

HEALTH SURVEILLANCE INDICATORS: MELANOMA SKIN CANCER



Public Health Relevance

Skin cancer is the most common type of cancer in Canada. Melanoma is the rarest form of skin cancer but is the most deadly. The lifetime probability of getting melanoma in Canada is 1 in 57 for men and 1 in 74 for women. In addition to melanoma, other skin cancers include basal cell carcinoma and squamous cell carcinoma. These cancers have low mortality rates but can cause pain and discomfort and often require surgery and/or radiation therapy.

The main risk factor for all skin cancers is exposure to the sun's ultraviolet radiation. Sun safety behaviours may decrease the risk of melanoma and other skin cancers. These behaviours include: staying indoors between 11am and 4pm, and whenever the UV index is 3 or higher; when outside, seeking shade, wearing protective clothing, a wide breemed hat and sunglasses, and applying sunscreen regularly. Avoiding tanning beds and sunlamps may also reduce your risk of skin cancer.

Highlights

1. Melanoma incidence, hospitalization and mortality rates in Toronto remained stable from 2003 to the most recent year of data available.
2. Melanoma incidence was significantly lower in Toronto compared to the rest of the Greater Toronto Area (GTA) and the rest of Ontario.
3. Humber-Downsview had a significantly lower mortality rate compared to Toronto as a whole.
4. Melanoma hospitalization and mortality rates in Income Quintile 1 and 2 (the two lowest income quintiles) were significantly lower compared to Quintile 5.

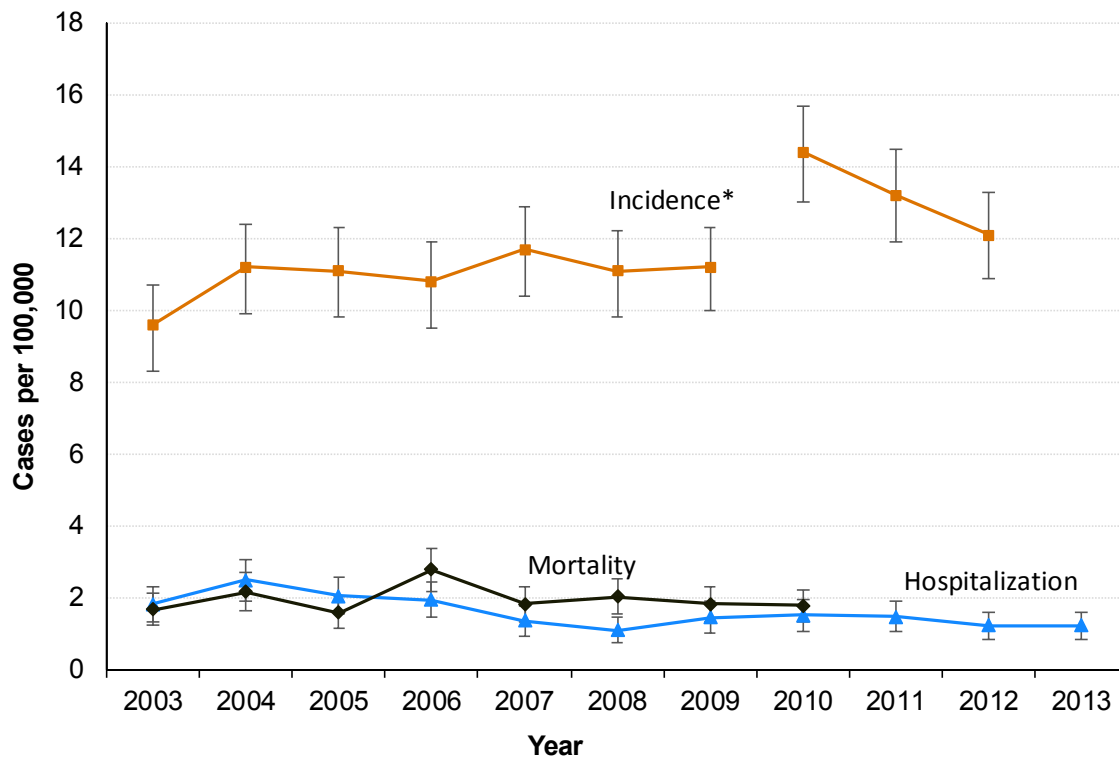
Trends Over Time

Melanoma incidence, hospitalization and mortality rates in Toronto remained stable from 2003 to the most recent year of data available.

