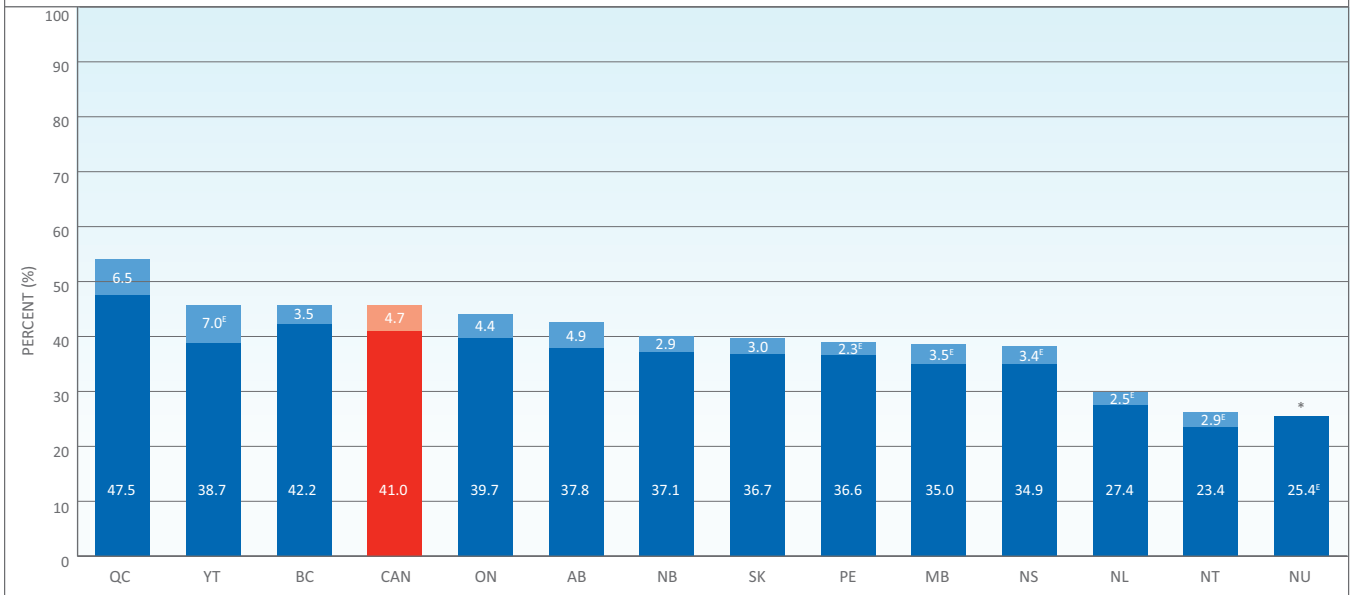
WHAT DO THE RESULTS SHOW?

- ***There is substantial variation by province/territory in the percentage of adults eating at least five servings of fruits or vegetables a day (Figure 14).***
  - The percentage of population age 12 years and older who reported consuming at least five fruit and vegetable servings daily by province/territory ranged from 54% in Quebec to just over 25% in Nunavut, with the national average of 46%.
- ***Fruit and vegetable consumption is greater in the highest income and education segments; people living in remote regions have significantly lower consumption (Figure 15).***
  - Fruit and vegetable intake increases with income. This effect is similar in both adults and adolescents (data not shown).
  - There was higher fruit and vegetable consumption among those who have completed post-secondary education when compared to others with less education.
  - A lower percentage of people living in very remote communities reported consuming five or more servings of fruits or vegetables a day relative to urban and rural dwellers.
- ***Fruit and vegetable consumption appears to be increasing between 2001 and 2009 (Figure 16).***
  - In 2001, only 38% of respondents reported consuming five or more fruit and vegetable servings daily compared to almost 46% in 2009.

FIGURE 14

Percentage of population (age ≥ 12) reporting consuming five or more servings of fruit or vegetables daily

BY PROVINCE/TERRITORY–CCHS 2009

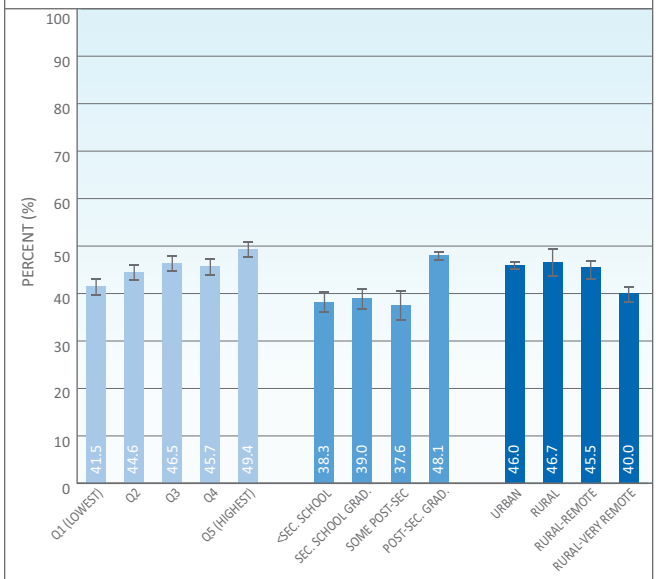


* Data suppressed due to statistical unreliability caused by small numbers
E Interpret with caution; coefficient of variation between 16.6% and 33.3%
Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 15

Percentage of population (age ≥ 12) reporting consuming five or more servings of fruit or vegetables daily

BY INCOME QUINTILE, HOUSEHOLD EDUCATION AND GEOGRAPHY, CANADA–CCHS 2009

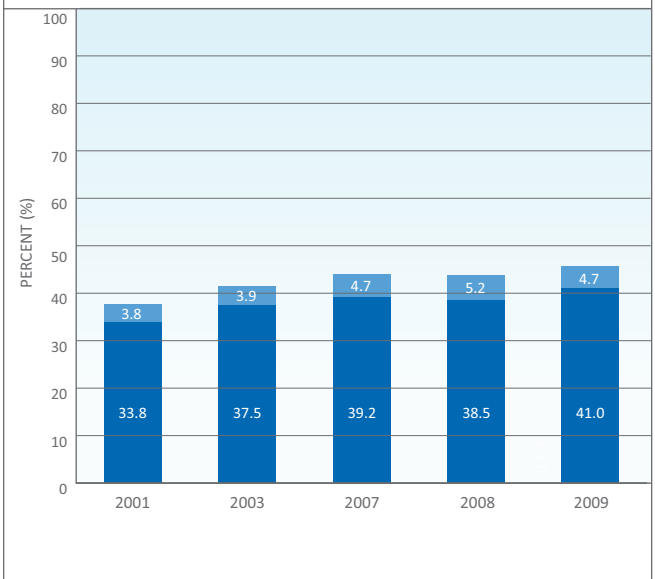


95% confidence intervals are indicated on figure
Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 16

Percentage of population (age ≥ 12) reporting consuming five or more servings of fruit or vegetables daily

BY YEAR, CANADA–CCHS 2001 TO 2009



Data source: Statistics Canada, Canadian Community Health Survey

- ***Age and sex are determinants of fruit and vegetable consumption (data not shown).***
  - There is little variation in fruit and vegetable consumption across age groups with 50% of those age 12–17 versus 43% of those age 35–49 (the lowest reporting age group) consuming more than five fruits and vegetables a day.
  - Females are more likely to consume more than five fruits or vegetables than males (51% vs. 40%, respectively).

WHAT IS HAPPENING INTERNATIONALLY?

- The 2008 Scottish Health Survey, conducted by personal interview, found that 20% of men and 24% of women consumed five or more servings of fruits or vegetables per day.[27]
- For 2009, the BRFSS survey found that 33% of adult Americans consume two or more fruits a day, and 26% consume three or more vegetables a day.[28]
- In an Australian survey, conducted by personal interview, approximately 10% of the population consumed the recommended five servings of vegetables a day, and 50% of the population ate two servings of fruit a day.[29]

WHAT IS BEING DONE?

- There are five CLASP initiatives that include a healthy eating element, some indirectly through promoting collaboration and others through more direct pathways such as education. Notably, the Collaborative Action on Childhood Obesity project has a component aiming to decrease the appeal and accessibility of unhealthy food and to focus on promoting the consumption of traditional foods among First Nations communities.[5]
- In Canada, there is growing use of policy options banning or restricting unhealthy food products in schools,[6] some of which may relate to an increase in fruit and vegetable consumption.
- As territories and remote communities have lower consumption of fruits and vegetables, subsidies though the Nutrition North Canada Program improve access.[30]

WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- Dietary measurements through self-report can often differ from true intake values. Dietary measurement is more prone to error compared to other epidemiological metrics.[31, 32]
- Detailed calculation methodology is provided in the Technical Appendix (see page 148).

PHYSICAL ACTIVITY—LEISURE

WHAT ARE WE MEASURING?

This indicator reports on the percentage of adults who are physically active during their leisure time.

WHY ARE WE MEASURING THIS?

- In the past two decades, there has been growing evidence of the protective effect of physical activity against the development of several different types of cancer.[1]
- The 2007 report of the World Cancer Research Fund (WCRF) concluded that physical activity was protective against colon cancer and potentially protective against cancers of the breast (post-menopausal) and endometrium.[1]
- In a more general sense, high physical activity in the population reduces obesity, which is another contributor to increased risk of some cancers.[1]
- The Canadian Healthy Living Strategy has set a target of increasing the proportion of Canadians who participate in regular physical activity based on 30 minutes/day of moderate to vigorous activity by 20% by 2015. With 2003 as the baseline, this translates to at least 60% of people participating in regular physical activity by 2015.[2]

WHAT DO THE RESULTS SHOW?

- ***There was variation by province/territory in the percentage of adults who report being physically active.***
  - The percentage of adults who reported being active in their leisure time varied from 19% in Northwest Territories to 32% in British Columbia. 26% of Canadians as a whole reported being active or very active (Figure 17).
- ***Physical activity was strongly correlated with household income and education (Figure 18).***
  - Adults in the lowest income and education levels reported the lowest level of physical activity during leisure time, whereas those in the highest income and education levels reported being the most physically active.
  - There were no significant differences in reported physical activity level by distance from urban centre.
- ***Young adults and males reported being most active in their leisure time.***
  - A higher proportion of men reported being active or very active (15% and 14%) compared to women (13% and 10%) (Figure 19).
  - There was high variation in the rate of high activity by age with 17% of respondents age 18–34 reporting being very active compared to 7% of respondents age 65 years and older (data not shown).
- ***Similar patterns were observed for physical activity as part of transportation.***
  - When examining physical activity for transportation (e.g., getting to and from work), patterns observed by SES, geography, sex and age group where similar to those for physical activity during leisure (data not shown).

WHAT IS HAPPENING INTERNATIONALLY?

- In the US for the years 2005 to 2007, 30.7% of adults engaged in regular physical activity during leisure time.[33]
- Seventy-two percent of Australians aged 15 years and over are classified as sedentary or having low exercise levels.[34]

- In the UK, 40% of men and 28% of women meet the minimum recommendations for physical activity in adults, which is 30 minutes or more activity per day of at least moderate intensity, at least five days per week.[35]
- All the above estimates are based on personal interview surveys.

WHAT IS BEING DONE?

- All CLASP projects include a component that addresses physical activity, some more directly than others. There are a variety of pathways through which these projects act, including improving school transportation plans to increase walking and biking to school and reducing sedentary leisure time for youth and encouraging greater physical activity among primary care patients and First Nations.[5]
- Canada has been producing a comprehensive annual report card on children's physical activity since 2004. This report card provides a source of information to policy-makers and the public to increase resources and attention to physical activity in youth.[36]

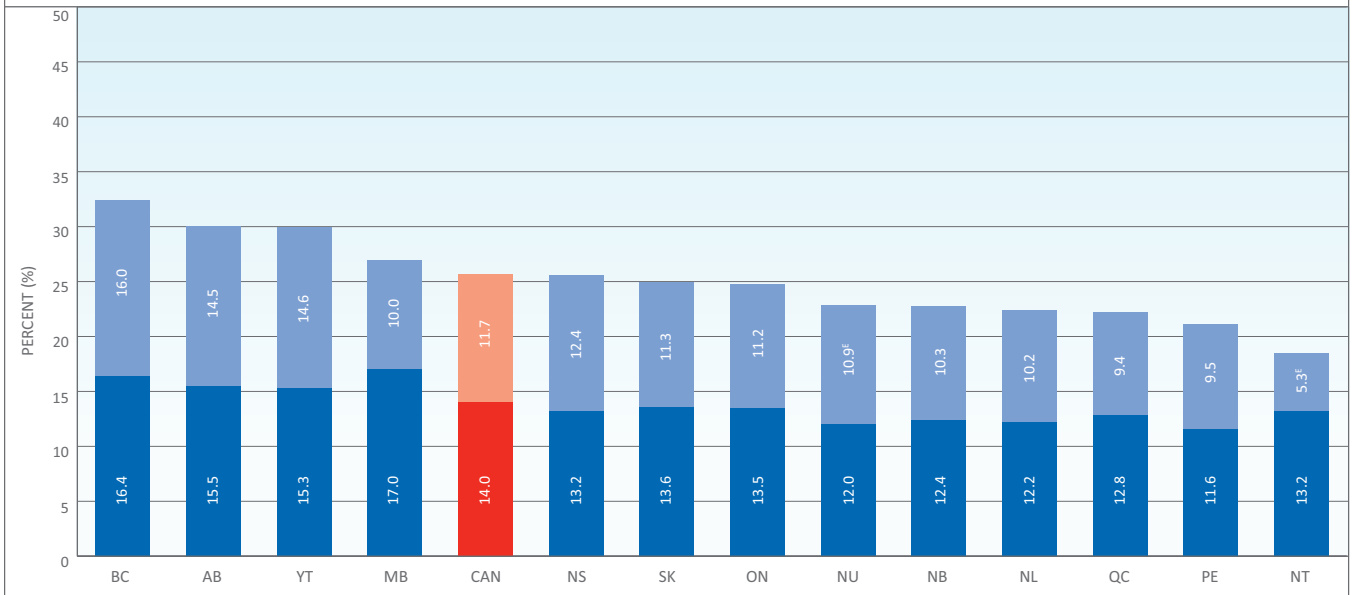
WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- In order to measure the physical activity levels of Canadians, frequencies on a range of physical activities and durations for each activity were collected as part of the suite of CCHS survey questions. Activities during leisure (e.g., gardening, walking, playing soccer, skiing) were captured. The average amount of energy expended daily was calculated using the frequency and duration per session of the physical activity as well as the MET value of the activity. It was then categorized as inactive, moderately active, active or very active based on tertiles of the observed data.
- The MET is a value of metabolic energy cost expressed as a multiple of the resting metabolic rate.
- Detailed calculation methodology is provided in the Technical Appendix (see page 149).

FIGURE 17

Percentage of adults who report being active or very active during their leisure time

BY PROVINCE/TERRITORY–CCHS 2009



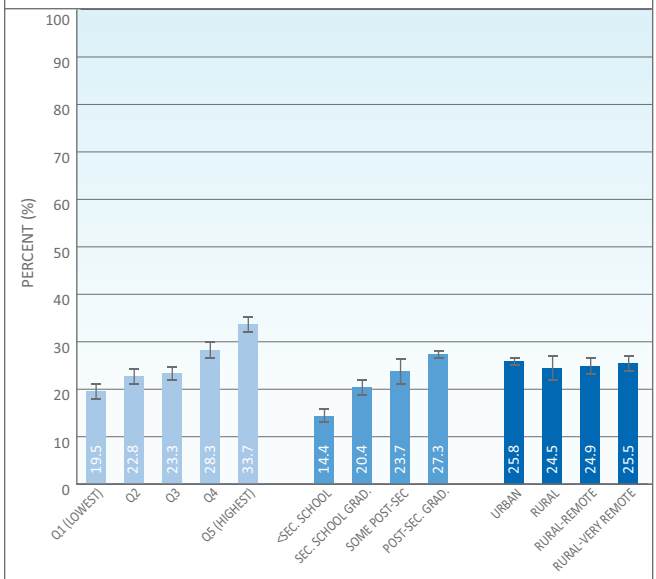
[E] Interpret with caution; coefficient of variation between 16.6% and 33.3%

Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 18

Percentage of adults who report being active or very active during their leisure time

BY INCOME QUINTILE, HOUSEHOLD EDUCATION AND GEOGRAPHY, CANADA–CCHS 2009



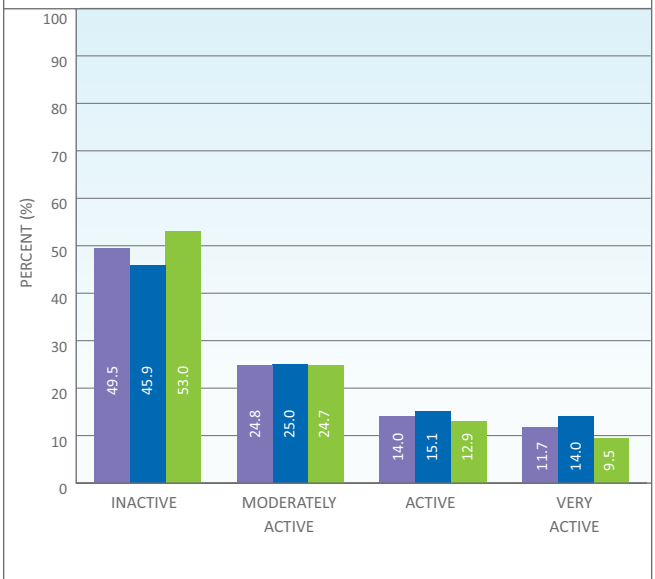
95% confidence intervals are indicated on figure

Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 19

Percentage of adults according to reported physical activity levels during leisure time

BY SEX, CANADA–CCHS 2009



Data source: Statistics Canada, Canadian Community Health Survey

ADULT OVERWEIGHT AND OBESITY

WHAT ARE WE MEASURING?

This indicator is defined as the percentage of the population age 18 years and older reporting height and weight that result in a Body Mass Index (BMI) of 25kg/m^2 or greater.

WHY ARE WE MEASURING THIS?

- Obesity has been found to raise the risk of a number of cancers. Convincing evidence exists that excess body fat increases the risk of cancer of the colon and rectum, breast (in post-menopausal women), endometrium, esophagus, pancreas and kidney.[1]
- The Canadian Healthy Living Strategy has set a target of increasing by 20% the proportion of Canadians with "normal" body weight (BMI=18.5 kg/m^2 to 24.9 kg/m^2) by 2015 from a 2003 baseline. This translates to 56.0% classified as "normal" body weight, up from 46.7% in 2003.[2]
- Reporting on overweight and obesity rates and patterns across the country allows for monitoring of progress in encouraging healthy living and helps identify at-risk sub-populations.

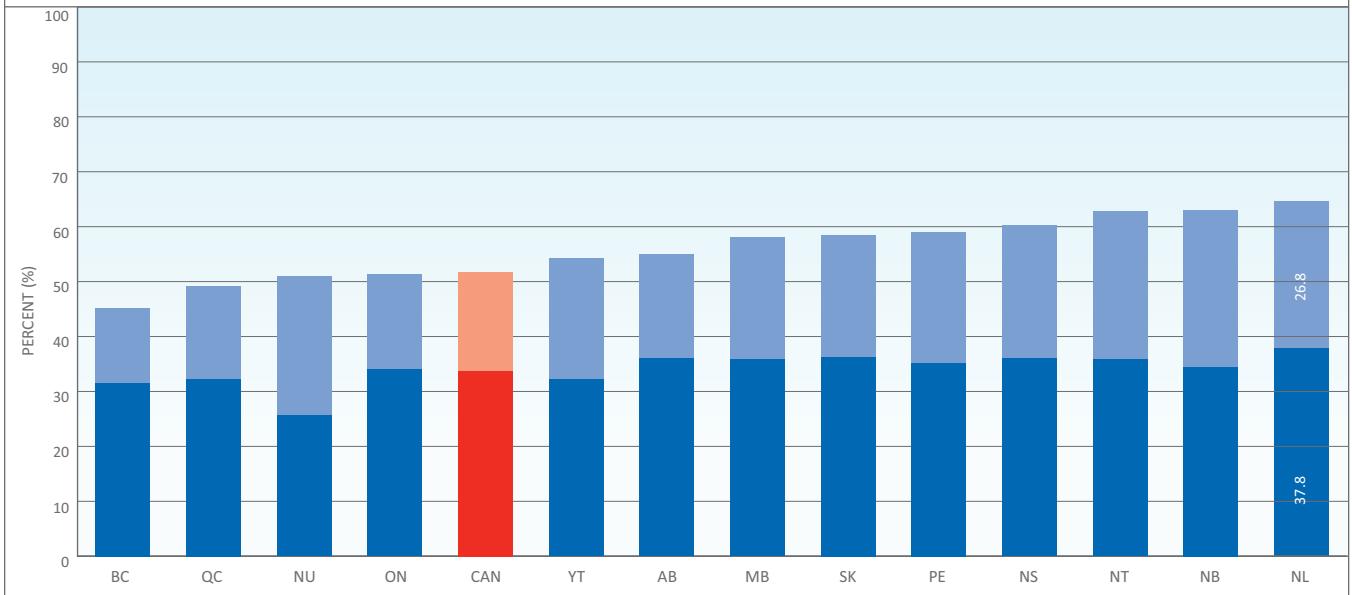
WHAT DO THE RESULTS SHOW?

- ***There was substantial variation by province/territory in the percentage of adults classified as overweight or obese (Figure 20).***
  - 52% of Canadians surveyed reported height and weight that places them in the overweight or obese categories (34% overweight and 18% obese).
  - British Columbia and Quebec had the lowest percentage of the population classified as overweight or obese at 45% and 49% respectively. The Atlantic Provinces continue to have among the highest percentages of overweight and obesity.
- ***The relationship between obesity and SES is different for males and females.***
  - A larger percentage of male respondents were categorized as overweight and obese compared to females (Figure 21).
  - When looking at the interaction of sex, household income and obesity, the relationship for men was quite different than for women. Overweight and obesity rates in males increase with increasing income, but women experienced the opposite pattern where overweight and obesity rates were highest in the lowest income quintile and, for the most part, decreased with increasing income (Figure 22).
  - Females with highest education are less likely to be overweight or obese. As with household income, there were different interactions in males and females with education and obesity. In higher income and education groups, there was a greater difference between male and female obesity/overweight rates (Figure 23).
  - The percentage of adults classified as overweight or obese was lowest for people living in urban centres. There was no significant difference among the rural/remote categories, although they do have higher rates of overweight and obesity compared to urban populations (Figure 24).

FIGURE 20

Percentage of adults classified as overweight or obese

BY PROVINCE/TERRITORY–CCHS 2009

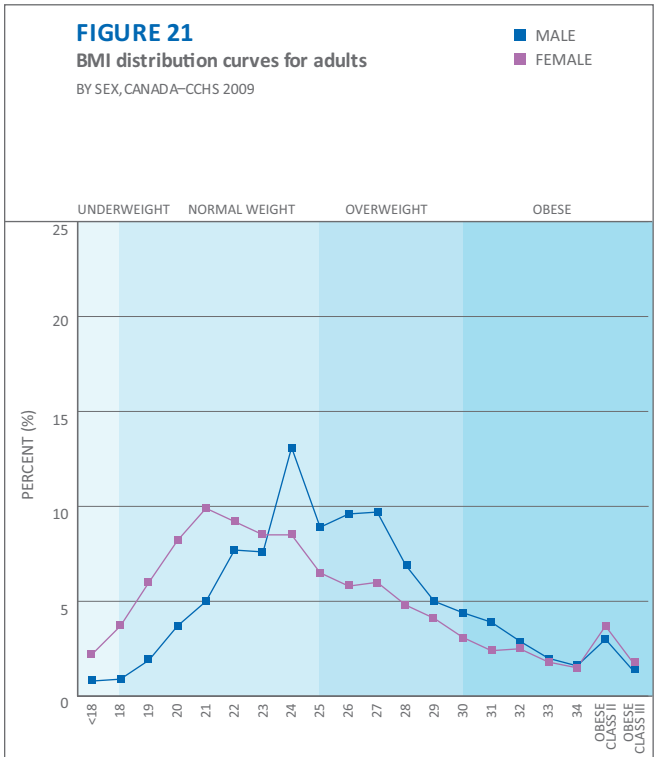


Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 21

BMI distribution curves for adults

BY SEX, CANADA–CCHS 2009

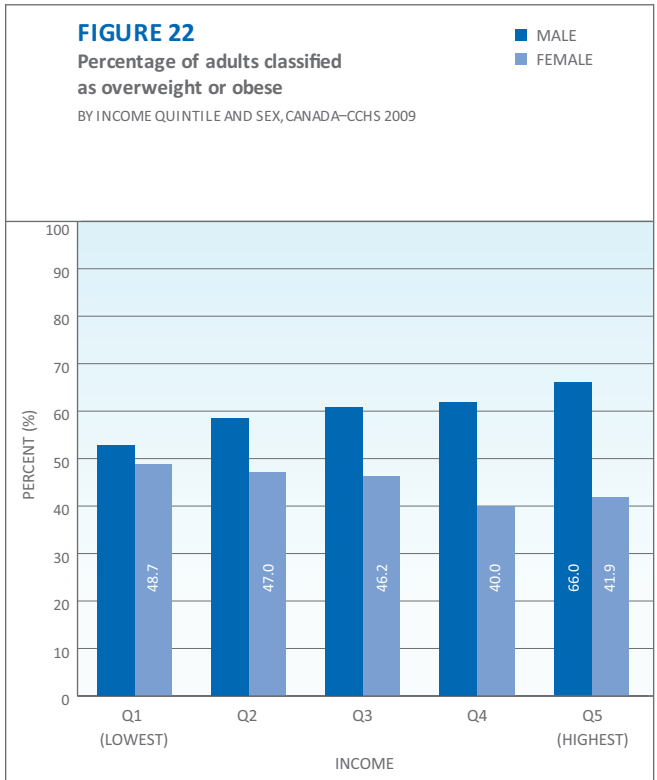


Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 22

Percentage of adults classified as overweight or obese

BY INCOME QUINTILE AND SEX, CANADA–CCHS 2009



Data source: Statistics Canada, Canadian Community Health Survey

- ***Time trend analysis from 2003 to 2009 shows a constant increase in the obese population, a constant decrease in the normal weight population and a relatively stable overweight population (figure not shown).***
  - Whereas healthier behaviours are reported as increasing in other domains examined in this *Report* (smoking prevalence, fruit and vegetable consumption, physical activity), there was a continued increase in the prevalence of obesity.

WHAT IS HAPPENING INTERNATIONALLY?

- In the US, the rate of obesity among adults is 27% with another 37% classified as overweight for 2009, for a total 64%.[37]
- Using measured BMI, Canada ranks fourth in prevalence of obesity among OECD countries, behind the US, Mexico and New Zealand. Using self-report data for Canada, the country ranks 10th out of 30 OECD countries[a].[38]

WHAT IS BEING DONE?

- The Integrated Pan-Canadian Healthy Living Strategy addresses risk factors including physical inactivity, unhealthy eating and unhealthy body weights and suggests a framework for action.[2]
- All of the CLASP initiatives have some component that addresses risk factors for overweight and obesity, including physical activity, nutrition, the built environment, social determinants of health and screening for overweight and obesity in primary care practices.[5]
- For more details on initiatives related to the overweight and obesity risk factors, see the Physical Activity and Nutrition sections.

WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

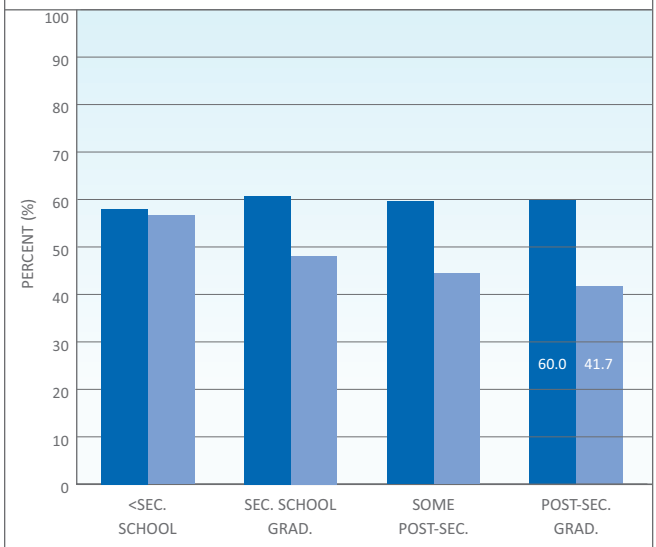
- BMI was calculated using self-reported personal height and weight. Canadian studies that use measurement find the prevalence of obesity to be higher than what is measured in self-reported surveys (24.3% in the Canadian Health Measures Survey from 2007 to 2009).[39]
- Respondents with a BMI of 25kg/m^2–29.9kg/m^2 were considered overweight; those with a BMI exceeding 30kg/m^2 were considered obese.[40-41]
- Detailed calculation methodology is provided in the Technical Appendix (see page 149).

[a] Method of data collection varies by country (self-report vs. measured, year of data collection, definition of population)

FIGURE 23

Percentage of adults classified as overweight or obese

BY EDUCATION AND SEX, CANADA–CCHS 2009

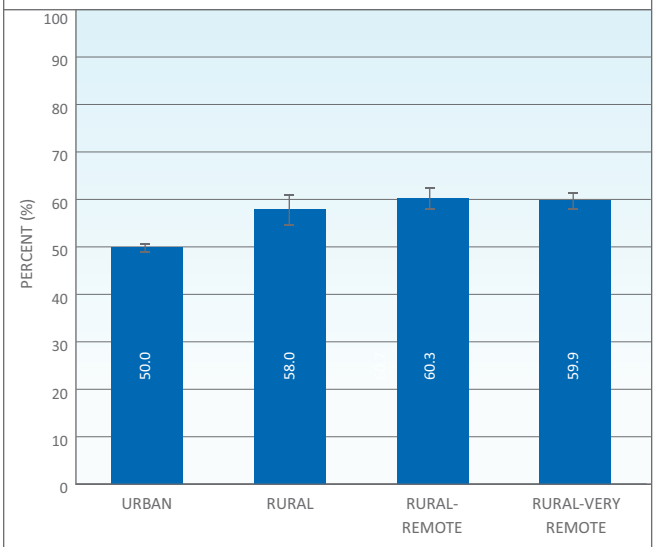


Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 24

Percentage of adults classified as overweight or obese

BY GEOGRAPHY, CANADA–CCHS 2009



95% confidence intervals are indicated on figure.
Data source: Statistics Canada, Canadian Community Health Survey

ADOLESCENT OVERWEIGHT AND OBESITY

WHAT ARE WE MEASURING?

This indicator is defined as the percentage of the population age 12–17 classified as "overweight" or "obese". The BMI cut-off for the classifications is age-specific with younger age groups having slightly lower cut-offs.

WHY ARE WE MEASURING THIS?

- Internationally, childhood obesity has become more prevalent. In Canada, the prevalence of overweight and obesity in youth age 12–17 years has doubled in the last decade.[42]
- Childhood and adolescent obesity increase the risk of obesity in adulthood,[43] therefore increasing the risk of experiencing negative health outcomes, including the risk of developing certain types of cancer.[1]

WHAT DO THE RESULTS SHOW?

- ***There was substantial variation by province/territory in the percentage of adolescents classified as overweight or obese (Figure 25).***
  - 20% of adolescent Canadians surveyed reported weight and height classifying them as overweight (15%) or obese (5%).
- ***There was variation by household education and geography but not household income in the percentage of adolescents classified as overweight or obese (Figure 26).***
  - There appears to be little interaction between household income and likelihood of being overweight or obese; this is unlike the relationship in adults.
  - Reported overweight or obesity rates are dramatically higher among youth living in households where the parent has the lowest education level.
  - By geography, overweight and obese rate are highest for adolescents living in very remote areas.
- ***There was variation among rates of males and females and among older and younger adolescents (Figure 27).***
  - Adolescent males were more likely to report a height and weight that classifies them as being overweight or obese compared to females.
  - Adolescents age 15–17 years were more likely to report a height and weight that classifies them as being overweight or obese than adolescents age 12–14, particularly males. 27% of older male adolescents reported being overweight or obese compared with 20% in the younger category.

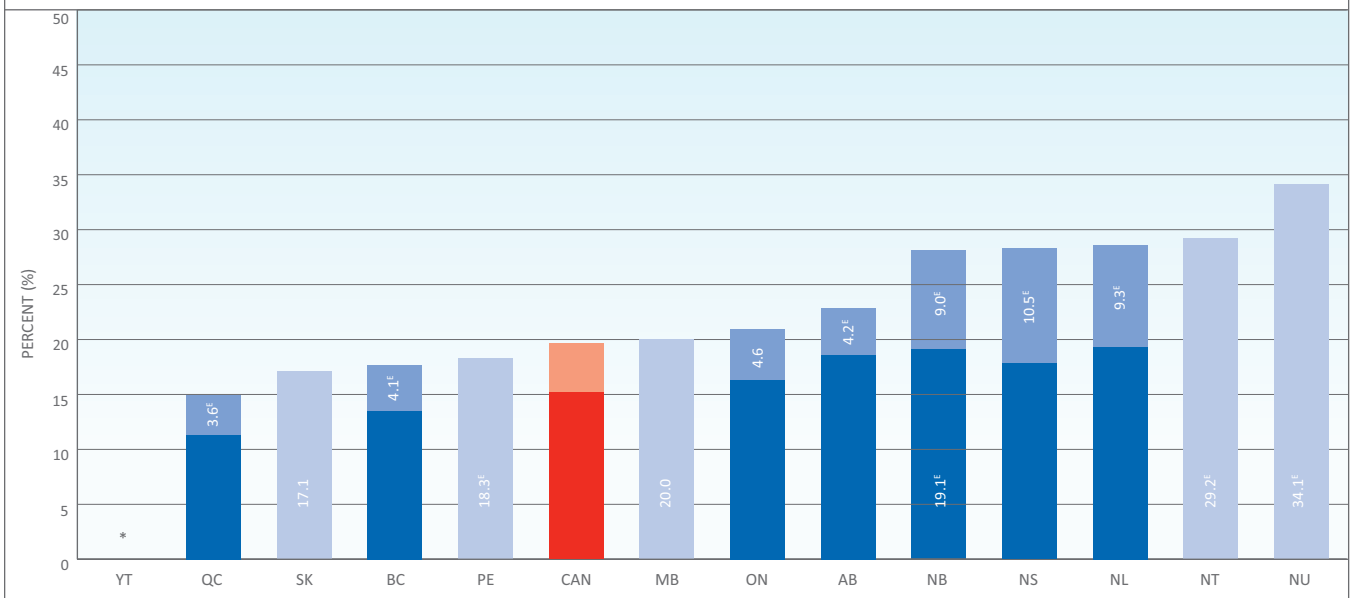
WHAT IS HAPPENING INTERNATIONALLY?

- In a study comparing 34 countries (most of which were European), Canada, had the fifth highest rate of childhood obesity, ranked lower than only Greenland, Wales, the United States, and Malta.[44]
- In Australia, the 1995 National Nutrition Survey showed 20% of 5–17 year olds classified as overweight or obese. Similar to Canada, obesity and overweight was highest in boys aged 15–17 at 6% and 18% respectively.[45]

FIGURE 25

Percentage of adolescents (age 12-17) classified as overweight or obese

BY PROVINCE/TERRITORY–CCHS 2009

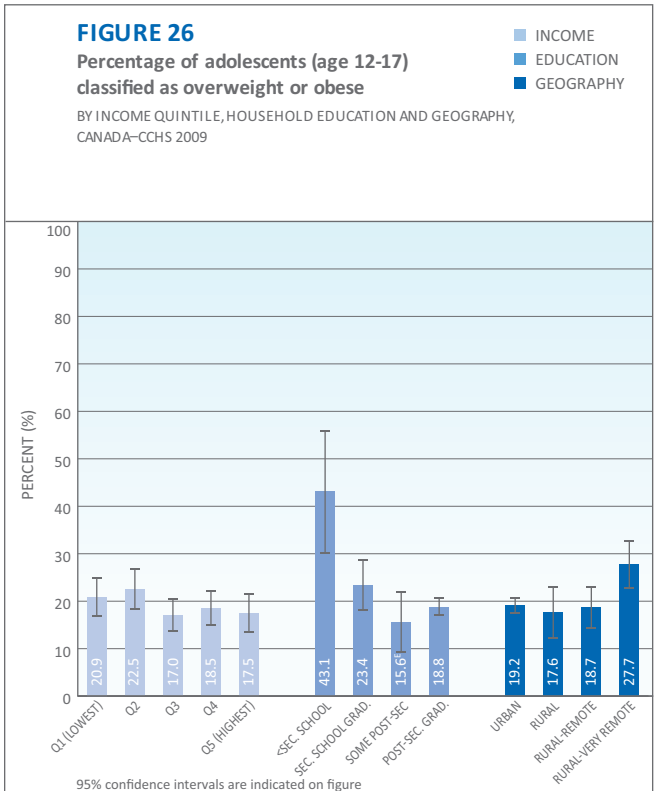


* Data suppressed due to statistical unreliability caused by small numbers
E Interpret with caution; coefficient of variation between 16.6% and 33.3%
Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 26

Percentage of adolescents (age 12-17) classified as overweight or obese

BY INCOME QUINTILE, HOUSEHOLD EDUCATION AND GEOGRAPHY, CANADA–CCHS 2009

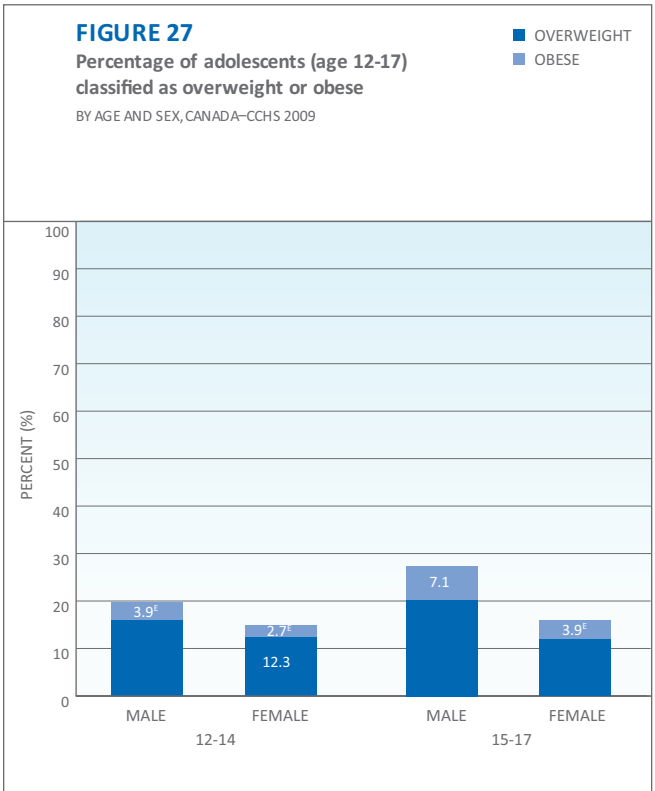


95% confidence intervals are indicated on figure
E Interpret with caution; coefficient of variation between 16.6% and 33.3%
Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 27

Percentage of adolescents (age 12-17) classified as overweight or obese

BY AGE AND SEX, CANADA–CCHS 2009



E Interpret with caution; coefficient of variation between 16.6% and 33.3%
Data source: Statistics Canada, Canadian Community Health Survey

WHAT IS BEING DONE?

- The Public Health Agency of Canada has developed a framework titled "Curbing Childhood Obesity: A Federal, Provincial and Territorial Framework" that outlines three key strategies to reverse the trend of unhealthy body weights.[42]
- There are five CLASP initiatives addressing risk factors for overweight and obesity, including physical activity, nutrition, the built environment, and social determinants of health. Three of these initiatives are targeted specifically at youth.[5]

WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- Adolescents age 12–17 are classified as "overweight" or "obese" according to the age-and-sex-specific BMI cut-off points as defined by Cole *et al*.[46]
- The Cole cut-off points are based on pooled international data (Brazil, Great Britain, Hong Kong, Netherlands, Singapore and United States) for BMI and linked to the internationally accepted adult BMI cut-off points of 25kg/m^2 (overweight) and 30kg/m^2 (obese).[46]
- BMI was calculated using self-reported personal height and weight.
- Detailed calculation methodology is provided in the Technical Appendix (see page 150).

HPV VACCINATION UPTAKE

WHAT ARE WE MEASURING?

This indicator is defined as the proportion of people in the targeted cohort to receive the first dose of the HPV vaccination. The targeted cohort comprises females from schools (and specific grades/age groups) where the provincial HPV vaccination program has been offered.

WHY ARE WE MEASURING THIS?

- Infection with Human Papillomavirus (HPV) causes nearly all cervical cancers as well as a significant proportion of anogenital cancers.[47] In Canada, 60% of HPV-attributable cancers were cervical cancer.[48]
- HPV vaccines protect against high-risk HPV types (16 and 18), which are responsible for over 70% of cervical cancers.[47]
- In 2007, the National Advisory Committee on Immunization released recommendations for the HPV vaccine[49], and later that year the federal government announced funding for provinces and territories to implement HPV immunization programs.
- With organized vaccination programs just beginning, it is premature to measure overall immunization rates.
- Measuring and reporting on provincial HPV vaccination program uptake allows for identification of performance gaps and informs opportunities for increased efforts in prevention activities.

WHAT DO THE RESULTS SHOW?

- ***All provinces and territories have begun implementing an HPV vaccination program.***
  - Ontario, Nova Scotia, Newfoundland and Labrador, and Prince Edward Island were the first provinces to implement a school-based HPV vaccination program, with roll-out starting in 2007; other provinces started their program in 2008. By 2010, all provinces and territories had implemented a school-based program.
  - Target populations for the vaccination programs vary by province/territory with the youngest being 4th grade (age 9–10) and the oldest being 8th grade (age 13-14). Catch-up cohorts were established in 10 of 13 provinces/territories to offer the vaccine to older age groups. Catch-up cohorts are typically one to four grades ahead of target population. Quebec and Northwest Territories opened their catch-up program to females in the general population under the ages of 18 and 22 respectively. All provinces target females only.
- ***Uptake rates[b] of organized HPV vaccination programs varied by province/territory (Figure 28).***
  - Of provinces that are able to report on this indicator, the percentage of the target population included in vaccination programs in 2008/09 school year that received the first dose of vaccination ranged from a high of 88% in Newfoundland and Labrador to 52% in Manitoba.
  - NT and Prince Edward Island were unable to provide actual data and offered an estimate of participation rates. These estimates are in line with actual data provided by other provinces/territories.

[b] The denominator for the uptake rate reported on here is the number of target grade (which varies by province) girls in schools where the provincial HPV vaccination program has been offered. It is not the entire female population within the targeted age range for the province.

WHAT IS HAPPENING INTERNATIONALLY?

- The UK national HPV immunization program reported an uptake of 88% in their first implementation year (September 2008).[50]
- In the first year of organized HPV vaccination implantation, Australia's State uptake ranged from 84% to 57% for the first dose.[51]

WHAT IS BEING DONE?

- The Surveillance and Epidemiology Division of the Public Health Agency of Canada, in direct collaboration with the Pan-Canadian Cervical Screening Initiative, is in the process of drafting quality indicators for HPV vaccination and assessing readiness for the measurement of these indicators across provinces. The orientation of these activities is toward future reporting of a core set of indicators for cervical cancer control.
- Provincial and territorial programs continue to be rolled out, allowing for more females in the target age range to be offered vaccination.

WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- The HPV vaccine is given in a series of three single doses over a six-month period. This indicator shows the percentage of the target population to receive the first of the three doses.
- Provincial/territorial programs have different target populations, different implementation plans and associated phases. As provinces continue with the implementation of the vaccine programs, it is expected that percentages will increase and interprovincial variation will decrease.
- Alberta and Ontario data indicate the percentage of target population to receive all three doses of the series; it is expected that their results for the first dose would be higher than as currently shown. In examining 2010 HPV vaccination coverage among adolescents age 13–17, the Centers for Disease Control and Prevention (CDC) found that 49% of females received ≥1 dose of HPV while 32% received ≥3 doses.[52]
- Nunavut and Prince Edward Island were able to provide only estimates of the number vaccinated; these numbers should be interpreted with caution.
- Detailed calculation methodology is provided in the Technical Appendix (see page 150).

TABLE 1

Implementation of province-wide organized HPV vaccination programs, by province

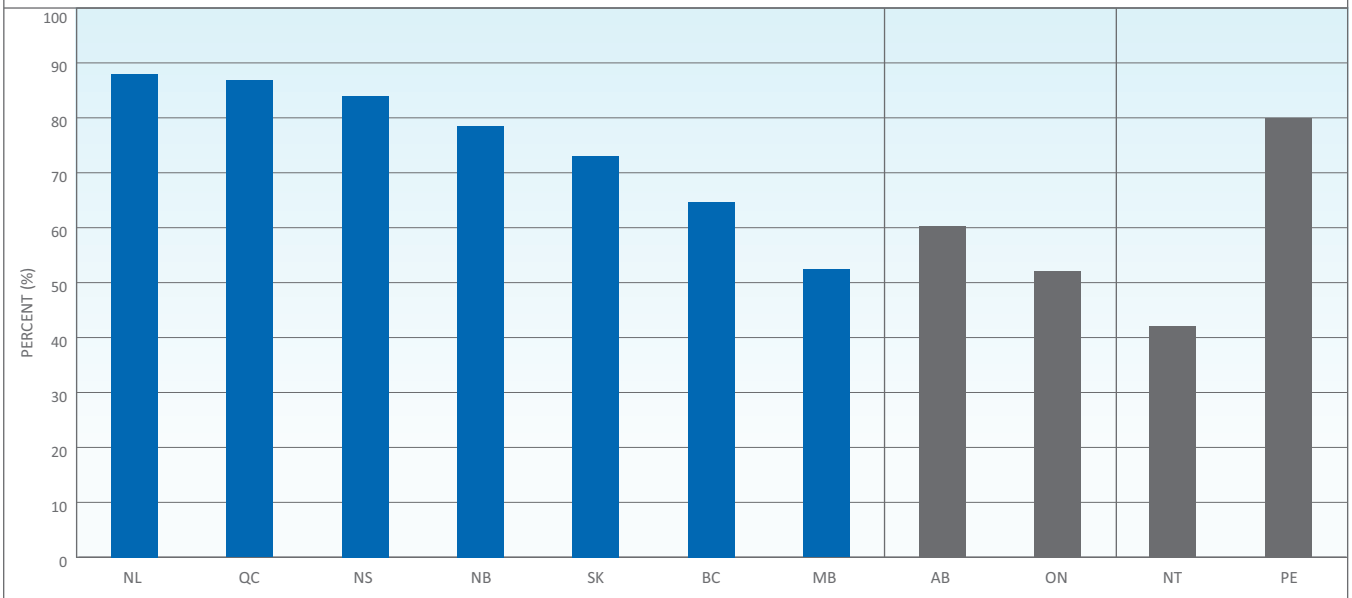
	NU	NT	YT	BC	AB	SK	MB	ON	QC	NB	NS	PE	NL
DATE OF FIRST IMPLEMENTATION	2010	Sep-09	Nov-09	Sep-08	Sep-08	Sep-08	Sep-08	Sep-07	Sep-08	Sep-08	2007	2007	Sep-07
TARGET AGE GROUP/ FEMALE COHORT IMMUNIZED	Grade 6 or ≥ 9 years old	Grade 5	Grade 6	Grade 6	Grade 6	Grade 6	Grade 6	Grade 8	Grade P4 Grade S3 (G4, G9)	Grade 7	Grade 7	Grade 6	Grade 7
CATCH-UP PROGRAM	No	Yes	Yes	Yes*	Yes	Yes	No	No**	Yes	Yes	No	Yes	Yes
CATCH-UP PROGRAM DETAILS	n/a	all females <22 yrs old	Grade 7 Grade 8	Grade 9	Grade 9	Grade 7	n/a	n/a	<18 yrs old	Grade 8	n/a	Grade 9	Grade 9

*BC has recently completed catch-up and as of 2011/12, the vaccine will no longer be offered to Grade 9 females.
**ON offers extended eligibility to Grade 9 females who have received at least one dose in Grade 8.

FIGURE 28

Percentage of cohort immunized* with first dose of HPV immunization

BY PROVINCE–2008-2009 SCHOOL YEAR



AB and ON data are for 3rd dose
NT, PE data are estimates
*Cohort immunized is unique to the province and implementation stage; it includes only schools/grades where programs have been offered
Data Source: Pan-Canadian Cervical Screening Initiative

Screening Indicators

This chapter of the *Report* presents indicators for cervical cancer screening and colorectal cancer screening. Different from self-reported data in previous reports, this year's *Report* presents actual baseline data on Papanicolaou (Pap) test screening participation rates in organized screening programs participating in the Pan-Canadian Cervical Screening Initiative. For colorectal cancer, the *Report* updates self-reported screening from a sample of provinces and territories and show availability of organized programs. There were no updated self-reported data on breast cancer screening available in time to include in this year's *Report*.

SCREENING HAS BEEN SHOWN TO REDUCE MORTALITY AND INCIDENCE IN SEVERAL CANCERS.

Regular screening has been identified as an effective strategy for reduction of mortality for breast, cervical and colorectal cancer though early detection, thus allowing for more successful treatment. Evidence from clinical trials and systematic reviews of the literature illustrates that screening can reduce the incidence, as well as the mortality, of colorectal cancer though the early detection of pre-cancerous polyps.[53-56] For these outcomes to be realized, high-quality screening needs to be accessed by a large proportion of the target population for each screening modality.

NATIONAL SCREENING TARGETS ARE IN PLACE FOR BREAST CANCER AND ARE UNDER DEVELOPMENT FOR COLORECTAL CANCER.

The Canadian Breast Cancer Screening Initiative (CBCSI) has set targets for breast cancer screening participation rates at a minimum of 70% of the female population age 50–69. This is the same minimum target set by the UK, Australia and the European Guidelines (albeit in some cases with differences in definition of target population).[57] The National Colorectal Cancer Screening Network (NCCSN) has begun a process to set national targets for colorectal cancer screening. Meanwhile, there are no national targets set for cervical cancer screening at this point in time. Many provinces, however, have set their own targets for breast, colorectal and cervical screening.

THE PARTNERSHIP, WITH ITS PARTNERS, IS WORKING TO CREATE INFRASTRUCTURE TO MONITOR, EVALUATE AND ULTIMATELY IMPROVE SCREENING IN CANADA.

Three national organizations, the National Colorectal Cancer Screening Network (NCCSN), the Canadian Breast Cancer Screening Initiative (CBCSI) and the Pan-Canadian Cervical Screening Initiative (PCCSI), are working to promote and advance screening for their respective disease sites. Each organization is working to identify and measure a range of performance indicators to help monitor and evaluate progress and identify opportunities for improvement. The organizations are also responsible for maintaining screening standards and guidelines and promoting knowledge across the country.

SCREENING DATA COME FROM A MIXTURE OF DATA SOURCES.

Data on cervical cancer screening come from provincial screening networks in provinces participating in the Pan-Canadian Cervical Cancer Screening Initiative. Data for colorectal cancer screening are based on self-reported data from the Canadian Community Health Survey (CCHS).

For more notes on the CCHS, please refer to the Prevention section introduction.

SCREENING PARTICIPATION RATES ARE INCREASING WHERE TREND DATA ARE AVAILABLE.

PREVENTION INDICATOR	SUMMARY OF NATIONAL SITUATION	TRENDS
Cervical cancer screening rates	Screening participation rate was relatively comparable across provinces, ranging from 64% to 76% for women having at least one Pap test in the three-year period (2006 to 2008).	Baseline screening program participation data suggest that coverage is high as has historically been the case according to self-report.[58]
Colorectal cancer screening rates	Participation rates ranged from 22% to 52% (of provinces reporting for 2009).	The proportion of Canadians age 50–74 who reported being up to date for CRC screening has increased in recent years as provincially organized screening programs continue to roll out.

CERVICAL CANCER SCREENING

WHAT ARE WE MEASURING?

This indicator examines screening rates within organized provincial programs and is measured in two ways. First, the average percentage of women age 20–69 who had at least one Pap test in a three-year period, also known as "participation rate", is presented. Next, the percentage of women age 20–69 who had a Pap test within three years after a negative Pap test, known as the "retention rate", is provided. Ideally, the calculation of the cervical screening participation rate should exclude women who have had a total hysterectomy (including the removal of the cervix). Only British Columbia provided participation rates corrected for hysterectomy. Elsewhere, rates have not been corrected for hysterectomy due to either lack of data, methodology to adjust for hysterectomy or analytic capacity.

WHY ARE WE MEASURING THIS?

- Approximately 1,300 women are diagnosed with cervical cancer in Canada each year, and the case fatality rate is over 25%.[48]
- Cervical cancer screening can lead to early detection of pre-cancerous lesions before they develop into invasive cervical cancer, therefore reducing cervical cancer incidence and mortality.[59-60] Indeed, since the introduction of the Papanicolaou (Pap) test in 1949, the incidence and mortality of cervical cancer have decreased markedly.[48]
- Making provincial screening rates available allows for the identification of potential gaps and sharing of best practice strategies between provinces. Ultimately, linkage between screening and outcome indicators would inform evaluation and impact analysis.
- Canadian cervical cancer screening guidelines are currently under revision by the Canadian Task Force on Preventive Health Care. Provincial guidelines have also been recently updated or are currently under review. Generally, revised cervical cancer screening guidelines across provinces recommend that screening be initiated at age 21 (a change from the previous recommendation of age 18), or within three years of onset of sexual activity, and be repeated every two to three years following three consecutive (annual) negative tests. While the Pap test does have limitations, its high false-negative rate being the most critical[61], the slow-growing nature of the disease makes the Pap test effective when performed at regular intervals.
- As yet, there are no national targets in Canada for cervical cancer screening participation or retention rates.

