



HEALTH SURVEILLANCE INDICATORS: BREAST CANCER

Public Health Relevance

Breast cancer is the most commonly diagnosed cancer among women in Ontario, accounting for over 25% of all cases. Breast cancer is responsible for the second highest number of cancer deaths among women in the province, despite a five-year survival rate of almost 90%.

Behaviours that increase a woman's risk for breast cancer include being obese, drinking alcohol, taking the birth control pill, and taking hormone replacement therapy. Breast cancer can be caught early by having regular mammograms between the ages of 50 and 69. Women are encouraged to talk to their doctor about the need for mammograms starting at age 40.

This document addresses female breast cancer only.

Highlights

1. Breast cancer hospitalization and mortality rates for Toronto women decreased from 2003 to the most recent year of data available.
2. Compared to the rest of Ontario, Toronto's breast cancer hospitalization rate was higher, whereas the mortality rate was lower.
3. Rexdale Etobicoke had a lower breast cancer hospitalization rate and York South Humber had a higher hospitalization rate compared to Toronto as a whole.
4. The lowest rates for breast cancer hospitalization and mortality were in the second lowest income group.

Trends Over Time

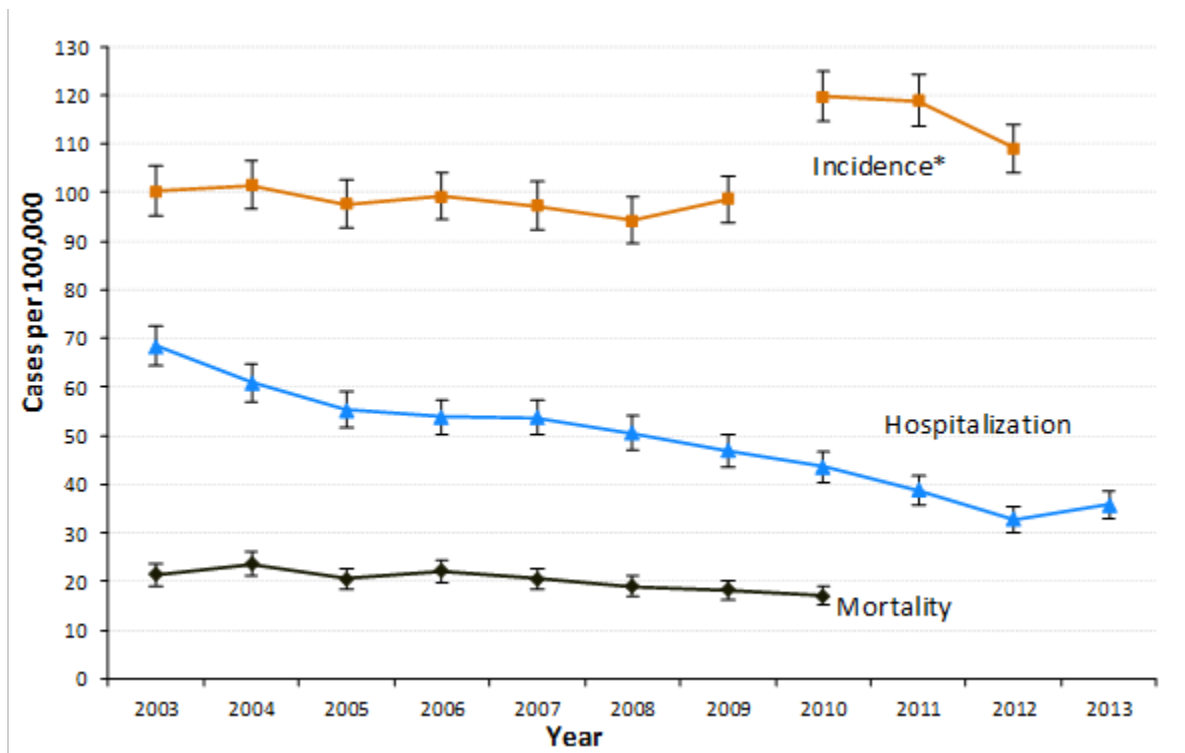
Breast cancer hospitalization and mortality rates for Toronto women decreased from 2003 to the most recent year of data available.

