Canadian Cancer Statistics

A **2018 special report** on cancer incidence by stage

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Canadian Cancer Society / Société canadienne du cancer

Produced by the Canadian Cancer Society, Statistics Canada, the Public Health Agency of Canada, in collaboration with the provincial and territorial cancer registries
cancer.ca/statistics

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This publication is available in English and French on the Canadian Cancer Society's website at cancer.ca/statistics. Visit the website for the most up-to-date version of this publication and additional resources, such as individual figures from the publication and an archive of previous editions.

The development of this publication over the years has benefited considerably from the comments and suggestions of readers. The Advisory Committee appreciates and welcomes such comments. To offer ideas on how the publication can be improved or to be notified about next year's publication, complete the evaluation form or email stats@cancer.ca.

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Introduction

About this publication

Canadian Cancer Statistics is an annual series that began in 1987. Over the past 30 years, the publication has provided detailed statistics on the burden of cancer in Canada. Typically, this includes measures of incidence, mortality, survival and other surveillance statistics for the most common cancers in Canada.

For this year's edition, updates were not made to any of the statistics presented in the 2017 edition because the Canadian Cancer Statistics Committee members focused their efforts on conducting an evaluation of the publication and producing the special report. Therefore, projections for 2018 cancer incidence and morality are not available.

The goal of the evaluation was to develop a plan for the publication that meets the needs of the cancer community. The new publication plan will be implemented as of the 2019 edition, which will include updated statistics on cancer incidence, mortality (including projected estimates to 2019) and survival.

The Canadian Cancer Statistics Advisory Committee also led the creation of this special report on cancer incidence by stage at diagnosis. The Canadian Cancer Statistics publication has not previously included statistics related to cancer stage because national-level stage data have only recently become available. The inclusion of stage data in the Canadian Cancer Registry reflects more than 25 years of hard work and collaboration across the provincial and territorial cancer registries, Statistics Canada and their partners.

These data represent an exciting opportunity to build on the statistics typically reported in *Canadian Cancer Statistics*, providing additional insight into the burden of cancer in Canada and what can be done about it.

Purpose and intended audience

Canadian Cancer Statistics is designed to provide health professionals, policy-makers and researchers with information they can use to make decisions and identify priority areas in the realm of cancer control. The media, educators and members of the public with an interest in cancer may also find this publication valuable.

Cancer stage is an important indicator of prognosis, offering a perspective on cancer in Canada that has not yet been presented in *Canadian Cancer Statistics*. The results of this report can be used in many ways. For example:

- These statistics reveal important information about the distribution of stage at diagnosis that cancer screening programs can use to understand the impact of their programs. Healthcare practitioners can also use these statistics to talk to their patients about screening options.
- Because treatment options for cancer typically vary by stage at diagnosis, healthcare planners and decision-makers can use these numbers when making decisions about how to allocate resources most effectively.
- These statistics provide new insight into cancer in Canada and raise questions about why stage at diagnosis differs across the country that can help guide research.

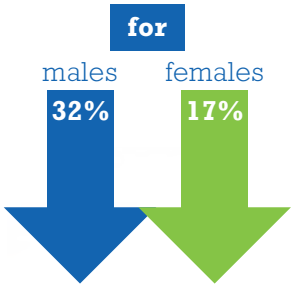
As additional years of data for cancer stage are collected and trends can be examined, these statistics will provide even greater insight into population-level cancer control initiatives and their impact.

Nearly **1 in 2 Canadians** is expected to be diagnosed with cancer in their lifetime

About **1 in 4 Canadians** is expected to die from cancer

1988 → 2017

Cancer death rates decreased



Overview of cancer in Canada

Nearly 1 in 2 Canadians is expected to be diagnosed with cancer at some point during their lifetime.[1] It was estimated that in 2017 alone, 206,200 new cases of cancer would be diagnosed in Canada. Although an increasing number of Canadians are surviving at least five years past their cancer diagnosis, cancer continues to be the leading cause of death in Canada. About 1 in 4 Canadians is expected to die from cancer.

Since this publication began, immense progress has been made in cancer control in Canada as a result of advances in prevention, screening, early detection and treatment. This progress is reflected in the consistent decline in cancer mortality rates since 1988. Trends in incidence rates have been more variable across cancer types, but the incidence rate for all cancers combined is decreasing in males and is no longer increasing in females.

Although age-standardized incidence rates (ASIR) are not increasing, the number of Canadians diagnosed with cancer every year is increasing. It is projected that the number of cancers diagnosed in 2030 will be almost 80% greater than the number diagnosed in 2005.[2] Although this increase is due to the growing and aging Canadian population rather than an increase in risk, these numbers have important implications for Canadians and Canadian healthcare resources.

Detailed statistics on the burden of cancer in Canada are vital for developing and evaluating health policies. These statistics help decision-makers set research priorities and assess the type and allocation of resources needed for cancer care and cancer control. This information is also essential for informing and evaluating primary and secondary cancer prevention activities and assessing the impact of early detection and treatment on the cancer trajectory. In addition, these statistics can be useful for prioritizing services to help Canadians and their families who have been affected by cancer and who may need support after their treatment has ended.

The Canadian Cancer Society, Public Health Agency of Canada and Statistics Canada remain committed to monitoring and reporting on cancer in Canada through the *Canadian Cancer Statistics* publication. Projections of 2017 incidence and mortality, along with the most recent estimates of survival, are presented in *Appendix II* for both sexes combined (Table A1), as well as males (Table A2) and females (Table A3). This year's publication builds on these statistics by providing detailed information on cancer incidence by stage at diagnosis. As the findings provide new insight into cancer in Canada, we hope that readers think critically about what the statistics mean and how they can be used to support cancer control activities and ultimately improve the health of Canadians.

References

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SPECIAL REPORT
Cancer incidence by stage

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Cancer stage provides valuable information for people with cancer, healthcare providers and healthcare decision-makers. For example, healthcare providers use stage information to assess prognosis, plan treatment and predict how well treatment will work for a given cancer case. This information also helps individuals with cancer better understand the diagnosis, treatment options and possible outcomes of the disease. At the population level, stage information can be important for understanding trends in cancer incidence over time and variations across geographic regions. It can also be used to help allocate resources, assess the effectiveness of screening and early detection programs and determine whether a new treatment has been used according to guidelines.

With the exception of Quebec, all provinces and territories have routinely collected stage data for lung and bronchus (lung), colorectal, female breast and prostate cancers diagnosed since 2010. All provinces and territories except Quebec and New Brunswick have done the same for cervical cancer. Six provinces have also collected data on the 15 other stageable cancers that are typically included in the *Canadian Cancer Statistics* publication. This report focuses on cancer incidence by stage at diagnosis for lung, colorectal, female breast, prostate and cervical cancers, and also provides information about the other 15 cancers.

This report represents one of the first that uses a national dataset to report on cancer incidence by stage in Canada. It provides the most comprehensive and up-to-date analysis of the available data.

Highlights

- Stage data were available for at least 90% of all lung, colorectal, female breast and prostate cancers diagnosed in Canada (excluding Quebec) between 2011 and 2015.
- Every year in Canada (excluding Quebec), an average of 6,823 lung and bronchus, 2,494 colorectal, 815 female breast and 1,187 prostate cancers were diagnosed after they had metastasized (stage IV).
- About half (50%) of all lung cancers were diagnosed at stage IV, which is reflected in its low five-year net survival of 17%. Small cell lung cancer, the more aggressive form of the disease, was more likely to be detected at stage IV (67%) compared to non–small cell lung cancer (47%).
- Despite the availability of organized screening programs in most provinces and territories in Canada, 1 in 2 (49%) colorectal cancers were diagnosed at a late stage (stage III or IV).
- More than 80% of female breast cancers were diagnosed at an early stage (stage I or II). This is likely attributed to early detection through organized breast cancer screening programs. Less than 5% were diagnosed at stage IV.
- Almost three-quarters (74%) of prostate cancers were diagnosed at stage I or II. The percentage and incidence rate of stage I prostate cancer varies considerably across the country, likely reflecting regional differences in the intensity of opportunistic prostate-specific antigen (PSA) testing.

[1] Please see Appendix I for a description of the peer review process.

- For the four most common types of cancer, the percentage of "stage unknown" cases at diagnosis was generally much higher in the older age groups than the younger age groups. This may be because older individuals were less likely to undergo a full diagnostic workup for their cancer than younger individuals.
- More than 70% of cervical cancers diagnosed in females aged 18–39 years were diagnosed at stage I, likely reflecting early detection though cervical cancer screening programs. The percentage of stage IV diagnoses increased with age, ranging from 0% in the youngest age group (18–24) to 23% in the oldest age group (70+).
- For the additional 15 cancers examined, there was also considerable variation in the stage distribution by cancer type. For example, most uterine (74%) and thyroid (67%) cancers were diagnosed at stage I, while most pancreatic (57%) and oral (53%) cancers were diagnosed at stage IV.
- In general, cancers that form deep in the body (e.g., pancreas, stomach, lung) were more likely to present at a late stage, whereas cancers that form in tissues or organs that are more visible or show symptoms quickly (e.g., breast, skin, thyroid, testis) were more likely to be diagnosed at an early stage.
- The distribution of cancer stage at diagnosis varied across the country more for some cancers (e.g., thyroid, prostate, ovarian) than for others (e.g., pancreatic, uterine).
- Although cancer stage at diagnosis is not the only factor that influences cancer survival, cancers that present at later stages generally have lower overall five-year net survival.

Introduction

What is cancer stage?

Staging is a way of classifying a cancer based on the extent of disease in the body at the time of diagnosis. This includes the size of the primary tumour, as well as whether it has extended or spread into surrounding tissues or to other parts of the body. The TNM (Tumour, Node, Metastasis) staging system is a globally accepted classification of the anatomical extent of disease.

The TNM system can be used to describe the stage of most solid tumours, but is not used to stage brain or central nervous system (CNS) tumours, cancers that affect the blood and lymphatic system (like leukemia and multiple myeloma) and some childhood cancers.

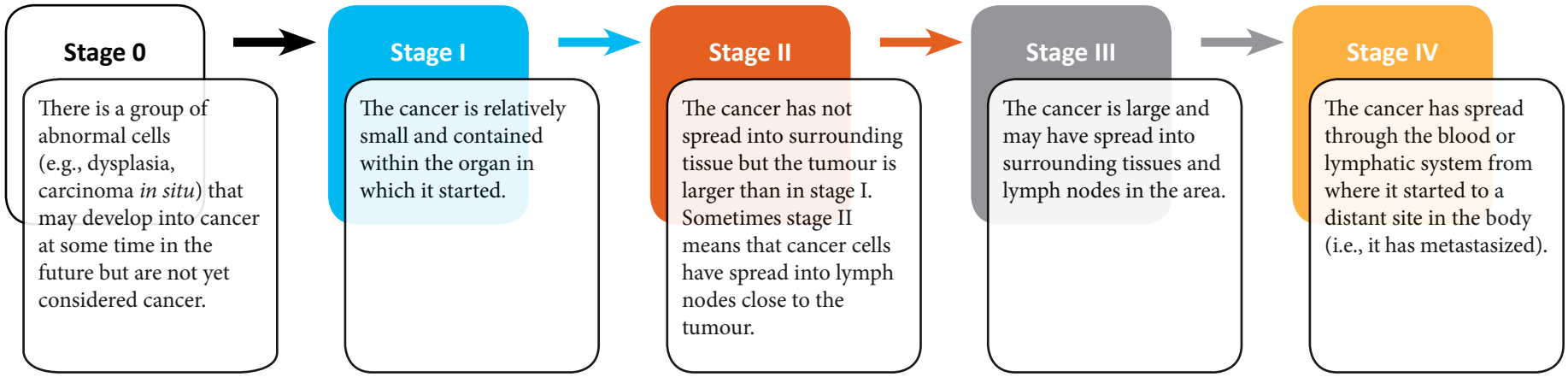
T refers to the size of the primary tumour. It also describes any local invasion of the cancer. T is usually given a number of 1 (smallest size or least amount) to 4 (largest size or greatest amount).

N refers to whether or not the cancer has extended to lymph nodes. N is given a number of 0 (less extension) to 3 (more extension).

M refers to whether or not the cancer has spread (metastasized) to another part of the body. M is given a number of 0 (no metastases) or 1 (metastases present).

Sometimes lowercase letters are used to subdivide these categories.

After the TNM categories have been assigned, cancers are usually assigned an overall stage grouping from 0 to 4 (written in Roman numerals 0, I, II, III, IV), where each successive stage represents a more advanced form of the disease. Generally, the higher the stage, the poorer the prognosis and the lower the survival rates. For most types of cancer, the stages are generally defined as follows:



Sometimes uppercase letters are added to the number to divide these categories into substages.

TNM stage and stage group may be assigned based on the initial clinical evaluation without surgical removal of the primary tumour (clinical stage) or based on a pathology specimen following surgery (pathological stage). Clinical staging involves assessment with physical examination, imaging, blood tests and biopsies. Pathological stage provides additional information after the initial surgical treatment. The stage information is recorded in the medical record.

Another staging system used by cancer registries is SEER (Surveillance, Epidemiology and End Results program) Summary Stage. SEER Summary Stage corresponds roughly, but not exactly, to anatomic TNM stage and is commonly used in the United States:

TNM stage	SEER Summary Stage
Stage 0	*In situ*
Stage I–II	Localized
Stage II–III	Regional
Stage IV	Distant

Although the extent of disease may be re-evaluated at various points throughout the course of the disease, cancer stage is defined by the extent of disease at the time of diagnosis before any treatment other than surgery. As such, cancer stage remains unchanged throughout the course of the disease. It is cancer stage at diagnosis (not the progression of disease) that is systematically collected and reported by cancer registries and forms the basis of this report.

Why are cancers staged?

Healthcare providers use stage information to help them plan treatment and evaluate the results of treatment. Stage is also used to indicate survival prognosis and predict how well treatment will work. In turn, this information helps people with cancer better understand their diagnosis, treatment options and possible outcome of the disease. Numerous other tumour-related factors that affect the prognosis may be used in conjunction with stage (Box 1).

The use of standardized language to describe cancer stage helps facilitate the exchange of information among clinicians and between treatment facilities. To support optimal decision-making in cancer care delivery, it is important that stage information is easily available.

Box 1 – Other prognostic factors

The TNM staging system is based on anatomic factors, but other non-anatomic prognostic factors (e.g., tumour grade, tumour markers and molecular factors) are also used to predict prognosis and determine treatment.

Grade refers to how abnormal the cancer cells look under a microscope when compared to normal cells. In a low-grade tumour, the cancer cells look more like healthy cells, they are more likely to grow slowly and they are less likely to spread to other parts of the body than cancer cells in a high-grade tumour.

