

HEALTH SURVEILLANCE INDICATORS: CERVICAL CANCER



Public Health Relevance

Cervical cancer is the third most commonly diagnosed cancer among women in Ontario aged 20 to 44. Overall, it affects about 1 in 152 women. Cervical cancer is largely preventable through a method of screening called the Papanicolaou test (Pap test) that helps detect pre-cancerous and cancerous tissue changes at an early stage. Women should have Pap tests every three years starting at age 21 up to age 70.

Smoking can increase a woman's risk for cervical cancer. Another risk factor for cervical cancer is the Human Papilloma Virus (HPV), which is a sexually transmitted infection that can be prevented by using condoms or other barriers during sexual activity.

Highlights

1. Cervical cancer hospitalization rates for Toronto women decreased from 2003 to 2013.
2. Cervical cancer hospitalization and mortality rates in Toronto were similar compared to the rest of the Greater Toronto Area and the rest of Ontario. Toronto Centre had a higher hospitalization rate for cervical cancer than Toronto as a whole.
3. No difference was found between income groups for cervical cancer hospitalization or mortality rates in Toronto.

Trends Over Time

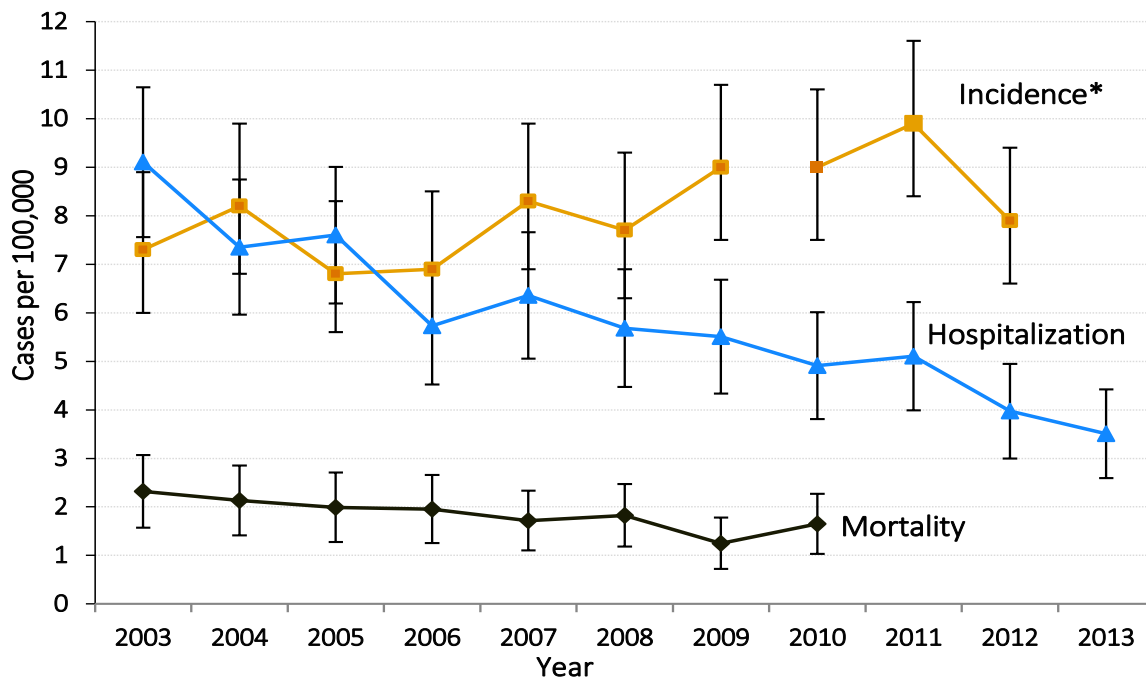
Cervical cancer hospitalization rates for Toronto women decreased from 2003 to 2013.

Figure 1 shows age-standardized cervical cancer incidence, hospitalization, and mortality rates.

Incidence remained stable between 2003 to 2009 at around 8 cases per 100,000 females. In 2012, the rate was 7.9 cases per 100,000 females. The 2010 to 2012 rates cannot be directly compared to the previous time period as a change was made in the way new cancer cases were counted (please see data notes for details).

Hospitalization rates decreased over time from 9.1 cases per 100,000 females in 2003 to 3.5 in 2013. Mortality rates remained stable from 2003 to 2010 at about 2 cases per 100,000 females.

