
2016
1981
85,648
new cancer cases expected in 2016

2

Incidence

The number of new cancer cases diagnosed each year in Ontario (the incidence), and the incidence rate, has increased since at least 1981.

In general, the incidence of cancer is influenced by:

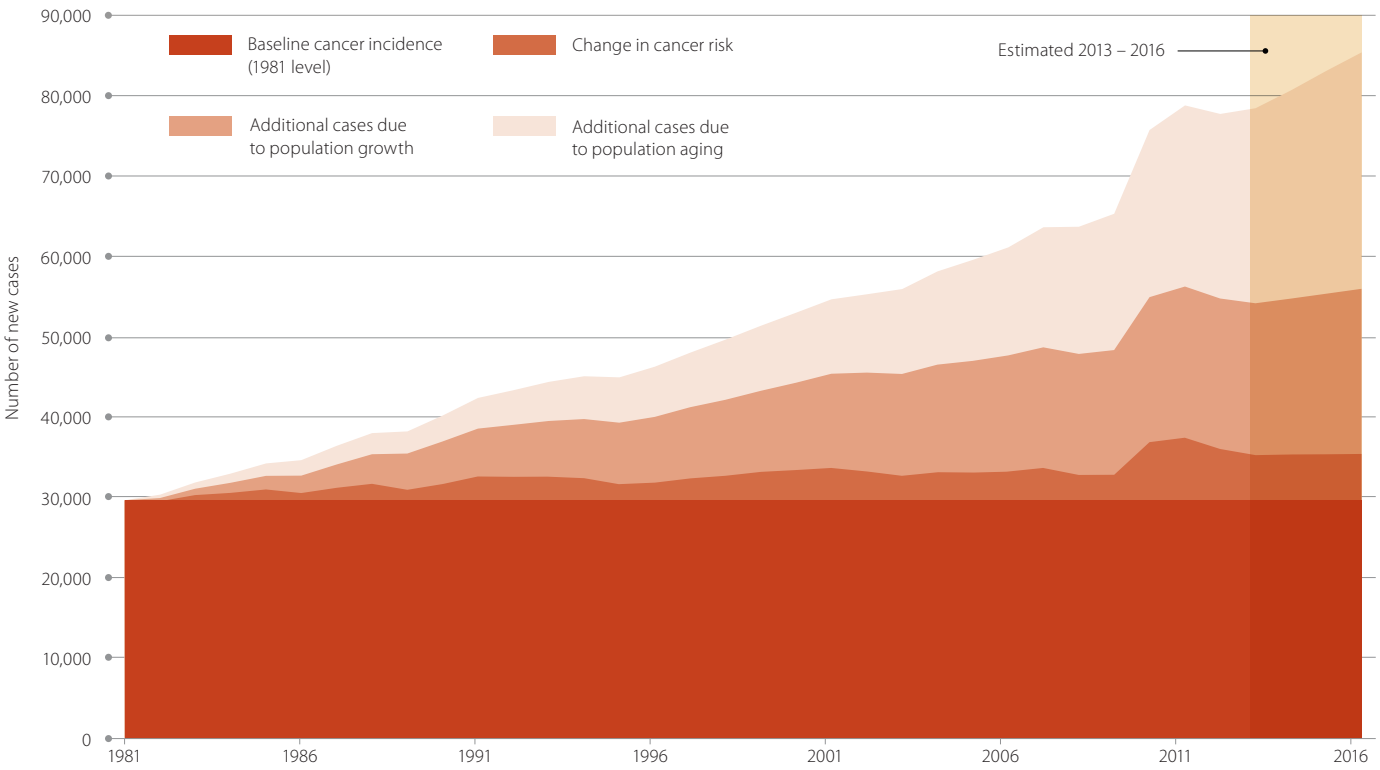
- socio-demographic factors;
- the availability of early detection and screening for cancer; and
- the prevalence of risk factors.

Risk factors can include unhealthy behaviours (e.g., smoking, poor diet, alcohol consumption and physical inactivity), non-modifiable factors (e.g., age at menarche and menopause), lifestyle factors (e.g., oral contraceptive or hormone-replacement therapy use), exposure to certain environmental and occupational carcinogens (e.g., radon, certain viral infections and air pollution), and genetic predispositions (e.g., BRCA1 and BRCA2 gene mutations).

Over the past three decades, aging of the population and population growth contributed far more to the number of new cancer cases than actual changes in cancer risk and cancer control practices (**Figure 2.1**). In 2016, approximately 85,648 new cases of cancer are expected to be diagnosed, representing a 188.9% increase over the 29,649 cancer cases diagnosed in 1981. Of this 188.9% increase, 89.2% will be attributable to aging of the population, 80.2% to population growth, and only 19.5% to changes in cancer risk and cancer control practices.

Over the past three decades, aging of the population and population growth contributed far more to the number of new cancer cases than actual changes in cancer risk and cancer control practices.

Figure 2.1 **Trend in incidence attributed to changes in cancer risk, population growth and aging, Ontario, 1981–2016**



Note: Rates standardized to the 2011 Canadian population
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

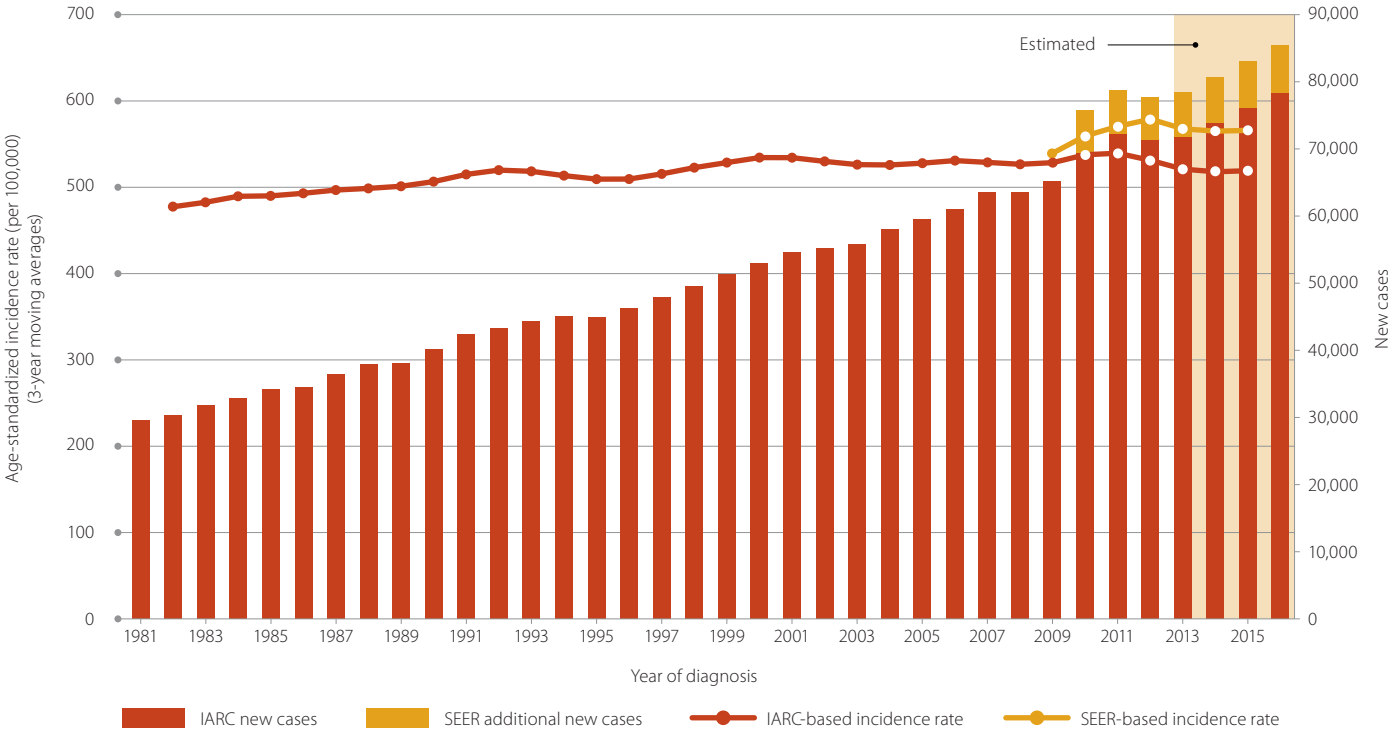
Multiple primary rules

Figures 2.2, 2.3 and **2.4** show the annual counts and age-standardized incidence rates (ASIR) for all cancers combined using the International Agency for Research on Cancer/International Association of Cancer Registries (IARC/IACR) rules for counting multiple primary cancers and, for more recent years, the Surveillance, Epidemiology and End Results (SEER) Program rules. The figures also include projected counts and rates for the years 2013–2016.