These non-anatomic factors relate to the biological (e.g., genetic, molecular, hormonal) aspects of cancer. Data on many of these factors are now routinely collected by registries in Canada. These include, but are not limited to, the Grade Group for prostate cancer and the human epidermal growth factor receptor 2 (HER2) status for breast cancer.

- The Grade Group, which is based on the Gleason score, is a measure of the grade of a prostate cancer. It provides information about how quickly the cancer may be growing and the likelihood that it will spread. Grade Group ranges from 1 (low) to 5 (very high).
- HER2 is a gene that controls a protein on the surface of cells that helps the cells grow. If this gene mutates, it can help a tumour grow. HER2 status testing is done to determine if breast cancer cells are making more HER2 protein than normal. This information helps healthcare providers plan treatment. HER2 status testing is most commonly done for breast cancer, but it may be done for some other cancers as well.

Such prognostic factors provide important additional information about the specific type of cancer, but they should not be confused with anatomic stage. In the era of personalized medicine, the value of these factors and our knowledge about them is increasing rapidly.

Why collect population data on cancer stage?

Stage information is reported to cancer registries from various sources, such as pathology reports and medical records. Cancer registries can then condense this information into a stage variable (e.g., TNM or SEER Summary Stage).

At the population level, information on cancer stage can be used for surveillance, as well as for planning and evaluating cancer control efforts.[1] For example:

- Stage-specific incidence and survival rates can be important for understanding trends in incidence and mortality over time and across geographic regions.
- By examining the changes in cancer stage distribution over time, stage information can be used to help assess the effectiveness of screening and early detection programs. It can also be used to determine if a new treatment has been used according to guidelines and has improved outcomes.
- Variations in stage across geographic regions can illuminate disparities in patient-level and system-level factors between regions.
- Because healthcare needs often vary by stage at diagnosis, information on the number of cancers diagnosed at each stage can help healthcare decision-makers in planning and potentially allocating resources more effectively.

To support such surveillance and evaluation activities, it is important that there is consistency in the collection of stage data over time and across geographic regions.[2] To support planning activities, it is crucial that this information be available in a timely manner.

For more information on cancer staging, visit cancer.ca/staging.

Collection of stage data in Canada

Cancer incidence data in Canada are collected by provincial and territorial cancer registries (PTCRs) and reported to Statistics Canada to populate the Canadian Cancer Registry (CCR). The CCR is governed by the Canadian Council of Cancer Registries (CCCR), a collaboration between the 13 provincial and territorial cancer registries and the Health Statistics Division of Statistics Canada. The CCCR provides direction on the collection of cancer data, including cancer stage data, across the country.

- As of the 2010 diagnosis year, all Canadian registries that report stage data to the CCR have collected these data using the Collaborative Stage (CS) system. CS is a data collection system designed to improve data quality and completeness by standardizing rules for timing, clinical and pathological assessments, and descriptions of cancer types. For this report, stage data were obtained through CS, which was derived using the seventh edition of the TNM staging definitions from the American Joint Committee on Cancer (AJCC).
- PTCRs have prioritized the collection of stage data for the four most commonly diagnosed invasive cancers (lung and bronchus, colorectal, female breast and prostate) with the goal of achieving population-level stage capture of at least 90% for these cancers. Although the standardized collection of stage data was generally restricted to invasive cancers, *in situ* (often assigned stage 0) breast cancers were also included because this information is valuable for evaluating breast cancer screening activities.
- Some PTCRs have collected stage information on other cancers as well, but this varies across the country due to available resources and competing priorities.
- Quebec began collecting stage data for cancers diagnosed from 2014 onward. These data are not included in the CCR yet, so were not part of this report.

Cancer stage in Canada

Lung and bronchus (lung), colorectal, breast and prostate cancers are the four most commonly diagnosed cancers in Canada. In 2017, these four cancers accounted for about half of all cancer diagnoses and cancer deaths in Canada.[3] These cancers, along with cervical cancer, also represent the cancers for which screening or early detection likely have had (or will have) a big impact on the stage at which they are diagnosed.

With the exception of Quebec, all provinces and territories have routinely collected stage data for lung, colorectal, female breast and prostate cancers diagnosed since 2010; many have done the same for cervical cancer. Six provinces have also collected stage data on at least 15 other cancers.

In 2014, the Canadian Partnership Against Cancer provided a first look at cancer stage in Canada by reporting 2010 stage-specific incidence rates for lung, colorectal, breast and prostate cancer.[4] This *Canadian Cancer Statistics* report builds on that work as it is based on data from 2011 to 2015, includes stage information on 20 cancer types, and provides measures of counts and percent distributions in addition to stage-specific incidence rates.

Stage data completeness

Table 1 indicates the percentage of cases for which stage data were available by geographic region.

- Stage data were available for at least 90% of all lung, colorectal, female breast and prostate cancers diagnosed in Canada, excluding Quebec, between

2011 and 2015. Completeness was similar across the years (see online supplementary data Table S1).

- Cervical cancer stage data were not available for Quebec or New Brunswick. More than 90% of cervical cancers were staged in all other provinces; about 76% of cervical cancers were staged in the territories.
- Alberta, Saskatchewan, Manitoba, Nova Scotia, Prince Edward Island and Newfoundland and Labrador had almost 100% stage coverage for the 15 other cancers typically included in *Canadian Cancer Statistics*.[3]

The chart on the right indicates the regions included in the analysis for each cancer type.

For additional information on stage coverage, see the online supplementary data, which includes the percent coverage for each year from 2011 to 2015 (Table S1), as well as the number of cases by stage group for the five years combined (Table S2).

	BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	Territories*
Lung, colorectal, female breast and prostate cancers	✓	✓	✓	✓	✓	–	✓	✓	✓	✓	✓
Cervical cancer	✓	✓	✓	✓	✓	–	–	✓	✓	✓	✓
Other cancers†	–	✓	✓	✓	–‡	–	–	✓	✓	✓§	–

✓ Region is included in the analyses for that cancer

* Includes pooled data for Yukon, Northwest Territories and Nunavut

† Reflects 15 cancer types: bladder, non-Hodgkin lymphoma, uterus (body, not otherwise specified), melanoma, thyroid, kidney and renal pelvis, pancreas, oral, stomach, ovary, liver, esophagus, larynx, testis, Hodgkin lymphoma

‡ Although Ontario's stage coverage for "other cancers" did not meet the inclusion criteria applied here, population-level stage for 2010–2013 is available for thyroid, melanoma and gynecological cancers

§ Based on data from 2011, 2012, 2013 and 2015; 2014 was excluded from the analyses because of temporarily low stage capture

Stage unknown

A case is classified as "stage unknown" when there is not enough stage information to determine a stage. It does not include cases classified as "unstageable" or for which the CS algorithm was not run (see online supplementary data Table S2). Stage unknown cases may arise when the person with cancer does not undergo all the diagnostic workups required to determine stage or when the record of the workup is not complete.

The age-specific analyses revealed that the percentage of stage unknown cases was generally much higher in the older age groups than the younger age groups (see online supplementary data Table S3). This suggests that older individuals were less likely to undergo a full diagnostic workup for their cancer than younger individuals. Because a high percentage of stage unknown cases hinders the ability to interpret percent stage distributions, all analyses that were not age-specific were restricted to cases in people aged 18–79 years at diagnosis.

Interpreting these statistics

How these statistics can be used

Three types of statistics are presented throughout this chapter to describe cancer stage: the number of cancers by stage, the percent distribution of cancer by stage and stage-specific age-standardized incidence rates (ASIR). The following is a brief introduction to how each of these three different types of statistics can be used.

The number of cancers diagnosed at each stage can help healthcare planners and decision-makers determine the type and amount of healthcare resources needed for different cancer care activities. Because these numbers are specific to the population under study, their generalizability to other populations or time periods is limited.

Percent distribution is a commonly used indicator that describes the percentage of cancers diagnosed at each stage as a function of the total number of cancers diagnosed across stages (including stage unknown). This information is helpful for comparing stage across populations and cancers.

Stage-specific ASIR indicates the number of new cancer cases diagnosed at a given stage per 100,000 people, standardized to the age structure of the 2011 Canadian population. Thus, stage-specific ASIR are a function of both the stage distribution and the cancer incidence rate. Stage-specific ASIR can provide important additional insight into stage that can be masked by only using percent distribution of cancer by stage.

Consider, for example, the use of stage in evaluating the impact of a screening program. The goal of screening is to diagnose cancers at an earlier stage when the chance of survival is higher. As a result, an effective screening program should theoretically result in a decrease in late-stage incidence rates. However, a screening program can also result in over-diagnosis, which is when a diagnosis of cancer is given to conditions that would not have caused death or decreased the individual's quality of life. In this case, monitoring the percent distribution would indicate an increase in stage I diagnoses over time and a corresponding decrease in the percentage of later stage cases, providing the illusion of a successful initiative. However, examining the stage-specific ASIR over time would indicate an increase in early stage incidence rates and no change in late-stage incidence rates, providing important evidence that the screening program is not achieving its goal.

The three measures of cancer stage included in this report provide unique but complementary information, all of which go toward better understanding cancer incidence in Canada.

Comparing statistics between groups

The statistics in this report do not include measures of precision, like *P* values or confidence intervals. Therefore, caution must be taken when comparing percentages and rates across different types of cancer, geographic regions, sex groups and age groups because the differences observed between the statistics may not be statistically significant or meaningful from a clinical or policy-related perspective.

Lung and bronchus (lung) cancer

Lung cancer is the most commonly diagnosed cancer among Canadians, accounting for a projected 28,600 new cases in 2017 (14% of all cancers).[3] The incidence rate for lung cancer is higher for males than females, although sex-specific rates among younger adults appear to be converging.

In males, the rising incidence rate of lung cancer began to level off in the mid-1980s[5] and has been declining since then.[3] Among females, the rate continued to rise and did not level off until 2006. Smoking remains the most important risk factor for lung cancer, and the differences in incidence rates between males and females reflect past differences in tobacco use. In females, the drop in smoking occurred approximately 20 years later than it did in males,[6] suggesting that lung cancer incidence rates in females may also begin to decrease in the coming years.

Non–small cell lung cancer and small cell lung cancer

There are two main types of lung cancer: non–small cell lung cancer (NSCLC) and small cell lung cancer (SCLC). NSCLC accounts for more than 80% all lung cancers and includes adenocarcinoma, which is the most common form of lung cancer in non-smokers. However, because lung cancer occurs much more frequently in smokers than non-smokers, the number of cases of adenocarcinoma is greater in smokers than non-smokers. SCLCs is rare among non-smokers. It tends to grow much faster and spread more easily than NSCLC.

Lung cancer survival is very low, especially among cases detected at later stages. For example, estimates of five-year relative survival rates for non–small cell lung cancer (NSCLC) in the United States range from 1% to 10% across the substages of stage IV, and from 68% to 92% for the substages of stage I.[7] Five-year survival estimates are lower for small cell lung cancer (SCLC): 2% for stage IV and 31% for stage I.[8,9]

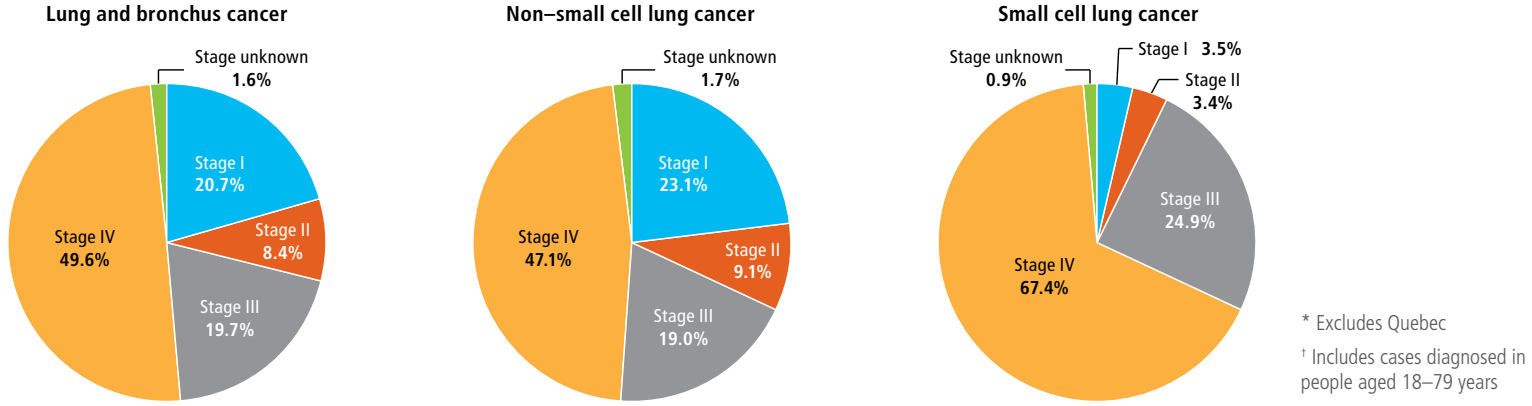
Currently there is no population-based screening for lung cancer. However, the Canadian Task Force on Preventive Health Care has released screening recommendations for high-risk individuals with low-dose computed tomography (CT).[10] Pilot studies are underway in Canada to investigate the feasibility of implementing lung cancer screening programs for high-risk populations,[11] with the aim of detecting disease at an earlier stage when it may respond better to treatment. Microsimulation modelling predicts that 1.4 million Canadians would be eligible for high-risk screening in 2018 (OncoSim, version 2.5[1]).

[1] This analysis is based on the Canadian Partnership Against Cancer's OncoSim model. OncoSim is led and supported by the Canadian Partnership Against Cancer, with model development by Statistics Canada, and is made possible through funding by Health Canada.

Lung cancer stage in Canada (excluding Quebec)

- Approximately half of all lung cancers diagnosed were stage IV (Figure 1). This represented an average of 6,823 individuals being diagnosed with metastatic lung cancer each year in Canada outside of Quebec (Table 2).
- A larger percentage of SCLC (67.4%) was diagnosed at stage IV compared to NSCLC (47.1%). Almost one-quarter (23.1%) of NSCLCs were diagnosed at stage I compared with only 3.5% of SCLCs (Table 2).
- The distribution of stage I lung cancers appeared higher in females (23.7%) than males (17.8%), and the distribution of stage IV lung cancers appeared higher in males (52.0%) than females (47.1%), but these differences may not be statistically significant.
- There was no obvious pattern in the percent distribution across age groups, except that the percentage of cases where the stage was unknown increased as age increased, from a low of 1.1% among people aged 18–59 years at diagnosis, to a high of 8.8% among people aged 90 years and older at diagnosis.
- The percent distributions of lung cancer stage was relatively similar across the provinces and territories for all stages of NSCLC (Table 2). There appeared to be somewhat greater variability for the stages of SCLC across the provinces and territories, but this may reflect the relatively low case counts for this subtype.

