HEALTH SURVEILLANCE INDICATORS:
CARDIOVASCULAR DISEASE

Public Health Relevance

Cardiovascular disease (CVD) is among the most common causes of illness and death in Canada. CVD refers to diseases of the circulatory system, which includes the heart and blood vessels. The six types of CVD are ischemic heart disease, cerebrovascular disease, peripheral vascular disease, heart failure, rheumatic heart disease, and congenital heart disease. Ischemic heart disease, which is the most common cause of heart attack, and cerebrovascular disease, also known as stroke, are the most common CVDs and the most affected by behavioural risk factors.

Behavioural risk factors for CVD include smoking, lack of exercise, and a diet high in fatty foods and salt and/or low in fruit and vegetables. Additional risk factors include overweight/obesity, high blood pressure, high cholesterol, diabetes, and stress.

Highlights

1. CVD hospitalization and mortality rates in Toronto decreased from 2003 to the most recent year of data.

2. The CVD hospitalization rate in Toronto was similar to the rest of the Greater Toronto Area and lower than the rest of Ontario.

3. Willowdale Don Mills and West Scarborough had lower hospitalization and mortality rates for CVD than Toronto as a whole.

4. Lower income groups in Toronto had higher CVD hospitalization rates compared to the highest income group.

Trends Over Time

CVD hospitalization and mortality rates in Toronto decreased from 2003 to the most recent year of data.

Figure 1 shows age-standardized CVD hospitalization and mortality rates per 100,000 people from 2003 to the most recent year of data.

Both hospitalization and mortality rates decreased over time in Toronto. The hospitalization rate decreased from over 800 per 100,000 in 2003 to 642 in 2013. The mortality rate decreased from 164 per 100,000 in 2003 to 115 in 2010.

Figure 1: Age-standardized CVD Hospitalization and Mortality Rates per 100,000 People from 2003 to 2013*
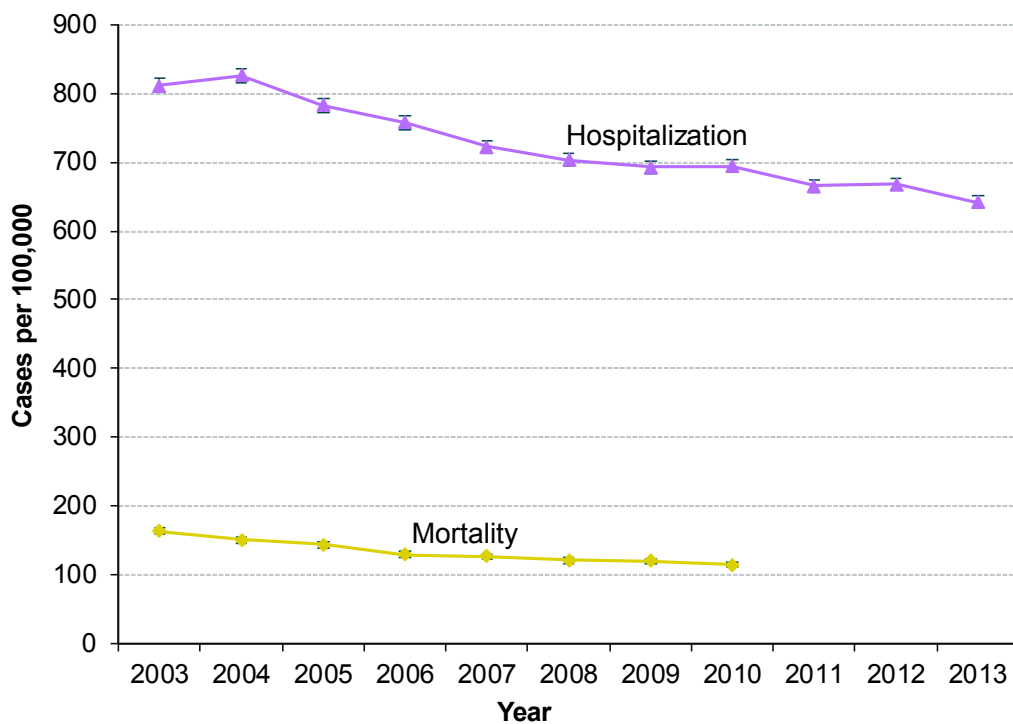
* Data is presented to most recent year available. Hospitalization includes data to 2013, and mortality to 2010.

