

HEALTH INDICATORS: OPIOID OVERDOSE (2003-2015)



Background

Overdose has become an urgent public health issue in Toronto, driven largely by opioids. Opioids include both pharmaceutical drugs (e.g. oxycodone, hydromorphone, etc.) and other unregulated drugs (e.g. heroin, non-pharmaceutical fentanyl, etc.).

Overdose is now a leading cause of death, and non-fatal overdose incidents are also on the rise, such as hospitalizations and emergency department visits. Non-fatal overdoses can cause serious health effects including seizures, heart and kidney problems, physical injury and brain injury, in addition to the traumatic effects on everyone involved. Many overdoses also go untreated and/or unreported.

This report looks at long-term trends in opioid overdoses for Toronto residents from 2003 to 2015. For more information on recent overdose monitoring at Toronto Public Health, please refer to the [Toronto Overdose Information System](#).

Highlights

1. The number of deaths caused by opioids, and the number of opioid overdose emergency department visits has been increasing. A notable rise occurred the number of people who died from 2012 to 2015.
2. Most people who overdose from opioids are males. Most of these incidents are people aged 25 to 64.
3. In 2015, fentanyl replaced oxycodone as the most commonly present drug type in opioid overdose deaths in Toronto.
4. When compared with Ontario, the rate of overdose deaths in Toronto is similar. However Toronto sees lower rates of opioid overdose emergency department visits and hospitalizations than the rest of Ontario.

Trends Over Time

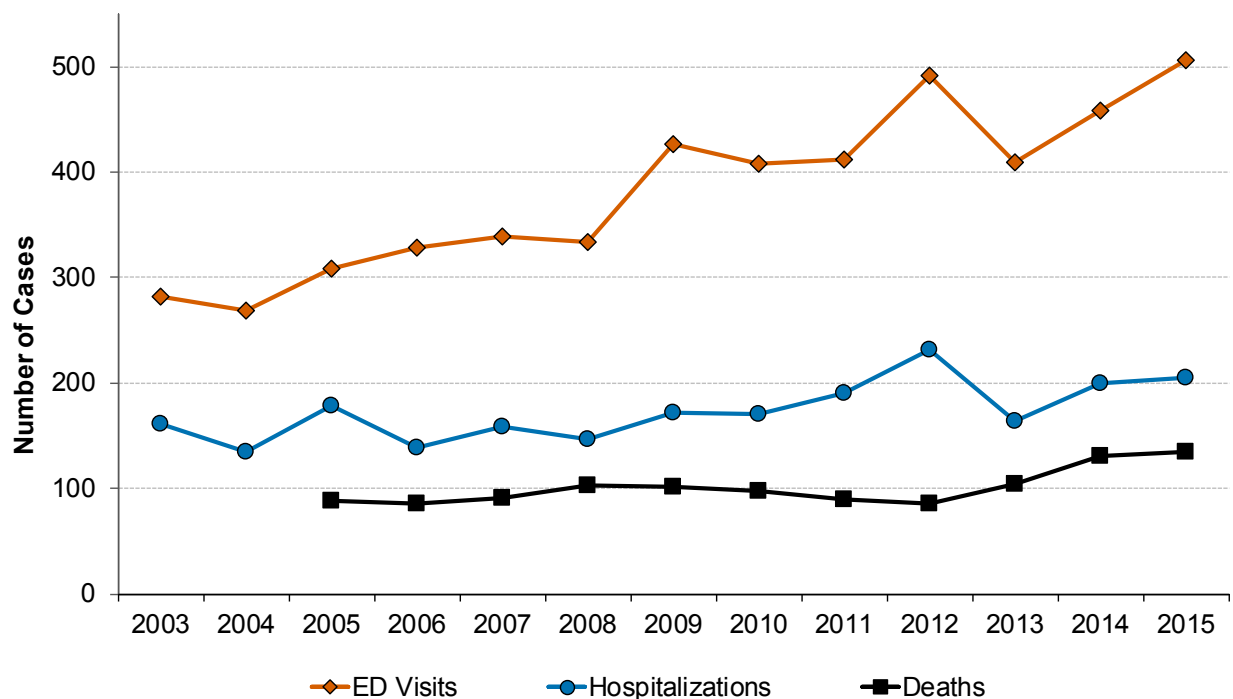
The number of deaths caused by opioids, and the number of opioid overdose emergency department visits has been increasing. A notable rise occurred the number of people who died from 2012 to 2015.

Figure 1 below shows the number of cases of opioid overdose emergency department visits, hospitalizations and deaths in Toronto from 2003 to 2015. In 2015, there were 508 emergency department visits, 205 hospitalizations and 135 deaths from opioid overdoses.

The number of emergency department visits fluctuated somewhat over this time period, however an overall increasing trend was observed, most notable from 2013 (409 cases) to 2015 (506 cases) when a 24 percent increase occurred. The number of hospitalizations also fluctuated over this time period.

Overall, the number of opioid overdose deaths increased over the time period, particularly between 2012 (85 deaths) and 2015 (135 deaths) when a 59 percent increase occurred.

Figure 1: Opioid Overdose Emergency Department (ED) Visits, Hospitalizations and Deaths, Toronto, 2003 to 2015



*Death data from 2003 to 2005 was not available. Death data from 2015 is preliminary.

Data Sources: Emergency Department Visits, Hospitalizations, Death, see Data Notes.