FIGURE 1 Percent distribution of lung and bronchus cancer cases by stage at diagnosis and subtype, both sexes, Canada,* 2011–2015†



* Excludes Quebec

† Includes cases diagnosed in people aged 18–79 years

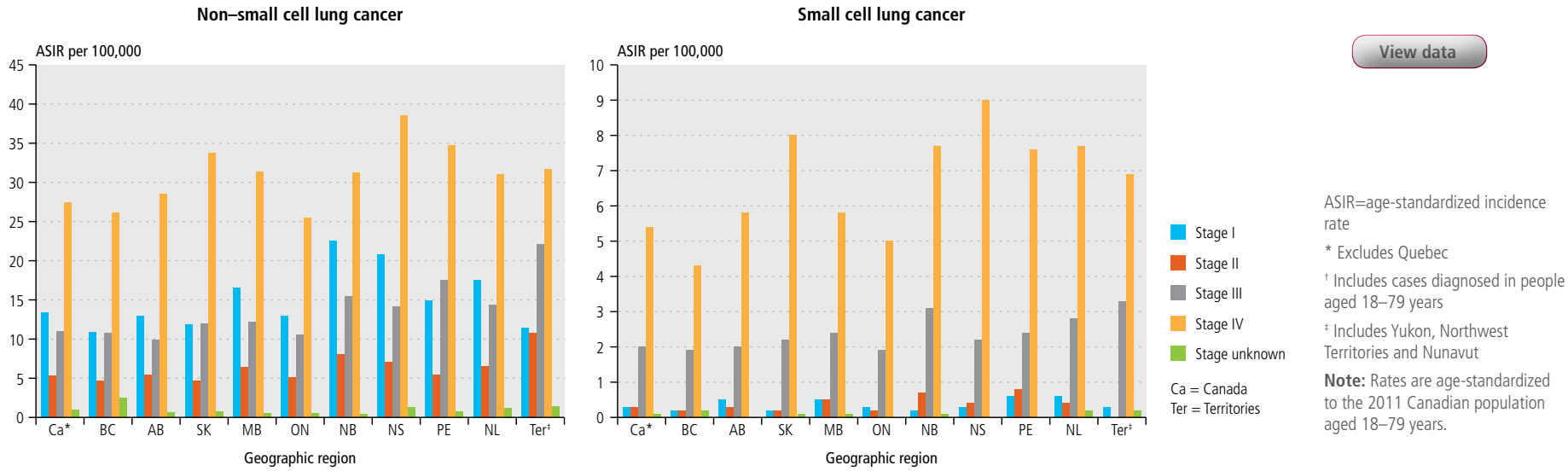
Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

- Figure 2 suggests variation across the country in stage-specific ASIR.
- The highest ASIR of stage IV NSCLC was observed for Nova Scotia (38.5 per 100,000) and the lowest in Ontario (25.5 per 100,000). For stage IV SCLC, the highest ASIR was also observed in Nova Scotia (9.0 per 100,000) but the lowest was observed in British Colombia (4.3 per 100,000).

Interpretation

- Most lung cancers were at an advanced stage and had already spread when they were diagnosed, which helps explain why lung cancer has one of the lowest net survival rates of all the major types of cancer in Canada.[3]
- The percent distributions of stages for NSCLC and SCLC reflect what is known about these subtypes: SCLC is more aggressive and has a high potential for metastasis, so it is more likely to be detected at a later stage than NSCLC.
- The variation across the country in stage-specific ASIR largely reflects the variation in ASIR for lung cancer, where rates are generally higher in the east than in the centre and west.[3] There is also some difference in overall five-year net survival rates reported by province,[3] but these patterns do not necessarily correspond with the patterns in percent distribution of stages and stage-specific ASIR, which suggests that factors other than stage (e.g., differences in detection and treatment) contribute to variations in outcomes.
- Stage-specific survival rates help illuminate the implications of differences in stage across the country. A recent report estimated two-year stage-specific survival rates using data from 2010 to 2012.[12] It showed that there was considerable variation in lung cancer survival within stage groups across provinces. For example, the two-year relative survival for stage I lung cancer ranged from 66.5% in Prince Edward Island to 84.8% in British Columbia. The two-year relative survival for stage IV also varied, ranging from 7.6% in Manitoba to 13.2% in British Columbia. These differences further point to possible differences in detection and treatment across the country. Additional years of stage data are needed to estimate longer-term stage-specific survival (e.g., five-year survival) and provide a more nuanced understanding of differences in outcomes between provinces and territories.

FIGURE 2 Age-standardized incidence rates for non–small cell and small cell lung cancers, by stage at diagnosis and geographic region, both sexes, Canada,* 2011–2015†



Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

Net survival and relative survival

Net survival refers to the probability of survival that would be observed in the hypothetical situation where the cancer of interest is the only possible cause of death (i.e., the probability of cancer survival in the absence of other causes of death). Relative survival is defined as the ratio of the proportion of observed survivors in a cohort of individuals with cancer to the proportion of expected survivors in a comparable set of cancer-free individuals. Relative survival was generally implicitly used to estimate net survival. However, traditional methods of estimating relative survival using life tables have been shown to produce biased estimates of net survival under certain circumstances.[13] As such, relative survival may over-estimate net survival. The net survival estimates cited herein incorporate a refinement to the traditional relative survival methods to mitigate this bias.

Colorectal cancer

Colorectal cancer is the second most common type of cancer in Canada, accounting for a projected 26,800 new cases in 2017 (13% of all cancers).[3] From 1988 to 2010 the age-standardized incidence rate for this disease dropped 11.3% among males and 14.5% among females. The decline in colorectal cancer incidence rates appears confined to older adults as rates are increasing among adults younger than 50 years of age in Canada and in the United States.[14,15]

Stage at diagnosis is strongly associated with survival for both colon and rectum cancers. For example, five-year relative survival for colon cancer is estimated to be 92% for cancers diagnosed at stage I compared with only 11% for stage IV; five-year survival for rectal cancer is estimated to be 87% for stage I and 12% for stage IV.[16]

There is strong evidence that colorectal cancer screening is effective in detecting cancers earlier (or even at precancerous stages) and decreasing mortality.[17,18] Organized colorectal cancer screening programs were first announced in Canada in 2007 in three provinces (Alberta, Manitoba and Ontario).[19] As of 2017, all 10 provinces and Yukon had implemented or were in the process of implementing organized colorectal cancer screening programs. Population-based studies have demonstrated that colorectal cancers detected through screening not only have a more favourable percent distribution of stages than symptom-detected cancers, but it also appears that survival within stage is higher for screen-detected cancers than symptom-detected cancers.[20-23]

Colon and rectum cancer

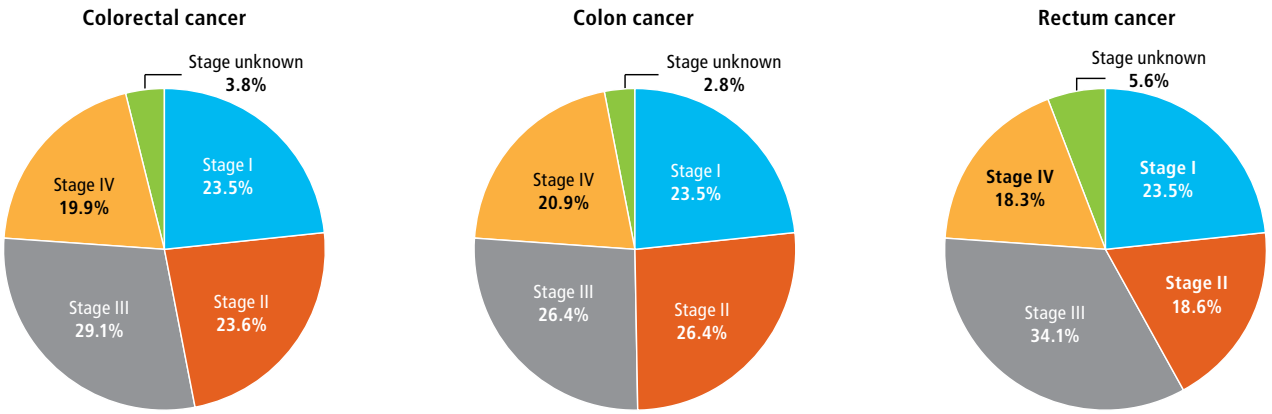
The colon and rectum are parts of the large intestine. The colon is the longest part of the large intestine and is divided into four parts: ascending, transverse, descending and sigmoid colon. The rectum is the lower part of the large intestine that connects to the sigmoid colon.

Most colorectal cancers arise in the colon, though around 30% arise in the rectum.[24] Colon and rectal cancers have very similar causes and risk factors, but rectal cancer is more strongly associated with red meat intake than colon cancer and colon cancer is more strongly linked to alcohol use.[24] Survival rates for earlier stage rectum cancer are somewhat lower than for colon cancer.[16]

Colorectal cancer stage in Canada (excluding Quebec)

- Approximately one-fifth (19.9%) of colorectal cancers were stage IV at diagnosis (Figure 3). This translates to an estimated 2,494 stage IV cases of colorectal cancer diagnosed in Canada (excluding Quebec) each year (Table 3). The most common stage at diagnosis was stage III (29.1%).
- The percent distributions of stages for colon and rectum cancers were similar, except rectum cancers appear more likely to be diagnosed at stage III than colon cancers (34.1% compared to 26.4%) and less likely to be diagnosed at stage II (18.7% compared to 26.4%) (Figure 3). Rectum cancers were two times more likely to have an unknown stage (5.6%) than colon cancers (2.8%).
- The percent distributions of stages were similar between males and females for both colon and rectum cancers (Table 3).
- For rectum cancer, cases were most commonly diagnosed at stage III in all age groups except for the oldest age group (90+ years); cases for people in the oldest age group were most likely to be assigned an unknown stage (27.0%). For colon cancer, the percent distribution between stage II and stage III cases was more similar across ages, though higher percentages of stage II cancers seemed to present in later age groups (Table 3).
- The variability in stage distribution for colon and rectum cancers was similar across the provinces (Table 3). Excluding the territories, which had very few cases, stage IV colon cancer varied from 19.3% (Newfoundland) to 23.6% (Alberta) and stage IV rectum cancer varied from 15.2% (Prince Edward Island) to 21.8% (Manitoba).

FIGURE 3 Percent distribution of colorectal cancer cases by stage at diagnosis and subtype, both sexes, Canada,* 2011–2015†



* Excludes Quebec

† Includes cases diagnosed in people aged 18–79 years

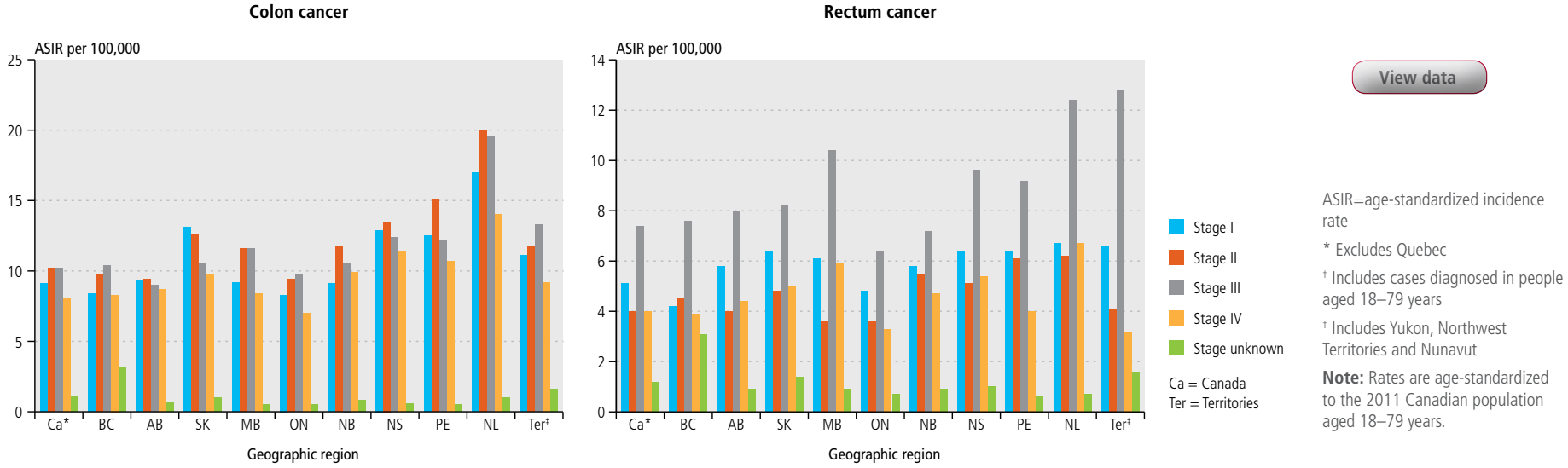
Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

- Figure 4 shows the stage-specific ASIR across the country. The highest stage-specific ASIR of colon cancer were in Newfoundland and Labrador, with ASIR of around 20 per 100,000 for each stage II and stage III colon cancer. In comparison, the ASIR for stage II and III colon cancer in the west (British Columbia and Alberta) were closer to 9–10 per 100,000. For rectal cancer, the ASIR were higher for stage III than any other stage in all provinces and the territories. The stage III ASIR ranged from 6.4 per 100,000 in Ontario to 12.4 per 100,000 in Newfoundland and Labrador.

Interpretation

- Despite the availability of organized colorectal cancer screening programs in most provinces and territories across the country,[25] about half of colorectal cancers were diagnosed at stage III or IV. The high percentage of late-stage diagnoses may reflect the suboptimal participation rates in these programs, as estimates from 2013–2014 suggest no program was meeting the target of at least 60% participation.[19] Organized colorectal cancer screening is still fairly new in many provinces, and it is still being implemented in the Northwest Territories, Nunavut and Quebec. As additional years of stage data are collected, it will be important to assess the impact of these screening programs on stage-specific ASIR.
- Stage at diagnosis is strongly associated with survival for both colon and rectum cancers.[26,27] Thus, increasing early detection through cancer screening programs may have a big impact on survival at a population level for these cancers.
- The large difference in stage-specific ASIR across the country strongly suggests that regional survival estimates can be better understood if calculated by stage. Additional years of stage data are needed to estimate five-year stage-specific survival, but estimates based on data from 2010 to 2012 showed that the two-year relative survival for stage IV colorectal cancer varied across the provinces, from a high of 39% in British Columbia to a low of 24% in Prince Edward Island. Variation across provinces in two-year relative survival was smaller for stage I, ranging from 92% in Nova Scotia to 98% in British Columbia.[12]

FIGURE 4 Age-standardized incidence rates for colon and rectum cancers, by stage at diagnosis and geographic region, both sexes, Canada,* 2011–2015†



Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

- The previously reported overall five-year net survival estimates for colorectal cancer varied little across the provinces, from 60% to 62%, with the exception of Ontario, where the five-year net survival was 67%.[3] However, the stage distribution for Ontario was not appreciably more favourable compared with provinces that had lower five-year net survival. This suggests that factors other than stage distribution, such as differences in treatment or data collection, are contributing to variation in five-year net survival across Canada.