Error bars (I) represent 95% confidence intervals.

Data Sources: see Data Notes.
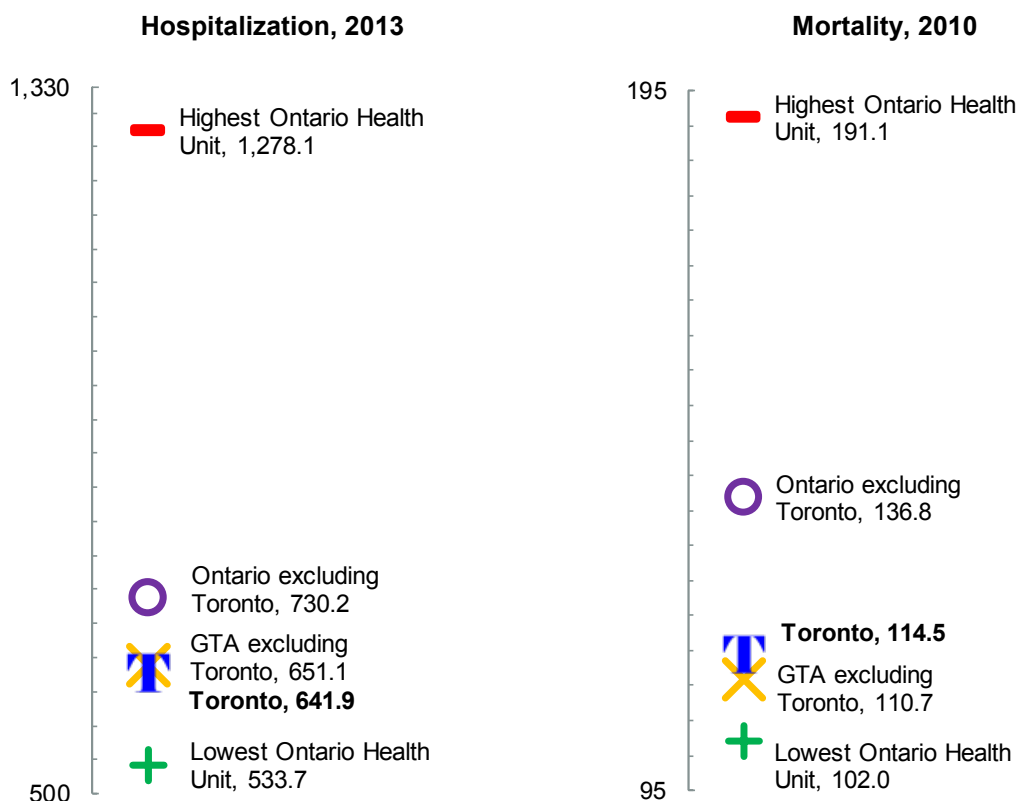
Regional Comparisons

CVD hospitalization rate in Toronto was similar to the rest of the Greater Toronto Area and lower than the rest of Ontario.

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

The hospitalization rate was significantly lower in Toronto compared to the rest of Ontario. Compared to the rest of the GTA, Toronto was not significantly different. Toronto ranked 32nd of the 36 health units in Ontario, with the 36th ranked health unit having the lowest (most favourable) rate. The hospitalization rate was significantly higher than the health unit with the lowest rate.

Mortality was significantly lower in Toronto than in the rest of Ontario. Compared to the rest of the GTA, Toronto was not significantly different. Toronto ranked 33rd of the 36 health units in Ontario, with the 36th ranked health unit having the lowest (most favourable) rate.

Figure 2: **Age-Standardized CVD Hospitalization and Mortality Rates per 100,000, Selected Regions in Ontario**

Hospitalization, 2013

1,330

— Highest Ontario Health Unit, 1,278.1

○ Ontario excluding Toronto, 730.2

GTA excluding Toronto, 651.1
Toronto, 641.9

✛ Lowest Ontario Health Unit, 533.7

500

Mortality, 2010

195

— Highest Ontario Health Unit, 191.1

○ Ontario excluding Toronto, 136.8

Toronto, 114.5
✕ GTA excluding Toronto, 110.7

✛ Lowest Ontario Health Unit, 102.0

95

Data Sources: see Data Notes.

Toronto Neighbourhood Comparisons

Willowdale Don Mills and West Scarborough had lower hospitalization and mortality rates for CVD than Toronto as a whole.