WHAT DO THE RESULTS SHOW?

- ***The average percentage of women age 20–69 who had at least one Pap test within an organized provincial program in a three-year period from 2006 to 2008 uncorrected for hysterectomy was 70%.***
  - The percentage of women with at least one Pap test in the three-year period included in the measure ranged from 64% in Saskatchewan to 76% in Alberta. The participation rate corrected for hysterectomy was 80% in British Columbia and 72% in Ontario (Figure 29).

- The percentage of women with at least one Pap test uncorrected for hysterectomy ranged from 81% among women age 20–29 to 51% among those age 60–69 (Figure 30). The hysterectomy-corrected participation rate was more uniform across the age groups because women not eligible for a Pap test were removed from the calculation of the rate.

- ***The percentage of women age 20–69 who had a Pap test within an organized provincial program within three years after a negative Pap test (known as the "retention rate") was 80.6% (Figure 31).***
  - Retention ranged from 75% in Saskatchewan to 87% in Alberta.
  - Retention also decreased with age. Retention in the 20–29 age group was 82%, and in the 60–69 age group it was 72% (data not shown).

WHAT IS HAPPENING INTERNATIONALLY?

- The *2010 System Performance Report* provided statistics based on self-reported data in the CCHS from 2008. The percentage of women age 18–69 (who had not undergone a hysterectomy) who reported having had a Pap test in the previous three years was 79% for Canada and ranged from 74% in Nunavut to 88% in the Northwest Territories.[62] The self-reported rate is somewhat higher than the screening rates measured by the networks and presented in this *Report*. This may reflect positive bias in self-reported data.
- Pap-test rates have fallen within the 70% to 80% range in other countries:
  - According to data from organized screening programs for the years 2005 to 2007, 74% of Australian women age 20–69 had received a Pap test in the previous three years.[63]
  - In the UK in 2009, 80% of eligible British women age 25–64 had received a Pap test in the previous five years, also according to screening program data.[64]
  - In the United States in 2008, 75.6% of respondents to the National Health Interview Survey who were age 18 years and older reported having a Pap smear within the last three years.[65]

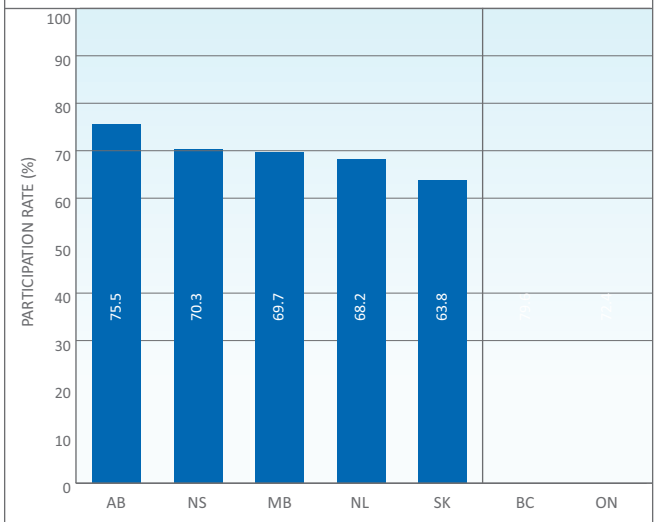
WHAT IS BEING DONE?

- The Pan-Canadian Cervical Screening Initiative, which held its inaugural meeting in June 2009, provides a national forum for discussion and action to improve cervical cancer control. In addition to the Partnership's Screening Advisory Group, the Initiative includes key stakeholders from the provinces and territories, professional health care groups, Public Health Agency of Canada—First Nations and Inuit Health Branch, Canadian Cancer Action Network and Canadian Cancer Society.[66]
- The report "Cervical Cancer Screening in Canada: Monitoring Performance" represents one early strategy that the Initiative has undertaken. The goal of this report, which is the first of its kind in Canada, is to provide information on the performance of cervical cancer screening programs across Canada according to a standardized set of performance indicators to facilitate comparisons across the country and to identify gaps in data availability.

FIGURE 29

Percentage of women 20 to 69 years of age who had at least one Pap test

BY PROVINCE, 2006–2008

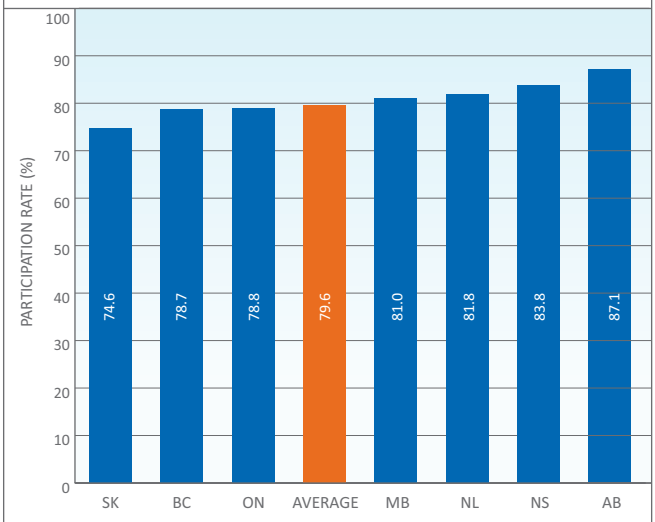


ON and BC data are corrected for hysterectomy
NL data are for 2005–2007
AB data are for the areas in which the organized program operated during these years (≈ 40% of the population)
Data Source: Provincial screening programs, Pan-Canadian Cervical Screening Initiative

FIGURE 31

Percentage of women 20 to 69 years of age who had a Pap test within 3 years after a negative Pap test

BY PROVINCE, 2004–2005

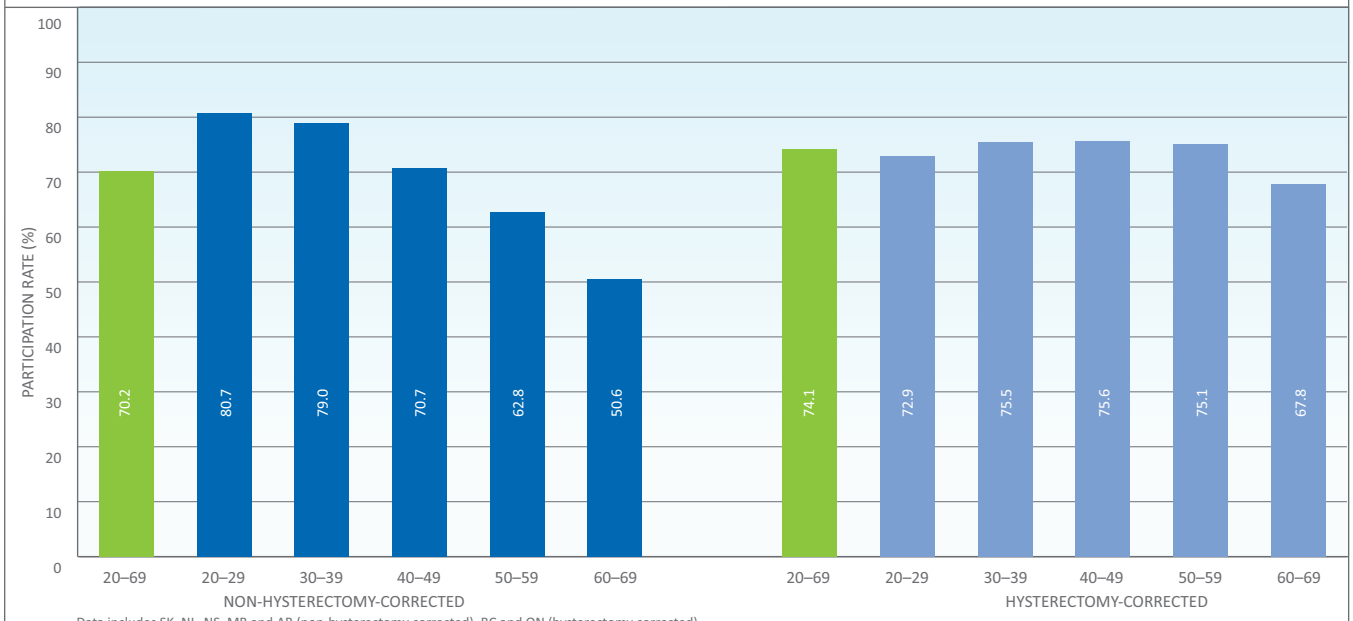


ON data are for 2003 and 2006 for ≈ 85% of all Pap tests performed in the province
NL data are for 2004
AB data are for the areas in which the organized program operated during these years (≈ 40% of the population)
Data Source: Provincial screening programs, Pan-Canadian Cervical Screening Initiative

FIGURE 30

Percentage of women who had at least one Pap test

BY AGE, 2006–2008, PROVINCES COMBINED



Data includes SK, NL, NS, MB and AB (non-hysterectomy corrected), BC and ON (hysterectomy corrected)
NL data are for 2005–2007
AB data are for the areas in which the organized program operated during these years (≈ 40% of the population)
Data Source: Provincial screening programs, Pan-Canadian Cervical Screening Initiative

WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- Data used to calculate this indicator was generated by the Pan-Canadian Cervical Screening Initiative, which is supported by the Partnership.
- Data for women age 20–69 for the years 2006, 2007 and 2008 were provided by the provincial screening programs in Newfoundland and Labrador, Nova Scotia, Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia.
- Ideally, the calculation of the cervical screening participation rate should exclude women who have had a total hysterectomy (including the removal of the cervix) and those who have never been sexually active. In addition, women who have previously been diagnosed with a gynecological cancer may not need routine screening and should be excluded. Only British Columbia provided participation rates corrected for hysterectomy, although other provinces such as Ontario, Manitoba, and Newfoundland and Labrador are moving towards being able to calculate a hysterectomy-corrected rate.
- For the participation rate indicator, Newfoundland and Labrador provided data from 2005 to 2007, and Alberta provided data for two health regions (approximately 40% of the population).
- For the retention rate indicator, Newfoundland and Labrador provided data for 2004, and Alberta provided data for two health regions (approximately 40% of the population). Because women may have had a Pap test in a non-included area of the province, retention rates in Alberta may be underestimated.
- Detailed calculation methodology is provided in the Technical Appendix (see page 151).

COLORECTAL CANCER SCREENING

WHAT ARE WE MEASURING?

This indicator examines the self-reported percentage of the population within the target age group (50–74 years of age) who have undergone screening for colorectal cancer (CRC) for asymptomatic reasons. Screening includes Fecal Occult Blood test (FOBT) within the previous two years and/or colonoscopy/sigmoidoscopy within the previous five years. This indicator also shows the availability of provincially organized screening programs; this is defined as the percentage of the target population for which the program is accessible.

WHY ARE WE MEASURING THIS?

- In 2011, it is estimated that 12,500 men and 9,700 women in Canada will be diagnosed with colorectal cancer (CRC) and 8,900 will die, making CRC the second leading cause of cancer death in Canada behind lung cancer.[67]
- Screening using fecal tests reduces CRC mortality as well as its overall incidence (through detection of cancerous polyps).[53-55] It is recommended that CRC screening be carried out in an organized program to allow for greater potential to monitor and evaluate the screening process. As of 2011, all provinces have developed or are developing screening programs all of which employ fecal occult blood tests (FOBTs) (either guaiac or immunochemical) as the entry screening test and recommend screening for average-risk persons age 50–74. Colonoscopy is the diagnostic test typically recommended as a follow-up to a positive FOBT result or as screening for high-risk individuals.
- Reporting on provincial screening rates identifies opportunities for program improvement and adoption of best practices.

WHAT DO THE RESULTS SHOW?

- ***Both self-reported testing rates and availability of organized screening programs vary widely by region.***
  - In 2009, self-reported testing rates for CRC for asymptomatic individuals age 50–74 varied by reporting province/territory, ranging from 22% in Yukon to 52% in Ontario (Figure 32). Over the past three CCHS cycles, most provinces that reported in all three years have shown steady improvements in participation rate (data not shown).
  - As of August 2011, provincial screening programs in Ontario, Prince Edward Island, and Nova Scotia reported having 100% availability to the target population (Figure 33). Manitoba reported between 50% and 99% availability, Alberta and Saskatchewan reported between 10% and 49% availability and British Columbia reported between 1% and 9% availability. New Brunswick, Newfoundland and Labrador, and Quebec are currently in the planning phase of their program.

WHAT IS HAPPENING INTERNATIONALLY?

- There are several countries in the process of implementing CRC screening programs, including the United Kingdom, Australia, France, Spain, Italy, Finland, and Israel.[68-75] Participation rates vary across the programs and pilot studies, from 17% in Spain to 70% in Finland. Program design varies considerably, including type of screening test and methods of invitation.

WHAT IS BEING DONE?

- The National Colorectal Cancer Screening Network (NCCSN) was established in 2007 to "serve as a national forum to discuss and take action on matters of mutual interest or concern related to the implementation of organized colorectal screening programs".[76] This network has helped accelerate the development of organized screening programs in all provinces.
- In 2010, the NCCSN launched a "Colonversation" campaign to promote awareness of CRC screening. The Colonversation website[77] was built to encourage discussion, inform the public and increase participation.
- The NCCSN has also established a process for national reporting of quality indicators. The first report, published in 2010, is an internal report focusing on process. The NCCSN looks forward to publishing a first external report within the next three years.
- The NCCSN is currently working toward quality improvement of screening in Canada through the development of common national targets for colorectal cancer screening quality indicators, by working toward building consensus on attainable targets and timelines for core quality indicators and on new national indicators.

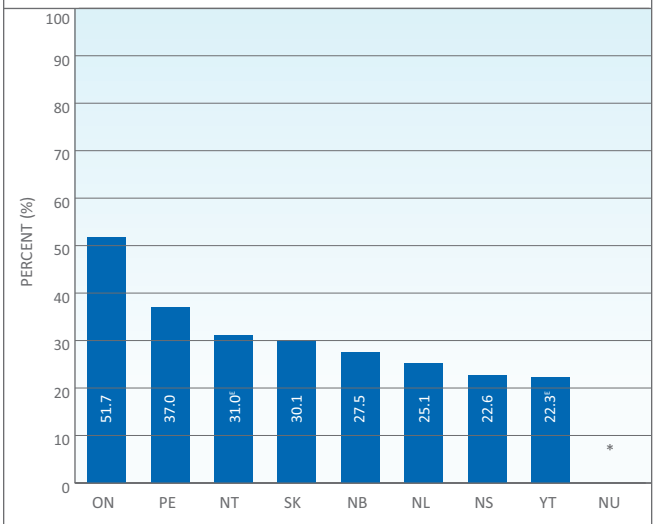
WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- The data are based on persons who reported being tested with FOBT within the previous two years and/or sigmoidoscopy/colonoscopy within the previous five years. As such, this indicator is not limited to screening through organized programs.
- There is variability among the provinces in their stage of planning and implementation, the program design and screening models, as well as patient recruitment approaches.
- Detailed calculation methodology is provided in the Technical Appendix (see page 151).

FIGURE 32

Percentage of population (age 50-74) reporting FOBT and/or sigmoidoscopy/colonoscopy for asyptomatic reasons

BY PROVINCE/TERRITORY, CANADA–CCHS 2009

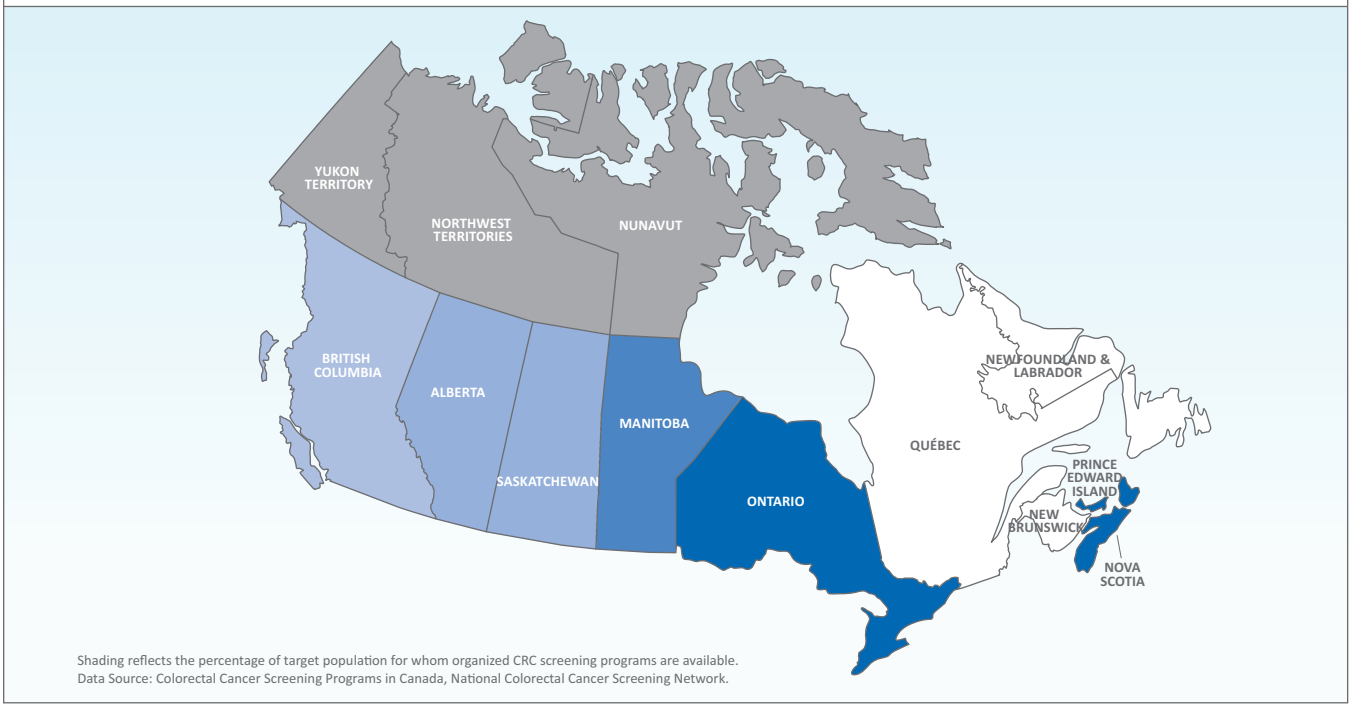


* Data suppressed due to statistical unreliability caused by small numbers
E Interpret with caution; coefficient of variation between 16.6% and 33.3%
Data source: Statistics Canada, Canadian Community Health Survey

FIGURE 33

Colorectal cancer screening program availability

BY PROVINCE, NCCSN–2011



Shading reflects the percentage of target population for whom organized CRC screening programs are available.
Data Source: Colorectal Cancer Screening Programs in Canada, National Colorectal Cancer Screening Network.

Diagnosis Indicators

In this *Report*, data are provided on two select markers of the diagnostic process including: Capture of Stage Data as a key diagnostic input to calculate other important indicators and Wait Times for Abnormal Breast Screen to Resolution as a measure of timely access to diagnostic services. In the *Developmental and Interim Indicators* chapter of this *Report*, data are presented on PET Scanner Capacity as a measure of system capacity and use. Despite its importance in the spectrum of cancer control, the availability of nationally comparable performance data for cancer diagnosis is limited.

IMPROVEMENTS IN THE DIAGNOSTIC PROCESS WILL IMPROVE THE PATIENT EXPERIENCE.

Cancer diagnosis marks the entry point into the treatment phase for cancer patients. As such, any measures that improve the diagnostic process will contribute to more timely treatment and less anxiety during the course of a patient's experience with the disease.

DIAGNOSIS INDICATOR	SUMMARY OF RESULTS
Capture of stage data	For 2009, six of nine reporting provincial registries captured stage data on at least 90% of cases in the top four cancer sites. The capture of stage data for all cancers has increased over time from 2007 to 2009.
Wait times for abnormal breast screen to resolution	Patients not requiring a biopsy were more likely to be diagnosed within the target timeframes following a positive mammogram than those requiring a biopsy to resolve their diagnosis.
PET scanner capacity and use *	There was much variability across the country in the availability and use of PET scanners, whether looked at by number of scanners per million people (range: 0 to 1.8) or by number of scans per million people (range of 515 to 1,819). That said, compared to 2009, use of scanners appeared to be increasing in 2010 in three of four provinces providing this data.

*Included in the *Developmental and Interim Indicators* chapter

THE PARTNERSHIP, WORKING WITH ITS PARTNERS, IS CREATING AN INFRASTRUCTURE TO MONITOR, EVALUATE AND ULTIMATELY IMPROVE DIAGNOSTIC SERVICES IN CANADA.

The Partnership's Staging Initiative is helping to facilitate population-based, electronic, collaborative stage data collection for the four major cancer sites in all provinces and territories across Canada. This availability of population-based staging will, among other benefits, improve our understanding of cancer diagnosis patterns. The Partnership is also supporting the implementation of synoptic pathology reporting nationally, which will also add substantial value to our ability to evaluate pathological diagnosis patterns and related diagnostic guidelines and standards in Canada.

CAPTURE OF STAGE DATA

WHAT ARE WE MEASURING?

This indicator measures the percentage of provincial cancer incident cases, overall and for the top four disease sites (breast, prostate, colorectal, and lung), for which valid stage at diagnosis data are available and collected by the provincial cancer agencies, for 2007, 2008 and 2009 diagnosis years.

WHY ARE WE MEASURING THIS?

- Stage at diagnosis is a critical prognostic factor that has important clinical value. Moreover, the availability of population-level staging at the provincial registry level allows for the calculation of more meaningful indicators of system performance, adding value to the interpretation of long-term outcome measures such as incidence, mortality and survival, and of treatment pattern indicators such as guideline concordance. Stage is also important for assessing the impact of screening and early detection on reducing the percentage of cases diagnosed with advanced cancer.
- The goal of the Partnership's Staging Initiative is to capture stage data for 90% of patients diagnosed in 2010 and beyond for the top four cancer sites (breast, colorectal, lung and prostate).

WHAT DO THE RESULTS SHOW?

- ***For the 2009 diagnosis year, six of nine reporting provinces had stage data on at least 90% of cases in the top four cancer sites.***
  - Of the nine provinces that reported data on stage capture for the 2009 diagnosis year, five had stage for over 90% of all cancer cases, compared to only three for 2008 (Figure 34). For the top four cancer sites, six of the nine provinces reported having stage data for over 90% of 2009 incident cases (Figure 35).
  - The percentage of total incident cases for which stage data are available has increased steadily between the 2007 and 2009 diagnosis years for most provinces.

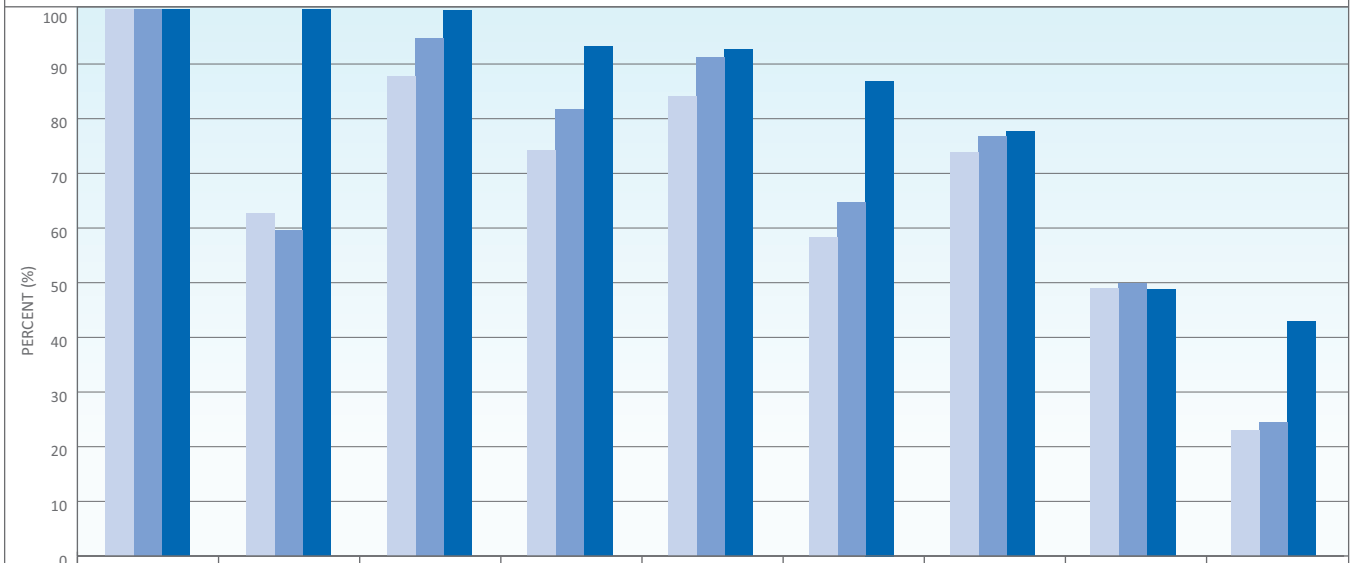
WHAT IS HAPPENING INTERNATIONALLY?

- Few large developed countries have population level stage data centrally collected for all cancers. In Australia, a population staging feasibility study conducted in 2004 identified several barriers to central collection of comprehensive stage data.[78] In the United States, stage data are collected for most cases within the Surveillance, Epidemiology and End Results (SEER) database, but the data included represent only 28% of total US cancer cases; the National Cancer Data Base includes stage data for 70% of stageable cancer cases in the US.[79] In Europe, the EUROCARE database project collects stage data from the European cancer registries through a sampling study but it is not population based.[80]

FIGURE 34

Percentage of incident cases for which stage data is available in provincial registries–all invasive cancers

BY PROVINCE–2007 TO 2009 DIAGNOSIS YEARS



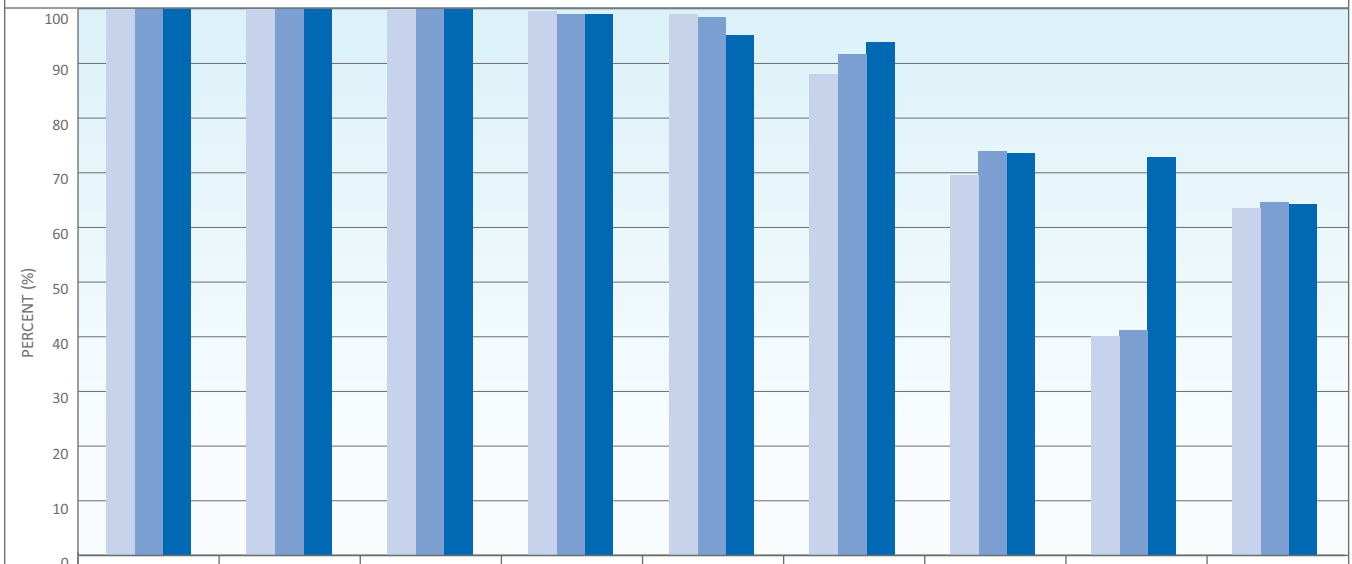
	MB	PE	AB	SK	NS	NL	ON	BC	NB
2007	100.0%	62.7%	87.8%	74.1%	84.0%	58.3%	73.8%	48.9%	22.9%
2008	100.0%	59.5%	94.7%	81.7%	91.2%	64.6%	76.7%	49.8%	24.4%
2009	100.0%	100.0%	99.8%	93.2%	92.7%	86.9%	77.7%	48.8%	42.9%

Data source: Provincial cancer agencies

FIGURE 35

Percentage of incident cases for which stage data is available in provincial registries–top 4 cancers*

BY PROVINCE–2007 TO 2009 DIAGNOSIS YEARS



	MB	PE	AB	SK	NS	ON	NL	NB	BC
2007	100.0%	100.0%	100.0%	99.6%	99.0%	88.0%	69.6%	40.2%	63.5%
2008	100.0%	100.0%	100.0%	99.1%	98.5%	91.8%	73.9%	41.3%	64.7%
2009	100.0%	100.0%	100.0%	99.1%	95.1%	94.0%	73.6%	72.9%	64.3%

*Top 4 cancers: Breast, Prostate, Colorectal, and Lung
Data source: Provincial cancer agencies

WHAT IS BEING DONE?

- The Partnership's Staging Initiative is a pan-Canadian approach to cancer staging and standardization of stage data collection. Toward that end, the Staging Initiative is creating common linkages across Canada and supporting provinces and territories to implement population-based, electronic, collaborative stage data collection for the four major cancer sites: Breast, Colorectal, Prostate and Lung.

WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- While it is acknowledged that virtually all clinicians stage patients as part of their prognostic assessment and treatment planning, what is being measured in this indicator is the collection and centralized retention of stage data at the cancer registry level.
- The stage capture rate includes staging collected through AJCC TNM system or through collaborative staging. Cases with invalid or missing stage data are considered not staged. Cases with stage unknown (UNK), for whom the clinical and pathological evaluation required for staging is not adequate to ascertain a complete stage, are included as staged in the indicator calculation.
- Several provinces retroactively augment their staging for prior years, so the stage rate for measured years may improve in subsequent measurement.
- Detailed calculation methodology is provided in the Technical Appendix (see page 152).

BREAST CANCER DIAGNOSIS WAIT TIMES: POSITIVE MAMMOGRAM TO RESOLUTION

WHAT ARE WE MEASURING?

This indicator examines the wait time between a positive mammogram and resolution of the diagnosis through biopsy or other diagnostic modality, by province. The indicator shows the percentage treated within the target timeframe and the 90th percentile wait time, for asymptomatic women age 50–69 screened within the provincial breast screening programs in 2009.

WHY ARE WE MEASURING THIS?

- Timely resolution of an abnormal screen through clinical investigation, and a definitive biopsy if required, facilitates prompt initiation of treatment and potentially improved patient outcomes.
- Measuring and comparing provincial wait times from positive mammogram to resolution allows for the identification of gaps, which could be addressed through quality improvement strategies.
- Guidelines identifying target wait times for abnormal breast screen to resolution were established by the Canadian Breast Cancer Screening Initiative's Working Group on the Integration of Screening and Diagnosis in 2000.[81] The target wait time is seven weeks for women requiring a biopsy and five weeks for those diagnosed by other means. These guidelines apply to asymptomatic women age 50–69 with no prior diagnosis of breast cancer.

WHAT DO THE RESULTS SHOW?

- ***Patients not requiring a tissue biopsy are more likely to be diagnosed within the target timeframes (following a positive mammogram) than those requiring a biopsy to resolve their diagnosis.***
  - The percentage of women enrolled in the screening program whose diagnosis is resolved following a positive mammogram within the target timeframes ranges from 45% to 84% when a biopsy is not required (Figure 36) and from 36% to 65% when a biopsy is required (Figure 38).
  - There is also interprovincial variation in the 90th percentile wait time, with a difference between shortest and longest wait time for provinces of 15.1 days without biopsy (Figure 37) and 7.6 days with biopsy (Figure 39).

WHAT IS HAPPENING INTERNATIONALLY?

- There are few international comparators for positive mammogram to resolution wait times. The United Kingdom has set a two-week wait times target for first outpatient appointment for "urgent" cases and 31 days from diagnosis to first treatment for cancer cases.[82]

WHAT IS BEING DONE?

- The Public Health Agency of Canada works through the National Committee of the Canadian Breast Cancer Screening Initiative (CBCSI) to support the development of quality, organized breast cancer screening programs in Canada. The National Committee monitors and assesses the performance of screening in Canada every two years. Initial investigations have been done to examine wait times across provinces and territories submitting data to CBCSI.[83]
- The Partnership is represented on CBCSI by the Director of the Screening Portfolio who, along with the chair of CBCSI, is currently co-chairing a working group struck specifically to address two recently identified priorities: revisiting the target wait time of seven weeks for abnormal breast screen to resolution, and devising strategies to further reduce wait times.
- The Canadian Breast Cancer Network, a national network of breast cancer survivors, published the *2008 Report Card* on wait times to diagnosis and treatment for breast cancer in Canada. Included in the report are guidelines and targets, factors explaining waits, as well as a suggested action strategy on wait times.[84]

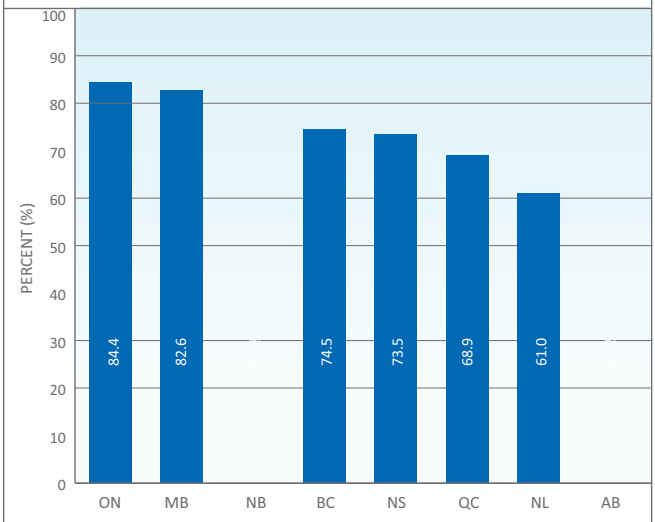
WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- Data were gathered directly from provinces and provided to the Screening Action Group of the Canadian Partnership Against Cancer. It is important to note that data collected are relevant only for women receiving mammograms or clinical breast exams through organized provincial breast screening programs. Program enrolment rates vary widely across provinces (from 8% in Alberta to 55% in Quebec and New Brunswick in 2007 to 2008) and should be taken into account when interpreting results. For more information on participation rates in organized breast screening programs, please see Figure A in the Technical Appendix.
- Detailed calculation methodology is provided in the Technical Appendix (see page 153).

FIGURE 36

Percentage of women (age 50-69) not requiring a tissue biopsy with resolution of abnormal breast screen within target* wait time

BY PROVINCE–2009

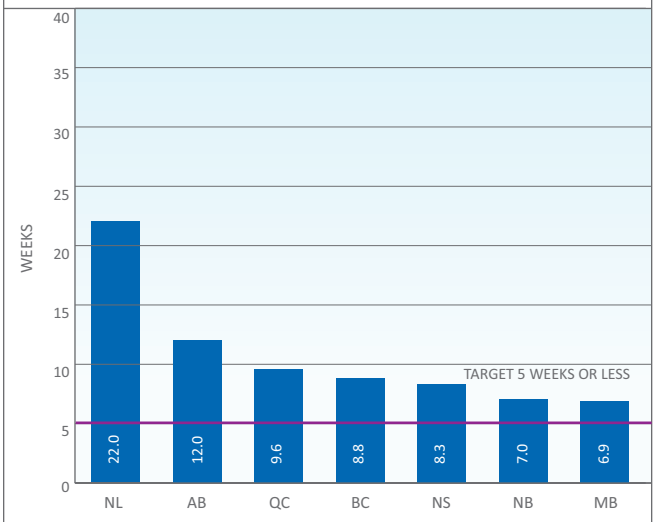


*Target time for resolution of abnormal breast screen for women not requiring a tissue biopsy is 5 weeks
Data for QC are for 2007
Data for AB are for Screen Test only (6% of screening mammograms in the province)
Data source: Provincial breast cancer screening databases

FIGURE 37

90th percentile wait time for resolution of abnormal breast screen for women (age 50-69) not requiring a tissue biopsy

BY PROVINCE–2009

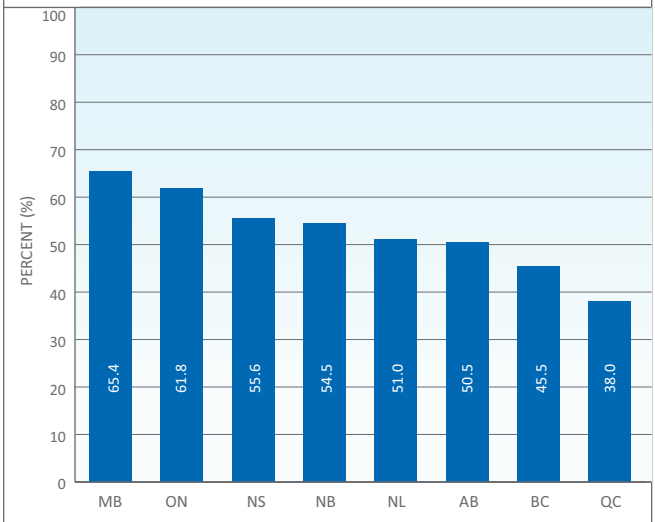


Data for QC are for 2007
Data for AB are for Screen Test only (6% of screening mammograms in the province)
Data source: Provincial breast cancer screening databases

FIGURE 38

Percentage of women (age 50-69) requiring a tissue biopsy with resolution of abnormal breast screen within target* wait time

BY PROVINCE–2009

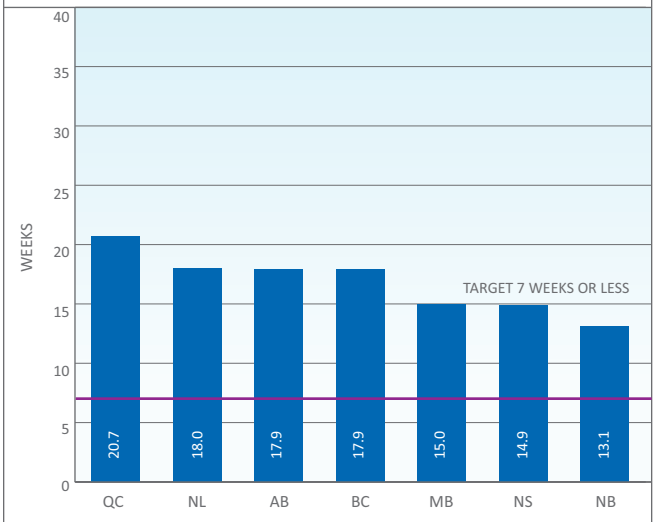


*Target time for resolution of abnormal breast screen for women requiring a tissue biopsy is 7 weeks
Data for QC are for 2007
Data for AB are for Screen Test only (6% of screening mammograms in the province)
Data source: Provincial breast cancer screening databases

FIGURE 39

90th percentile wait time for resolution of abnormal breast screen for women (age 50-69) requiring a tissue biopsy

BY PROVINCE–2009



Data for QC are for 2007
Data for AB are for Screen Test only (6% of screening mammograms in the province)
Data source: Provincial breast cancer screening databases

Treatment Indicators

Cancer treatment accounts for the majority of resources in the cancer control system, and includes delivering services such as surgery, systemic therapy and radiation therapy. The *2011 Report* includes a number of indicators of cancer treatment including capacity and utilization, wait times and treatment patterns compared to established guidelines.

SIMPLIFIED VERSIONS OF SEVERAL OF THE TREATMENT RATES RELATIVE TO GUIDELINES INDICATORS HAVE BEEN INCLUDED TO ALLOW FOR BROADER PROVINCIAL PARTICIPATION.

Reflecting its importance in the spectrum of cancer control, many indicators exist in the area of treatment. With that said, the data with which to measure these indicators are not always universally available in Canada. As a result, many of the treatment indicators presented in this chapter have "simplified" versions. Although they do not constitute a measure of evidence-based practice, the simplified measures were formulated to increase the number of provinces included in the different indicators. Where presented, simplified measures are clearly defined next to the "full guideline" indicator definitions, and results are carefully interpreted.

TREATMENT INDICATOR	SUMMARY OF RESULTS
Radiation therapy wait times	Seven of 10 provinces had achieved the target of 90% of patients starting radiation therapy within four weeks of being ready to treat. The 90th percentile wait time had dropped for most provinces between 2008 and 2010.
Radiation therapy capacity and utilization	Radiation therapy capacity, i.e., the number of linear accelerators per capita, is increasing in several provinces and overall comparing 2010 to 2009. Meanwhile, radiation therapy use was shown to vary by province, overall and by disease site, with no consistent trends from 2007 to 2009.
Neoadjuvant radiation therapy for resected stage II and III rectal cancer	There was some interprovincial variation in the percentage of resected stage II and III rectal cancer cases treated with pre-operative radiation therapy, ranging from 36% to 48% in 2008 and representing an increase since 2007.
Adjuvant radiation therapy for stage I and II breast cancer	In 2008, there was substantial variation in the percentage of early stage breast cancer cases treated with radiation therapy, ranging from 77% to 89% among provinces providing data on the percentage of stage I or II breast cancer patients who receive adjuvant radiation therapy following breast-conserving surgery. This represents an increase in 2008 compared to 2007. The percentage of stage I or II breast cancer patients receiving radiation therapy within 21 months (irrespective of surgery) ranged from 40% to 67%.
Adjuvant chemotherapy for fully resected stage III colon cancer	The percentage of resected stage III colon cancer cases treated with adjuvant chemotherapy ranged across provinces from 49% to 90%, with the treatment rate appearing to drop for some provinces between 2007 and 2008.
Adjuvant chemotherapy for stage II and IIIA non– small cell lung cancer	Rates ranged from 41% to 64% across provinces, and there was no obvious trend in the rates between 2007 and 2008.
Removal and examination of 12 or more lymph nodes in colon resections	The percentage of colon resections with 12 or more nodes removed and examined varied from 52% to 76% across provinces in 2008. This represented a slight increase from 2007.

RADIATION THERAPY WAIT TIMES

WHAT ARE WE MEASURING?

This indicator measures radiation therapy wait times from ready-to-treat to start of treatment for 2008 to 2010. This is expressed as the percentage of patients treated within the target timeframe as well as 90th percentile wait time in days.

WHY ARE WE MEASURING THIS?

- Timely access to radiation therapy is a key component of a high-quality cancer control system.
- National targets for radiation therapy wait times have been established, and all provinces have implemented initiatives to measure and improve their wait times.[85] The national target is for patients to start radiation therapy within four weeks of being ready to treat. Provinces have targeted a reduction in wait times for 90% of patients to below the national four-week benchmark.

WHAT DO THE RESULTS SHOW?

- ***In 2010, seven of 10 provinces had achieved the target of 90% of patients treated within the national wait time benchmark.***
  - The percentage of patients treated with radiation therapy within four weeks of being ready to treat in 2010 ranged from 80% in Nova Scotia to 100% in Manitoba (Figure 40).
  - The 90th percentile wait time has improved for most provinces between 2008 and 2010 (Figure 41). The lowest 90th percentile wait times are in Saskatchewan and Ontario at 20 days in the last year measured.

WHAT IS HAPPENING INTERNATIONALLY?

- There are surprisingly very few international comparators for radiation therapy wait times. Other countries have focused to some extent on measuring wait times in emergency or wait times for surgery but not on radiation therapy.

WHAT IS BEING DONE?

- All provinces have initiatives in place to reduce wait times and monitor variations within the provinces. This interprovincial comparison provides information on relative performance nationally and can help identify local best practices that could be applied more broadly.

WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

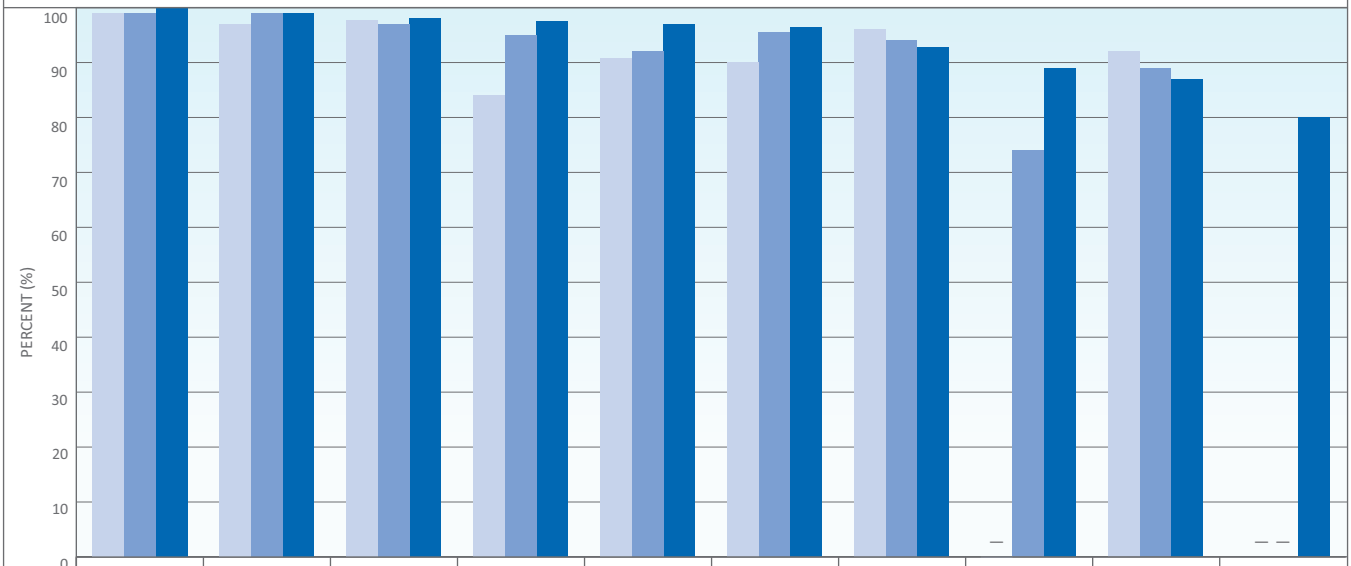
- "Ready to Treat" is the starting point for the wait times measurement. While considerable effort has gone into development and adoption of standardized definitions for this, interprovincial variations persist.
- Nova Scotia began measuring and monitoring wait times using the "ready-to-treat to start of treatment" standard only in 2010.
- Detailed definitions and calculation methodology are provided in the Technical Appendix (see page 154).

[3] Ready-to-treat is defined somewhat differently by different provinces but essentially represents the point at which a patient is judged by the clinician to be ready to receive radiation therapy and can therefore be scheduled for their first treatment session.

FIGURE 40

Percentage of cancer patients treated within radiation therapy wait times target*–all cancers

BY YEAR OF TREATMENT (2008 TO 2010), BY PROVINCE



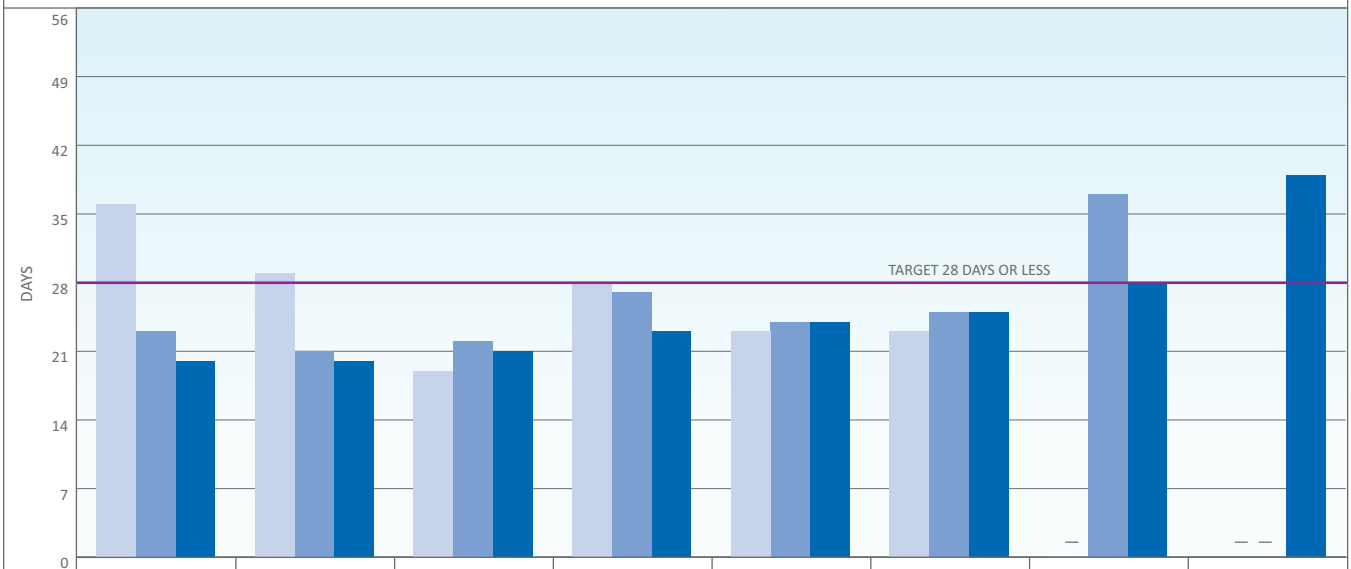
	MB	QC	PE	SK	NL	ON	BC	AB	NB	NS
2008	99.0%	97.0%	97.6%	84.0%	90.7%	90.0%	96.0%	—	92.0%	—
2009	99.0%	99.0%	97.0%	95.0%	92.0%	95.4%	94.0%	74.0%	89.0%	—
2010	100.0%	99.0%	98.0%	97.5%	97.0%	96.3%	92.8%	89.0%	87.0%	80.0%

* Wait times target: 4 weeks between ready to treat and start of treatment
NS did not collect ready to treat dates prior to 2010
Data Source: Provincial cancer agencies

FIGURE 41

90th percentile radiation therapy wait times for all cancers

BY PROVINCE AND YEAR OF TREATMENT–2008 TO 2010



	SK	ON	PE	NL	BC	MB	AB	NS
2008	36	29	19	28	23	23	—	—
2009	23	21	22	27	24	25	37	—
2010	20	20	21	23	24	25	28	39

NS did not collect ready to treat dates prior to 2010
"—" Data not available
Data Source: Provincial cancer agencies

RADIATION THERAPY CAPACITY AND UTILIZATION

WHAT ARE WE MEASURING?

This indicator examines capacity and utilization of radiation therapy services by province. Capacity is measured as number of linear accelerators (LINACs) per capita and the number of radiation treatments per LINAC. The use of radiation therapy for cancer treatment is measured by the percentage of incident cases treated with radiation therapy within two years of diagnosis. Trends by year as well as by patient age are examined.

WHY ARE WE MEASURING THIS?

- Along with surgery and systemic therapy, radiation therapy forms the backbone of cancer treatment services. It plays a key role in both curative and palliative therapy. It can be the primary treatment or it can also be used in neoadjuvant (pre-treatment) and adjuvant (post-treatment) settings.
- Measuring and comparing provincial capacity and utilization rates may help identify potential gaps in the system.

WHAT DO THE RESULTS SHOW?

- ***Radiation therapy capacity was increasing in several provinces and overall.***
  - The number of LINACs per million populations in 2010 ranged from 4.6 in Alberta to 14.1 in Prince Edward Island with an average of 6.5. The 2010 average represents an increase of 0.8 LINACs per capita (or 13%) over 2009 (Figure 42).
  - The number of treatments per LINAC has dropped slightly, by 2.4%, from 2009 to 2010 (data not shown). This suggests utilization growth lagged slightly behind capacity expansion. The average number of radiation treatments per LINAC was just over 7,000 in 2010 (Figure 43).
- ***Radiation therapy use varied by province, overall and by disease site.***
  - The percentage of patients treated with radiation therapy within two years of diagnosis was relatively consistent by province; ranging from 29% for Nova Scotia to 34% for Prince Edward Island (Figure 44).
  - Analysis by age reveals a lower treatment rate for older patients, with the rate for patients under age 60 twice that of patients 80 and older (Figure 45).
  - There was also a sex differential with younger women having a higher rate than younger men and the converse for older men and women (data not shown). This is likely due to incidence and treatment patterns for breast cancer, which is diagnosed earlier in women, compared to prostate cancer, which is diagnosed later in men (both breast and prostate cancers account for a higher percentage of radiation therapy utilization).