Female breast cancer

Breast cancer is the third most commonly diagnosed cancer in Canada, accounting for 13% of all cancers. It is the most commonly diagnosed cancer in females in Canada, accounting 25% of all cancers among females. This section focuses only on breast cancer in females, as less than 1% of breast cancers are diagnosed in males.

In recent decades, the incidence rate of female breast cancer has fluctuated. The reasons for these fluctuations are unclear, but they are likely attributable to variations in participation in mammography screening and to long-term changes in hormonal factors, such as early age at menarche, breastfeeding, late age at menopause, oral contraceptive use and late age at full-term pregnancy.[28] The breast cancer mortality rate, on the other hand, has decreased at least 44% since its peak in 1986. The decline is likely due to a combination of increased mammography screening and the use of more effective therapies following breast cancer surgery.

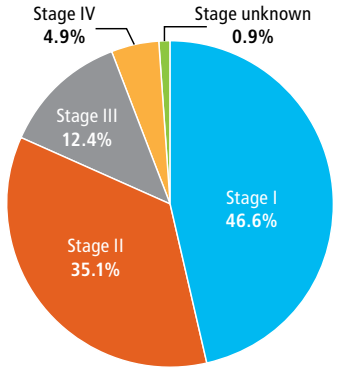
The first organized breast cancer screening program in Canada was implemented in 1988 (British Columbia); programs have since been implemented in all provinces and territories except Nunavut. The Canadian Task Force on Preventive Health Care recommends that females aged 50–74 years with average risk have screening with mammography every two to three years.[29]

Currently, the overall five-year net survival for female breast cancer is relatively high at 87%.[3] However, survival varies considerably by stage from 22% for stage IV to close to 100% for stage I.[30]

Female breast cancer stage in Canada (excluding Quebec)

- More female breast cancers were diagnosed at stage I (46.6%) than any other stage. Approximately 5% of cases were diagnosed at stage IV (Figure 5). On average in Canada (excluding Quebec), 7,715 females were diagnosed with stage I breast cancer and 815 females were diagnosed with stage IV breast cancer annually (Table 4).
- The percentage of breast cancers diagnosed at stage IV generally increased with age, from 4.8% among females aged 18–59 years to almost double at 8.4% for females aged 90 years and older (Table 4). Breast cancers diagnosed in the younger age groups (18–59, 60–69, 70–79) were most commonly diagnosed at stage I, whereas breast cancers diagnosed in the older age groups were most commonly diagnosed at stage II. The percentage of cancers with an unknown stage increased by age group, ranging from approximately 1% among females aged 18–69 years to 16.5% among females aged 90 years and older.

FIGURE 5 Percent distribution of breast cancer cases by stage at diagnosis, females, Canada,* 2011–2015†



* Excludes Quebec

† Includes cases diagnosed in females aged 18–79 years

Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

- There was very little variation in the distribution of early stage breast cancer across the provinces, with the percentage of stage I and stage II cases combined ranging from 80% to 83% (Table 4). The percentage was slightly lower in the territories (78%), but these estimates are based on a small number of cases and are therefore more prone to variation.
- Figure 6 shows the stage-specific ASIR across the country. The ASIR for stage I varied from 70.3 per 100,000 females in Ontario to 84.9 per 100,000 females in Nova Scotia. The ASIR for stage IV varied across provinces, from 7.1 per 100,000 females in Ontario to 10.9 per 100,000 females in Newfoundland and Labrador. Comparatively, the territories had a low ASIR for both stage I (12.7 per 100,000 females) and stage IV (5.2 per 100,000 females).

Interpretation

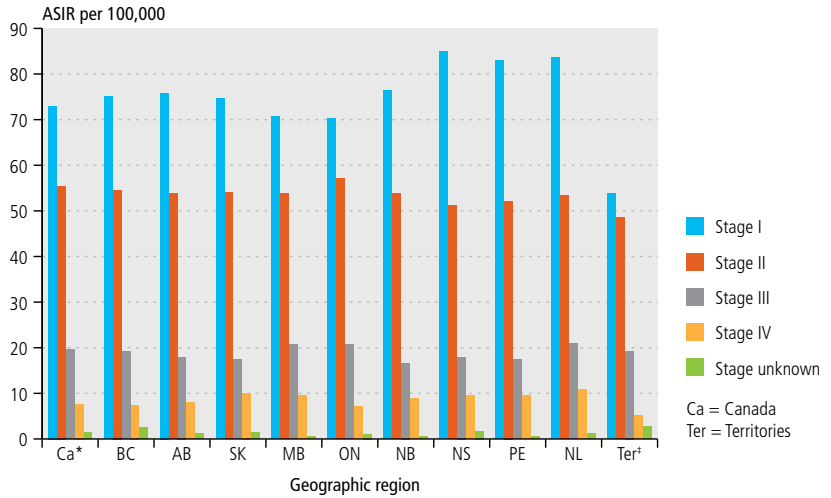
- More than 80% of all female breast cancers were diagnosed at stage I or II. The high percentage of early stage diagnoses helps explain why the five-year net survival is relatively high at 87%.[3] It also likely reflects the impact of early detection through the organized screening programs.
- The geographical variation in the stage-specific ASIR may reflect differences in screening participation rates and incidence rates across the country.[3,31] For example, some provinces (Prince Edward Island, New Brunswick, Alberta) that had higher mammography screening participation rates also had some of the highest ASIR of stage I cancers.[31]

Stage 0 breast cancer

The majority of stage 0 breast cancers are ductal carcinoma *in situ* (DCIS). Although these cancers are non-invasive, they are collected by the cancer registries because of their value in monitoring and assessing breast cancer screening activities. The number of stage 0 breast cancers captured by the cancer registries is provided in the online supplementary data (Table S2).

- The overall five-year net survival for breast cancer ranges from 84% in Prince Edward Island to 88% in British Columbia, Ontario, and New Brunswick.[3] This is a relatively small difference, but the variation in the ASIR across the country suggests that stage-specific survival estimates will more clearly reveal differences in outcomes between the provinces and territories. Although not definitive, results here show that provinces that had the lowest percentages of stage IV cancers tended to be those with the highest survival.

FIGURE 6 Age-standardized incidence rates for breast cancer, by stage at diagnosis and geographic region, females, Canada,* 2011–2015†



ASIR=age-standardized incidence rate

* Excludes Quebec

† Includes cases diagnosed in females aged 18–79 years

‡ Includes Yukon, Northwest Territories and Nunavut

Note: Rates are age-standardized to the 2011 Canadian population aged 18–79 years.

Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

View data

Prostate cancer

Prostate cancer is the most commonly diagnosed cancer among Canadian males with a projected 21,300 new cases in 2017.[3] Trends in the incidence of prostate cancer in Canada have been historically linked to the intensity of opportunistic screening in the population with the prostate-specific antigen (PSA) test.[32,33] There have been two significant peaks in prostate cancer incidence rates over the past few decades, the most recent occurring in the early 2000s, after which incidence rates steadily declined. Between 2007 and 2013, the ASIR of prostate cancer fell by about 5.3% per year.

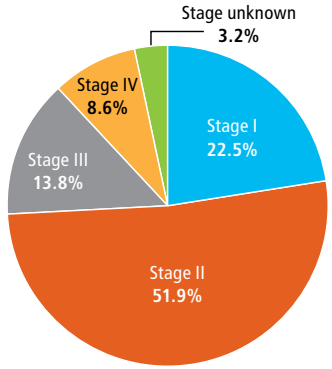
Based on past data (2010–2013), estimates of PSA testing are available for five provinces and the territories through the Canadian Community Health Survey.[34] Across the provinces, an estimated 41%–53% of males aged 35 years and older reported ever having a PSA test. Estimates were lower in the territories, with 22%–32% reporting ever having a PSA test. The Canadian Task Force on Preventive Health Care recommends against screening males for prostate cancer with the PSA test.[35]

In Canada, the five-year net survival for prostate cancer is among the highest of all cancers at 95%.[3] Estimates from the United States (where five-year survival is closer to 97%), indicate that survival for early stage disease is almost 100%. But it is much lower for cancers that presented with distant metastases (stage IV) at diagnosis (29%).[36]

Prostate cancer stage in Canada (excluding Quebec)

- Almost 3 in 4 prostate cancers in Canada were diagnosed at an early stage, with 22.5% diagnosed at stage I and 51.9% at stage II (Figure 7). Almost 9% of prostate cancers were diagnosed at stage IV (Table 5), representing an average of 1,187 stage IV diagnoses per year (Table 5).
- The distribution of prostate cancer stage varied by age group (Table 5). The percentage of stage I cases decreased from 27.9% among males aged 18–25 years to 6.9% among males aged 90 years and above; the percentage of stage IV cases increased from 6.8% to 37.1% between these age groups. The fraction of cases with an unknown stage also increased with age to the point where almost one-quarter (23.3%) of cases diagnosed in males aged 90 years and older were recorded as "stage unknown."
- There was variation across provinces and territories in the stage distribution of prostate cancer (Table 5). The percentage of stage I cases was highest in Prince Edward Island (44.9%) and New Brunswick (35.9%). The percentage of stage IV cases was highest in Saskatchewan (11.1%), Manitoba (13.4%) and the territories (14.3%).

FIGURE 7 Percent distribution of prostate cancer by stage at diagnosis, males, Canada,* 2011–2015†



* Excludes Quebec

† Includes cases diagnosed in males aged 18–79 years

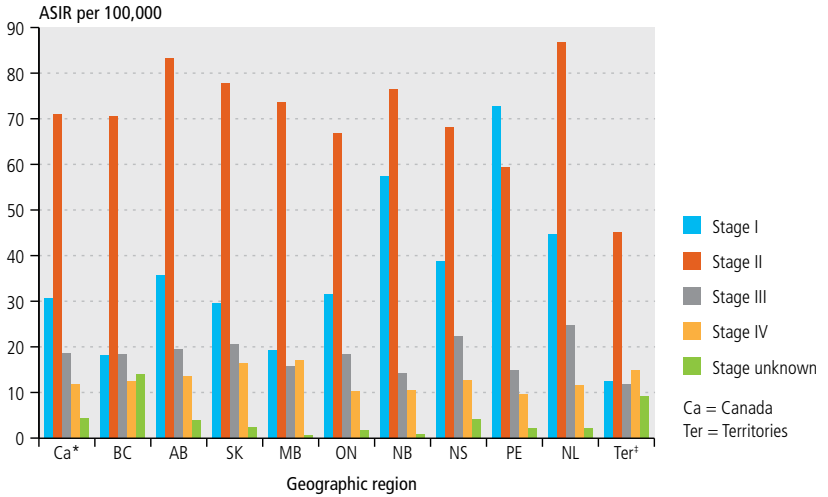
Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

- The stage-specific incidence rates in Figure 8 highlight the variation in stage-specific ASIR across the country. In most regions, the ASIR of stage II cases is much higher than the ASIR of stage I cases, but in Prince Edward Island the reverse was observed.
- The geographic patterns in the percent distribution of stage IV prostate cancer (Table 5) were similar to the geographic patterns in stage-specific incidence (Figure 8). For example, Manitoba, Saskatchewan and the territories also had the highest ASIR of stage IV prostate cancer.

Interpretation

- The high percentage (74%) of early stage prostate cancers explains why estimates of five-year net survival are higher for prostate cancer (95%) than many other types of cancer.[3] The high survival rate for early stage prostate cancer (almost 100%[36]) suggests an over-diagnosis of the disease.
- Across Canada, five-year net survival estimates range from 89% in Manitoba to 96% in Ontario.[3] This seems to correspond with the ASIR of stage IV tumours, as Manitoba has among the highest while Ontario had among the lowest, but these differences may not be statistically significant. In the future, using stage information to generate stage-specific survival statistics, overall and by province and territory, will provide more insight into differences in prostate cancer outcomes across the country.

FIGURE 8 Age-standardized incidence rates for prostate cancer, by stage at diagnosis and geographic region, males, Canada,* 2011–2015†



View data

ASIR=age-standardized incidence rate

* Excludes Quebec

† Includes cases diagnosed in males aged 18–79 years

‡ Includes Yukon, Northwest Territories and Nunavut

Note: Rates are age-standardized to the 2011 Canadian population aged 18–79 years.

Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

- The variation in both the percent distribution and incidence rate of early stage tumours by geographic region may result from continued differences in the use of opportunistic PSA screening across the provinces and territories. It will be important to monitor trends in stage-specific incidence rates for any changes corresponding to recent recommendations from the Canadian Task Force on Preventive Health Care against the use of PSA testing as a screening tool for average risk men. [35]

Recent data from the Canadian Cancer Registry (available through CANSIM Table 103-0554) suggest prostate cancer incidence rates in Canada are declining following this recommendation, but no formal analyses have been performed. Stage information will support more comprehensive assessments of changing incidence patterns.

Cervical cancer

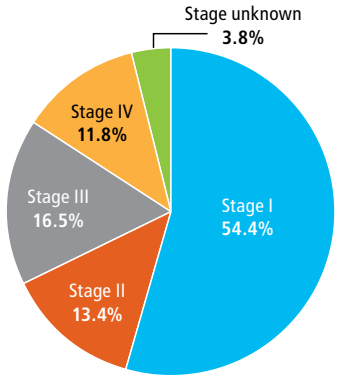
It was projected that 1,550 cases of cervical cancer would be diagnosed in Canada in 2017, making it the 13th most commonly diagnosed cancer among females in Canada.[3] The ASIR has fallen sharply in Canada since the 1980s due largely to the success of organized cervical cancer screening programs. Between 2009 and 2013, the ASIR for cervical cancer continued to fall by an average of 3% per year.

Five-year net survival for cervical cancer is about 73% in Canada. Estimates from the United States (where five-year net survival is about 63%), indicate survival is much higher for localized cancers (86%) than for cancers diagnosed with regional involvement (56%); those with distant metastases have very low survival (17%).[37]

Cervical cancer stage in Canada (excluding Quebec and New Brunswick)

- The majority (54.4%) of cervical cancers in Canada were diagnosed at stage I, while 11.8% were diagnosed at stage IV (Figure 9). The percentage of new cases recorded as stage unknown was relatively low for cervical cancer at 3.8% for all regions combined.
- On average, at least 114 cervical cancer cases were diagnosed at stage IV in Canada annually (Table 6). Since this number does not include data from Quebec and New Brunswick, the actual national number is expected to be higher.
- The percentage of cases diagnosed at stage I decreased with age (Table 6). In the 18–24 age group, 78.6% of cases diagnosed were stage I; this dropped to 26.6% for females diagnosed at ages 70 years and older. The proportion of stage IV cases increased with age from a low of 0.0% in the youngest age group to a high of 22.6% in the oldest age group.
- There was variation in the percent stage distribution by geographic region (Table 6). This variation is likely at least partially attributable to low case counts in some regions (especially the territories and Prince Edward Island) and high percentage of stage unknown cases in Alberta (12.8%) and Newfoundland and Labrador (7.1%). But variation in stage distribution existed even among the remaining provinces. For example, the percentage of stage IV diagnoses was almost two times higher in Saskatchewan (16.7%) than in Manitoba (8.7%).