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

- East Scarborough (mortality)

- Toronto Centre (hospitalization)

- West Scharborough (hospitalization and lower mortality)

- Willowdale Don Mills (hospitalization and lower mortality)

Significantly higher rates were found in:

- Danforth East York (hospitalization and mortality)

- East Scarborough (mortality)

- Humber Downsview (hospitalization)

- Rexdale Etobicoke (hospitalization)

- York South Humber (hospitalization and mortality)

Table 1: Age-Standardized CVD Hospitalization and Mortality Rates per 100,000, by Service Delivery Areas*, Toronto

Service Delivery Area	Hospitalization (2011 to 2013 combined)	Mortality (2008 to 2010 combined)
Rexdale Etobicoke	752.6 H	118.0
York South Humber	726.9 H	123.6 H
Humber Downsview	790.5 H	114.5
Willowdale Don Mills	612.2 L	92.0 L
Toronto Centre	646.6 L	112.7
Danforth East York	738.3 H	140.2 H
West Scarborough	599.9 L	99.2 L
East Scarborough	635.8 L	122.9 H
Toronto	**670.5**	**112.2**

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.
* Toronto Public Health's service delivery areas for Chronic Disease and Injury Prevention.
   Data Sources: see Data Notes.

Map 1 shows age-standardized CVD hospitalization rates for Toronto's 140 neighbourhoods for 2011 to 2013 combined.

Hospitalization rates ranged from 406.9 to 1054.4 per 100,000. Midtown, North York, central Etobicoke, and northwestern Scarborough had clusters of neighbourhoods with lower CVD hospitalization rates than Toronto as a whole. Some neighbourhoods with significantly lower rates included:

- Agincourt North
- Kingsway South
- Milliken

- Rosedale-Moore Park
- Steeles
- Yonge-St.Clair

Northwest Etobicoke and southwest Scarborough had clusters of neighbourhoods with higher hospitalization rates than Toronto as a whole. Some neighbourhoods with significantly higher rates included:

- Clairlea-Birchmount
- Humber Summit
- Moss Park

- Mount Olive-Silverstone-Jamestown
- South Parkdale
- Thistletown-Beaumond Heights

Map 1: Age-Standardized CVD Hospitalization Rates by Neighbourhood, Toronto, 2011 to 2013 combined
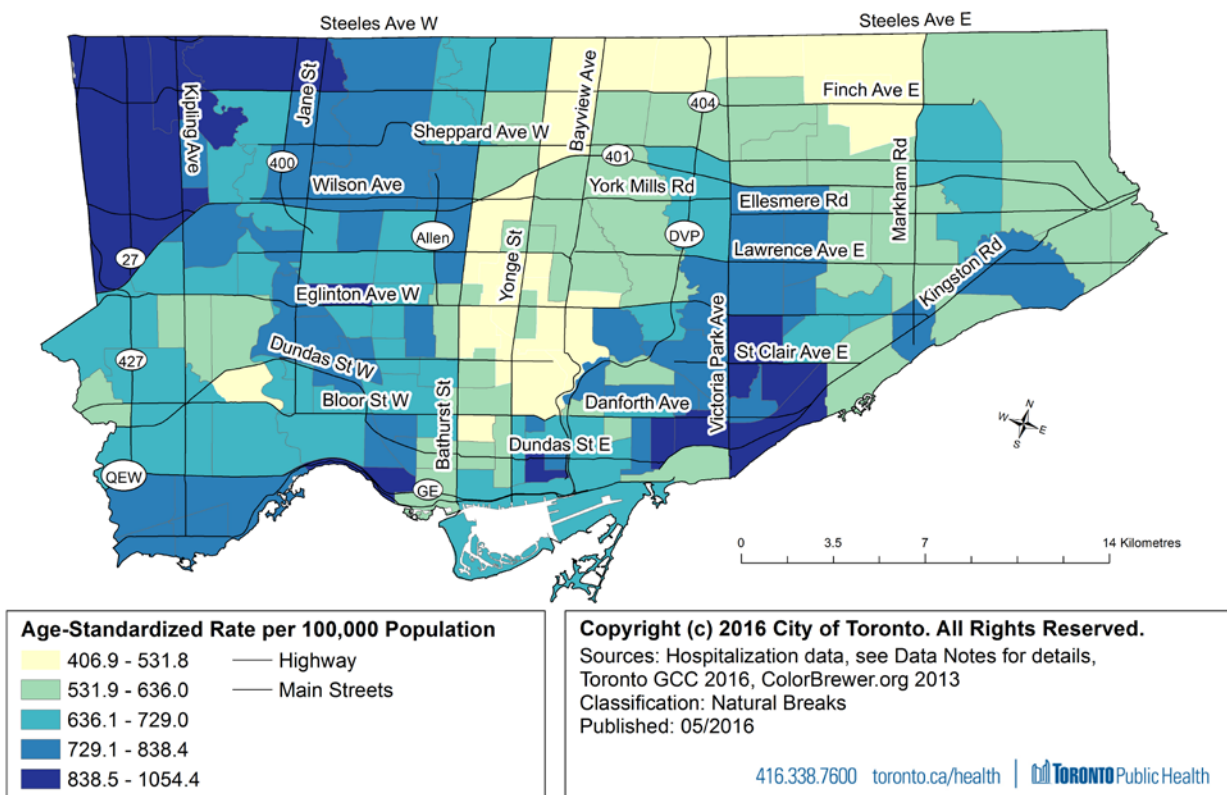
Map 2 shows age-standardized CVD mortality rates by Toronto's 140 neighbourhoods, for 2008 to 2010 combined.