Figure 1 shows age-standardized melanoma incidence, hospitalization and mortality rates. Melanoma incidence remained stable over time at about 11 cases per 100,000. In 2012 the rate was 12 cases per 100,000, however, the rates for 2010 and later cannot be directly compared to previous years since a change was made in 2010 in the way new cancer cases were counted (please see data notes for details).

Hospitalization and mortality rates also remained stable from 2003 to the most recent year of data available.

Figure 1: Age-Standardized Melanoma Incidence*, Hospitalization, and Mortality Rates for Melanoma Skin Cancer per 100,000 People, Toronto, 2003 to 2013**



* Incidence: A new rule for counting cancer cases was adopted from 2010 onwards, Please see data note 6 on page 7.

** Data are presented to the most recent year available. Incidence includes data to 2012 hospitalization to 2013, and mortality to 2010.

Error bars (I) represent 95% confidence intervals.

Data Sources: see Data Notes.

Regional Comparisons

Melanoma incidence was significantly lower compared to the rest of the GTA and the rest of Ontario.

Figure 2 shows age-standardized melanoma incidence for Toronto compared to the rest of Ontario (Ontario excluding Toronto), the rest of the Greater Toronto Area (GTA excluding Toronto), and the Ontario health units with the highest and lowest incidence rates.

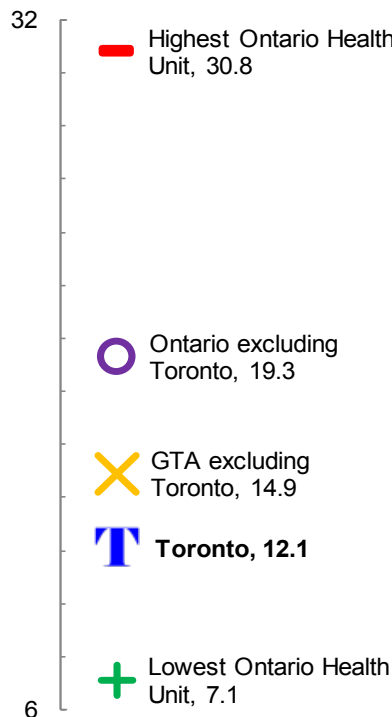
Incidence in Toronto was significantly lower compared to the rest of the GTA and the rest of Ontario and not significantly different compared to the Ontario health unit with the lowest rates.

Toronto's hospitalization rate (1.2 cases per 100,000; 2013) was not significantly different compared to the rest of the GTA (1.3) and the rest of Ontario (1.6).

Toronto's mortality rate (1.8 deaths per 100,000; 2010) was significantly lower compared to the rest of Ontario (2.6), but not significantly different compared to the rest of the GTA.

Hospitalization and mortality rates for the highest and lowest Ontario health units are not releasable due to low counts.

Figure 2: Age-Standardized Melanoma Incidence rate per 100,000, Selected Regions in Ontario, 2012.



Data Sources: see Data Notes.

Toronto Neighbourhood Comparisons

Humber-Downsview had a lower mortality rate compared to Toronto as a whole. Table 1 shows age-standardized melanoma hospitalization and mortality rates, for Toronto Public Health's Chronic Disease and Injury Prevention Program's (CDIP) Service Delivery Areas (SDAs). There were no significant differences in rates between the SDAs compared to Toronto as a whole with the exception of one significantly lower rate in:

- Humber-Downsview (mortality rate).

There are no data available on incidence rates for Toronto sub-regions.

Table 1: Age-Standardized Melanoma Hospitalization and Mortality Rates, by Service Delivery Area*, Toronto

CDIP Service Delivery Area	Hospitalization (2009 to 2013 combined)	Mortality (2006 to 2010 combined)
Rexdale Etobicoke	2.3	3.0
York South Humber	2.6	2.4
Humber-Downsview	1.3	0.8 ^L
Willowdale Don Mills	1.8	2.2
Toronto Centre	2.4	2.4
Danforth East York	2.3	2.8
West Scarborough	0.9	1.8
East Scarborough	1.7	2.2
Toronto	1.4	2.0

* Toronto Public Health's Service Delivery Areas (SDAs) for Chronic Disease and Injury Prevention (CDIP)

^L Significantly lower than the Toronto total indicating a more favourable result for that area.

