



# Canadian Cancer Statistics

A **2022 special report**  
on cancer prevalence



Government  
of Canada

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du Canada



Canadian  
Cancer  
Society

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

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The development of this publication over the years has benefited considerably from the comments and suggestions of readers. The Canadian Cancer Statistics Advisory Committee appreciates and welcomes such comments. To offer ideas on how the publication can be improved or to be notified about future publications, complete the [evaluation form](#) or email [stats@cancer.ca](mailto:stats@cancer.ca).

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# About this special report



This special report is on cancer prevalence, which estimates the number of people who have been diagnosed with cancer in the past and are still alive. Therefore, cancer prevalence can be thought of as the number of people living with and beyond cancer. This special report provides new detailed estimates of prevalence counts and proportions by cancer type, sex, age, geographic region, duration, income, and urban and rural status in adults and by cancer type in children. Trends in prevalence are also presented. The findings provide insights that can help in planning for the future allocation of resources and in identifying where gaps and opportunities exist.



The prevalence of cancer in Canada has been rising over time.

The prevalence of cancer in Canada has been rising over time. People living with and beyond cancer have unique healthcare needs during the course of their cancer experience. In the first couple of years after diagnosis, individuals are likely receiving primary treatment or recovering from its effects. The third to fifth year after diagnosis is a period that typically requires close clinical follow-up for recurrence or another primary cancer, as well as supportive care. People alive more than five years after a cancer diagnosis have likely completed their treatment, but some may still need clinical monitoring and supportive care.

We hope that our readers think critically about what these numbers mean and how they can be used to develop better overall care for those living with and beyond cancer in Canada.

## Cancer prevalence

Population-based cancer prevalence can be measured by the number of living individuals previously diagnosed with cancer (person-based) or by the number of cancers diagnosed in such individuals (tumour-based).

Person-based estimates refer to the number of individuals living with or beyond cancer on a specified date (index date).

Tumour-based estimates refer to the number of cancers diagnosed among individuals living with or beyond cancer on a specified date (index date).

# About Canadian Cancer Statistics



Canadian Cancer Statistics was developed through a collaboration between the Canadian Cancer Society, Statistics Canada and the Public Health Agency of Canada, who brought together expertise from across the cancer surveillance and epidemiology community in the form of the Canadian Cancer Statistics Advisory Committee.

The three main Canadian Cancer Statistics products are:

- 1. Full publication:** Every other year, we release a publication that provides detailed estimates of cancer incidence, mortality and survival by sex, age group, geographic region and time period for more than 20 of the most commonly diagnosed cancers in Canada. The most recent edition was [Canadian Cancer Statistics 2021](#), which was released in November of 2021. The next edition will be published in 2023.
- 2. Snapshot of projected estimates:** In between full-publication years, we release projected estimates of incidence and mortality by sex and geographic region for the current year. The purpose of this work is to ensure that current-year estimates are publicly available annually. The 2022 projected estimates were published in an article titled “Projected estimates of cancer in Canada in 2022” in the *Canadian Medical Association Journal* in May of 2022. The next snapshot will be released in 2024.

- 3. Special report:** In the same years as the snapshot publication, we also publish a special report on a topic of particular importance to the cancer control community. The 2022 special report is on cancer prevalence. The next special report will be published in 2024.

These Canadian Cancer Statistics products are designed to inform health professionals, policy-makers and researchers to help them make decisions and identify priorities for action in their respective areas. However, the information contained in these products is relevant to a much broader audience. As such, the media, educators and members of the public with an interest in cancer may also find these products valuable.

The prevalence analyses presented in this report use data up to January 1, 2018. As such, the data presented do not account for any changes in diagnosis or cancer control due to the COVID-19 pandemic (first declared in March 2020). How the pandemic has affected cancer diagnosis, control and prevalence is an important issue that will need to be explored when the necessary data are available.

All Canadian Cancer Statistics products, along with supporting resources, are accessible through [cancer.ca/statistics](https://cancer.ca/statistics).

# Introduction



## Led by Canadian Cancer Statistics Advisory Committee's Working Group on Cancer Prevalence:

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## Key findings

- At the beginning of 2018, over 1.5 million Canadians were living with and beyond cancer, representing almost 1.7 million cancer cases that had been diagnosed in people still alive up to 25 years after their cancer diagnosis.
- Approximately 60% of people who were living with or beyond cancer at the beginning of 2018 were diagnosed within the previous five to 25 years. This high number of Canadians living long-term with one or more diagnoses of cancer has implications for planning healthcare and supportive services.
- The number and proportions (per 100,000 people) of Canadians with a prevalent cancer in two-, five- and 10-year windows since diagnosis have been increasing over time.
- The proportions of prevalent cases diagnosed in the past 25 years were highest in the eastern provinces and generally lower in the central and western provinces. These patterns follow those observed with cancer incidence.
- For all cancers combined, the two-year prevalence proportion was generally higher among people living in rural areas compared with urban areas.
- The relationship between neighbourhood income and two-year prevalence proportions varied by cancer type. For breast and prostate cancers, prevalence was highest among those living in the highest income neighbourhoods. For colorectal and lung cancers, the pattern was reversed.

## Background

Cancer prevalence is a measure of the impact of cancer on society and, in particular, on health resources.

The ongoing rise in the annual number of new cancer diagnoses (due to a growing and aging population), combined with an improving survival rate for most types of cancer,<sup>(1)</sup> has meant that a substantial number of people are living with and beyond their cancer diagnosis. This prevalent population of people with cancer and cancer survivors is likely to have unique healthcare needs during the course of their cancer experience. Thus, prevalence statistics are required to estimate the needs for ongoing healthcare<sup>(2,3)</sup> and supportive services for people with cancer, cancer survivors and their families.

Recent diagnoses of cancer (within the past two years) include individuals who are either receiving primary treatment or recovering from its effects. People who were diagnosed more than two years ago have likely completed their primary treatment, but they may still need maintenance therapy and clinical monitoring for recurrence or another primary cancer, as well as supportive care.



Cancer prevalence is a measure of the impact of cancer on society and, in particular, on health resources.

Two measures of population-based prevalence – person-based and tumour-based – are used in this report. Person-based estimates refer to the number of individuals living with or beyond a diagnosis of cancer at a particular point in time (referred to as the index date). Since a person can be diagnosed with more than one primary cancer, tumour-based estimates are used to measure the number of new primary cancer cases diagnosed among individuals living with or beyond cancer on the index date. Person-based estimates of prevalence are intuitively easier to understand than tumour-based estimates, although they may underestimate the true impact of cancer to both the individual and the health system. Within the context of this report, we distinguish between the two types of measures and refer to people for person-based estimates and cases for tumour-based estimates.

Prevalence represents the combined effects of cancer incidence and survival over time. Due to the ongoing increases in incidence and improving survival for many cancer types, the number of people living with and beyond cancer has continued to rise over time.<sup>(1, 4-6)</sup>

### Primary cancer

Primary cancers are defined by the site or area in the body where the cancer started. Individuals who have had cancer in the past can be diagnosed with another primary cancer (also called second cancer or a second primary).



Prevalence represents the combined effects of cancer incidence and survival over time.

**Table 1** illustrates how incidence and survival interact to affect prevalence estimates in both the short and long term. For example, lung cancer – which has high incidence but low survival – will rank lower with respect to prevalence because fewer survivors remain in the population over time compared with other cancer types. It ranks second for incidence among both sexes but drops to the ninth rank for 25-year prevalence. Conversely, some cancer types that are much less commonly diagnosed, such as testicular and cervical cancers, make it to the top 10 for 25-year prevalence of the respective sexes due to their high survival and younger average age at diagnosis (see [supplementary online data](#)). The rankings were the same for person-based and tumour-based prevalence.

## Why is estimating prevalence important?

Knowing the prevalence of cancer is essential to adequately plan and account for the ongoing healthcare and supportive care resources that will be required within a population. Updated estimates of prevalence are also important for cancer surveillance, as it reflects the impact of cancer on individuals, families, communities and societies.<sup>(7)</sup> For example, those diagnosed with cancer within the past two years may have different needs than those diagnosed between two and five, five and 10 or more than 10 years ago.



Cancer prevalence highlights the impact of cancer on individuals, families, communities and societies.

Recent diagnoses (within the past two years) include individuals who may be undergoing active treatment or who are in recovery. Individuals diagnosed in the more distant past (more than two years) may have completed their treatment, yet still require additional follow-up and care for complications or recurrences. There are many, many permutations of what people with cancer may experience in the long-term period following their diagnoses, and the complexity of their needs can vary by cancer type. Generally, people diagnosed with cancer will require a higher level of support and resources early in their care, during the transition to recovery and survivorship,

as well as through end-of-life care. In the long-term prevalence periods, people may not be undergoing active cancer treatment or palliative care but still have important and distinct needs that require attention.

As both survival for most cancers and the number of long-term survivors from cancer increase, resources to ensure optimal quality of life in the post-treatment and survivorship periods will be needed. Long after the need for active cancer treatment has passed, individuals may still require rehabilitation and supportive care services to address physical, emotional and other consequences of cancer.<sup>(8)</sup> Moreover, many of these individuals still require close follow-up care to monitor the risk of cancer recurrence and late effects, even several years after an initial diagnosis. In some instances, the cancer requires a long-term or even lifetime treatment regimen, resulting in an accrued long-term burden for the person with cancer, their family, their caregivers and the healthcare system.

## Challenges related to estimating prevalence for all of Canada

At the time of this publication, cancer incidence data from Quebec had not been submitted to the Canadian Cancer Registry from the 2011 diagnosis year onward. So, to obtain prevalence counts for all of Canada, including Quebec, the following method was used. Prevalence proportions by cancer type, sex and age were estimated using available data from all provinces and territories, excluding Quebec. These prevalence proportions were applied to Canadian sex- and age-specific population estimates, which include Quebec, and summed across the strata to estimate prevalence counts for all of Canada (see [Appendix](#)).



Sometimes cancer requires a long-term or even lifetime treatment regimen.

# Cancer prevalence in Canada



## Prevalence by cancer type

As of January 1, 2018, close to 1,574,000 people in Canada had received a cancer diagnosis in the previous 25 years and were still alive on that date (Table 2). The corresponding five- and two-year prevalence estimates were 635,185 and 302,300, respectively. However, as one person can have more than one cancer diagnosis, these estimates increase to 1,698,255 (25-year prevalence), 663,370 (five-year prevalence) and 312,190 (two-year prevalence), when counting prevalence based on the number of tumours diagnosed (Table 3).

Figure 1 shows that breast, prostate and colorectal cancers accounted for nearly half (48.5% or 823,440 cases) of all 25-year prevalent cancers. Other common prevalent diagnoses included melanoma of the skin (5.5% or 93,890 cases), thyroid cancer (5.0% or 84,760 cases), urinary bladder cancer (4.6% or 77,735 cases) and non-Hodgkin lymphoma (4.5% or 77,245 cases), as well as uterine cancer (4.4% or 74,955 cases) and lung cancer (4.1% or 68,785 cases). Additional detail on site definitions and groupings are included in *Appendix*.

As previously noted, prevalence reflects both the frequency of occurrence and prognosis for a cancer. For example, even though the incidence rate of colorectal cancer is lower than that of lung cancer, the 25-year tumour-based prevalence for colorectal cancer is 2.8 times greater, reflecting the poorer prognosis for lung cancer (Table 3).

Similarly, while melanoma accounts for 3.5% of all newly diagnosed cancers in 2018, it represents 5.5% of 25-year prevalent cancers because of its relatively high survival. The relative rankings of the cancer types examined in this report were the same for person- and tumour-based estimates, for all periods of time since diagnosis.

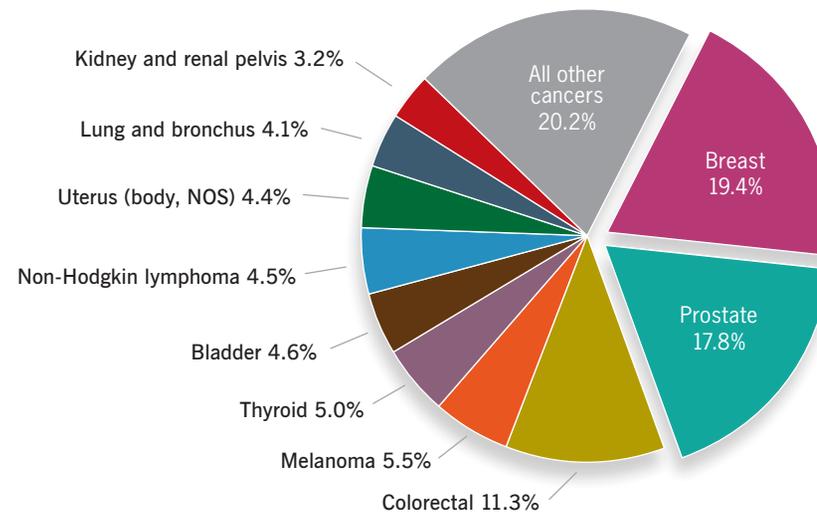
The two- and five-year tumour-based prevalence has increased for aggressive tumour types (Table 3), such as pancreatic, esophageal and lung cancers, and leukemias.<sup>(9,10)</sup> Despite poor prognoses, the rising number of prevalent cancers among these aggressive tumour types may reflect both the magnitude of disease

(e.g., high incidence of lung cancer) combined with continued improvements in survival due to clinical management of several of these cancers with surgery, radiation and targeted therapies.<sup>(11-16)</sup>



Over 1.5 million people in Canada are living with and beyond cancer.