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

Incidence remained stable between 2003 and 2009 at about 98 cases per 100,000 females. In 2012, the rate was 109 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).

The hospitalization rate in Toronto decreased over time from 68 cases per 100,000 females in 2003 to 36 in 2013. Mortality also decreased from 21 deaths per 100,000 females in 2003 to 17 in 2010.

Figure 1: Age-Standardized Breast Cancer Incidence*, Hospitalization and Mortality Rates per 100,000 Females, Toronto, 2003 to 2013**



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

** Data is 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

Compared to the rest of Ontario, Toronto's breast cancer hospitalization rate was higher, whereas the mortality rate was lower.

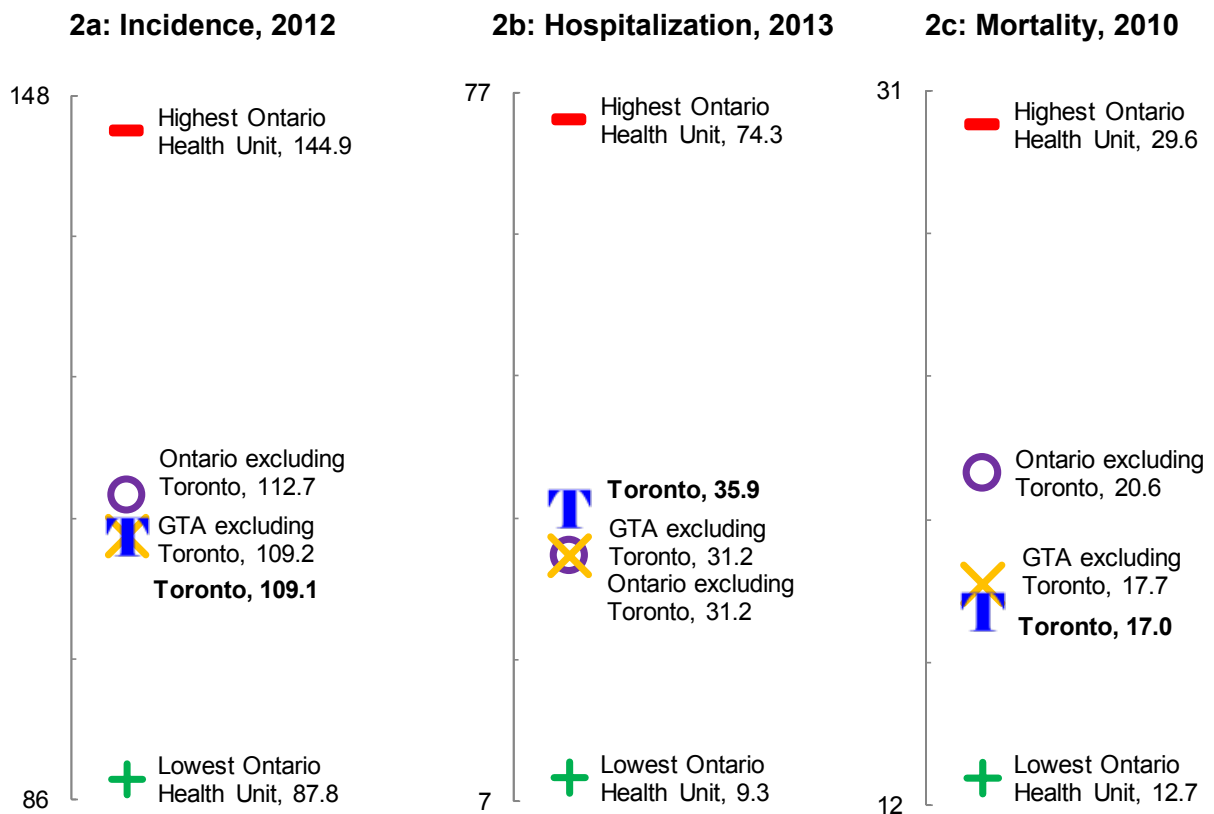
Figure 2 shows age-standardized breast cancer incidence, hospitalization and mortality rates for Toronto compared to the rest of Ontario (Ontario excluding Toronto), the rest of the Greater Toronto Area (GTA excluding Toronto), and the Ontario health units with the highest and lowest rates.