FIGURE 9 Percent distribution of cervical cancer by stage, females, Canada,* 2011–2015†



* Excludes Quebec and New Brunswick

† Includes cases diagnosed in females aged 18–79 years

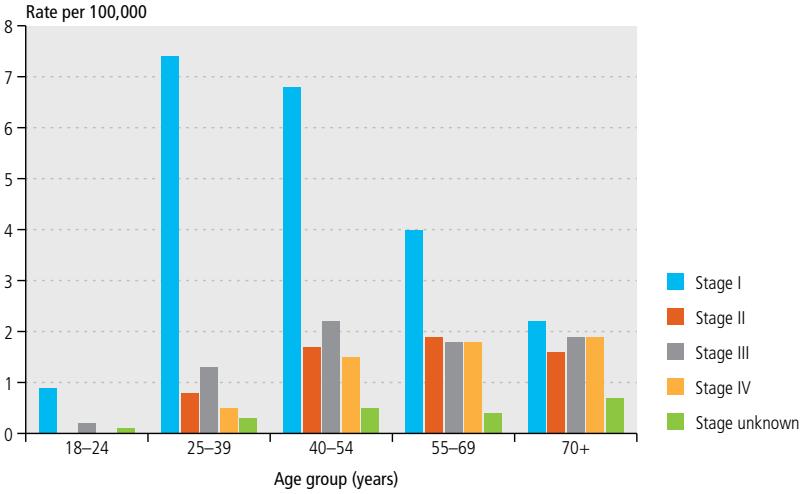
Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

- For each age group, incidence rates were considerably higher for stage I than any other stage. These incidence rates were particularly high among females aged 25–39 years (7.4 per 100,000) and 40–54 (6.8 per 100,000) (Figure 10). Among stage IV cancers, the highest incidence rates were among females aged 55 years and older.

Interpretation

- More than 70% of cervical cancers diagnosed in females aged 18–39 years were diagnosed at stage I. This is largely attributable to detection through organized cervical cancer screening programs, which are typically offered as of 21 or 25 years of age, depending on the province or territory.
- Participation in cervical cancer screening typically exceeds 60%,[38] which is higher than participation in breast or colorectal cancer screening programs.[31,39] However, 12% of cervical cancers are still diagnosed at stage IV, and about 1 in 5 cervical cancers are stage IV among females older than 55 years of age. This may help explain why survival from cervical cancer is only 73%.[3]
- Over the past few decades, monitoring of the impact of cervical cancer screening programs in Canada has been achieved largely by an examination of the trends in both incidence and mortality rates for the disease. The dramatic declines in these rates support the effectiveness of screening on outcomes for cervical cancer.[3] Moving forward, as the strategies for cervical cancer screening and prevention are further enhanced with new technologies (e.g., human papillomavirus DNA testing and vaccinations) and by changes in recommended screening practices, the availability of cancer stage data will allow for a more timely and precise assessment of early detection and screening efforts.

FIGURE 10 Age-specific incidence rates for cervical cancer by stage, females, Canada,* 2011–2015†



View data

* Excludes Quebec and New Brunswick

† Includes cases diagnosed in females aged 18–79 years

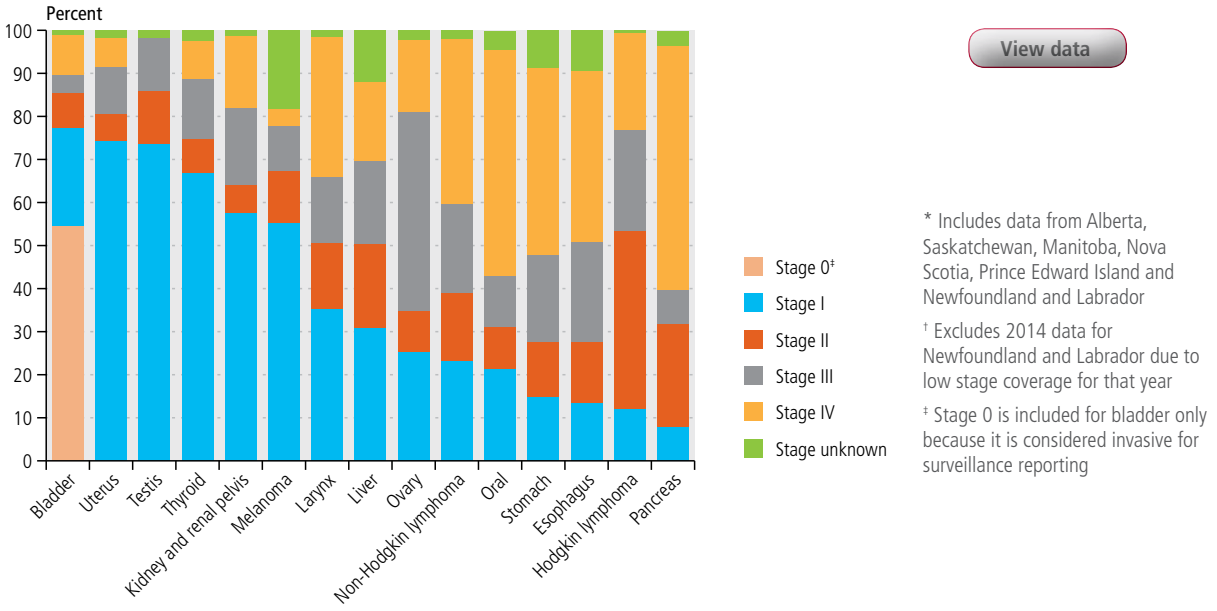
Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

Other cancers

Alberta, Saskatchewan, Manitoba, Nova Scotia, Prince Edward Island and Newfoundland and Labrador routinely collect staging information on at least 15 other cancers (Table 1). The online supplementary data provides the number of cases by stage (Table S2), the percent stage distribution (Table S4) and stage-specific age-standardized rates (Table S5) for these cancers by province. Selected highlights of those data are described in this section.

- There is considerable variation in the stage distribution by cancer type (Figure 11). There is a high proportion of stage IV diagnoses for several cancers, including pancreatic (56.7%), oral (52.7%), stomach (43.5%) and esophageal (39.9%) cancers. This contrasts with other types, such as melanoma (3.9%), uterine (6.6%), thyroid (8.8%) and bladder (9.1%) cancers, for which a much lower percentage of cases are diagnosed at this late stage. A high percentage (>65%) of cancers of the thyroid, testis, uterus and bladder were diagnosed at stage I (includes stage 0 for bladder). This contrasted with other types of cancer, such as pancreatic and esophageal, for which a low percentage were diagnosed at stage I.
- There were also interesting patterns in the stage distributions of cancers when compared across provinces (see online supplementary data Table S4). For example, the percentage of stage I oral cancers ranged from 14.6% (Alberta) to 33.6% (Manitoba); the percentage of stage I thyroid cancers ranged from 55.6% (Prince Edward Island) to 70.4% (Newfoundland and Labrador); the percentage of stage IV ovarian cancers ranged from 14.1% (Nova Scotia) to 24.2% (Saskatchewan). In contrast, the stage distribution for some cancers, such as pancreatic and uterine, was very similar across provinces. The online supplementary data also provides stage-specific age-standardized rates (Table S5) and counts (Table S3) by province.
- In general, cancers that form in tissues or organs that are likely to show visible signs or early symptoms (such as the skin, thyroid, testis or bladder) were more likely to be diagnosed at earlier stages. In contrast, cancers that develop in internal organs that may not exhibit visible signs or early symptoms (such as the pancreas, stomach and esophagus) are more likely to present at a late stage.
- As with the previous five cancers discussed in this report, cancers that were more likely diagnosed at later stages (such as esophageal, liver, stomach and pancreatic cancers) had some of the lowest five-year net survival estimates (ranging from 8% to 25% for these four types of cancer).[3] In contrast, five-year net survival was 88% for melanoma, which tends to present early. Although cancer stage at diagnosis is not the only factor that influences cancer survival, there is an important pattern of lower survival for cancers that tend to present at later stages.

FIGURE 11 Percent distribution of cancer stage at diagnosis, selected cancers, Canada,* 2011–2015†



Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

- Some of these 15 cancers demonstrate a higher percentage of stage unknown cases compared to the four most common types of cancer presented previously, either for one region or for several regions. This may reflect challenges the cancer registries face collecting this information, such as access to the medical reports or data sources necessary to accurately determine stage at diagnosis.

Where do we go from here?

This report provides a snapshot of cancers by stage at diagnosis for nine provinces and three territories in Canada. As such, it builds on the information about cancer incidence typically reported in *Canadian Cancer Statistics*, offering new insight into the burden of cancer in Canada. As additional years of stage data accumulate and are reported to the Canadian Cancer Registry (CCR), the data can contribute to the monitoring and evaluation of cancer and cancer control in Canada in even more ways. For example:

- Estimating stage-specific survival rates will provide the opportunity to directly compare the outcomes of cancers diagnosed in different regions across the country. This information can be used to assess the extent to which survival differences between provinces and territories are influenced by differences in screening and early detection, treatment effectiveness or both.
- Monitoring changes in the distribution of stage and stage-specific incidence rates over time will be important for assessing the impact of new screening programs, such as colorectal cancer screening and possibly lung cancer screening, as well as for assessing the impact of changes in PSA testing recommendations on prostate cancer incidence and the introduction of HPV vaccination on cervical cancer incidence.
- Also, it is expected that data from Quebec will be available in the CCR in the coming years, which will provide a more complete picture of cancer stage in Canada.

Statistics on cancer stage play an important role in describing the burden of cancer in Canada. The results of this report can be used in many ways, including by healthcare planners in allocating resources, researchers in identifying research priorities and healthcare providers in understanding and communicating about the burden of cancer in Canada. In the future, stage data will provide additional insight into population-level cancer control initiatives and their impact.

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TABLE 1 Percentage of cases for which stage data were available for selected cancers, by geographic region, Canada,* 2011–2015

	Canada*	BC	AB	SK	MB	ON	QC	NB	NS	PE	NL	Territories†
Top four cancers‡	93.1	99.8	100.0	100.0	100.0	86.3	—	99.1	99.9	100.0	99.9	95.7
Lung and bronchus§	94.4	99.9	100.0	100.0	100.0	88.9	—	99.9	100.0	100.0	99.8	94.9
NSCLC	94.1	99.8	100.0	100.0	100.0	88.3	—	99.9	100.0	100.0	99.9	95.0
SCLC	97.1	100.0	100.0	100.0	100.0	94.0	—	100.0	100.0	100.0	99.7	94.1
Colorectal	94.7	99.4	100.0	100.0	100.0	89.4	—	96.3	100.0	100.0	99.9	94.6
Colon	94.3	99.2	100.0	100.0	100.0	88.9	—	96.0	100.0	100.0	99.9	94.2
Rectum and rectosigmoid	95.4	99.9	100.0	100.0	99.9	90.4	—	97.0	99.9	100.0	100.0	95.3
Breast**	89.5	99.9	100.0	100.0	100.0	80.0	—	99.9	99.9	100.0	100.0	96.7
Female breast	89.5	99.9	100.0	100.0	100.0	80.0	—	99.9	99.9	100.0	100.0	96.7
Prostate	94.7	99.9	100.0	100.0	100.0	89.3	—	100.0	99.9	100.0	99.9	97.3
Bladder**	25.4	0.0	100.0	100.0	100.0	0.0	—	0.0	99.3	100.0	77.9	25.9
Non-Hodgkin lymphoma	24.4	0.0	100.0	100.0	100.0	0.0	—	0.0	99.8	100.0	86.4	42.1
Uterus (body, NOS)	55.0	0.0	100.0	100.0	100.0	51.2	—	0.0	99.9	100.0	99.8	57.1
Melanoma	44.3	0.0	100.0	100.0	100.0	36.2	—	0.0	99.7	100.0	99.4	51.6
Thyroid	44.6	0.0	100.0	100.0	100.0	35.0	—	0.0	99.7	100.0	99.2	42.9
Kidney and renal pelvis	31.6	0.0	100.0	100.0	100.0	0.0	—	0.0	100.0	100.0	94.8	58.9
Pancreas	28.6	0.0	100.0	100.0	100.0	0.0	—	0.0	100.0	100.0	92.8	44.4
Oral	25.6	0.0	100.0	100.0	100.0	0.0	—	0.0	100.0	100.0	80.5	35.6
Stomach	24.9	0.0	100.0	100.0	100.0	0.0	—	0.0	100.0	100.0	84.8	48.9
Ovary	47.7	0.0	100.0	100.0	100.0	41.9	—	0.0	100.0	100.0	98.1	46.2
Liver	21.7	0.0	100.0	100.0	100.0	0.0	—	0.0	100.0	100.0	87.2	30.4
Esophagus	27.4	0.0	100.0	100.0	100.0	0.0	—	0.0	100.0	100.0	79.5	37.0
Cervix	93.9	99.2	100.0	100.0	100.0	93.1	—	0.0	100.0	100.0	100.0	76.2
Larynx	27.1	0.0	100.0	100.0	100.0	0.0	—	0.0	99.5	100.0	95.8	62.5
Testis	30.0	0.0	100.0	100.0	100.0	0.0	—	0.0	100.0	100.0	100.0	52.2
Hodgkin lymphoma	28.3	0.0	100.0	100.0	100.0	0.0	—	0.0	100.0	100.0	80.4	X

Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

NOS=not otherwise specified
NSCLC=non–small cell lung cancer
SCLC= small cell lung cancer

— Not available

X Suppressed due to small cell counts (1–4)

* Excludes Quebec; includes cases diagnosed in people 18 years of age and older

† Includes Yukon, Northwest Territories and Nunavut

‡ Includes lung and bronchus, colorectal, female breast and prostate cancers

§ Coverage includes cases assigned a stage grouping of "occult"

** Includes *in situ* cases

Note: Cases that have been assigned a value of "N/A" under the Collaborative Stage algorithm based on the 7th edition of the AJCC Cancer Staging Manual are excluded from calculations.