**FIGURE 1** Distribution of 25-year tumour-based prevalence for selected cancers, Canada,\* January 1, 2018†



NOS=not otherwise specified  
\* Prevalence for Quebec has been imputed because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

† 25-year prevalence refers to cases diagnosed between 1993 and 2017 (see *Methods*).

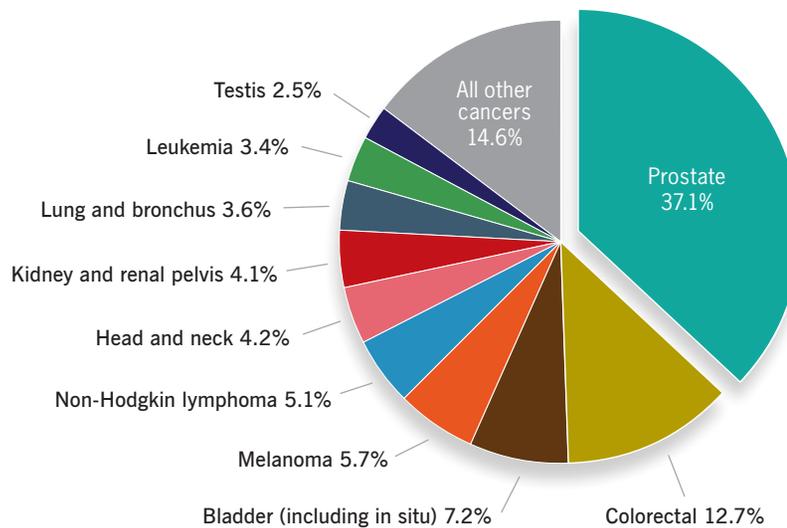
**Analysis by:** Centre for Population Health Data, Statistics Canada  
**Data sources:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992-2017) at Statistics Canada

## Prevalence by sex

The distribution of prevalent cases is similar between those assigned male and female at birth for several types of cancer, including colorectal cancer, non-Hodgkin lymphoma, melanoma of the skin, pancreatic cancer, leukemia, multiple myeloma, cancers of the brain and central nervous system and Hodgkin lymphoma (Table 3). However, large differences are seen between sexes for cancer of the bladder, kidney and renal pelvis, head and neck, thyroid, stomach, liver and esophagus. These cancer types are up to three times more prevalent in males, except for thyroid, which is on average three times more prevalent in females. These sex differences in tumour-based prevalence are observed at two, five and 25 years after diagnosis and largely result from differences in cancer incidence rather than observed survival. Therefore, these observed sex differences in prevalence may be reflective of differences in genetic factors and risk factor distributions for these cancer types, as well as differences in diagnostic and referral patterns, all of which have an impact on incidence.<sup>(1, 17, 18)</sup>

Prostate and colorectal cancers accounted for half (49.8% or 405,210 cases) of all 25-year prevalent cancers among males (Figure 2a). Other common diagnoses included urinary bladder cancer (7.2% or 58,240 cases), melanoma of the skin (5.7% or 46,480 cases) and non-Hodgkin lymphoma (5.1% or 41,165 cases). Cancers of the head and neck, kidney and renal pelvis, lung and bronchus and testis, along with leukemia and all other cancers, together, accounted for a third of the cancers diagnosed in males alive 25 years after diagnosis. For females, breast and colorectal cancers accounted for nearly half (47.1% or 416,276 cases) of all 25-year prevalent cancers (Figure 2b). Other common diagnoses included cancers of the uterus (8.5% or 74,955 cases),

**FIGURE 2a** Distribution of 25-year tumour-based prevalence for selected cancers, males, Canada,\* January 1, 2018†



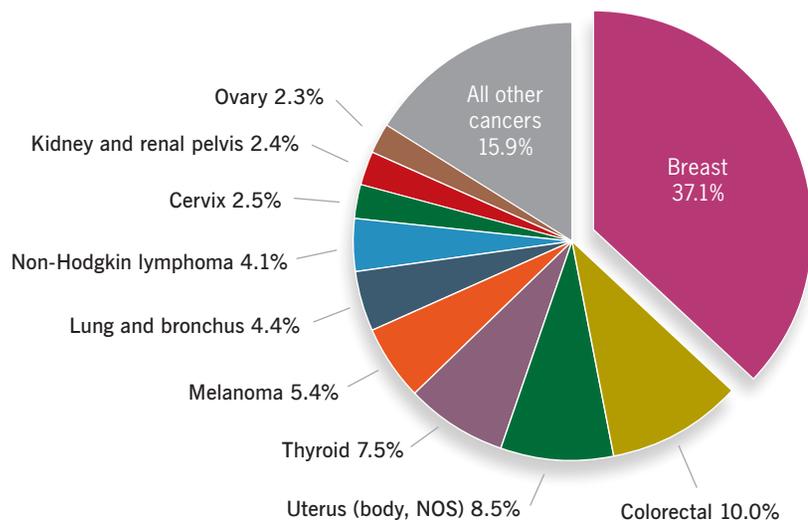
\* Prevalence for Quebec has been imputed because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

† 25-year prevalence refers to cases diagnosed between 1993 and 2017 (see *Methods*).

**Analysis by:** Centre for Population Health Data, Statistics Canada

**Data sources:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

**FIGURE 2b** Distribution of 25-year tumour-based prevalence for selected cancers, females, Canada,\* January 1, 2018†



NOS=not otherwise specified

\* Prevalence for Quebec has been imputed because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

† 25-year prevalence refers to cases diagnosed between 1993 and 2017 (see *Methods*).

**Analysis by:** Centre for Population Health Data, Statistics Canada

**Data sources:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

thyroid (7.5% or 65,970 cases) and melanoma of the skin (5.4% or 47,415 cancers). Cancers of the lung and bronchus, cervix, kidney and renal pelvis and ovary, along with non-Hodgkin lymphoma and all other cancers, together, represented a third of the cancers diagnosed in females alive 25 years after diagnosis.

### Observed survival

The proportion of people with cancer who are alive after a given period of time (e.g., five years) following diagnosis.

### Prevalence by age

Table 4 shows that the 25-year person-based prevalence for commonly diagnosed cancers is generally highest among those aged 70–79 years, except for breast, which is highest in the 60–69 years age group. From a site-specific perspective, many common cancer types have peak incidence in people who are in their late 60s and early 70s in Canada. Consequently, long-term measures of prevalence are highest among those 70–79 years of age because this age group includes those long-term survivors of less aggressive cancers diagnosed in younger age groups, as well as those recently diagnosed with common cancers such as prostate, colorectal, breast and lung.

A higher percentage of people aged 60–69 years were living with or beyond a diagnosis of uterine, head and neck, liver or ovarian cancer. For thyroid and cervical cancers, the highest person-based estimates are seen in the 50–59 years age group (see [supplementary online data](#)).

### Prevalence by duration

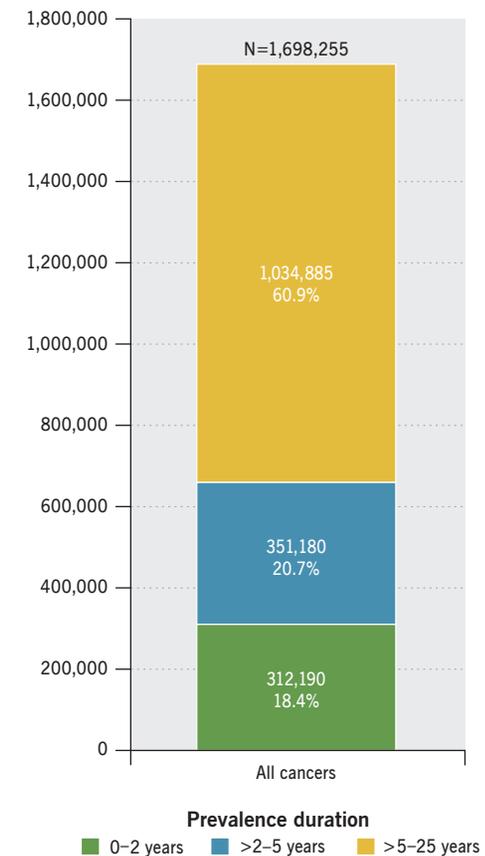
At the beginning of 2018, there were approximately 1,698,000 25-year prevalent tumours in Canada (Figure 3a). Of these, 18.4% had been diagnosed within the previous two years (2016 to 2017), 20.7% within two to five years (2013 to 2015) and 60.9% within the previous five to 25 years (1993 to 2012). These results have implications for planning healthcare and supportive services because they provide insight into the resources needed for different types of care. For example:

1. Within the first couple of years after a diagnosis, individuals are likely undergoing primary treatment (surgery, radiation and systemic therapies) for their cancer or recovering from its effects.
2. The period from two to five years since diagnosis typically requires close clinical follow-up for recurrence and supportive care.
3. Individuals alive more than five years after a cancer diagnosis have likely completed their treatment, but some people may still require clinical monitoring, which can impact primary care.



Prevalence estimates have implications for planning healthcare and supportive services across the cancer experience.

**FIGURE 3a** Tumour-based prevalence for all cancers combined by prevalence duration, Canada,\* January 1, 2018†



\* Prevalence for Quebec has been imputed because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

† Prevalence duration refers to cases diagnosed between: 2016 and 2017 for 0 to 2 years duration; 2013 and 2015 for >2 to 5 years; 1993 and 2012 for >5 to 25 years (see [Methods](#)).

**Analysis by:** Centre for Population Health Data, Statistics Canada

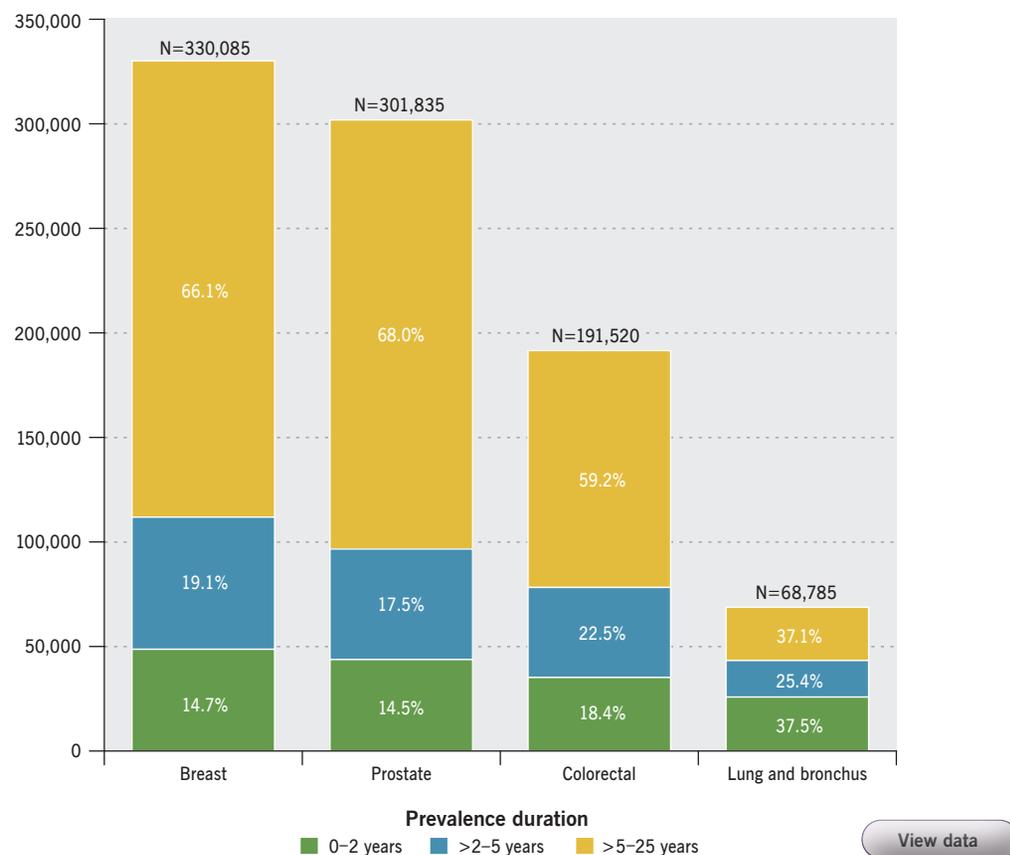
**Data sources:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

Figure 3b shows the distribution of prevalent tumours by prevalence duration for each of the four most commonly diagnosed types of cancer in Canada. For both breast and prostate cancers, about two-thirds of cases were five to 25 years since diagnosis, whereas 15% of each were still within the first two years since diagnosis. In contrast, for lung cancer only 37% were more than five years since their diagnosis. This reflects the relatively poor prognosis for those diagnosed with lung cancer. This also indirectly helps explain, in spite of its high incidence, the smaller relative contribution of lung cancer to overall 25-year prevalence for all cancers combined (Figure 1).