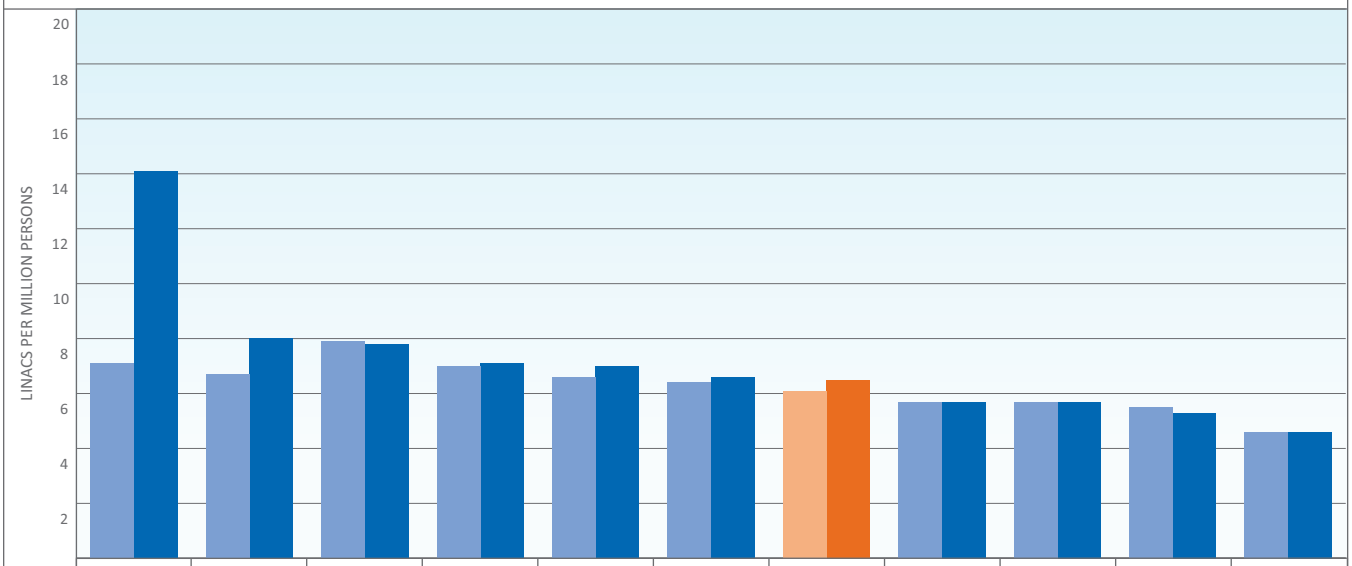
WHAT IS HAPPENING INTERNATIONALLY?

- Several jurisdiction and multi-jurisdiction studies have examined the number of linear accelerators (LINACS) per capita. In 2005, the Organisation for Economic Co-operation and Development (OECD) reported an average of 6.2 LINACS per million populations for OECD member countries.[86] This is lower than the Canadian average of 6.9 for 2010 (Japan is the closest to the Canadian rate at 6.8). A preliminary review of internationally published values for the average number of radiation treatments per LINAC at the jurisdictional level yielded

FIGURE 42

Linear accelerators per million persons

BY PROVINCE–2009 AND 2010



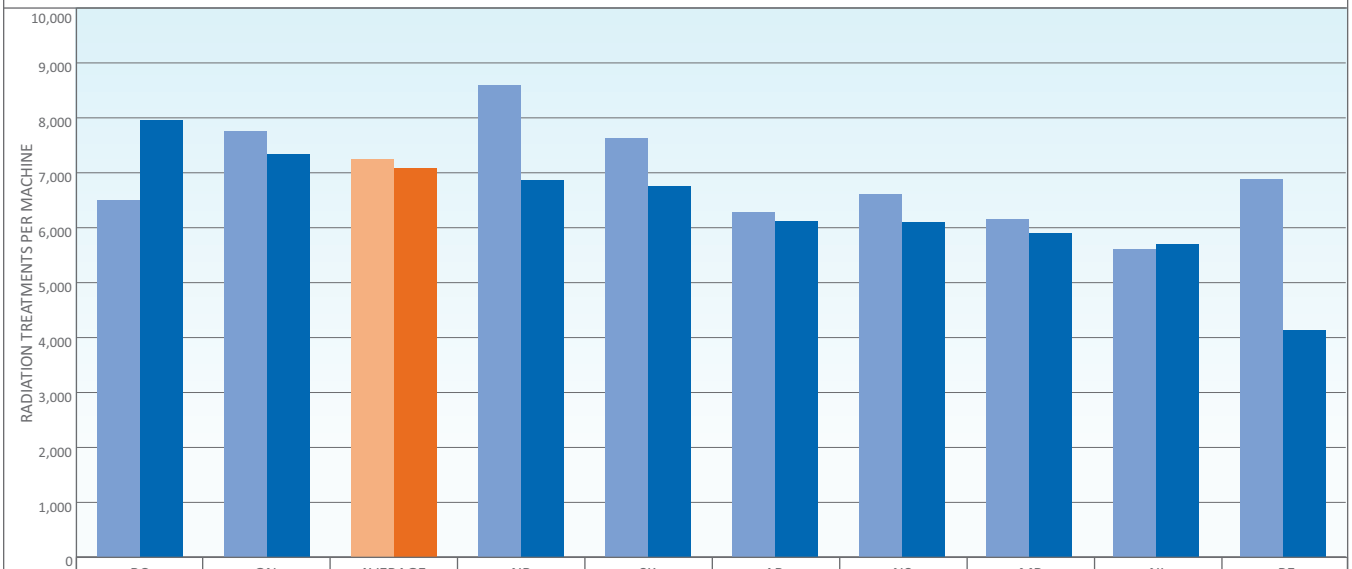
	PE	NB	NL	QC	ON	NS	AVERAGE	SK	MB	BC	AB
2009	7.1	6.7	7.9	7.0	6.6	6.4	6.1	5.7	5.7	5.5	4.6
2010	14.1	8.0	7.8	7.1	7.0	6.6	6.5	5.7	5.7	5.3	4.6

Data Source: Provincial Cancer Agencies

FIGURE 43

Radiation therapy treatments per linear accelerators

BY PROVINCE–2009 AND 2010



	BC	ON	AVERAGE	NB	SK	AB	NS	MB	NL	PE
2009	6,510	7,760	7,248	8,595	7,626	6,284	6,616	6,150	5,610	6,877
2010	7,961	7,339	7,076	6,860	6,759	6,119	6,102	5,906	5,693	4,126

*LINACs pro-rated for partial availability
Data Source: Provincial Cancer Agencies

a range of 4,500 to 8,000 treatments per machine.[87] The average utilization rate of 7,000 treatments per machine in Canada in 2010 is at the high end of that comparator range.

- For the radiation therapy utilization rate, a commonly cited benchmark is 50% of cancer patients typically receiving radiation therapy at some point during the course of their disease.[88-89] It is difficult to compare this international benchmark to the indicator measured in this *Report*, which is limited (for methodological reasons) to radiation delivered in the first two years after diagnosis. The radiation therapy utilization ratio, presented in the *Developmental and Interim Indicators* chapter of this *Report*, may provide a more direct comparison to the 50% benchmark.

WHAT IS BEING DONE?

- The Partnership is planning to launch special studies aimed at more detailed investigation and analysis of the system performance indicator findings. This includes chart reviews and surveys aimed at explaining rationale for observed treatment patterns. In 2011, chart reviews are under way for lung and rectal cancer. Other disease sites and treatment modalities may be evaluated in upcoming years.
- The Partnership's Quality Initiatives Implementation team will be using the results of the system performance indicators to identify opportunities for launching strategies to improve the quality of clinical practice. *The Canadian Partnership for Quality Radiotherapy* (C-PQR) has been struck to plan and implement a national quality program in radiotherapy. This may include the refinement of standards for equipment and delivery of radiation therapy, the development of a consistent, common taxonomy for measuring concordance to standards and incident reporting, the piloting of an audit tool to measure concordance and a tool for reporting near misses and critical incidents.

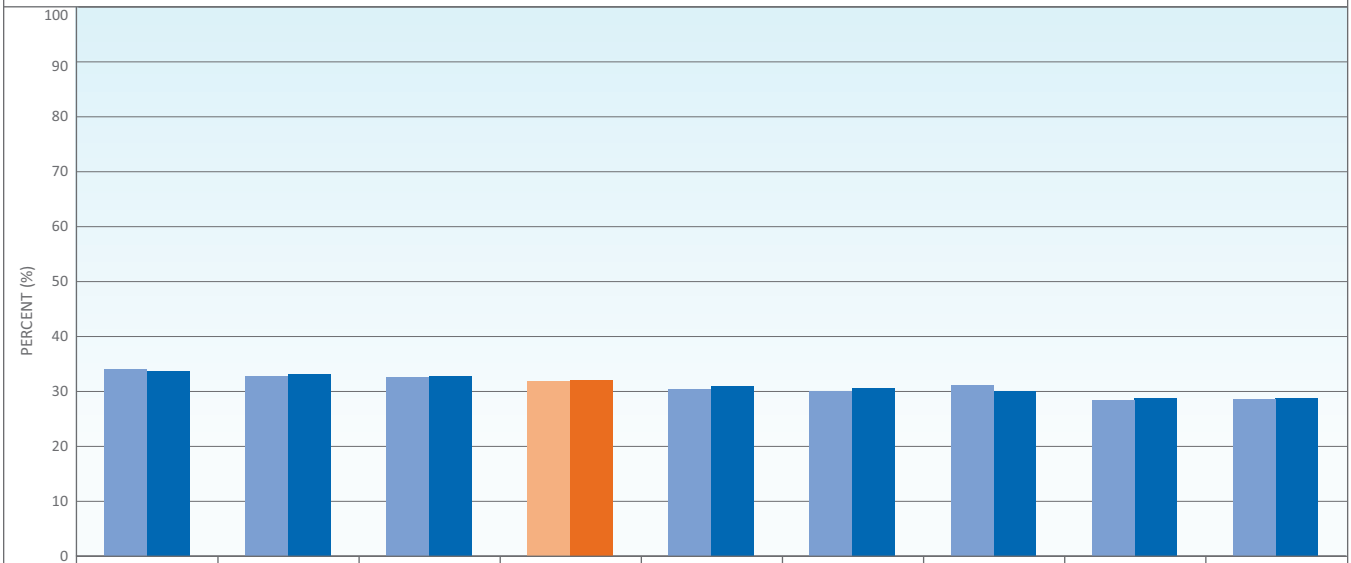
WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- Number of LINACs is as reported by each provincial cancer agency and is pro-rated when machines are commissioned or decommissioned part way through the year.
- Number of treatments for the machine utilization ratio corresponds to number of fractions.
- The radiation utilization rate examines the percentage of incident cases receiving radiation therapy within two years of diagnosis. The two-year timeframe was chosen to include mainly primary treatment (neoadjuvant, adjuvant and curative), although palliative radiation does occur for several disease sites within that timeframe. Due to methodological and data limitations, a lifetime radiation therapy rate could not be calculated for this *Report*. Attempts will be made to develop models to calculate the lifetime rate in the future.
- An alternative utilization indicator, the radiation therapy utilization ratio, is presented in the *Developmental and Interim Indicators* chapter of this *Report*.
- Detailed calculation methodology is provided in the Technical Appendix (see page 154).

FIGURE 44

Percentage of cancer patients receiving radiation therapy within 2 years of diagnosis

BY PROVINCE–PATIENTS DIAGNOSED IN 2007 AND 2008



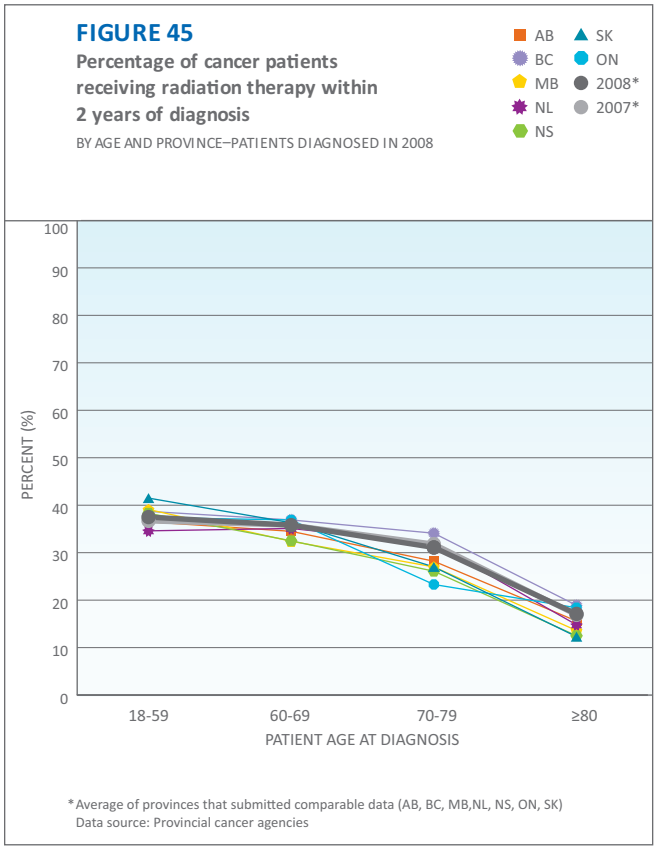
	PE	BC	ON	AVERAGE	NL	AB	SK	MB	NS
2007	34.1%	32.7%	32.6%	31.8%	30.4%	30.1%	31.2%	28.4%	28.6%
2008	33.6%	33.2%	32.7%	32.0%	30.9%	30.6%	30.1%	28.8%	28.7%
N* 2007	826	20,752	61,227	115,831	2,918	14,013	5,085	5,767	5,243
N* 2008	816	20,663	61,499	116,765	3,073	14,339	5,128	5,935	5,312

*N: Number of cancer cases diagnosed in the year
Data source: Provincial cancer agencies

FIGURE 45

Percentage of cancer patients receiving radiation therapy within 2 years of diagnosis

BY AGE AND PROVINCE–PATIENTS DIAGNOSED IN 2008



*Average of provinces that submitted comparable data (AB, BC, MB,NL, NS, ON, SK)
Data source: Provincial cancer agencies

NEOADJUVANT RADIATION THERAPY FOR STAGE II AND III RECTAL CANCER

WHAT ARE WE MEASURING?

This indicator measures the percentage of resected stage II or III rectal cancer patients who receive neoadjuvant (pre-operative) radiation therapy as per widely published treatment guidelines. This year's indicator compares results for patients diagnosed in 2007 and 2008 and examines age and sex patterns, as well as interprovincial comparisons.

A simplified measure for this indicator looks at all stage II and III rectal cancer cases without limiting to resected cases and presents the percentage receiving radiation therapy within 120 days of diagnosis. Although they do not constitute an indicator of evidence-based practice, the simplified measure allows for the inclusion of results for provinces that are unable to identify cases undergoing surgery as required for the full measure.

WHY ARE WE MEASURING THIS?

- Over 9,000 people in Canada die from colorectal (CRC) cancer each year.[48] Around 20% of CRC cases are tumours of the rectum.[90] Five-year relative survival in stage II and III rectal cancer ranges from 78% for stage IIA to 31% for stage IIIC; local recurrence rates can be as high as 22% for stage III.[91]
- The delivery of radiation therapy preceding surgical resection (i.e., neoadjuvant) has been shown to improve surgical outcomes and local control for stage II and III rectal cancer patients.[91] There is also clinical trial evidence to suggest pre-operative short course radiation leads to improved disease-free survival relative to post-operative radiation.[92]
- Measuring national practice patterns relative to this treatment guideline allows for the identification of gaps, which could be addressed through quality improvement strategies.
- While neoadjuvant radiation therapy should be considered for most resectable stage II and III rectal cancer, there are no formal Canadian performance targets for the actual treatment rate. There may be cases where pre-operative radiation therapy is not provided for a variety of reasons, in which case post-operative radiation is strongly recommended.[93] While the frequency of cases with contraindications to neoadjuvant radiation therapy is not known, it is not expected to vary significantly between provinces.

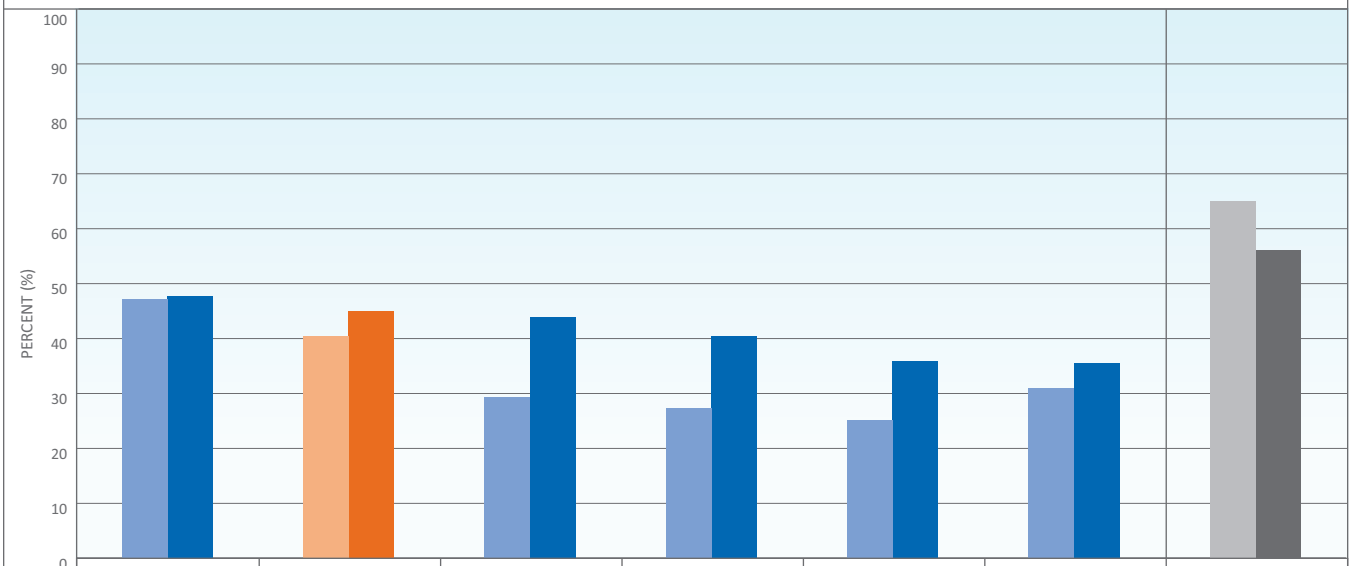
WHAT DO THE RESULTS SHOW?

- ***There was some interprovincial variation in the percentage of resected stage II and III rectal cancer cases treated with neoadjuvant radiation therapy.***
  - Neoadjuvant therapy rates for the five provinces submitting non-suppressed data compliant with the indicator specifications for 2008 cases ranged from 36% to 48%, with an average of 45% (Figure 46). PEI data was in line with other that of other provinces and above the average of provinces submitting data.
  - For all five provinces submitting data for both years, the treatment rate increased in 2008 relative to 2007; for some, this was by considerable amounts. The average treatment rate for the five provinces rose from 40% to 45%. Further analysis is needed to ascertain the significance of this trend.

FIGURE 46

Percentage of stage II or III rectal cancer patients receiving radiation therapy preceding surgical resection

RADIATION THERAPY STARTED UP TO 120 DAYS BEFORE SURGERY, BY PROVINCE –PATIENTS DIAGNOSED IN 2007 AND 2008



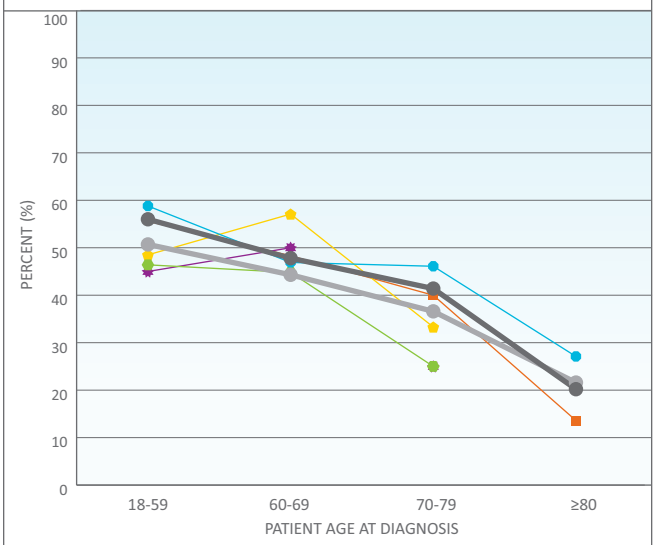
	ON	AVERAGE*	AB	NL	MB	NS	BC
2007	47.1%	40.4%	29.4%	27.3%	25.2%	30.9%	65.0%
2008	47.7%	44.9%	43.9%	40.4%	35.8%	35.6%	56.0%
N* 2007	862	1,358	262	22	115	97	357
N* 2008	906	1,496	319	47	123	101	373

BC data include only cases referred to the cancer centres
PE data suppressed due to small numbers
* Average includes AB, MB, NL, NS, ON
Data source: Provincial cancer agencies

FIGURE 47

Percentage of stage II or III rectal cancer patients receiving radiation therapy preceding surgical resection

RADIATION THERAPY STARTED UP TO 120 DAYS BEFORE SURGERY, BY PROVINCE AND AGE–PATIENTS DIAGNOSED IN 2008

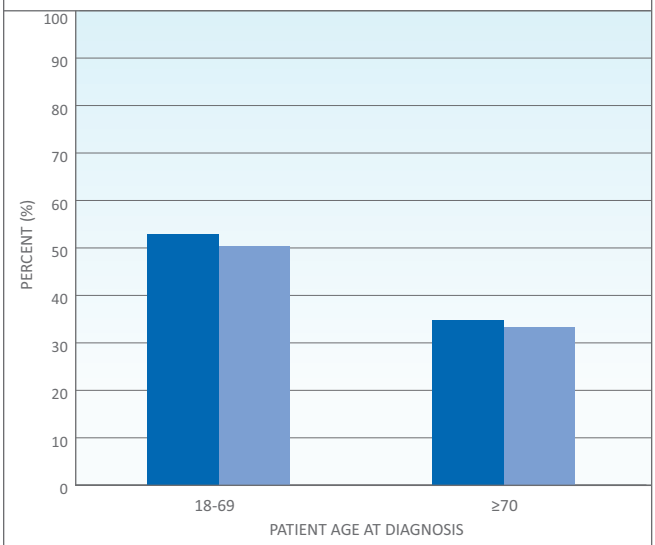


Some data suppressed due to small numbers
*Average includes AB, MB, NL, NS, ON
Provinces that did not submit data for both 2007 and 2008 were excluded from the Average*
Data source: Provincial cancer agencies

FIGURE 48

Percentage of stage II or III rectal cancer patients receiving radiation therapy preceding surgical resection

BY SEX AND AGE, CANADA–PATIENTS DIAGNOSED IN 2008



Average of provinces that submitted comparable data (includes AB, MB, NL,NS, ON)
Data source: Provincial cancer agencies

- ***The treatment rate dropped substantially for older patients.***
  - The neoadjuvant radiation treatment rate dropped from an average of around 56% for patients under 60 to 20% for patients 80 and older (Figure 47).
  - There does not appear to be a difference in the treatment rate for males and females (Figure 48).
- ***The interprovincial variation was wider for the simplified measure than the full guideline indicator (Figure 49).***
  - Seven provinces provided data for the simplified measure (resection status not identified). The average radiation therapy rate was 51%; this would include both pre- and post-operative therapy (Figure 49). The interprovincial variation was wider for the simplified measure than the full guideline indicator. A comparison of the full guideline and simplified measure results suggests that, on average, 70% of rectal cancer patients who received radiation therapy received it pre-operatively, as per the guidelines.

WHAT IS HAPPENING INTERNATIONALLY?

- The most recent analysis of the use of radiation therapy for the treatment of rectal cancer based on the Surveillance Epidemiology and End Results (SEER) database (3,151 cases between 2002 and 2005) identified 42% of patients receiving pre-operative therapy,[94] which is comparable to the range of the Canadian results presented in this *Report*.
- A US study of treatment of elderly rectal cancer patients based on an analysis of the SEER data found that 37% of patients over 65 were treated with radiation therapy, but only a quarter of those were treated pre-operatively.[95]

WHAT IS BEING DONE?

- The Partnership is conducting a retrospective chart review of resected rectal cancer patients in five provinces to better understand referral and treatment patterns and to help identify the decision rationale for radiation therapy. The results will be published in a special report due in 2012.

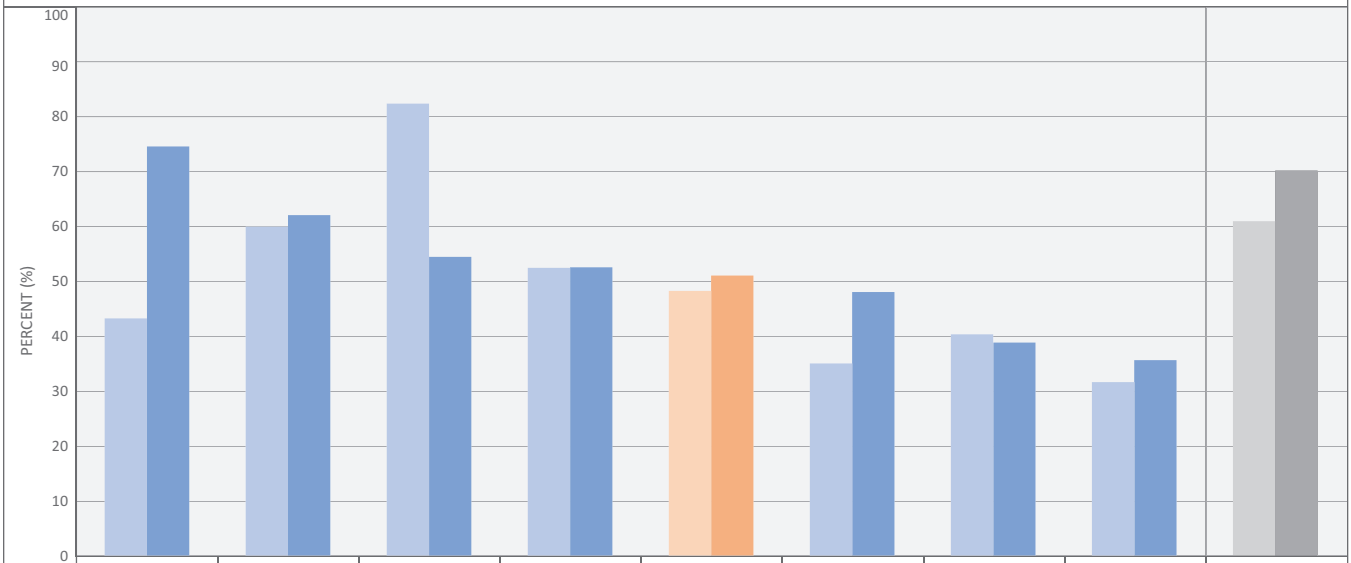
WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- The "simplified" indicator allows for inclusion of provinces that could not identify cases undergoing surgery. It shows the overall radiation treatment rate for all stage II and III rectal cancer cases (pre- and/or post-operative). The simplified indicator does not, however, assess concordance with evidence-based guidelines.
- Results for British Columbia are shown separately and not included in the overall average because they include data only for cases referred to the provincial cancer centres. Patients referred to cancer centres and seen by radiation oncologists were more likely to receive radiation therapy relative to the overall population, and so this reporting limitation results in an upward bias of the results relative to provinces that include the overall population of cases.
- PE's results were derived from patient chart reviews (whereas results of other provinces were based on analysis of administrative data).
- Several provinces reported substantial increases in the number of stage II and III rectal cancer cases included in the indicator calculation in 2008 versus 2007. This may reflect improvements in the ability to identify the target cases in the administrative data but may also reflect real trends.
- Detailed calculation methodology is provided in the Technical Appendix (see page 156).

FIGURE 49

Simplified measure: Percentage of stage II or III rectal cancer patients receiving radiation therapy

RADIATION THERAPY STARTED WITHIN 120 DAYS OF DIAGNOSIS, BY PROVINCE, PATIENTS DIAGNOSED IN 2007 AND 2008



	NL	SK	PE	ON	AVERAGE*	AB	NS	MB	BC
2007	43.3%	60.0%	82.4%	52.5%	48.3%	35.1%	40.4%	31.7%	61.0%
2008	74.6%	62.1%	54.5%	52.6%	51.1%	48.1%	38.9%	35.7%	70.2%
N* 2007	30	115	17	1,224	1,908	279	104	139	385
N* 2008	63	116	11	1,290	2,084	345	113	157	383

BC data include only cases referred to the cancer centres
Average* includes AB, MB, NL, NS, ON, PE, SK
Data source: Provincial cancer agencies

ADJUVANT RADIATION THERAPY FOR STAGE I AND II BREAST CANCER

WHAT ARE WE MEASURING?

This indicator measures the percentage of stage I or II breast cancer patients who receive adjuvant radiation therapy following breast-conserving surgery, as per widely published treatment guidelines. This year's indicator compares results for patients diagnosed in 2007 and 2008 and examines age patterns as well as interprovincial comparisons.

A simplified measure for this indicator looks at all stage I or II breast cancer cases without limiting to partially resected cases and presents the percentage receiving radiation therapy within 21 months of diagnosis. The simplified measure allows for the inclusion of results for provinces that are unable to identify cases undergoing surgery as required for the full measure.

WHY ARE WE MEASURING THIS?

- Over 23,000 people are diagnosed with breast cancer in Canada and 5,400 die from it each year.[48] Five-year recurrence rate for early (stage I and II) breast cancer has been shown to exceed 25% in the absence of standard treatment.[96]
- Surgery is the primary treatment for early stage breast cancer, and breast-conserving surgery is an alternative to radical breast resection or mastectomy. The delivery of radiation therapy following breast-conserving surgery has been shown in many studies to reduce the risk of recurrence to a level comparable to that of treatment by mastectomy.[96]
- Measuring national practice patterns relative to this treatment guideline allows for the identification of gaps, which could be addressed through quality improvement strategies.
- While adjuvant radiation therapy should be considered for most early stage breast cancer patients who undergo breast-conserving surgery, there are no formal Canadian performance targets for the actual treatment rate. In some patients, the risks associated with radiation therapy may outweigh the benefits (e.g., patients with connective tissue disease or those who have previously received radiation in the same site);[97] although for those patients, mastectomy may be the better treatment option.

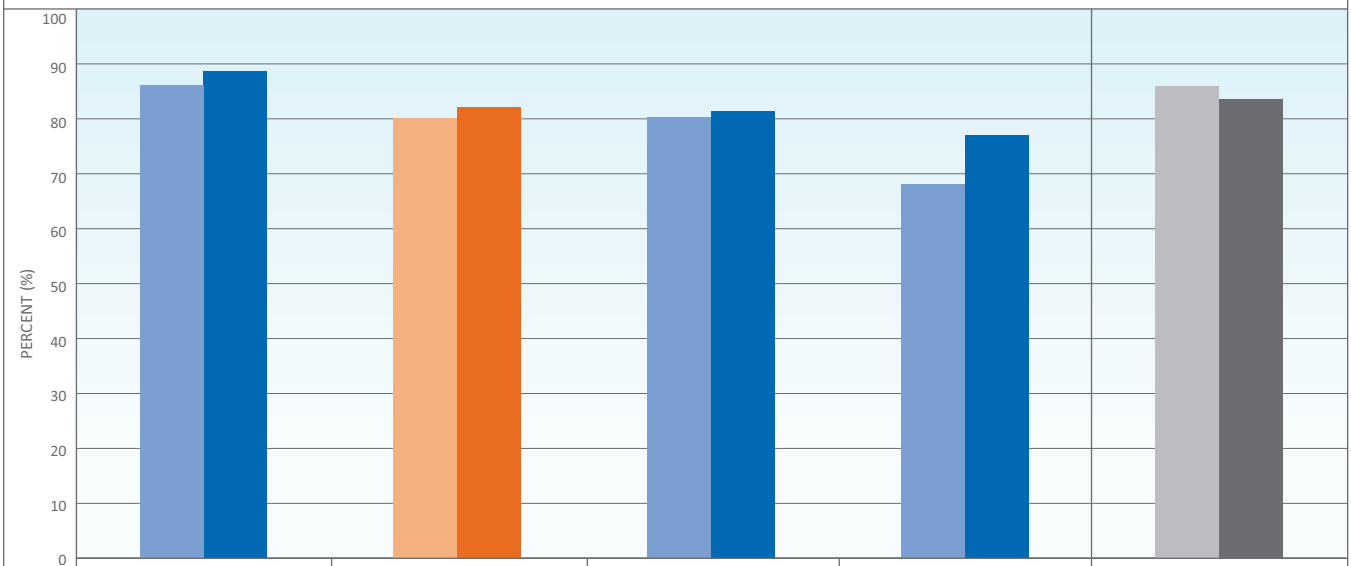
WHAT DO THE RESULTS SHOW?

- ***There was substantial interprovincial variation in the percentage of early-stage breast cancer cases treated with radiation therapy.***
  - Only three provinces provided data required to calculate the full guideline treatment rate (i.e., post breast-conserving surgery); the treatment rates for those ranged from 77% to 89% in 2008, with an average of 82%. The rate appears to have increased slightly from 2007 (Figure 50).
- ***The treatment rate dropped substantially for patients 80 and older.***
  - The adjuvant radiation rate dropped from an average of 87% for patients under age 70 to 48% for patients over age 80 (Figure 51). Several clinical trials suggest that radiation therapy following breast-conserving surgery for stage I, estrogen-receptor-positive women over 70 years of age has limited benefits in recurrence and survival.[98]

FIGURE 50

Percentage of stage I or II breast cancer patients receiving radiation therapy following breast-conserving surgery

RADIATION THERAPY STARTED WITHIN 270 DAYS FOLLOWING SURGERY, BY PROVINCE–PATIENTS DIAGNOSED IN 2007 AND 2008



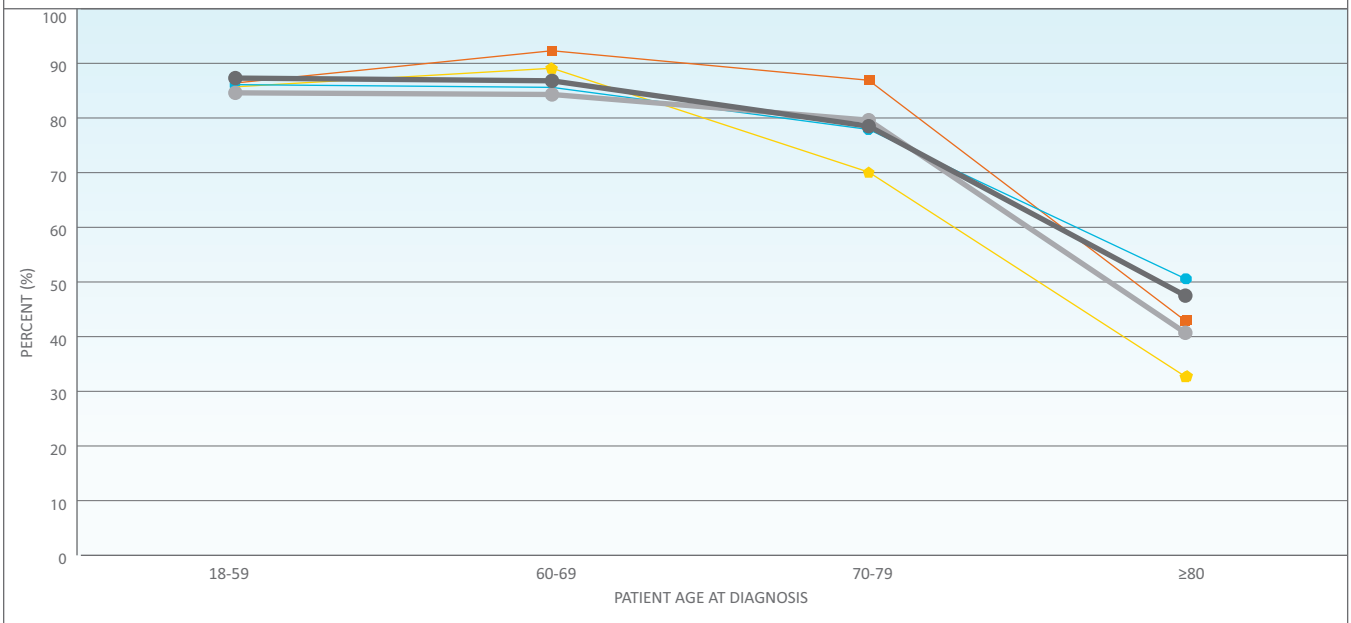
	AB	AVERAGE*	ON	MB	BC
2007	86.2%	80.2%	80.3%	68.1%	86.0%
2008	88.6%	82.1%	81.4%	77.0%	83.6%
N* 2007	725	4,953	3,842	386	1,240
N* 2008	709	4,967	3,832	426	1,094

BC data include only cases referred to the cancer centres
*Average for 2007 and 2008 includes only AB, MB, ON
Data source: Provincial cancer agencies

FIGURE 51

Percentage of stage I or II breast cancer patients receiving radiation therapy following breast conserving-surgery

RADIATION THERAPY STARTED WITHIN 270 DAYS OF SURGERY, BY AGE AND PROVINCE–PATIENTS DIAGNOSED IN 2008



*Average includes only AB, MB, ON
Data source: Provincial cancer agencies

- ***Seven provinces reported data for the simplified indicator that examines radiation therapy for all stage I and II breast cancer patients (irrespective of the type of surgery) (Figure 52).***
  - It showed more substantial variation with a range from 40% in Prince Edward Island to 67% in Ontario, and an average of 61% for 2008. One of the contributing factors to the variation may be interprovincial differences in mastectomy rates, given that radiation therapy is not generally recommended post mastectomy for node-negative cases, which constitute the majority in stage I and II.

WHAT IS HAPPENING INTERNATIONALLY?

- A comparative review of published results at the jurisdictional level for this indicator (adjuvant radiation therapy for early stage breast cancer cases following breast-conserving surgery) yielded concordance rates in the low- to mid-90% range. A US study using SEER data from 2000 to 2002 published treatment rates of 94% for women age 66–70.[99] A Swiss nationwide study reported a concordance rate of 92% for stage I to III patients under age 80.[100] The Canadian rate measured in this *Report* is slightly lower than these comparator measures.
- In 2007, a retrospective cohort study of 1999 breast cancer incident cases from a region in England reported that non-standard management of breast cancer patients increased with age. The study also pointed out that breast cancer incidence rates were highest for women over age 70. Women over age 70 were less likely to receive radiotherapy following breast-conserving surgery as compared with women with breast cancer age 65–69.[101] At the same time, several guidelines (e.g., NCCN[102]) restrict their recommendation for adjuvant radiation therapy to patients under age 70 based on a number of clinical trials showing limited benefit in survival for patients age 70 years and older.[98] Thus, the drop in treatment according to guidelines over age 79 may reflect reasonable clinical practice.

WHAT IS BEING DONE?

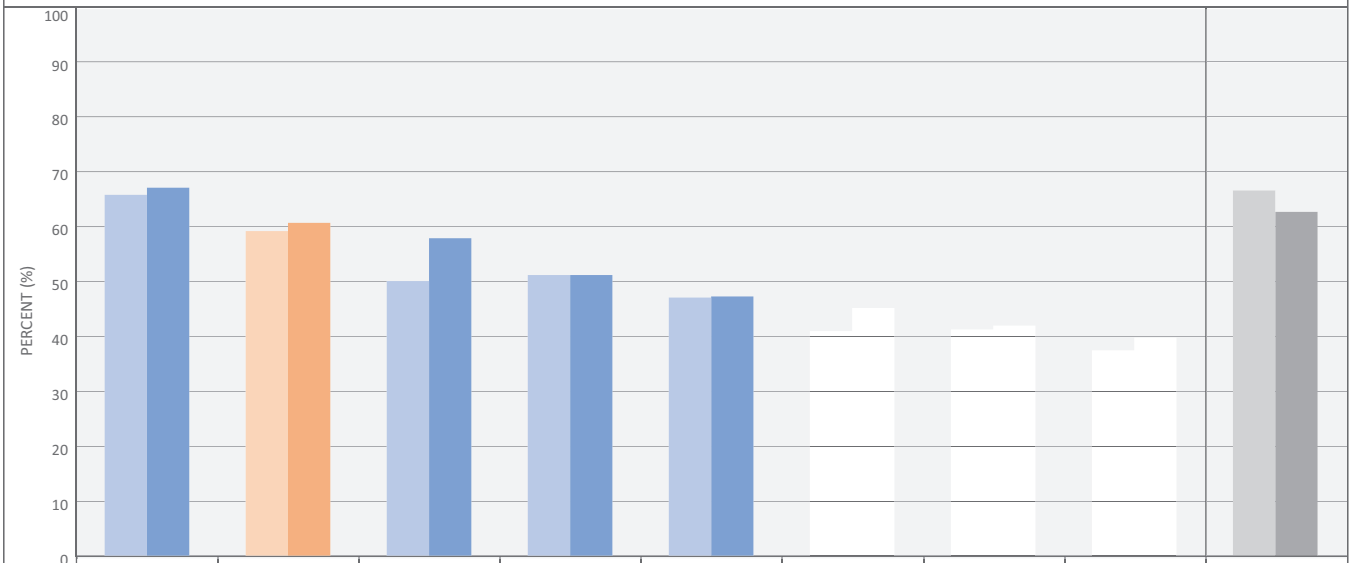
- The Partnership is collaborating with the Canadian Institute for Health Information (CIHI) to examine breast cancer surgery patterns across the country. Relative differences in mastectomy and breast-conserving surgery rates will be compared to radiation treatment rates to identify correlations that may explain the results reported here. This analysis will be included in an upcoming "Focus on Breast Cancer" report planned for early 2012 publication.

WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- The simplified indicator allows for inclusion of provinces that could not identify partially resected cases. It shows overall radiation treatment rate for all stage I and II breast cancer cases, although it does not measure the evidence-based practice described in the guidelines.
- Results for British Columbia are shown separately because British Columbia includes data only for cases referred to the provincial cancer centres, which results in an upward bias of the results compared to provinces that include the entire population of cases.
- Detailed calculation methodology is provided in the Technical Appendix (see page 157).

Simplified measure: Percentage of stage I or II breast cancer patients receiving radiation therapy

RADIATION THERAPY STARTED WITHIN 1 YEAR + 270 DAYS FOLLOWING DIAGNOSIS, BY PROVINCE, PATIENTS DIAGNOSED IN 2007 AND 2008



	ON	AVERAGE*	MB	AB	NS	SK	NL	PE	BC
2007	65.8%	59.2%	50.1%	51.2%	47.1%	41.0%	41.3%	37.5%	66.6%
2008	67.1%	60.7%	57.9%	51.2%	47.3%	45.2%	42.0%	39.8%	62.7%
N* 2007	5,868	9,364	641	1,560	482	519	230	64	1,960
N* 2008	5,978	9,583	651	1,544	560	498	269	83	1,995

BC data include only cases referred to the cancer centres
*Average includes AB, MB, NL, NS, ON, PE, SK
Data source: Provincial cancer agencies

Systemic Therapy

ADJUVANT CHEMOTHERAPY FOR STAGE III COLON CANCER

WHAT ARE WE MEASURING?

This indicator measures the percentage of stage III colon cancer patients who received adjuvant chemotherapy following resection, as per widely published treatment guidelines. This year's indicator compares results for patients diagnosed in 2007 and 2008 and examines age and sex patterns as well as interprovincial comparisons.

A simplified measure for this indicator examines all stage III colon cancer cases without limiting to cases receiving surgery and presents the percentage receiving chemotherapy within 16 months of diagnosis. This simplified measure allows for the inclusion of results for provinces that are unable to identify cases undergoing surgery as required for the full guideline measure.

WHY ARE WE MEASURING THIS?

- Over 9,000 people in Canada die from colorectal cancer (CRC) each year.[48] Around 70% of CRC cases are tumours of the colon.[103]
- The delivery of chemotherapy following resection has been shown to improve outcomes for node-positive (stage III) colon cancer patients.[104-105]
- Measuring national practice patterns relative to this treatment guideline allows for the identification of gaps, which could be addressed through quality improvement strategies.
- While adjuvant chemotherapy should be considered for most stage III colon cancer patients, there are no formal Canadian performance targets for the actual treatment rate. In some patients, the negative implications of chemotherapy may outweigh the benefits; while the frequency of these cases is not known, it is not expected to vary significantly between provinces.

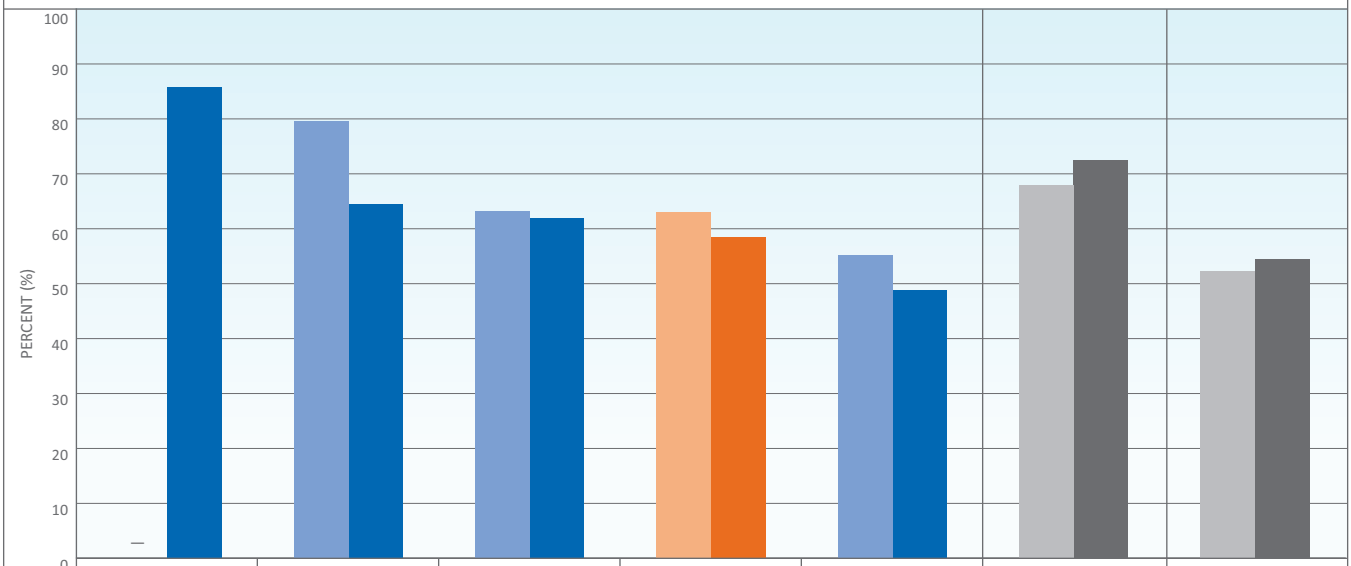
WHAT DO THE RESULTS SHOW?

- ***There was substantial interprovincial variation in the percentage of resected stage III colon cancer cases treated with adjuvant chemotherapy.***
  - Adjuvant therapy rates for the four provinces submitting data compliant with the indicator specifications for 2008 cases ranged from 49% to 86%, with an average of 62% (Figure 53).
  - Although the treatment rate appears to have dropped between 2007 and 2008 for three of those provinces, not enough data exist to suggest a definitive trend.
- ***The treatment rate dropped substantially with patient age and potentially for older women relative to older men.***
  - The adjuvant chemotherapy rate dropped from an average of 87% for patients under age 60 to 25% for patients over age 80 (Figure 54).
  - The treatment rate for patients age 70 years and older is 37% for women compared to 47% for men (Figure 55).
- ***The average chemotherapy rate for the simplified measure (resection status not identified) was also 62% for the five provinces submitting population-based data (Figure 56).***

FIGURE 53

Percentage of stage III colon cancer patients receiving chemotherapy following surgical resection

CHEMOTHERAPY STARTED WITHIN 120 DAYS FOLLOWING SURGERY, PATIENTS DIAGNOSED IN 2008



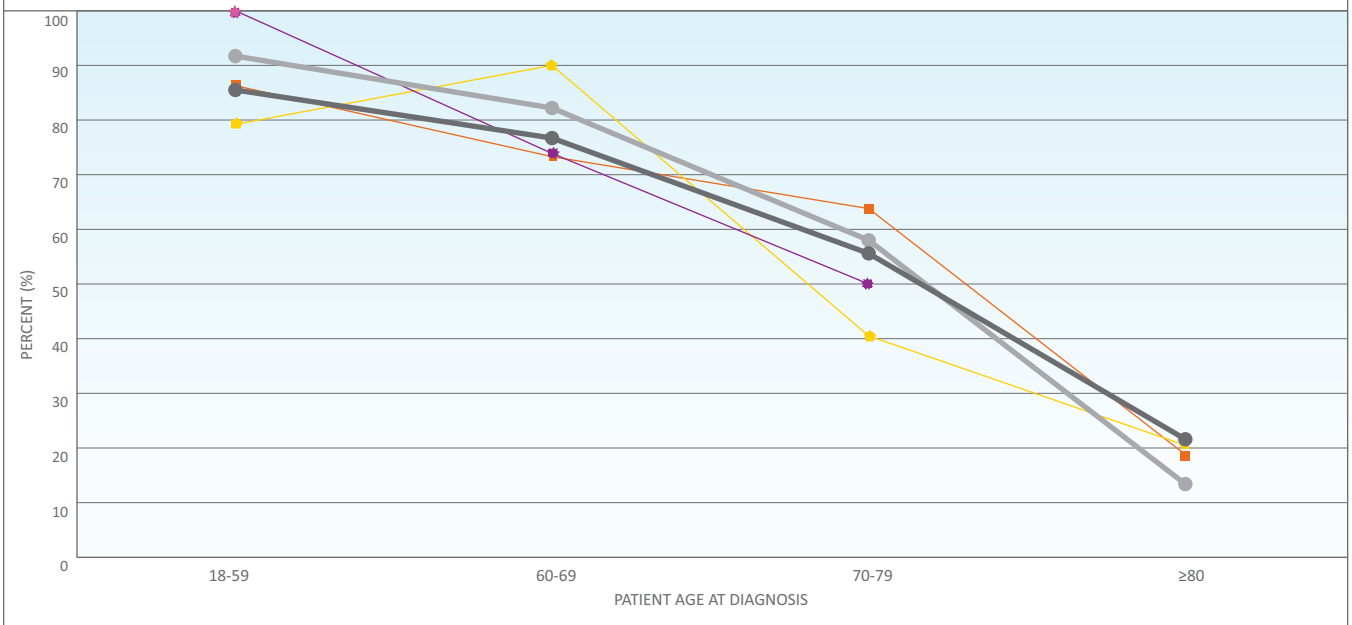
	PE	NL	AB	AVERAGE*	MB	BC	ON
2007	—	79.6%	63.2%	63.1%	55.2%	67.9%	52.3%
2008	85.7%	64.4%	61.9%	58.4%	48.8%	72.4%	54.5%
N* 2007	—	54	258	428	116	271	1,044
N* 2008	21	59	239	423	125	294	1,177

"—" Data not available
*Average includes AB, MB, NL
BC data include only cases referred to the cancer centres
ON does not fully capture chemotherapy
Data source: Provincial cancer agencies

FIGURE 54

Percentage of stage III colon cancer patients receiving chemotherapy following surgical resection

CHEMOTHERAPY STARTED WITHIN 120 DAYS FOLLOWING SURGERY, BY AGE AND PROVINCE–PATIENTS DIAGNOSED IN 2008



Some data suppressed due to small numbers
*Average includes AB, MB, NL
Data source: Provincial cancer agencies

WHAT IS HAPPENING INTERNATIONALLY?

- Adjuvant chemotherapy rates for stage III colon cancer rates as measured in other jurisdictions ranged between 55% and 65%.[106-107] The Canadian rates measured in this *Report* fall within that range.
- There is conflicting opinion and evidence on the benefit of treating older patients.[108] A recent meta-analysis of relevant studies suggests that only 50% of stage III colon cancer patients age 75 years and older would benefit from treatment with post-operative chemotherapy,[109] which supports lower than expected chemotherapy rates for older patients.

WHAT IS BEING DONE?

- The Partnership is planning a series of special studies aimed at more detailed investigation and analysis of the system performance indicator findings. This includes chart reviews and surveys aimed at explaining rationale for observed treatment patterns. In 2011, chart reviews are under way for lung and rectal cancer. Other disease sites, including colon, and treatment guidelines may be evaluated in upcoming years.

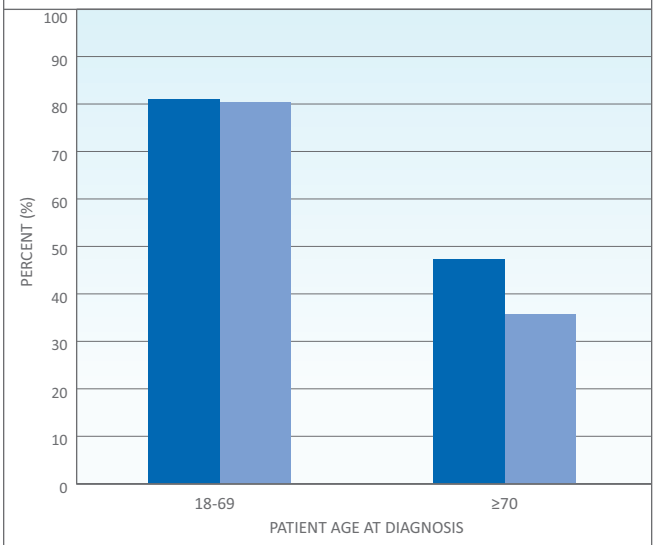
WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- The "simplified" indicator allows for inclusion of provinces that could not identify cases undergoing surgery. It shows the overall chemotherapy treatment rate for all stage III colon cancer cases. Because most stage III colon cancer patients would be resected, the results for the simplified indicator should be a reasonable proxy for the adjuvant therapy guideline treatment rate.
- Results for British Columbia, Ontario and Nova Scotia are shown separately and are not included in the overall average, due to deviations from the indicator specifications that affect their comparability with other provinces. British Columbia and Nova Scotia include data only for cases referred to the provincial cancer centres, which probably led to biased results compared to provinces including the entire population (since patients referred to a cancer centre are more likely to be treated with chemotherapy). Ontario does not fully capture oral chemotherapy, which is a common alternative to intravenous drugs for colon cancer, so their reported treatment rates are likely understated.
- PE's results were derived from patient chart reviews (whereas results of other provinces were based on analysis of administrative data).
- Detailed calculation methodology is provided in the Technical Appendix (see page 158).