The SEER multiple primary rules were implemented for Ontario data starting with the diagnosis year 2010. The rates and counts using both methods of counting multiple primaries are presented here to illustrate the impact of the new rules. The SEER rules are more liberal than the IARC/IACR in what is considered a new primary case of cancer. As a result, the SEER rules lead to higher counts and rates.

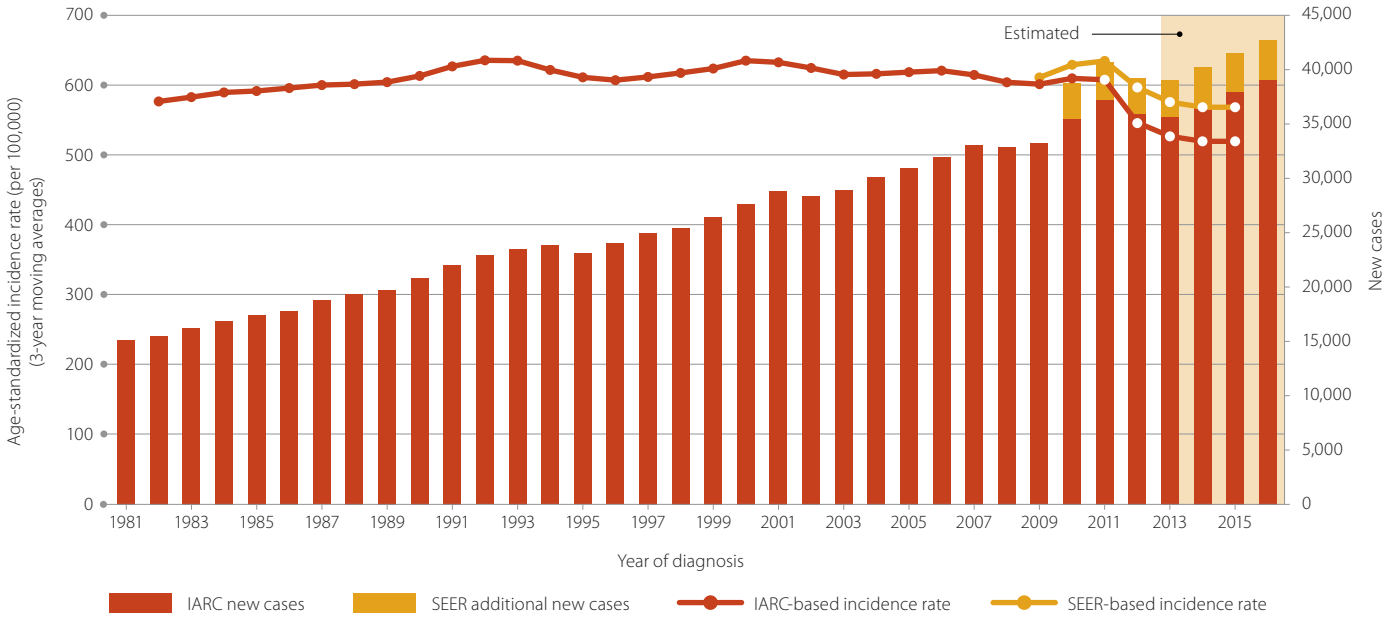
For 2012, the SEER multiple primary rules resulted in 6,295 additional cases of cancer being counted compared to the IARC/IACR rules. These additional cases are the result of a different method of counting cancers, not an actual increase in cancer incidence (see the *Technical appendix* for more details).

Figure 2.2 **Incidence counts and age-standardized rates, all cancers combined, Ontario, 1981–2016**



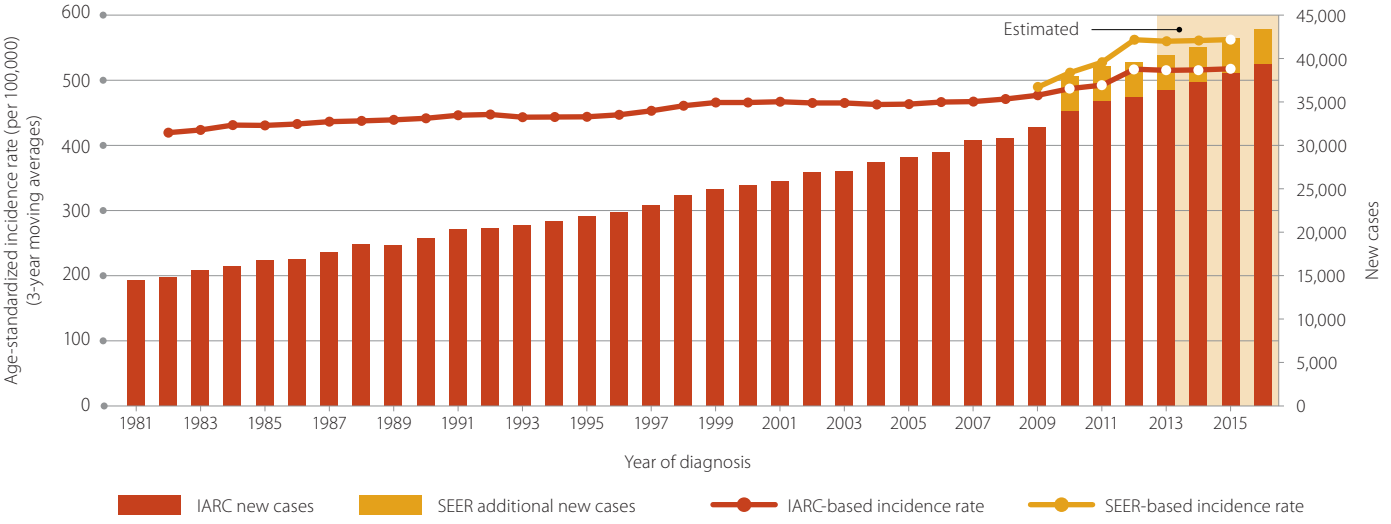
Note: Rates standardized to the 2011 Canadian population
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

Figure 2.3 **Incidence counts and age-standardized rates, all cancers combined, males, Ontario, 1981–2016**



Note: Rates standardized to the 2011 Canadian population
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

Figure 2.4 **Incidence counts and age-standardized rates, all cancers combined, females, Ontario, 1981–2016**



Note: Rates standardized to the 2011 Canadian population
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

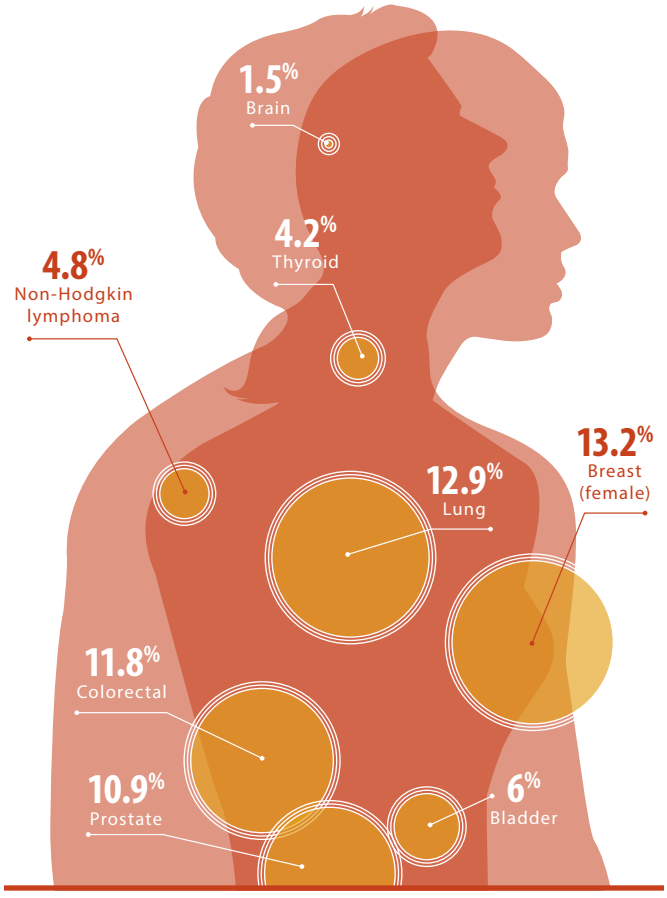
Incidence counts and rates

In 2012 (the most recent year of non-projected data available), there were 77,941 new cases of cancer in Ontario, resulting in an ASIR of 578.1 per 100,000 (**Table 2.1**). The ASIR was significantly higher in males (638.1 per 100,000) than in females (537.0 per 100,000).