## Prevalence by income

The two-year and five-year person-based prevalence proportions were examined by neighbourhood income quintile (using the after-tax income quintile assignment from Postal Code Conversion File Plus; see definition and [Appendix](#)). As the time frame for measurement is only a few years compared to several decades, these prevalence proportions are more reflective of incident cases than long-term survival. The two-year and five-year prevalence proportions showed very similar patterns both for all cancers and by cancer type (Figures 4a and 4b). Information on the relationship between income and cancer is provided for all cancers combined as an overall snapshot for policy-makers and health systems users. It is important to note that the relationship between income and prevalence proportion varies by cancer type. For breast and prostate cancers, prevalence was highest in the highest neighbourhood income quintile. For colorectal and lung cancer, the pattern was reversed. For all these cancer types, the differences between quintiles 1 and 5 were statistically significant ( $p < 0.05$ ).

**FIGURE 3b** Tumour-based prevalence for the four most common cancers by prevalence duration, Canada,\* January 1, 2018†



\* Prevalence for Quebec has been imputed because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

† Prevalence duration refers to cases diagnosed between: 2016 and 2017 for 0 to 2 years duration; 2013 and 2015 for >2 to 5 years; 1993 and 2012 for >5 to 25 years (see [Methods](#)).

**Analysis by:** Centre for Population Health Data, Statistics Canada

**Data sources:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

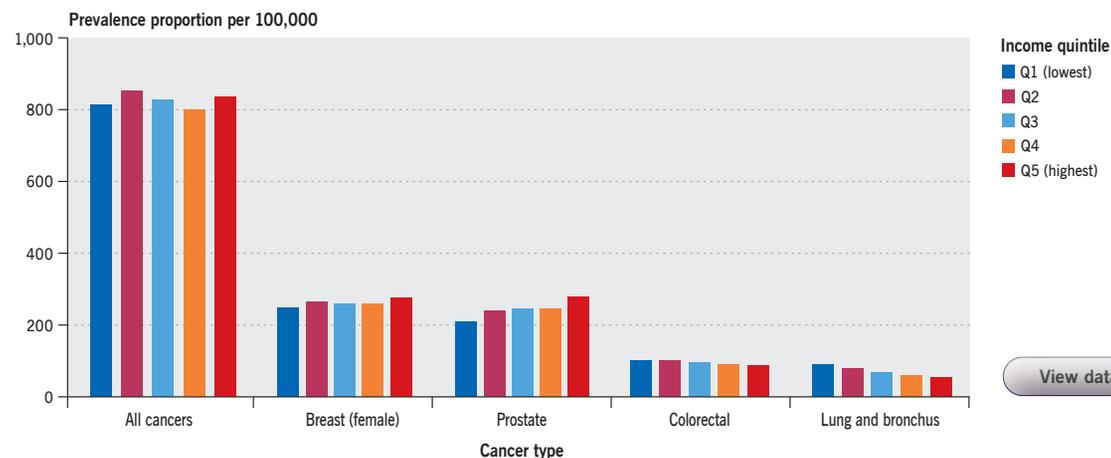
### Crude prevalence

Crude prevalence estimates are unadjusted for differences in population demographics, such as age, to show natural differences in disease burden across regions. These crude or unadjusted estimates enable jurisdictions to plan resource allocation for healthcare and supportive services to address the burden.

By cancer type, we observed a trend of increasing prevalence with increasing income quintile for breast and prostate cancers for both the two-year prevalence and five-year prevalence. For breast cancer, available screening programs may mean that those in higher income groups are more likely to be tested, diagnosed and treated at earlier stages than those in lower income groups.<sup>(19)</sup> Additionally, females with higher socio-economic status are more likely to have lower parity, which can also increase their risk for breast cancer.<sup>(20)</sup> For prostate cancer, males of higher income are more likely to be diagnosed compared to those of lower income, thereby increasing prevalence.<sup>(21)</sup>

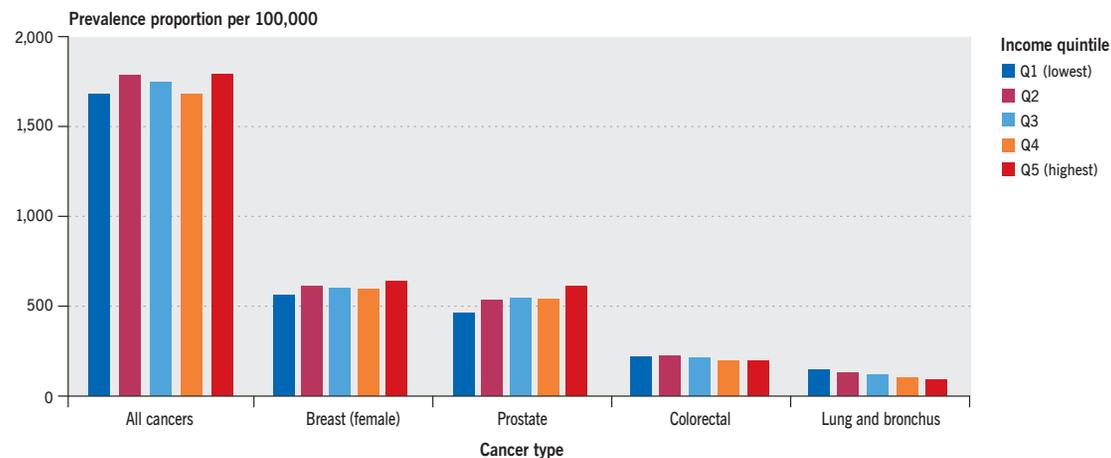
However, the prevalence trends are opposite for colorectal and lung cancers. In other words, the prevalence of these cancers is higher in lower income groups than in higher income groups. People in lower income groups are less likely to survive these cancer types than people in higher income groups<sup>(22)</sup> (thus, lowering prevalence). But people in lower income groups are still much more likely to be newly diagnosed for these cancers (thus, increasing prevalence).<sup>(23, 24)</sup> Higher incidence can be attributed to several reasons, including barriers to accessing primary care<sup>(25)</sup> and lower participation in colorectal

**FIGURE 4a** Crude two-year person-based prevalence per 100,000 people for all cancers\* and selected cancers by income quintile, Canada,† January 1, 2018



[View data](#)

**FIGURE 4b** Crude five-year person-based prevalence per 100,000 people for all cancers\* and selected cancers by income quintile, Canada,† January 1, 2018



\* “All cancers” includes *in situ* bladder tumours and excludes non-melanoma skin cancer (neoplasms, NOS; epithelial neoplasms, NOS; basal and squamous cell carcinomas).

†Prevalence for Quebec has been imputed because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

**Note:** Neighbourhood income quintiles were derived from postal code using Postal Code Conversion File Plus (PCCF+)

**Analysis by:** Canadian Partnership Against Cancer (CPAC)

**Data sources:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

cancer screening programs<sup>(26)</sup> that can identify and remove polyps.<sup>(27)</sup> Some modifiable risk factors, such as smoking (a key risk factor for lung and colorectal cancers), are more common among those in lower income groups.<sup>(28)</sup> But it is more difficult to interpret certain risks for colorectal cancer, such as obesity, sedentary behaviour and diet, because they do not always vary across income groups.<sup>(29)</sup>

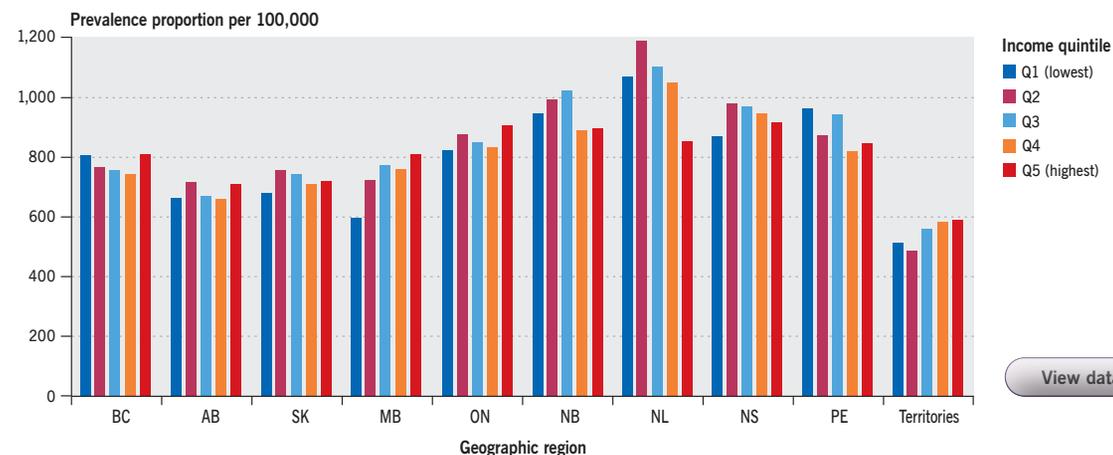
### Income quintile

A measure of neighbourhood socio-economic status that divides the population into five income groups (from lowest income to highest income) so that approximately 20% of the population is in each group.

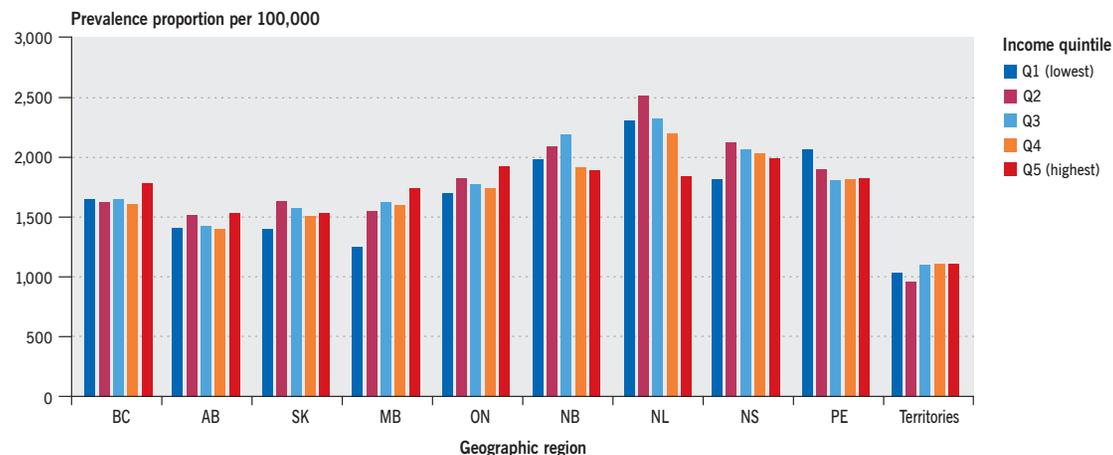
For all cancers combined, the crude two-year person-based prevalence proportion was higher among those who were in the highest income quintile (837.1 per 100,000) compared to those in the lowest income quintile (813.3 per 100,000). However, there was no clear linear trend in increasing prevalence as income quintile increased for all cancers combined. We also observed higher crude prevalence among the Atlantic provinces (New Brunswick, Newfoundland and Labrador, Nova Scotia and Prince Edward Island) (Figures 5a and 5b), likely due to the older populations in these geographic regions.<sup>(30)</sup>

People with cancer who have a higher income are more likely to have better access to a primary care physician and healthcare services, which can allow for early diagnosis and treatment.<sup>(31)</sup> As a result, this can improve cancer survival, which subsequently increases prevalence.

**FIGURE 5a** Crude two-year prevalence per 100,000 people for all cancers\* combined by income quintile and geographic region (excluding Quebec<sup>†</sup>), January 1, 2018



**FIGURE 5b** Crude five-year prevalence per 100,000 people for all cancers\* combined by income quintile and geographic region (excluding Quebec<sup>†</sup>), January 1, 2018



\* "All cancers" includes *in situ* bladder tumours and excludes non-melanoma skin cancer (neoplasms, NOS; epithelial neoplasms, NOS; basal and squamous cell carcinomas).