FIGURE 55

Percentage of stage III colon cancer patients receiving chemotherapy following surgical resection

CHEMOTHERAPY STARTED WITHIN 120 DAYS FOLLOWING SURGERY, BY AGE AND SEX, CANADA–PATIENTS DIAGNOSED IN 2008

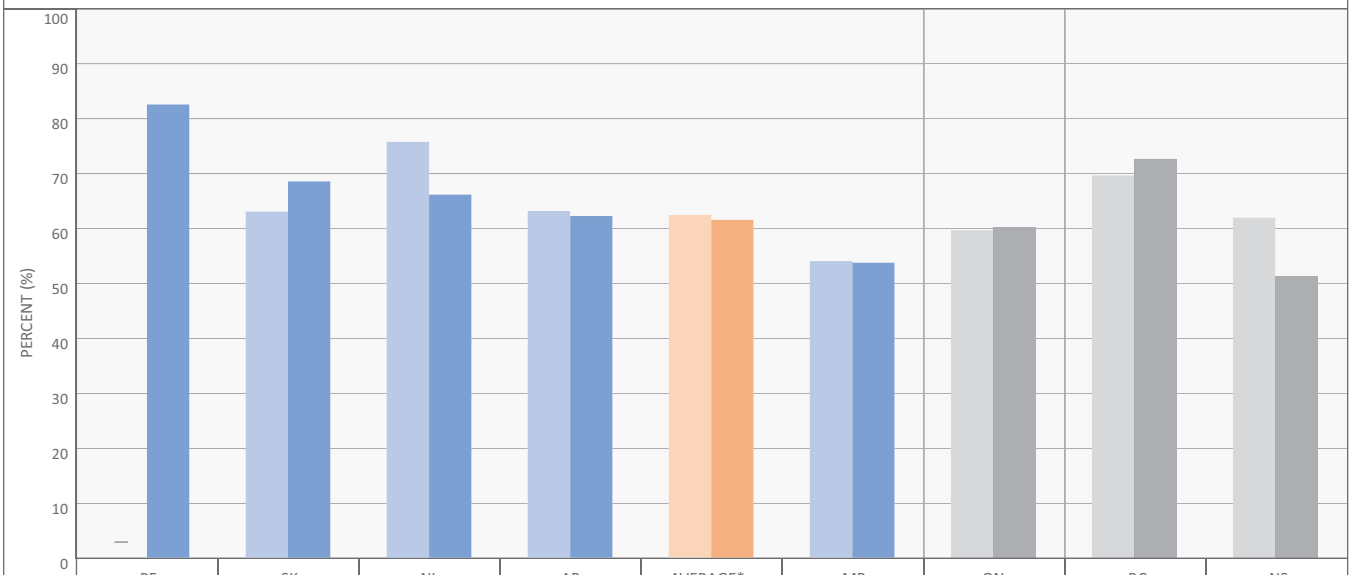


Average of provinces that submitted comparable data (includes AB, MB, NL, PE)
Data source: Provincial cancer agencies

FIGURE 56

Simplified measure: Percentage of stage III colon cancer patients receiving chemotherapy

CHEMOTHERAPY STARTED WITHIN 1 YEAR + 120 DAYS FOLLOWING DIAGNOSIS, BY PROVINCE–PATIENTS DIAGNOSED IN 2007 AND 2008



	PE	SK	NL	AB	AVERAGE*	MB	ON	BC	NS
2007	—	63.1%	75.8%	63.2%	62.5%	54.1%	59.7%	69.7%	62.0%
2008	82.6%	68.6%	66.2%	62.3%	61.6%	53.8%	60.3%	72.7%	51.3%
N* 2007	—	103	66	261	565	135	1,226	271	71
N* 2008	23	86	71	247	547	143	1,388	326	76

"—" Data not available
NS data limited to residents of Cape Breton DHA and Capital Health DHA as chemotherapy treatment information is only captured when provided in the cancer centres
BC data include only cases referred to the cancer centres
Average* for 2007 and 2008 includes only AB, MB, NL, SK
ON does not fully capture oral chemotherapy
Data source: Provincial cancer agencies

ADJUVANT CHEMOTHERAPY FOR STAGE II AND IIIA NON–SMALL CELL LUNG CANCER

WHAT ARE WE MEASURING?

This indicator measures the percentage of resected, stage II and IIIA non–small cell lung cancer (NSCLC) patients receiving adjuvant chemotherapy, as per widely published treatment guidelines.

The indicator includes patients diagnosed in each of 2007 and 2008 and presents treatment patterns by province, age group and sex.

WHY ARE WE MEASURING THIS?

- Over 20,000 people in Canada die from lung cancer each year; this is more than the next four highest mortality cancer sites combined.[48]
- Median survival in non–small cell cancer (NSCLC) is 47, 24 and 17 months for stage IIA, IIB and IIIA respectively (based on international data from the IASLC database).[110]
- The delivery of chemotherapy following resection has been shown to improve disease-free and overall survival for locally advanced (stage II and IIIA) NSCLC patients.[111]
- Measuring national practice patterns relative to this treatment guideline allows for the identification of gaps, which could be addressed through quality improvement strategies.
- While adjuvant chemotherapy should be considered for most resected stage II and IIIA NSCLC patients, there are no formal Canadian performance targets for the actual treatment rate. Factors such as the patient's performance status and level of co-morbidity, among others, play a part in the decision to treat with chemotherapy. While the frequency of cases with contraindications to adjuvant chemotherapy is not known, it is not expected to vary significantly between provinces.

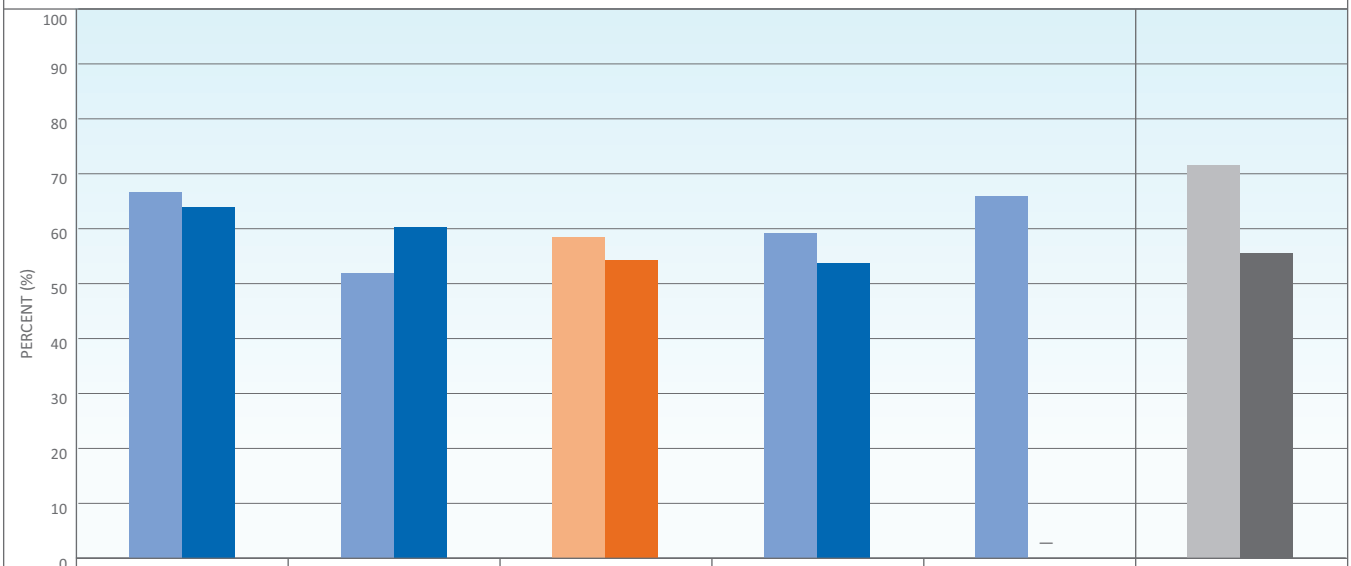
WHAT DO THE RESULTS SHOW?

- ***There was some interprovincial variation in the percentage of resected stage II and IIIA NSCLC cases treated with adjuvant chemotherapy.***
  - Adjuvant therapy rates for the four provinces submitting data compliant with the indicator specifications for 2008 cases ranged from 54% to 64%, with an average of 55%. The rates for Saskatchewan, Alberta and Ontario were within 10% of each other (Figure 57).
  - There was no discernible trend in the rates between 2007 and 2008, partially due to low patient volumes.
- ***The treatment rate for patients age 70 years and older was half that for younger patients; the treatment rate for older females appeared higher than for older males.***
  - The adjuvant chemotherapy rate dropped from an average of approximately 70% for patients under age 70 to approximately 35% for patients age 70 years and older (Figure 58).
  - The treatment rate for women age 70 years and older is 38% compared to 28% for men of the same age group. This difference requires further investigation (Figure 59).

FIGURE 57

Percentage of stage II or IIIA non-small cell lung cancer patients receiving chemotherapy following surgical resection

CHEMOTHERAPY STARTED WITHIN 120 DAYS FOLLOWING SURGICAL RESECTION, BY PROVINCE–PATIENTS DIAGNOSED IN 2007 AND 2008



	SK	AB	AVERAGE*	ON	MB	BC
2007	66.7%	51.9%	58.4%	59.1%	65.9%	71.6%
2008	64.0%	60.3%	55.2%	53.7%	—	55.6%
N* 2007	27	54	438	357	41	74
N* 2008	25	58	420	337	—	108

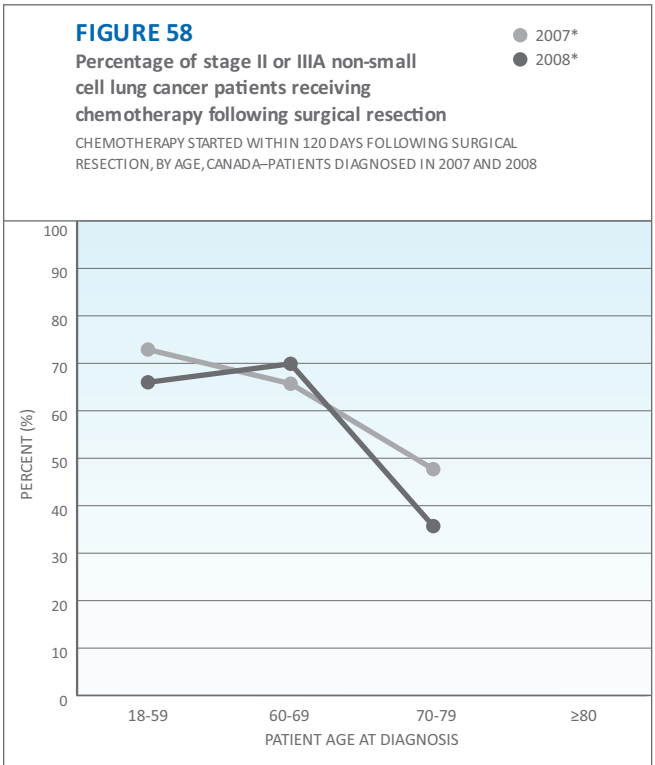
"—" Data not available
BC data include only cases referred to the cancer centres
MB data not available for reporting in 2008
*Average includes only AB, ON, SK

Data source: Provincial cancer agencies

FIGURE 58

Percentage of stage II or IIIA non-small cell lung cancer patients receiving chemotherapy following surgical resection

CHEMOTHERAPY STARTED WITHIN 120 DAYS FOLLOWING SURGICAL RESECTION, BY AGE, CANADA–PATIENTS DIAGNOSED IN 2007 AND 2008

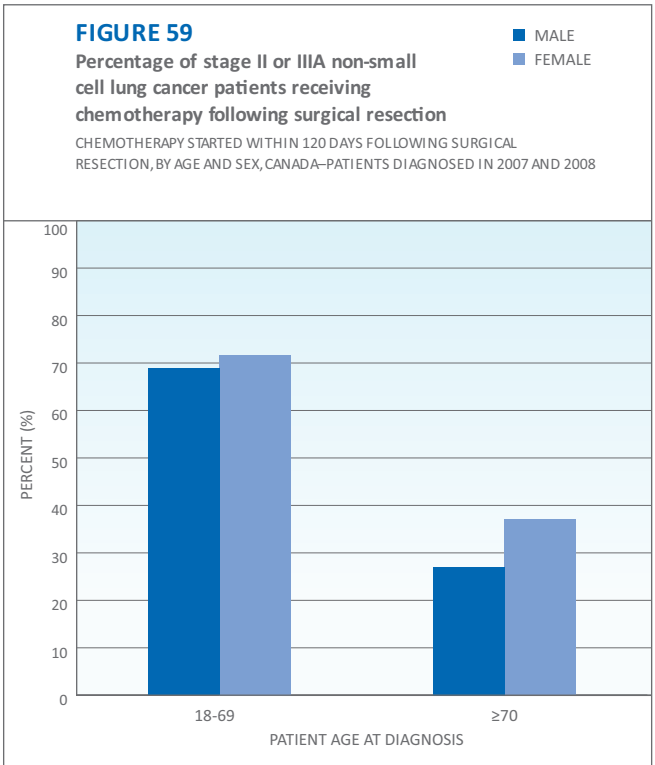


Some data suppressed due to small numbers
*Average includes AB, ON, SK
Data source: Provincial cancer agencies

FIGURE 59

Percentage of stage II or IIIA non-small cell lung cancer patients receiving chemotherapy following surgical resection

CHEMOTHERAPY STARTED WITHIN 120 DAYS FOLLOWING SURGICAL RESECTION, BY AGE AND SEX, CANADA–PATIENTS DIAGNOSED IN 2007 AND 2008



Average of provinces that submitted comparable data (includes AB, ON,SK)
Data source: Provincial cancer agencies

WHAT IS HAPPENING INTERNATIONALLY?

- Outside of clinical trial compliance rates, there is very little published information on jurisdiction-wide treatment rates for adjuvant chemotherapy in NSCLC.
- The few studies on the treatment of elderly NSCLC patients suggest that the survival benefits of chemotherapy may be diminished in the elderly due to co-morbidity and organ failure as well as a higher risk of toxicity.[112] These findings may explain lower adjuvant therapy rates for older patients measured in this *Report*.

WHAT IS BEING DONE?

- The Partnership is planning to launch a series of special studies aimed at more detailed investigation and analysis of the system performance indicator findings. This includes chart reviews and surveys aimed at explaining rationales for observed treatment patterns. In 2011, a chart review was initiated to examine referral and treatment patterns for resected NSCLC patients (as per the treatment guideline assessed in this indicator). A report on the results of the chart review is due early in 2012. Other disease sites and treatment guidelines may be evaluated in upcoming years.

WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- Results for British Columbia are shown separately and not included in the overall average, since British Columbia includes data only for cases referred to the provincial cancer centres, which results in an upward bias of the results compared to provinces that include the entire population of cases.
- Detailed calculation methodology is provided in the Technical Appendix (see page 159).

Surgery

REMOVAL AND EXAMINATION OF 12 OR MORE LYMPH NODES IN COLON RESECTIONS

WHAT ARE WE MEASURING?

This indicator measures the percentage of resections for colon cancer that had 12 or more lymph nodes removed and examined. Results are presented for cases resected in each of 2007 and 2008 and compares rates by province, age group and sex.

WHY ARE WE MEASURING THIS?

- The number of lymph nodes removed and examined in resection specimens has been shown to be critical for proper staging and, therefore, subsequent treatment planning.[113]
- Most clinical guidelines recommend that a minimum of 12 nodes be removed to more definitively establish N stage[105] (which indicates the extent of cancer spread to lymph nodes). This is because the chance of a false negative diagnosis is reduced to acceptable levels beyond the threshold of 12 nodes examined.
- Measuring provincial treatment patterns relative to this guideline can inform opportunities for quality improvements.
- The removal of a minimum of 12 nodes is recommended for resections of all non-metastatic, invasive colon cancers.[105]

WHAT DO THE RESULTS SHOW?

- ***There was substantial interprovincial variation in the percentage of colon resections with 12 or more nodes removed and examined.***
  - Results for the participating provinces ranged from 52% to 76%, with an average of 72% (Figure 60).
  - There appears to be a slight increase in the rate between 2007 and 2008, although more years of data are needed to confirm a definitive trend.
- ***There is relatively little variation across patient age group and sex.***
  - While the trend of lower concordance with older age is less pronounced in these results than in other guidelines examined in this *Report*, the differences between the provinces are more pronounced in the older age groups (Figure 61).
  - There was a small difference in the rate between males and females in both the 18-69 and 70 years and older age groups (Figure 62).

WHAT IS HAPPENING INTERNATIONALLY?

- Overall rates are consistent with those of other jurisdictions/studies with reported results ranging from 65% to 75%.[106]
- The variation in rates across patient age and sex are largely consistent with the findings of other jurisdictions, although a stronger age trend (older patients with lower rates than younger) has been cited in recent studies.[107, 109]

WHAT IS BEING DONE?

- The Partnership's National Synoptic Pathology and Synoptic Surgery initiatives are expected to shed a spotlight on node removal practices for colon cancer (and other disease sites). Recent experience has shown a link between synoptic reporting and improved quality of surgical and pathological practice.[109]
- Future system performance measurement reports may compare stage distribution (particularly N status) for colon cancer with 12 or more nodes removal rate to examine relationships.

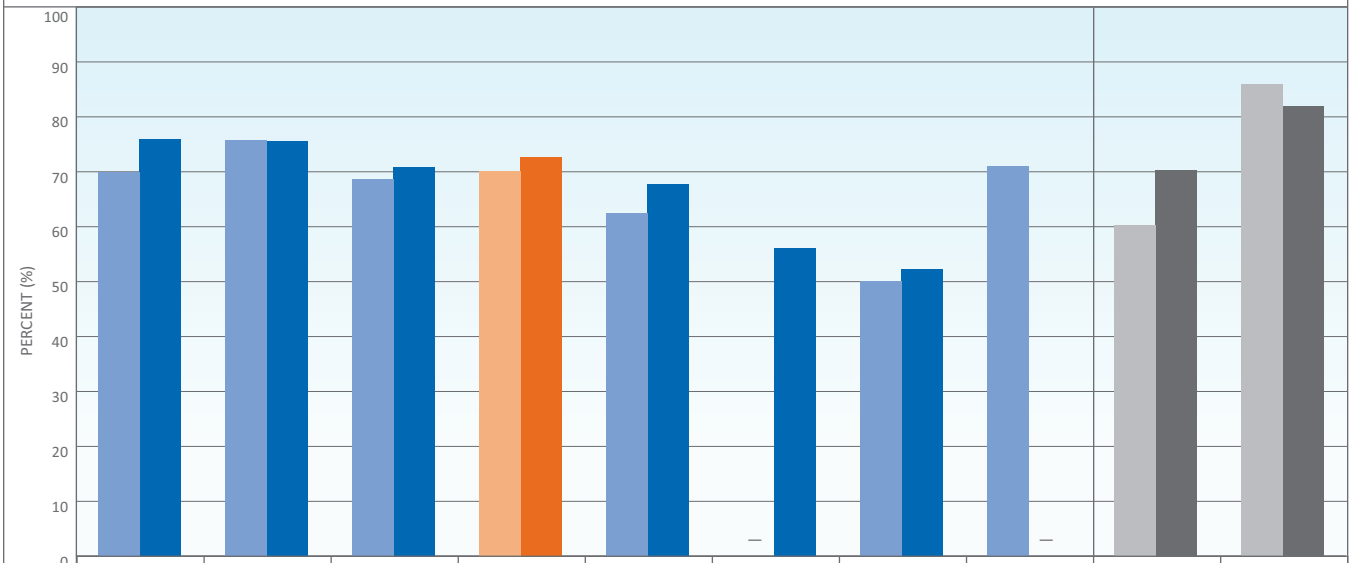
WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- Rates for British Columbia are shown but not included in the averages as the data include only cases referred to cancer centres (50% of registered colon cancer cases) and are subsequently not population-based. This may give rise to biased results compared to provinces that include the entire population of cases.
- Ontario's data include only cases for which collaborative staging data were available, which in 2008 represented 41% of colon cancer cases. The increase in number of cases included in Ontario's data in 2008 relative to 2007 reflects additional hospitals implementing synoptic reporting.
- PE's data include resections for colon cases diagnosed in 2007 and 2008 (as opposed to cases resected in 2007 and 2008). Age group-specific rates are partially suppressed for Prince Edward Island due to low cell counts.
- Detailed calculation methodology is provided in the Technical Appendix (see page 159).

FIGURE 60

Percentage of colon resections with 12 or more lymph nodes removed and examined

BY PROVINCE–PATIENTS DIAGNOSED IN 2007 AND 2008



	MB	AB	NS	AVERAGE*	SK	NB	PE	NL	BC	ON
2007	68.9%	75.7%	68.6%	70.1%	62.4%	—	50.0%	71.1%	60.3%	85.9%
2008	75.9%	75.5%	70.9%	72.7%	67.8%	56.1%	52.2%	—	70.2%	82.0%
N* 2007	408	883	421	2,106	338	—	56	249	730	1,063
N* 2008	415	891	450	2,154	329	223	69	—	761	1,493

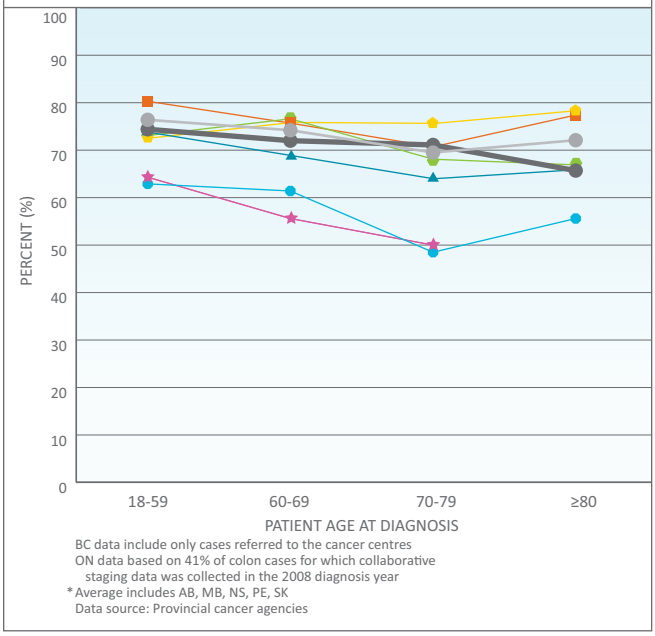
"—" Data not available for the province in the diagnosis year
BC data include only cases referred to the cancer centres
ON data based on 41% of colon cases for which collaborative staging data was collected for the 2008 diagnosis year

*Average includes AB, MB, NS, PE, SK
Data source: Provincial cancer agencies

FIGURE 61

Percentage of colon resections with 12 or more lymph nodes removed and examined

BY AGE AND PROVINCE–PATIENTS DIAGNOSED IN 2008

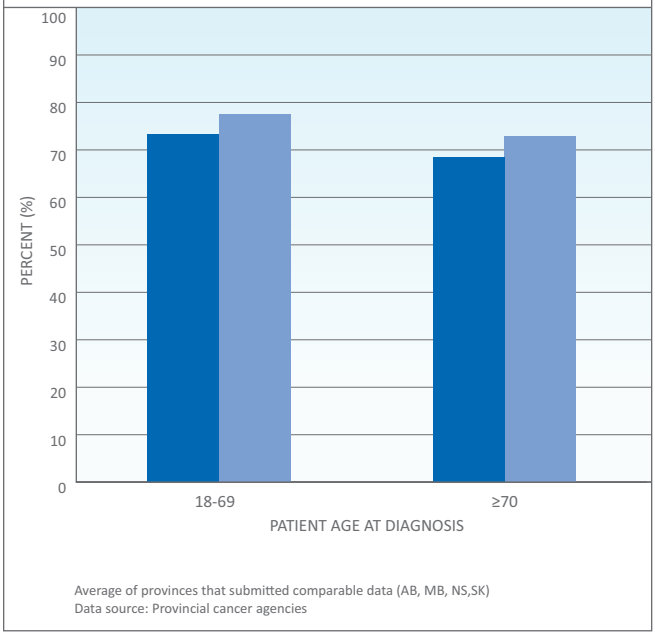


BC data include only cases referred to the cancer centres
ON data based on 41% of colon cases for which collaborative staging data was collected in the 2008 diagnosis year
*Average includes AB, MB, NS, PE, SK
Data source: Provincial cancer agencies

FIGURE 62

Percentage of colon resections with 12 or more lymph nodes removed and examined

BY AGE AND SEX, CANADA–PATIENTS DIAGNOSED IN 2008



Average of provinces that submitted comparable data (AB, MB, NS,SK)
Data source: Provincial cancer agencies

Research Indicators

This chapter presents indicators on adult and pediatric clinical trial participation. It builds off of the *2010 System Performance Report* by reporting adult clinical trial participation by disease site.

RESEARCH THAT EVALUATES THE SAFETY AND EFFICACY OF EMERGING TREATMENTS PAVES THE WAY FOR BEST PRACTICES.

Clinical trials are essential for evaluating the safety and efficacy of emerging cancer therapies and protocols. Therefore, participation by the patient population in clinical trials enables the development and evolution of best practice treatments, which in turn improve outcomes for future patients. There is conflicting evidence on the impact of clinical trial participation on outcomes for patients on trials, although a number of studies have shown that treatment centres that participate in clinical trials tend to have better patient outcomes than those that do not.[114-115]

For this reason, pediatric and adult indicators have been calculated for clinical trial participation ratios, defined as the ratio of the total number of all patients newly enrolled in Phase I to IV clinical trials (cancer-related therapeutic trials or clinical research studies) in 2010 to the total number of newly registered cancer cases at cancer centres in 2010. For the purposes of registration, a clinical trial is any cancer-related research study that prospectively assigns human participants to a health-related intervention to evaluate the effects on health outcomes. Data exclude enrolments in biology studies and include Phase I to IV clinical trials. Please refer to the Technical Appendix for specific details on the research indicator data submitted by each of the provinces.

RESEARCH INDICATOR	SUMMARY OF RESULTS
Adult clinical trial participation	The ratio of adult patients enrolled in clinical trials to newly registered cancer centre patients ranged from 6% to 8% across provinces in 2010 and from 4% to 9% across sites. There was no consistent trend in the ratio between 2009 and 2010.
Pediatric clinical trial participation	The ratio of pediatric patients enrolled in clinical trials to newly registered cancer centre patients in 2010 ranged from 11% to 38% across the eight provinces that have pediatric cancer centres. There was no consistent trend in the ratio between 2009 and 2010.

THE PARTNERSHIP IS WORKING TO SUPPORT COORDINATION AND CONTINUATION OF CANCER RESEARCH FUNDING ACROSS CANADA.

The Canadian Cancer Research Alliance (CCRA), funded by the Partnership, is a coalition of cancer research funding organizations and affiliated partners that also serves as the Partnership's Research Advisory Group. The CCRA has developed the Pan-Canadian Cancer Research Strategy to maximize the impact of targeted funding in cancer research and accelerate progress in cancer control. The strategy represents collaboration among 23 major organizations coordinating efforts on large research initiatives and other joint activities. It is the first initiative of its kind in Canada.

CLINICAL TRIAL PARTICIPATION—ADULT

WHAT ARE WE MEASURING?

This indicator is defined as the ratio of the total number of all patients 19 years and older newly enrolled in cancer-related therapeutic trials or clinical research studies in 2010 to the total number of cancer cases age 19 years and older newly registered to provincial cancer centres in 2010.

WHY ARE WE MEASURING THIS?

- Participation in Phase I to IV clinical trials is a crucial enabler of the development and evolution of best practice treatments, which could lead to improved treatment and outcomes. It has also been shown that the outcomes of patients treated at centres with active clinical trials programs are better than those who are not, likely due to increased adherence to best practice guidelines for treating patients.[114-116]
- Comparing the percentage of patients enrolled in clinical trial across the country could highlight opportunities for enhanced efforts in encouraging increased clinical trial participation. Given current data limitations, a proxy was used to estimate this percentage: a ratio of patient registrations in clinical trials to new patient registrations in cancer centres.

WHAT DO THE RESULTS SHOW?

- ***There was some variation in clinical trial participation between provinces and between the top four disease sites.***
  - For 2010, the ratio of patients enrolled in clinical trials to newly registered cancer centre patients ranged from 0.01 in Prince Edward Island to 0.08 in Alberta with an overall average of 0.05 among the eight provinces providing data for 2010. There is no consistent trend in the ratio between 2009 and 2010 (Figure 63).
  - The 2010 clinical trial participation ratio for the top four disease sites ranged from a low of 0.04 for CRC to a high of 0.09 for prostate cancer (Figure 64).

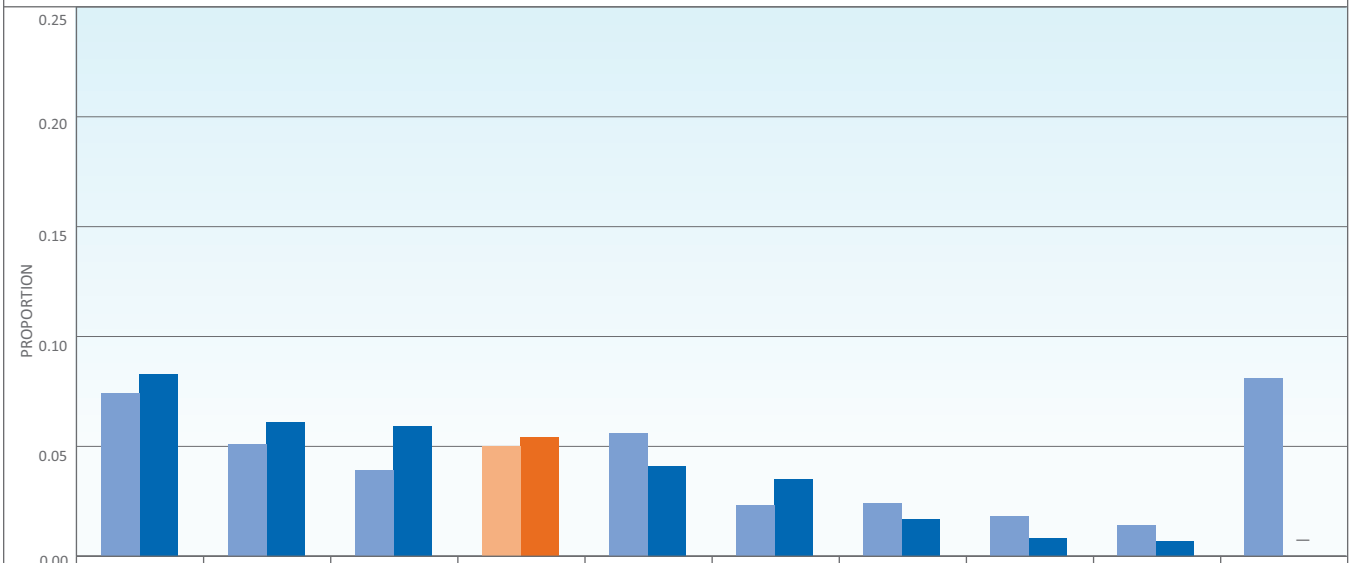
WHAT IS HAPPENING INTERNATIONALLY?

- Between 2002 and 2007 in Canada, the total number of all Phase I clinical trials increased, while the numbers of Phase II or III trials remained steady or potentially even decreased.[117] Several factors may explain this trend including high costs of conducting clinical trials, challenges in patient recruitment and registration, regulatory and ethical oversight, waning physician recruitment, emergence of more competitive markets for conducting trials and cuts to clinical trials programs at home. Canada is not alone in facing these challenges. Other countries such as the United Kingdom have experienced similar issues and have made significant investments in translational research, patient-centred research and increasing public access to clinical trials information.[118]
- Standards for designated cancer programs have been set by the American College of Surgeons' Commission on Cancer. These standards require a minimum clinical trial accrual rate ranging from 4% to 6% (of annual analytic cases), depending on the type of facility, age of the patient and whether or not patients are diagnosed and receiving most of their treatment at the facility.[119] A more aggressive goal for cancer clinical trial accrual was set in the UK over a decade ago, leading to the establishment of the National Cancer Research Network in 2001.[120]

FIGURE 63

Ratio of patients enrolled in clinical trials to new registrations at cancer centres

BY PROVINCE–ADULTS SEEN IN PROVINCIAL CANCER CENTRES IN 2009 AND 2010.



	AB	BC	SK	AVERAGE*	MB	NS	NB	NL	PE	ON
2009	0.074	0.051	0.039	0.050	0.056	0.023	0.024	0.018	0.014	0.081
2010	0.083	0.061	0.059	0.054	0.041	0.035	0.017	0.008	0.007	—
N* 2009	9,775	16,409	2,803	41,708	4,176	2,568	3,486	1,487	1,004	52,754
N* 2010	9,422	14,170	3,203	40,381	3,797	2,388	3,337	3,045	1,019	—

"—"Data not available

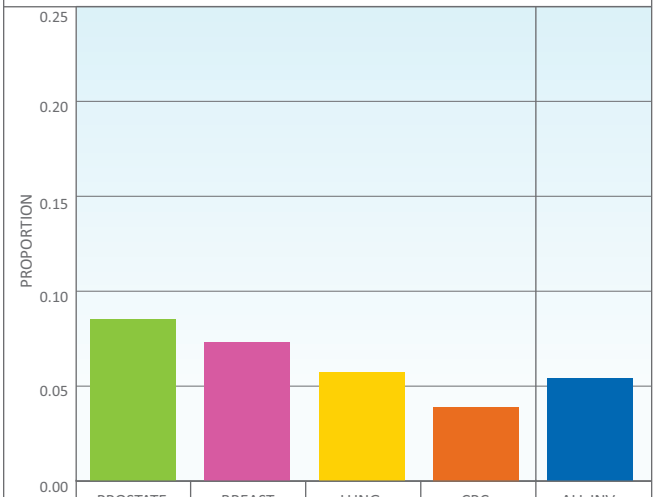
*Average includes only provinces that submitted data for both 2009 and 2010

Data source: Provincial cancer agencies

FIGURE 64

Ratio of patients enrolled in clinical trials to new registrations at cancer centres

BY DISEASE SITE, CANADA–ADULTS SEEN IN PROVINCIAL CANCER CENTRES IN 2009 AND 2010



	PROSTATE	BREAST	LUNG	CRC	ALL INV.
RATIO	0.085	0.073	0.057	0.039	0.054
N*	2018	3324	2253	2056	40381

Average of provinces that submitted comparable data (disease site breakdown includes AB, NL, NS, SK; All invasive includes AB, BC, MB, NB, NL, NS, PE, SK)

Data source: Provincial cancer agencies

- In the United States, the National Cancer Institute reports that less than 5% of adults diagnosed with cancer participate in a clinical trial. Approximately 14% of adults diagnosed with cancer in the United Kingdom are enrolled in a clinical trial, which is the highest clinical trial participation rate in the world.[120]

WHAT IS BEING DONE?

- During regional consultations of the development of the Pan-Canadian Cancer Research Strategy, concerns were expressed regarding the continuing ability of researchers to conduct cancer clinical trials in Canada. Indeed, this has been identified as a specific area for action by Canada's cancer research funders.[117]

WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- For this indicator, the numerator is the total number of adult cancer cases (≥19 years), whether incident or previously diagnosed, newly enrolled in therapeutic clinical trials at provincial cancer centres in 2009 and 2010. The denominator is the total number of adult cancer centre cases, whether incident or previously diagnosed, newly registered in provincial cancer centres in 2009 and 2010.
- The denominator, new referrals to cancer centres, was specifically chosen as a proxy for those patients receiving active treatment only, and as such, excludes those patients on the cancer centre roster who were not receiving active treatment and who by definition would be ineligible to participate in therapeutic clinical trials.
- For further details on data inclusions and exclusions among provinces, please refer to Table A in the Technical Appendix (see page 161).

CLINICAL TRIAL PARTICIPATION—PEDIATRIC

WHAT ARE WE MEASURING?

This indicator examines the ratio of the total number of all patients age 18 years and younger newly enrolled in cancer-related therapeutic trials or clinical research studies in 2010 to the total number of new cancer cases age 18 years and younger diagnosed and undergoing active treatment at pediatric centres in 2010.

WHY ARE WE MEASURING THIS?

- Patient participation in clinical trials is a crucial enabler of the development and evolution of best practice treatments, which could lead to improved treatment and outcomes. It has also been shown that the outcomes of patients treated at centres with active clinical trials programs are better than those that do not, likely due to increased adherence to best practice guidelines for treating patients.[114-116]
- Cancers affecting children and adolescents are different from those affecting adults. Therefore, research into how these cancers develop and what causes them in the pediatric population is crucial to understanding how to prevent or halt their progress in this population.
- Comparing the percentage of pediatric patients enrolled in clinical trials across the country could highlight opportunities for enhanced efforts in encouraging increased clinical trial participation.

WHAT DO THE RESULTS SHOW?

- ***There is some variation in pediatric clinical trial participation between provinces (Figure 65).***
  - For 2010, the ratio of pediatric patients enrolled in clinical trials to newly registered pediatric cancer centre patients ranged from 0.11 in Saskatchewan to 0.38 in Manitoba with an overall average ratio of 0.31 among the eight provinces providing data for 2010. Ontario had the highest ratio (0.04) in 2009, while Saskatchewan had the lowest at 0.15. With the exception of Manitoba, the ratio was lower in all provinces in 2010 compared to 2009, with the biggest differences seen in Quebec, Newfoundland and Labrador, and Alberta.

WHAT IS HAPPENING INTERNATIONALLY?

- Data from the National Cancer Institute (NCI) Cooperative Group in the United States show that 50% of children age zero to 14 years treated for cancer from 1998 to 1999 were enrolled in a clinical trial. Furthermore, nearly 95% of patients with cancer in the United States under age 15 are registered by the Children's Cancer Group and the Pediatric Oncology Group, which are two of four national pediatric cancer research organizations in the United States.[121-122]
- The Children's Oncology Group (COG) is a clinical trials organization of 5,000 pediatric cancer specialists in approximately 230 pediatric medical centres in the United States, Canada, Switzerland, the Netherlands, Australia and New Zealand. COG has active and planned affiliations with cooperative groups in Europe, Israel and Central and South America. In 2007, COG included over 70,000 children with cancer who were being managed with research protocols or were in active follow-up.[123]
- In the United Kingdom, 70% of all children diagnosed with cancer are currently enrolled in clinical trials, which are coordinated either by the UK Children's Cancer Study Group (UKCCSG) (solid tumours) or the Medical Research Council (leukemia).[124]

WHAT IS BEING DONE?

- In 2009, the Canadian Cancer Research Alliance and the Partnership released a report that found that $1 out of every $30 invested in cancer research in Canada was focused on childhood/adolescent cancers. It also found that annual investments in childhood/adolescent cancer research increased from $12.4 million in 2005 to $13.2 million in 2007.[125]
- The C17 Research Network holds a two-stage, peer-reviewed grant competition twice a year to fund research into cancer, serious hematological childhood diseases and bone marrow transplantation, including all phases of clinical trials.[126]
- In March 2010, the "Workshop on Adolescents and Young Adults with Cancer, Towards Better Outcomes in Canada" was held in Toronto, Canada. The Adolescent and Young Adult (AYA) Task Force has a goal to improve outcomes and health-related quality of life for adolescents and young adults with cancer and adolescent and young adult survivors of childhood cancer. This task force has developed recommendations for care and strategies for implementing and identifying research priorities for these groups.[127]

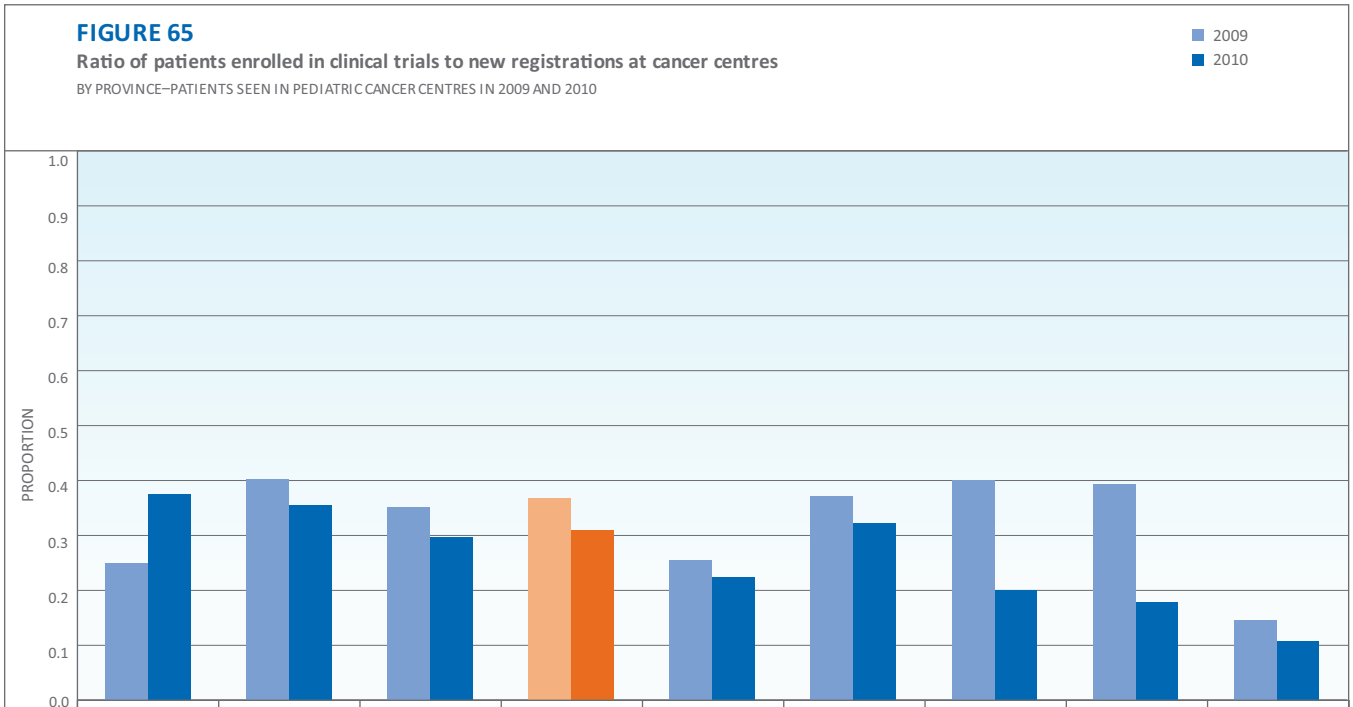
WHAT SHOULD YOU KNOW ABOUT DATA AND MEASUREMENT?

- Data for pediatric clinical trial ratios for 2010 were available for the eight provinces that have pediatric cancer centres treating children in Canada under age 14 years, as well as many 15–18 year olds. Individual pediatric cancer programs within each province are known to vary in size, and some programs are affiliated with larger, multi-centre, international pediatric clinical trial cooperative groups that coordinate the majority of oncology clinical trials for children. This may explain a portion of the provincial variation in pediatric clinical trial enrollment.
- Adolescents (age 15–18 years) are typically treated in either pediatric centres or adult centres, based on their medical needs, local referral patterns and overall availability of services. The proportion of adolescents with cancer treated in pediatric centres is known to differ from province to province, and the likelihood of adolescents being enrolled in a clinical trial is known to be higher in pediatric centres. That said, according to the Canadian Childhood Cancer Surveillance and Control Program, as many as 80% of Canadian adolescents diagnosed with cancer between 1995 and 2000, were known not to have participated in a clinical trial.[128]
- Detailed calculation methodology is provided in the Technical Appendix (see page 160).

FIGURE 65

Ratio of patients enrolled in clinical trials to new registrations at cancer centres

BY PROVINCE–PATIENTS SEEN IN PEDIATRIC CANCER CENTRES IN 2009 AND 2010



	MB	ON	BC	AVERAGE	NS	QC	NL	AB	SK
2009	0.250	0.402	0.352	0.367	0.254	0.372	0.400	0.393	0.146
2010	0.375	0.355	0.296	0.309	0.224	0.323	0.200	0.179	0.108
N* 2009	40	495	108	1,144	59	274	10	117	41
N* 2010	40	550	135	1,251	49	291	15	134	37

Data source: C17 Council, collected July 2011

Patient Experience Indicators

In Canada, the cancer community at large recognizes the need to develop indicators to assess the cancer patient's experience in the system. There is still much work to be done to collect meaningful data in this important domain. This *Report* presents data for two indicators in this chapter: Patient satisfaction with coordination and continuity of care and Place of cancer death. A third indicator on screening for distress is presented in the *Developmental and Interim Indicators* chapter. Combined, these three indicators contribute toward a greater understanding of the elements important to cancer patients and begin to address an under-measured domain in the cancer control continuum.

A cancer diagnosis brings with it emotional, social, spiritual and practical consequences for patients and families that can reach well beyond the time spent in treatment. High-quality care should take into account the specific needs of individual patients. For many people, lack of access to information and supportive care services while undergoing treatment contributes to the difficulty of the cancer experience. There is also growing evidence that survivors may continue to have special needs after their cancer has been treated, while for others, improvements are needed in end-of-life care.

SUPPORTIVE CARE AND SURVIVORSHIP INDICATOR	SUMMARY OF RESULTS
Patient-Centred Care—Coordination and Continuity of Care	Overall satisfaction with Coordination and Continuity of Care ranged from 73% to 60%. Of the eight dimensions related to Coordination and Continuity of Care, patients ranked "knowing who was in charge for each therapy" the highest, and "providers aware of med history" ranked the lowest.
Cancer Patient Place of Death	Approximately 70% of cancer deaths occurred in hospital. Provincial rates varied from 50% to 90%. Categorization methods differ by province and by year, accounting for much of the variation.
Screening for Distress*	There is variation in the implementation of standardized screening tools. Currently, six provinces are rolling out a standardized symptom screening tool; in other provinces, screening tools are used but not in a provincially standardized manner.

* Included in the Developmental and Interim Indicators chapter of this *Report*.

PATIENT SATISFACTION WITH COORDINATION AND CONTINUITY OF CARE

WHAT ARE WE MEASURING?

This indicator examines comparative patient satisfaction scores from seven provinces that have implemented a survey based on the NRC Picker Ambulatory Oncology Patient Satisfaction Survey (AOPSS). Specifically, it focuses on the Coordination and Continuity of Care dimension and comprises eight questions.

WHY ARE WE MEASURING THIS?

- Coordination and continuity of care represent particularly challenging aspects of the cancer system since they require integration between various constituents within the cancer control system in the delivery of care.
- The degree to which cancer patients feel that they are well supported and cared for throughout their cancer care journey is a crucial requirement of a high-quality cancer control system.[129-130]

WHAT DO THE RESULTS SHOW?

- ***Patterns of patient satisfaction across the survey questions were relatively consistent between provinces (Figure 66).***
  - The order of the survey sections from highest to lowest satisfaction was consistent across provinces.
  - "Knew who was in charge for each therapy" received the highest scores, ranging from 92% to 77%. Also receiving higher scores were the questions "Providers knew enough about cancer therapy" and "Never given confusing or conflicting information" with provinces ranging from 86% to 79% and 85% to 71% respectively.
  - "Providers aware of medical history" was the lowest score question for all seven participating provinces with a range of 40% to 60%.
  - The gap between highest and lowest score provinces was consistent across all eight questions at around 15%.
- ***The 2010 Report showed overall patient satisfaction rates were high, with variation among specific dimension.***
  - Greater than 95% of respondents in each province were satisfied with the overall quality of care they received during the previous six months.
  - When specifically polled about the six individual domains, satisfaction rates varied. Patterns of scores were similar across provinces: all provinces reported patient satisfaction levels ranging from 60% to 85% for physical comfort; respect for patient preferences; access to care; coordination and continuity of care; information, communication and education; and emotional support. The dimension of emotional support ranked lowest among all provinces.

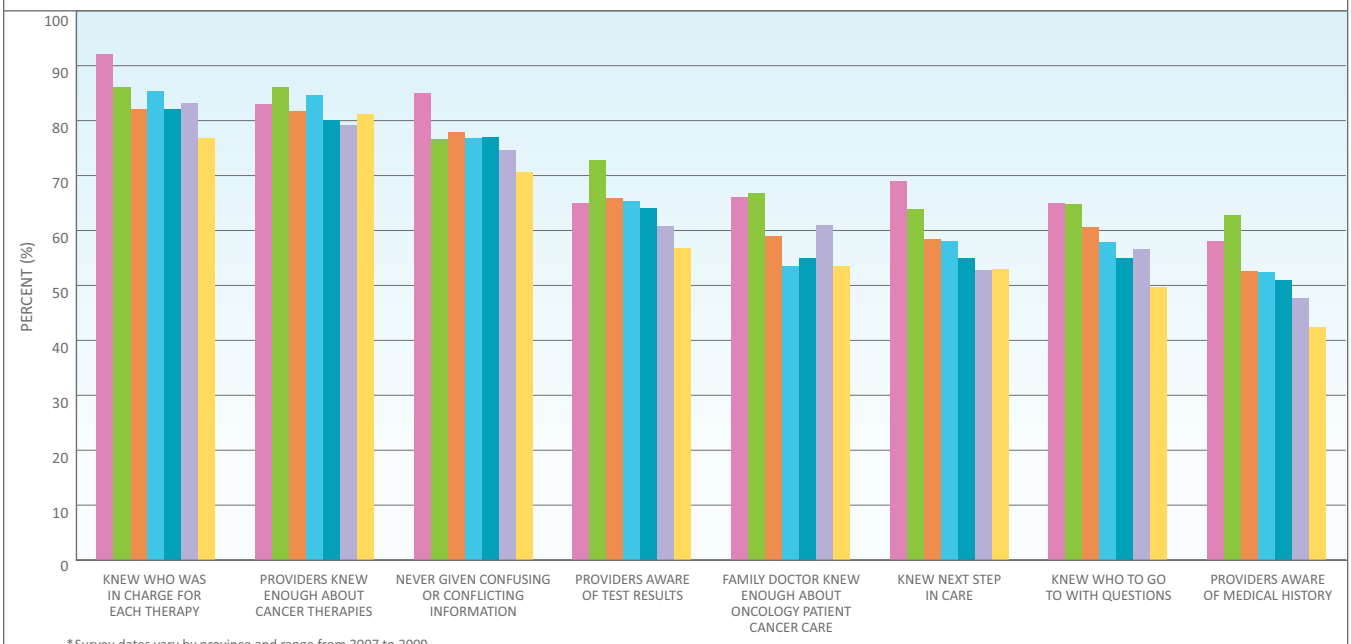
WHAT IS HAPPENING INTERNATIONALLY?

- Many jurisdictions have conducted patient satisfaction surveys on ambulatory care cancer patients but due to differences in the survey tools employed, it is difficult to draw direct comparisons with the Canadian results.

FIGURE 66

Percentage of patients reporting good, very good or excellent satisfaction with coordination and continuity of care

BY CHARACTERISTIC OF CARE, CANADA–2007 TO 2009



*Survey dates vary by province and range from 2007 to 2009

Data Source: NRC Picker Ambulatory Oncology Patient Satisfaction Survey results

Data provided by individual provincial cancer agencies.

WHAT IS BEING DONE?

- The Cancer Journey team at the Partnership is partnering with jurisdictions across Canada to implement customized local, provincial and territorial navigation programs designed to connect cancer patients and their families with specially trained professionals or volunteers who offer proactive, practical help to negotiate the maze of treatments, services and challenges on their cancer journey.
- The Partnership will continue to work towards expanding the set of indicators available to assess the domain of patient satisfaction, supportive care and other patient focused outcomes.

WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- While the provincial surveys used to produce the patient satisfaction results are all based on the NRC Picker AOPSS tool, there may be some variation in application of the tool between provinces. Also, the results presented in this *Report* are based on the latest surveys conducted in each province, but, the timeframe varies between provinces.
- Detailed calculation methodology is provided in the Technical Appendix (see page 162).

PLACE OF DEATH

WHAT ARE WE MEASURING?

This indicator examines the percentage of patients who die in hospital versus several non-hospital locations. As such, it begins to address an important aspect of end-of-life care and may help contribute toward better planning and quality of end-of-life care for cancer patients.

WHY ARE WE MEASURING THIS?