Mortality rates ranged from 60.1 to 224.1 per 100,000. Midtown and northeastern areas of Toronto had clusters of neighbourhoods with lower CVD mortality rates than Toronto as a whole. Some neighbourhoods with significantly lower rates included:

- Bayview Village
- Milliken
- Rosedale-Moore Park

- St. Andrew-Windfields
- Steeles
- Willowdale East

Downtown by the waterfront and southeastern Scarborough had clusters of neighbourhoods with higher mortality rates than Toronto as a whole. Some neighbourhoods with significantly higher rates included:

- Beechborough-Greenbrook
- Birchcliffe-Cliffside
- Blake-Jones

- East End-Danforth
- Moss Park
- South Parkdale

Map 2: Age-Standardized CVD Mortality Rates by Neighbourhood, Toronto, 2008 to 2010 combined
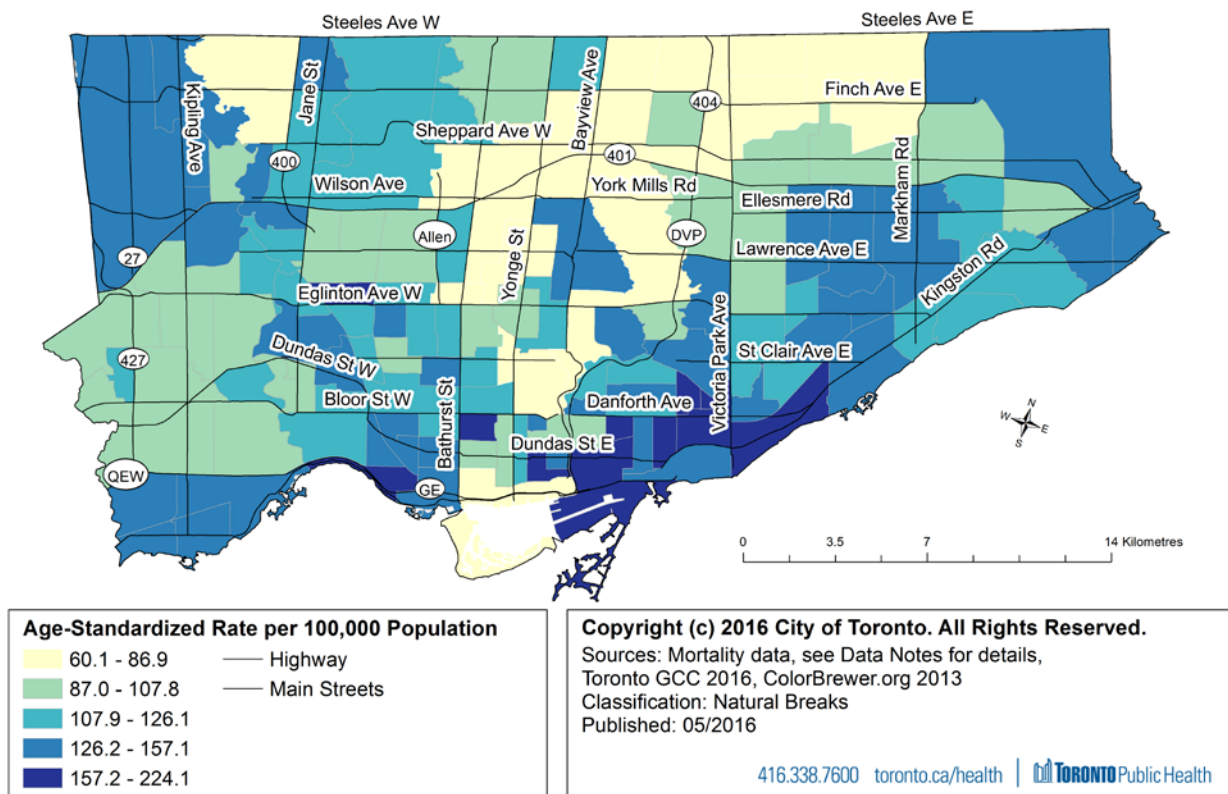
Socio-Demographics