† Quebec is excluded because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

**Note:** Neighbourhood income quintiles were derived from postal code using Postal Code Conversion File Plus (PCCF+)

**Analysis by:** Canadian Partnership Against Cancer (CPAC)

**Data sources:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

## Prevalence by urban and rural status

Crude two-year and five-year person-based prevalence proportions were examined by urban and rural status (see definition and [Appendix](#)). For all cancers combined, the crude two-year person-based prevalence proportion was higher among those living in rural areas (944.5 per 100,000) compared to urban areas (805.9 per 100,000), and a similar pattern was observed for five-year prevalence (Figures 6a and 6b). This pattern was also seen for the four most commonly diagnosed cancer types, although it was less pronounced for breast cancer. The higher proportion in rural areas is likely driven by age differences. People in rural areas are typically older than those living

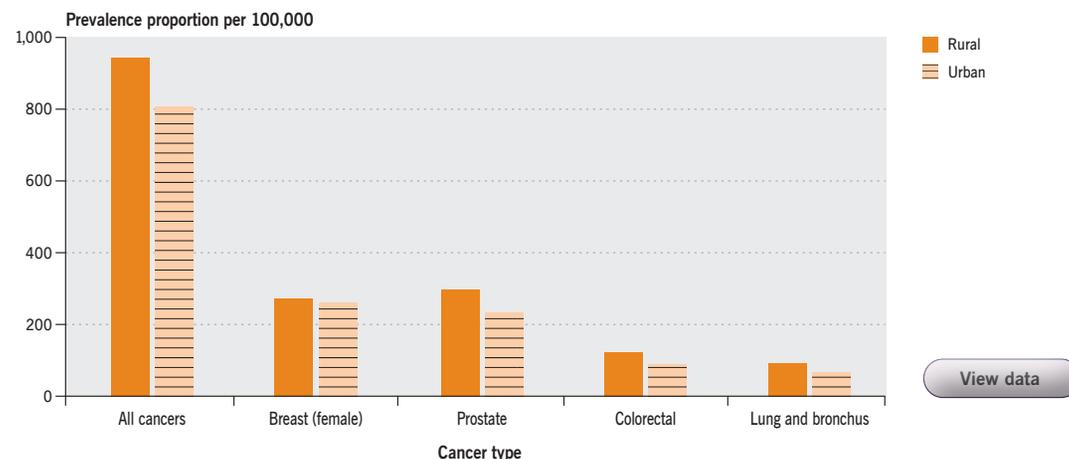


Two-year person-based prevalence proportion was higher among those living in rural areas.

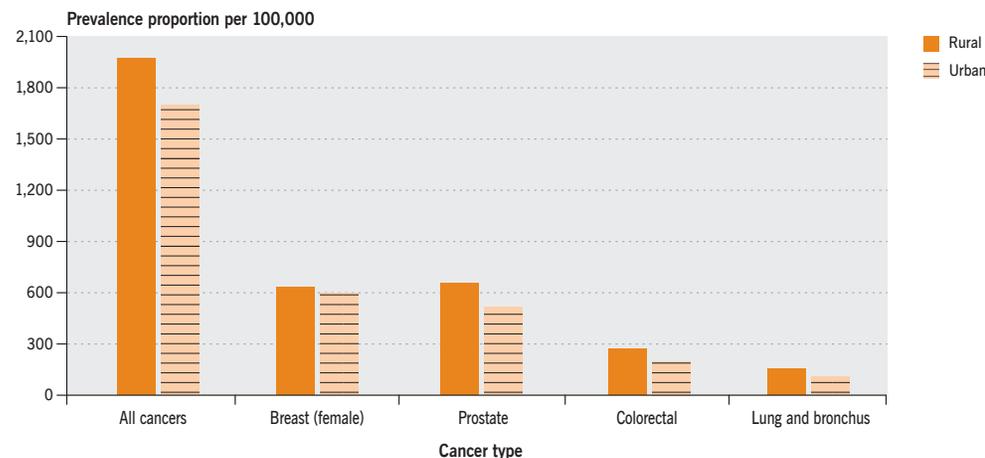
### Urban and rural area

For the purpose of this report, urban areas were defined as [census subdivisions](#) located within [census metropolitan areas](#) or [census agglomerations](#). All other census subdivisions with either smaller population sizes or lower population densities were considered rural. Additional details are included in [Appendix](#).

**FIGURE 6a** Crude two-year person-based prevalence per 100,000 people for all cancers\* and selected cancers by urban and rural status, Canada, January 1, 2018



**FIGURE 6b** Crude five-year person-based prevalence per 100,000 people for all cancers\* and selected cancers by urban and rural status, Canada, January 1, 2018



\* "All cancers" includes *in situ* bladder tumours and excludes non-melanoma skin cancer (neoplasms, NOS; epithelial neoplasms, NOS; basal and squamous cell carcinomas).

\*Prevalence for Quebec has been imputed because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

**Note:** Urban/rural were derived from postal code using Postal Code Conversion File Plus (PCCF+)

**Analysis by:** Canadian Partnership Against Cancer (CPAC)

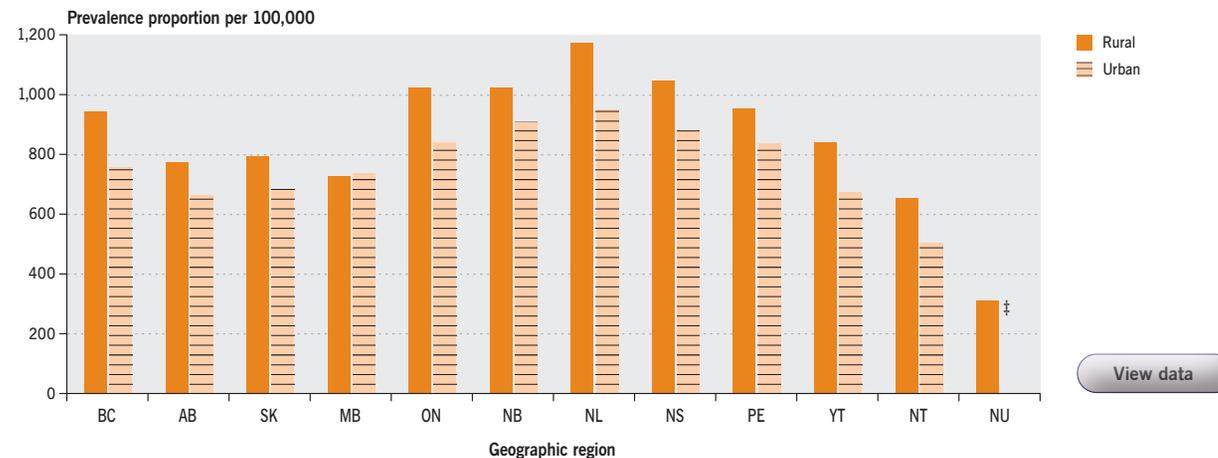
**Data sources:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

in urban areas in Canada, which means there will be more cancer diagnoses among these older populations.<sup>(32)</sup>

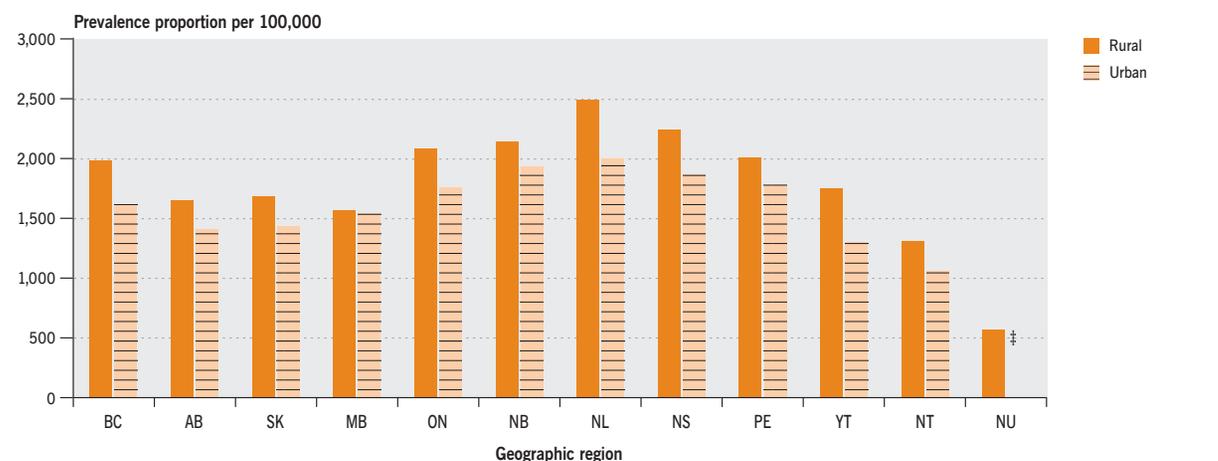
The two-year prevalence of cancer by geographic region also demonstrates that those living in regions that are predominantly rural have higher prevalence, except for Manitoba where the prevalence is comparable between rural and urban areas (Figure 7a). The difference in prevalence between those living in rural and urban areas was the greatest in Newfoundland and Labrador. Results were similar for five-year prevalence (Figure 7b). Note that for Nunavut, all residential areas were considered rural.

In addition to differences in the ages of urban and rural populations, other factors may contribute to higher prevalence among rural areas. For example, established cancer risk factors such as smoking, alcohol consumption and obesity tend to be more common in those living in rural as compared to urban areas, contributing to higher cancer incidence.<sup>(33-35)</sup> Access to screening and care may be more difficult for those living in rural areas due to travel distance to a healthcare facility,<sup>(36)</sup> which may affect incidence of cancer and survival.

**FIGURE 7a** Crude two-year prevalence per 100,000 people for all cancers\* combined by urban and rural status and geographic region (excluding Quebec<sup>†</sup>), January 1, 2018



**FIGURE 7b** Crude five-year prevalence per 100,000 people for all cancers\* combined by urban and rural status and geographic region (excluding Quebec<sup>†</sup>), January 1, 2018



\* "All cancers" includes *in situ* bladder tumours and excludes non-melanoma skin cancer (neoplasms, NOS; epithelial neoplasms, NOS; basal and squamous cell carcinomas).

† Quebec is excluded because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

‡ Prevalence for urban areas in Nunavut was suppressed due to small numbers.

**Note:** Urban/rural were derived from postal code using Postal Code Conversion File Plus (PCCF+)

**Analysis by:** Canadian Partnership Against Cancer (CPAC)

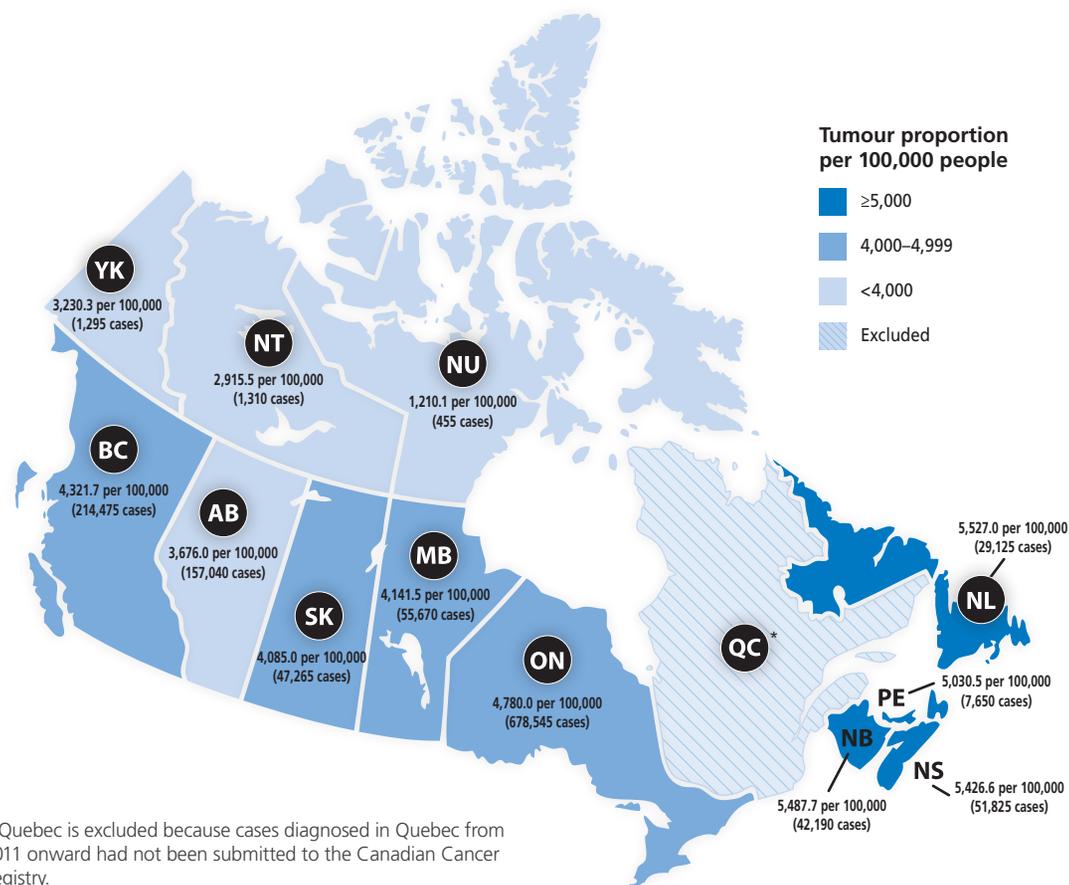
**Data sources:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

## Prevalence by geographic region

The number of prevalent cancer cases varies considerably across Canada due to the significant differences in population size across the provinces and territories (Figures 8a and 8b). Of note, data from Quebec were not included in these analyses. As of January 1, 2018, a total of 678,545 prevalent cases had been diagnosed in Ontario over the past 25 years, representing about 40% of all prevalent cases in Canada. British Columbia (214,475 cases) and Alberta (157,040 cases) have the next largest numbers of prevalent cancer cases, while Prince Edward Island (7,650 cases) and the territories (3,060 cases combined) had the fewest. The proportion of cases within the 25-year group that were diagnosed in the past five years was generally similar across most provinces (37% to 42%) and slightly higher in Yukon (44%) and Nunavut (47%). The number of 25-year cancer survivors by geographic region are available in [supplementary online data](#).