Incidence in Toronto was not significantly different from the rest of Ontario, the rest of the GTA, or the Ontario health units with highest and lowest rates. (Figure 2a).

Toronto's hospitalization rate was significantly higher than the rest of Ontario and the Ontario health unit with the lowest rate. There was no significant difference compared to the rest of the GTA. Toronto was significantly lower compared to the Ontario health unit with the highest rate (Figure 2b).

The breast cancer mortality rate was significantly lower in Toronto than in the rest of Ontario. It was not significantly different compared to the rest of the GTA and Ontario health units with highest and lowest rates (Figure 2c).

Figure 2: Age-Standardized Breast Cancer Incidence, Hospitalization and Mortality Rates per 100,000 Females, Selected Regions in Ontario.



Data Sources: see Data Notes.

Toronto Neighbourhood Comparisons

Rexdale Etobicoke had a lower breast cancer hospitalization rate and York South Humber had a higher hospitalization rate compared to Toronto as a whole.

Table 1 shows age-standardized breast cancer hospitalization and mortality rates for Toronto Public Health's Chronic Disease and Injury Prevention (CDIP) Service Delivery Areas. Significantly lower rates were found in some areas compared to Toronto as a whole, including

- Rexdale Etobicoke (hospitalization rate),
- Willowdale Don Mills (mortality rate), and
- West Scarborough (mortality rate).

A significantly higher rate was found in

- York South Humber (hospitalization rate).

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

CDIP Service Delivery Area	Hospitalization	Mortality
	(2009 to 2013 combined)	(2006 to 2010 combined)
Rexdale Etobicoke	31.5 L	19.7
York South Humber	45.1 H	21.5
Humber-Downsview	42.4	18.7
Willowdale Don Mills	36.7	15.0 L
Toronto Centre	43.4	19.9
Danforth East York	42.7	22.4
West Scarborough	36.1	14.3 L
East Scarborough	36.7	20.8
Toronto	39.4	18.6

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

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

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

Data Source: see Data Notes.

Map 1 shows age-standardized breast cancer hospitalization rates for Toronto neighbourhoods, in 2009 to 2013 combined.

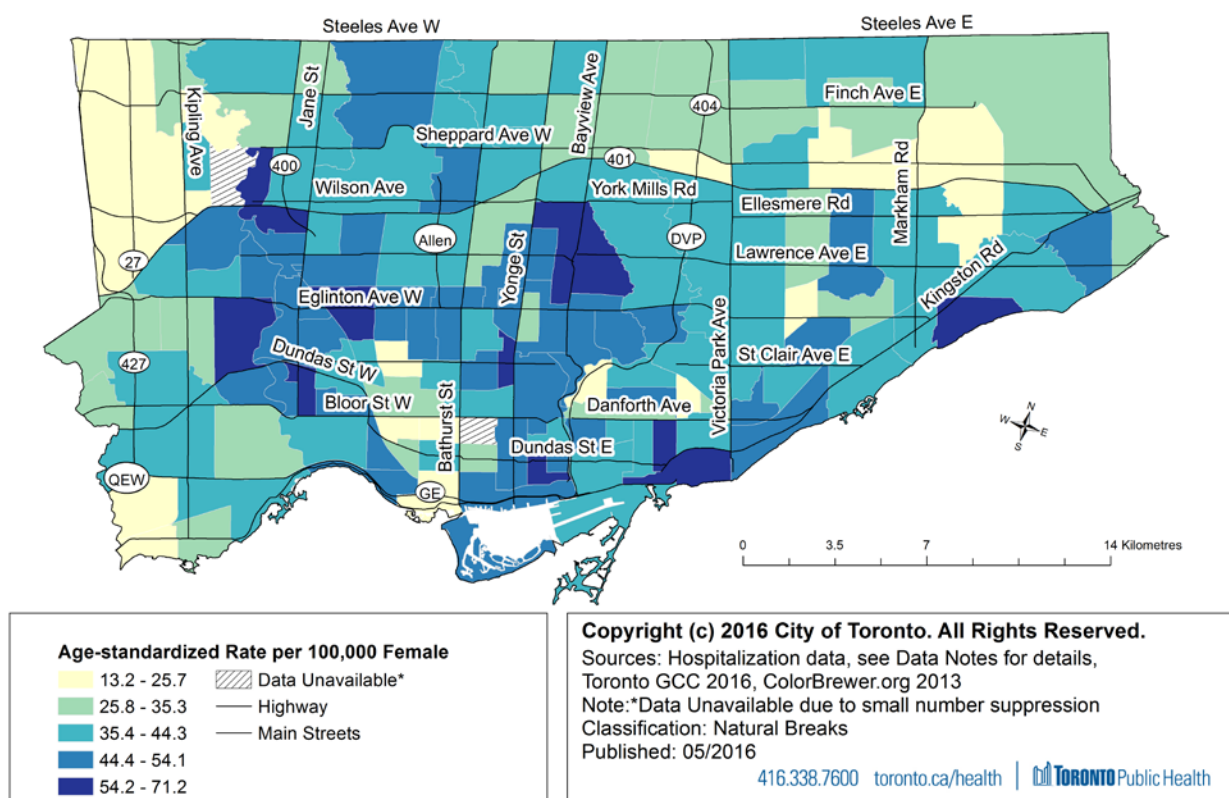
Northwest Scarborough and northern Etobicoke had clusters of neighbourhoods with lower hospitalization rates than the city as a whole. Some significantly lower neighbourhoods include:

- Niagara
- Long Branch
- Alderwood
- Thistletown-Beaumont Heights
- Ionview
- Henry Farm

No neighbourhood had a significantly higher rate compared to Toronto as a whole.

Mortality rate is not available by neighbourhood due too small numbers.

Map 1: Age-Standardized Breast Cancer Hospitalization by Neighbourhood, Toronto 2009 to 2013 combined*



Socio-demographics

The lowest rates for breast cancer hospitalization and mortality were in the second lowest income group.

Table 2 shows breast cancer rates for three age groups in Toronto. All rates increase as age increases for incidence, hospitalization and mortality.

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

Age	Incidence (2012)	Hospitalization (2013)	Mortality (2010)
20 to 39 years	19.1	8.9	2.6
40 to 64 years	219.8	65.8	29.6
65 plus years	397.8	133.0	84.8

Data Source: Incidence, Hospitalization and Mortality, see Data Notes for details.

Table 3 shows age-standardized breast 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 second lowest income group (Quintile 2) had significantly lower hospitalization and mortality rates compared to the highest income group (Quintile 5). Also, the middle income group (Quintile 3) had a significantly lower hospitalization rate and the lowest income group (Quintile 1) had a significantly lower mortality rate compared to the highest income group (Quintile 5).

Table 3: Age-standardized Breast Cancer Hospitalization and Mortality Rates per 100,000 Females by Income Quintile, Toronto

Income Level	Hospitalization (2009 and 2013 combined)	Mortality (2006 and 2010 combined)
Quintile 1 (lower)	40.5	17.4 ^L
Quintile 2	33.4 ^L	16.6 ^L
Quintile 3	36.9 ^L	18.1
Quintile 4	42.3	19.5
Quintile 5 (higher)	44.1	21.9

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

Data Source: Hospitalization, Mortality and Income quintiles, see Data Notes for details.

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 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 3 and Map 1 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.

Breast Cancer is defined by ICD-10 code C-50 and ICD-9 code 174. Only females are included in the current analysis.

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

Incidence includes females who were diagnosed with breast 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 females whose primary cause of death is breast cancer.

Sources

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

- Figures 1 and 2a
- Table 2

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 2b
- Tables 1, 2, and 3
- Map 1

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:

- Figures 1 and 2c
- 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 from cancer incidence was extracted in May 2016. Used in:

- Figures 1 and 2
- Table 2

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

- Tables 1 and 3
- Map 1

Health Surveillance Indicator: Breast 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