Lower income groups had higher CVD hospitalization rates compared to the highest income group.

Table 2 shows CVD rates by sex. Males had significantly higher hospital and mortality rates compared to females.

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

Sex	Hospitalization (2013)	Mortality (2010)
Male	846.5 **H**	148.4 **H**
Female	471.4 **L**	87.9 **L**

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

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

Data Sources: see Data Notes.

Table 3 shows CVD rates for each of three age groups. Hospitalization and mortality rates increased as age increased.

Table 3: CVD Hospitalization and Mortality Rates per 100,000 by Age Group, Toronto

Age Group	Hospitalization (2013)	Mortality (2010)
20 to 39 years	89.2	4.2
40 to 64 years	728.7	67.7
65 plus years	4070.8	1062.1

Data Sources: see Data Notes.

Table 4 shows the age-standardized CVD 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). Quintile 5 includes areas in Toronto with the lowest percent of people living below the LIM.

People in lower income groups (Quintiles 1, 2, 3 and 4) had significantly higher hospitalization rates compared to the highest income group (Quintile 5). The mortality rates in Quintiles 1, 3 and 4 were also significantly higher compared to Quintile 5.

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

Income Level	Hospitalization (2011 to 2013 Combined)	Mortality (2008 to 2010 Combined)
Quintile 1 (lowest income)	761.2 **H**	127.2 **H**
Quintile 2	643.8 **H**	99.8
Quintile 3	691.7 **H**	120.1 **H**
Quintile 4	676.9 **H**	114.4 **H**
Quintile 5 (highest income)	605.3	104.3

H Significantly higher than Quintile 5, the higher income group, indicating a less favourable result.

Data Sources: see Data Notes.

Data Notes

Notes

- Significant differences were estimated using overlapping confidence intervals. Although this method is conservative (α ~< 0.01) and most appropriate when comparing mutually exclusive groups, it was chosen as an objective means of making conclusions on population-based data. The multiple comparisons performed in the analysis were not taken into consideration when choosing the level of significance to test.

- 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 GTA (Greater Toronto Area) for the same reason.

- Data used for Regional Comparisons normally shows the rates for the Ontario Health Units with the highest and the lowest rates. The purpose of these comparisons is to show the rate for Toronto relative to other areas in Ontario. If data for the Health Unit with the lowest rate is suppressed due to small numbers, the rate for the next lowest Health Unit with sufficient numbers is shown instead.

- Tables 1 and 4 and Maps 1 and 2 are based on three 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.

- Neighbourhoods identified as having significantly higher or lower rates than Toronto as a whole do not necessarily represent all such neighbourhoods. Cut-offs for inclusion in the written list are arbitrary.

- 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.

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 that removes the effects of the distribution of age in two or more populations.

Cardiovascular Disease is disease of the heart and/or blood vessels, and includes ischemic heart disease, cerebrovascular disease, peripheral vascular disease, heart failure, rheumatic heart disease, and congenital heart disease. It is defined by ICD-10 code I-00 to I-99 and ICD-9 codes 390 to 459.

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

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 people whose primary cause of death is Cardiovascular Disease.

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

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
- Map 1

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
- Map 2

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 extimates from 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
- Maps 1 and 2

Health Surveillance Indicator: Cardiovascular Disease

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