- Many surveys have suggested that terminal cancer patients prefer to die at home or in home-like settings, such as hospices or other residential facilities.[48] In its special topic on end-of-life care, the 2010 Canadian Cancer Statistics publication confirmed that measures are still needed to refine end-of-life care systems and to address the uneven access to end-of-life services both within and among provinces.[48, 131]
- Until more focused indicators on end-of-life care become available, reporting on cancer patient location of death can help maintain a focus on a crucial yet relatively under-measured segment of the cancer control continuum.

WHAT DO THE RESULTS SHOW?

- ***Data discrepancies persist in the national vital statistics data used to measure cancer patient location of death.***
  - Based on available vital statistics data from the 10 provinces, the percentage of cancer patients who die in hospitals ranged from 50% to 90%. Inconsistencies exist, however, in the provincial database's categorization of the various locations. For example, Manitoba's data do not differentiate between hospitals and other institutions, and Saskatchewan does not detail its non-hospital locations.
  - Approximately 70% of cancer deaths occurred in hospital. A 2003 to 2007 trend analysis reveals fluctuations that were more likely the result of year-to-year variations in reporting practice rather than actual trends in patient care.

WHAT IS HAPPENING INTERNATIONALLY?

- A recent study of place of death for cancer patients in six European countries found the percentage of cancer patients dying at home to be as 12.8% in Norway, 22.1% in England, 22.7% in Wales, 27.9% in Belgium, 35.8% in Italy and 45.4% in the Netherlands.[132] Across the US, 29% of cancer patients who died between 2003 and 2007, died in hospital.[133]

WHAT IS BEING DONE?

- A palliative and end-of-life care research initiative was launched by the Canadian Institute of Health Research (CIHR) and its partners in 2003. The initiative was designed to support infrastructure development, enhance interdisciplinary research collaboration, encourage the development of early career researchers and attract trainees to this emerging area.
- Several end-of-life care networks and coalitions exist in Canada, notably, the Canadian Researchers at the End of Life Network (CARENET) and the Quality End-of-Life Care Coalition of Canada.
- The Partnerships' network Hospice Palliative End-of-Life (HPEOL) is developing new methods to measure and report on palliative care.
- There are a number of other initiatives that Partnership supports including; Education in Palliative and End-of-Life Care for Oncology (EPEC™-O Canada), a palliative and end-of-life care training program for oncology; Speak UP, the Canadian Hospice Palliative Care Association's advanced care planning campaign; and, the Canadian Virtual Hospice, an online resource for patient caregivers and health professionals.
- Several provinces have palliative and end-of-life care as a focus of their provincial health system strategy.

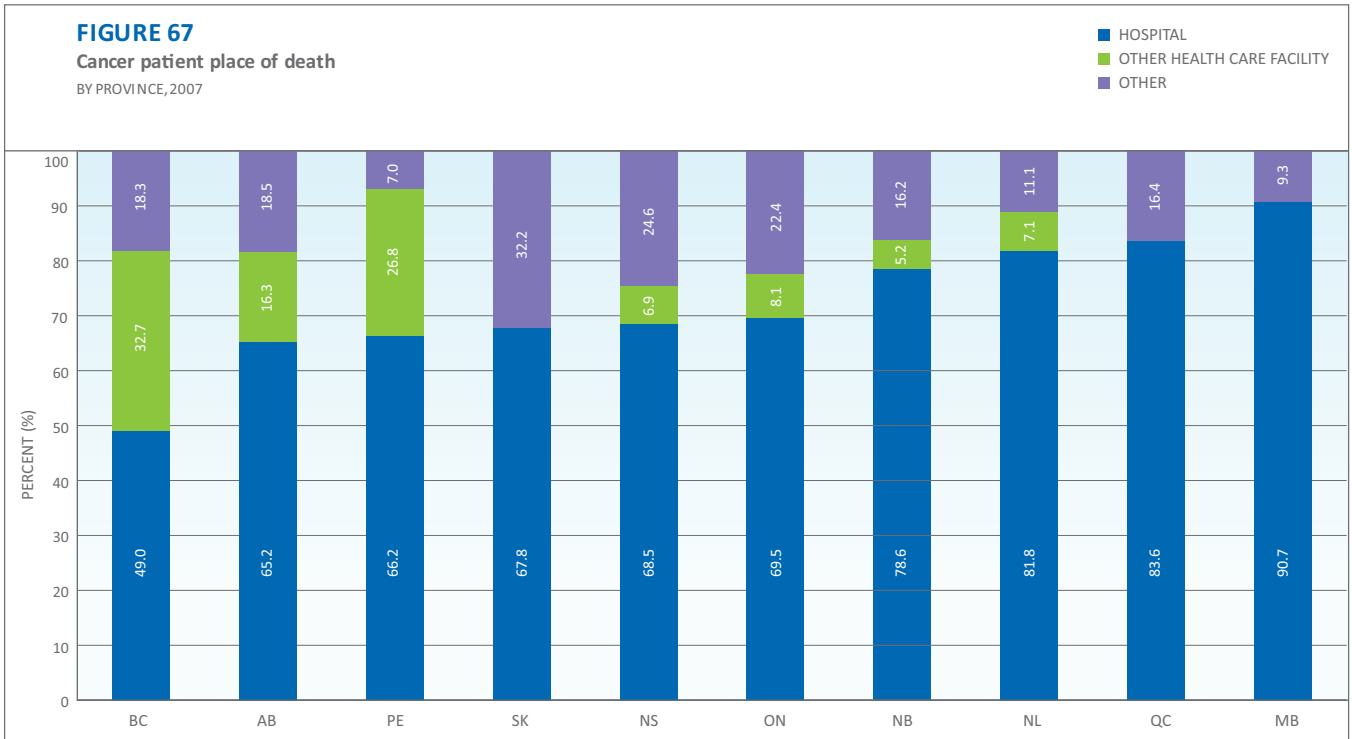
WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- The data sources for this indicator are the vital statistics submitted by the provinces to Statistics Canada. This database includes a data element identifying location of death grouped into the following categories: hospital, other health care facility (e.g., long term care or chronic care facility), private home, other specified locality and unknown.
- As discussed above, there are various discrepancies in the vital statistics data used to calculate these indicators, particularly around interpretation of the location categories described above. For example, a hospice can be categorized as an "other health care facility" or as an "other specified locality". It is hoped that reporting on these results will provide an incentive to improved data quality and standardization.
- Detailed calculation methodology is provided in the Technical Appendix (see page 162).

FIGURE 67

Cancer patient place of death

BY PROVINCE, 2007

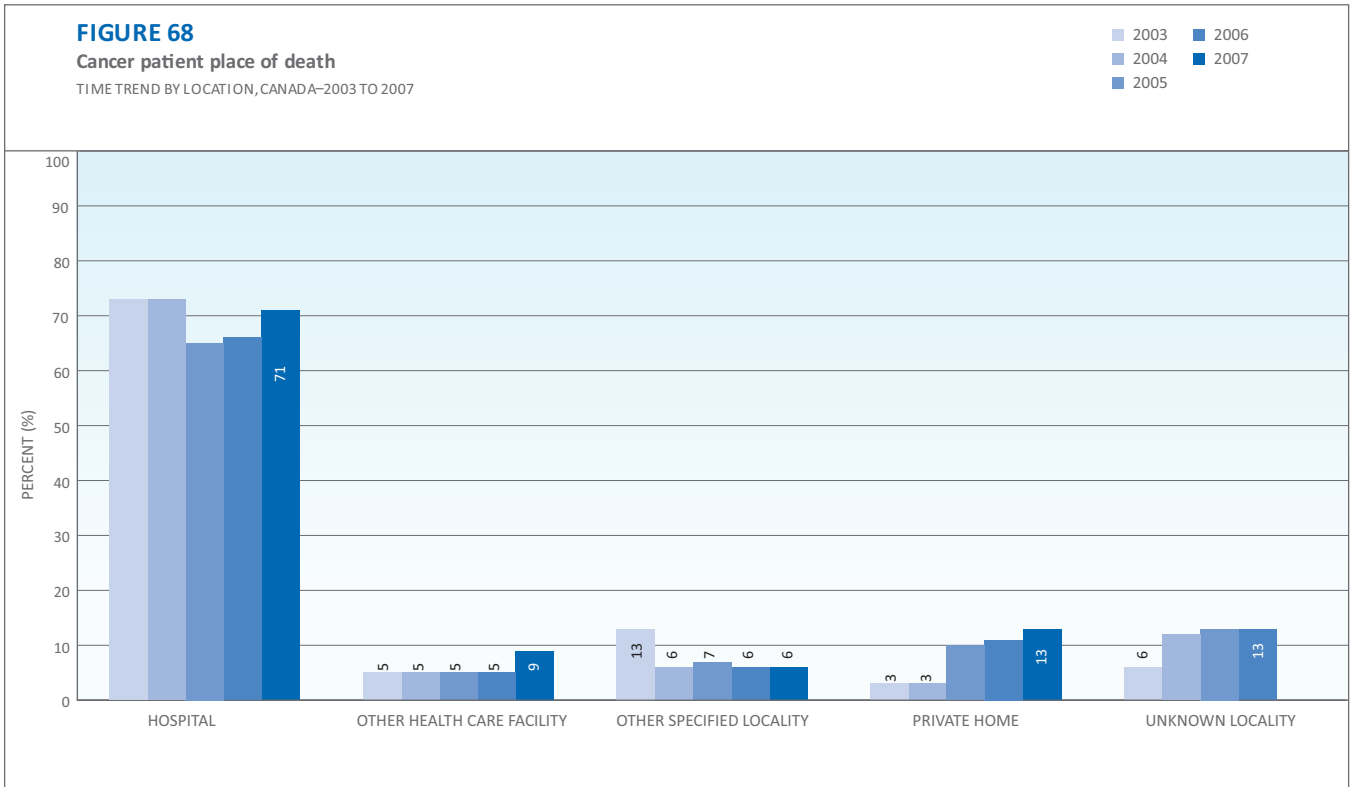


Other includes other specified locality and private home (excludes unknown locality)
Data source: Statistics Canada, Vital Statistics Death Database

FIGURE 68

Cancer patient place of death

TIME TREND BY LOCATION, CANADA–2003 TO 2007



Data Source: Statistics Canada, Vital Statistics Death Database

Long-Term Outcome Indicators

This chapter updates incidence, mortality and relative survival statistics presented in the *2010 System Performance Report* for all cancers as a group and for each of lung, breast and colorectal cancer. For prostate cancer, only incidence and mortality statistics are presented. This year, a special section focusing on conditional relative survival has been added. Also new this year, survival statistics are presented by socio-economic status (SES) measured using neighbourhood income quintiles.

CANCER SURVEILLANCE STATISTICS HELP IN UNDERSTANDING THE CANCER BURDEN.

Much of the work in the cancer control domain is aimed at improving long-term outcomes, including reducing incidence and mortality, and extending survival. The definitions for each of these outcomes, for the purposes of this *Report*, are as follows:

- The incidence rate is defined as the number of cancer cases newly diagnosed during a year, per 100,000 people. Age-standardized incidence is defined as the incidence rate that would have occurred if the age distribution of the population of interest was the same as that of the standard population.
- The mortality rate is defined as the number of deaths due to cancer in a year per 100,000 people. Age-standardized mortality is defined as the mortality rate that would have occurred if the age distribution of the population of interest was the same as that of the standard population.

Observed survival is measured as the percentage of a defined patient population living a specific number of years from a given starting point, which is usually diagnosis (with exceptions, such as in conditional survival). Relative survival is the ratio of the observed survival for a group of cancer patients to the expected survival for members of the general population (referred to as the comparison population) that have the same main factors affecting survival (sex, age, province) as the cancer patients. Conditional relative survival expresses the likelihood of surviving a set number of years into the future (e.g., 5 years) at various points after diagnosis (e.g., 1 year, 2 years, etc.), relative to the expected survival of a similar population.

Incidence and mortality statistics help quantify the burden of cancer in Canada and measure the impact of cancer control efforts on reducing its effects across the country. Survival is a key indicator of the overall effectiveness of health care systems in managing patients with cancer.

Reporting on long-term outcome measures helps identify interprovincial variations and allows for identification of correlations with other cancer control indicators (such as for prevention, screening, diagnosis and treatment) for impact evaluation. Survival patterns have been used to evaluate the success of health care systems in diagnosing and treating patients with cancer.[134]

THERE ARE A NUMBER OF TECHNICAL DETAILS RELEVANT TO UNDERSTANDING THE INDICATORS IN THIS CHAPTER.

Incidence and mortality statistics were calculated on the basis of three years of data (2005 to 2007 inclusive) to allow for the determination of more stable rates for the four provinces with populations of less than 1 million (New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador). SES and geography were determined using the most recent year of data because they apply to Canada overall.

For the generation of relative survival statistics, 'Canada' represented all provinces and territories except for Quebec (due to data limitations). Expected survival proportions were derived from sex-specific, complete provincial life tables produced by Statistics Canada, using the Ederer II approach.[135] Those younger than age 15 and those older than 74 at the time of diagnosis were excluded from analysis of relative survival for all cancers and lung, colorectal and prostate cancer, while those younger than age 15 and older than age 79 at the time of diagnosis were excluded for breast cancer. The older ages were excluded because some provinces had elevated survival in this group suggesting a bias in their data due to incomplete capture of death information. Including the older ages would inflate the relative survival estimates for Canada as a whole as well as reduce the comparability of survival across provinces. Survival analysis includes data on all primary cancer diagnoses (i.e., if patient has more than one primary, each is included).

The incidence, mortality and relative survival estimates presented in this section are age-standardized to the 1991 Canadian population and exclude non-melanoma skin cancer. It is important to understand that age-standardization allows for comparisons to be made over time and across provinces by removing the effect of the age structure of the population from the rate estimates.[136] Age-standardized rates are not real and should not be used for the purposes of resource planning, but are meant for interprovincial/territorial comparison. The conditional relative survival estimates are not age-standardized.

Incidence rates may be calculated differently in other reports for various jurisdictions within and outside Canada, and age-standardization may have used different base populations. Therefore, rates may not be directly comparable between Canada and other countries and regions. Long-term outcome statistics are available for countries around the world but are not directly comparable unless collected using the same definitions and standardized against the same population. Therefore, rather than present these statistics for other countries and regions, trend data are presented where available to provide a sense patterns and directionality.

The long-term outcome indicator results in this chapter are organized by disease site, starting with All Cancers followed by incidence, mortality and relative survival for each of breast, lung, colorectal and prostate cancer. This is followed by a special look at relative survival by SES (income quintile), and the last section presents indicators on conditional relative survival.

Incidence, Mortality and Relative Survival by Disease Site

ALL CANCERS

WHAT DO THE RESULTS SHOW?

- ***Between 1995 and 2007, the age-standardized cancer incidence rate (ASIR) remained mostly stable for men and increased slightly for women while the age-standardized cancer mortality rate (ASMR) decreased significantly in both sexes (Figure 69).***
  - The ASIR for all cancers in Canada remained relatively stable for males from 1995 to 2007 at just over 450 cases per 100,000, while during the same time period there was a slight but significant increase in the ASIR of cancer for females from less than to greater than 350 cases per 100,000 (Annual Percentage Change = 0.46%).
  - Meanwhile, the ASMR for cancers overall in Canada decreased significantly for males from 1995 to 2007 (Annual Percentage Change = –1.44%) and for females during that same time period (Annual Percentage Change = –0.62%).
- ***Generally speaking, Western Canadian provinces had lower incidence (Figure 70) and mortality (Figure 71) rates than Ontario, Quebec and the Atlantic provinces.***
  - The overall ASIR for Canada was 405 per 100,000 people and ranged from 370 per 100,000 people in British Columbia to 455 per 100,000 people in Nova Scotia.
  - The overall ASMR for Canada was 166 per 100,000 people and ranged from 153 per 100,000 people in British Columbia to 195 per 100,000 people in Newfoundland and Labrador.

WHAT IS HAPPENING INTERNATIONALLY?

- In the United States, the Surveillance Epidemiology and End Results (SEER) program collects incidence, mortality and survival information from 17 geographic areas representing 28% of the US population.[137] Age-adjusted rates are produced using the year 2000 US standard population based on single years, and statistics are generated for the entire US population. According to these data, the incidence of all cancers decreased in males from 2000 to 2008 and decreased in females from 1998 to 2004, with no significant change in rates outside of those time periods. [137]

WHAT IS BEING DONE?

- Information about incidence and survival by stage will enhance the ability to interpret results. The Partnership has a strategic initiative dedicated to National Cancer Staging.[138] The goal is to work with provinces and territories to develop a pan-Canadian approach to electronically capture and standardize the collection of cancer stage.

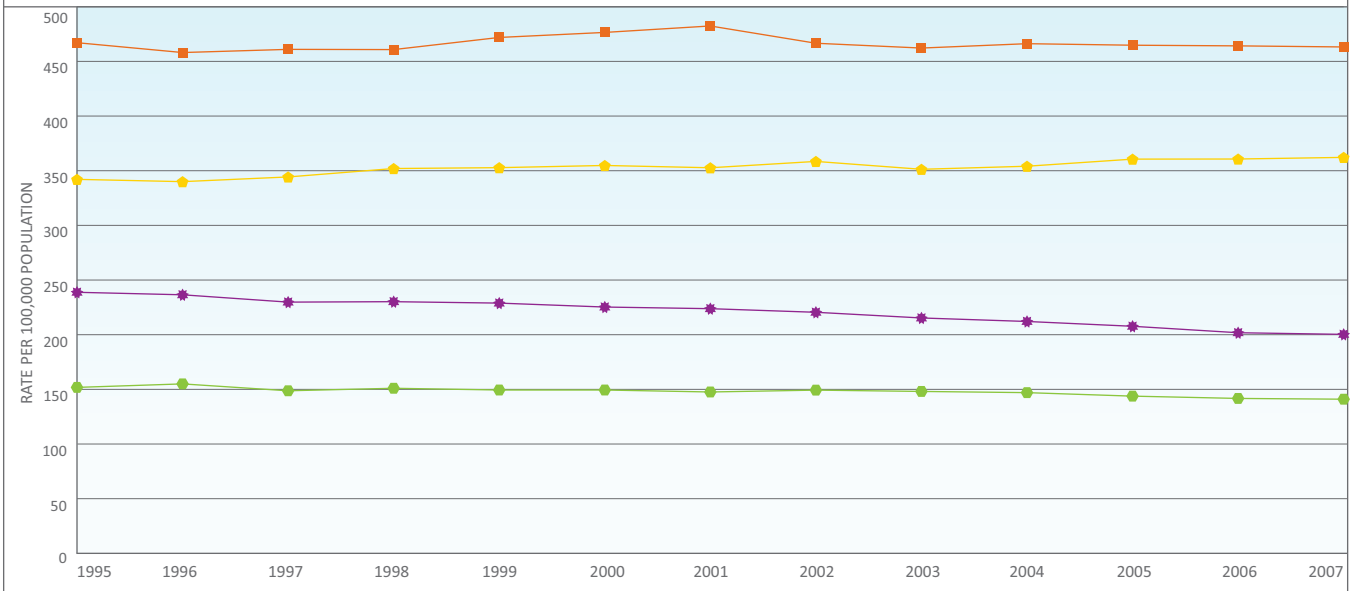
WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- Detailed calculation methodology is provided in the Technical Appendix (see page 163-164).

FIGURE 69

Age-standardized incidence and mortality rates–all cancers

BY SEX, CANADA–1995 TO 2007

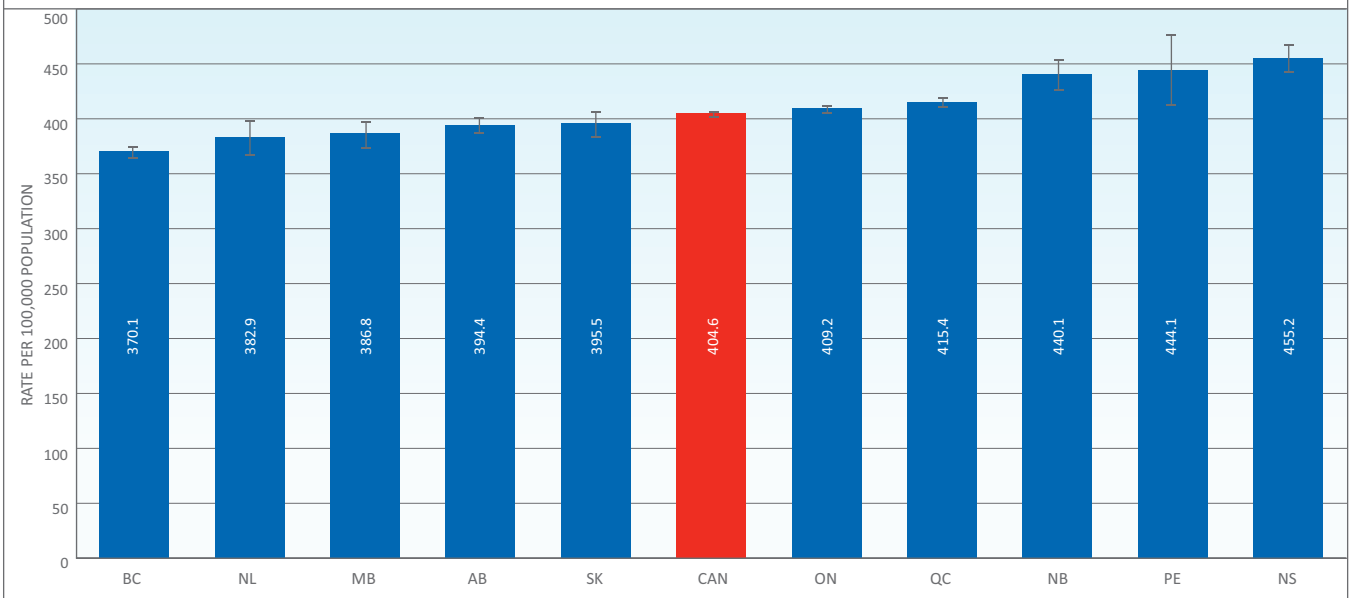


Data source: Statistics Canada–Canadian Cancer Registry, Vital Statistics Death Database

FIGURE 70

Age-standardized incidence rates–all cancers

BY PROVINCE, 2005–2007

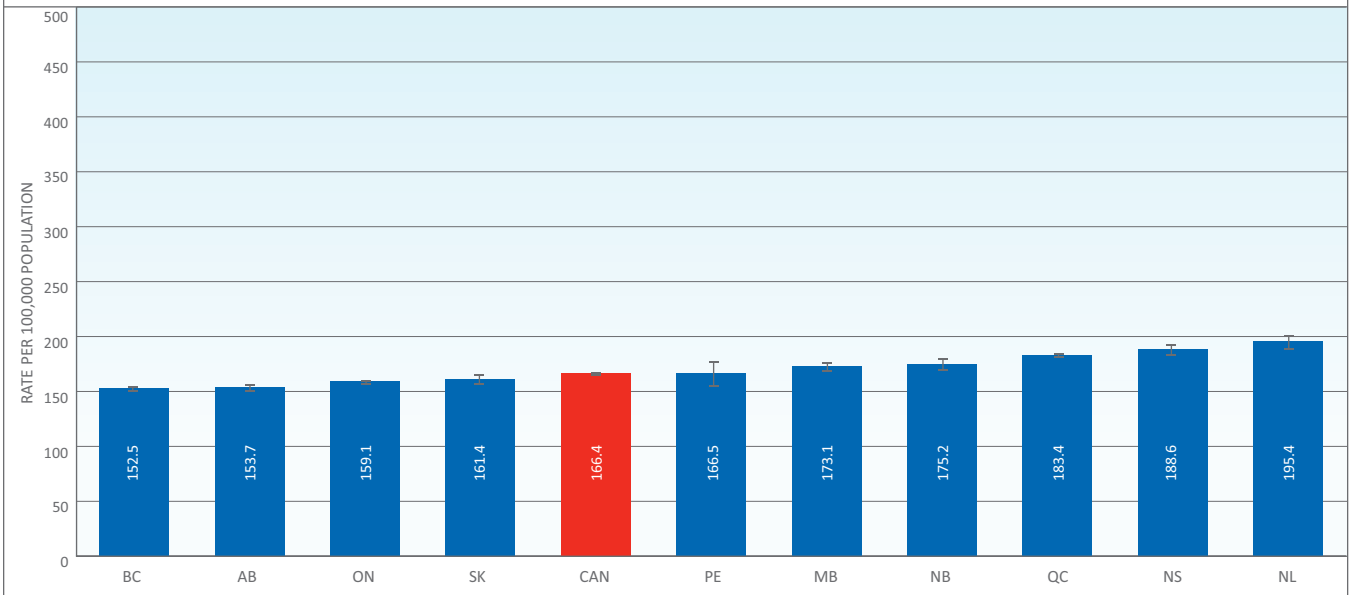


95% confidence intervals are indicated on figure.
Data source: Statistics Canada, Canadian Cancer Registry

FIGURE 71

Age-standardized mortality rates–all cancers

BY PROVINCE, 2005–2007



95% confidence intervals are indicated on figure.
Data source: Statistics Canada, Vital Statistics Death Database

BREAST CANCER

WHAT DO THE RESULTS SHOW?

- ***The age-standardized incidence rate (ASIR) and age-standardized mortality rate (ASMR) for breast cancer in Canada remained relatively stable from 1992 to 2007 (Figure 72).***
  - The ASIR hovered at around 100 cases per 100,000 females over the time period investigated while the ASMR decreased significantly to less than 25 deaths per 100,000 cases (Annual Percentage Change = –2.35%).
- ***In 2005-2007, the percentage difference between lowest and highest provincial rate was 19% in age-standardized breast cancer incidence rates (Figure 73) and a 21% for age-standardized mortality rates (Figure 74).***
  - The overall ASIR for Canada was 98 cases per 100,000 females and ranged from 84 cases per 100,000 females in Prince Edward Island to 102 cases per 100,000 females in Nova Scotia.
  - The overall ASMR for Canada was 22 per 100,000 females and ranged from 19 per 100,000 females in British Columbia to 25 per 100,000 females in Newfoundland and Labrador.
- ***The five-year age-standardized relative survival ratio for breast cancer in Canada did not vary substantially by province in 2004-2006.***
  - The 5 year relative survival ratio for Canada was 89% and ranged from 87% in Manitoba to 90% in New Brunswick.

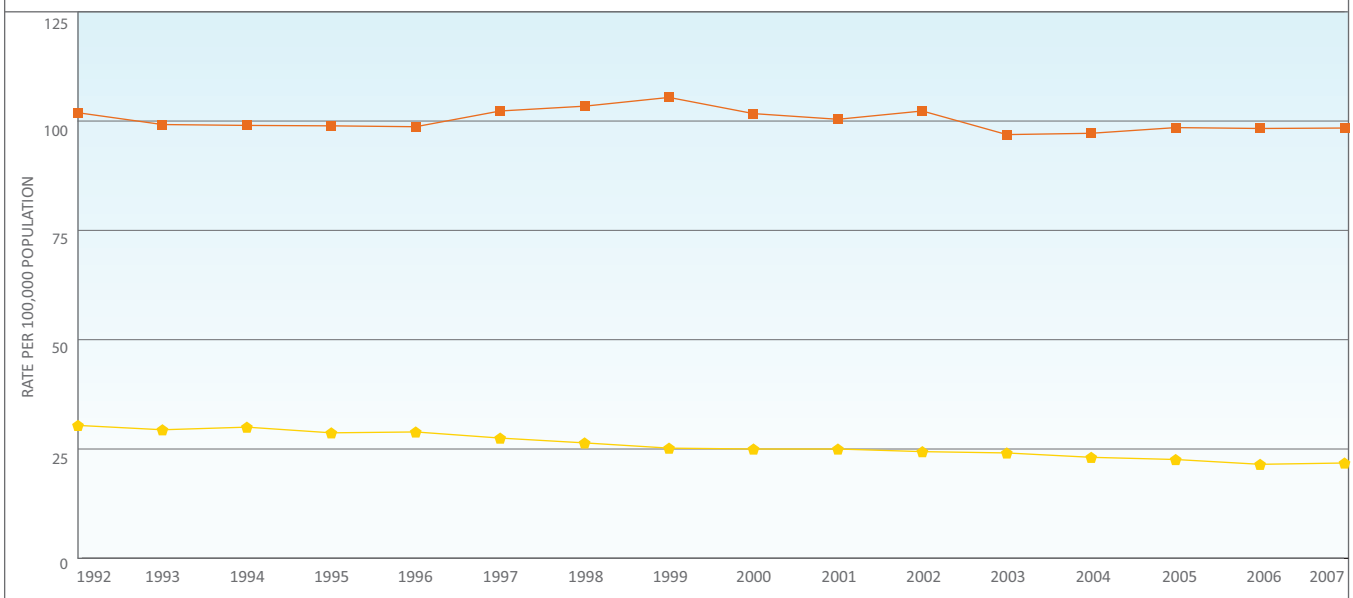
WHAT IS HAPPENING INTERNATIONALLY?

- In the United States, data from the Surveillance Epidemiology and End Results (SEER) program[137] suggest that breast cancer incidence rates increased significantly from 1992 to 1999, decreased from 199 9 to 2005, and have since stabilized. The five-year relative survival however rose 15% since 1975 to 90% in 2003.
- One international study has looked at three-year moving-average world-standardized incidence and mortality rates from 1985 to 2005, comparing rates across countries for a few cancers.[134] For breast cancer, three-year moving-average world-standardized incidence rates in Canada have increased at a lower rate than the UK or Australia.
- Meanwhile, world-standardized breast cancer mortality rates have decreased overall in Canada and are the lowest they have been since 1950, likely due to an increase in mammography screening combined with more effective adjuvant therapies following breast cancer surgery. These decreases have also occurred in several other countries.[134, 139]

FIGURE 72

Age-standardized incidence and mortality rates–breast cancer

FEMALE, CANADA–1992 TO 2007

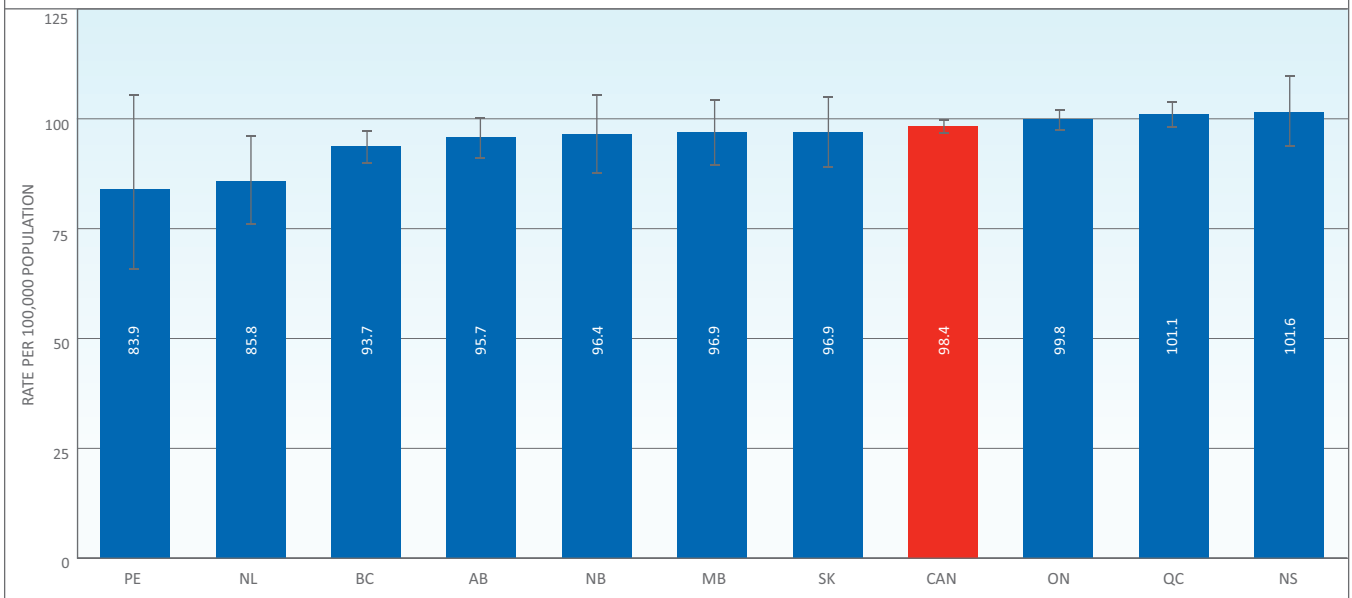


Female breast cancer cases only
Data source: Statistics Canada–Canadian Cancer Registry, Vital Statistics Death Database

FIGURE 73

Age-standardized incidence rates–breast cancer

BY PROVINCE, 2005–2007

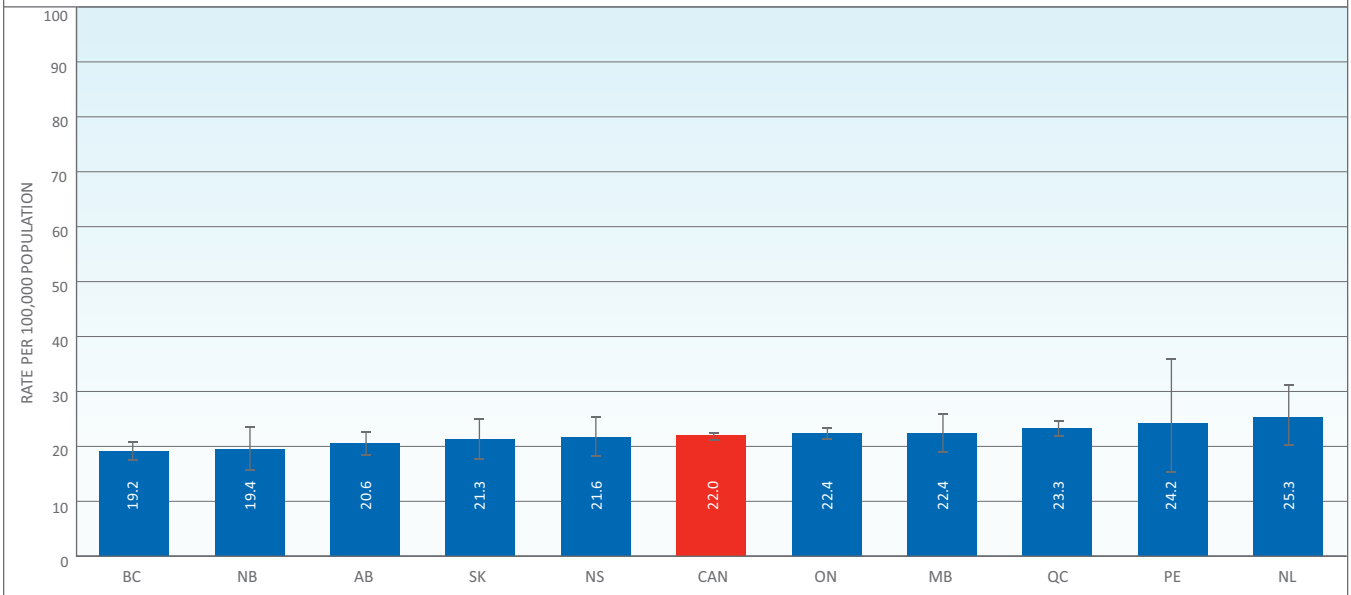


Female breast cancer cases only
95% confidence intervals are indicated on figure.
Data source: Statistics Canada, Canadian Cancer Registry

FIGURE 74

Age-standardized mortality rates–breast cancer

BY PROVINCE, 2005–2007

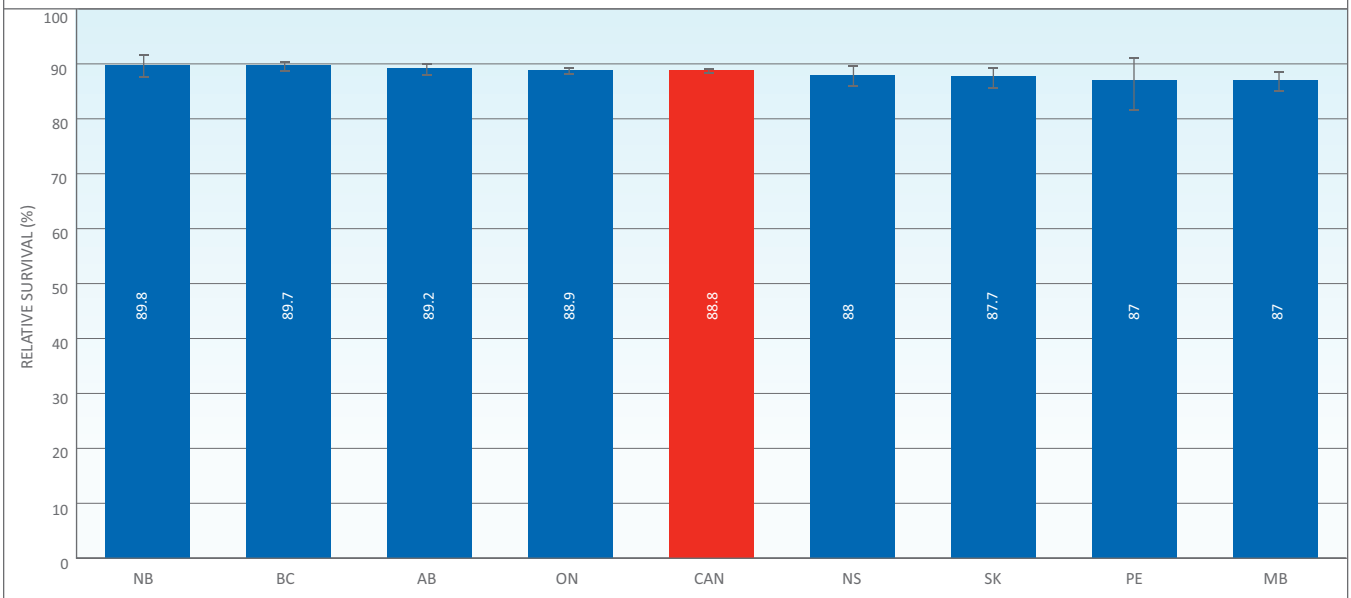


Female breast cancer cases only
95% confidence intervals are indicated on figure.
Data source: Statistics Canada, Vital Statistics Death Database

FIGURE 75

Five-year relative survival ratios (age 15-79)–breast cancer

BY PROVINCE, 2004–2006



Female breast cancer cases only
95% confidence intervals are indicated on figure.
Data source: Statistics Canada, Canadian Cancer Registry

LUNG CANCER

WHAT DO THE RESULTS SHOW?

- ***Between 1992 and 2007, the age-standardized incidence rate (ASIR) and age-standardized mortality rate (ASMR) for lung cancer in Canada were consistently decreasing for men but increasing for women (Figure 76).***
  - The ASIR for lung cancer in Canada decreased significantly for males from approximately 90 cases per 100,000 in 1992 to approximately 68 cases per 100,000 in 2007 (Annual Percentage Change = –1.9%) while for females, it increased significantly from approximately 40 cases per 100,000 to just under 50 cases per 100,000 (Annual Percentage Change = 1.32%) in the same time period.
  - The ASMR for lung cancer in Canada decreased significantly for males from approximately 78 deaths per 100,000 in 1992 to approximately 56 deaths per 100,000 in 2007 (Annual Percentage Change = –2.13%) while for females, it increased significantly from approximately 30 deaths per 100,000 to approximately 35 deaths per 100,000 (Annual Percentage Change = 1.17%) in the same time period.
- ***Across Canada in 2005-2007, there were inter-provincial differences in the age-standardized lung cancer incidence (Figure 77) and mortality (Figure 78) rates.***
  - The overall ASIR for lung cancer in Canada was 56 per 100,000 people and ranged from 50 per 100,000 people in Alberta to 69 per 100,000 people in New Brunswick (data not shown).
  - Overall and across provinces, the incidence rate for males was higher than for females but to varying proportions. The difference in ASIR between males and females was 68% in Quebec but only 24% in British Columbia.
  - The overall ASMR for Canada was 46 per 100,000 people and ranged from 39 per 100,000 people in Alberta to 56 per 100,000 people in Quebec.
- ***The five-year age-standardized relative survival ratio for lung cancer in Canada also varied by province (Figure 79).***
  - The overall 5-year relative survival ratio for Canada for patients diagnosed between 2004 and 2006 was 18% and ranged from 15% in Nova Scotia to 20% in Manitoba.

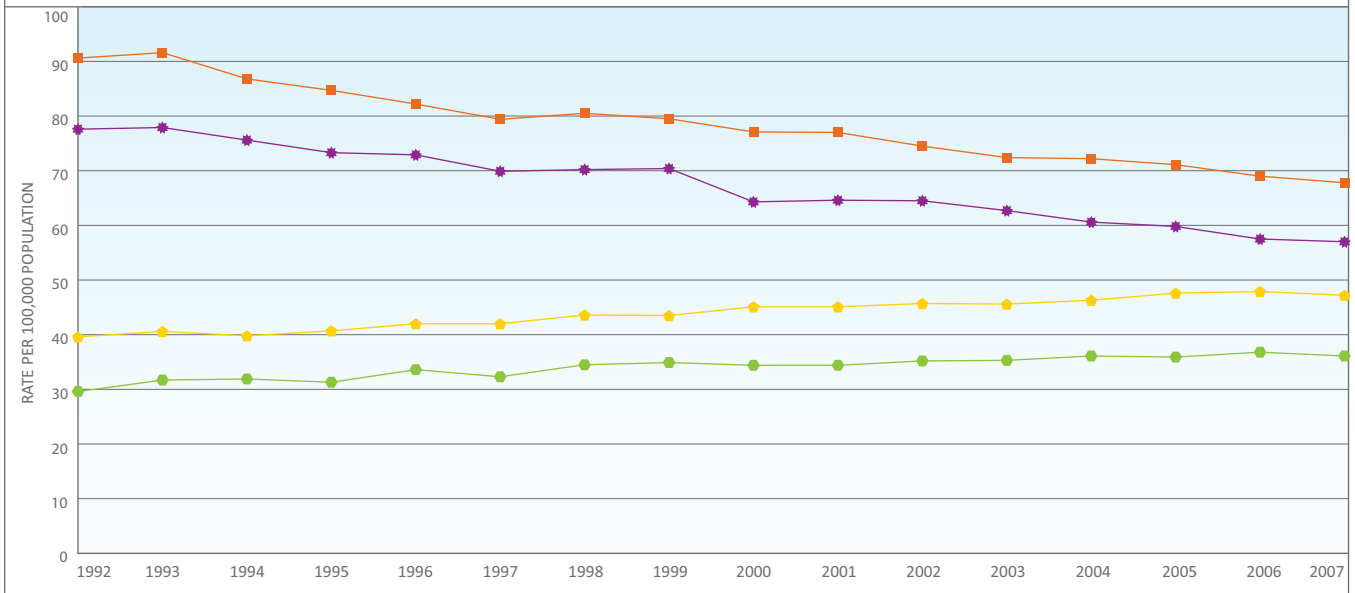
WHAT IS HAPPENING INTERNATIONALLY?

- Data from the Surveillance Epidemiology and End Results (SEER) program suggest that there are similar trends in lung cancer incidence among males and among females in the United States as in Canada, with rates decreasing among males over time and fluctuating for females. Five-year relative survival however stayed roughly the same at about 10%.[137]
- Trend data available internationally suggest that lung cancer incidence and mortality rates have peaked among men in many countries, including the United States, Canada, England, Denmark and Australia. Rates among women continue to rise, having not yet peaked in most countries, with the exception of the United States where recent evidence shows rates to be declining.[140-141] Researchers suggest that the differences in male and female lung cancer trends are linked to differences in patterns of tobacco consumption. Tobacco consumption among males began to decrease in the mid-1960s preceding the decline in lung cancer rates by roughly 20 years, while consumption among females began to decline in the mid-1980s.[67]

FIGURE 76

Age-standardized incidence and mortality rates–lung cancer

BY SEX, CANADA–1992 TO 2007

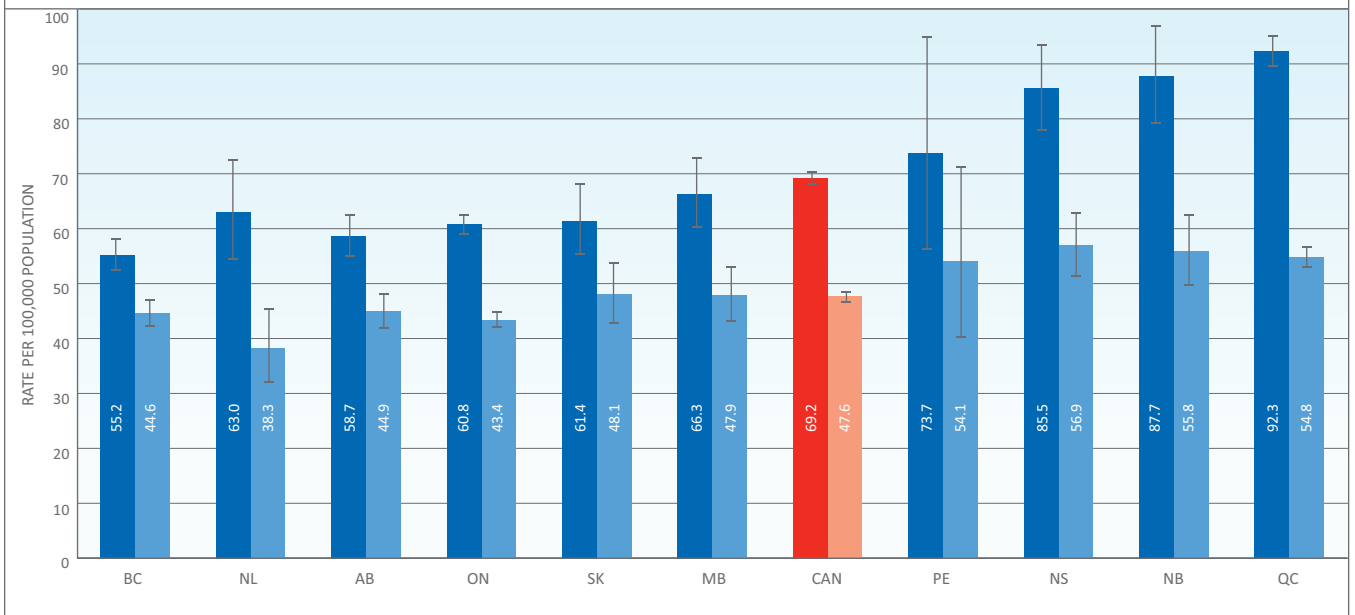


Data Source: Statistics Canada–Canadian Cancer Registry, Vital Statistics Death Database

FIGURE 77

Age-standardized incidence rates–lung cancer

BY PROVINCE AND SEX, 2005–2007

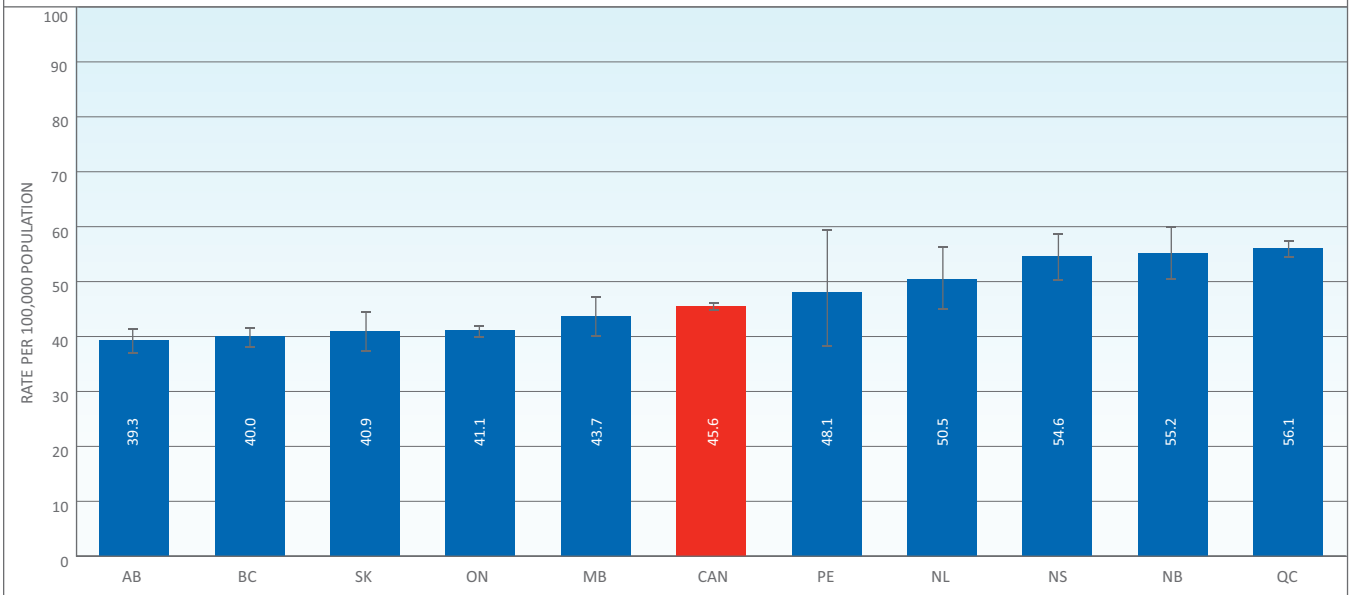


95% confidence intervals are indicated on figure.
Data source: Statistics Canada, Canadian Cancer Registry

FIGURE 78

Age-standardized mortality rates–lung cancer

BY PROVINCE, 2005–2007

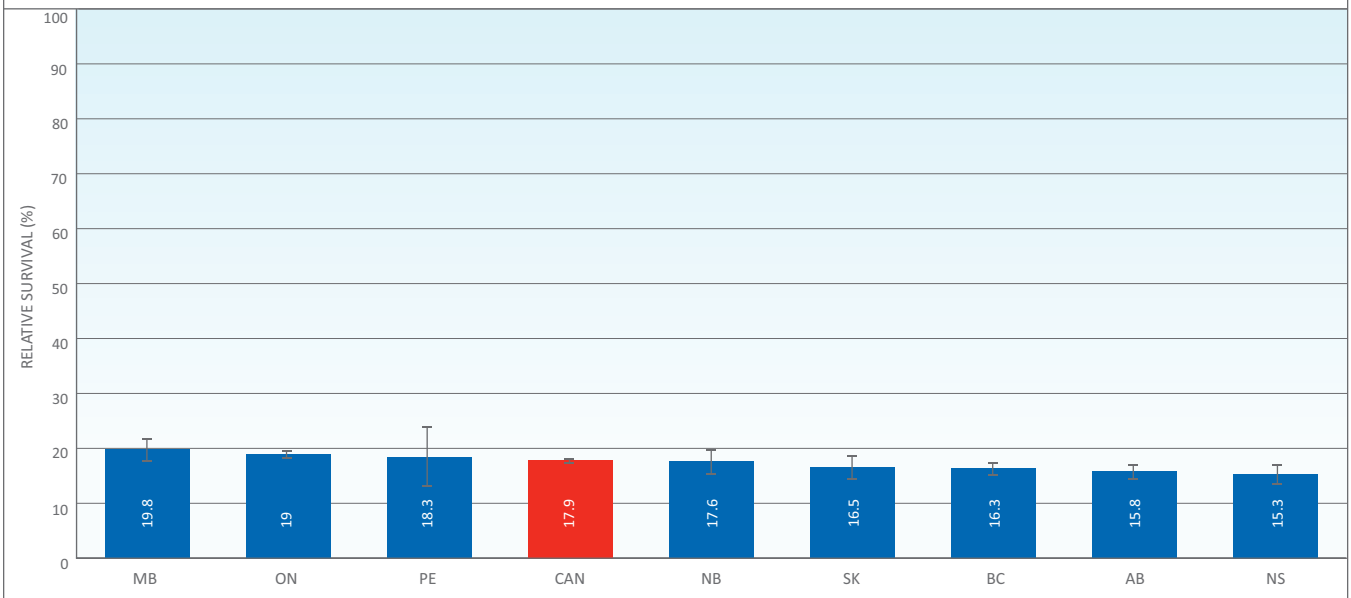


95% confidence intervals are indicated on figure.
Data source: Statistics Canada, Vital Statistics Death Database

FIGURE 79

Five-year relative survival ratios (age 15-79)–lung cancer

BY PROVINCE, 2004–2006



95% confidence intervals are indicated on figure.
Data source: Statistics Canada, Canadian Cancer Registry

COLORECTAL CANCER

WHAT DO THE RESULTS SHOW?

- ***The age-standardized incidence rate (ASIR) and age-standardized mortality rate (ASMR) for colorectal cancer in Canada were fairly stable for both men and women from 1992 to 2007, although substantially higher for men (Figure 80).***
  - The ASIR for colorectal cancer in Canada did not significantly change for males from 1992 to 2007 hovering at approximately 60 cases per 100,000, and for females it decreased significantly (Annual Percentage Change = –0.26%, *p*-value < 0.05) but very slightly dropping from 43 to 41 cases per 100,000.
  - Meanwhile, the ASMR for colorectal cancer in Canada decreased significantly for males from 1992 to 2007 from approximately 30 to about 25 cases per 100,000 (Annual Percentage Change = –1.18%, *p*-value < 0.05) and also for females from approximately 20 to about 16 cases per 100,000 (Annual Percentage Change = –1.36%, *p*-value < 0.05).
- ***In 2005-2007 for colorectal cancer, the percentage difference between lowest and highest provincial rate was 43% for age-standardized incidence (Figure 81) and 58% for age-standardized mortality (Figure 82).***
  - The overall ASIR for Canada was 50 per 100,000 people and ranged from 44 per 100,000 people in British Columbia to 69 per 100,000 people in Newfoundland and Labrador.
  - The overall ASMR for Canada was 21 per 100,000 people and ranged from 18 per 100,000 people in Alberta to 33 per 100,000 people in Newfoundland and Labrador.
- ***The five-year age-standardized relative survival ratio for colorectal cancer in Canada varied by four percentage points between lowest and highest province in 2004- 2006 (Figure 83).***
  - The overall survival ratio for Canada was 66% and ranged from 64% in Alberta to 68% in Prince Edward Island.