The most commonly diagnosed cancers for males were prostate (21.6% of all new male cases), lung (13.3%), colorectal (12.4%) and bladder (8.9%). In females, the leading cancer types were breast (26.6% of all new female cases), lung (12.6%) and colorectal (11.1%),

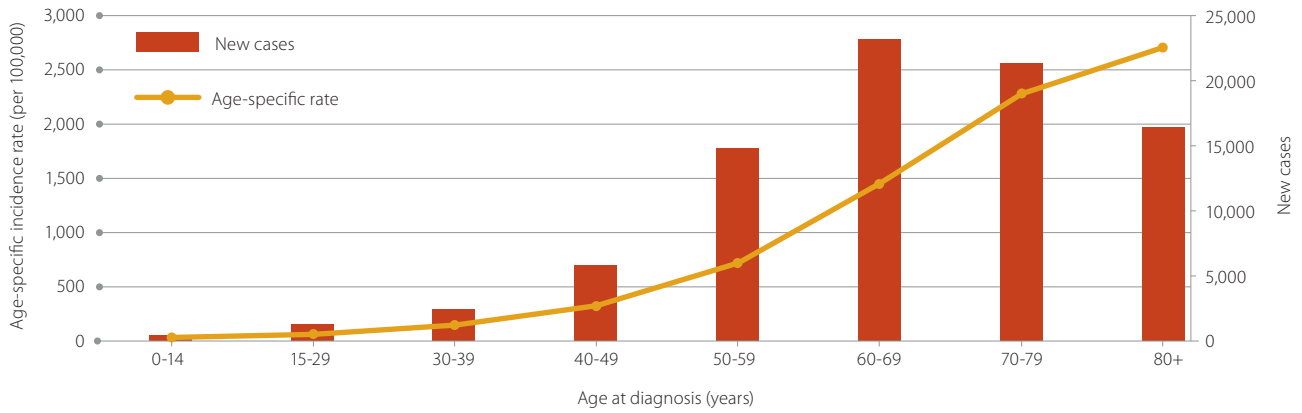
It is estimated that in 2016 the ASIR for all cancers combined will be 569.9 per 100,000, representing 85,648 new cases (data not shown). For males, the ASIR is estimated to be 614.0 per 100,000, representing 42,881 new cases. For females, the ASIR is estimated to be 540.6 per 100,000, representing 42,767 new cases. The lower estimated ASIR in males in 2016 compared to 2012 is likely due to a decline in prostate cancer cases.

Distribution of new cases for selected cancers, 2012



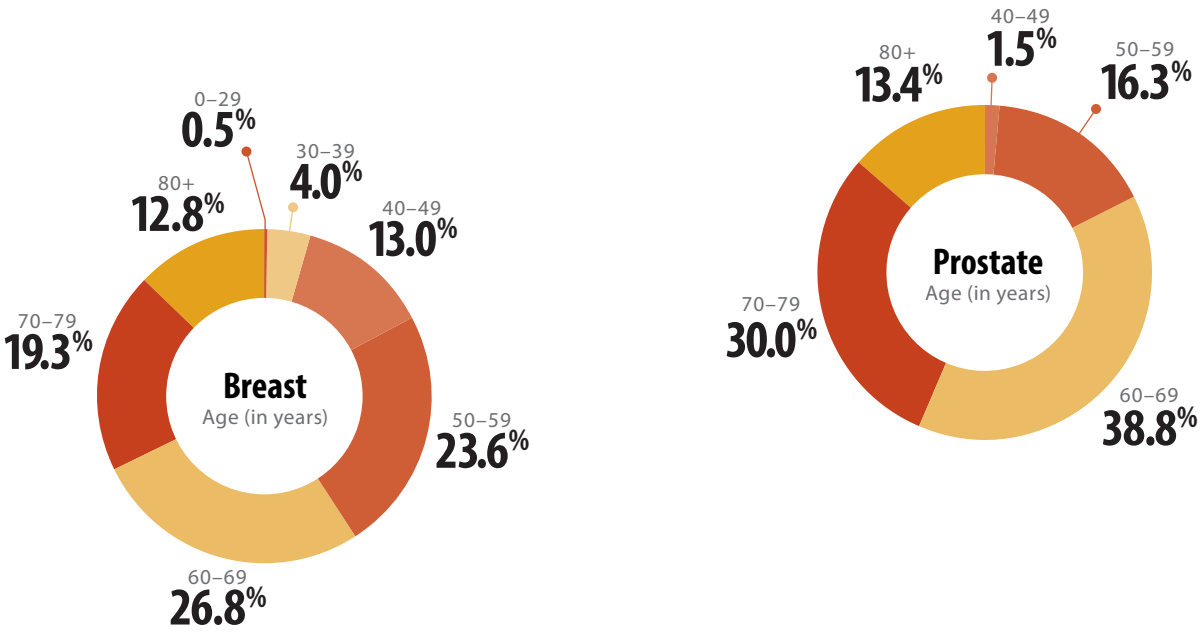
Number of new cases of cancer projected to occur in 2016

Figure 2.5 **Estimated incidence counts and age-specific rates, all cancers combined, by age group, Ontario, 2016**



Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

Figure 2.6 **Estimated distribution of most common cancers, by age group, Ontario, 2016**



Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

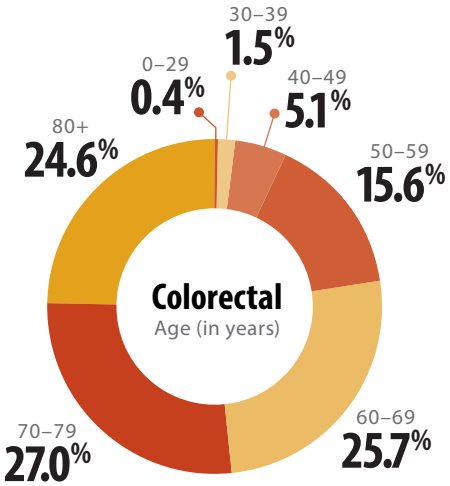
Incidence by age group

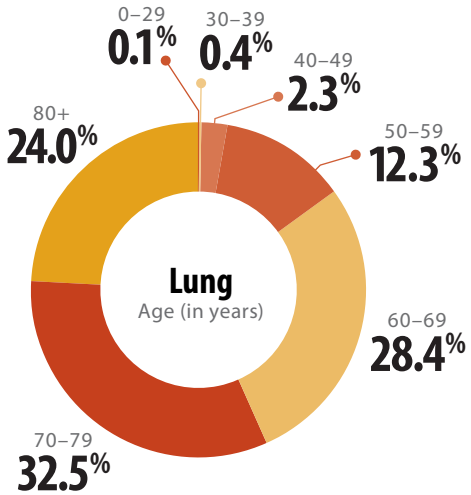
Over the past three decades, the incidence of cancer in Ontario has generally increased in every age group (**Table 2.2**). In 2016, the highest number of cases are projected to occur in people 60 years of age and older and the lowest number in children 0 to 14 years of age.

Cancer primarily affects Ontarians over the age of 50. In 2016, 88.4% of all new cases will be diagnosed in people in this age group (**Figure 2.5**). Incidence by age group is projected as follows:

- 19.2% of all new cases will occur in people 80 years of age or older.
- 24.9% of all new cases will occur in people 70 to 79 years of age.
- 27.1% of all new cases will occur in people 60 to 69 years of age.
- 17.2% of all new cases will occur in people 50 to 59 years of age.
- 9.6% of all new cases will occur in people between 30 and 49 years of age.
- Less than 3% of all new cases will occur in people under the age of 30.

In 2016, the greatest proportion of new cases of female breast and prostate cancers are projected to occur in people 60 to 69 years of age. This age group will account for 26.8% of all new cases of female breast cancer and 38.8% of all new cases of prostate cancer (**Figure 2.6**). Lung and colorectal cancer incidence rates will peak in people 70 to 79 years of age, with 32.5% of all new lung cancer cases and 27.0% of all new colorectal cancer cases occurring in this age group. More than half of all new lung and colorectal cancer cases will be in people 70 years of age and older.