TABLE 2 Percent distribution of lung cancer stage by age group, sex and geographic region, Canada,* 2011–2015

	Lung and bronchus					Non–small cell lung					Small cell lung				
	Stage					Stage					Stage				
	I	II	III	IV	Unknown	I	II	III	IV	Unknown	I	II	III	IV	Unknown
Canada*†	20.7	8.4	19.7	49.6	1.6	23.1	9.1	19.0	47.1	1.7	3.5	3.4	24.9	67.4	0.9
BC	18.0	8.1	20.5	49.1	4.4	19.8	8.6	19.6	47.3	4.6	2.7	3.5	27.9	63.6	2.3
AB	20.2	8.6	17.9	52.4	1.0	22.4	9.3	17.1	50.1	1.0	5.1	3.2	23.5	67.7	0.5
SK	16.2	6.5	19.4	56.7	1.2	18.7	7.4	19.1	53.5	1.4	1.2	2.3	20.9	74.4	1.2
MB	22.2	9.1	19.2	48.9	0.6	24.6	9.5	18.3	47.0	0.6	4.7	4.7	25.9	63.5	1.2
ON	21.4	8.6	19.9	49.1	0.9	23.9	9.3	19.2	46.6	1.0	3.5	3.1	25.4	67.7	0.4
QC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
NB	25.7	9.7	20.5	43.5	0.5	29.2	10.4	19.7	40.2	0.4	1.3	5.2	26.0	66.2	0.0
NS	22.7	8.0	17.4	50.4	1.4	25.5	8.8	17.2	46.9	1.6	3.0	4.0	18.2	74.7	0.0
PE	17.6	8.3	24.1	49.1	0.9	20.2	8.5	23.4	46.8	1.1	6.3	6.3	25.0	62.5	0.0
NL	22.1	8.5	21.1	46.8	1.5	25.1	9.3	20.3	43.6	1.8	5.4	3.6	25.0	64.3	1.8
Territories‡	13.0	10.9	30.4	43.5	2.2	14.6	12.2	29.3	41.5	2.4	14.3	0.0	28.6	57.1	0.0
Sex†															
Male	17.8	8.4	20.0	52.0	1.8	19.8	9.1	19.7	49.5	1.9	3.0	3.2	22.0	70.8	1.0
Female	23.7	8.5	19.4	47.1	1.4	26.5	9.2	18.3	44.6	1.4	4.0	3.7	27.7	64.0	0.7
Age															
18–59	17.7	7.0	19.7	54.5	1.1	20.1	7.8	18.6	52.4	1.1	2.4	2.7	26.1	67.9	0.8
60–69	20.4	8.4	20.1	49.9	1.3	23.0	9.1	19.3	47.2	1.3	2.8	3.4	25.2	67.9	0.8
70–79	22.5	9.1	19.4	47.0	2.0	24.6	9.7	18.8	44.6	2.2	5.0	3.9	23.7	66.4	1.1
80–89	19.3	8.0	18.4	50.2	4.1	20.3	8.4	18.2	48.8	4.3	5.6	4.3	21.0	67.4	1.7
90+	12.9	6.2	13.4	58.7	8.8	13.0	6.4	13.3	58.2	9.1	8.3	0.0	25.0	66.7	0.0
Average annual number†§	2,856	1,163	2,712	6,823	214	2,797	1,106	2,297	5,698	200	58	56	416	1,126	15

— Not available

* Excludes Quebec

† Includes cases diagnosed in people aged 18–79 years

‡ Includes Yukon, Northwest Territories and Nunavut

§ Calculated based on the average number of cases diagnosed at each stage in Canada (except Quebec) between 2011 and 2015

Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

TABLE 3 Percent distribution of colorectal cancer stage by subtype, age group, sex and geographic region, Canada,* 2011–2015

	Colorectal					Colon					Rectum				
	Stage					Stage					Stage				
	I	II	III	IV	Unknown	I	II	III	IV	Unknown	I	II	III	IV	Unknown
Canada*†	23.5	23.6	29.1	19.9	3.8	23.5	26.4	26.4	20.9	2.8	23.5	18.7	34.1	18.3	5.6
BC	20.0	22.7	28.3	19.1	10.0	21.1	24.5	25.7	20.5	8.1	18.0	19.5	32.7	16.6	13.3
AB	25.1	21.8	28.6	22.0	2.6	25.1	24.9	24.5	23.6	1.9	24.9	17.1	35.0	19.2	3.7
SK	26.7	23.9	25.8	20.3	3.3	27.6	26.8	22.5	21.0	2.1	25.0	18.6	31.9	19.1	5.4
MB	22.6	22.3	32.1	21.0	2.1	22.3	28.1	28.1	20.2	1.3	22.6	13.7	38.7	21.8	3.2
ON	24.3	24.2	29.9	19.3	2.3	23.6	27.0	27.7	20.1	1.6	25.5	19.0	34.0	17.8	3.7
QC	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
NB	22.6	26.3	26.7	21.9	2.5	21.7	27.8	25.3	23.5	1.8	24.2	22.9	29.3	19.7	3.8
NS	25.0	24.0	27.8	21.2	2.0	25.7	26.8	24.2	22.1	1.2	23.9	18.5	34.7	19.4	3.6
PE	24.7	27.8	27.8	18.6	1.0	23.1	30.8	24.6	20.0	1.5	24.2	24.2	33.3	15.2	3.0
NL	22.6	25.3	30.5	20.0	1.6	23.8	28.0	27.4	19.3	1.5	20.7	19.3	37.3	20.7	2.0
Territories‡	23.9	19.6	34.8	17.4	4.3	25.0	25.0	25.0	21.4	3.6	21.1	15.8	47.4	10.5	5.3
Sex†															
Male	23.5	23.3	29.2	20.1	3.9	24.0	26.2	25.8	21.0	3.0	22.8	18.9	34.3	18.7	5.3
Female	23.4	24.1	29.1	19.7	3.7	22.9	26.6	27.1	20.7	2.7	24.5	18.3	33.8	17.4	6.0
Age															
18–59	22.7	20.2	31.1	22.2	3.8	23.4	23.1	26.8	24.0	2.7	21.7	16.4	36.8	19.8	5.3
60–69	23.6	22.7	30.0	20.3	3.5	23.8	24.7	27.2	21.8	2.5	23.1	19.1	34.7	17.6	5.4
70–79	24.2	27.3	26.8	17.7	4.1	23.4	30.0	25.4	17.9	3.3	26.1	20.9	29.9	17.1	6.0
80–89	20.2	29.0	25.1	17.6	8.1	19.5	31.1	24.9	17.4	7.2	22.5	22.6	25.6	18.0	11.3
90+	14.8	27.1	19.0	17.8	21.3	12.3	29.7	20.1	18.4	19.5	23.4	17.7	16.3	15.6	27.0
Average annual number†§	2,940	2,954	3,646	2,494	477	1,888	2,118	2,118	1,676	227	1,052	836	1,527	818	249

— Not available

* Excludes Quebec

† Includes cases diagnosed in people aged 18–79 years

‡ Includes Yukon, Northwest Territories and Nunavut

§ Calculated based on the average number of cases diagnosed at each stage in Canada (except Quebec) between 2011 and 2015

Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

TABLE 4 Percent distribution of breast cancer stage by geographic region and age group, females, Canada,* 2011–2015

	Stage				
	I	II	III	IV	Unknown
Canada*†	46.6	35.1	12.4	4.9	0.9
BC	47.6	34.1	11.9	4.8	1.7
AB	47.7	34.7	11.7	5.0	0.8
SK	47.4	34.1	11.1	6.5	0.9
MB	45.5	34.7	13.3	6.2	0.4
ON	45.2	36.4	13.1	4.5	0.7
QC	—	—	—	—	—
NB	49.6	34.0	10.4	5.6	0.4
NS	52.2	30.5	10.5	5.8	1.0
PE	52.0	31.0	11.0	6.0	0.0
NL	50.0	31.2	11.9	6.2	0.8
Territories‡	40.0	37.8	15.6	4.4	2.2
Age					
18–59	40.4	38.8	15.2	4.8	0.8
60–69	52.7	31.7	10.2	4.6	0.8
70–79	51.4	32.2	9.5	5.7	1.2
80–89	34.3	41.2	12.6	7.7	4.1
90+	20.4	38.8	15.8	8.4	16.5
Average annual number†§	7,715	5,819	2,058	815	148

Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

— Not available

* Excludes Quebec

† Includes cases diagnosed in females aged 18–79 years

‡ Includes Yukon, Northwest Territories and Nunavut

§ Calculated based on the average number of cases diagnosed at each stage in Canada (except Quebec) between 2011 and 2015

TABLE 5 Percent distribution of prostate cancer stage by age group and geographic region, males, Canada,* 2011–2015

	Stage				
	I	II	III	IV	Unknown
Canada*†	22.5	51.9	13.8	8.6	3.2
BC	13.5	52.8	13.8	9.4	10.5
AB	23.7	52.8	12.9	8.3	2.3
SK	20.2	52.9	14.1	11.1	1.7
MB	15.4	58.1	12.5	13.4	0.5
ON	24.5	51.7	14.4	8.0	1.3
QC	—	—	—	—	—
NB	35.9	48.3	8.7	6.6	0.6
NS	26.5	46.6	15.3	8.8	2.7
PE	44.9	37.8	10.2	6.1	1.0
NL	26.1	51.0	14.7	6.9	1.3
Territories‡	17.9	50.0	10.7	14.3	7.1
Age					
18–59	27.9	47.1	15.5	6.8	2.6
60–69	23.5	49.8	16.1	7.7	2.8
70–79	17.3	58.1	9.4	11.1	4.1
80–89	10.7	48.6	4.2	25.7	10.8
90+	6.9	31.0	1.7	37.1	23.3
Average annual number†§	3,105	7,154	1,899	1,187	437

Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

— Not available

* Excludes Quebec

† Inlcude cases diagnosed in males aged 18–79 years

‡ Includes Yukon, Northwest Territories and Nunavut

§ Calculated based on the average number of cases diagnosed at each stage in Canada (except Quebec) between 2011 and 2015

TABLE 6 Percent distribution of cervical cancer stage by age and geographic region, females, Canada,* 2011–2015

	Stage				
	I	II	III	IV	Unknown
Canada*†	54.4	13.4	16.5	11.8	3.8
BC	54.8	10.2	18.7	13.3	3.0
AB	54.7	7.4	14.9	10.1	12.8
SK	45.2	14.3	21.4	16.7	2.4
MB	43.5	23.9	21.7	8.7	2.2
ON	56.0	14.4	15.6	12.1	1.9
QC	—	—	—	—	—
NB	--	--	--	--	--
NS	50.0	21.1	15.8	10.5	2.6
PE	50.0	25.0	25.0	0.0	0.0
NL	64.3	17.9	7.1	3.6	7.1
Territories‡	66.7	0.0	33.3	0.0	0.0
Age					
18–24	78.6	0.0	14.3	0.0	7.1
25–39	71.5	8.2	12.8	4.6	2.8
40–54	53.8	13.4	17.2	11.5	4.1
55–69	40.5	19.0	18.5	17.7	4.3
70+	26.6	19.4	23.4	22.6	8.1
Average annual number†§	524	129	159	114	37

Analysis by: Health Statistics Division, Statistics Canada
Data source: Canadian Cancer Registry database at Statistics Canada

— Not available

-- Not included in the analyses

* Excludes Quebec

† Includes cases diagnosed in females aged 18–79 years

‡ Includes Yukon, Northwest Territories and Nunavut

§ Calculated based on the average number of cases diagnosed at each stage in Canada (except Quebec and New Brunswick) between 2011 and 2015

APPENDIX I: Data sources and methods

Data sources

Incidence data: The Canadian Cancer Registry (CCR)

Cancer incidence data used in this publication cover the period of 2011 to 2015 for all provinces and territories with the exception of Quebec (staging data for this province are not available in the CCR for these years). Data were obtained from the CCR[1] November 2017 Tabulation Master File (TMF), released January 29, 2018.

- The CCR is a person-oriented database that includes clinical and demographic information about residents of Canada diagnosed with new cases of cancer.
- The Health Statistics Division at Statistics Canada maintains the CCR. CCR data has been linked to the end of the 2015 diagnosis year to identify duplicate person and tumour records. A similar provincial record linkage for Quebec records was completed for cases diagnosed up to December 31, 2008.
- Cancer diagnoses are classified according to the *International Classification of Diseases for Oncology*, Third Edition, (ICD-O-3) from 1992 onward.[2]
- The CCR adopted the Surveillance, Epidemiology, and End Results (SEER) multiple primary rules as a standard for reporting as of the 2007 diagnosis year. Analyses for previous CCS publications used a version of the CCR TMF that employed the International Agency for Research on Cancer (IARC) multiple primary rules. The CCR November 2017 TMF used for the analyses herein includes all tumour information submitted using the multiple primary rules applied within the individual PTCRs. No additional algorithm has been employed on the data in this file by Statistics Canada to verify that multiple primaries have been identified per the SEER rules.
- Tumours that fall within the CCR reporting scope and are diagnosed in 2004 onward are staged according to the most recent Collaborative Stage (CS) Data Collection System and Coding Instructions,[3] which is available from the Collaborative Staging Task Force of the American Joint Committee on Cancer (AJCC) (http://www.cancerstaging.org/cstage/Pages/default.aspx).
- Provincial and territorial cancer registries (PTCRs) have prioritized collecting stage data for the four most commonly diagnosed invasive cancers (lung and bronchus, colorectal, breast and prostate). Some PTCRs have collected stage information for other cancers, but coverage varies based on available resources and competing priorities.
- The present analyses utilized stage data obtained through the CS system, which is based on the seventh edition of the *AJCC Cancer Staging Manual*.[4]
- Cancer staging data were restricted to those aged 18 years and older at time of diagnosis, as staging often differs between children and adults.[5]
- In general, data were collapsed across the five-year period from 2011 to 2015.

Population data: Census of the population

- Population estimates for 2011 to 2015 used in the analyses were as of July 1, 2017. They were obtained from the Demography Division at Statistics Canada,[6,7] and released on September 27, 2017.
- Estimates prepared by Statistics Canada are final postcensal from 2011 to 2013 and updated postcensal for 2014 and 2015.[7]
- All population estimates include non-permanent residents and are adjusted for net census undercoverage and Canadians returning from abroad.

Cancer definitions

- Cancer cases are defined according to ICD-O-3.[2] Table A1 outlines the ICD-O-3 topography codes (cancer site), histology codes (tissue type) or both used to identify cancer groupings.
- In general, histology codes that define lymphomas, multiple myeloma, leukemia, Kaposi sarcoma and mesothelioma were excluded from the analyses with the exception of Hodgkin and non-Hodgkin lymphomas. Brain cancers were also excluded as they are not staged using the seventh edition of the *AJCC Cancer Staging Manual*[4] within the CS framework.
- Only malignant cancer cases were included in the analyses with the exception of bladder cancer and breast cancer, both of which included *in situ* carcinomas as well. Bladder *in situ* carcinomas are considered invasive for the purpose of incidence reporting in all provinces and territories. *In situ* breast cancers were included because of their value in assessing breast cancer screening.