Differences in population sizes, age distributions and risk factor profiles across Canadian regions<sup>(37)</sup> affect the numbers of prevalent cases reported in a given geographic region. Crude prevalence proportions (the measure of prevalent cases per 100,000 people) permit regions to be compared with a similar population denominator. Prevalence proportions do not adjust for the differences in age distribution across regions as these measures are meant to show the natural differences in disease burden across regions. Prevalence proportions of cases diagnosed in the past 25 years were highest in the eastern provinces and generally lower in central and western provinces (Figure 8a). Newfoundland and Labrador had the highest 25-year tumour-based prevalence proportion (5,527 per 100,000 people), followed by New Brunswick (5,488 per 100,000 people) and Nova Scotia (5,427 per 100,000 people).

**FIGURE 8a** Geographic distribution of 25-year tumour-based prevalence counts and proportions by province and territory,\* both sexes, January 1, 2018



\* Quebec is excluded because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

**Analysis by:** Centre for Population Health Data, Statistics Canada  
**Data sources:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

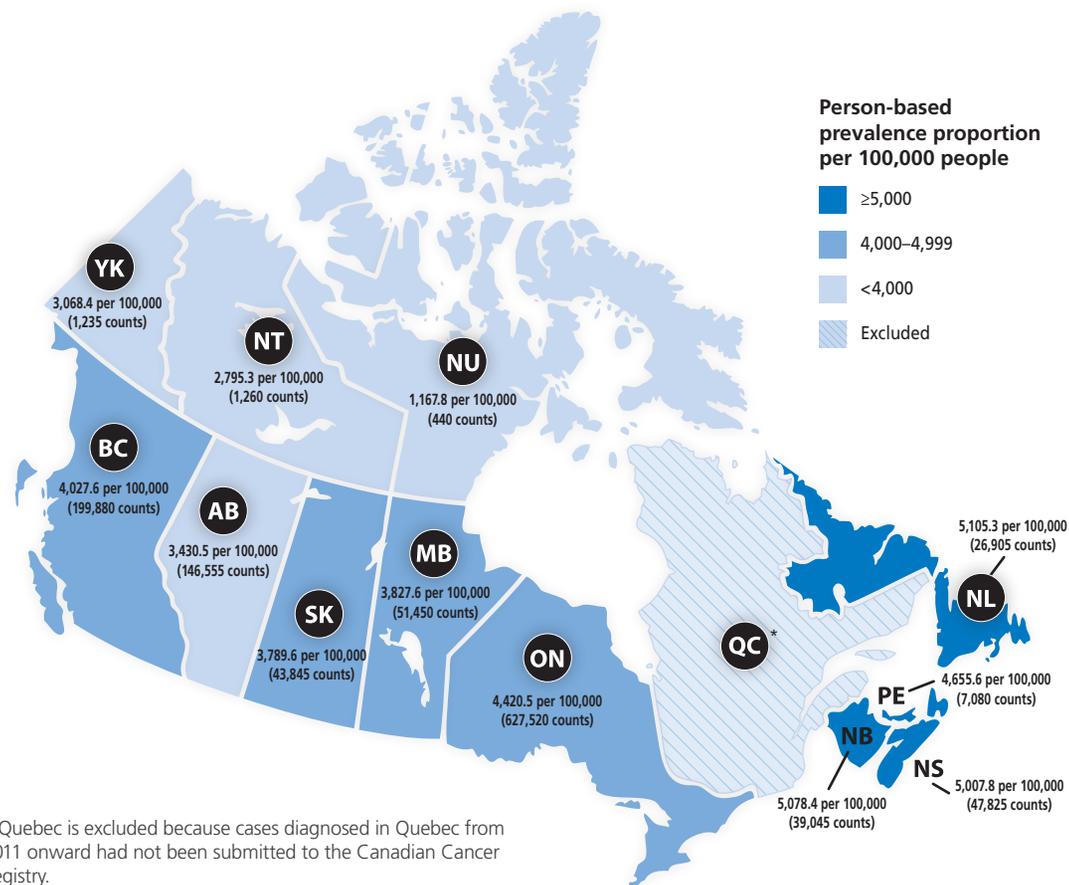
Canadian regions with the lowest tumour-based prevalence proportions were Alberta (3,676 per 100,000 people) and the territories (all less than 3,250 per 100,000 people). These numbers closely mirror the trends reported in cancer incidence across Canada.<sup>(1, 4)</sup> These differences are likely to reflect differences in risk factors and age structures across Canada.

Breast cancer was the most common 25-year prevalent cancer in all geographic regions except Newfoundland and Labrador, New Brunswick and Prince Edward Island, where prostate cancer was most common. When considering 25-year tumour-based prevalence, colorectal cancer ranked third in all regions except Nunavut and Northwest Territories, where it was the most and second most prevalent cancer, respectively (see [supplementary online data](#)).



Prevalence proportions of cases diagnosed in the past 25 years were highest in the eastern provinces and generally lower in central and western provinces.

**FIGURE 8b** Geographic distribution of 25-year person-based prevalence counts and proportions by province and territory, \* both sexes, January 1, 2018



\* Quebec is excluded because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

**Analysis by:** Centre for Population Health Data, Statistics Canada  
**Data sources:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

## Prevalence of cancers diagnosed during childhood

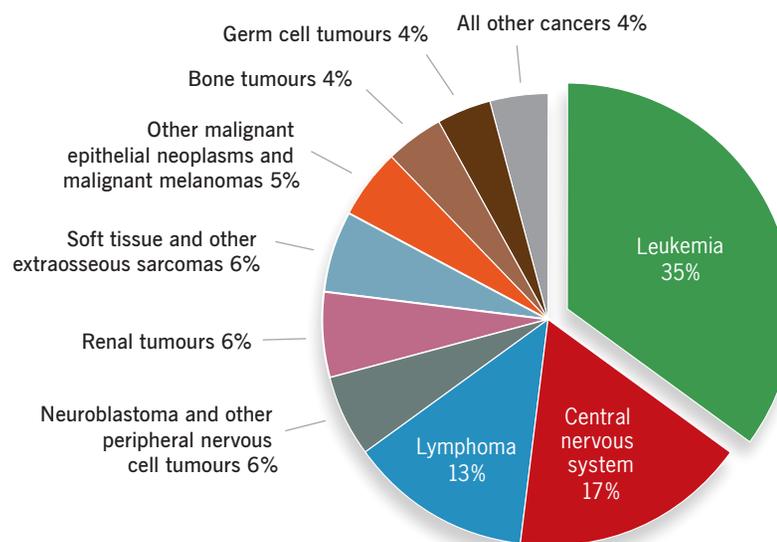
As of January 1, 2018, there were close to 18,000 individuals in the Canadian population who had been diagnosed with cancer before the age of 15 within the previous 25 years (Table 5). Of these people, about 1 in 4 (24%) had received a cancer diagnosis within the previous five years and 1 in 10 (10%) within the previous two years. Overall, slightly more males (54%) than females (46%) were diagnosed with cancer. The difference between tumour-based and person-based counts is very small since only childhood cancers diagnosed before the age of 15 were taken into consideration.

Blood and brain malignancies accounted for a large proportion of the total case count among childhood cancer survivors. Overall, leukemia was the most common diagnosis, accounting for more than 1 in 3 cases (35%) (Figure 9), while different types of central nervous system tumours, such as astrocytomas and other gliomas, accounted for another 17% of the cases. Other prevalent cancers included both Hodgkin and non-Hodgkin lymphomas (13%), as well as neuroblastomas and other tumours of the peripheral nervous system (6%), renal tumours (6%) and soft tissue sarcomas (6%). Some of these cancers have a rather favourable prognosis (e.g., Hodgkin lymphoma), while others, including certain types of brain, bone, liver and soft tissue cancers, still have relatively poor survival.<sup>(38)</sup>

Most childhood cancer survivors have an increased lifetime risk of being diagnosed with a second primary malignancy. This higher risk can be due to genetic predispositions or certain adverse effects induced through treatment toxicity. As a result, survivors of childhood cancer must

be closely monitored for the remainder of their lives.<sup>(39)</sup> Additionally, the long-term prevalence proportion of childhood cancer (over a duration of 10 years or more) is expected to increase within the Canadian population as a result of improving survival outcomes for many of the cancers that affect children, most especially those of the blood and bone marrow.<sup>(38)</sup>

**FIGURE 9** 25-year tumour-based prevalence by childhood cancer diagnostic group, ages 0–14 years at diagnosis, Canada,\* January 1, 2018



\* Prevalence for Quebec has been imputed because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

**Note:** Cancers were classified according to the Surveillance, Epidemiology, and End Results Program (SEER) update of the *International Classification of Childhood Cancer, Third Edition* (ICCC-3). Only selected subgroups within each diagnostic group are listed.

**Analysis by:** Centre for Population Health Data, Statistics Canada

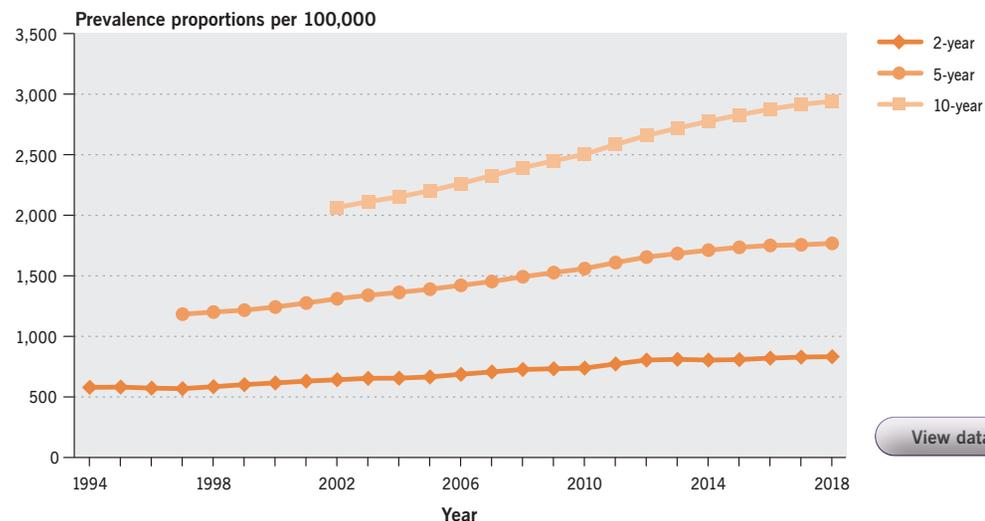
**Data sources:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

## Prevalence proportions over time

The two-, five- and 10-year prevalence proportion trends for all cancers combined are presented in Figures 10a–c. For all three time windows, the number of prevalent cancers per 100,000 people increased between 1994 and 2018. This growth in prevalence is likely a function of an aging population, cancer screening and improved treatments and clinical management of disease, which have resulted in improved survival across several cancer types.

Table 6 displays the 25-year person-based prevalence expressed as a percentage of the Canadian population for the four most commonly diagnosed cancers and all cancers combined. As of January 1, 2018, 4.2% of the Canadian population (1 in 24 people) had been diagnosed with cancer within the previous 25 years and were still alive. As with other measures of prevalence shown in this report, the relative impacts of incidence and survival across cancer types can be observed. For instance, despite a high incidence burden, lung cancer has a low prevalence proportion (0.2% or 1 in 562 people) among both males and females when compared with prostate cancer among males (1.6% or 1 in 62) or breast cancer among females (1.7% or 1 in 58) due to their comparatively higher long-term survival outcomes. The list of cancer types in Table 6 is expanded in the [supplementary online data](#) to the 22 cancers reported on in [Canadian Cancer Statistics 2021](#).