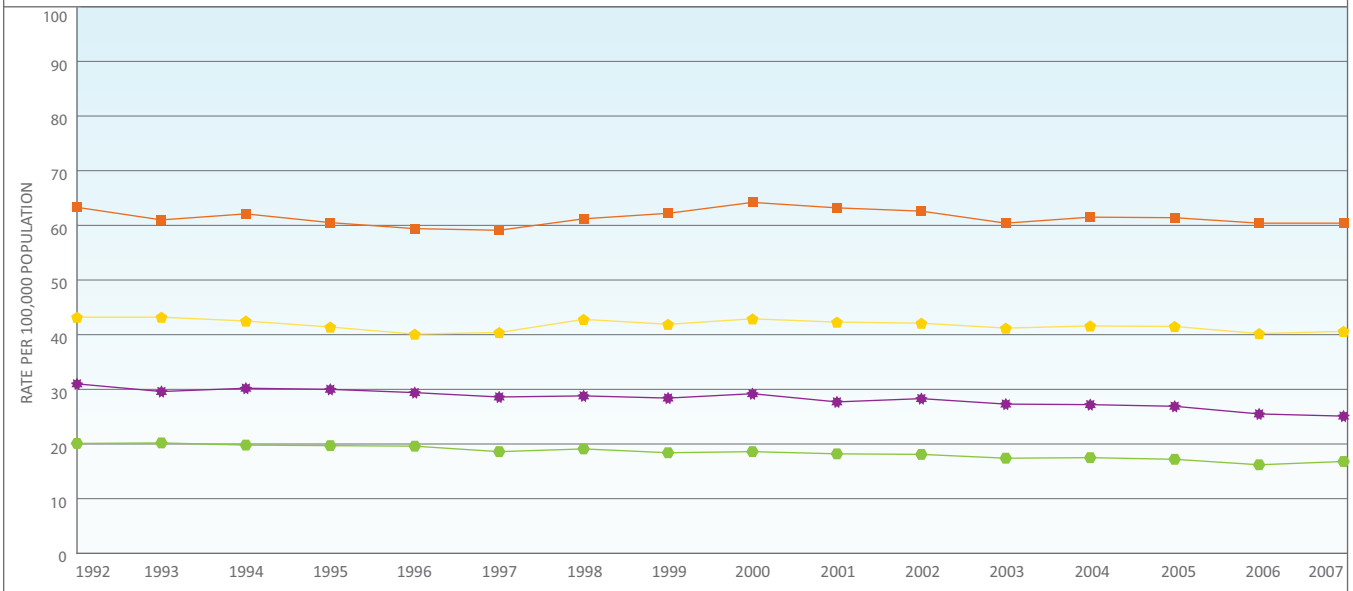
WHAT IS HAPPENING INTERNATIONALLY?

- Data from the Surveillance Epidemiology and End Results (SEER) program suggest that in the United States, there were significant decreases in colorectal cancer incidence among both males and females since the early 1990s. Trends in five-year relative survival by year of diagnosis reveal that among males and females, relative survival increased between 1975 to 2003.[137]
- One international study has looked at three-year moving-average world-standardized incidence and mortality rates for colorectal cancer from 1985 to 2005. Compared with other countries, the researchers found that colorectal cancer incidence rates in Canada had decreased from 1985 to 2000 while in other countries including Sweden, Australia, Norway, Denmark and the UK, they had increased. That said, as of 2000, they began to increase again more sharply than elsewhere.[134] Meanwhile, colorectal cancer mortality rates have decreased but not as dramatically as in the UK and Australia. These decreases in rates are suggested to be the likely result of improvements in treatment, improved screening techniques and organized screening programs.[67]

FIGURE 80

Age-standardized incidence and mortality rates–colorectal cancer

BY SEX, CANADA–1992 TO 2007

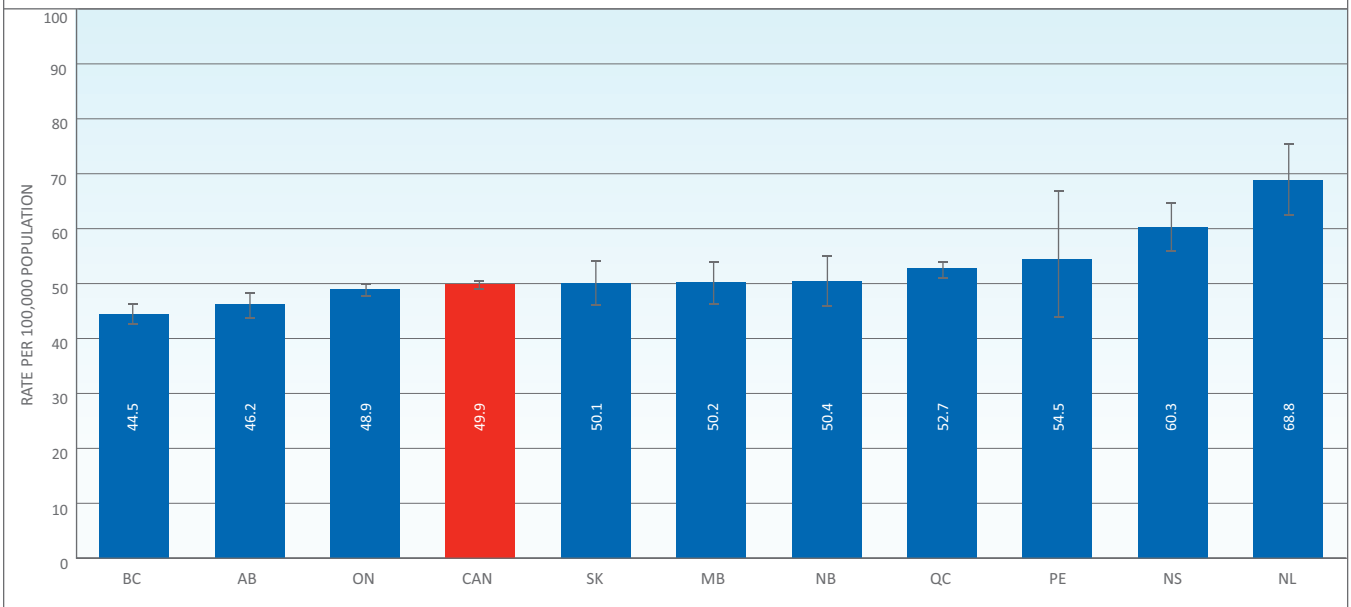


Data source: Statistics Canada–Canadian Cancer Registry, Vital Statistics Death Database

FIGURE 81

Age-standardized incidence rates–colorectal cancer

BY PROVINCE, 2005–2007

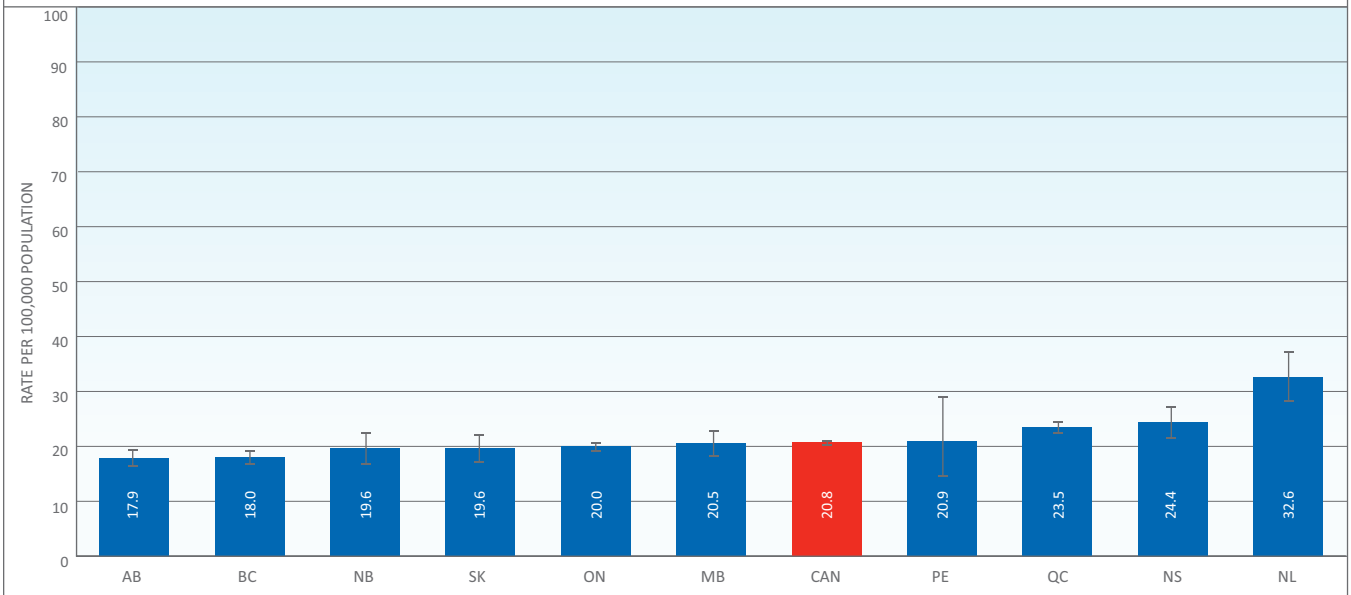


95% confidence intervals are indicated on figure.
Data source: Statistics Canada, Canadian Cancer Registry

FIGURE 82

Age-standardized mortality rates–colorectal cancer

BY PROVINCE, 2005–2007

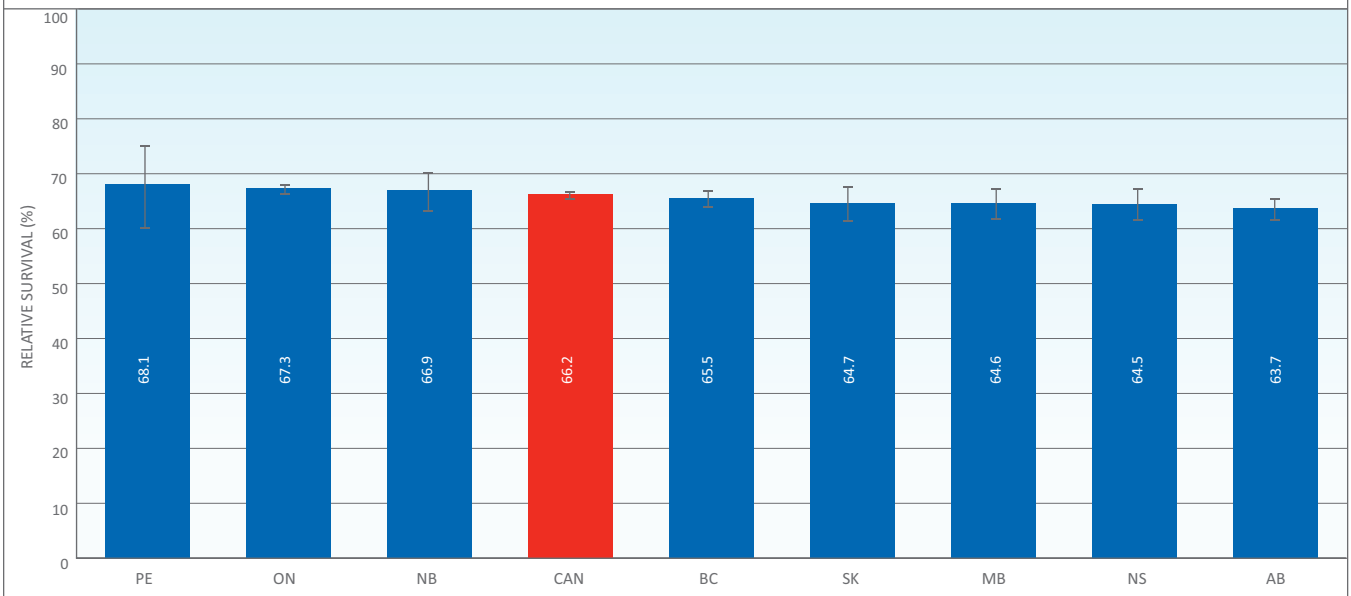


95% confidence intervals are indicated on figure.
Data source: Statistics Canada, Vital Statistics Death Database

FIGURE 83

Five-year relative survival ratios–colorectal cancer

BY PROVINCE, 2004–2006



95% confidence intervals are indicated on figure.
Data source: Statistics Canada, Canadian Cancer Registry

PROSTATE CANCER

WHAT DO THE RESULTS SHOW?

- ***The age-standardized incidence rate (ASIR) for prostate cancer in Canada did not significantly change from 1992 to 2007 while during the same time period there was a very slight decrease in the age-standardized mortality rate (ASMR) (Figure 84).***
  - The ASIR for prostate cancer remained stable at around 125 cases per 100,000 men, while the ASMR decreased significantly from 31 to 20 cases per 100,000 men (Annual Percentage Change = –2.9%, p-value < 0.05).
- ***In 2005-2007 for prostate cancer, the percentage difference between lowest and highest provincial rate was 52% for age-standardized incidence (Figure 85) and a 46% for age-standardized mortality (Figure 86).***
  - The overall ASIR for Canada was 124 per 100,000 men and ranged from 97 per 100,000 men in Quebec to 166 per 100,000 men in Prince Edward Island.
  - The overall ASMR for Canada was 21 per 100,000 men and ranged from 18 per 100,000 men in Quebec to 29 per 100,000 men in Saskatchewan.

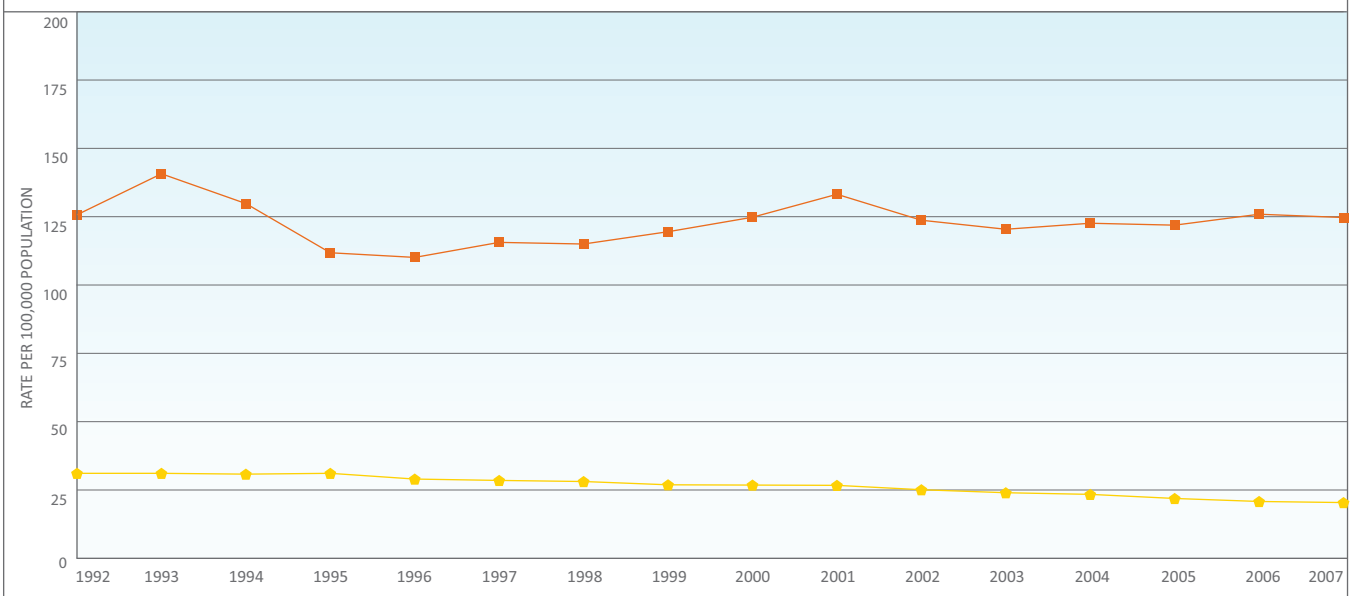
WHAT IS HAPPENING INTERNATIONALLY?

- Incidence trends in countries with a high uptake of PSA testing, including the United States, Canada and Australia, have followed a similar pattern with an increase around the time of introduction of the test.[142] Meanwhile, in the UK and Japan, rates have increased more slowly over time. In the UK, this is most likely due to a reduced uptake of PSA testing compared with countries like the US and Canada. Between 1979 and 2005, statistically significant reductions in mortality were identified for men aged 50–79 years in 15 out of 24 developed countries.[142]
- Research suggests that increases in incidence in the past have likely been due to the introduction of the PSA test for early prostate cancer detection.[67] The decrease in mortality rates and improvement in survival likely reflects improved treatment. In fact, an Anticipatory Science expert panel convened by the Partnership in 2009 published a PSA Toolkit, which provides background information regarding PSA screening and testing (opportunistic screening, case-finding or ad-hoc testing). It also includes screening practices to be considered as well as those to be avoided. The panel concluded that expansion of PSA screening practices beyond the current ad hoc situation is not justified and indeed may produce net harm.[143]

FIGURE 84

Age-standardized incidence and mortality rates–prostate cancer

CANADA–1992 TO 2007

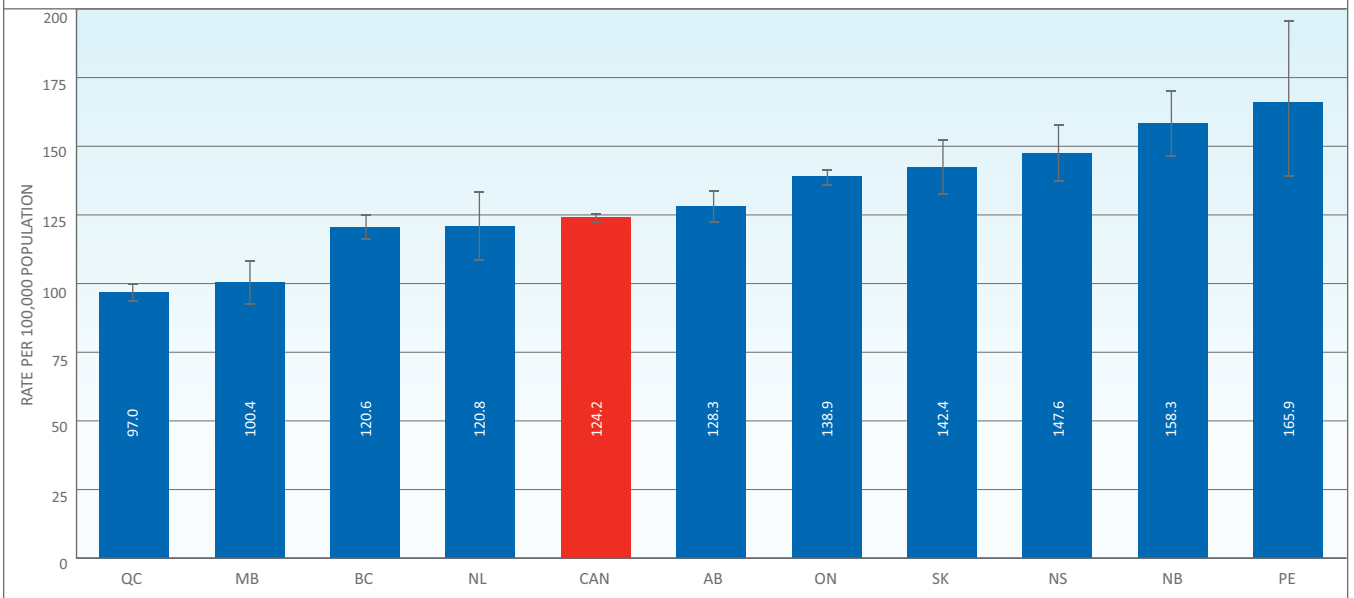


Data source: Statistics Canada–Canadian Cancer Registry, Vital Statistics Death Database

FIGURE 85

Age-standardized incidence rates–prostate cancer

BY PROVINCE, 2005–2007

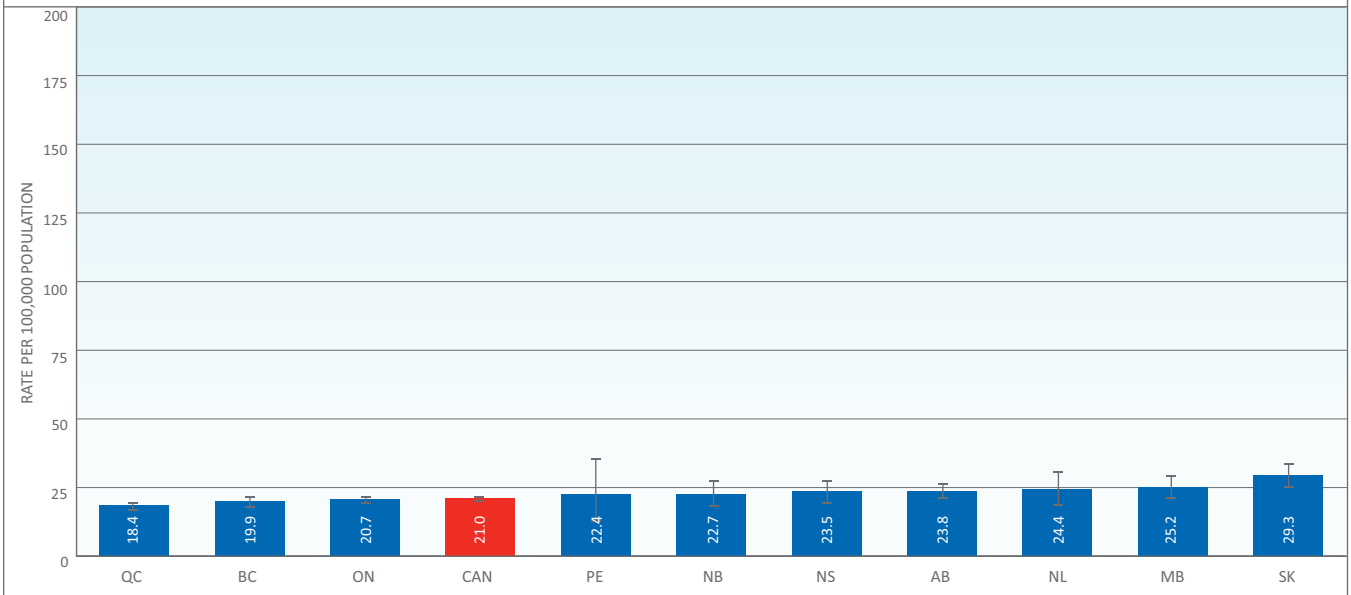


95% confidence intervals are indicated on figure
Data source: Statistics Canada, Canadian Cancer Registry

FIGURE 86

Age-standardized mortality rates–prostate cancer

BY PROVINCE, 2005–2007



95% confidence intervals are indicated on figure.
Data source: Statistics Canada, Vital Statistics Death Database

RELATIVE SURVIVAL BY SOCIO-ECONOMIC STATUS (SES) – URBAN CANADA

WHAT ARE WE MEASURING?

This indicator examines five-year relative survival by socio-economic status for urban Canada. Relative survival is the ratio of the observed survival for a group of patients with malignant neoplasms to the expected survival for members of the general population (referred to as the comparison population) that have the same main factors affecting survival (sex, age, place of residence) as the cancer patients. Household income quintiles are used as a measure of socio-economic status. Life tables by income quintile were used to calculate the relative survival for all cancers. Lung cancer is known to have a low 5-year survival rate and incidence is strongly related to income with risk being highest among those in low income quintiles.[144] Prostate cancer is known to have a high 5-year survival rate but men of higher income are more likely to be diagnosed with the disease.[145] Given the strong relationship between survival and SES for lung and prostate cancer, both were removed in order to examine the relationship between survival and SES for other cancers.

WHY ARE WE MEASURING THIS?

- Survival of cancer overall is a key indicator of the overall effectiveness of health care systems in managing patients with cancer.

WHAT DO THE RESULTS SHOW?

- ***Relative survival for all cancers increases with household income (Figure 87); the relationship persisted but was less marked when lung and prostate cancer were excluded (Figure 88).***
  - The five-year relative survival ratio for patients age 15–74 diagnosed with any cancer was 61% in the lowest income quintile compared to 74% in the highest income quintile.
  - When lung and prostate cancer were excluded, the five-year relative survival ratio for patients age 15–74 diagnosed with all other cancers was 64% in the lowest income quintile compared to 72% in the highest income quintile.

WHAT IS HAPPENING INTERNATIONALLY?

- A series of studies comparing observed one- and five-year cancer survival by income quintile in major American cities including Detroit, Hartford, San Francisco and Seattle, showed that lower income groups in American cities had poorer survival compared to higher income groups. The studies included comparisons with Toronto where they did not find the same SES relationship as the US cities.[146-149]

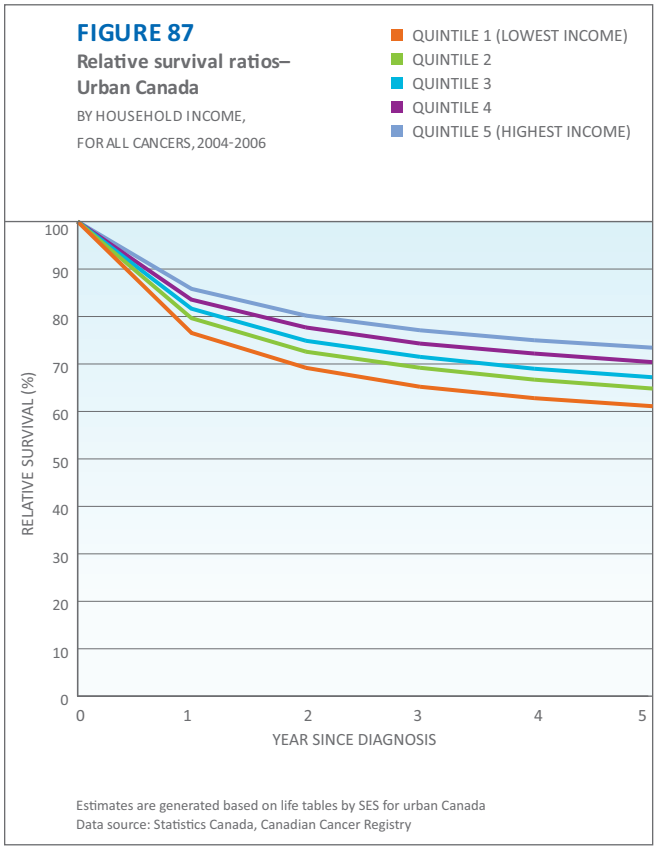
WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- It is important to note that this analysis is restricted to urban Canada as life tables by socio-economic status are not available for rural Canada. The life tables used were for urban Canada as a whole and broken down by age group and household income quintile. Life tables specific to income quintile are used to remove the confounding effect of deaths due to other causes also related to socio-economic status. These findings cannot be generalized to all Canadians diagnosed with cancer. In this analysis, it is important to recall that income quintile is an aggregate measure that is based on the average income of a geographic dissemination area. This definition is provided in the Technical Appendix as the Canadian Census Stratification Variable of Neighbourhood Income Quintiles (see page 168). Therefore income quintiles should be considered and interpreted at an aggregate level, as opposed to individual level, only.
- Zhang-Salomons *et al* have investigated and concluded that the relationship between SES and cancer survival tends to change depending on the measure used for SES. Income quintile is recommended as the best measure for this type of study compared to poverty measures such as percentage of the population below a low income threshold or percentage of the population that are blue collar workers.[150]
- Detailed calculation methodology is provided in the Technical Appendix (see page 164).

FIGURE 87

Relative survival ratios–Urban Canada

BY HOUSEHOLD INCOME, FOR ALL CANCERS, 2004-2006

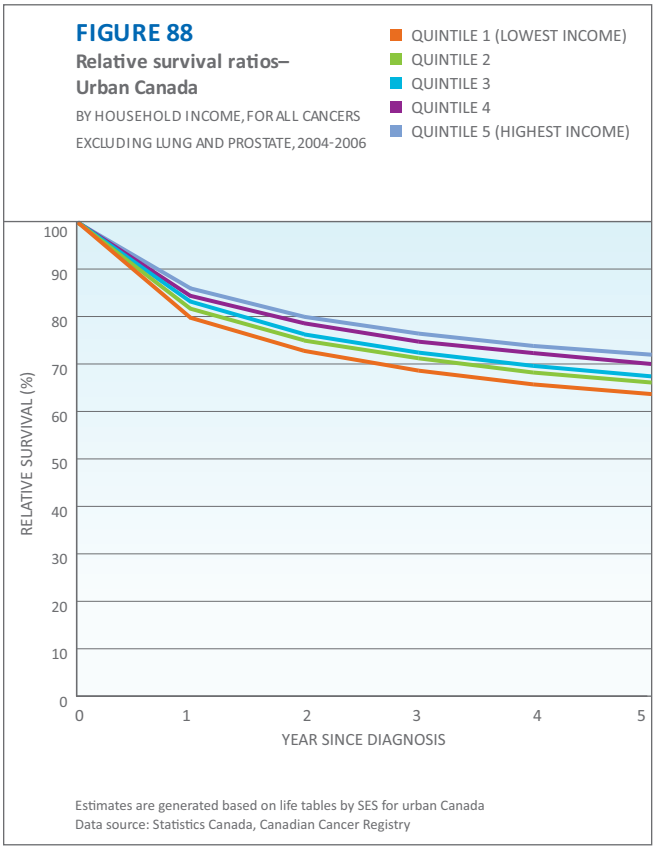


Estimates are generated based on life tables by SES for urban Canada
Data source: Statistics Canada, Canadian Cancer Registry

FIGURE 88

Relative survival ratios–Urban Canada

BY HOUSEHOLD INCOME, FOR ALL CANCERS EXCLUDING LUNG AND PROSTATE, 2004-2006



Estimates are generated based on life tables by SES for urban Canada
Data source: Statistics Canada, Canadian Cancer Registry

CONDITIONAL RELATIVE SURVIVAL

WHAT ARE WE MEASURING?

This indicator is defined as the absolute (observed) survival among cancer patients divided by the expected survival of a comparable group from the general population (same period, age and sex), conditional upon being alive at the beginning of each year following diagnosis.[151] This indicator examines five-year relative survival ratio conditional upon surviving 1, 2, 3, 4 and 5 years from diagnosis, compared to the standard 5-year survival at diagnosis (or at 0 years).

WHY ARE WE MEASURING THIS?

- Survival is a key indicator of the overall effectiveness of health care systems in managing patients with cancer. Survival patterns have helped to shape and assess national cancer strategies, as exemplified in places like Denmark, Norway and the UK. Survival is also of interest to clinicians providing direct care and to patients, who usually want this information as part of their prognosis.[152]
- Conditional relative survival statistics are particularly helpful in that they provide an estimate of survival presuming an individual has survived the early period following diagnosis, when the risk of death is greatest.

WHAT DO THE RESULTS SHOW?

- ***Conditional survival patterns varied by type of cancer.***
  - A conditional relative survival ratio of 90% or higher was achieved for breast cancer after two years and remained close to that level with each year survived topping up at 93% after five years (Figure 89).
  - In contrast to breast cancer, the conditional relative survival ratio for colorectal cancer showed more marked improvement with each year survived but was always slightly higher for women than for men. A 5-year survival of 90% or higher was conditional on surviving three years for women versus four years for men (Figure 90).
- ***Patient age was a factor in conditional survival for lung cancer bur not colorectal cancer.***
  - The conditional relative survival ratio for colorectal cancer over time showed little difference by age (Figure 91).
  - In contrast to colorectal cancer, the conditional relative survival ratio for lung cancer differed over age groups at each year from diagnosis onward (Figure 92). Over time, the conditional relative survival ratio increased most sharply for adults aged 15–44 and 45–54 within the first and second year since diagnosis. Improvements in conditional relative survival levelled out over time for all age groups.

WHAT IS HAPPENING INTERNATIONALLY?

- According to data on cases diagnosed during 1990 to 2001 and followed through 2006 from the Surveillance Epidemiology and End Results (SEER) program, the five-year relative survival probabilities generally tended to increase the longer that the patient survived, but at a decreasing rate.[153]
- A Danish study on conditional survival found that there were age-related differences in colorectal cancer survival at the time of diagnosis, these disappeared as time from diagnosis passed; whereas in lung cancer, while only small age differences existed at the time of diagnosis, they became more visible with time since diagnosis which is the pattern observed in this report.[154]

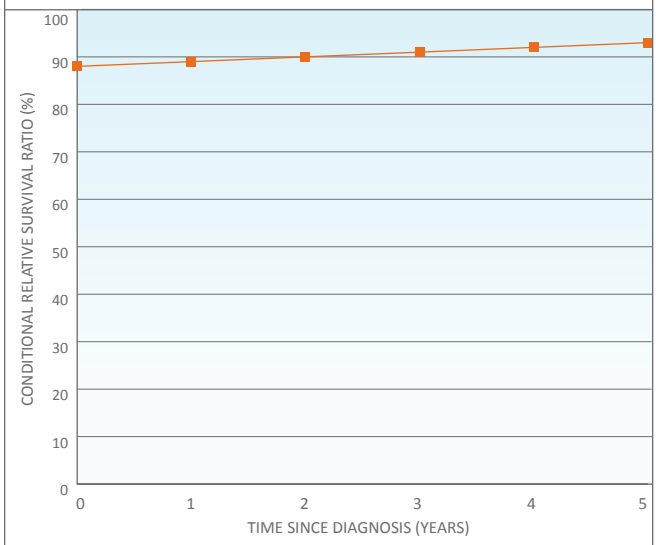
WHAT SHOULD YOU BE AWARE OF ABOUT DATA AND MEASUREMENT?

- These findings are population-based and so cannot be extrapolated to determine individual prognosis.
- These findings exclude data from the province of Quebec mainly because of issues in ascertaining the vital status of cases. Also excluded were records where age at diagnosis was outside of the range of 15–99, diagnosis was established through autopsy or death certificate only, and the year of birth or death was unknown.
- The period method, a more conservative but timely prediction of the survival eventually observed, was used to derive survival.
- Detailed calculation methodology is provided in the Technical Appendix (see page 165).

FIGURE 89

Five-year conditional relative survival–breast cancer

FEMALES, CANADA–2004-2006

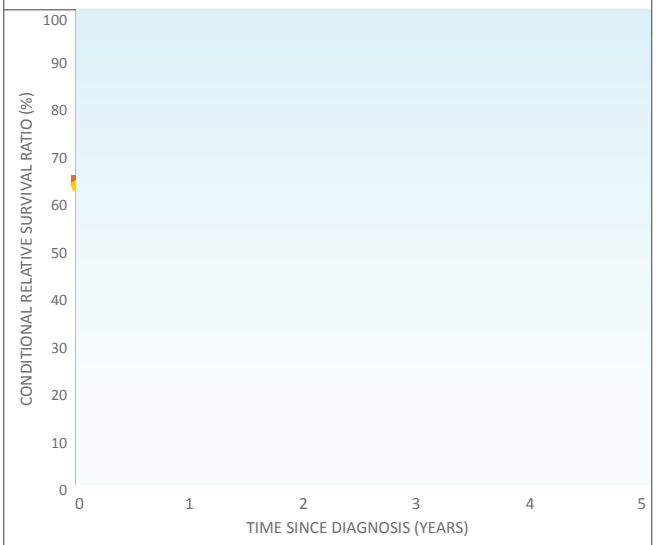


Analyzed by Statistics Canada–Health Statistics Division
Data source: Statistics Canada–Canadian Cancer Registry

FIGURE 90

Five-year conditional relative survival–colorectal cancer

BY SEX, CANADA–2004-2006

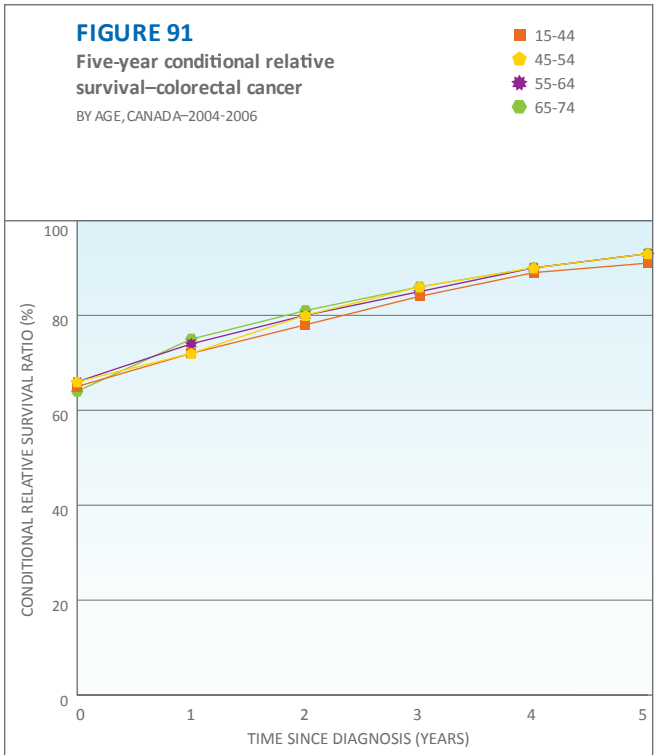


Analyzed by Statistics Canada–Health Statistics Division
Data source: Statistics Canada–Canadian Cancer Registry

FIGURE 91

Five-year conditional relative survival–colorectal cancer

BY AGE, CANADA–2004-2006

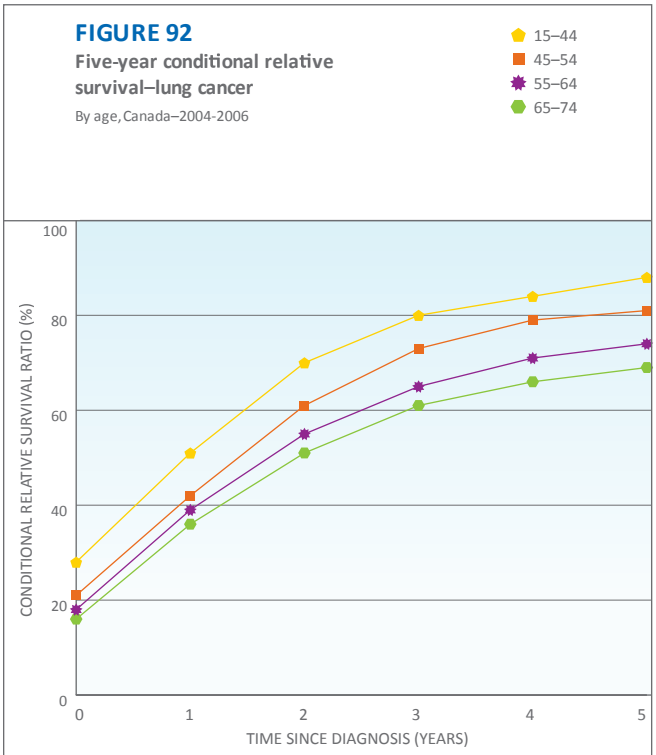


Analyzed by Statistics Canada–Health Statistics Division
Data source: Statistics Canada–Canadian Cancer Registry

FIGURE 92

Five-year conditional relative survival–lung cancer

By age, Canada–2004-2006



Analyzed by Statistics Canada–Health Statistics Division
Data source: Statistics Canada–Canadian Cancer Registry

Developmental and Interim Indicators

This chapter of the *Report* includes two types of indicators:

1. Developmental indicators that are still under development and require some additional refinement or validation before they can be included as performance indicators.
2. Interim indicators that are not the preferred measures of performance for the specific domain but that are still useful to show until better indicators become available. Interim indicators may also be included because they are used internationally and allows for inter-jurisdictional comparisons.

In future reports, developmental indicators may be moved to the main chapters as full system performance indicators when the developmental issues are addressed. Similarly, interim indicators may be phased out when more meaningful indicators become available or may be modified to qualify as system performance indicators.

Developmental and interim indicators are included in this *Report* because they fill measurement gaps that would otherwise be entirely unaddressed and also to highlight where work is in progress to develop better measures for future reports.

The following indicators are included in this chapter:

- **PET Scanner Capacity and Use**
- **Radiation Therapy Utilization Ratio**
- **Symptom Assessment**

PET SCANNER CAPACITY AND UTILIZATION

The benefits of PET scanning for cancer diagnosis and treatment (including staging, detection of recurrence, etc.) are still being evaluated through a number of evidence-generating clinical trials.[155] While by no means an ideal indicator of the availability and use of this emerging technology, the number of PET scanners per capita continues to be used as a common measure of diagnostic technology capacity in health care in general and cancer care specifically.[156]

This indicator assesses PET scanner capacity by measuring the number of PET scanners available for cancer diagnosis and treatment per million people in each province in 2009 and 2010. The indicator also includes a utilization rate expressed as the number of exams conducted per million persons. This is a measure of machine capacity and general clinical utilization; it does not reflect efficiency or appropriateness of PET scan use.

The results showed significant variability across the country in the availability and use of PET scanners. More specifically:

- The number of PET scanners per million people ranged from 0 in Prince Edward Island, Newfoundland and Labrador and Saskatchewan to 1.8 in Quebec (Figure 93). The difference between Ontario's results (at 0.5 machines per million) and Quebec's suggests that the variation is not necessarily related to the size of the province.
- The variation persists when examining PET scanner utilization by calculating the number of cancer-related PET scans per million people with a range of 515 in ON to 1,819 in Nova Scotia (Figure 94).
- Utilization appeared to be increasing in 2010 vs. 2009 for three of the four provinces that provided data for both years, suggesting expanding uptake of the modality.

A 2004 survey of 14 members of the International Network of Agencies for Health Technology Assessment (INAHTA) identified the number of PET scanners per million ranging from 0.25 in the Netherlands to 1.26 in Belgium, with Australia at 0.65, the United States at 0.83 and Canada at 0.39 (compared to 0.9 as measured in 2010).[157] If the surveyed countries' rates grew proportionately from 2004, then Canada is likely to still be at the lower end of per capita PET capacity.

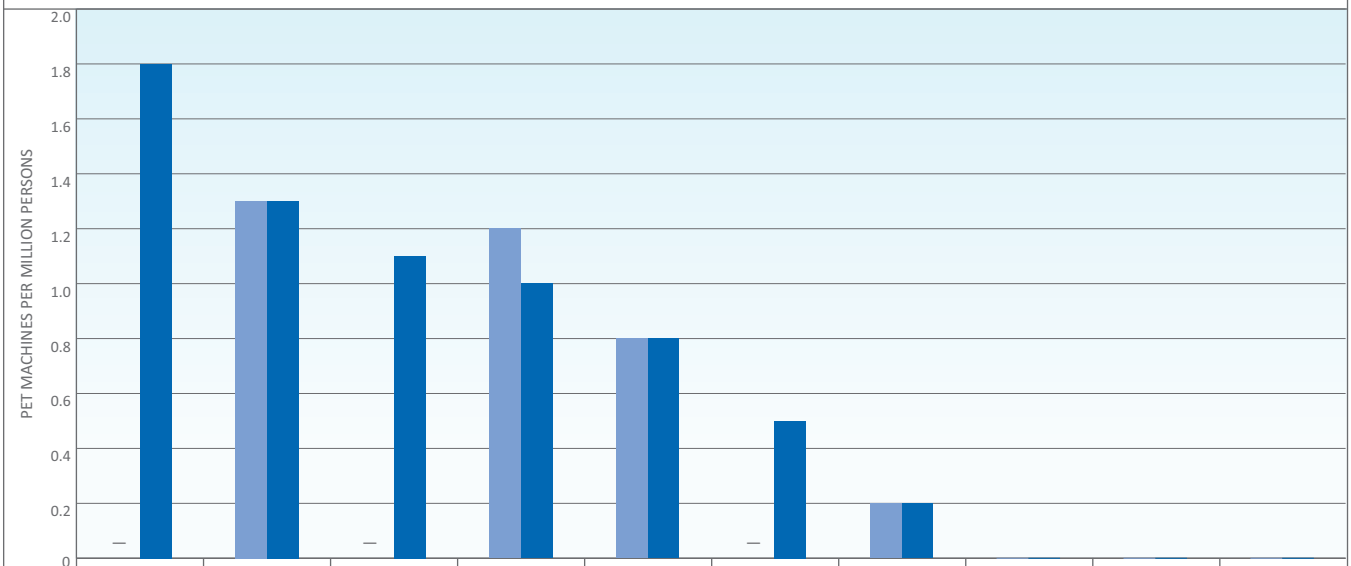
PET scanners per capita and the utilization rate results presented here are temporary proxies for more definitive measures of accessibility and evidence-based use of PET scanner technology. As such, interprovincial variations in the current indicator results should be interpreted with caution. Other important issues to note in the calculation of this indicator are as follows:

- A proration was applied for PET scanners commissioned or decommissioned partway through the year based on number of days in service.
- Only publicly funded PET scanners used for cancer diagnosis and treatment were included in the calculations. PET scanners used exclusively for research were excluded.

FIGURE 93

PET machines* per million persons

BY PROVINCE–2009 AND 2010



	QC	NB	NS	AB	MB	ON	BC	PE	NL	SK
2009	—	1.3	—	1.2	0.8	—	0.2	0.0	0.0	0.0
2010	1.8	1.3	1.1	1.0	0.8	0.5	0.2	0.0	0.0	0.0

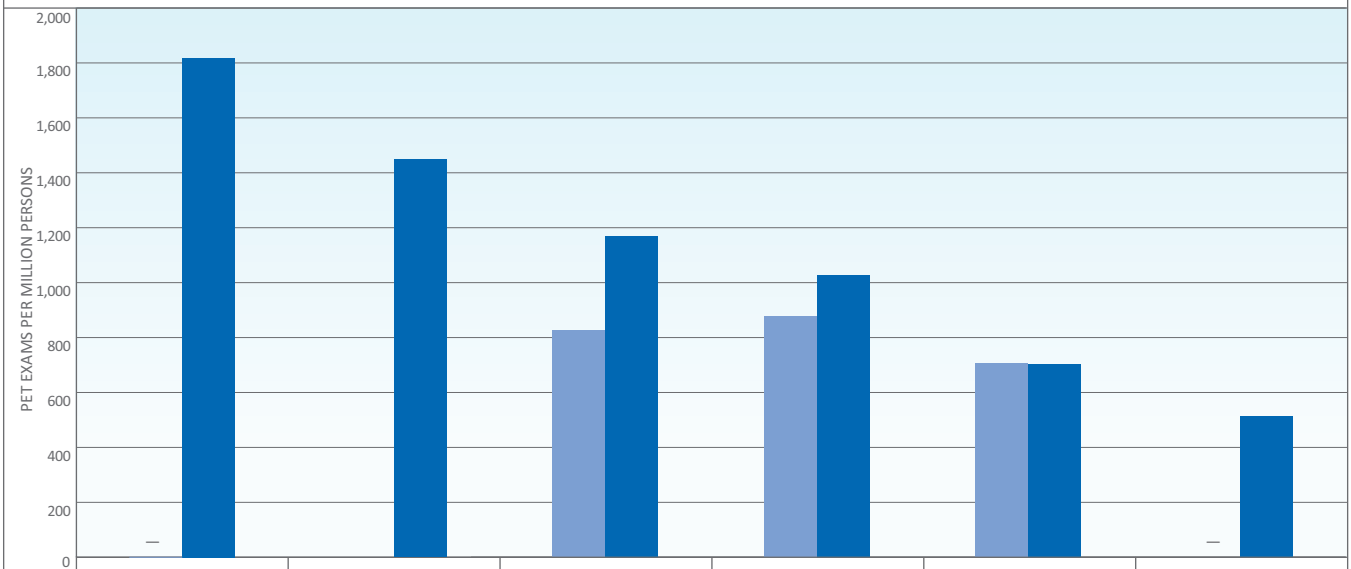
* Cancer use only
"—" Data not available

Data source: Provincial cancer agencies

FIGURE 94

PET exams* per million persons

BY PROVINCE–2009 AND 2010



	NS	AB	NB	MB	BC	ON
2009	—	1,202	826	879	705	—
2010	1,819	1,448	1,171	1,028	704	515

* Cancer exams only
"—" Data not available

Data source: Provincial cancer agencies

- Provinces have taken different approaches to PET use and the extent to which clinical criteria are applied in deciding which patients obtain a PET scan. This contributes to variations in PET scanning utilization rates between provinces, which cannot, at this time, be interpreted as differences in quality or appropriateness of care.
- Detailed calculation methodology is provided in the Technical Appendix (see page 165).

The Partnership will continue to work with its partners and other stakeholders to improve the ability to measure and assess PET scanner availability and the appropriateness of its use for cancer care. Efforts will be made to ensure future measures are more closely linked to standards of practice, where they exist.

RADIATION THERAPY UTILIZATION RATIO

The treatment chapter of this *Report* includes a radiation therapy utilization rate that measured the percentage of cancer patients treated with radiation within the first two years after diagnosis. While the two-year cut-off is methodologically necessary, it does not allow for comparison to the generally cited benchmark of 50% of cancer patients receiving radiation therapy at some point during the course of their disease.[88-89] To allow closer comparison to that benchmark, a proxy measure is used, which is the ratio of courses of radiation therapy to incident cases in a given year. Detailed calculation methodology is provided in the Technical Appendix (page 166).

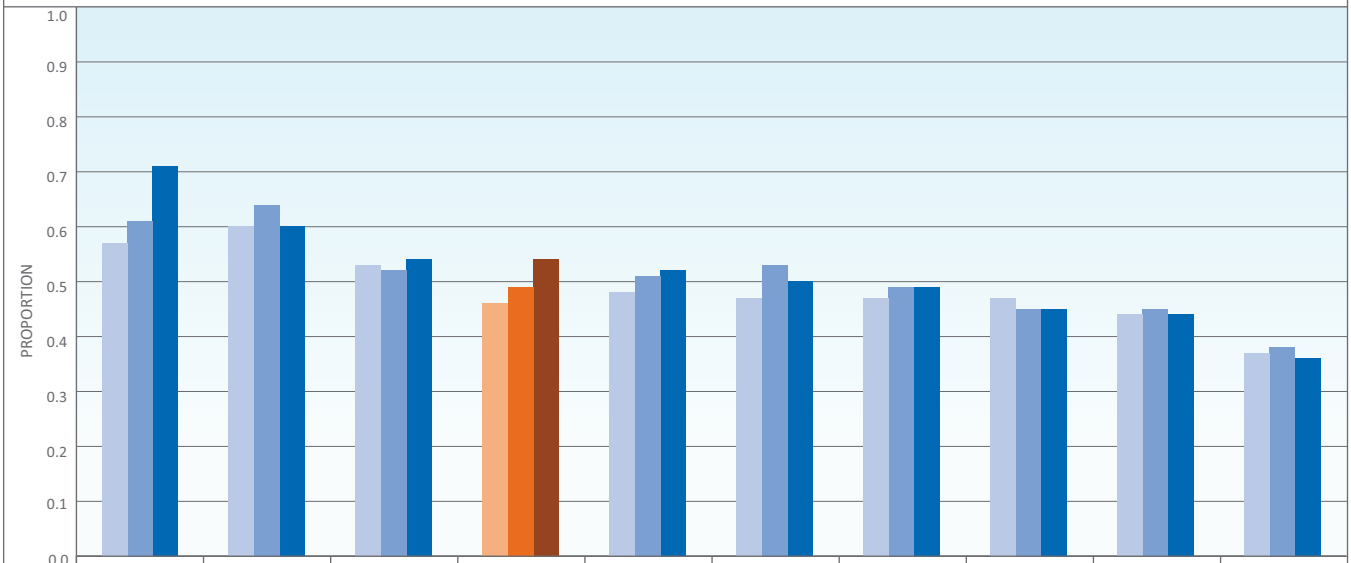
The 2009 radiation therapy utilization ratio ranged from 0.36 in Manitoba to 0.71 in Ontario with an overall average of 0.54. There was no consistent trend between 2007 and 2009 (Figure 95). There were also provincial variations in the radiation therapy ratio by disease site for the top four cancers (Figure 96); for example, in Lung, the ratio ranged from 0.31 in Manitoba to 0.95 in Newfoundland and Labrador. Breast had the highest radiation therapy ratio among the top four in all six participating provinces except Newfoundland and Labrador and Prince Edward Island.

The radiation utilization ratio is considered an interim indicator because the numerator and denominator are not linked, and so courses of radiation therapy include treatment given for recurrent cases or for palliative purposes. This explains why the ratio can exceed one at the disease site level. The more definitive indicator would be the percentage of cancer patients who receive radiation therapy at some point in the course of their disease.