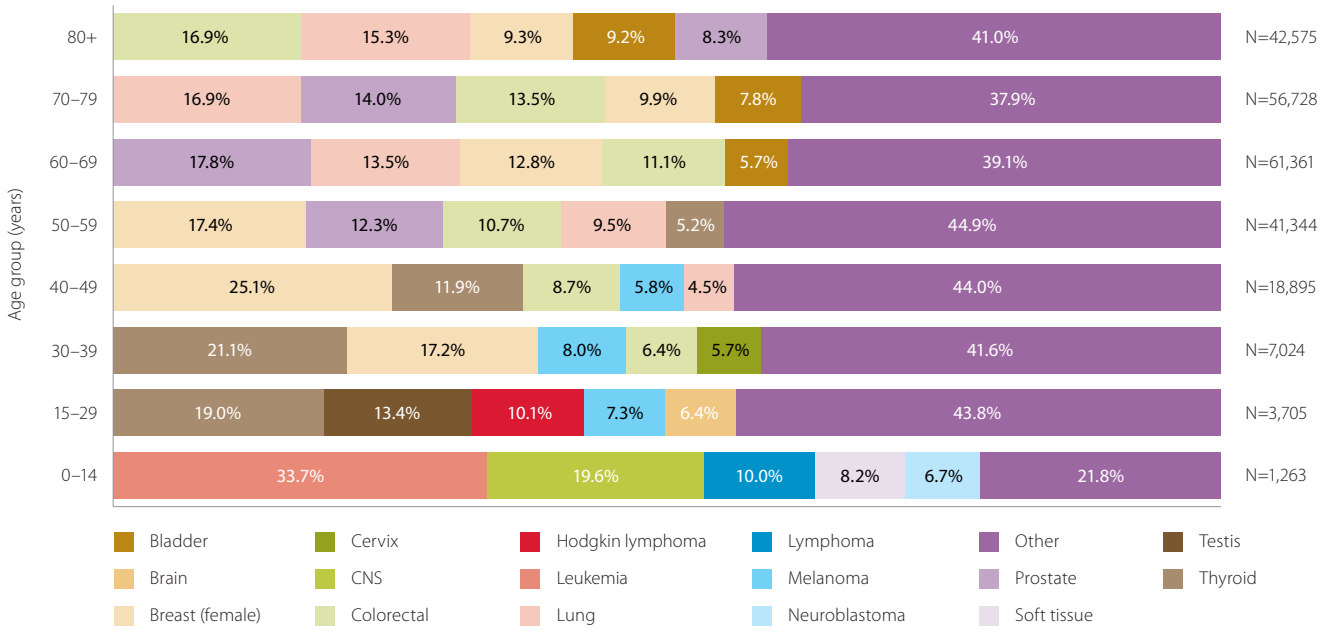
Cancer type distribution by age group

In 2012, the median age at cancer diagnosis was 66 years. The median age at diagnosis was higher for males (68 years) than females (65 years) (see **Table DA.3** in the *Data appendix*). Bladder cancer had the highest median age of diagnosis among males (74 years) and females (76 years). The lowest median age at diagnosis was for testicular cancer (33 years) among males and Hodgkin lymphoma (34 years) among females.

Between 2010 and 2012, the most common childhood cancers were leukemia (33.7%) and central nervous system (CNS) cancers. These cancer types accounted for more than half of all the cancers in children 0 to 14 years of age (**Figure 2.7**). Lymphomas, soft tissue cancers and neuroblastomas were also among the more common childhood cancers. The most common cancers in adolescents and young adults (15 to 29 years of age) were thyroid cancer (19.0%), followed by testicular cancer, Hodgkin lymphoma, melanoma and brain cancer.

Thyroid and female breast were the two most commonly diagnosed cancers among people 30 to 49 years of age, representing more than one-third of all the cancers in these age groups. Among people 50 to 59 years of age, female breast (17.4%) and prostate (12.3%) were the most common cancers. Prostate cancer (17.8%) was also the most commonly diagnosed cancer among those 60 to 69 years of age, followed by lung cancer (13.5%). For people 80 years of age and older, the most commonly diagnosed cancers were colorectal (16.9%) and lung (15.3%).

Figure 2.7 **Distribution of cancer incidence, by age group and cancer type, Ontario, 2010–2012**



Note: CNS=Central nervous system
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

Incidence trends over time

Between 1981 and 2012 there were two periods of significant increase in the ASIR for all cancers combined (**Table 2.3**):

- Between 1981 and 1991 the incidence rate increased by 0.8% per year.
- Between 1991 and 2012 it increased by 0.2% per year.

PROSTATE CANCER

The prostate cancer ASIR rose by 1.0% per year between 1992 and 2007, and then fell by 4.9% per year between 2007 and 2012. A peak in the incidence rate in 1993 coincided with the introduction of prostate-specific antigen (PSA) testing in 1988. An abrupt rise and fall in the incidence rate is common when a new method of early diagnosis is introduced.

There was also a large drop in the prostate cancer incidence rate between 2011 and 2012. This decline in incidence was likely due to recommendations from the U.S. Preventative Services Task Force against using PSA for screening healthy men.

FEMALE BREAST CANCER

The ASIR for breast cancer increased by 2.0% per year during the 1980s and early 1990s. This increase in the incidence rate was likely due to a rise in both opportunistic and then programmatic mammography screening through the Ontario Breast Screening Program (OBSP). The OBSP began in 1990 and resulted in increased detection of breast cancer.

Between 1992 and 2012 the incidence rate for breast cancer in women in Ontario decreased. The substantial decrease in the incidence rate that occurred around 2002 coincides with a reduction in use of hormone replacement therapy (HRT), which is associated with an increased risk of breast cancer, among post-menopausal women.[1,2]

COLORECTAL CANCER

The ASIR for colorectal cancer for both sexes combined fell by 0.4% per year between 1981 and 2012.

Among females, the changes in the colorectal cancer incidence rate were complex. The rate fell by 1.2% per year through 1996, was stable between 1996 and 1999, and fell again after 1999 (0.6% annually). These incidence rate fluctuations reflect an increase in rectal cancer between 1996 and 1999 and a steady decrease in colon cancer between 1981 and 2012 in females (data not shown).

In males, the colorectal cancer incidence rate declined steadily from the early 1980s by 0.3% per year. Individually, incidence rates for both colon and rectal cancers also declined during this period (data not shown).

Prostate cancer incidence fell by 4.9% between 2007 and 2012

Breast cancer incidence fell by 0.2% per year between 1992 and 2012

Colorectal cancer incidence fell by 0.4% per year 1981 and 2012

LUNG CANCER

In males, the ASIR for lung cancer decreased by 2.1% per year between 1989 and 2008, and then stabilized. In females, the incidence rate has been increasing since the 1980s, but the upward trend has been slowing. The female rate increased by 6.4% per year from 1981 to 1985, by 2.1% per year from 1985 to 1996, and then by 0.8% per year from 1996 to 2012.

The long-term decline in the lung cancer incidence rate in males and the slowing increase in the incidence rate in females over the last two decades reflects differences in historical smoking rates between the sexes.[3] Tobacco use is the primary cause of lung cancer, but other causes include exposure to radon, asbestos, environmental tobacco smoke and air pollution.

OTHER CANCERS

The following are noteworthy changes in incidence rates that occurred between 1981 and 2012 for cancers other than the most common types.

The ASIR for thyroid cancer increased significantly throughout the time period. The greatest increase occurred between 1998 and 2002: the ASIR increased by 12.9% per year during this period. It continued to increase, albeit at a slower pace of 6.8% per year between 2002 and 2012. This increase in the incidence rate has been attributed to improved diagnostic technology which may have allowed for detection of subclinical tumours.[4,5]

The myeloma incidence rate increased by 6.6% per year between 2008 and 2012. This increase was driven mainly by the increased ASIR in males, which went up by 6.0% per year between 2007 and 2012. The rate for females increased by 0.4% per year between 1981 and 2012. Increasing trends in other jurisdictions suggest that the rise in myeloma rates may be due to improvements in diagnostics and better case ascertainment.[6]

Changes in incidence rates between 1981 and 2012 for other cancer types are provided in **Table 2.3**.

Ten-year trends

Over the most recent 10-year period of 2003 to 2012 (**Figure 2.8**), the average annual percent change (AAPC) in ASIR for males:

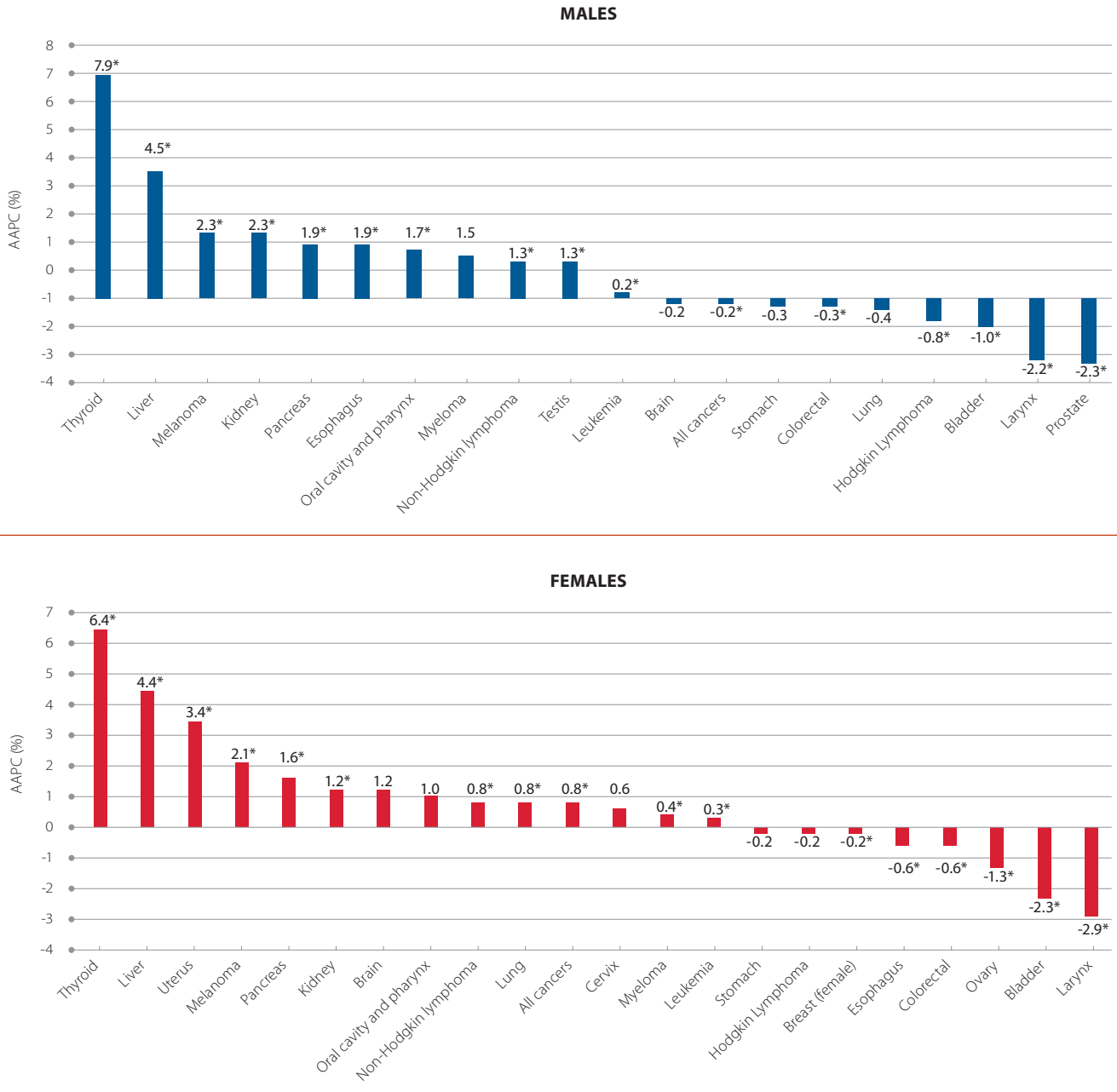
- decreased most for prostate (2.3% per year), laryngeal (2.2%) and bladder (1.0%) cancers;
- increased most for thyroid (7.9%) and liver (4.5%) cancers and melanoma (2.3%); and
- was stable for lung, stomach and brain cancers and myeloma.

Over the most recent 10-year period of 2003 to 2012 (**Figure 2.8**), the AAPC in ASIR for females:

- decreased most for laryngeal (2.9% per year), bladder (2.3%) and ovarian (1.3%) cancers;
- increased most for thyroid (6.4%), liver (4.4%) and uterine (3.4%) cancers; and
- was stable for oral cavity and pharynx, brain, cervical and stomach cancers and Hodgkin lymphoma.

Thyroid cancer incidence increased by 6.8% per year between 2002 and 2012

Figure 2.8 **Average annual percent change (AAPC) in age-standardized incidence rates, by cancer type and sex, Ontario, 2003–2012**



*Statistically significant AAPC
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

Incidence by stage at diagnosis

Stage is defined as the classification of people with cancer into prognostically similar groups according to the extent of the disease. Stage at diagnosis is the extent of the disease at the time of initial diagnosis. Knowing the stage of the disease helps physicians plan appropriate treatment and determine the likely outcome or course of the disease. A cancer diagnosed at an early stage is more likely to be treated successfully. If the cancer has spread, treatment becomes more difficult and a person's chances of survival are generally much lower.

Information about stage at diagnosis is one of the most important prognostic factors for cancer. High-quality stage data at the population level supports healthcare providers, administrators, researchers and decision-makers in planning, evaluation, and efforts to enhance quality of care and improve treatment outcomes.

Currently, Ontario data on stage at diagnosis is available for five cancers — female breast, prostate, colorectal, lung and cervix. Between 2010 and 2012, 95,143 new cases of these cancers were staged in the OCR. Of these new cancer cases, 28.8% were diagnosed at stage I, 31.9% at stage II, 18.7% at stage III and 20.6% at stage IV.

STAGE DISTRIBUTION BY AGE GROUP

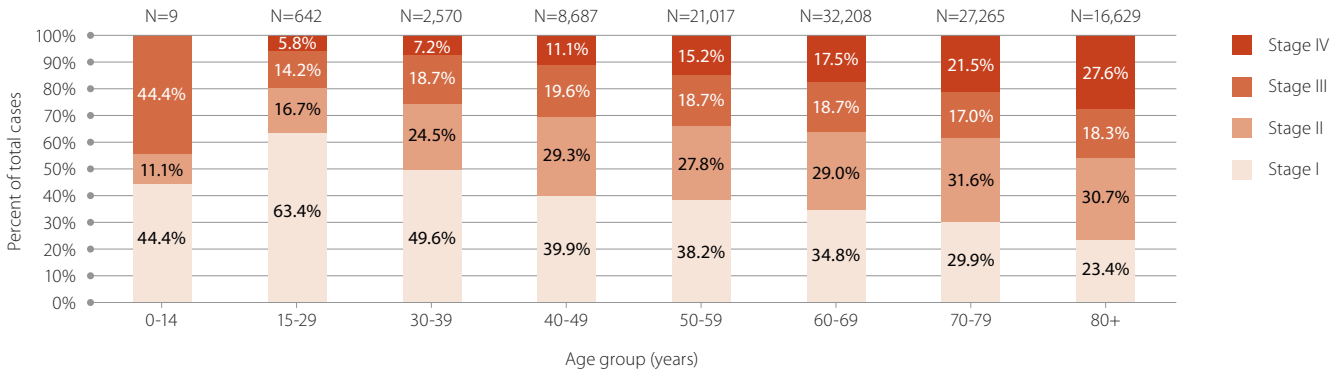
Between 2010 and 2012 the majority of new cancer cases were diagnosed at stage I or II in every age group (**Figure 2.9**). The greatest proportion of staged cancers in those aged 69 and younger were diagnosed at stage I. The proportion of cancers diagnosed at stage IV increased with age.

STAGE BY CANCER TYPE

Of the staged cancers (prostate, female breast, colorectal, lung and cervix) in 2012, lung cancer cases were the most likely to be diagnosed at stage IV. Stage IV cancers accounted for 49.4% of all staged lung cancer cases (**Table 2.4**).

The majority of colorectal cancer cases that were staged were diagnosed at stage II (26.2%) or stage III (31.4%). For breast, prostate and cervical cancers, the highest proportion of cases were stage I or II. This could be the result of organized and opportunistic screening, which may have increased detection of these cancers at early stages.

Figure 2.9 **Stage distribution of new cases, by age group, Ontario, 2010–2012**



Note: Excludes 1,609 cases of unknown stage. Figure represents stage distribution for five cancers – female breast, prostate, colorectal, lung and cervix
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

Incidence by geography

Geographic factors, such as the following, can affect incidence rates:

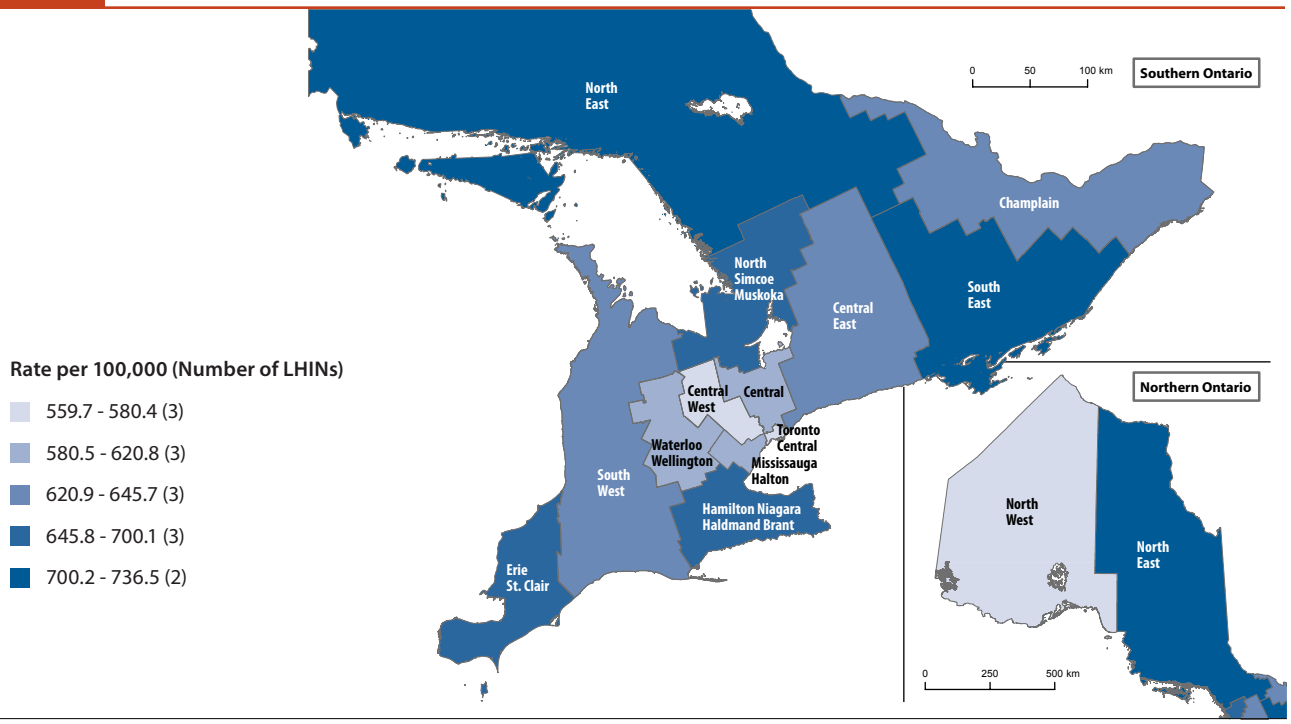
- the prevalence of risk factors
- the demographic makeup
- regional differences in diagnostic and treatment practices.

The province of Ontario can be broken down into a number of different geographic regions. Two methods to partition the province are by Local Health Integration Networks (LHINs) and Public Health Units (PHUs), which are considered here. Incidence rates by geography are presented for all cancers combined.

Among males (**Figure 2.10** and **Table DA.5** in the *Data appendix*):

- The LHINs with the lowest ASIR were in the south-central region of Ontario, which includes the Toronto area. The ASIR in the Central, the Central West, the Mississauga Halton and the Toronto Central LHINs were all significantly lower than the Ontario ASIR. The North West LHIN also had one of the lowest incidence rates.
- The North East and the South East LHINs had the highest male ASIR, both of which were significantly higher than the Ontario ASIR. Additionally, the incidence rates recorded at the Erie St. Clair and the North Simcoe Muskoka LHINs were significantly higher than the Ontario average rate.
- The rates varied substantially across the northern Ontario LHINs.

Figure 2.10 **Age-standardized incidence rates, males, by LHIN,† Ontario, 2012**



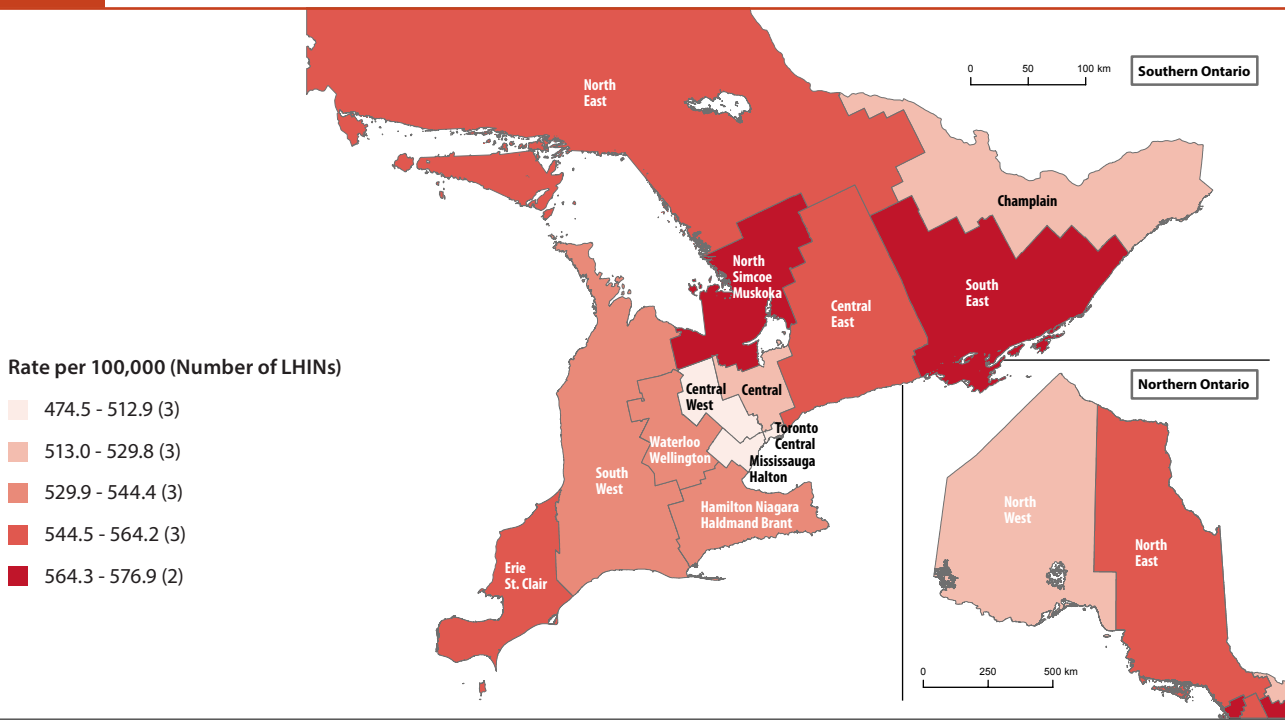
†LHIN=Local Health Integration Network
Note: Rates standardized to the 2011 Canadian population
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

Among females (**Figure 2.11** and **Table DA.6** in the Data appendix):

- Similar to the incidence rates among males, the LHINs with the lowest ASIR among females were in the south-central region of Ontario, which is made up of the Central, the Central West, the Mississauga Halton and the Toronto Central LHINs. All of these LHINs recorded significantly lower rates than the Ontario ASIR.
- The North Simcoe Muskoka and the South East LHINs recorded the highest ASIR among females. However, only the South East LHIN had a rate significantly higher than the Ontario ASIR.

LHINs with the lowest ASIR among both males and females were in the south-central region of Ontario.

Figure 2.11 **Age-standardized incidence rates, females, by LHIN,† Ontario, 2012**



†LHIN=Local Health Integration Network
Note: Rates standardized to the 2011 Canadian population
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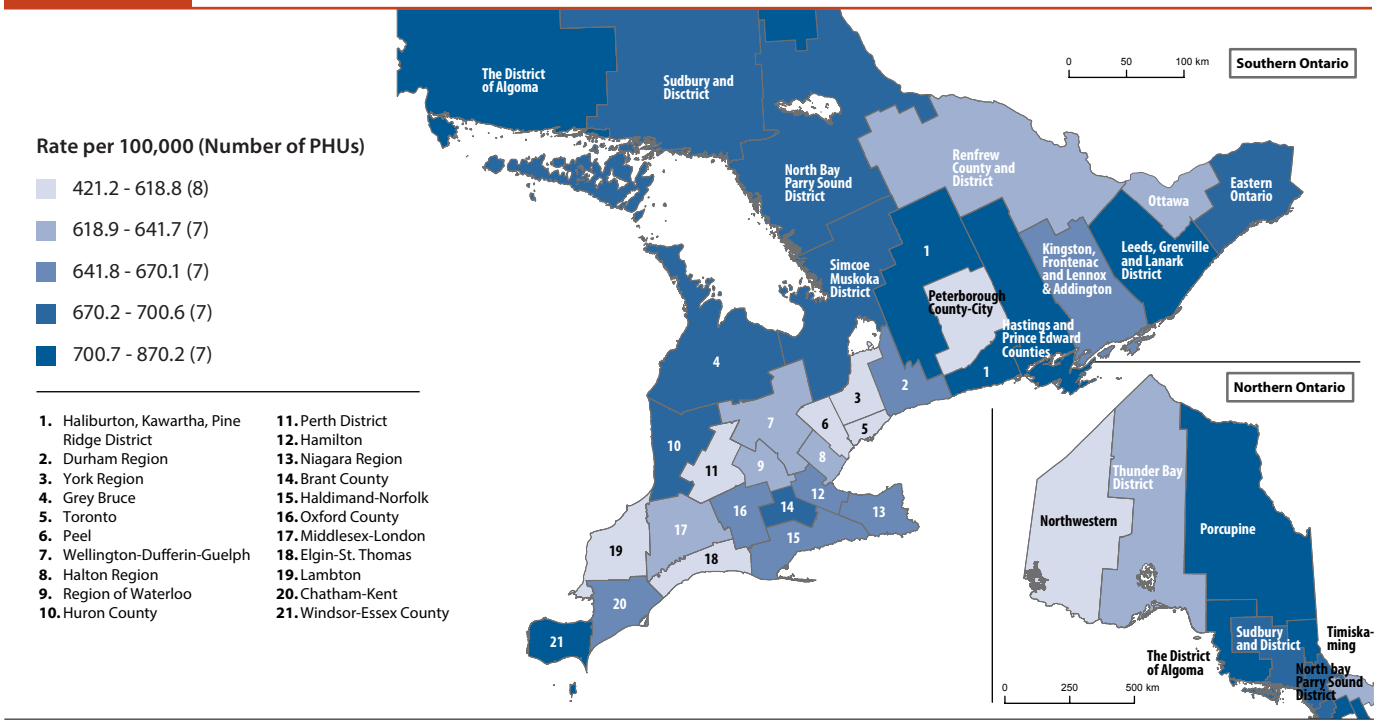
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