**FIGURE 10a** Two-, five- and 10-year tumour-based prevalence proportions per 100,000 people, all cancers combined, Canada (excluding Quebec),\* 1994–2018

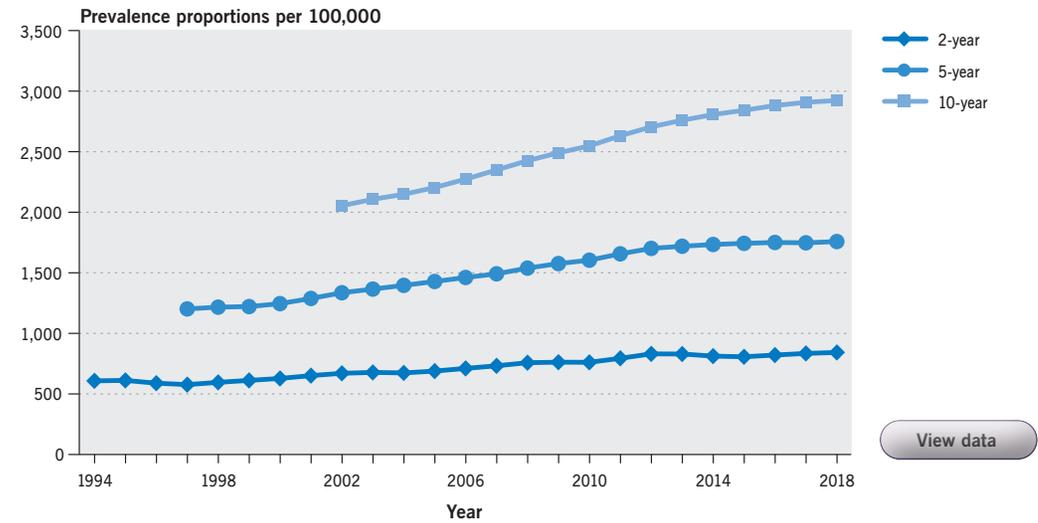


\* Quebec is excluded because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

**Analysis by:** Centre for Population Health Data, Statistics Canada

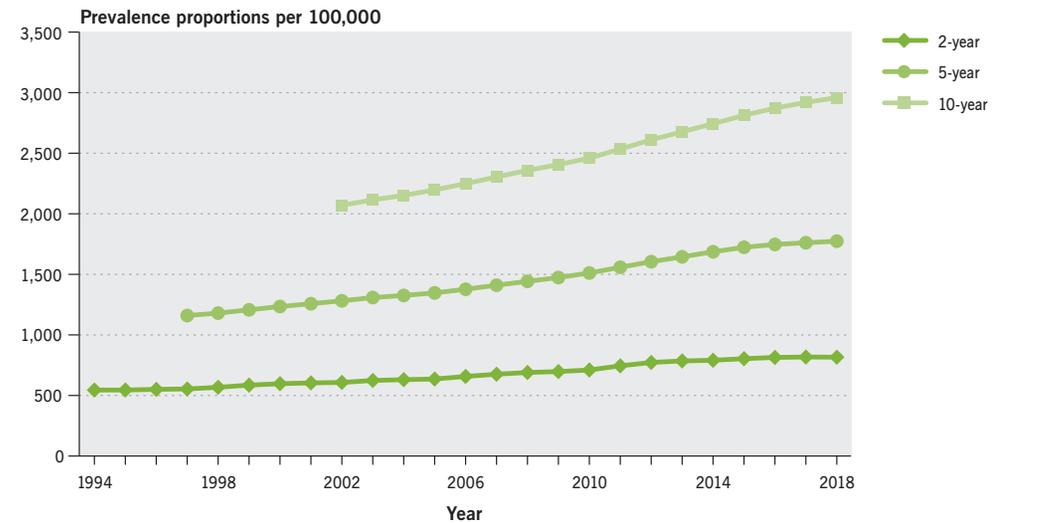
**Data sources:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

**FIGURE 10b** Two-, five- and 10-year tumour-based prevalence proportions per 100,000 males, all cancers combined, Canada (excluding Quebec),\* 1994–2018



[View data](#)

**FIGURE 10c** Two-, five- and 10-year tumour-based prevalence proportions per 100,000 females, all cancers combined, Canada (excluding Quebec),\* 1994–2018



\* Quebec is excluded because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

**Analysis by:** Centre for Population Health Data, Statistics Canada  
**Data sources:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

# Conclusion



## How do we use these statistics?

Prevalence statistics help identify and quantify the burden of cancer in a population. The breakdown of prevalence by duration is instrumental in estimating the short- and long-term costs associated with cancer care and resource allocation. A recent study that used a prevalence-based approach to quantify the direct annual cancer care costs from 2005 to 2012 found that these costs rose steadily from \$2.9 billion to \$7.5 billion between these two dates.<sup>(40)</sup> A simulation-based study recently estimated that direct system costs in 2021 are as high as \$22.8 billion. These increasing costs are due to the rising costs of all phases of cancer care, from diagnosis to initial and continuing care through to palliative care.<sup>(41)</sup>

Measures of cancer prevalence for different countries generally indicate that Canada is similar to other high-resource countries. While we have not compared age-standardized estimates, general comparisons can be made. For example, as of January 1, 2018, 5.0% of the population in the United States (16,353,421 people) were living with and beyond cancer diagnosed in the previous 25 years<sup>(42)</sup> compared to 4.2% in Canada. In Australia, as of January 1, 2017, 4.9% of the population (1,176,285 people) had been diagnosed with cancer in the previous 35 years (from 1982 to 2016).<sup>(43)</sup>

Prevalence estimates, especially short-term ones, can help jurisdictions plan regional resource allocation in terms of cancer care, coordination

with primary care, cancer screening, prevention initiatives (such as smoking cessation) and clinical practice guideline development. Prevalence estimates can also help jurisdictions ensure the availability of psychosocial support, survivorship care, surveillance and treatment. Provincial and territorial public drug benefit programs use prevalence data for budget planning and forecasting.



Prevalence estimates can help jurisdictions plan regional resource allocation in terms of cancer care, coordination with primary care, cancer screening, prevention initiatives and survivorship care.

Long-term prevalence estimates can help to inform survivorship planning, which means that healthcare and other services can be designed to support the unique needs of cancer survivors. These estimates also help identify areas of concern among people with a history of cancer whose daily activities may still be impacted by

the long-term effects of their diagnosis, treatment or both. Fear of recurrence, depression, chronic pain, cognitive dysfunction, heart disease and impaired functional status are some of the lasting challenges that cancer survivors can face.<sup>(44)</sup> In addition, they may need support to transition back to work or school, to get to and from appointments and to pay healthcare bills.<sup>(41)</sup> Long-term follow-up care should be tailored to a variety of factors, including sex, age at diagnosis and cancer type, as well as treatment type and duration.

Long after people have finished their cancer treatment, they may still need rehabilitation and supportive care services to address physical, emotional and other consequences of cancer. To address the growing demand and the increased complexity of cancer survivors' health needs, we will need to plan and implement new models of care that involve multidisciplinary teams.

## Cancer outcomes are not evenly distributed among Canadians

Cancer outcomes have generally improved in Canada over the past several decades. However, these improvements may not be equally distributed among different population groups. Differences in factors such as neighbourhood socio-economic status, racial and ethnic profile and locality are important predictors of cancer outcomes.<sup>(45)</sup> This report provides a small window into the relationship between cancer

prevalence and neighbourhood income, an important measure of socio-economic status. It also points to differences among those living in rural versus urban areas. These differences may have implications for resource allocation aimed to improve access to screening and care, particularly for rural<sup>(36)</sup> and low-income areas.<sup>(25, 26)</sup> However, national data needed to rigorously measure and understand the broader influence of the social, material and environmental conditions on health outcomes in various population subgroups in Canada are limited or lacking.

The collaborators involved in this report and other members of the cancer control community are investing in efforts to increase data collection, availability and accessibility to address these crucial gaps. For example, the Canadian Cancer Society is currently co-leading a pan-Canadian cancer data strategy with the Canadian Partnership Against Cancer (CPAC) that focuses on enhancing data collection, integration and use to improve cancer control and outcomes for all people in Canada. The 2019–2029 Canadian Strategy for Cancer Control includes several key investments in building capacity for data collection by partners, including partners that have a focus on First Nation, Inuit and Métis populations. The Public Health Agency of Canada and Statistics Canada are focused on better integrating socio-economic and ethnocultural data with cancer outcome data. In addition, they have recently launched important data collection initiatives to improve data quality and consistency across the country. Their goal is to address critical gaps in data collection and to ensure data are accessible for researchers. Along with these efforts, the Canadian Institute for Health Information (CIHI) endorsed the collection of race-based and ethnicity data in a publication from 2020 that outlines proposed standards

of data collection to facilitate better reporting of population groups that typically experience disparate access and outcomes. Together the cancer control community is working to address these important data and knowledge gaps so that we can better identify disparities in outcomes that require increased attention and investment.<sup>(46)</sup>

## Experience of people with cancer

The data and estimates included in this report provide insight into the population-level impact of cancer in Canada. But it is important to also consider the experience of people who are diagnosed with cancer and their families since cancer can impact all facets of their lives. We hope that, when reviewing these often sizeable population-based estimates, our readers note that each prevalent case can represent a long and meaningful experience for an individual and their family.

Cancer can affect a person's mental health while they are going through and after they have completed their treatment. Mental health impacts and the need for additional support have been reported for cancer survivors of all ages.<sup>(47)</sup> For example, the most commonly reported mental health impacts were depression and anxiety among childhood cancer survivors.<sup>(48)</sup> Their worries reflect the uncertainty of living beyond a cancer diagnosis. Many young people facing cancer often ask, "How will this affect my ability to have children later on?" This is because some cancers or their treatments affect the reproductive system, which can lead to fertility problems down the road.<sup>(49)</sup>

Living with and beyond cancer also has a considerable economic impact on people with cancer and their families. The different phases of

cancer treatment, management and survivorship come with out-of-pocket costs for the person with cancer, and they also have the potential to limit employment and earnings. A review of the economic evidence suggests that people with cancer and caregivers in high-income countries like Canada spent 16% of their annual income on out-of-pocket expenses while going through cancer treatments. Healthcare systems have an opportunity to improve the coverage of medical and non-medical costs for people with cancer to help alleviate this burden and ensure equitable access to care.<sup>(50)</sup> According to a 2018 report from CPAC, 4 in 10 people with cancer reported having practical and financial challenges after their treatments ended.<sup>(51)</sup> These challenges often involved difficulties returning to school or work. Cancer rehabilitation can help address these concerns so that survivors can go back to doing the things they love.



It is important to consider the experience of people with cancer and their families since cancer can impact all facets of their lives.

## The impact of COVID-19 on cancer control

The COVID-19 pandemic has affected cancer control efforts across the spectrum. The data presented here do not account for any changes in diagnosis or cancer control due to COVID-19 as they only include data reported until the end of 2017. While it remains quite early to accurately report the impact of COVID-19, several initiatives are underway at the provincial and national levels to understand how it has affected cancer diagnoses, outcomes and prevalence.

International efforts suggest that the diagnoses of cancers were reduced by 40% between March 9 and May 17, 2020, compared to diagnoses averaged over the same time period in 2018 and 2019.<sup>(52)</sup> In terms of screening, we know that the interruptions to programs will have a notable impact on future cancer survival. These impacts will be picked up in subsequent versions of our analyses. Early reports from provincial analyses suggest that screening programs were paused and that biopsies, surgical referrals and even emergency department visits are down. Furthermore, data from CIHI on the number of cancer surgeries shows a reduction in the first four months of the pandemic.<sup>(53)</sup> Importantly, COVID-19 has impacted some populations more than others, exacerbating the inequities faced by many, including Indigenous people, racialized communities, LGBTQ2+ people and others.