TABLE A1 Cancer definitions

Cancer grouping	ICD-O-3 site and type
Lung and bronchus	C34
NSCLC*	C34 (Excludes Type 8041–8045)
SCLC*	C34 (Type 8041–8045)
Colorectal	C18–C20, C26.0
Colon	C18.0–C18.9, C26.0
Rectum and rectosigmoid	C19.9, C20.9
Breast	C50
Female breast	C50
Prostate	C61.9
Bladder	C67
Non-Hodgkin lymphoma†	Type 9590–9597, 9670–9719, 9724–9729, 9735, 9737, 9738 or Types 9811–9818, 9823, 9827, 9837 except for C42.0, C42.1, and C42.4
Uterus (body, NOS)	C54–C55
Melanoma (skin)	C44 (Type 8720–8790)
Thyroid	C73.9
Kidney and renal pelvis	C64.9, C65.9
Pancreas	C25
Oral	C00–C14
Stomach	C16
Brain/CNS	C70–C72
Multiple myeloma†	Type 9731, 9732, 9734
Ovary	C56.9
Liver	C22.0
Esophagus	C15
Cervix	C53
Larynx	C32
Testis	C62
Hodgkin lymphoma†	Type 9650–9667

CNS=central nervous system; NOS=not otherwise specified;
NSCLC= non–small cell lung cancer; SCLC= small cell lung cancer

* Definitions for these cancers are based on SEER coding rules found here: https://training.seer.cancer.gov/lung/abstract-code-stage/morphology.html

† Histology types 9590–9992 (leukemia, lymphoma and multiple myeloma), 9050–9055 (mesothelioma) and 9140 (Kaposi sarcoma) are excluded from other specific cancer sites defined in the table.

Note: ICD-O-3 refers to the *International Classification of Diseases for Oncology, Third Edition*.[2]

Methods

Incidence and stage distribution

Tumour records from each province or territory (with the exception of Quebec) were initially extracted from the CCR incidence TMF and then classified by year of diagnosis, cancer type and stage group determined by the CS system using the seventh edition of the *AJCC Cancer Staging Manual* (i.e., stages 0–IV or stage unknown; occult cases were derived for lung cancers).

Cancer cases that are considered "unstageable" in the CS framework are assigned a value of "not applicable" ("N/A") in the CCR data. Cases that have not been staged under this framework are assigned a missing value to indicate that the CS algorithm was not run. These cases are not included in the "stage unknown" category, which is assigned when stage information is insufficient to determine a stage (e.g., individual did not undergo all diagnostic workups required to determine stage or record of the workup is not complete).

For the four most commonly diagnosed types of cancer (i.e., lung and bronchus, female breast, colorectal and prostate) and cervical cancer, tumour records were also classified by sex (for lung and colorectal cancers) and age group (e.g., 18–59, 60–69, 70–79, 80–89 and 90+ years for the four most common types of cancer; 18–24, 25–39, 40–54, 55–69 and 70+ years for cervical cancer).

- Cancer cases from the territories were grouped together to increase case counts used in calculating rate estimates and stage distribution. This was done to mitigate the need or extent of data suppressions for cancers other than the four most common cancers. Population estimates for all three territories were combined when calculating age-specific incidence rates. All tables and figures presented in this publication show estimates for the territories grouped together. Supplemental tables containing estimates for each territory are available online for reference. Estimates based on small case counts (i.e., 1–4 cases) should be interpreted with caution.
- Staging data for the 2014 diagnosis year from Newfoundland and Labrador were only included in calculations pertaining to the four most common cancer types and cervical cancer. Data for the 2014 diagnosis year were excluded for all "other" cancers examined in the analyses. Due to the implementation of a new cancer reporting system in Newfoundland and Labrador, the province's staging coverage for many of those cancers was significantly lower in 2014 compared to other years from 2011 to 2015. The 2014 data were excluded because they were not representative of the province's staging coverage in 2011–2013 and 2015 and their inclusion could have skewed staging distributions and rates when data are combined for 2011–2015. To account for this, population data have been adjusted when calculating age-specific incidence rates.
- No staging data were available for cancer cases diagnosed in Quebec. Moreover, due to the transition to a new cancer reporting system, no incidence data were available for the province as of the 2011 diagnosis year. As such, Quebec was excluded from the analyses presented this report, and the population estimates for Canada were adjusted to account for the exclusion. Incidence data from Quebec for diagnosis year 2011 onward are expected to be available in the CCR in the near future.
- Staging coverage for each cancer type and jurisdiction (i.e., each the province and the territories, and Canada – excluding Quebec) was calculated by dividing the total number of cancer cases assigned a stage group (0–IV, unknown or occult) by the total number of "stageable" cases diagnosed within the period from 2011 to 2015. The denominator excluded all cases assigned a value of "N/A" under the stage group field on the CCR data, which the CS system derived from the seventh edition of the *AJCC Cancer Staging Manual*.
- Based on an initial assessment of stage coverage for each of the provinces and territories, some data were excluded from analyses pertaining to cancer types other than the four most commonly diagnosed and cervical cancer. A more detailed description of which jurisdictions were included for each cancer site can be found in the section on "Cancer stage in Canada" in this report.
- Stage distributions were calculated by dividing the number of cases assigned to a given stage grouping by the sum of all cases assigned stages I–IV and unknown. Cancer cases that were not staged (i.e., the CS system's algorithm was not run to assign a stage) and those considered "unstageable" (value of "N/A") were not included in these analyses.
- Preliminary age-specific analyses revealed that the percentage of unknown stage cases was generally much higher in the older age groups than in the younger age groups, suggesting older individuals were less likely to be submitted to the full diagnostic workup for their cancer than younger individuals. Because a high percentage of stage unknown cases hinders the ability to interpret percent stage distributions, all analyses that were not age-specific were restricted to cases in people aged 18–79 years at diagnosis.
- Age-specific rates by stage group were calculated by dividing the number of cases in a particular age group in each category (province or territories; sex, when applicable; cancer type) by the corresponding population figure. These formed the basis for calculations of age-standardized rates. For rates pertaining to the four most commonly diagnosed types of cancer combined, the population figures used in the calculations included both sexes, whereas rates pertaining to sex-specific cancers (e.g., female breast, prostate, cervix and testis) used population estimates for females or males only, as applicable.

- Age-standardized incidence rates (ASIR) were calculated using the direct method based on the following age groupings: 18–59, 60–69 and 70–79 years. Because the 2011 standard population is based on 19 age groups from 0 to 90+ (Table A2), the standard population weights were recalculated for this study including ages 18–79 years only (Table A3). Age-specific rates were calculated based on the five-year reference period for the analyses (2011–2015). For additional information on age-standardization, see Statistics Canada's resource "Age standardized rate" (available at: http://www.statcan.gc.ca/eng/dai/btd/asr).

TABLE A2 2011 Canadian standard population (both sexes)

Age group	Population	Standard weight
0–4	1,899,064	0.055297
5–9	1,810,433	0.052717
10–14	1,918,164	0.055853
15–19	2,238,952	0.065194
20–24	2,354,354	0.068555
25–29	2,369,841	0.069006
30–34	2,327,955	0.067786
35–39	2,273,087	0.066188
40–44	2,385,918	0.069474
45–49	2,719,909	0.079199
50–54	2,691,260	0.078365
55–59	2,353,090	0.068518
60–64	2,050,443	0.059705
65–69	1,532,940	0.044636
70–74	1,153,822	0.033597
75–79	919,338	0.026769
80–84	701,140	0.020416
85–89	426,739	0.012426
90+	216,331	0.006299
Total	**34,342,780**	**1.000000**

Note: The Canadian population distribution is based on the final postcensal estimates of the July 1, 2011, Canadian population, adjusted for census undercoverage.

TABLE A3 2011 Canadian standard population (both sexes, aged 18–79 years)

Age group	Population	Standard weight
18–59	20,400,895	0.782920
60–69	3,583,383	0.137519
70–79	2,073,160	0.079561
Total	**26,057,438**	**1.000000**

Note: The Canadian population distribution is based on the final postcensal estimates of the July 1, 2011, Canadian population, adjusted for census undercoverage and restricted to those aged 18–79 years.

Rounding for reporting

To prevent inappropriate disclosure of health-related information and to alleviate the need for suppression of sensitive and complementary cells in published tables, the actual number of cases within a given cell were randomly rounded to a lower or higher multiple of 5; true zeros and actual counts evenly divisible by 5 were not affected.

Random rounding was applied to each cell count independently. Specifically, an unbiased random rounding procedure was applied such that numbers ending in 0 or 5 were not rounded; numbers ending in a 1 or 6 were rounded up with a probability of 0.20 and down with a probability of 0.80; numbers ending in 2 or 7 were rounded up and down with probabilities of 0.40 and 0.60, respectively; numbers ending in 3 or 8 were rounded up and down with probabilities of 0.60 and 0.40, respectively; and numbers ending in 4 or 9 were rounded up and down with probabilities of 0.80 and 0.20, respectively. Consequently, columns and rows that are additive will sum to totals only by chance. By design, differences between the rounded and actual counts will never exceed 4 and actual counts are more likely to be rounded to the nearest multiple of 5.

- To better assess the availability of stage data by jurisdiction for diagnosis years 2011 to 2015 combined, stage coverage was calculated using the unrounded count of cases assigned a CS-derived AJCC seventh edition stage grouping by cancer type and reporting jurisdiction (province or the territories). Coverage estimates based on a low number of cases (i.e., 1–4 cases) were suppressed to protect data confidentiality per the CCR disclosure rules.
- The randomly rounded number of cases was used to calculate the stage distribution (case counts and percentages per stage group) for all cancers, provinces and the territories. Age-specific rates for the four most common types of cancer and cervical cancer were also calculated using rounded case counts; otherwise, the actual count could be deciphered by using publicly available population estimates.
- Age-standardized rates are more complex to calculate because they combine data across multiple age groups. So the actual age-specific counts were used to calculate the age-standardized rates. For the special circumstance where the rounded overall case count in a given category (e.g., province or the territories, cancer type, stage group) contributing to the age-standardized rate is zero, the actual age-standardized rate was suppressed so that true zero case counts are not distinguished from rounded zero case counts in the tables.
- Stage unknown, staging not applicable (N/A) and missing stage (the CS system's algorithm was not run) were treated akin to survey "non-response" categories in the analysis herein. As a result, it was deemed that distinction of true zero counts from rounded zero counts does not pose a risk to confidentiality. Knowing that a few cancers (e.g., 1–4) have not been staged or have been assigned an unknown stage for cancer surveillance is not expected to result in identifying a particular individual.
- In general, estimates based on small case counts should be interpreted and compared with caution.

Data and methods issues

The Canadian Council of Cancer Registries (CCCR) and its standing Data Quality and Management Committee (DQMC) strive to achieve uniformity in defining and classifying new cancer cases. Nevertheless, reporting procedures and completeness vary across the country. The standardization of case-finding procedures, including linkage to provincial or territorial mortality files, has improved the registration of cancer cases and comparability of data across the country. Some specific issues remain:

- The CCR is updated annually with new records for current and earlier diagnosis years as well as changes to previous records, so the incidence for any given diagnosis year may change from one reference year to the next. In particular, delays in the reporting of new cases to the CCR typically result in undercounts of cases, which are more pronounced in the most recently reported diagnosis year. Generally, the reporting delay ranges between 2% and 3% nationally. The missing cases are added to their appropriate diagnosis year with the reporting of data from a new reference year.
- In October 2014, Ontario implemented a new cancer reporting system called the Ontario Cancer Registry (OCR). The new system has several enhancements that permit the identification of cancer cases that previously went unrecorded. These include the use of more liberal rules for counting multiple primary sites, the use of additional source records and the inclusion of records that were previously not included. The implementation of this new system affects incidence data from the 2010 diagnosis year onward.
- For the 2014 diagnosis year, there was a case reporting delay of about 9% for all cancers combined in British Columbia.
- Staging data for the 2014 diagnosis year for Newfoundland and Labrador were excluded from all analyses pertaining to cancer types other than the four most commonly diagnosed cancers (i.e., lung and bronchus, female breast, prostate and colorectal) and cervical cancer. These data were not representative of the province's staging coverage in 2011–2013 and 2015, and their inclusion could have skewed staging distributions and rates when data are combined for 2011–2015.

Peer-review process

The peer-review process was overseen by the Canadian Cancer Statistics Advisory Committee's Working Group (WG) on Cancer Staging. The WG recruited four peer reviewers based on their clinical, epidemiologic and cancer registry data expertise. A full draft of this chapter (including text, tables, figures and the description of data sources and methods) was sent to those who agreed to participate. Peer reviewers were provided with two weeks to review the materials, and they provided written feedback on the materials directly to the WG. The WG reviewed and discussed the feedback as a group and decided what changes would be made as a result.

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APPENDIX II: Other statistics on cancer in Canada

This appendix is divided into two sections. The first provides a summary of national statistics reported in *Canadian Cancer Statistics 2017*, organized by cancer type. The second provides an overview of Statistics Canada's online resources, CANSIM.