The additional granularity of the PHUs provides further details for the patterns observed by the LHINs. For example, among males (**Figure 2.12** and **Table DA.7** in the *Data appendix*):

- The lowest ASIR occurred in the Northwestern, Peel, Toronto and York Region PHUs, which all had significantly lower incidence rates than the Ontario ASIR. Incidence rates within the remaining southern Ontario PHUs were not significantly lower than the Ontario ASIR and were geographically dispersed.
- The highest ASIR were observed within nine PHUs located throughout the province: Timiskaming; the District of Algoma; Hastings and Prince Edward Counties; Haliburton, Kawartha, Pine Ridge District; Porcupine; Leeds, Grenville and Lanark District; Sudbury and District; Windsor-Essex County; and Simcoe Muskoka. The rates in all these PHUs were significantly higher than the Ontario ASIR with the exception of Porcupine, which had a high variance in the ASIR because of its small population.
- There was an increasing west to east gradient in male ASIR across northern Ontario, giving additional detail to the disparate incidence rates evident by LHIN.

Figure 2.12 **Age-standardized incidence rates, males, by PHU,† Ontario, 2012**

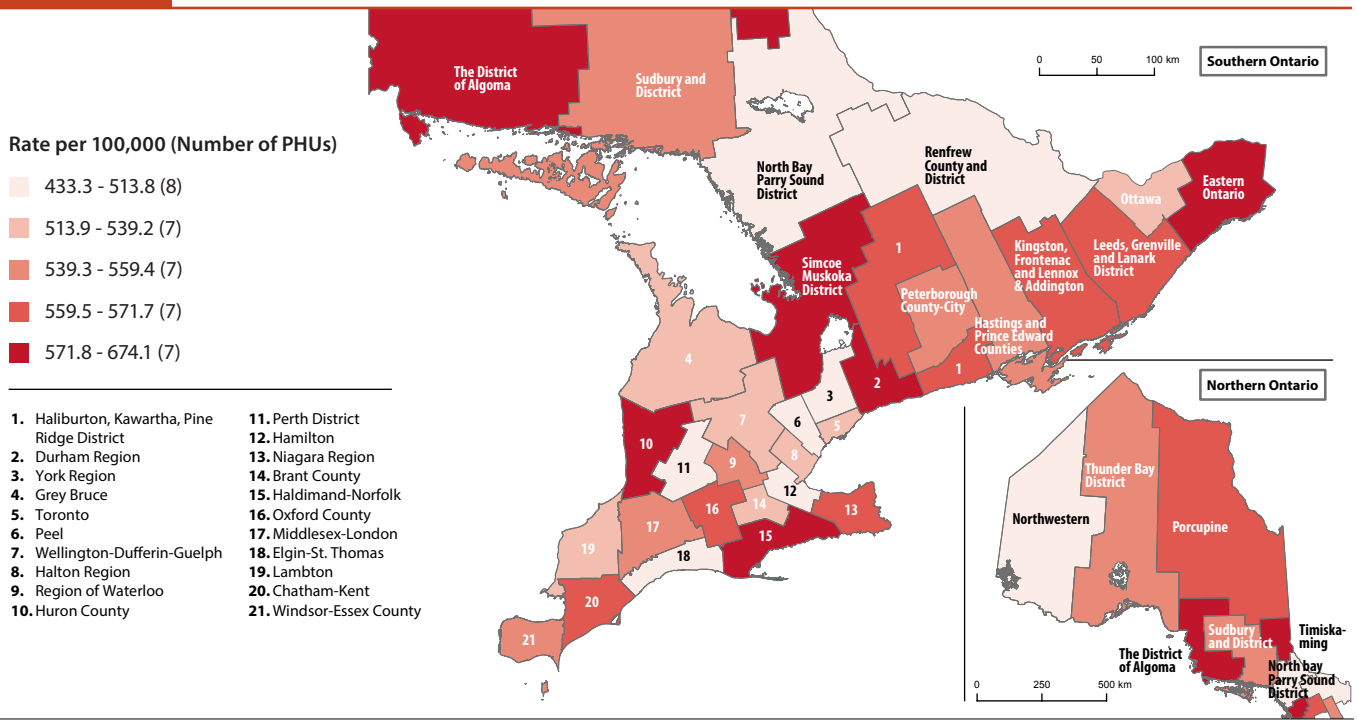


†PHU=Public Health Unit
Note: Rates standardized to the 2011 Canadian population
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

Among females (**Figure 2.13** and **Table DA.8** in the *Data appendix*):

- The Northwestern, Peel, Toronto and York Region PHUs had significantly lower ASIR. (These same PHUs had lower incidence rates for males.) Other PHUs also had low rates (e.g., Perth District and Hamilton), but they were not significantly different from the Ontario ASIR.
- The female ASIR were significantly higher than the Ontario ASIR in three of the same PHUs that had higher incidence rates for males: District of Algoma, Simcoe Muskoka District and Timiskaming. However, incidence rates for females were also significantly higher within the Durham Region, Haldimand-Norfolk, Niagara Region and Eastern Ontario PHUs compared to the Ontario rate.
- High variability in female ASIR across northern Ontario was also evident by PHU. However, higher incidence rates among females were recorded in the Algoma and Timiskaming PHUs, rather than in the Porcupine PHU (which had high incidence rates for males).

Figure 2.13 **Age-standardized incidence rates, females, by PHU,† Ontario, 2012**



†PHU=Public Health Unit
Note: Rates standardized to the 2011 Canadian population
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

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Table 2.1 Cancer incidence counts and rates, by cancer type and sex, Ontario, 2012

Cancer type	Total				Males				Females			
	New cases	% of new cases	Crude rate (per 100,000)	ASIR† (per 100,000)	New cases	% of new cases	Crude rate (per 100,000)	ASIR (per 100,000)	New cases	% of new cases	Crude rate (per 100,000)	ASIR (per 100,000)
All cancers	**77,941**	**100.0%**	**581.2**	**578.1**	**39,337**	**100.0%**	**597.2**	**638.1**	**38,604**	**100.0%**	**565.8**	**537.0**
Bladder	4,696	6.0%	35.0	34.7	3,500	8.9%	53.1	58.2	1,196	3.1%	17.5	16.0
Brain	1,198	1.5%	8.9	8.9	660	1.7%	10.0	10.4	538	1.4%	7.9	7.6
Breast (female)	10,283	13.2%	150.7	145.1	—	—	—	—	10,283	26.6%	150.7	145.1
Cervix	621	0.8%	9.1	9.0	—	—	—	—	621	1.6%	9.1	9.0
Colorectal	9,172	11.8%	68.4	67.9	4,897	12.4%	74.3	80.2	4,275	11.1%	62.7	57.7
Esophagus	840	1.1%	6.3	6.2	646	1.6%	9.8	10.5	194	0.5%	2.8	2.6
Hodgkin lymphoma	358	0.5%	2.7	2.7	203	0.5%	3.1	3.1	155	0.4%	2.3	2.3
Kidney	2,079	2.7%	15.5	15.4	1,316	3.3%	20.0	20.9	763	2.0%	11.2	10.7
Larynx	405	0.5%	3.0	3.0	341	0.9%	5.2	5.5	64	0.2%	0.9	0.9
Leukemia	2,311	3.0%	17.2	17.1	1,351	3.4%	20.5	22.1	960	2.5%	14.1	13.1
Liver	1,104	1.4%	8.2	8.2	759	1.9%	11.5	12.3	345	0.9%	5.1	4.7
Lung	10,072	12.9%	75.1	74.5	5,223	13.3%	79.3	86.1	4,849	12.6%	71.1	66.3
Melanoma	3,074	3.9%	22.9	22.8	1,732	4.4%	26.3	28.1	1,342	3.5%	19.7	18.8
Myeloma	1,222	1.6%	9.1	9.0	691	1.8%	10.5	11.4	531	1.4%	7.8	7.1
Non-Hodgkin lymphoma	3,726	4.8%	27.8	27.6	2,087	5.3%	31.7	33.7	1,639	4.2%	24.0	22.6
Oral cavity and pharynx	1,912	2.5%	14.3	14.2	1,313	3.3%	19.9	20.8	599	1.6%	8.8	8.2
Ovary	1,157	1.5%	17.0	16.3	—	—	—	—	1,157	3.0%	17.0	16.3
Pancreas	1,862	2.4%	13.9	13.8	931	2.4%	14.1	15.1	931	2.4%	13.6	12.5
Prostate	8,500	10.9%	129.0	136.2	8,500	21.6%	129.0	136.2	—	—	—	—
Stomach	1,478	1.9%	11.0	10.9	927	2.4%	14.1	15.1	551	1.4%	8.1	7.4
Testis	429	0.6%	6.5	6.5	429	1.1%	6.5	6.5	—	—	—	—
Thyroid	3,282	4.2%	24.5	24.6	770	2.0%	11.7	11.9	2,512	6.5%	36.8	36.8
Uterus	2,527	3.2%	37.0	35.9	—	—	—	—	2,527	6.5%	37.0	35.9