# Tables



**TABLE 1** Relative rankings for selected cancers with respect to incidence, survival, as well as five- and 25-year prevalence, Canada (excluding Quebec\*), selected time frames<sup>†</sup>

Rank	Incidence (2018)	5-year observed survival (2015–2017)	5-year prevalence (2018)	25-year prevalence (2018)
	Both sexes	Both sexes	Both sexes	Both sexes
1	Breast	Testis	Breast	Breast
2	Lung and bronchus	Thyroid	Prostate	Prostate
3	Prostate	Hodgkin lymphoma	Colorectal	Colorectal
4	Colorectal	Breast	Bladder	Melanoma
5	Bladder	Prostate	Lung and bronchus	Thyroid
6	Non-Hodgkin lymphoma	Melanoma	Melanoma	Bladder
7	Melanoma	Uterus (body, NOS)	Non-Hodgkin lymphoma	Non-Hodgkin lymphoma
8	Uterus (body, NOS)	Cervix	Thyroid	Uterus (body, NOS)
9	Kidney and renal pelvis	Kidney and renal pelvis	Uterus (body, NOS)	Lung and bronchus
10	Thyroid	Bladder	Kidney and renal pelvis	Kidney and renal pelvis
11	Head and neck	Non-Hodgkin lymphoma	Head and neck	Head and neck
12	Leukemia	Head and neck	Leukemia	Leukemia
13	Pancreas	Colorectal	Multiple myeloma	Cervix
14	Stomach	Leukemia	Ovary	Testis
15	Multiple myeloma	Multiple myeloma	Stomach	Ovary
16	Brain/CNS	Ovary	Cervix	Hodgkin lymphoma
17	Ovary	Stomach	Pancreas	Multiple myeloma
18	Liver	Brain/CNS	Testis	Stomach
19	Esophagus	Liver	Brain/CNS	Brain/CNS
20	Cervix	Lung and bronchus	Hodgkin lymphoma	Pancreas
21	Testis	Esophagus	Liver	Liver
22	Hodgkin lymphoma	Pancreas	Esophagus	Esophagus

CNS=central nervous system; NOS=not otherwise specified

\* Quebec is excluded because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

† Incidence ranking is based on cases diagnosed in 2018; survival ranking is based on predicted survival for the 2015 to 2017 period; prevalence rankings are based on an index date of January 1, 2018. Five-year prevalence refers to cases diagnosed between 2013 and 2017, 25-year prevalence refers to cases diagnosed between 1993 and 2017 (see *Methods*).

**Note:** Prevalence rankings were identical for both tumour- and person-based prevalence. The complete definition of the specific cancers listed here can be found in [Table A1](#).

**Analysis by:** Centre for Population Health Data, Statistics Canada

**Data source:** Canadian Cancer Registry and Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

**TABLE 2** Person-based prevalence for selected cancers by prevalence duration and sex, Canada,\* January 1, 2018

	25-year prevalence (diagnosed since 1993)			5-year prevalence (diagnosed since 2013)			2-year prevalence (diagnosed since 2016)		
	Both sexes	Males	Females	Both sexes	Males	Females	Both sexes	Males	Females
<b>All cancers<sup>†</sup></b>	<b>1,573,960</b>	<b>747,875</b>	<b>826,085</b>	<b>635,185</b>	<b>312,540</b>	<b>322,645</b>	<b>302,300</b>	<b>152,005</b>	<b>150,300</b>
Lung and bronchus	67,155	29,090	38,060	42,600	18,910	23,690	25,575	11,740	13,825
Breast	329,805	1,960	327,840	111,795	840	110,955	48,645	405	48,240
Colorectal	188,160	101,340	86,820	76,820	42,755	34,060	34,640	19,340	15,300
Prostate	301,820	301,820	—	96,590	96,590	—	43,740	43,735	—
Bladder	77,625	58,150	19,475	37,315	28,635	8,685	17,595	13,535	4,055
Non-Hodgkin lymphoma	77,180	41,125	36,060	32,915	18,070	14,845	15,320	8,455	6,865
Melanoma	93,895	46,475	47,420	34,715	18,435	16,275	15,555	8,470	7,085
Uterus (body, NOS)	74,900	—	74,900	27,820	—	27,820	12,690	—	12,685
Kidney and renal pelvis	54,295	33,245	21,050	23,035	14,840	8,195	10,590	6,885	3,705
Head and neck	47,700	33,560	14,135	20,350	14,720	5,625	9,875	7,185	2,690
Pancreas	7,500	3,865	3,635	5,375	2,890	2,480	3,845	2,080	1,765
Leukemia	47,055	27,300	19,760	19,310	11,500	7,805	8,590	5,155	3,435
Thyroid	83,915	18,575	65,345	28,925	7,280	21,645	11,160	2,925	8,235
Stomach	13,555	8,375	5,180	6,940	4,465	2,480	3,945	2,590	1,355
Multiple myeloma	15,030	8,475	6,555	9,570	5,495	4,075	4,960	2,865	2,095
Liver	6,825	5,115	1,705	4,265	3,260	1,000	2,485	1,955	530
Brain/CNS	13,385	7,175	6,210	5,075	2,840	2,230	2,875	1,610	1,260
Ovary	20,040	—	20,040	8,100	—	8,100	3,935	—	3,935
Esophagus	5,100	3,810	1,280	3,235	2,470	760	2,170	1,670	495
Cervix	22,235	—	22,235	5,695	—	5,695	2,630	—	2,635
Testis	20,090	20,090	—	5,135	5,135	—	2,135	2,130	—
Hodgkin lymphoma	16,180	8,730	7,455	4,260	2,365	1,890	1,820	1,010	805
All other cancers	104,940	51,260	53,680	49,310	24,670	24,635	25,570	12,940	12,630

—Not applicable; CNS=central nervous system; NOS=not otherwise specified

\* Prevalence for Quebec has been imputed because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

† "All cancers" includes *in situ* bladder tumours and excludes non-melanoma skin cancer (neoplasms, NOS; epithelial neoplasms, NOS; basal and squamous cell carcinomas).

**Analysis by:** Centre for Population Health Data, Statistics Canada

**Data sources:** Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

**TABLE 3** Tumour-based prevalence for selected cancers by prevalence duration and sex, Canada, \* January 1, 2018

	25-year prevalence (diagnosed since 1993)			5-year prevalence (diagnosed since 2013)			2-year prevalence (diagnosed since 2016)		
	Both sexes	Males	Females	Both sexes	Males	Females	Both sexes	Males	Females
<b>All cancers<sup>†</sup></b>	<b>1,698,255</b>	<b>814,545</b>	<b>883,710</b>	<b>663,370</b>	<b>328,420</b>	<b>334,950</b>	<b>312,190</b>	<b>157,720</b>	<b>154,465</b>
Lung and bronchus	68,785	29,630	39,155	43,285	19,160	24,125	25,810	11,840	13,970
Breast	330,085	1,960	328,125	111,855	845	111,010	48,665	405	48,255
Colorectal	191,520	103,370	88,150	78,230	43,615	34,620	35,175	19,665	15,510
Prostate	301,835	301,840	—	96,600	96,595	—	43,740	43,740	—
Bladder	77,735	58,240	19,490	37,355	28,660	8,695	17,605	13,545	4,055
Non-Hodgkin lymphoma	77,245	41,165	36,080	32,945	18,090	14,855	15,320	8,460	6,870
Melanoma	93,890	46,480	47,415	34,715	18,440	16,280	15,555	8,470	7,085
Uterus (body, NOS)	74,955	—	74,955	27,850	—	27,850	12,700	—	12,700
Kidney and renal pelvis	54,455	33,355	21,100	23,120	14,900	8,225	10,635	6,910	3,720
Head and neck	48,885	34,405	14,485	20,840	15,085	5,755	10,145	7,380	2,765
Pancreas	7,520	3,880	3,645	5,390	2,900	2,490	3,855	2,085	1,770
Leukemia	47,125	27,340	19,780	19,330	11,515	7,820	8,600	5,155	3,440
Thyroid	84,760	18,790	65,970	29,170	7,350	21,820	11,200	2,940	8,260
Stomach	13,640	8,435	5,200	6,995	4,500	2,490	3,980	2,615	1,365
Multiple myeloma	15,030	8,475	6,555	9,575	5,495	4,075	4,960	2,865	2,095
Liver	6,835	5,130	1,705	4,270	3,265	1,000	2,490	1,960	535
Brain/CNS	13,430	7,205	6,230	5,100	2,860	2,235	2,895	1,625	1,270
Ovary	20,055	—	20,055	8,110	—	8,110	3,945	—	3,945
Esophagus	5,110	3,825	1,285	3,240	2,475	765	2,175	1,675	500
Cervix	22,270	—	22,270	5,710	—	5,710	2,645	—	2,645
Testis	20,090	20,090	—	5,135	5,135	—	2,135	2,130	—
Hodgkin lymphoma	16,185	8,730	7,455	4,255	2,365	1,890	1,820	1,015	805
All other cancers	106,805	52,210	54,590	50,300	25,175	25,120	26,145	13,235	12,910

—Not applicable; CNS=central nervous system; NOS=not otherwise specified

\* Prevalence for Quebec has been imputed because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

† "All cancers" includes *in situ* bladder tumours and excludes non-melanoma skin cancer (neoplasms, NOS; epithelial neoplasms, NOS; basal and squamous cell carcinomas).

**Analysis by:** Centre for Population Health Data, Statistics Canada

**Data sources:** Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

**TABLE 4** Age distribution for 25-year person-based prevalence for most commonly diagnosed cancers by sex, Canada,\* January 1, 2018†

Age (years)	All cancers‡			Lung and bronchus			Colorectal			Prostate	Breast
	Both sexes N=1,573,960	Males N=747,875	Females N=826,085	Both sexes N=67,155	Males N=29,090	Females N=38,060	Both sexes N=188,160	Males N=101,340	Females N=86,820	Males N=301,820	Females N=327,840
	%	%	%	%	%	%	%	%	%	%	%
0–14	0.4	0.5	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
15–29	1.4	1.6	1.3	0.2	0.2	0.2	0.4	0.3	0.5	0.0	0.1
30–39	2.7	2.3	3.1	0.5	0.5	0.5	1.0	0.9	1.1	0.0	1.3
40–49	6.0	4.3	7.6	1.6	1.6	1.7	3.0	2.9	3.2	0.3	6.2
50–59	15.0	11.8	17.9	9.7	8.7	10.4	11.0	11.1	10.8	5.9	18.8
60–69	25.9	25.8	26.1	27.6	27.4	27.9	23.2	24.8	21.3	25.7	28.1
70–79	27.8	31.5	24.5	37.2	37.8	36.7	30.5	32.7	27.9	39.6	26.6
80–89	16.6	18.8	14.7	20.1	20.9	19.5	24.0	22.6	25.6	24.4	14.6
90+	3.9	3.5	4.3	3.1	2.9	3.2	7.0	4.8	9.6	4.1	4.2
	<b>counts</b>	<b>counts</b>	<b>counts</b>	<b>counts</b>	<b>counts</b>	<b>counts</b>	<b>counts</b>	<b>counts</b>	<b>counts</b>	<b>counts</b>	<b>counts</b>
50–74	878,465	404,415	474,050	37,875	16,010	21,870	92,795	53,135	39,660	155,900	202,270
65+	984,885	512,880	472,000	51,175	22,610	28,565	140,450	75,520	64,930	254,270	197,875

\* Prevalence for Quebec has been imputed because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

† 25-year prevalence refers to cases diagnosed between 1993 and 2017 (see *Methods*).

‡ “All cancers” includes *in situ* bladder tumours and excludes non-melanoma skin cancer (neoplasms, NOS; epithelial neoplasms, NOS; basal and squamous cell carcinomas).

**Analysis by:** Centre for Population Health Data, Statistics Canada

**Data sources:** Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

**TABLE 5** Tumour- and person-based prevalence counts of cancers diagnosed between the ages of 0 and 14, by sex and years since diagnosis, Canada,\* January 1, 2018

Prevalence type / Years since diagnosis <sup>†</sup>	Both sexes		Males		Females	
	Count	Cumulative	Count	Cumulative	Count	Cumulative
Tumour-based						
≤2 years	1,800	1,800	1,000	1,000	800	800
>2 years to 5 years	2,550	4,350	1,385	2,385	1,165	1,965
>5 years to 10 years	3,985	8,335	2,090	4,475	1,895	3,860
>10 years to 25 years	9,635	17,970	5,200	9,675	4,435	8,295
Person-based						
≤2 years	1,760	1,760	980	980	780	780
>2 years to 5 years	2,525	4,285	1,375	2,355	1,150	1,930
>5 years to 10 years	3,905	8,190	2,060	4,415	1,845	3,775
>10 years to 25 years	9,570	17,760	5,155	9,570	4,415	8,190

\* Prevalence for Quebec has been imputed because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

† For the years since diagnosis: 0 to 2 years refers to cases diagnosed between 2016 and 2017; >2 to 5 years refers to cases diagnosed between 2013 and 2015; >5 to 10 years refers to those diagnosed between 2008 and 2012; >10 to 25 years refers to cases diagnosed between 1993 and 2007 (see *Methods*).