FIGURE 95

Courses of radiation to new invasive incident cases

TIME TREND BY PROVINCE–2007 TO 2009



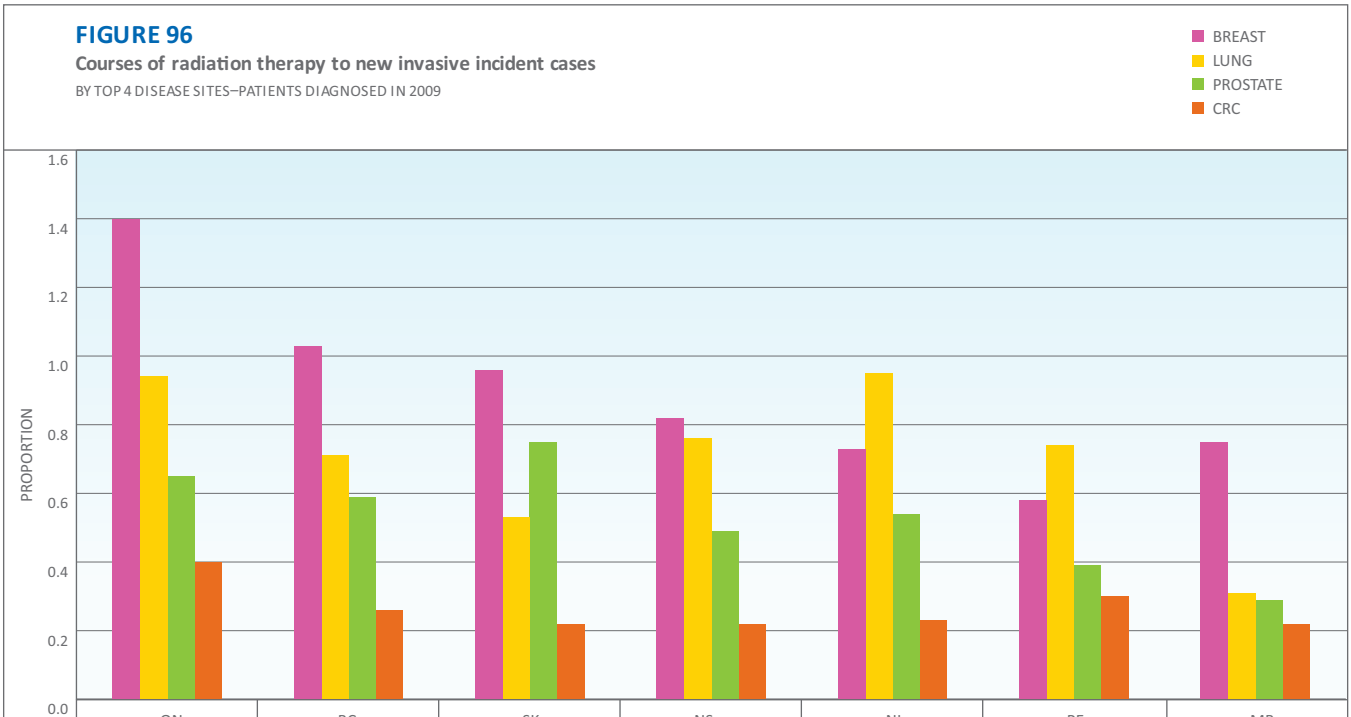
	ON	NB	BC	AVERAGE*	AB	NL	SK	PE	NS	MB
2007	0.57	0.60	0.53	0.46	0.48	0.47	0.47	0.47	0.44	0.37
2008	0.61	0.64	0.52	0.49	0.51	0.53	0.49	0.45	0.45	0.38
2009	0.71	0.60	0.54	0.54	0.52	0.50	0.49	0.45	0.44	0.36

AB data is for fiscal year
See technical appendix for defintion of "courses"
Data sources: Provincial cancer agencies (RT course), and Canadian Cancer Registry (incident cases)

FIGURE 96

Courses of radiation therapy to new invasive incident cases

BY TOP 4 DISEASE SITES–PATIENTS DIAGNOSED IN 2009



	ON	BC	SK	NS	NL	PE	MB
BREAST	1.42	1.03	0.96	0.82	0.73	0.58	0.75
LUNG	0.94	0.71	0.53	0.76	0.95	0.74	0.31
PROST.	0.65	0.59	0.75	0.49	0.54	0.39	0.29
CRC	0.40	0.26	0.22	0.22	0.23	0.30	0.22

Excludes in situ and borderline cases
See technical appendix for defintion of "courses"
Data sources: Provincial cancer agencies (RT course), and Canadian Cancer Registry (incident cases)

SCREENING FOR DISTRESS

Research has shown that 35% to 40% of cancer patients feel enough distress that they would benefit from professional support services.[158] Routine screening for pain and emotional distress, which are often referred to as the fifth and sixth vital sign[159] respectively, helps to identify any problems early on, so that the appropriate support services can be offered to address a patient's specific needs. Negative outcomes associated with heightened distress include poorer adherence to treatment recommendations,[160] worse satisfaction with care[161] and worse quality of life.[162] The use of tools for standardized symptom screening for distress signals the extent to which symptoms of pain and emotional distress are being experienced by patients and identified by health care providers.

This indicator measures the extent to which provinces and their cancer agencies have implemented standardized symptom screening tools for pain and emotional distress. Detailed calculation methodology is provided in the Technical Appendix (page 166). There is significant provincial variation in the use of standardized symptom assessment tools within provincial cancer centres (Table 2):

- Alberta, British Columbia, Manitoba and Quebec have undertaken standardized symptom screening for at least a portion of patients at selected provincial cancer centres and are in the process of rolling out a standardized screening tool.
- Ontario, Saskatchewan and Nova Scotia use a standardized symptom screening tool for at least a portion of patients at all provincial cancer centres.
- New Brunswick and Prince Edward Island are in the beginning stages of planning use of a standardized screening tool, although no standardized symptom screening is undertaken at provincial cancer centres currently.
- In other provinces, there is no standard tool; however, some cancer centres use a symptom assessment tool on an ad hoc basis.
- ESAS is the most commonly used screening tool in Canada.

Progress is being made in countries such as Australia,[163] the UK[164] and the US,[165] where recommendations that screens for distress are being/have been incorporated as a standard.[166]

In 1999, the National Comprehensive Cancer Network (NCCN) in the United States published guidelines recommending that all patients be screened for distress at their initial visit and at appropriate intervals thereafter.[167] However, progress to follow up on this recommendation by implementation of a routine screening tool has been slow.[168]

In 2008, screening for distress was endorsed by Accreditation Canada and five professional and patient organizations. In the spring of 2009, the Partnership endorsed a minimum dataset for screening for pain and distress. The data elements identified as part of this minimum dataset are contained in the Edmonton Symptom Assessment Scale (ESAS) and the Canadian Problem Checklist (CPC).[169] Figure 97 shows a sample image of the ESAS and CPC tool. Currently the Cancer Journey Advisory Group of the Partnership is partnering with eight jurisdictions in seven Canadian provinces that will complete their implementation of Screening for Distress programs by early 2012. The main goal of screening for distress initiatives is to help shape the system so that all cancer patients will be asked about and observed for distress when they are first diagnosed and at several other times during their treatment. Health care workers will use questionnaires and symptom checklists that have been proven through research to identify distress symptoms.

Future reports will move towards reporting the percentage of cancer patients that are screened through a standardized assessment tool as well as developing more specific measures of this important aspect of patient care.

TABLE 2
Extent of usage of standardized symptom assessment tools across clinics within the provincial cancer agencies

PROVINCE	PROVINCE-WIDE IMPLEMENTATION	SELECTED CENTRES – (PROVINCIALLY SUPPORTED)	NOT CENTRALLY MANAGED – USE VARIES BY CENTRE
BC		X	
AB		X	
SK	X		
MB		X	
ON	X		
QC		X	
NB			X
NS		X	
PE		X	
NL			X

Definitions:
Province-wide implementation: Standardized symptom screening is undertaken for at least a portion of patients at each provincial cancer centre.
Selected centres – (provincially supported): Standardized symptom screening is undertaken for at least a portion of patients at selected provincial cancer centres.
Not centrally managed – use varies by centre: Provincially managed implementation of symptom screening does not exist, however some centres may use a screening tool.

FIGURE 97
ESAS Screening Tool with the Canadian Problem Checklist

Edmonton Symptom Assessment System:

Date of Completion:_____ **Time:** _____

Completed by:
❒ Patient
❒ Family
❒ Health Professional
❒ Assisted by family or health professional

Please circle the number that best describes:

No pain	0	1	2	3	4	5	6	7	8	9	10	Worst possible pain
Not tired	0	1	2	3	4	5	6	7	8	9	10	Worst possible tiredness
Not nauseated	0	1	2	3	4	5	6	7	8	9	10	Worst possible nausea
Not depressed	0	1	2	3	4	5	6	7	8	9	10	Worst possible depression
Not anxious	0	1	2	3	4	5	6	7	8	9	10	Worst possible anxiety
Not drowsy	0	1	2	3	4	5	6	7	8	9	10	Worst possible drowsiness
Best appetite	0	1	2	3	4	5	6	7	8	9	10	Worst possible appetite
Best feeling of wellbeing	0	1	2	3	4	5	6	7	8	9	10	Worst possible feeling of wellbeing
No shortness of breath	0	1	2	3	4	5	6	7	8	9	10	Worst possible shortness of breath
Other problem	0	1	2	3	4	5	6	7	8	9	10	

Canadian Problem Checklist:

Please check all of the following items that have been a concern or problem for you in the past week including today:

Emotional:
❒ Fears/Worries
❒ Sadness
❒ Frustration/Anger
❒ Changes in appearance
❒ Intimacy/Sexuality

Practical:
❒ Work/School
❒ Finances
❒ Getting to and from appointments
❒ Accommodation

Informational:
❒ Understanding my illness and/or treatment
❒ Talking with the health care team
❒ Making treatment decisions
❒ Knowing about available resources

Spiritual:
❒ Meaning/Purpose of life
❒ Faith

Social/Family:
❒ Feeling a burden to others
❒ Worry about family/friends
❒ Feeling alone

Physical:
❒ Concentration/Memory
❒ Sleep
❒ Weight

Guide to Implementing Screening for Distress, the 6th Vital Sign: Background, Recommendations, and Implementation
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Moving Forward

This *2011 Report* represents the third annual compendium of indicators measuring the performance of Canadian cancer control systems. The Partnership's first forays into system performance measurement in 2009 and 2010 were driven primarily by what data were available and were of adequate validity and consistency to allow for meaningful comparisons across provinces. The *2011 Report* has built on the first two foundational reports by expanding the number of indicators but also, particularly with the treatment pattern measures, beginning to present multi-year data to inform identification of trends. The work done over the three-year period, in close collaboration with partners at the provincial and national level, has built a strong foundation of confidence in the integrity of the development process and belief in the value of the work's outcome.

Looking ahead, system performance measurement and reporting will move from its "opportunistic" beginnings to a more deliberate, systematic approach. As always, the work will be informed and guided by broad consultations with experts and knowledge leaders and close collaborations with partners and other key stakeholders.

Some of the key planned directions for 2012 and beyond include:

- Working with partners to build on existing information resources to expand the availability of indicators in relatively under-measured domains, particularly patient experience and the concept of patient-centred care.
- Researching and developing indicators that assess system efficiency.
- Developing and incorporating evidence-based performance targets and incorporating them into the reporting.
- More closely assessing the impacts of key determinants of health (e.g., socio-economic status) and issues related to special populations (e.g., rural and remote communities, new immigrants, etc.).
- Conducting exploratory studies to better explain variations and other patterns in the performance results.

Plans are also in place to develop several categories of reports including:

- System Performance Reports limited to measures for which there are clearly established targets, standards or norms.
- Reports on Emerging Trends and Developmental Measures, which would contain new and exploratory indicators as well as new trends requiring further investigation.
- Thematic reports that will focus on disease sites, modalities (e.g., diagnosis, systemic therapy, surgery, etc.) and/or sub-populations to provide a deeper understanding in specific areas to inform quality improvements.

Finally, efforts will be made to expand the dissemination and reach of system performance information and to improve access and usability.

References

1. World Cancer Research Fund/American Institute for Cancer Research. Food, nutrition, physical activity, and the prevention of cancer: a global perspective. Washington, DC: AICR, 2007.
2. The Secretariat for the Intersectoral Healthy Living Network in partnership with the Healthy Living Task Group and the Advisory Committee on Population Health and Health Security (ACPHHS). The Integrated Pan-Canadian Healthy Living Strategy. Ottawa: Public Health Agency of Canada, 2005.
3. Health Canada. The Federal Tobacco Control Strategy: A Framework for Action. 2002.
4. Latino-Martel P, Arwidson P, Ancellin R *et al*. Alcohol consumption and cancer risk: revisiting guidelines for sensible drinking. *Can Med Assoc J*. 2011;183(16):1861-5.
5. Canadian Partnership Against Cancer. Coalitions Linking Action and Science for Prevention. Available at: http://www.cancerview.ca/portal/server.pt/community/initiatives_and_resources/468/coalitions_linking_action_and_science_for_prevention_-_clasp.
6. Canadian Partnership Against Cancer. Environmental Scan of Primary Prevention Activities in Canada: Part 1—Policies and Legislation. 2009.
7. Canadian Partnership Against Cancer. Prevention Policies Directory. Available at: http://www.cancerview.ca/portal/server.pt/community/prevention_policies/464.
8. Statistics Canada. Canadian Community Health Survey—Annual Component (CCHS). Available at: http://www.statcan.gc.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS=3226&lang=en&db=imdb&adm=8&dis=2.
9. US Department of Health and Human Services. Reducing the Health Consequences of Smoking: 25 Years of Progress. A Report of the Surgeon General. Centers for Disease Control and Prevention, Coordinating Center for Health Promotion, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, eds. Washington, DC: US Government Printing Office, 1989.
10. Gaudette LA, Altmayer CA, Wysocki M, Gao RN. Cancer incidence and mortality across Canada. *Health Rep*. 1998;10(1):51-66.
11. Centers for Disease Control and Prevention. Behavioural Risk Factor Surveillance System Prevalence and Trends Data: Adults who are current smokers. Available at: http://apps.nccd.cdc.gov/BRFSS/display.asp?cat=TU&yr=2010&qkey=4396&state=US.
12. Office for National Statistics. Smoking and drinking among adults, 2009: A report on the 2009 General Lifestyle Survey.
13. Australian Bureau of Statistics. National Health Survey, Summary of Results: 2007–2008. Available at: http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4364.0Main%20Features42007-2008%20(Reissue)?opendocument&tabname=Summary&prodno=4364.0&issue=2007-2008%20(Reissue)&num=&view=.
14. Peto R, Darby S, Deo H, Silcocks P, Whitley E, Doll R. Smoking, smoking cessation, and lung cancer in the UK since 1950: combination of national statistics with two case-control studies. *Brit Med J*. 2000;321(7257):323.
15. Centers for Disease Control and Prevention. Fact Sheet—Smoking Cessation. Available at: http://www.cdc.gov/tobacco/data_statistics/fact_sheets/cessation/quitting/index.htm.
16. Centers for Disease Control and Prevention. Cigarette Smoking Among Adults and Trends in Smoking Cessation—United States, 2008. *Morbidity and Mortality Weekly Report*. 2009;58(44):1227-1232.
17. Surgeon General. The health consequences of involuntary exposure to tobacco smoke: a report of the Surgeon General. Atlanta, 2006.
18. Centres for Disease Control and Prevention. Smoking-attributable mortality, years of potential life lost, and productivity losses—United States, 2000–2004. *Morbidity and Mortality Weekly Report*. 2008;57(45):1226-8.
19. Centers for Disease Control and Prevention. Fact Sheet—Second hand Smoke Facts. Available at: http://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhand_smoke/general_facts/index.htm.
20. Health Canada. Public Smoking Bans by Province and Territory. Available at: http://www.hc-sc.gc.ca/hc-ps/tobac-tabac/res/news-nouvelles/ban-interdiction-public-eng.php.
21. Canadian Cancer Society. Laws Banning Smoking in Vehicles Carrying Children—International Overview. 2011.
22. Physicians for a Smoke-Free Canada. Exposure to second-hand smoke in vehicles; Canada 2009. Tobacco use in Canada: Findings from the CCHS, 2010.

23. Australian Bureau of Statistics. Alcohol consumption in Australia: A snapshot, 2004/5. Available at: http://www.abs.gov.au/ausstats/abs@.nsf/mf/4832.0.55.001/.
24. World Health Organization Department of Mental Health and Substance Abuse. Global Status Report on Alcohol 2004. Geneva, 2004.
25. Riboli E, Norat T. Epidemiologic evidence of the protective effect of fruit and vegetables on cancer risk. *Am J Clin Nutr*. 2003;78(3):559S.
26. World Health Organization. Diet, nutrition and the prevention of chronic diseases. Report of a Joint FAO/WHO Expert Consultation. WHO Technical Report Series, No. 916. Geneva.
27. The Scottish Government. The Scottish Health Survey. Available at: http://www.scotland.gov.uk/Publications/2009/09/28102003/58.
28. Centers for Disease Control and Prevention. State-Specific Trends in Fruit and Vegetable Consumption Among Adults—United States, 2000–2009. *Morbidity and Mortality Weekly Report*. 2010;59(35):1125-1130.
29. Australian Bureau of Statistics. National Health Survey: Summary of Results: 2004–05. 2006.
30. Government of Canada. Nutrition North Canada. Available at: http://www.nutritionnorthcanada.ca/index-eng.asp.
31. Freedman LS, Schatzkin A, Midthune D, Kipnis V. Dealing With Dietary Measurement Error in Nutritional Cohort Studies. *J Natl Cancer Inst*. 2011.
32. Kristal AR, Vizenor NC, Patterson RE, Neuhouser ML, Shattuck AL, McLerran D. Precision and bias of food frequency-based measures of fruit and vegetable intakes. *Cancer Epidem Biomar*. 2000;9(9):939-944.
33. Schoenborn C, Adams P. Health behaviors of adults: United States, 2005–2007. *Vital and health statistics*. Series 10, Data from the National Health Survey. 2010;(245):1.
34. Australian Government. Physical Activity: Research and Statistics. Available at: http://www.health.gov.au/internet/main/publishing.nsf/Content/health-pubhlth-strateg-active-evidence.htm.
35. Craig R, Mindell J. Health Survey for England 2006. Volume 1: Cardiovascular disease and risk factors in adults. London: The NHS Information Centre for Health and Social Care. 2008.
36. Active and Healthy Kids Canada. 2011 Report Card Overview. Available at: http://www.activehealthykids.ca/ReportCard/2011ReportCardOverview.aspx.
37. Flegal KM, Carroll MD, Ogden CL, Johnson CL. Prevalence and trends in obesity among US adults. *JAMA*. 2002;288(14):1723-1727.
38. Canadian Institute for Health Informantion, Public Health Agency of Canada. Obesity in Canada, A Joint Report From the Public Health Agencyof Canada and the Canadian Institute for Health Research. 2011.
39. Statistics Canada. Canadian Health Measures Survey (CHMS), Cycle 1 Data Table 34 2007 to 2009. Ottawa, 2010.
40. Douketis JD, Paradis G, Keller H, Martineau C. Canadian guidelines for body weight classification in adults: application in clinical practice to screen for overweight and obesity and to assess disease risk. *Can Med Assoc J*. 2005;172(8):995.
41. World Health Organization. Obesity-Preventing and Managing the Global Epidemic: Report on a WHO Consultation: World Health Organization, 2000.
42. Public Health Agency of Canada. Curbing Childhood Obesity: A Federal-Provincial-Territorial Framework for Action to Promote Healthy Weights.
43. Singh A, Mulder C, Twisk J, Van Mechelen W, Chinapaw M. Tracking of childhood overweight into adulthood: a systematic review of the literature. *Obes Rev*. 2008;9(5):474-488.
44. Janssen I, Katzmarzyk PT, Boyce WF *et al*. Comparison of overweight and obesity prevalence in school aged youth from 34 countries and their relationships with physical activity and dietary patterns. *Obes Rev.* 2005;6(2):123-132.
45. Australian Government. Risk factor monitoring: A rising epidemic: obesity in Australian children and adolescents. Risk Factor Data Briefing Number 2, 2004.
46. Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity world-wide: international survey. *Brit Med J*. 2000;320(7244):1240.
47. Parkin DM, Bray F. The burden of HPV-related cancers. *Vaccine*. 2006;24:S11-S25.
48. Canadian Cancer Society's Steering Committee. *Canadian Cancer Statistics 2010*. Toronto: Canadian Cancer Society, 2010.
49. Public Health Agency of Canada. National Advisory Committee on Immunization (NACI) Statement on Human Papillomavirus Vaccine. Ottawa: Public Health Agency of Canada, 2007.
50. Kumar V, Whynes D. Explaining variation in the uptake of HPV vaccination in England. *BMC public health*. 2011;11(1):172.
51. Government of Australia. Interim estimates of human papillomavirus vaccination coverage in the school-based program in Australia. *Communicable Diseases Intelligence*. 2008;32(4).
52. Centres for Disease Control and Prevention. National and State Vaccination Coverage Among Adolescents Aged 13 Through 17 Years—United States, 2010. *Morbidity and Mortality Weekly Report*. 2011;60(33):1118-1123.

53. 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(6):1541-1549.
54. Mandel JS, Church TR, Ederer F, Bond JH. Colorectal cancer mortality: effectiveness of biennial screening for fecal occult blood. *J Natl Cancer Inst*. 1999;91(5):434.
55. Jørgensen OD, Kronborg O, Fenger C. A randomised study of screening for colorectal cancer using faecal occult blood testing: results after 13 years and seven biennial screening rounds. *Gut*. 2002;50(1):29.
56. Mandel JS, Church TR, Bond JH *et al*. The effect of fecal occult-blood screening on the incidence of colorectal cancer. *New Engl J Med*. 2000;343(22):1603-1607.
57. The Screening Action Group of the Canadian Partnership Against Cancer. Mammography Participation and Utilization in Canada. Toronto: Canadian Partnership Against Cancer, 2010.
58. Machii R, Saito H. Time Trends in Cervical Cancer Screening Rates in the OECD Countries. *Japn J Clinl Oncol*. 2011;41(5):731.
59. Ng E, Wilkins R, Fung MFK, Berthelot JM. Cervical cancer mortality by neighbourhood income in urban Canada from 1971 to 1996. *Can Med Assoc J*. 2004;170(10):1545.
60. Spence AR, Goggin P, Franco EL. Process of care failures in invasive cervical cancer: systematic review and meta-analysis. Prev Med. 2007;45(2-3):93-106.
61. Nanda K, McCrory D, Myers E *et al*. Accuracy of the Papanicolaou Test in Screening for and Follow up of Cervical Cytologic Abnormalities: A Systematic Review. *J Low Genit Tract Di*. 2001;5(1):60-60.
62. Canadian Partnership Against Cancer. 2010 System Performance Report. Toronto, 2010.
63. Australian Institute of Health and Welfare. Cervical screening in Australia 2006-2007. Cancer series No. 47. Canberra, 2009.
64. Cervical Screening Programme England. Cervical Screening Programme England 2006/07. The Information Centre, 2007.
65. National Center for Health Statistics. Health, United States, 2009: with special feature on medical technology. Hyattsville, MD, 2010.
66. Cancer View Canada. Cervical Cancer Control. Available at: http://www.cancerview.ca/portal/server.pt/community/initiatives_and_resources/469/cervical_cancer_control.
67. Canadian Cancer Society's Steering Committee. *Canadian Cancer Statistics 2011*. Toronto: Canadian Cancer Society, 2011.
68. Manfredi S, Piette C, Durand G, Plihon G, Mallard G, Bretagne J. Colonoscopy results of a French regional FOBT-based colorectal cancer screening program with high compliance. *Endoscopy*. 2008;40(5):422-427.
69. Shaw C, Cunningham R, Sarfati D. From screening criteria to colorectal cancer screening: what can New Zealand learn from other countries? *J New Zeal Med Assoc*. 2008;121(1279).
70. Malila N, Oivanen T, Hakama M. Implementation of colorectal cancer screening in Finland: Experiences from the first three years of a public health programme. *Z Gastroenterol*. 2008;46(Suppl 1):S25-S28.
71. Weller D, Coleman D, Robertson R *et al*. The UK colorectal cancer screening pilot: results of the second round of screening in England. *Brit J Cancer*. 2007;97(12):1601-1605.
72. Ananda SS, McLaughlin SJ, Chen F *et al*. Initial impact of Australia's National Bowel Cancer Screening Program. Women. 2009;53(12):14.
73. Peris M, Espinas JA, Munoz L, Navarro M, Binefa G, Borras JM. Lessons learnt from a population-based pilot programme for colorectal cancer screening in Catalonia (Spain). *J Med Screen*. 2007;14(2):81.
74. International Cancer Screening Network. Inventory of colorectal cancer screening activities in ICSN countries. Available at: http://appliedresearch.cancer.gov/icsn/colorectal/screening.html.
75. Lisi D, Hassan CC, Crespi M. Participation in colorectal cancer screening with FOBT and colonoscopy: an Italian, multicentre, randomized population study. *Digest Dis*. 2010;42(5):371-376.
76. Cancer View Canada. Colorectal Cancer Screening Program Elements. Available at: http://www.cancerview.ca/idc/groups/public/documents/webcontent/screen_colorec_elements_dec10.pdf.
77. Cancer View Canada. Colonversation. Available at: http://www.cancerview.ca/portal/server.pt/community/colonversation/492/colonversation.
78. Threlfall T, Wittorff J, Boutdara P *et al*. Collection of population-based cancer staging information in Western Australia—a feasibility study. *Popul Health Metrics*. 2005;3(1):9.
79. National Cancer Institute. Surveillance, Epidemiology, and End Results (SEER). Available at: http://seer.cancer.gov/.
80. EUROCARE. EUROCARE—Survival of cancer patients in Europe. Available at: http://www.eurocare.it/Home/tabid/36/Default.aspx.

81. Working group on the integration of screening and diagnosis of the Canadian Breast Cancer Screening Initiative. Waiting for a diagnosis after an abnormal breast screen in Canada. Ottawa, 2000.
82. National Institute for Clinical Excellence. Improving Outcomes in Breast Cancer. London: National Institute for Clinical Excellence, 2002.
83. Limburg H, Onysko J. Organized Screening Monitoring and Evaluation Program: Canadian Breast Cancer Screening Initiative.
84. Canadian Breast Cancer Network. Breast Cancer Wait Times in Canada: 2008 Report Card. Ottawa: Canadian Breast Cancer Network.
85. Postl BD. Final Report of the Federal Advisor on Wait Times. Ottawa: Health Canada, 2006.
86. OECD. Health at a Glance 2007: OECD Indicators. 2007.
87. Bernier J, Horiot JC, Bartelink H *et al*. Profile of radiotherapy departments contributing to the Cooperative Group of Radiotherapy of the European Organization for Research and Treatment of Cancer. *Int J Radiat Oncol*. 1996;34(4):953-960.
88. Zhang-Salomons J, Mackillop WJ. Estimating the lifetime utilization rate of radiotherapy in cancer patients: the multicohort current utilization table (MCUT) method. *Comput Meth Prog Bio*. 2008;92(1):99-108.
89. Delaney G, Jacob S, Featherstone C, Barton M. The role of radiotherapy in cancer treatment. *Cancer*. 2005;104(6): 1129-1137.
90. Gunderson LL, Sargent DJ, Tepper JE *et al*. Impact of T and N substage on survival and disease relapse in adjuvant rectal cancer: a pooled analysis. *Int J Radiat Oncol*. 2002;54(2): 386-396.
91. Hoffe SE, Shridhar R, Biagioli MC. Radiation therapy for rectal cancer: current status and future directions. *Cancer Control*. 2010;17(1):25-34.
92. Sebag-Montefiore D, Stephens RJ, Steele R, *et al*. Preoperative radiotherapy versus selective postoperative chemoradiotherapy in patients with rectal cancer (MRC CR07 and NCIC-CTG C016): a multicentre, randomised trial. *Lancet*. 2009;373(9666):811-820.
93. National Comprehensive Cancer Network. Clinical Practice Guidelines in Oncology, Rectal Cancer, Version 4.2011. 2011.
94. Lin C, Charlton M, Meza J, Enke C, Loberiza Jr F. Temporal and regional variations in the use of preoperative radiation therapy for rectal cancer. *Am J Clin Oncol*. 2010;33(5):443.
95. Neugut AI, Fleischauer AT, Sundararajan V et al. Use of adjuvant chemotherapy and radiation therapy for rectal cancer among the elderly: a population-based study. *J Clin Oncol*. 2002;20(11):2643.
96. Clarke M, Collins R, Darby S *et al*. Effects of radiotherapy and of differences in the extent of surgery for early breast cancer on local recurrence and 15-year survival: an overview of the randomised trials. *Lancet*. 2005;366(9503):2087.
97. Whelan TJ. Use of conventional radiation therapy as part of breast-conserving treatment. *J Clin Oncol*. 2005;23(8):1718.
98. Hughes KS, Schnaper LA, Berry D *et al*. Lumpectomy plus tamoxifen with or without irradiation in women 70 years of age or older with early breast cancer. *New Engl J Med*. 2004;351(10):971-977.
99. Smith BD, Smith GL, Roberts KB, Buchholz TA. Baseline utilization of breast radiotherapy before institution of the Medicare practice quality reporting initiative. *Int J Radiat Oncol*. 2009;74(5):1506-1512.
100. Ess S, Savidan A, Bouchardy C *et al*. Patterns of Care of Breast Cancer Patients in Switzerland: A Population Based Study. St Gallen: Krebsforschung Schweiz, 2009.
101. Lavelle K, Todd C, Moran A, Howell A, Bundred N, Campbell M. Non-standard management of breast cancer increases with age in the UK: a population based cohort of women > 65 years. *Brit J Cancer*. 2007;96(8):1197-1203.
102. National Comprehensive Cancer Network. Clinical Practice Guidelines in Oncology, Breast Cancer, Version 2.2011. 2011.
103. Giovannucci E, Wu K. Cancers of the colon and rectum. In: Schottenfeld D, Fraumeni JF, eds. Cancer. Epidemiology and prevention. Oxford University Press, USA, 2006.
104. André T, Boni C, Navarro M, *et al*. Improved overall survival with oxaliplatin, fluorouracil, and leucovorin as adjuvant treatment in stage II or III colon cancer in the MOSAIC trial. *J Clin Oncol*. 2009;27(19):3109.
105. National Comprehensive Cancer Network. Clinical Practice Guidelines in Oncology, Colon Cancer, Version 3.2011. 2011.
106. Kahn KL, Adams JL, Weeks JC *et al*. Adjuvant chemotherapy use and adverse events among older patients with stage III colon cancer. *JAMA*. 2010;303(11):1037.
107. Jessup JM, Stewart A, Greene FL, Minsky BD. Adjuvant chemotherapy for stage III colon cancer: implications of race/ethnicity, age, and differentiation. *JAMA*. 2005;294(21):2703.
108. Chang G. Issues in the Treatment of Colorectal Cancer: Not for Surgeons Only. *Medscape Education*. 2005.

109. Moore M, Gibbs P. Adjuvant Chemotherapy Use Among Older Patients With Stage III Colon Cancer. *JAMA*. 2010;303(23):2353.
110. Goldstraw P, Crowley J, Chansky K *et al*. The IASLC Lung Cancer Staging Project: proposals for the revision of the TNM stage groupings in the forthcoming (seventh) edition of the TNM Classification of malignant tumours. *J Thorac Oncol*. 2007;2(8):706.
111. National Comprehensive Cancer Network. Clinical Practice Guidelines in Oncology, Non-Small Cell Lung Cancer, Version 3.2011. 2011.
112. Gridelli C, Maione P, Comunale D, Rossi A. Adjuvant chemotherapy in elderly patients with non-small-cell lung cancer. *Cancer Control: Journal of the Moffitt Cancer Center*. 2007;14(1):57.
113. Shen SS, Haupt BX, Ro JY, Zhu J, Bailey HR, Schwartz MR. Number of lymph nodes examined and associated clinicopathologic factors in colorectal carcinoma. *Arch Pathol Lab Med*. 2009;133(5):781-786.
114. Majumdar SR, Roe MT, Peterson ED, Chen AY, Gibler WB, Armstrong PW. Better Outcomes for Patients Treated at Hospitals That Participate in Clinical Trials. *Arch Intern Med*. 2008;168(6):657-662.
115. Du Bois A, Rochon J, Lamparter C, Pfisterer J. Pattern of care and impact of participation in clinical studies on the outcome of ovarian cancer. *Int J Gynecol Cancer*. 2005;15:183-191.
116. Du Bois A, Reuss A, Pujade Lauraine E, Harter P, Ray Coquard I, Pfisterer J. Role of surgical outcome as prognostic factor in advanced epithelial ovarian cancer: A combined exploratory analysis of 3 prospectively randomized phase 3 multicenter trials. *Cancer*. 2009;115(6):1234-1244.
117. Canadian Cancer Research Alliance. Pan-Canadian Cancer Research Strategy: A plan for collaborative action by Canada's cancer research funders. Toronto: CCRA, 2010.
118. Sinha G. United Kingdom becomes the cancer clinical trials recruitment capital of the world. *J Natl Cancer Inst*. 2007;99(6):420.
119. American College of Surgeons. Commission on Cancer Cancer Program Standards 2009. Revised Edition. 2009.
120. National Cancer Research Network. Celebrating a decade of progress through partnership in cancer research: 2001–2011. 2011.
121. Bond MC, Pritchard S. Understanding clinical trials in childhood cancer. *Paediatr Child Healt*. 2006;11(3):148.
122. Bleyer W. The US pediatric cancer clinical trials programmes: international implications and the way forward. *Eur J Cancer*. 1997;33(9):1439-1447.
123. O'Leary M, Krailo M, Anderson JR, Reaman GH. Progress in Childhood Cancer: 50 Years of Research Collaboration. A Report From the Children's Oncology Group. 2008.
124. Ablett S, Pinkerton C. Recruiting children into cancer trials—Role of the United Kingdom Children's Cancer Study Group (UKCCSG). *Brit J Cancer*. 2003;88(11):1661-1665.
125. Canadian Cancer Research Alliance. Investment in Research on Childhood and Adolescent Cancers, 2005–2007: A Special Report from the Canadian Cancer Research Alliance's Survey of Government and Voluntary Sector Investment in Cancer Research. Toronto: CCRA, 2009.
126. Council of Canadian Pediatric Hematology/Oncology Directors (C17). C17 Research Network: Annual Report, 2008–2009. 2009.
127. Canadian Partnership Against Cancer. Adolescents and Young Adults with Cancer. Available at: http://www.cancerview.ca/portal/server.pt/community/adolescents_and_young_adults/491.
128. Klein-Geltink J, Shaw A, Morrison H, Barr R, Greenberg M. Use of paediatric versus adult oncology treatment centres by adolescents 15–19 years old: the Canadian Childhood Cancer Surveillance and Control Program. *Eur J Cancer*. 2005;41(3):404-410.
129. Jacobsen PB, Shibata D, Siegel EM *et al*. Initial evaluation of quality indicators for psychosocial care of adults with cancer. *Cancer Control*. 2009;16(4):328-334.
130. Institute of Medicine (IOM). Cancer care for the whole patient: Meeting psychosocial health needs. Washington, DC: The National Academies Press, 2008.
131. Leeb K, Morris K, Kasman N. Dying of Cancer in Canada's Acute Care Facilities. *Home Health Care Serv Q*. 2005; 8:26–28.
132. Cohen J, Houttekier D, Onwuteaka-Philipsen B *et al*. Which patients with cancer die at home? A study of six European countries using death certificate data. *J Clin Oncol*. 2010;28(13):2267.
133. Dartmouth Atlas of Health Care. Available at: http://www.dartmouthatlas.org/data/topic/topic.aspx?cat=18.

134. Coleman M, Forman D, Bryant H et al. Cancer survival in Australia, Canada, Denmark, Norway, Sweden, and the UK, 1995–2007 (the International Cancer Benchmarking Partnership): an analysis of population-based cancer registry data. *Lancet*. 2011;377(9760):127-138.
135. Ederer F, Heise H. The effect of eliminating deaths from cancer on general population survival rates, methodological note 11: End results evaluation section. National Cancer Institute, 1959.
136. Bray F. Chapter 8 Age Standardization. In: Parkin DM WS, Ferlay J *et al*, ed. Cancer Incidence in Five Continents. IARC Scientific Publication No. 155.
137. Surveillance Research Program; National Cancer Institute. Fast Stats: An interactive tool for access to SEER cancer statistics. Available at: http://seer.cancer.gov/faststats.
138. Canadian Partnership Against Cancer. National Cancer Staging Program. Available at: http://www.cancerview.ca/portal/server.pt/community/initiatives_and_resources/470/a_national_cancer_staging_program.
139. Bray F, McCarron P, Parkin DM. The changing global patterns of female breast cancer incidence and mortality. *Childhood*. 2004;4:5.
140. Devesa SS, Bray F, Vizcaino AP, Parkin DM. International lung cancer trends by histologic type: male: female differences diminishing and adenocarcinoma rates rising. *Int J Cancer*. 2005;117(2):294-299.
141. Kohler BA, Ward E, McCarthy BJ *et al*. Annual report to the nation on the status of cancer, 1975–2007, featuring tumors of the brain and other nervous system. *J Natl Cancer Inst*. 2011;103(9):714.
142. Baade PD, Youlden DR, Krnjacki LJ. International epidemiology of prostate cancer: geographical distribution and secular trends. *Mol Nutr Food Res*. 2009;53(2):171-184.
143. Canadian Partnership Against Cancer. PSA Toolkit: PSA Screening and Testing for Prostrate Cancer. Toronto: Canadian Partnership Against Cancer, 2009.
144. Mackillop WJ, Zhang-Salomons J, Boyd CJ, Groome PA. Associations between community income and cancer incidence in Canada and the United States. *Cancer* 2000;89(4):901-912.
145. Mao Y, Hu J, Ugnat AM, Semenciw R, Fincham S. Socioeconomic status and lung cancer risk in Canada. *International journal of epidemiology* 2001;30(4):809-817.
146. Gorey KM, Holowaty EJ, Fehringer G *et al*. An international comparison of cancer survival: Toronto, Ontario, and Detroit, Michigan, metropolitan areas. *Am J Public Health*. 1997;87(7):1156-63.
147. Gorey KM, Holowaty EJ, Fehringer G, Laukkanen E, Richter NL, Meyer CM. An international comparison of cancer survival: relatively poor areas of Toronto, Ontario and three US metropolitan areas. *J Public Health Med*. 2000;22(3):343-8.
148. Gorey KM, Holowaty EJ, Fehringer G, Laukkanen E, Richter NL, Meyer CM. An international comparison of cancer survival: metropolitan Toronto, Ontario, and Honolulu, Hawaii. *Am J Public Health*. 2000;90(12):1866-72.
149. Gorey KM, Holowaty EJ, Laukkanen E, Fehringer G, Richter NL. An international comparison of cancer survival: advantage of Toronto's poor over the near poor of Detroit. *Can J Public Health*. 1998;89(2):102-4.
150. Zhang-Salomons J, Qian H, Holowaty E, Mackillop WJ. Associations between socioeconomic status and cancer survival: choice of SES indicator may affect results. *Ann Epidemiol*. 2006;16(7):521-8.
151. Janssen-Heijnen MLG, Gondos A, Bray F *et al*. Clinical relevance of conditional survival of cancer patients in Europe: age-specific analyses of 13 cancers. *J Clin Oncol*. 2010;28(15):2520.
152. Ellison LF, Bryant H, Lockwood G, Shack L. Conditional survival analyses across cancer sites. *Health Reports*. 2011;22(2):21.
153. Merrill RM, Hunter BD. Conditional survival among cancer patients in the United States. *Oncologist*. 2010;15(8):873.
154. Skuladottir H, Olsen JH. Conditional survival of patients with the four major histologic subgroups of lung cancer in Denmark. *J Clin Oncol*. 2003;21(16):3035.
155. Hillner BE, Siegel BA, Liu D *et al*. Impact of positron emission tomography/computed tomography and positron emission tomography (PET) alone on expected management of patients with cancer: initial results from the National Oncologic PET Registry. *J Clin Oncol*. 2008;26(13):2155.
156. Esmail N, Wrona D. Medical Technology in Canada. The Fraser Institute, 2008.
157. Hastings J, Adams EJ. Joint project of the international network of agencies for health technology assessment—Part 1: Survey results on diffusion, assessment, and clinical use of positron emission tomography. *Int J Technol Assess*. 2006;22(02):143-148.
158. Zabora J, Brintzenhofeszoc K, Curbow B, Hooker C, Piantadosi S. The prevalence of psychological distress by cancer site. *Psychol Oncol*. 2001;10(1):19-28.
159. Bultz BD, Carlson LE. Emotional distress: the sixth vital sign in cancer care. *J Clin Oncol*. 2005;23(26):6440.
160. Kennard BD, Stewart SM, Olvera R *et al*. Nonadherence in adolescent oncology patients: preliminary data on psychological risk factors and relationships to outcome. *J Clin Psychol Med S*. 2004;11(1):31-39.

161. Von Essen L, Larsson G, Oberg K, Sjödén P. Satisfaction with care: associations with health-related quality of life and psychosocial function among Swedish patients with endocrine gastrointestinal tumours. *Eur J Cancer Care*. 2002;11(2):91-99.
162. Skarstein J, Aass N, Fosså SD, Skovlund E, Dahl AA. Anxiety and depression in cancer patients: relation between the Hospital Anxiety and Depression Scale and the European Organization for Research and Treatment of Cancer Core Quality of Life Questionnaire. *J Psychosom Res*. 2000;49(1):27-34.
163. National Breast Cancer Centre NCCI. Clinical Practice Guidelines for the Psychosocial Care of Adults With Cancer. 2003.
164. NHS National Institute for Health and Clinical Excellence. How to Change Practice: Understand, identify and overcome barriers to change. London, 2007.
165. Holland JC, Andersen B, Breitbart WS *et al*. Distress management. *J Nat Comprehensive Cancer Network*. 2010;8(4):448.
166. Bultz BD, Johansen C. Screening for Distress, the 6th Vital Sign: where are we, and where are we going? *Psycho Oncol*. 2011;20(6):569-571.
167. Holland J. NCCN practice guidelines for the management of psychosocial distress. *Oncology*. 1999;13(5A):113-147.
168. Jacobsen PB. Screening for psychological distress in cancer patients: challenges and opportunities. *J ClinOncol*. 2007;25(29):4526.
169. Canadian Partnership Against Cancer Cancer Journey Action Group. Guide to Implementing Screening for Distress, the 6th Vital Sign: Moving Towards Person-Centred Care. Part A: Background, Recommendations and Implementation. 2009.
170. Brenner H, Gefeller O. An alternative approach to monitoring cancer patient survival. *Cancer.* 1996;78:2004–10.
171. Baili P, Micheli A, Montanari A, Capocaccia R. *Comparison of Four Methods for Estimating Complete Life Tables from Abridged Life Tables Using Mortality Data Supplied to EURO-CARE-3*. Mathematical Population Studies, 2005;12:183–198.
172. Elandt-Johnson RC and Johnson NL. *Survival Models and Data Analysis*. 1980;111–115. New York: Wiley series.

Technical Appendix

Prevention

INDICATOR: SMOKING PREVALENCE

Definition:

Percentage of population aged 12 years and older in each specified group—daily, occasional, former or never smokers

Numerator:

Number of daily, occasional, former, or never smokers, aged 12+

Denominator:

Total population, aged 12+

Data Source:

Canadian Community Health Survey

Measurement Timeframe:

2003 (CCHS Cycle 2.1); 2009 (CCHS 2009)—Pan-Canadian data

CCHS Variables:

- Have smoked 100 or more cigarettes during lifetime
- Ever smoked a whole cigarette
- Type of smoker at present time
- Ever smoked cigarettes daily

Stratification Variables:

Province/territory, age, sex, income, education, urban/rural/rural-remote/rural-very remote (see CCHS stratification variables)

Notes:

CCHS data is based on a representative sample which is then extrapolated to the overall population.

INDICATOR: SMOKING CESSATION

Definition:

Percentage of recent smokers aged 20 and older that quit smoking in the previous 2 years

Numerator:

Recent quitters: former smokers who were no longer smoking at the time of the survey who have quit in the last 2 years

Denominator:

Recent quitters plus current smokers (those who are currently daily or occasional smokers)

Data Source:

Canadian Community Health Survey

Measurement Timeframe:

2003 (CCHS Cycle 2.1); 2009 (CCHS 2009)—Pan-Canadian data

CCHS Variables:

- Current smoking status
- Number of years stopped smoking daily
- Number of years stopped smoking completely

Stratification Variables:

Province/territory, age, sex, income, education, urban/rural/rural-remote/rural-very remote (see CCHS stratification variables)

Notes:

1. This indicator could not be derived in Cycle 1.1 (2000–01) because respondents were asked only whether they had stopped smoking daily. As someone could have switched from being a daily smoker to an occasional smoker, it was impossible to determine if they had stopped smoking completely. From Cycle 2.1 onward, an additional question, "When you stopped smoking daily, was this when you completely stopped? If not, when did you stop smoking completely?" was asked.
2. CCHS data based is on a representative sample which is then extrapolated to the overall population.

INDICATOR: SECOND-HAND SMOKE EXPOSURE

Definition:

Percentage of non-smokers aged 12 years and older regularly exposed to second-hand smoke at home, in vehicles, or in public spaces

Numerator:

- Number of non-smokers who reported someone smoking inside the home every day or almost every day
- Number of non-smokers who reported being exposed to second-hand smoke in private vehicles every day or almost every day in the past month
- Number of non-smokers who reported being exposed to second-hand smoke in public places every day or almost every day in the past month

Denominator:

Non-smokers, aged 12+

Data Sources:

Canadian Community Health Survey

Measurement Timeframe:

2003 (CCHS Cycle 2.1); 2005 (CCHS Cycle 3.1); 2007 (CCHS 2007), 2008 (CCHS 2008), 2009 (CCHS 2009)—Pan-Canadian data

CCHS Variables:

- Including both household members and regular visitors, does anyone smoke inside your home, every day or almost every day?
- In the past month, were you exposed to second-hand smoke every day or almost every day, in a car or other private vehicle?
- (In the past month,) were you exposed to second-hand smoke, every day or almost every day, in public places?

Stratification Variables:

Province/territory, age

Notes:

CCHS data is based on a representative sample which is then extrapolated to the overall population.

INDICATOR: ALCOHOL CONSUMPTION—LOW-RISK DRINKING GUIDELINE

Definition:

Percentage of adults aged 18 and older that reported exceeding the low-risk drinking guideline as defined below:

Low-Risk Drinking Guideline: An AVERAGE of no more than 2 drinks per day for males, and an AVERAGE of no more than 1 drink per day for females. The daily average was calculated based on the total number of drinks the respondent reported consuming in the week prior to the CCHS interview, divided by 7 days.

Numerator:

Number of adults (>18 years) who reported exceeding the low-risk drinking guideline

Denominator:

Total population (>18 years)

Data Source:

Canadian Community Health Survey

Measurement Timeframe:

2003 (CCHS Cycle 2.1); 2005 (CCHS Cycle 3.1)—Pan-Canadian data

CCHS Variables:

- During the past 12 months, have you had a drink of beer, wine, liquor or any other alcoholic beverage?
- Thinking back over the past week, did you have a drink of beer, wine, liquor or any other alcoholic beverage?
- How many drinks did you have on each day during the past week?

Stratification Variables:

Province/territory, income, education, urban/rural/rural-remote/rural-very remote (see CCHS stratification variables)

Notes:

1. The total population differed slightly between 2003 and 2005. The universe for 2003 included people who drank over the past week, while the universe for 2005 not only included people who drank over the past week, but also those who answered "don't know" or refusal—approximately 0.2% of the universe.
2. This indicator is presented for 2005 as data are not available for all provinces/territories in later survey cycles.
3. The word drink means: 1 bottle or can of beer or a glass of draft, 1 glass of wine or a wine cooler, or 1 drink or cocktail with 1 1/2 ounces of liquor.
4. CCHS data is based on a representative sample which is then extrapolated to the overall population.

INDICATOR: ALCOHOL CONSUMPTION—NO ALCOHOL

Definition:

Percentage of adults aged 18 years and older that reported no alcohol drinking in the past 12 months

Numerator:

Number of people aged 18+ who reported drinking no alcohol in the past 12 months

Denominator:

Total population, aged 18+

Data Source:

Canadian Community Health Survey

Measurement Timeframe:

2003 (CCHS Cycle 2.1); 2009 (CCHS 2009)—Pan-Canadian data

CCHS Variables:

During the past 12 months, have you had a drink of beer, wine, liquor or any other alcoholic beverage?

Stratification Variables:

Province/territory, income, education, urban/rural/rural-remote/rural-very remote (see CCHS stratification variables)

Notes:

1. The word drink means: 1 bottle or can of beer or a glass of draft, 1 glass of wine or a wine cooler, or 1 drink or cocktail with 1 1/2 ounces of liquor.
2. CCHS data is based on a representative sample which is then extrapolated to the overall population.

INDICATOR: FRUIT & VEGETABLE CONSUMPTION

Definition:

Percentage of population aged 12 years and older in each level of fruits and vegetables consumption: 5 to 10 times daily or >10 times daily

Numerator:

Number of population aged 12+ reporting consuming fruits and vegetables 5 to10 times daily or >10 times daily

Denominator:

Total population, aged 12+

Data Source:

Canadian Community Health Survey

Measurement Timeframe:

2000–2001 (CCHS Cycle 1.1); 2003 (CCHS Cycle 2.1); 2007 (CCHS Cycle 4.1); 2008 (CCHS Cycle 5.1); 2009—Pan-Canadian data

CCHS Variables:

Derived from FVCGTOT (daily consumption—total fruits and vegetables); included daily consumption of fruit juice, fruit (excluding fruit juice), green salad, potatoes (excluding French fries, fried potatoes or potato chips), carrots and other vegetables (excluding carrots, potatoes or salad)

Stratification Variables:

Province/territory, income, education, urban/rural/rural-remote/rural-very remote (see CCHS stratification variables)

Notes:

1. The CCHS measures the number of times (frequency), not the amount consumed.
2. This indicator is not presented for 2005 as data are not available for all provinces/territories.
3. CCHS data is based on a representative sample which is then extrapolated to the overall population.

INDICATOR: PHYSICAL ACTIVITY – LEISURE

Definition:

Percentage of population aged 18 and older in each physical activity level—inactive (EE <1.5 KKD); moderately active (1.5 KKD<=EE<3.0 KKD); active (3.0 KKD<=EE<4.5 KKD); very active (EE>=4.5 KKD)

Daily energy expenditure (EE) is calculated for each leisure physical activity and measured in kilocalories per day (KKD). The daily EE values from each activity are added up, resulting in an overall daily EE value for leisure-time physical activity.

Numerator:

Number of people aged 18+ who are inactive, moderately active, active and very active

Denominator:

Total population, aged 18+

Data Source:

Canadian Community Health Survey

Measurement Timeframe:

2003 (CCHS Cycle 2.1); 2009 (CCHS 2009)—Pan-Canadian data

CCHS Variables:

- Type of physical activities for leisure
- Number of times spent on each physical activity for leisure
- Amount of hours spent on each physical activity for leisure

Stratification Variables:

Province/territory, sex, income, education, urban/rural/rural-remote/rural-very remote (see CCHS stratification variables)

Notes:

1. Daily EE for each activity = (N x 4 x D x MET value)/365

Where:

N = the number of times a respondent engaged in an activity over a 3-month period (N is further multiplied by 4 in order to get the number of times respondent engaged in the activity over a 12-month period)

D = the average duration in hours of the activity

MET value = the energy cost of the activity expressed as kilocalories expended per kilogram of body weight per hour of activity (kcal/kg per hour)/365 (to convert yearly data into daily data)

2. Examples of leisure activities include gardening, walking, playing soccer and skiing.
3. CCHS data is based on a representative sample which is then extrapolated to the overall population.

INDICATOR: OVERWEIGHT & OBESITY RATES—ADULTS

Definition:

Percentage of adults aged 18 years and older in each BMI group—underweight (BMI < 18.50); normal weight (BMI 18.50–24.99); overweight (BMI 25.00–29.99); obese II (BMI 35.00–39.99); obese III (BMI 40.00+) or obese (BMI 30.00+)

Numerator:

Number of adults (age 18+) underweight, normal weight, overweight or obese

Denominator:

Total number of adults (age 18+) with valid height and weight responses

Population Exclusions:

Pregnant women, lactating women, persons less than 3 feet tall or greater than 6 feet 11 inches

Data Source:

Canadian Community Health Survey

Measurement Timeframe:

2003 (CCHS Cycle 2.1); 2009 (CCHS 2009)—Pan-Canadian data

CCHS Variables:

- Self-reported weight (kg)
- Self-reported height (m)
- Calculated BMI values: BMI=weight/(height)^2

Stratification Variables:

Province/territory, sex, income, education, urban/rural/rural-remote/rural-very remote (see CCHS stratification variables)

Notes:

1. Although heights and weights were reported in CCHS Cycle 1.1 (2000 to 2001), they are not included in this analysis because the age range differed from subsequent years (Adults: 20–64).
2. CCHS data is based on a representative sample which is then extrapolated to the overall population.