†ASIR=Age-standardized incidence rate
Note: Rates standardized to the 2011 Canadian population
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

Table 2.2 **Incidence counts and age-specific rates, all cancers combined, by age group, Ontario, 1986, 1996, 2006, 2016**

	Year							
	1986		1996		2006		2016 (estimates)	
Age group	New cases	Age-specific rate (per 100,000)	New cases	Age-specific rate (per 100,000)	New cases	Age-specific rate (per 100,000)	New cases	Age-specific rate (per 100,000)
0–14	327	17.1	323	14.3	339	15.4	395	17.9
15–29	846	33.4	821	35.4	1,065	42.0	1,227	44.0
30–39	1,484	96.0	1,967	100.2	2,072	113.6	2,297	124.8
40–49	2,772	260.5	4,118	255.4	5,506	266.2	5,425	292.7
50–59	5,695	600.7	6,772	614.8	11,386	681.2	13,732	649.8
60–69	9,381	1,206.0	12,221	1,346.7	15,109	1,418.8	21,319	1,306.4
70–79	9,207	2,001.1	13,226	2,112.3	15,658	2,111.7	19,290	2,052.9
80+	4,938	2,396.6	6,895	2,336.4	10,092	2,293.0	14,867	2,434.6

Notes: New cases and rates are calculated based on IARC rules to compare over time
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

Table 2.3 Annual percent change (APC) in age-standardized incidence rates, by cancer type and sex, 1981–2012

Cancer type	Both Sexes			Males			Females		
	Period	APC		Period	APC		Period	APC	
All cancers	**1981–1991**	**0.8**	↑	**1981–1992**	**0.9**	↑	**1981–2008**	**0.4**	↑
	1991–2012	**0.2**	↑	**1992–2012**	**-0.2**	↓	**2008–2012**	**1.2**	↑
Bladder†	1989–2012	-0.9	↓	1989–2012	-1.0	↓	1989–2003	-0.4	
							2003–2012	-2.3	↓
Brain	1981–2006	-0.5	↓	1981–2012	-0.2		1981–2008	-0.5	↓
	2006–2012	1.6					2008–2012	3.5	
Breast (female)							1981–1992	2.0	↑
							1992–2012	-0.2	↓
Cervix							1981–2006	-2.1	↓
							2006–2012	2.0	
Colorectal	1981–2012	-0.4	↓	1981–2012	-0.3	↓	1981–1996	-1.2	↓
							1996–1999	1.3	
							1999–2012	-0.6	↓
Esophagus	1981–2007	0.1		1981–2006	0.4	↑	1981–2012	-0.6	↓
	2007–2012	2.7	↑	2006–2012	2.7	↑			
Hodgkin lymphoma	1981–2012	-0.5	↓	1981–2012	-0.8	↓	1981–2012	-0.2	
Kidney	1981–1989	5.2	↑	1981–1989	4.6	↑	1981–1985	11.4	↑
	1989–1997	-0.4		1989–2001	0.0		1985–2012	1.2	↑
	1997–2012	1.8	↑	2001–2012	2.3	↑			
Larynx	1981–2012	-2.2	↓	1981–2012	-2.2	↓	1981–1988	3.2	
							1988–2012	-2.9	↓
Leukemia	1981–2012	0.3	↑	1981–2012	0.2	↑	1981–2012	0.3	↑
Liver	1981–2012	4.5	↑	1981–2012	4.5	↑	1981–2012	4.4	↑
Lung	1981–1989	1.2	↑	1981–1989	-0.1		1981–1985	6.4	↑
	1989–2008	-0.8	↓	1989–2008	-2.1	↓	1985–1996	2.1	↑
	2008–2012	1.9	↑	2008–2012	1.8		1996–2012	0.8	↑

†Bladder cancer trend begins at 1989 due to classification changes and excludes carcinomas in situ
Notes: Statistically significant changes in trend and their direction are indicated by corresponding arrows.
Rates standardized to the 2011 Canadian population
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

Table 2.3 *(Cont'd)* **Annual percent change (APC) in age-standardized incidence rates, by cancer type and sex, 1981–2012**

Cancer type	Both Sexes			Males			Females		
	Period	APC		Period	APC		Period	APC	
Melanoma	1981–1987	5.2	↑	1981–1988	5.7	↑	1981–1987	4.1	↑
	1987–1992	-1.4		1988–1992	-1.4		1987–1992	-2.5	
	1992–2012	2.2	↑	1992–2012	2.3	↑	1992–2012	2.1	↑
Myeloma	1981–2004	0.7	↑	1981–2004	0.6	↑	1981–2012	0.4	↑
	2004–2008	-3.1		2004–2007	-5.2				
	2008–2012	6.6	↑	2007–2012	6.0	↑			
Non-Hodgkin lymphoma	1981–1994	2.1	↑	1981–1990	2.6	↑	1981–1997	1.9	↑
	1994–2012	1.1	↑	1990–2012	1.3	↑	1997–2012	0.8	↑
Oral cavity and pharynx	1981–2003	-1.5	↓	1981–2003	-2.0	↓	1981–2003	-0.8	↓
	2003–2012	1.5	↑	2003–2012	1.7	↑	2003–2012	1.0	
Ovary							1981–2002	0.3	↑
							2002–2012	-1.3	↓
Pancreas	1981–2006	-0.7	↓	1981–2004	-1.3	↓	1981–2006	-0.3	↓
	2006–2012	3.0	↑	2004–2012	2.3	↑	2006–2012	2.6	↑
Prostate				1981–1989	2.1				
				1989–1992	10.9				
				1992–2007	1.0	↑			
				2007–2012	-4.9	↓			
Stomach	1981–2007	-1.9	↓	1981–2008	-1.9	↓	1981–1998	-2.9	↓
	2007–2012	1.6		2008–2012	1.8		1998–2012	-0.2	
Testis				1981–2012	1.3	↑			
Thyroid	1981–1998	4.7	↑	1981–1998	4.3	↑	1981–1998	4.9	↑
	1998–2002	12.9	↑	1998–2012	7.9	↑	1998–2002	14.6	↑
	2002–2012	6.8	↑				2002–2012	6.4	↑
Uterus							1981–1989	-2.4	↓
							1989–2006	0.6	↑
							2006–2012	4.8	↑

†Bladder cancer trend begins at 1989 due to classification changes and excludes carcinomas in situ
Notes: Statistically significant changes in trend and their direction are indicated by corresponding arrows.
Rates standardized to the 2011 Canadian population
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: CCO SEER*Stat Package Release 10—OCR (August 2015)

Table 2.4 Distribution of new cases and age-standardized rates, by stage, Ontario, 2012

Cancer type	Stage I		Stage II		Stage III		Stage IV	
	% of cases	Age-standardized rate (per 100,000)	% of cases	Age-standardized rate (per 100,000)	% of cases	Age-standardized rate (per 100,000)	% of cases	Age-standardized rate (per 100,000)
Breast (female)	43.5	29.3	37.5	25.3	13.9	9.4	5.1	3.4
Cervix[†]	57.6	4.5	15.0	1.2	15.2	1.2	12.2	1.0
Colorectal	23.5	11.9	26.2	13.3	31.4	16.0	18.9	9.6
Lung	20.5	11.7	9.0	5.1	21.1	12.0	49.4	28.1
Prostate	23.8	26.7	53.7	61.2	13.8	15.3	8.7	10.4

[†]Due to the low number of cases of cervix cancer, the results provided are based on the combined data for 2011 and 2012.
Note: Stage 0 (in situ) cases: lung n=34; colorectal n=451, breast n=1,617; prostate n=923; cervix=6,253
Analysis by: Surveillance, Analytics and Informatics, CCO
Data source: Ontario Cancer Registry (November 2015), CCO