Figure 1: Age-Standardized Cervical Cancer Incidence*, Hospitalization and Mortality Rates, Toronto, 2003 to 2013**



*Incidence: A new rule for counting cancer cases was adopted from 2010 onwards, see Data Notes.

**Data are presented to 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

Cervical cancer hospitalization and mortality rates in Toronto were similar compared to the rest of the Greater Toronto Area and the rest of Ontario.

Toronto's cervical cancer incidence, hospitalization, and mortality rates did not significantly differ from the rates in the rest of Ontario (Ontario excluding Toronto) and the rest of the GTA (GTA excluding Toronto). Toronto's rates were:

- Incidence: 7.9 new cases per 100,000 females (2012)
- Hospitalization: 3.5 cases per 100,000 females (2013)
- Mortality: 1.7 deaths per 100,000 females (2010)

Rates for the highest and lowest Ontario health units are not releasable because of low counts.

Data Sources: see Data Notes.

Toronto Neighbourhood Comparisons

Toronto Centre had a higher hospitalization rate for cervical cancer than Toronto as a whole.

Table 1 shows age-standardized cervical cancer hospitalization and mortality rates for Toronto Public Health's Chronic Disease and Injury Prevention (CDIP) Service Delivery Areas (SDAs).

When compared to Toronto as a whole, a significantly lower rate was found in:

- West Scarborough (hospitalization)

A significantly higher rate was found in:

- Toronto Centre (hospitalization)

Table 1: Age-Standardized Cervical Cancer Hospitalization and Mortality Rates per 100,000 Females, by Service Delivery Area*, Toronto

CDIP Service Delivery Area	Hospitalization (2009 to 2013 combined)	Mortality (2006 to 2010 combined)
Rexdale Etobicoke	4.8	1.7
York South Humber	5.9	1.7
Humber-Downsview	4.3	1.7
Willowdale Don Mills	2.7	1.1
Toronto Centre	6.2 ^H	1.9
Danforth East York	6.2	2.0
West Scarborough	2.6 ^L	1.8
East Scarborough	3.3	1.9
Toronto	4.6	1.7

* Toronto Public Health's Service Delivery Areas for Chronic Disease and Injury Prevention

^H Significantly higher than the Toronto total indicating a less favourable result for that area.

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

Data Sources: see Data Notes.

Socio-demographics

No difference was found between income groups for both hospitalization and mortality rates.

Table 2 shows cervical cancer rates for three age groups in Toronto. Incidence and mortality rates increased as age increased. However, females aged 40 to 64 years had a higher hospitalization rate compared to females aged 65 and older.

Table 2: Cervical Cancer Incidence, Hospitalization, and Mortality Rates per 100,000 Females by Age Group, Toronto

Age Group	Incidence (2012)	Hospitalization (2013)	Mortality (2010)
20 to 39 years	5.9	2.7	0.5
40 to 64 years	14.6	8.2	2.8
65 plus years	16.6	3.9	6.6

Data Sources: see Data Notes.

Table 3 shows age-standardized cervical cancer hospitalization and mortality rates per 100,000 females 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 lower income groups (Quintile 1, 2, 3, and 4) had no significant difference in hospitalization and mortality rates compared to the highest income group (Quintile 5).

Table 3: Age-standardized Female Cervical Cancer Hospitalization and Mortality Rates by Income Quintile, Toronto

Income Level	Hospitalization (2009 to 2013 combined)	Mortality (2006 to 2010 combined)
Quintile 1 (lowest group)	3.6	2.1
Quintile 2	5.1	1.9
Quintile 3	5.2	1.9
Quintile 4	5.1	1.5
Quintile 5 (highest group)	3.9	1.3

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 SeerStat 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 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 3 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 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.

Cervical Cancer is defined by ICD-10 code C-53. Only females are included in the current analysis.

Hospitalization includes Toronto female residents who have stayed in a hospital bed overnight because of cervical cancer. 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 Toronto female residents diagnosed with a cervical cancer 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.

Mortality includes Toronto female residents whose primary cause of death is cervical cancer.

Sources

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

- Figure 1, Regional Comparisons
- Tables 2

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

- Figure 1, Regional Comparisons
- Tables 1, 2, and 3

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

- Table 3

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

- Figure 1, Regional Comparisons
- Tables 1, 2, and 3

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 Regional Comparisons
- Table 2

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

- Tables 1 and 3

Health Surveillance Indicator: Cervical Cancer

Category: Chronic Disease

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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.