Data Sources: see Data Notes.

Socio-demographics

Melanoma hospitalization and mortality rates in Income Quintile 1 and 2 (the two lowest income quintiles) were significantly lower compared to Quintile 5.

Table 2 shows Toronto age-standardized melanoma incidence, hospitalization and mortality rates per 100,000 by sex. Incidence and mortality rates in males were significantly higher compared to females, but not significantly different for hospitalization.

Table 2: Age-Standardized Melanoma Incidence, Hospitalization, and Mortality Rates per 100,000 People by Sex, Toronto

Sex	Incidence (2012)	Hospitalization (2013)	Mortality (2010)
Male	14.5 ^H	1.1	2.9 ^H
Female	10.5 ^L	0.6	1.0 ^L

^H Significantly higher than the other sex indicating a less favourable result for this group.

^L Significantly lower than the other sex indicating a more favourable result for this group.

Data Sources: see Data Notes.

Table 3 shows Toronto melanoma incidence, hospitalization, and mortality rates per 100,000 for three age groups. Rates increased as age increased for incidence, hospitalization and mortality.

Table 3: Melanoma Incidence, Hospitalization, and Mortality Rates per 100,000 People by Age Group, Toronto

Age	Incidence (2012)	Hospitalization (2013)	Mortality (2010)
20 to 39 years	4.2	0.1	0.2
40 to 64 years	17.1	2.1	2.1
65 plus years	58.0	6.0	10.5
Toronto	12.1	1.2	1.8

Data Sources: see Data Notes.

Table 4 shows age-standardized melanoma hospitalization and mortality rates per 100,000 people by income quintile. Quintile 1 includes areas in Toronto with the highest percent of people living below the low income measure (LIM), making it the lowest income quintile. Quintile 5 includes areas in Toronto with the lowest percent of people living below the LIM, making it the highest income quintile.

The two lowest income groups (Quintile 1 and 2) had significantly lower hospitalization and mortality rates compared to the highest income group (Quintile 5). Other income groups (Quintile 3 and 4) had no significant difference in hospitalization and mortality rates compared to the highest income group.

Table 4: Age-standardized Melanoma Hospitalization and Mortality Rates per 100,000 People by Income Quintile, Toronto

Income Level	Hospitalization (2009 to 2013 combined)	Mortality (2006 to 2010 combined)
Quintile 1 (lowest)	1.0 ^L	1.0 ^L
Quintile 2	1.1 ^L	1.2 ^L
Quintile 3	1.2	2.2
Quintile 4	1.4	2.3
Quintile 5 (highest)	2.1	2.8

^L Significantly lower than Quintile 5, the highest income group, indicating a health inequality and more favourable result for this group.

Data Sources: see Data Notes.

Data Notes

Notes

- Significant differences were estimated using overlapping confidence intervals. Although this method is conservative ($\alpha \sim < 0.01$) and most appropriate when comparing mutually exclusive groups, it was chosen as an objective means of making conclusions on population-based data. Multiple comparisons performed in the analysis were not taken into consideration when choosing the level of significance to test. The inverse chi-squared distribution is used by the U.S. National Cancer Institute's SEER*Stat program and has been adopted by Cancer Care Ontario to calculate confidence intervals for age-standardized cancer incidence rates in Ontario. The Poisson distribution, the standard used by Toronto Public Health, was used to calculate confidence intervals for age-standardized cancer hospitalization and mortality rates.
- Toronto is compared to the rest of Ontario (Ontario with Toronto removed) as opposed to the Ontario total because Toronto comprises such a large proportion of the Ontario population. Toronto is also compared to the rest of the Greater Toronto Area (GTA) for the same reason.
- Tables 1 and 4 are based on five years of data combined in order to obtain a sample size large enough to analyze at smaller geographic levels or income groups. By combining years of data, changes over time in and between geographic areas may be hidden.
- For comparisons of smaller geographic areas, any person who could not be linked to a valid Toronto postal code was excluded from the total.
- Rates (except for age-specific rates) are age-standardized to the 1991 Canadian population. This allows for comparison of rates over time and geography. Because the standard population's distribution is younger than the current Toronto population, the age-standardized rates are lower than the true rates.
- For cancer cases diagnosed from 2010 onwards, the new Ontario Cancer Registry (OCR) adopted the Surveillance, Epidemiology and End Results (SEER) rules for identifying multiple primary cancers and assigning histology to cases, due to greater recognition of multiple primaries. Prior to 2010, the OCR did not recognize a second primary cancer unless it differed substantially from the first primary on both topography and morphology. With the new rules, the number of newly diagnosed cancer cases registered by the OCR in 2010 to 2012 is 5.8 percent higher than the number of cases that would have been reported using the old rules. The impact of the change in multiple primary rules varies by cancer. This does not mean more people are being diagnosed or treated, just that more cases of certain types of cancer are being registered. This impacts understanding trends over time for cancer incidence. The line graph has a gap between 2009 and 2010 to show where this change occurred.