INDICATOR: OVERWEIGHT & OBESITY RATES—ADOLESCENTS

Definition:

Percentage of adolescents aged 12–17 in each BMI group—overweight or obese according to the age- and sex-specific BMI cut-off points as defined by Cole *et al*

Numerator:

Number of adolescents (aged 12-17) overweight or obese

Denominator:

Total number of adolescents (aged 12-17) with valid height and weight responses

Population Exclusions:

Female respondents aged 15–17 who were pregnant or did not answer the pregnancy question, lactating female respondents, persons less than 3 feet tall or greater than 6 feet 11 inches

Data Source:

Canadian Community Health Survey

Measurement Timeframe:

2005 (CCHS Cycle 3.1); 2009 (CCHS 2009)—Pan-Canadian data

CCHS Variables:

- Self-reported weight (kg)
- Self-reported height (m)
- Calculated BMI values: BMI=weight/(height)^2
- Date of birth
- Date of interview
- Sex

Stratification Variables:

Province/territory, age, sex, income, education, urban/rural/rural-remote/rural-very remote (see CCHS stratification variables)

Notes:

1. Adolescents age 12–17 are classified as "overweight" or "obese" according to the age-and-sex-specific BMI cut-off points as defined by Cole *et al* and are based on pooled international data (Brazil, Great Britain, Hong Kong, Netherlands, Singapore and United States) for BMI and linked to the widely internationally accepted adult BMI cut-off points of 25kg/m^2 (overweight) and 30kg/m^2 (obese).[46]
2. Data from 2005 (CCHS Cycle 2.1) are not included because actual height and weight values were not available and thus BMI categories could not be determined.
3. CCHS data is based on a representative sample which is then extrapolated to the overall population.

INDICATOR: HPV VACCINATION PROGRAM UPTAKE

Definition:

The proportion of females in the targeted cohort to receive the first of 3 doses of the HPV vaccination.

Numerator:

Number of females who have received the first dose of the HPV vaccination through the provincially/territorially organized program

Denominator:

Number of females in the target grade/age group (which varies by province) in schools where the provincial HPV vaccination program has been offered

Data Source:

Pan-Canadian Cervical Screening Initiative

Measurement Timeframe:

2008 to 2009 school year (approximately September 1st, 2008 to August 31st, 2009)

Stratification Variables:

Province/territory

Provinces Submitting Data:

AB, BC, MB, NB, NL, NS, NT, ON, PE, QC, SK

Province Specific Notes:

AB Data are for 3rd dose of HPV vaccine.
NT Data reported are based on estimate.
ON Data are for 3rd dose of HPV vaccine.
PE Data reported are based on estimate.

General Notes:

Provincial/territorial programs have different target populations, different implementation/roll-out plans (phase in) and different phases of implementation. As provinces continue with the implementation of the vaccine programs, it is expected that percentages will increase and interprovincial variation will decrease.

Screening

INDICATOR: CERVICAL CANCER SCREENING—PARTICIPATION

Definition:

Percentage of women aged 20–69 who had at least 1 Papanicolaou (Pap) smear from 2006 to 2008

Numerator:

Number of women (20–69) who had at least 1 Pap test in the last 3 years

Denominator:

Total number of women aged 20–69

Data Source:

Cervical Cancer Screening in Canada: Monitoring Program Performance (Draft Report)

Measurement Timeframe:

2006 to 2008

Provinces submitting data:

AB, BC, MB, NL, NS, ON, SK

Stratification Variables:

Province, age, hysterectomy correction

Province Specific Notes:

AB AB provided data for the areas in which the organized program operated during these years (approximately 40% of the population).

BC BC excluded all non-cervical cytology tests (e.g., vaginal vault tests) and adjusted the denominator based on historical hysterectomy rates within the province.

NL NL provided historical data from 2005 to 2007.

ON ON provided participation rates corrected for hysterectomy; method used administrative data to identify women who had a prior hysterectomy and previously published hysterectomy rates to adjust participation.

INDICATOR: CERVICAL CANCER SCREENING—RETENTION

Definition:

Percentage of women aged 20–69 who had a Pap test within 3 years after a negative Pap test between 2004 and 2005

Numerator:

Number of women who had a Pap test within 3 years after a negative Pap test

Denominator:

Total number of women aged 20–69

Data Source:

Cervical Cancer Screening in Canada: Monitoring Program Performance (Draft Report)

Measurement Timeframe:

2004 and 2005

Provinces submitting data:

AB, MB, NL, NS, SK (non-hysterectomy corrected) and BC, ON (hysterectomy corrected)

Stratification Variables:

Province, age

Province Specific Notes:

AB AB provided data for the areas in which the organized program operated during these years (approximately 40% of the population).

NL NL provided historical data from 2005 to 2007.

ON ON data are for 2003 and 2006 for approximately 85% of all Pap tests performed in the province.

INDICATOR: COLORECTAL CANCER SCREENING—ASYMPTOMATIC

Definition:

Percentage of asymptomatic individuals aged 50–74 who reported undergoing a colorectal cancer (CRC) screening test where asymptomatic is defined as:

Asymptomatic: Respondents who reported having a CRC screening test for any of the following reasons:

- Family history; Part of routine check-up/screening; Age; Race

And not for any of the following reasons:

- Follow-up of a problem; Follow-up of colorectal cancer treatment; Other Reason

Numerator:

1. Number of asymptomatic individuals aged 50–74 reporting having had an FOBT within the past 2 years
2. Number of asymptomatic individuals aged 50–74 reporting having had an FOBT within the past 2 years and/or a colonoscopy/sigmoidoscopy within the past 5 years

Denominator:

Total number of asymptomatic individuals aged 50–74

Data Source:

Canadian Community Health Survey

Measurement Timeframe:

2009 (CCHS 2009)

CCHS Variables:

- Have you ever had an FOBT test? When was the last time? Why did you have it?
- Have you ever had a colonoscopy or sigmoidoscopy? When was the last time? Why did you have it?

Provinces/territories Submitting Data:

NB, NS, NL, NT, NU, ON, PE, SK, YT

Stratification Variables:

Province

Notes:

1. CRC screening participation was an optional component of the CCHS 2009 survey.
2. CCHS data is based on representative sample which is then extrapolated to the overall population.

INDICATOR: COLORECTAL CANCER SCREENING—AVAILABILITY

Definition:

Percentage of individuals in the target population for whom organized colorectal cancer screening programs are available (0%, 1-9%, 10-49%, 50-99%, 100%)

Numerator:

Individuals in the target population who could access the colorectal cancer screening entry test

Denominator:

Total number of individuals aged 50–74

Data Source:

National Colorectal Cancer Screening Network

Measurement Timeframe:

Availability in 2011

Province Specific Notes:

NB Currently in planning phase of program

NL Currently in planning phase of program

QC Currently in planning phase of program

General Notes:

Target population for provincial screening programs is adults aged 50–74.

Diagnosis

INDICATOR: CAPTURE OF STAGE DATA

Definition:

Percentage of incident cancer cases for which stage data are available in provincial cancer registries

Numerator:

Number of incident cancer cases for which stage data is available in the provincial cancer registry

Denominator:

Total number of incident cancer cases in the provincial cancer registry

Data Source:

Reported by provincial cancer agencies or equivalents to the Canadian Partnership Against Cancer

Measurement Timeframe:

2007, 2008, 2009 diagnosis years

Stratification Variable

Province, cancer type:

1. All invasive cancers
2. Breast
3. Colorectal
4. Lung
5. Prostate

Provinces Submitting Data:

AB, BC, MB, NB, NL, NS, ON, PE, SK

Province Specific Notes:

NB
- Data submission contains stage data only for prostate cases that underwent radical prostatectomy.
- Data submission includes incident cases that are stageable as per AJCC *Cancer Staging Manual* 6th edition (AJCC 7th edition did not come into effect until January 1, 2010).

General Notes:

1. Only invasive incident cases that are stageable as per AJCC *Cancer Staging Manual* 7th Edition are included in denominator.
2. Indicator is based on data reported directly by the provinces for this Report. No separate validation or verification of the submitted data was done.
3. Staging can be based on AJCC TNM staging reported directly by clinicians and/or based on the Collaborative Staging methodology. Data from other staging systems or standards were not included as valid stage data in the indicator.
4. The Canadian Partnership Against Cancer has recently launched an initiative to support the implementation of Collaborative Staging across the country. Upon the conclusion of this initiative, complete staging is expected to be available from the participating provinces for the top four disease sites: breast, prostate, lung and colorectal.

INDICATOR: WAIT TIMES, ABNORMAL BREAST SCREEN TO RESOLUTION

Definition:

Time (in weeks) from abnormal breast screen to resolution (test date of definitive diagnosis)

Population:

Women aged 50–69 participating in the organized breast screening program with an abnormal breast screen result (mammogram or clinical breast examination):

1. Requiring a tissue biopsy
2. Not requiring a tissue biopsy

Measures:

1. 90th percentile
2. Percentage with resolution within the target wait time—targets are 7 weeks for women requiring a tissue biopsy and 5 weeks for women not requiring a tissue biopsy[169]

Data Source:

Provincial breast cancer screening database

Measurement Timeframe:

2009

Data Reported:

AB, BC, MB, NB, NL, NS, ON, QC

Province Specific Notes:

AB Data reported are from the Screen Test program only. Screen Test is an organized program that conducts approximately 6% of screening mammograms in the province, about 65% of which are performed in mobile screening units.

ON 90th percentile data were not provided.

QC QC data are for 2007.

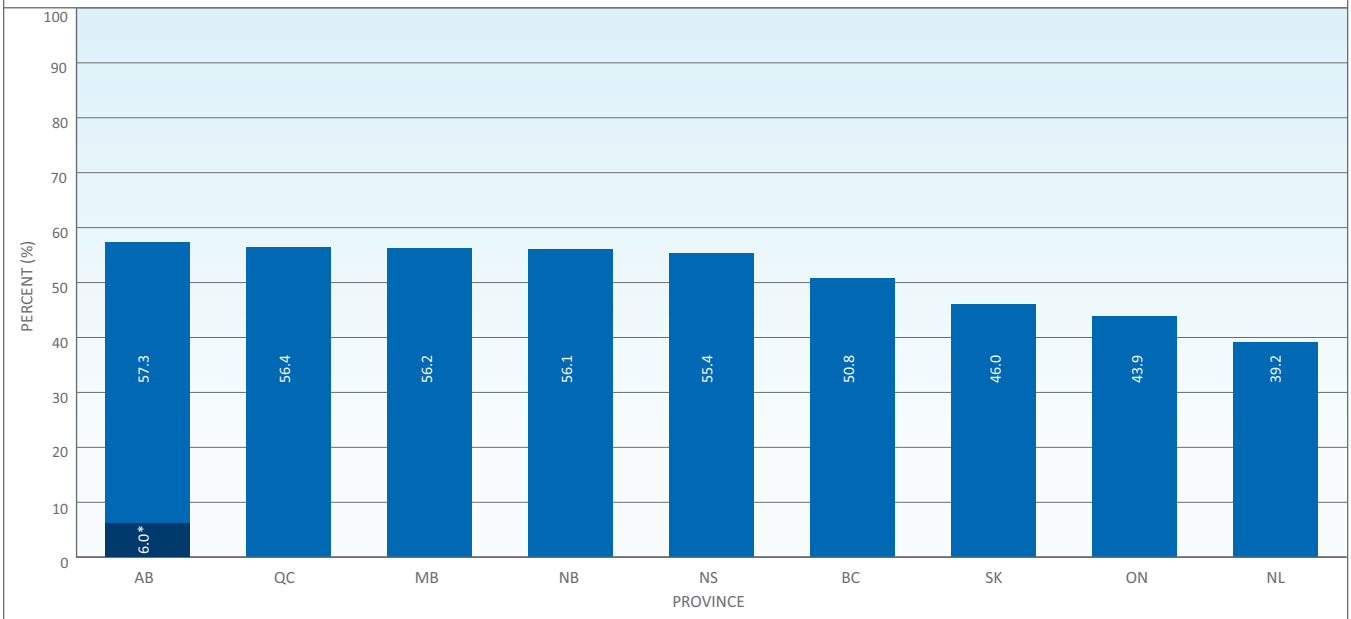
General Notes:

1. The wait times presented must be evaluated in the context of the overall participation in organized breast cancer screening programs. The figure (below) represents the population in which the indicator is based. Participation in organized breast cancer screening programs across Canada was calculated in 2-year intervals due to biennial recall. The figure (below) displays the participation rate by province, for women aged 50–69, for 2009 and 2010. Statistics Canada data for 2003 and 2004 (from the July 2008 population file) were used for the denominator values. These values are slightly different from the denominators used in previously published reports, and therefore the participation rates are not identical to those published.
2. Tissue biopsy includes open and core/needle biopsy.

FIGURE A

Participation rates for provincial breast cancer screening programs

2009-2010



Data from MB are for 2008-2010. Data from QC are for 2009. Data from ON are for 2008-2009

* AB Wait-times are based on the Screen Test program only. Screen Test is an organized program that conducts 6% of screening mammograms in the province

Data Source: Provincial breast cancer screening databases

[1]Public Health Agency of Canada, "Organized Breast Cancer Screening Programs in Canada—Report on Program Performance in 2001 and 2002", July 4, 2005. http://www.phac-aspc.gc.ca/publicat/obcsp-podcs01/pdf/Breast-En_2001-2002.pdf

Treatment

INDICATOR: RADIATION THERAPY WAIT TIMES

Definition:

1. The 90th percentile elapsed time from ready-to-treat to start of radiation therapy measured in days/weeks
2. The percentage of radiation therapy cases for which the above wait time was within target timeframes

Included Population:

All cancer patients receiving radiation therapy who have wait time data collected as consistent with the specifications of this indicator

Measures:

1. 90th percentile wait time in days
2. Percentage of patients starting treatment within target timeframe (4 weeks after ready-to-treat)

Data Source:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer

Measurement Timeframe:

2008, 2009 and 2010 treatment years

Stratification Variables:

Province

Provinces Submitting Data:

AB, BC, MB, NB, NL, NS, ON, QC, PE, SK

Province Specific Notes:

AB Province began reporting data for 2009.

QC 90th percentile data were not reported.

NB 90th percentile data were not available.

- New Brunswick Cancer Network reports wait times for radiation therapy for the following areas: brain and CNS, breast, gastro-intestinal, genitourinary, gynecology, head & neck, leukemia, lung, lymphoma, malignant melanoma, sarcoma, skin, benign cancer.

NS NS did not collect the ready-to-treat date prior to 2010. The wait times reported for 2008 and 2009 are based on a proxy developed by the province.

General Notes:

1. The source data for this indicator were submitted by the provincial cancer agencies based on definitions provided by the Canadian Partnership Against Cancer.
2. There are known discrepancies in the ways in which different provinces measure wait times. One of the key sources of variation is the way the "Ready-to-Treat" timeframe is defined. Efforts are underway to standardize these definitions. The following table outlines the definitions used by the different provinces.

DEFINITION OF READY-TO-TREAT FOR THE RADIATION WAIT TIME INDICATOR

Province "READY-TO-REAT" Definition

AB The date when the patient is physically ready to commence treatment.

BC The date at which both oncologist and patient agree that treatment can commence. Being ready to treat requires that all diagnostic tests and procedures required to assess the appropriateness of, indications for, and fitness to undergo radiation therapy are complete.

MB The date when a decision has been made by the radiation oncologist and is agreed to by the patient that radiation therapy is appropriate and should commence AND the patient is medically ready to start treatment AND the patient is willing to start treatment.

NB The date when any planned delay is over and the patient is ready to begin treatment from both a social/personal and medical perspective.

NL The date when all pre-treatment investigations and any planned delay are over, and the patient is ready to begin the treatment process from both a social/personal and medical perspective.

NS The date when all pre-treatment investigations and any planned delay are over, and the patient is ready to begin the treatment process from both a social/personal and medical perspective. Nova Scotia did not have a ready-to-treat date until February 2010; a proxy date was used prior to this time.

ON The time from when the specialist is confident that the patient is ready to begin treatment to the time the patient receives treatment.

PE The date when all pre-treatment investigations and any planned delay are over, and the patient is ready to begin the treatment process from both a social/personal and medical perspective.

QC At consultation, the radiation oncologist enters the date at which the patient will be ready to treat on a formulary requesting treatment.

SK The date when the patient is ready to receive treatment, taking into account clinical factors and patient preference. In the case of radiation therapy, any preparatory activities (e.g., simulation, treatment planning, dental work) do not delay the ready-to-treat date.

INDICATOR: LINAC CAPACITY AND UTILIZATION

Definition:

Per Capita Linear Accelerator Availability / Linear Accelerator Utilization Rate

Numerator:

1. Number of operational linear accelerators (available for radiation therapy) in province
2. Number of radiation therapy treatments delivered through linear accelerators

Denominator:

1. Total provincial population
2. Number of operational linear accelerators (available for radiation therapy) in province

Data Source:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer

Population from CANSIM table 051-0001—Estimates of population, by age group and sex for July 1, Canada, provinces and territories, annual (persons) accessed from www.statcan.gc.ca

Measurement Timeframe:

2009 and 2010 calendar year

Stratification Variables:

Province

Provinces Submitting Data:

AB, BC, MB, NB, NL, NS, ON, PE, QC, SK

Province Specific Notes:

MB Data are for fiscal year 2010/2011.

QC Number of radiation therapy treatments was not available.

General Notes:

1. "Radiation treatments" refers to the session of radiation delivered to a patient. Patients typically receive multiple treatments over several weeks during the treatment period. In some cases, patients may even receive 2 treatments on the same day. For the purposes of this indicator, 1 treatment is counted whenever a patient is taken into a treatment bunker, given radiation therapy and then taken out.
2. LINACS were pro-rated for partial availability.

INDICATOR: RADIATION THERAPY UTILIZATION

Definition:

Percentage of cancer cases receiving radiation therapy within 2 years of diagnosis

Numerator:

Total number of cancer incident cases diagnosed during the year who have received radiation therapy within two years of diagnosis

Denominator:

Total number of cancer incident cases diagnosed during the year

Denominator Exclusions:

- *In situ* cases
- Non-melanoma skin cancer

Data Source:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer

Measurement Timeframe:

2007 and 2008 diagnosis year

Stratification Variables:

Province, age

Provinces Submitting Data:

AB, BC, MB, NL, NS, ON, PE, SK

Province Specific Notes:

AB Cannot confirm site of RT treatment (used all initial or post-initial RT treatments within timeframe)

NS
- Cases from Cumberland Health Authority were excluded because they may be receiving treatment in New Brunswick, and Nova Scotia does not have out-of-province treatment data.
- Data includes external beam radiation therapy only.

PE No patient age or sex breakdown was provided.

General Notes:

1. Treatments associated with Brachytherapy treatment are included.
2. The "incident case" is at the patient/primary disease level as per Canadian Cancer Registry. The same person with 2 separate primaries would be treated as 2 incident cases (within applicable CCR/NAACCR rules).
3. Cases for patients under 18 years of age were excluded.

INDICATOR: NEOADJUVANT RADIATION FOR STAGE II AND III RECTAL CANCER

Definition:

Percentage of resected stage II and III rectal cancer cases receiving neoadjuvant (pre-operative) radiation therapy

Numerator:

Stage II and III rectal cancer cases diagnosed during the year receiving neo-adjuvant radiation therapy up to 120 days before resection

Denominator:

Stage II and III rectal cancer cases diagnosed in the province during the year and having a rectal resection within one year of diagnosis

Data Source:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer

Measurement Timeframe:

2007 and 2008 diagnosis year

Stratification Variables:

Province, age, sex

Provinces Submitting Data:

AB, BC, MB, NL, NS, ON, PE

Province Specific Notes:

AB Radiation therapy was not limited to primary tumour site.

BC Data include only cases referred to cancer centres, which in 2008 represented approximately 66% of BC residents diagnosed with rectal cancer.

MB Radiation therapy was not limited to primary tumour site.

NS
- Cases from Cumberland Health Authority were excluded as they may be receiving cancer care in New Brunswick, and Nova Scotia does not have out-of-province treatment data.
- In the event of synchronous primaries, analysis restricted to a single disease.

NL Radiation therapy was not limited to primary tumour site.

ON Radiation therapy was not limited to primary tumour site.

General Notes:

1. Rectal cases defined as ICDO3 codes: C19.9 or C20.9, AJCC Group Stage at Diagnosis = II or III.
2. Rectal resections defined as CCI codes 1NQ59 or 1NQ87 or 1NQ89.
3. Resected cases included regardless of margin status (due to data limitations).
4. Last resection date (if multiple)—diagnosis date ≤365 days
5. Cases for patients under 18 years of age were excluded.

INDICATOR: SIMPLIFIED MEASURE—RADIATION THERAPY FOR STAGE II AND III RECTAL CANCER

Definition:

Percentage of stage II and III rectal cancer cases receiving radiation therapy

Numerator:

Stage II and III rectal cancer cases diagnosed during the year receiving radiation therapy within 120 days of diagnosis

Denominator:

Stage II and III rectal cancer cases diagnosed in the province during the year

Data Source:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer

Measurement Timeframe:

2007 and 2008 diagnosis year

Stratification Variables:

Province

Provinces Submitting Data:

AB, BC, MB, NL, NS, ON, PE, SK

Province Specific Notes:

AB Radiation therapy was not limited to primary tumour site.

BC Data include only cases referred to cancer centres, which in 2008 represented approximately 66% of BC residents diagnosed with rectal cancer.

MB Radiation therapy was not limited to primary tumour site.

ON Radiation therapy was not limited to primary tumour site.

NL Radiation therapy was not limited to primary tumour site.

NS Cases from Cumberland Health Authority were excluded as they may be receiving cancer care in New Brunswick, and Nova Scotia does not have out-of-province treatment data.

General Notes:

1. No filter for treatment intent was used.
2. Rectal cases defined as ICDO3 codes: C19.9 or C20.9, AJCC Group Stage at Diagnosis = II or III.
3. Resected cases included regardless of margin status (due to data limitations).
4. Cases for patients under 18 years of age were excluded.

INDICATOR: ADJUVANT RADIATION THERAPY FOLLOWING BREAST-CONSERVING SURGERY FOR STAGE I AND II BREAST CANCER

Definition:

Percentage of stage I and II breast cancer cases receiving adjuvant radiation therapy following breast-conserving surgery

Numerator:

Stage I and II breast cancer cases diagnosed in the province during the year and starting radiation therapy within 270 days following breast-conserving surgery

Denominator:

Stage I and II breast cancer cases diagnosed in the province during the year and receiving breast-conserving surgery within one year of diagnosis

Exclusions:

Cases receiving a mastectomy

Data Source:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer

Measurement Timeframe:

2007 and 2008 diagnosis year

Stratification Variables:

Province, age, sex

Provinces Submitting Data:

AB, BC, MB, ON

Province Specific Notes:

AB
- Segmental resections were included as lumpectomy.
- Radiation therapy was not limited to primary tumour site.

BC Includes only cases referred to cancer centres, which in 2008 represented approximately 86% of BC residents diagnosed with breast cancer.

MB Radiation therapy was not limited to primary tumour site.

ON Radiation therapy was not limited to primary tumour site.

General Notes:

1. Breast cases identified as ICDO3 codes: C50.0 to C50.9, AJCC Group Stage at Diagnosis = I or II.
2. Only cases receiving breast-conserving surgery and no subsequent mastectomy are included. Include CCI Codes: 1YM87 or 1YM88; exclude CCI Codes = 1YM89 to 1YM92 in specified time period.
3. Resected cases included regardless of margin status (due to data limitations).
4. Timeframe: Last resection date (if multiple) ≤365 days from diagnosis date.
5. Cases for patients under 18 years of age were excluded.

INDICATOR: SIMPLIFIED MEASURE—RADIATION THERAPY FOR STAGE I AND II BREAST CANCER

Definition:

Percentage of stage I and II breast cancer cases receiving radiation therapy

Numerator:

Stage I and II breast cancer cases diagnosed during the year and starting radiation therapy within 1 year plus 270 days (635 days) following diagnosis

Denominator:

Stage I and II breast cancer cases diagnosed in the province during the year

Data Source:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer

Measurement Timeframe:

2007 and 2008 diagnosis year

Stratification Variables:

Province

Provinces Submitting Data:

AB, BC, MB, NL, NS, ON, PE, SK

Province Specific Notes:

AB
- Radiation therapy was not limited to primary tumour site.
- Used radiation information (whether radiation therapy was given within the timeframe), but no details related to treatment intent or site of RT treatment.

BC
- Includes only cases referred to cancer centres, which in 2008 represented approximately 86% of BC residents diagnosed with breast cancer.
- Applied filter for treatment intent to restrict to adjuvant therapy.

MB Radiation therapy was not limited to primary tumour site.

NL Radiation therapy was not limited to primary tumour site.

NS Cases from Cumberland Health Authority were excluded as they may be receiving cancer care in New Brunswick, and Nova Scotia does not have out-of-province treatment data.

PE Radiation therapy was not limited to primary tumour site.

SK Radiation therapy was not limited to primary tumour site.

General Notes:

1. No filter for treatment intent was used, unless otherwise specified in the province specific notes.
2. Cases for patients under 18 years of age were excluded.
3. Breast cases identified as ICDO3 codes: C50.0 to C50.9, AJCC Group Stage at Diagnosis = I or II.
4. Resected cases included regardless of margin status (due to data limitations).
5. Cases for patients under 18 years of age were excluded.

INDICATOR: ADJUVANT CHEMOTHERAPY FOR STAGE III COLON CANCER

Definition:

Percentage of stage III colon cancer cases receiving chemotherapy following surgical resection

Numerator:

Stage III colon cancer cases diagnosed during the year starting adjuvant chemotherapy within 120 days of surgery

Denominator:

Stage III colon cancer cases diagnosed in the province during the year and having a colon resection within one year of diagnosis

Data Source:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer

Measurement Timeframe:

2007 and 2008 diagnosis year

Stratification Variables:

Province, age, sex

Provinces Submitting Data:

BC, AB, MB, ON, NL, PE

Province Specific Notes:

BC
- Data include only cases referred to the regional cancer centres, which in 2008 represented approximately 49% of all BC residents diagnosed with colon cancer (*in situ* or invasive).
- Treatment intent filter was used to identify adjuvant therapy.

MB Oral drugs are included but may be undercounted.

ON Chemotherapy data exclude most oral chemotherapy since that data are not reliably reported to Cancer Care Ontario.

General Notes:

1. No filter for treatment intent was used, unless otherwise specified by province.
2. Colon cases defined as ICDO3 codes: C18.0 to C18.9, AJCC Group Stage at Diagnosis = III.
3. Colon resections defined as CCI codes: 1NM87 or 1NM89 or 1NM91.
4. Resected cases included regardless of margin status (due to data limitations).
5. Last resection date (if multiple)—diagnosis date ≤365 days.
6. Cases for patients under 18 years of age were excluded.

INDICATOR: SIMPLIFIED MEASURE—ADJUVANT CHEMOTHERAPY FOR STAGE III COLON CANCER

Definition:

Percentage of stage III colon cancer cases receiving chemotherapy
Chemotherapy started within 1 year + 120 days of diagnosis

Numerator:

Stage III colon cancer cases diagnosed during the year starting adjuvant chemotherapy within 1 year + 120 days of diagnosis

Denominator:

Stage III colon cancer cases diagnosed in the province during the year

Data Source:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer

Measurement Timeframe:

2007 and 2008 diagnosis year

Stratification Variables:

Province

Provinces Submitting Data:

AB, BC, MB, NL, NS, ON, PE, SK

Province Specific Notes:

BC BC data include only cases referred to the regional cancer centres, which in 2008 represented approximately 49% of all BC residents diagnosed with colon cancer (*in situ* or invasive).

MB Oral drugs are included but may be undercounted.

ON Chemotherapy data excluded most oral chemotherapy since that data are not reliably reported to Cancer Care Ontario.

NS Cases residing outside the two District Health Authorities that host the provincial cancer centres (Cape Breton DHA and Capital Health) were excluded because chemotherapy treatment information was not available.

General Notes:

1. No filter for treatment intent was used.
2. Colon cases defined as ICDO3 codes: C18.0 to C18.9, AJCC Group Stage at Diagnosis = III.
3. Resected cases included regardless of margin status.
4. Cases for patients under 18 years of age were excluded.

INDICATOR: ADJUVANT CHEMOTHERAPY FOR STAGE II AND IIIA NON-SMALL CELL LUNG CANCER

Definition:

Percentage of stage II and IIIA non-small cell lung cancer cases receiving chemotherapy following surgical resection

Numerator:

Stage II and IIIA non-small cell lung cancer cases diagnosed during the year starting adjuvant chemotherapy within 120 days of surgery

Denominator:

Stage II and IIIA non-small cell lung cancer cases diagnosed in the province during the year and having a lung resection within one year of diagnosis

Data Source:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer

Measurement Timeframe:

2007 and 2008 diagnosis year

Stratification Variables:

Province, age, sex

Provinces Submitting Data:

AB, BC, MB, ON, SK

Province Specific Notes:

AB Resections nor necessarily limited to the specified types (lobectomy, pneumonectomy or segmentectomy).

BC Data include only cases referred to the regional cancer centres, which in 2008 represented approximately 66% of all BC residents diagnosed with non-small cell lung cancer.

MB 2008 data are not available for reporting.

General Notes:

1. Non-small cell lung cases defined as ICDO3 codes: C34.0 to C34.9. Exclude histology codes: 8002, 8041, 8043, 8044, 8045, 8073, 8803. Exclude lymphoma codes: (M-95 to M-98).
2. AJCC Group Stage at Diagnosis = II or IIIA.
3. Resections defined as CCI codes: 1GR87, 1GR89, 1GR91, 1GT59, 1GT87, 1GT89 or 1GT91.
4. All resected cases are included regardless of margin status (due to data limitations).
5. Cases included where last resection date (if multiple) is ≤365 days from diagnosis date.
6. No filter for treatment intent was used, unless otherwise specified by province.
7. Cases for patients under 18 years of age were excluded.

INDICATOR: REMOVAL OF 12 OR MORE LYMPH NODES FOR COLON CANCER RESECTIONS

Definition:

The number of colon cancer resections for which 12 or more lymph nodes were removed and examined

Numerator:

Colon cancer cases diagnosed during the year and resected within 1 year of diagnosis for which 12 or more lymph nodes were removed and examined

Denominator:

All colon cancer cases diagnosed in the province during the year and resected within 12 months of diagnosis

Exclusions:

Cases with unknown number of nodes removed and examined were excluded from both numerator and denominator.

Data Source:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer, typically form collaborative staging data.

Measurement Timeframe:

2007 and 2008 diagnosis year

Stratification Variables:

Province, age, sex

Provinces Submitting Data:

AB, BC, MB, NB, NS, ON, PE, SK

Province Specific Notes:

AB Did not limit data to complete resections (colectomy).

BC Data include only cases referred to the regional cancer centres, which in 2008 represented approximately 49% of all BC residents diagnosed with colon cancer (*in situ* or invasive).

ON
- 2008 data were based on 41% of colon cases for which collaborative staging data were collected in 2008.
- 2007 data included only hospitals with synoptic reporting.

PE Resections identified through CS Extension Evaluation code (=3) which was used to meet AJCC pathological criteria for staging.

General Notes:

1. Colon cases defined as ICDO3 codes: C18.0 to C18.9.
2. Colon resections identified as CCI codes: 1NM87 or 1NM89 or 1NM91.
3. Resected cases included regardless of margin status (due to data limitations).
4. Last resection date (if multiple)—diagnosis date ≤365 days.
5. Cases for patients under 18 years of age were excluded.

Research

INDICATOR: PEDIATRIC CLINICAL TRIAL PARTICIPATION RATIO

Definition:

The ratio of the total number of all patients (≤18 years) enrolled in cancer-related therapeutic trials or clinical research studies in 2010 to the total number of new cancer cases (≤18 years) diagnosed at pediatric cancer centres in 2010

Numerator:

All patients (≤18 years) newly enrolled in cancer-related therapeutic trials or clinical research studies during the year

Denominator:

New cancer cases (≤18 years) newly registered at pediatric cancer centres during the year

Data Source:

Reported by C[17] Council to the Canadian Partnership Against Cancer, collected August 2011

Measurement Timeframe:

2009 and 2010 calendar year

Provinces Submitting Data:

AB, BC, MB, NL, NS, ON, QC, SK

Notes:

1. For the purposes of registration, a clinical trial is any cancer-related research study that prospectively assigns human participants to a health-related intervention to evaluate the effects on health outcomes.
2. Data exclude enrolments in biology studies and include Phase I to Phase IV clinical trials.

INDICATOR: ADULT CLINICAL TRIAL PARTICIPATION RATIO

Definition:

The ratio of the total number of all patients (≥19 years) newly enrolled in cancer-related therapeutic trials or clinical research studies in 2010 to the total number of cancer cases (≥19 years) newly registered to provincial cancer centres in 2010

Numerator:

Cancer patients (≥19 years), whether incident or previously diagnosed, newly enrolled in therapeutic clinical trials at provincial cancer centres during the year

Denominator:

Cancer centre patients, whether incident or recurrent, newly registered to provincial cancer centres for the first time during the year

Stratification Variables:

Province, cancer type:

1. All invasive cancers
2. Breast
3. Colorectal
4. Lung
5. Prostate

Exclusions:

See table on the next page

Data Source:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer

Measurement Timeframe:

2009 and 2010 calendar year

Provinces Submitting Data:

AB, BC, MB, NB, NL, NS, ON, QC, PE, SK

Province Specific Notes:

AB ***For 2010 data:*** Disease site groupings for 2009 may vary fro 2010 due to use of tumour groups (i.e., GI, GU, etc.), whereas for 2010, data use the same AJCC groupings.
For 2009 data: Data are from the 2 tertiary centres only. Clinical trial accrual does not generally occur at the associate cancer centres in the province.

BC Data by cancer disease site are not available.

MB
- Several patients were entered into more than 1 clinical trial. These patients were counted for each trial they participated in.
- *In situ* trials were excluded, with the exception of 1 trial that accrued a large number of patients with both *in situ* and invasive tumours.

NB Data by cancer disease site are not available.

NS Data are from Nova Scotia Cancer Centre only.

PE Data by cancer disease site are not available.

SK
- All invasive includes patients from the following disease sites: breast, colorectal, lung, prostate, brain, melanoma, renal cell, hematologic, and head & neck cancers.
- Includes symptom control trials.

General Notes:

See following table for indicator inclusion and exclusion by province.

TABLE A: CLINICAL TRIAL INDICATOR DEFINITIONS, EXCLUSIONS

	AB	BC	MB	NB	NL	NS	PE	SK
Numerator: Cancer cases (≥19 years), whether incident or previously diagnosed, newly enrolled in therapeutic clinical trials at provincial cancer centres in 2010								
Cases for non-therapeutic trials are EXCLUDED from the numerator	YES[1]	YES	YES	YES	YES	NO	YES	YES
Cases registered for longer-term follow-up are EXCLUDED from the numerator	NO	YES	YES	YES	YES	NO	YES	YES
Questionnaire/Interview studies without intervention are EXCLUDED	YES	YES	YES	YES	YES	NO	YES	YES
Cases identified but did not commence intervention in 2010 are EXCLUDED	YES[2]	YES	YES	YES	YES	NO	YES	YES
Persons who did NOT have a cancer diagnosis are EXCLUDED from the numerator	YES	YES	YES	YES	YES	YES	YES	YES
Persons with borderline tumours are EXCLUDED from the numerator	YES	YES	YES	YES	YES	YES	YES	YES
Persons with *in situ* cancer are EXCLUDED from the numerator	YES	YES	YES[3]	NO†	YES	YES	YES	YES
Denominator: Cancer centre cases, whether incident or previously diagnosed, newly referred to provincial cancer centres in 2010								
Persons who did NOT have a cancer diagnosis are EXCLUDED from the denominator	YES	YES	NO	NO	YES	YES	NO	YES
Persons with borderline tumours are EXCLUDED from the denominator	YES	YES	NO	NO	YES	NO*	NO	YES
Persons with *in situ* cancer are EXCLUDED from the denominator	YES	YES	NO	NO	YES	NO*	NO	YES

†2 of 3 centres excluded persons with *in situ* cancers from the numerator
*If answered "unsure", response displayed as "no" (i.e., no exclusion process was undertaken)
[1]With caveat that some IGAR studies appeared interventional
[2]Patients who had consented but not randomized would be excluded
[3]Except for enrolment to a trial that allowed both *in situ* and invasive cancers

Patient Experience

INDICATOR: PATIENT REPORTED OUTCOMES—COORDINATION AND CONTINUITY OF CARE

Definition:

NRC Picker AOPSS Survey (self-reported data)—provincial % ***positive score*** (% of valid respondents that replied "good", "very good" or "excellent") for the 8 dimensions of coordination and continuity of care:

1. Knew next step in care
2. Knew who to go to with questions
3. Providers knew enough regarding oncology patient therapy
4. Providers aware of test results
5. Never given confusing/conflicting info
6. Providers aware of medical history
7. Knew who was in charge for each therapy
8. Family doctor knew enough regarding oncology patient cancer care

Data Source:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer

Measurement Timeframe:

Most recent year available (see below)

Provinces Submitting Data:

AB, BC, MB, NS, ON, PE, SK

Province Specific Notes:

AB Survey date: 2008
BC Survey date: November 2005–May 2006
MB Survey date: 2007/08
NS Survey date: July–December 2009
ON Survey date: April–September 2010
PE Survey date: 2008
SK Survey date: 2009/10

INDICATOR: PLACE OF DEATH

Definition:

The percentage of patients who die of cancer by location of death: hospital, other health care facility, other specified location, private home, or unknown location

Numerator:

Number of patients who die of cancer in: hospital; other health care facility; other specified location; private home or unknown location

Denominator:

Number of patients who died of cancer

Data Sources:

Canadian Vital Statistics—Death Database (annual file)

Measurement Timeframe:

2003 to 2007

Stratification Variables:

Province

Notes:

1. All deaths in British Columbia in 2005 and 2006 were recorded as unknown location.
2. In the figure, Cancer patient place of death, by province—2007, unknown locality was excluded. Other included other specified location and private home.

Long-Term Outcomes

INDICATOR: AGE-STANDARDIZED INCIDENCE RATES

Definition:

The incidence rate that would have occurred if the age distribution in the population of interest was the same as that of the standard, where incidence rate is defined as the number of cases of cancer (malignant neoplasms) newly diagnosed during a year, per 100,000 population at risk

Numerator:

Number of new cancer cases (all ages)

1. All cancers
2. Breast (female)
3. Colorectal
4. Lung
5. Prostate

Denominator:

1., 3., 4. Annual population estimates in hundreds of thousands

2. Annual female population estimate in hundreds of thousands

5. Annual male population estimate in hundreds of thousands

Age Standardization:

Direct method using the 1991 Canadian Census population

Data Sources:

Canadian Cancer Registry (CCR) Database (July 2011 file)—cancer incidence data

Demography Division of Statistics Canada—population estimates

Measurement Timeframe:

All cancers: 1995 to 2007; Breast, Colorectal, Lung and Prostate cancer: 1992 to 2007

Stratification Variables:

Province

Notes:

1. World Health Organization, International Classification of Diseases for Oncology, Third Edition (ICD-O-3) and the International Agency for Research on Cancer (IARC) rules for determining multiple primaries sites were used: colorectal (ICD-O-3 C18.0 to C18.9, C19.9, C20.9, C26.0), lung and bronchus (ICD-O-3 C34.0 to C34.9), female breast (ICD-O-3 C50.0 to C50.9) and prostate (ICD-O-3 C61.9). The four categories are excluding morphology types M-9050 to M-9055, M-9140, and M-9590 to M-9989. Included are all invasive sites and *in situ* for bladder.

INDICATOR: AGE-STANDARDIZED MORTALITY RATES

Definition:

The mortality rate that would have occurred if the age distribution in the population of interest was the same as that of the standard, where mortality rate is defined as the number of deaths due to cancer (malignant neoplasms) in a year per 100,000 population at risk

Numerator:

Number of deaths from cancer (all ages)

1. All cancers
2. Breast (female)
3. Colorectal
4. Lung
5. Prostate

Denominator:

1., 3., 4. Annual population estimates in hundreds of thousands

2. Annual female population estimate in hundreds of thousands

5. Annual male population estimate in hundreds of thousands

Age Standardization:

Direct method using the 1991 Canadian Census population

Data Sources:

Canadian Vital Statistics—Death Database (annual file)—cancer mortality data

Demography Division of Statistics Canada—population estimates

Measurement Timeframe:

All cancers: 1995 to 2007;

Breast, Colorectal, Lung and Prostate cancer: 1992 to 2007

Stratification Variables:

Province, sex

Notes:

1. Up to the year 1999, causes of death were coded according to World Health Organization (WHO), International Classification of Diseases, Ninth Revision (ICD-9): All cancers (ICD-9: 140-208), colorectal (ICD-9 153-154), lung (ICD-9 162), female breast (ICD-9: 174) and prostate cancer (ICD-9: 185).
2. After the year 1999, causes of death were coded according to the World Health Organization (WHO), International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10): All Cancers (ICD-10: C00-C97), colorectal (ICD-10:C18-C20, C26), lung (ICD-10 : C34), female breast (ICD-10: C50) and prostate cancer (ICD-10: C61).

INDICATOR: RELATIVE SURVIVAL RATIOS

Definition:

Relative survival is the ratio of the observed survival for a group of cancer patients (malignant neoplasms) to the expected survival for members of the general population who have the same main factors affecting survival (sex, age, place of residence) as the cancer patients (referred to as the comparison population).

Numerator:

Observed survival of cancer patients (aged 15–74) who were alive for 1, 2, 3, 4 and 5 years after diagnosis for patients with follow-up in 2004 to 2006.

1. Breast (female, aged 15–79)
2. Colorectal
3. Lung

Denominator:

Expected survival of comparison population that was alive for 1, 2, 3, 4 and 5 years for patients with follow-up in 2004 to 2006.

1. Females

2.,3. Both sexes

Age Standardization:

Direct method by weighing age-specific estimates for a given cancer to the age distribution of persons diagnosed with cancer during 1992 to 2001

Population Exclusions:

- Age <15 or >74 at time of diagnosis for colorectal and lung; age <15 or >79 at time of diagnosis for breast cancer
- Subjects diagnosed through autopsy only or death certificate only
- Subjects with an unknown year of birth or death

Data Sources:

Canadian Cancer Registry (July 2010 with death clearance complete up to 2006)

Provincial life tables (Statistics Canada)

Urban Canada by income quintile life tables (Statistics Canada)

Measurement Timeframe:

Patients with follow-up in 2004 to 2006

Stratification Variables:

Province, income (see Canadian Census 2006 stratification variables)

Notes:

1. World Health Organization, International Classification of Diseases for Oncology, Third Edition (ICD-O-3) and the International Agency for Research on Cancer (IARC) rules for determining multiple primaries sites were used: colorectal (ICD-O-3 C18.0 to C18.9, C19.9, C20.9, C26.0), lung and bronchus (ICD-O-3 C34.0 to C34.9), female breast (ICD-O-3 C50.0 to C50.9) and prostate (ICD-O-3 C61.9). The four categories are excluding morphology types M-9050 to M-9055, M-9140, and M-9590 to M-9989. Included are all invasive sites and *in situ* for bladder.
2. "Canada" represents all provinces and territories, minus Quebec. Data from Quebec have been excluded, in part, because the method of ascertaining the date of cancer diagnosis differs from the method used by other registries and because of issues in correctly ascertaining the vital status of cases.
3. Survival estimates from Newfoundland and Labrador are included in the national average but are not shown in this Report. In the years under study, there was a known under-reporting of cancer cases in Newfoundland and Labrador. There is likely to be some overestimation of survival for this province as the survival of such 'missed' cases is generally less favourable than that of cases in the registry population. Relative survival was calculated using the period method and all primary cancers.[170]
4. Expected survival proportions were derived from sex-specific complete provincial life tables produced by Statistics Canada, using the Ederer II approach.[135]
5. Abridged life tables with 5-year age group for 1991, 1996 and 2001 of urban Canada by income quintile were produced by Statistics Canada and then extended to complete life tables with each single year of age using Elandt-Johnson method. Complete life tables between any 2 census years were estimated by using linear interpolation[171, 172]
6. Patients aged >75 (or >80 for breast cancer) are excluded from the analysis because there was empirical evidence of systematic bias in provincial survival estimates for older patients.

[3]Russell Wilkins. *PCCF+ Version 5C User's Guide. Automated Geographic Coding Based on the Statistics Canada Postal Code Conversion Files, Including Postal Codes through March 2008*. Catalogue 82F0086-XDB. Health Information and Research Division, Statistics Canada, Ottawa, November 2008.

INDICATOR: CONDITIONAL RELATIVE SURVIVAL RATIO

Definition:

Conditional survival is the probability of living an additional number of years (y) given that the person has already survived at x years

Conditional five-year relative survival expresses the likelihood of surviving 5 years into the future at x (x = 0, 1, 2, 3, 4, 5) years since diagnosis, relative to the expected survival of similar people in the general population

Numerator:

Cumulative survival at x + 5 (x = 0, 1, 2, 3, 4, 5) years of cancer patients (aged 15–74) for cohort 2004–2006.

1. Breast (female, aged 15–79)
2. Colorectal
3. Lung

Denominator:

Cumulative survival at x (x = 0, 1, 2, 3, 4, 5) years of cancer patients (aged 15–74) for cohort 2004–2006.

Data Sources:

Canadian Cancer Registry (July 2010 with death clearance complete up to 2006)

Provincial life tables (Statistics Canada)

Urban Canada by income quintile life tables (Statistics Canada)

Measurement Timeframe:

Patients with follow-up in 2004 to 2006

Stratification Variables:

Age and sex

Notes:

See above for relative survival.

Analysis provided by Health Statistics Division, Statistics Canada

Developmental and Interim Indicators

INDICATOR: PET SCANNER CAPACITY AND UTILIZATION

Definition:

1. Per capita PET scanner machine availability
2. Per capita PET scanner exam rate

Numerator:

1. Total number of operational PET Scanners in the province used for cancer patient diagnosis and treatment
2. Total number of diagnostic exams performed on cancer patients with PET scanners

Denominator:

1. Total provincial population in millions
2. Total provincial population in millions

Data Source:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer

Population from CANSIM table 051-0001—Estimates of population, by age group and sex for July 1, Canada, provinces and territories, annual (persons) accessed from www.statcan.gc.ca

Measurement Timeframe:

2009 and 2010 calendar year

Stratification Variables:

Province

Provinces Submitting Data:

AB, BC, MB, NB, NL, NS, ON, PE, QC, SK

Province Specific Notes:

MB Data are for fiscal year 2009/2010.

NS Data are for fiscal year 2009/2010.

NL No PET scanners in province

ON Criteria for PET scanner use:

- an insured service where there is sufficient evidence to demonstrate clinical utility
- as part of a registry to build evidence where there is compelling but insufficient evidence to include the indication in the insured program
- as part of provincially run clinical trials, and through the PET Access Program, where a physician is able to request expert panel review of referrals for patients who may benefit from a PET scan but do not otherwise meet criteria

PE No PET scanners in province

QC
- 90% of machine use is for cancer.
- Number of PET exams was not provided.

SK No PET scanners in province

General Notes:

1. A proration was applied for PET scanners commissioned or decommissioned partway through the year based on number of days in service.

2. Only PET scanners used for cancer patient diagnosis and treatment were included in the calculations. This includes PET scanners and exams used in clinical trials.

INDICATOR: RADIATION THERAPY UTILIZATION RATIO

Definition:

Ratio of the number of courses of radiation therapy delivered in a year (for all intents) to number of new cases of invasive cancer in that year

Numerator:

Number of courses of radiation therapy (any reason, any indication, including palliative, curative, benign disease, first and subsequent courses) in each for given year

Denominator:

Total number of incident cancer cases diagnosed in a given year denominator

Exclusions:

- *In situ* cases
- Non-melanoma skin cancer

Data Sources:

Numerator:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer

Denominator:

CANSIM table 103-0550—New cases for ICD-O-3 primary sites of cancer (based on the July 2010 CCR tabulation file), by age group and sex, Canada, provinces and territories, annual accessed from www.statcan.gc.ca

Stratification Variables:

Province, cancer type:

1. All invasive cancers
2. Breast
3. Colorectal
4. Lung
5. Prostate

Provinces Submitting Data:

AB, BC, MB, NB, NL, NS, ON, PE, SK

Measurement Timeframe:

2007, 2008 and 2009

Province Specific Notes:

AB
- Data are for fiscal years: 2007/2008, 2008/2009, 2009/2010.
- Disease site specific data were not available.

NB Disease site specific data were not available.

General Notes:

1. Cases for patients under 18 years of age were excluded.
2. A course of treatment usually includes a series of radiation therapy sessions over a defined period of time, in accordance with a treatment or symptom management plan. The same patient may receive multiple radiation treatment courses as part of the treatment and management of the disease, and within each course will be multiple radiation treatment sessions.
3. Courses associated with Brachytherapy treatment are included.
4. The "case" is at the patient/primary disease level as per Canadian Cancer Registry. The same person with 2 separate primaries would be treated as 2 incident cases (within applicable CCR/NAACCR rules).

INDICATOR: SCREENING FOR DISTRESS

Definition:

Extent to which provincial cancer agencies undertake centralized data collection of screening for distress results. Examples of such tools include the Edmonton Symptom Assessment Scale (ESAS) and the Canadian Problem Checklist (CPC).

Information Requested:

- Identify if any cancer centres in the province implemented standardized screening for distress tools at time of data request (June 2009).
- Identify total number of unique patients assessed using such tools.
- Identify total number of assessments completed.
- Description of the role of the provincial cancer agency in managing the implementation of standardized symptom assessment and screening for distress tools.
- Information on the number of centres in each province using standardized tool(s). This will include only instances where the tool has been implemented centrally, on behalf of the provincial cancer agency.
- Who gets screened? What percentage of patients are screened?
- How often are they screened?

Information Sources:

Reported by provincial cancer agencies or equivalent to the Canadian Partnership Against Cancer for this Report, as well as from the Canadian Partnership Against Cancer's Cancer Journey Group

Information Availability:

Information was collected on a free-form basis based on the general questions posed above. Provinces were free to select a timeframe of their choosing.

Provinces Submitting Data:

BC, AB, SK, MB, ON, QC, NB, NS, PE, NL

Most provinces provided descriptive information but did not provide numerical data.

CCHS *STRATIFICATION VARIABLES*

1. Income Quintiles (Socio-economic status)

Definition: A relative measure of each respondent's household income to the household incomes of all other respondents. The measure is a ratio of the total household income to the low income cut-off (LICO) (varies according to the size of the household and the community where the household is located). After calculating the ratio between the household income and its corresponding low income cut-off (LICO), the ratios are standardized across all regions of Canada and then ordered from lowest to highest and then divided into 5 equal groups to get the quintiles.

2. Urban/Rural/Rural-Remote/Rural-Very Remote Status

Definition: Whether the respondent lives in an urban or rural area. Rural area is subcategorized into 'Rural', 'Rural-Remote' and 'Rural-Very Remote'.

- Urban areas are areas having a population concentration of 10,000 or more and adjacent areas with 50% or more of the population who commute to the urban core.
- Rural areas are areas with a population less than 10,000 and proportion of population who commute to an urban area of 30% to 49%.
- Rural-Remote areas are areas with a population less than 10,000 and proportion of population who commute to an urban area of 5% to 29%.
- Rural-Very Remote areas are areas with a population less than 10,000 and proportion of population who commute to an urban area of 0% to less than 5%. This category includes non-urban parts of territories.

3. Highest Level of Education

Definition: Highest level of education acquired by the household:

- Less than secondary school graduation
- Secondary school graduation
- Some post-secondary
- Post-secondary graduation
- Not stated

CANADIAN CENSUS 2006 *STRATIFICATION VARIABLES*

1. Neighbourhood Income Quintiles (Socio-economic status)

Definition: Neighbourhood income per person equivalent is a household size-adjusted measure of household income, based on 2006 census summary data at the Dissemination Area (DA) level and using person-equivalents implied by the 2006 low income cut-offs (LICOs).

1. The postal code of each subject's (non-institutional population) usual place of residence at the time of diagnosis was ascertained with the Postal Code Conversion File 5C+3.
2. Quintiles of population by neighbourhood (Dissemination Area) are derived within Census Metropolitan Areas, Census Agglomerations or Residual areas within each province and then pooled across areas. The reason for creating the quintiles within each area is that housing costs vary enormously across Canada.

2. Urban/Rural/Rural-Remote/Rural-Very Remote Status

Definition: Whether the respondent lives in an urban or rural area. Rural area is subcategorized into 'Rural', 'Rural-Remote' and 'Rural-Very Remote'.

- Urban areas are areas having a population concentration of 10,000 or more and adjacent areas with 50% or more of the population who commute to the urban core.
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1. The postal code of each subject's (non-institutional population) usual place of residence at the time of diagnosis was ascertained with the Postal Code Conversion File 5C+ (see reference 1 below).
2. Community Size is defined in terms of the 2006 census population in each census metropolitan area or census agglomeration (CMA or CA), as shown above. Community Size 1 consists of Toronto, Montreal and Vancouver CMAs. Community Size 2 consists of Ottawa-Gatineau, Edmonton, Calgary, Quebec City, Winnipeg and Hamilton CMAs. Community Size 3 includes all 18 other CMAs plus 7 of the larger CAs. Community Size 4 includes all 106 other CAs. Community Size 5—"rural and small town Canada"—includes all places not included in any CMA or CA. (i.e., places with an urban area population less than about 10,000, plus rural areas).
3. For rural postal codes and for urban postal codes of outlying suburban and rural areas, the same postal code is generally used for multiple enumeration areas or dissemination areas. The selection of a single such area for coding purposes is random but with probabilities respecting the proportions of population with that postal code in each of the possible small areas. Thus, the coding is far less precise than for centralized urban postal codes, which are usually linked only to a single enumeration area or dissemination area.

3. Education Level

Note this variable was not available from the census data.

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PATIENT EXPERIENCE QUALITY IMPROVEMENT
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