Summary of cancer statistics from *Canadian Cancer Statistics 2017*

TABLE A1 Incidence, mortality and survival statistics for selected cancers, both sexes combined, Canada

	Projected incidence			Projected mortality			5-year net survival
Both sexes combined	**Rank**	**Cases**	**ASIR***	**Rank**	**Deaths**	**ASMR***	**%**
All cancers	**—**	**206,200**	**515.9**	**—**	**80,800**	**198.1**	**60**
Lung and bronchus	1	28,600	69.9	1	21,100	51.4	17
Colorectal	2	26,800	66.3	2	9,400	23.1	64
Breast	3	26,500	68.1	3	5,000	12.6	87
Prostate	4	21,300	110.4	5	4,100	23.8	95
Bladder	5	8,900	21.8	8	2,400	5.7	73
Non-Hodgkin lymphoma	6	8,300	20.8	7	2,700	6.7	66
Uterus (body, NOS)	7	7,300	35.7	18	1,150	5.3	84
Melanoma	8	7,200	18.5	15	1,250	3.1	88
Thyroid	9	7,100	19.0	21	220	0.5	98
Kidney and renal pelvis	10	6,600	16.5	12	1,900	4.6	67
Leukemia	11	6,200	15.5	6	2,900	7.2	58
Pancreas	12	5,500	13.5	4	4,800	11.9	8
Oral	13	4,700	11.9	16	1,250	3.1	63
Stomach	14	3,500	8.6	11	2,100	5.1	25
Brain/CNS	15	3,000	7.8	9	2,400	6.0	24
Multiple myeloma	16	2,900	7.1	14	1,450	3.5	42
Ovary	17	2,800	13.7	13	1,800	8.2	44
Liver	18	2,500	6.1	17	1,200	3.0	19
Esophagus	19	2,300	5.7	10	2,200	5.3	14
Cervix	20	1,550	8.3	20	400	2.0	73
Larynx	21	1,150	2.8	19	440	1.1	63
Testis	22	1,100	6.1	23	45	0.2	96
Hodgkin lymphoma	23	990	2.7	7	140	0.4	85
All other cancers	—	19,500	48.5	—	10,400	25.5	—

Source: *Canadian Cancer Statistics 2017*

ASIR=age-standardized incidence rate
ASMR=age-standardized mortality rate
CNS=central nervous system
NOS=not otherwise specified

* Rates are age-standardized to the 2011 Canadian population and are per 100,000 males and females

— Not applicable

TABLE A2 Incidence, mortality, lifetime probability and survival statistics for selected cancers, males, Canada

Males	Projected incidence			Projected mortality			Lifetime probability of developing and dying from cancer (respectively)		5-year net survival
	Rank	Cases	ASIR*	Rank	Deaths	ASMR*	One in:	One in:	%
All cancers	—	**103,100**	**548.4**	—	**42,600**	**233.3**	**2**	**3.5**	**60**
Prostate	1	21,300	110.4	3	4,100	23.8	7	29	95
Colorectal	2	14,900	79.6	2	5,100	28.1	13	29	63
Lung and bronchus	3	14,400	76.5	1	11,100	59.4	11	14	14
Bladder	4	6,700	36.3	5	1,700	9.5	25	83	74
Non-Hodgkin lymphoma	5	4,600	24.6	8	1,500	8.4	43	95	63
Kidney and renal pelvis	6	4,200	22.3	11	1,200	6.6	54	142	66
Melanoma	7	4,000	21.3	15	790	4.3	56	241	85
Leukemia	8	3,600	19.6	6	1,650	9.2	51	90	58
Oral	9	3,200	17.1	13	860	4.6	68	206	60
Pancreas	10	2,800	14.7	4	2,400	13.1	74	72	7
Stomach	11	2,200	11.8	10	1,250	6.9	78	126	23
Liver	12	1,900	9.9	12	950	5.0	127	199	19
Esophagus	13	1,800	9.5	7	1,650	8.9	112	112	13
Brain/CNS	14,15	1,700	9.2	9	1,350	7.1	123	163	22
Multiple myeloma	14,15	1,700	9.1	14	810	4.4	117	179	42
Thyroid	16	1,650	8.8	17	95	0.5	189	1,512	95
Testis	17	1,100	6.1	20	45	0.2	247	—	96
Larynx	18	970	5.1	16	350	1.9	170	459	64
Hodgkin lymphoma	19	570	3.1	18	85	0.5	426	—	83
Breast	20	230	1.2	19	60	0.3	756	—	79
Other cancers	—	9,600	52.4	—	5,500	30.7	—	—	—

Source: *Canadian Cancer Statistics 2017*

ASIR=age-standardized incidence rate
ASMR=age-standardized mortality rate
CNS=central nervous system

* Rates are age-standardized to the 2011 Canadian population and are per 100,000 males

— Not applicable

TABLE A3 Incidence, mortality, lifetime probability and survival statistics for selected cancers, females, Canada

Females	Projected incidence			Projected mortality			Lifetime probability of developing and dying from cancer (respectively)		5-year net survival
	Rank	Cases	ASIR*	Rank	Deaths	ASMR*	One in:	One in:	%
All cancers	—	**103,200**	**495.6**	—	**38,200**	**172.1**	**2.2**	**4.2**	**61**
Breast	1	26,300	130.3	2	5,000	23.2	8	31	87
Lung and bronchus	2	14,200	65.3	1	10,000	45.3	14	17	20
Colorectal	3	11,900	54.9	3	4,300	19.0	16	34	65
Uterus (body, NOS)	4	7,300	35.7	8	1,150	5.3	35	154	84
Thyroid	5	5,400	29.1	19	120	0.5	56	1,703	98
Non-Hodgkin lymphoma	6	3,700	17.6	7	1,200	5.3	51	116	69
Melanoma	7	3,300	16.3	15	450	2.1	74	397	92
Ovary	8	2,800	13.7	5	1,800	8.2	69	100	44
Pancreas	9	2,700	12.4	4	2,400	10.8	72	66	8
Leukemia	10	2,600	12.0	6	1,250	5.5	70	122	59
Kidney and renal pelvis	11	2,400	11.3	12	670	3.0	88	221	69
Bladder	12	2,200	9.8	11	680	2.9	82	219	71
Cervix	13	1,550	8.3	16	400	2.0	152	426	73
Oral	14	1,450	7.1	17	400	1.8	136	443	68
Brain/and CNS	15	1,300	6.6	9	1,050	5.0	151	203	28
Stomach	16	1,300	5.9	10	790	3.6	133	199	28
Multiple myeloma	17	1,200	5.6	13	650	2.9	141	234	41
Liver	18	580	2.7	18	270	1.2	359	672	20
Esophagus	19	530	2.4	14	480	2.1	349	333	17
Hodgkin lymphoma	20	430	2.3	21	60	0.3	497	—	87
Larynx	21	180	0.8	20	95	0.4	966	16,62	63
Other cancers	—	9,900	45.6	—	4,900	21.6	—	—	—

ASIR=age-standardized incidence rate;
ASMR=age-standardized mortality rate
CNS=central nervous system
NOS=not otherwise specified

* Rates are age-standardized to the 2011 Canadian population and are per 100,000 females

— Not applicable

Source: *Canadian Cancer Statistics 2017*

Using CANSIM to find additional cancer statistics

In the past, *Canadian Cancer Statistics* included data tables with the actual (not projected) number of cancer cases and cancer deaths for the most recent year of data that was used in the preparation of the publication. Although this was meant to provide a view of the most recent data available, the tables in the publication quickly became out of date as new data are regularly provided to the public through Statistics Canada's online resources. To support readers in accessing the most up-to-date data available at any given time, this section now offers links to Statistics Canada's online resources (referred to as CANSIM tables) along with a brief description of how to use these resources.

What is CANSIM?

CANSIM is Statistics Canada's socio-economic database. It provides the public with fast and easy access to the latest statistics available in Canada relating to demography, health, trade, education and other key topics. This includes a number of tables related to cancer. CANSIM tables can be accessed from the Statistics Canada website at http://www5.statcan.gc.ca/cansim/home-accueil?lang=eng&p2=50&HPA=1

Users can browse available data tables by topic or search CANSIM by keywords or a CANSIM table number. Users can generate customized statistical summaries of tables using some of CANSIM's data functions (e.g., "Add/Remove data" and "Manipulate"). Final summaries can be exported using the "Download" function.

Which CANSIM tables are relevant?

The table below contains a list of the CANSIM tables most relevant to this publication. This is not a list of all CANSIM tables. Additional tables can be found by browsing CANSIM by subject.

Table number	Title and description
103-0550	*Number and rates of new cases of primary cancer, by cancer type, age group and sex, Canada, provinces and territories* Provides counts of new cancer cases and crude incidence rates (along with 95% confidence intervals) for Canada, provinces and territories by cancer type, age group, sex and diagnosis year
103-0554	*Number of new cases and 2011 age-standardized rates of primary cancer, by cancer type and sex, Canada, provinces and territories* Provides counts of new cancer cases and age-standardized incidence rates (along with 95% confidence intervals) for Canada, provinces and territories by cancer type, sex and diagnosis year
103-0406	*Cancer incidence, by selected sites of cancer and sex, three-year average, Canada, provinces, territories and health regions (2015 boundaries)* Provides counts of new cancer cases, crude and age-standardized incidence rates (along with 95% confidence intervals and standardized to the 2011 population), and indicators for statistically significant differences for Canada, provinces and territories, and health regions for selected cancer sites by sex and diagnosis year (three-year average)
103-0407	*Cancer incidence, by selected sites of cancer and sex, three-year average, census metropolitan areas* Provides counts of new cancer cases, crude and age-standardized incidence rates (along with 95% confidence intervals and standardized to the 2011 population), and indicators for statistically significant differences for Canada and census metropolitan areas for selected cancer sites by sex and diagnosis year (three-year average)
051-0001	*Estimates of population, by age group and sex for July 1, Canada, provinces and territories* Provides population counts for Canada or provinces and territories by age, year and sex

How do I use CANSIM tables?

A detailed description of how to access, modify and download CANSIM tables is provided online. The following offers a brief overview of how to customize and download the summary statistics.

Upon accessing a CANSIM table, the user is provided with the initial view of the table containing the default table dimensions and summary statistics. Directly below the title of the table, there is a series of tabs that allow the user to perform additional functions or obtain additional information.

To customize the selection of dimensions (e.g., geography, cancer type, age, sex) as well as statistics, open the "Add/Remove data" tab and select the items of interest. The "Apply" button at the bottom of the page generates a table based on the items specified.

At any time, users can access the "Download" tab, which provides options to download the customized table into a comma-separated value (CSV) file format. This allows the user to further manipulate the data or save the information in a spreadsheet. The entire (unrestricted) data can also be downloaded, provided that the total number of data series (i.e., combinations of different dimensions) in the CANSIM table does not exceed 4,000 (the maximum allowed). A warning message is displayed if the selection made exceeds the maximum number of data series for display.

Differences between data used for *Canadian Cancer Statistics* and CANSIM

Users of CANSIM tables should be aware that there are sometimes differences between data compiled for the *Canadian Cancer Statistics* publication and those used in the CANSIM online tables. For additional details on CANSIM data, users should review the footnotes provided under each CANSIM table on the Statistics Canada website. The information in those footnotes can be compared to the details provided in *Appendix I* of this publication.

The following are a few notable differences between the methodology used in compiling the statistics in the CANSIM tables and *Canadian Cancer Statistics 2017*:

- CANSIM tables cover cases diagnosed at all ages. Cancer staging data used within this publication were restricted to those aged 18 years and older at time of diagnosis because staging often differs between children and adults. Population weights used to age-standardize rates were adjusted accordingly (see the "Methods" subsection provided in *Appendix II* of this publication for more details).
- Cancer groupings sometimes differ between CANSIM tables and this publication. For example, oral cancers are split into several subtypes in some CANSIM tables (e.g., lip, tongue, floor of mouth), but they are grouped as one for the purposes of this publication. Users should carefully compare cancer group definitions across data sources.
- Data on new cancer cases for the province of Quebec are available in the Canadian Cancer Registry for diagnosis years up to and including 2010. These data are included in CANSIM tables 103-0550 and 103-0554. However, Quebec data are not included in this publication because incidence data and information on Collaborative Stage (CS) Data Collection System are not available for cases diagnosed in the province from 2011 to 2015, which is the period of time covered in this publication.
- Cancer incidence data from the territories were grouped together to increase case counts used in calculating rate estimates and stage distribution in this publication. This was done to mitigate the need, extent or both of data suppressions for cancers other than the four most common types (i.e., lung, female breast, prostate and colorectal). Supplementary tables presenting estimates for each territory are available online for reference.
- Cancer incidence data for the 2014 diagnosis year for Newfoundland and Labrador were excluded from all analyses in this publication pertaining to cancer types other than the four most common cancers (i.e., lung, female breast, prostate and colorectal) and cervical cancer. These data were not representative of the province's staging coverage in 2011–2013 and 2015, and their inclusion could have skewed staging distributions and rates when data are combined for 2011–2015. However, incidence data from all diagnosis years have been included for Newfoundland and Labrador in CANSIM tables.

APPENDIX III: Additional information

Previous special topics

Special topics are related to current or ongoing issues in cancer surveillance or cancer control. In particular, they aim to provide an in-depth look at the Canadian context. The following previous special topics are available at cancer.ca/statistics:

2017	Pancreatic cancer
2016	HPV-associated cancers
2015	Predictions of the future burden of cancer in Canada
2014	Skin cancers
2013	Liver cancer
2011	Colorectal cancer
2010	End-of-life care; Cancer in depth: esophagus cancer; Cancer in depth: kidney cancer
2009	Cancer in adolescents and young adults (15–29 years)
2008	Childhood cancer (ages 0–14)
2007	Breast cancer
2006	Progress in cancer control: screening
2005	Progress in cancer prevention: modifiable risk factors
2004	International variation in cancer incidence, 1993–1997; Economic burden of cancer in Canada, 1998
2003	Non-Hodgkin's lymphoma
2002	Cancer incidence in young adults; Five-year relative cancer survival in Canada, 1992
2001	Colorectal cancer
2000	Progress in cancer control
1999	Factors contributing to the population burden of cancer incidence and mortality; A new national cancer surveillance system for Canada
1998	International comparisons
1997	Ten years of Canadian cancer statistics
1996	Prostate cancer; Direct costs of cancer in Canada, 1993; Evaluation of cancer estimates: 1987–1991
1995	Prevalence of cancer
	Colorectal cancer
1993	Female breast cancer
1991	Smoking and lung cancer; Cancer among the Inuit and Indians
1990	Cancer of the female breast and genital organs – recent trends; Hodgkin's disease and cancer of the testis; Cancer mortality by income quintile; Economic cost of illness in Canada; Cancer control
1989	Cancer incidence and mortality: an international comparison
1988	Tobacco consumption from smoking and mortality from lung cancer; Cancer mortality: an international comparison

Partner organizations

Canadian Council of Cancer Registries

Cancer incidence data are supplied to Statistics Canada by provincial and territorial cancer registries. Detailed information regarding the statistics for each province or territory is available from the relevant registry.

Public Health Agency of Canada

phac-aspc.gc.ca (select "surveillance")

Detailed information on the incidence and mortality methodology used in past editions of this publication is available from the Chronic Disease Surveillance and Monitoring Division, CCDP, Public Health Agency of Canada, 785 Carling Avenue, Ottawa, Ontario, K1A 0K9. Email: phac.ccs-ssc.aspc@canada.ca

Chronic Disease Infobase Cubes (infobase.phac-aspc.gc.ca) is an interactive online tool for easy access to cancer surveillance data. It allows you to generate tables, charts and maps according to a choice of parameters, such as cancer type, geographic area and time period.

Statistics Canada

statcan.gc.ca (search "cancer")

More detailed information on the methodology used in this publication is available from the Health Statistics Division, Statistics Canada, National Enquiries Line (statcan.infostats-infostats.statcan@canada.ca) or through Client Services in the Health Statistics Division (statcan.hd-ds.statcan@canada.ca).

Custom tabulations are available on a cost-recovery basis upon request. Analytical articles appear regularly in *Health Reports,* Statistics Canada, Catalogue no. 82-003. Detailed standard tables are available on the Statistics Canada website (statcan.gc.ca).

Canadian Cancer Society

cancer.ca

For general information about cancer (such as cancer prevention, screening, diagnosis, treatment or care), contact the Canadian Cancer Society's Cancer Information Service at 1-888-939-3333 or the Canadian Cancer Society, National Office or regional offices.

For information about research funded by the Canadian Cancer Society, visit cancer.ca/research or contact us at research@cancer.ca.

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http://www2.gnb.ca/content/gnb/en/departments/health/NewBrunswickCancerNetwork.html

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Questions about cancer?

When you want to know more about cancer, call the Canadian Cancer Society's Cancer Information Service.

1-888-939-3333 Monday to Friday
cancer.ca

Canadian Cancer Society
Société canadienne du cancer