Definitions

95% Confidence Interval is the range within which the true value lies, 19 times out of 20.

Age Standardization is a technique based on weighted averaging which removes the effects of the distribution of age when comparing two or more populations.

GTA excluding Toronto means the Greater Toronto Area (GTA) with Toronto removed from the GTA data.

Hospitalization includes people who have stayed in a hospital bed overnight because of melanoma. It counts hospital admissions not individual people, such that if an individual was hospitalized two times in a year they would be counted twice.

Incidence includes people who were diagnosed with melanoma by a medical professional.

Income Quintiles: Five groups, each containing approximately 20% of the population, were created by ranking Toronto's census tracts based on the percent of residents living below the Statistics Canada after-tax Low Income Measure (LIM). Quintile 1 includes the census tracts with the highest percent of people living below the LIM and is therefore the lowest income quintile. Quintile 5 includes the census tracts with the lowest percent of people living below the LIM, making it the highest income quintile. LIM is an income level set at 50% of the median income in Canada in a given year, adjusted for household size.

Melanoma includes malignant tumours of melanocytes in the skin, and is defined by ICD-10 code C-43. Melanocytes are the cells that produce the pigment of the skin. For estimates of incidence, other non-epithelial cancers are also included. Squamous and basal cell skin cancers are excluded.

Mortality includes people whose primary cause of death is melanoma.

Ontario excluding Toronto means Ontario with Toronto removed from the Ontario data.

Sex defines people based on their biological characteristics, whereas gender is a socially constructed concept. From a social determinants of health perspective, certain health conditions can be associated with gender, and from a biological perspective, health conditions can be associated with sex. Although reporting based on both concepts would be preferable, the data source used here only collects information on sex, and not gender.

Sources

Cancer Incidence: SEER*Stat Package Release 10 – Ontario Cancer Registry, Cancer Care Ontario, August 2015. Used in:

- Figures 1 and 2
- Tables 2 and 3

Hospitalization: Inpatient Discharges 2003 to 2013, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO. Date Extracted: June 2015. Used in:

- Figures 1 and 2
- Tables 1, 2, 3 and 4

Income Quintiles: Income Estimates for Census Families and Individuals (T1 Family File), Table F-18, Statistics Canada, 2009-2013. Used in:

- Table 4

Mortality: Ontario Mortality Data 2003 to 2010, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO. Date Extracted: June 2015. Used in:

- Figures 1 and 2
- Tables 1, 2, 3 and 4

Denominator data:

Population for Toronto and Larger Areas: Population Estimates 2003 to 2013, Ontario Ministry of Health and Long-Term Care: IntelliHEALTH ONTARIO. Date extracted: June 2015. The population estimates for cancer incidence was extracted in May 2016. Used in:

- Figures 1 and 2
- Tables 2 and 3

Population for Neighbourhood or Service Delivery Areas or Income Quintile: 2011 Canada Census, Statistics Canada. Used in:

- Tables 1 and 4

Health Surveillance Indicator: Melanoma Skin Cancer

Category: Chronic Disease

Prepared: July, 2017

This indicator report is part of a series that informs the ongoing assessment of Toronto's health status. For a full list of the indicators, please go to: www.toronto.ca/health