**Analysis by:** Centre for Population Health Data, Statistics Canada

**Data source:** Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

**TABLE 6** 25-year person-based prevalence proportions for most commonly diagnosed cancers by sex, Canada,\* January 1, 2018<sup>†</sup>

	Percentage of Canadian population			1 in:		
	Both sexes	Males	Females	Both sexes	Males	Females
<b>All cancers<sup>‡</sup></b>	<b>4.2</b>	<b>4</b>	<b>4.4</b>	<b>24</b>	<b>25</b>	<b>23</b>
Prostate	—	1.6	—	—	62	—
Lung and bronchus	0.2	0.2	0.2	562	643	500
Female breast	—	—	1.7	—	—	58
Colorectal	0.5	0.5	0.5	200	184	219

—Not applicable

\* Prevalence for Quebec has been imputed because cases diagnosed in Quebec from 2011 onward had not been submitted to the Canadian Cancer Registry.

† 25-year prevalence refers to cases diagnosed between 1993 and 2017 (see *Methods*).

‡ "All cancers" includes *in situ* bladder tumours and excludes non-melanoma skin cancer (neoplasms, NOS; epithelial neoplasms, NOS; basal and squamous cell carcinomas).

**Analysis by:** Centre for Population Health Data, Statistics Canada

**Data sources:** Canadian Cancer Registry death-linked analytic file (1992–2017) at Statistics Canada

## Data sources and methods



### Data sources and definitions

#### Prevalence

Prevalence analyses were performed on a pre-existing analytic file: the Canadian Cancer Registry (CCR) death-linked file. It was created by linking CCR cases diagnosed from 1992 to 2017 to mortality information complete through December 31, 2017, via Statistics Canada's Social Data Linkage Environment.<sup>(54)</sup> The CCR is a population-based database comprised of cases diagnosed among Canadian residents since 1992.<sup>(55)</sup> The mortality information was obtained from the CCR itself, the Canadian Vital Statistics Death (CVSD) database – whose current scope is all deaths in Canada<sup>(56)</sup> – and T1 personal master files (as reported on tax returns). The use of death information on tax returns facilitated the identification of additional death events on the CCR that may not have been included in the CVSD, such as out-of-country deaths. It was also used to validate the date of death when discrepancies between dates on the CCR and the CVSD were encountered.

The analytic file followed the multiple primary coding rules of the International Agency for Research on Cancer (IARC).<sup>(57)</sup> Cases were defined based on the International Classification of Diseases for Oncology, Third Edition,<sup>(58)</sup> and classified using Surveillance, Epidemiology and End Results (SEER) Program grouping definitions.<sup>(11)</sup> When all cancers are considered together, *in situ* bladder cancer cases are included but non-melanoma skin cancers are excluded.<sup>(55)</sup>

#### Prevalence by income and residential area

The prevalence statistics reported in the section examining income and urban or rural status are person-based. Two- and five-year limited duration crude prevalence proportions were based on the number of individuals living with or beyond cancer in the previous two years (2016–2017) and five years (2013–2017) and who were alive as of January 1, 2018. Age-standardized prevalence estimates by income and residential area are available in [supplementary online data](#).

#### Population

Population estimates by sex, age group and province or territory on January 1, 2018, were calculated by averaging the mid-year 2017 and 2018 population counts by sex, age group and province or territory.<sup>(59)</sup>

For sub-provincial and sub-territorial population estimates based on census counts, a standard average provincial growth rate<sup>(60)</sup> was used to project population counts on census day (May 16, 2016) to January 1, 2018, assuming exponential population growth.

#### Statistical analysis

Both person-based and tumour-based prevalence counts and proportions are reported in this report. Two-, five-, 10- and 25-year limited duration prevalence estimates are based on the number of cancers diagnosed in the previous two, five, 10 and 25 years among people who are still alive on the given reference date of January 1, 2018 (i.e., the index date). The four prevalence durations refer to cancers diagnosed from 2016 to 2017, from 2013 to 2017, from 2008 to 2017, and from 1993 to 2017, respectively. Estimating prevalence requires current, accurate information about both the incidence of cancer and the vital status of the individuals that have received a cancer diagnosis within the reference period of interest. Because cancer incidence data from Quebec have not been submitted to the CCR from 2011 onward, the following approach was used:

- Limited duration tumour-based prevalence estimates by cancer type, sex and age, for all of Canada excluding Quebec, were determined directly using the counting method.<sup>(61, 62)</sup> Specifically, all primary invasive cancers (including *in situ* bladder cancers) diagnosed among persons residing in Canada but outside of Quebec in the relevant time period and alive on January 1, 2018, were counted, regardless of whether they were the first primary malignancy ever diagnosed in a person or a subsequent cancer diagnosis.

- Person-based limited duration prevalence counts were estimated by counting individuals rather than tumours for each cancer type. For instance, a woman consecutively diagnosed with two primary breast tumours would only contribute once to the person-based prevalence count for breast cancer. Conversely, if the two consecutive cancer diagnoses affect different sites (e.g., thyroid gland and breast), the person will be counted once for each site. However, the person-based estimate for all cancers combined only counts each person once and is systematically lower than the tumour-based estimate. In this report, the first primary cancer, per cancer type in the prevalence duration of interest, was retained for the estimation of person-based prevalence counts and proportions. For all cancers combined, only the first primary cancer was retained.
- Limited duration prevalence proportions (per 100,000 people) by cancer type, sex and age, for all of Canada excluding Quebec, were then estimated by dividing prevalence counts by the estimated population for Canada excluding Quebec on January 1, 2018, and multiplying by 100,000.
- Prevalence proportions for Canada excluding Quebec were then applied to population estimates for all of Canada in order to estimate the total number of cases at the national level. The underlying assumption is that the limited duration prevalence proportions by age, sex and cancer type for Canada excluding Quebec are the same as for Canada including Quebec.

- The age groups considered in this report refer to the attained age of the person on January 1, 2018, not to the age at the time of diagnosis, which is typically the case when incidence is the main analytical focus.

### Statistical analysis for prevalence by income and residential area

The analyses focused on all cancers combined and the four most commonly diagnosed cancer types: breast (female), prostate, colorectal and lung and bronchus. The analyses were stratified by neighbourhood income quintile and residential area (urban vs. rural) for Canada (including Quebec) and by geographic region (excluding Quebec). The postal code for the place of residence of the person with cancer at the time of diagnosis available in the Canadian Cancer Registry was used to assign the after-tax neighbourhood income quintiles and residential areas through PCCF+ v7B. [Statistical Area Classification](#) (SAC) type<sup>(63)</sup> was used to define urban and rural areas, where SAC types 1 to 3 were classified as urban and 4 to 8 were classified as rural (Table A1). The boundaries of the census subdivisions are those of the 2016 Census of Population. Using this approach, the surface areas designated as urban tend to be much greater than when urbanity is determined using Statistics Canada Population Centres. The same categorization was used in a previous report that examined the relationship between lung cancer incidence and equity.<sup>(24)</sup>

The population estimates were aggregated to the same strata from the 2016 census and projected to January 1, 2018. The Canadian Vital Statistics – Death database was used to identify those who were still alive on January 1, 2018.

**TABLE a1** Statistical Area Classification (SAC) types used to classify urban and rural status

Geography	SAC type	SAC type description
Urban	1	Census subdivision within census metropolitan area
	2	Census subdivision within census agglomeration with at least one census tract
	3	Census subdivision within census agglomeration having no census tracts
Rural	4	Census subdivision outside of census metropolitan area and census agglomeration area having <a href="#">strong metropolitan influence</a>
	5	Census subdivision outside of census metropolitan area and census agglomeration area having <a href="#">moderate metropolitan influence</a>
	6	Census subdivision outside of census metropolitan area and census agglomeration area having <a href="#">weak metropolitan influence</a>
	7	Census subdivision outside of census metropolitan area and census agglomeration area having <a href="#">no metropolitan influence</a>
	8	Census subdivision within the territories, outside of census agglomeration

## The Postal Code Conversion File Plus

The purpose of the Postal Code Conversion File Plus (PCCF+) is to provide a link between six-character postal codes produced by Canada Post, standard 2016 census geographic areas (such as dissemination areas, census subdivisions and census tracts) produced by Statistics Canada and supplementary administrative areas and neighbourhood income quintiles.

Postal codes do not respect census geographic boundaries and so may be linked to more than one standard geographic area or be assigned to more than one set of coordinates. Therefore, one postal code may be represented by more than one record. The PCCF product, produced by Statistics Canada, provides links between postal codes and all recorded matches to census geography.

PCCF+ improves upon the PCCF by applying a population-weighted matching process to some residential postal codes where more than one geographic code is possible. PCCF+ also provides routines for institutional postal codes and for historic postal codes.

## Quebec Data

Quebec data were imputed as follows:

- Person-based prevalence counts for all of Canada, excluding Quebec, were determined directly by using the counting method,<sup>(61, 62)</sup> regardless of whether they were first or subsequent primaries in the relevant time period.

- Limited duration prevalence proportions by cancer type, sex, age, income quintile or residential area, for all of Canada excluding Quebec, were then estimated by dividing the prevalence counts by the appropriate population estimates.
- Prevalence counts by cancer type, sex, age, income quintile or residential area, for all of Canada including Quebec, were then estimated by applying those prevalence proportions to the same strata of Canadian population, which included Quebec, and then summing across the strata.

## Limitations

For these analyses, as we only had postal code information available at the time of the cancer diagnosis, it was assumed that people with cancer did not move across geographic regions or outside of Canada in the two-year (2016–2017) and five-year (2013–2017) time frames. Similarly, another assumption made in this analysis was that neighbourhood income and residential area classifications had not changed since diagnosis.

The definitions of urban and rural follows the Statistics Canada definition where SAC types 1 to 3 were classified as urban and 4 to 8 were classified as rural. However, “urban” or “rural” may take on a different meaning in smaller provinces and territories.

In previous editions of the Canadian Cancer Statistics publication, it was noted that data from Newfoundland and Labrador (NL) were potentially affected by under-reporting of cases due to incomplete linkage of cancer and vital statistics information. The NL Cancer Registry has implemented death clearance processes to improve case ascertainment and has improved

the reporting of cases from sub-provincial regions that previously under-reported cases. As a result, of the enhancements to the NL Cancer Registry, case ascertainment is improved in the 2006 data onward. However, under-reporting persists in this province in years prior to 2006. For example, the total number of cases reported to the CCR by NL for 2005 is 21% lower than the corresponding count for 2006.

At the time of this publication, cancer incidence data from Quebec had not been submitted to the Canadian Cancer Registry from the 2011 diagnosis year onward. Consequently, Quebec was excluded from analyses that examined prevalence across geographic regions. In all other analyses, data for Quebec were imputed.

## Peer review

The peer-review process was overseen by the Canadian Cancer Statistics Advisory Committee’s Working Group (WG) on Cancer Prevalence. The WG recruited three peer reviewers based on their clinical and epidemiologic expertise. A full draft of this report (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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# Contact us



## Partner organizations

### Canadian Cancer Society

[cancer.ca](http://cancer.ca)

For general information about cancer (such as cancer prevention, screening, diagnosis, treatment or care), contact the Canadian Cancer Society's Cancer Information Helpline at 1-888-939-3333 or visit [cancer.ca](http://cancer.ca). For questions about this publication, email: [stats@cancer.ca](mailto:stats@cancer.ca).

### Public Health Agency of Canada (PHAC)

For information on chronic diseases including cancer, their determinants, and their risk and protective factors in Canada, please refer to [www.canada.ca/en/public-health.html](http://www.canada.ca/en/public-health.html) or email [phac.chronic.publications-chronique.aspc@canada.ca](mailto:phac.chronic.publications-chronique.aspc@canada.ca).

### Statistics Canada

[statcan.gc.ca](http://statcan.gc.ca) (search "cancer")

More detailed information on the methodology used in this publication is available from the Centre for Population Health Data at Statistics Canada, National Enquiries Line (1-800-263-1136) or through Client Services at the Centre for Population Health Data ([statcan.hd-ds.statcan@canada.ca](http://statcan.hd-ds.statcan@canada.ca) or 613-951-1746).

## Canadian Council of Cancer Registries

Cancer incidence data are supplied to Statistics Canada by provincial and territorial cancer registries to form 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 Centre for Population Health Data Statistics Canada. Information about the CCR and CCCR can be found on Statistics Canada's [Canadian Cancer Registry \(CCR\)](http://www.statcan.gc.ca/eng/health/cancer/cancer-registry) website. Detailed information regarding the statistics for each province or territory is available from the relevant registry:

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## Vital Statistics Council for Canada

Mortality data are supplied to Statistics Canada by the provincial and territorial Vital Statistics Registrars to form the Canadian Vital Statistics – Death database (CVSD). The Canadian Vital Statistics System is governed by the Vital Statistics Council for Canada (VSCC) since 1945. The VSCC is a collaboration between the 13 provincial and territorial Vital Statistics Registrars and the federal government represented by the Centre for Population Health Data of Statistics Canada. Detailed information on the VSCC and the CVSD can be found on Statistics Canada's [Vital Statistics – Death database \(CVSD\)](http://www.statcan.gc.ca/eng/health/cvsc).

## Questions about cancer?

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

**1-888-939-3333** Monday to Friday

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