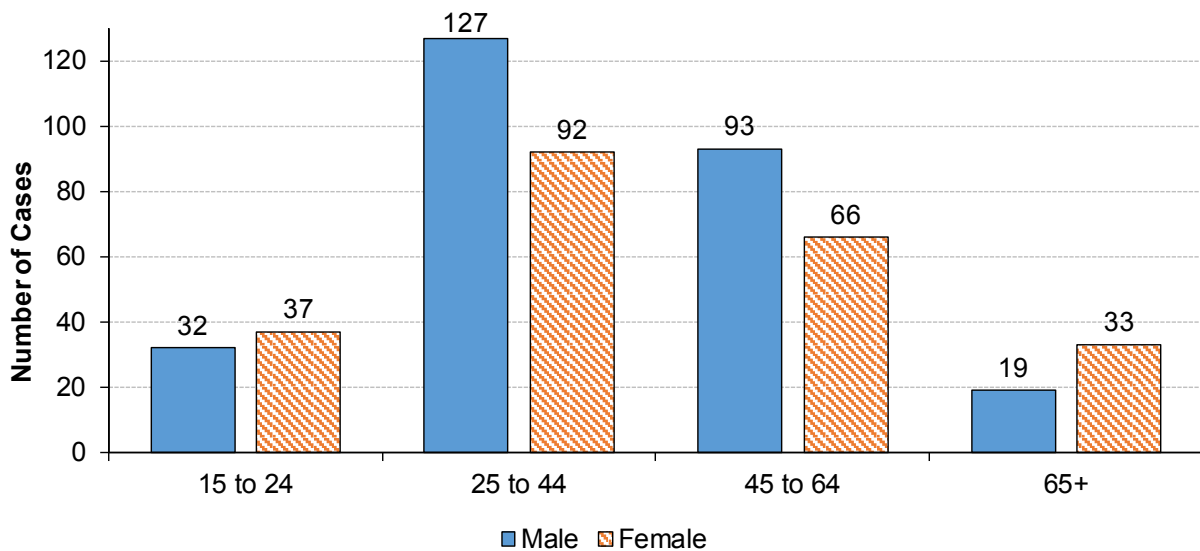
Socio-demographics

Most people who overdose from opioids are males. Most of these incidents are people aged 25 to 64.

Figure 2 shows the number of opioid overdose emergency department visits for Toronto residents by age and sex. Those aged 25 to 44 had the highest number of emergency department visits.

Males ages 25 to 44 and 45 to 64 had more emergency department visits, compared to females in these age groups. Females ages 15 to 24 and 65 and older had more emergency department visits, compared to males in these age groups.

Figure 2: Number of Opioid Overdose Emergency Department Visits by Age and Sex, Toronto, 2015



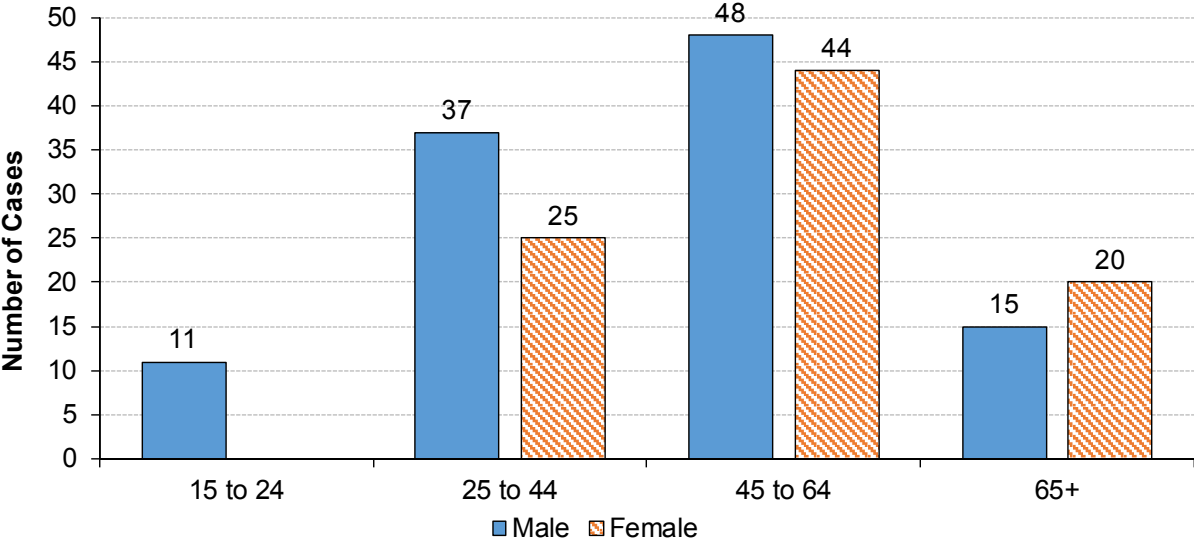
*The number of cases for those aged 0 to 14 has been suppressed for privacy concerns.

Data Sources: Emergency Department Visits, see Data Notes.

Figure 3 shows the number of opioid overdose hospitalizations for Toronto residents by age and sex. Males aged 45 to 64 had the highest number of hospitalizations.

Males of all age groups, except those aged 65 and older, had more hospitalizations, compared to females.

Figure 3: Number of Opioid Overdose Hospitalizations by Age and Sex, Toronto, 2015

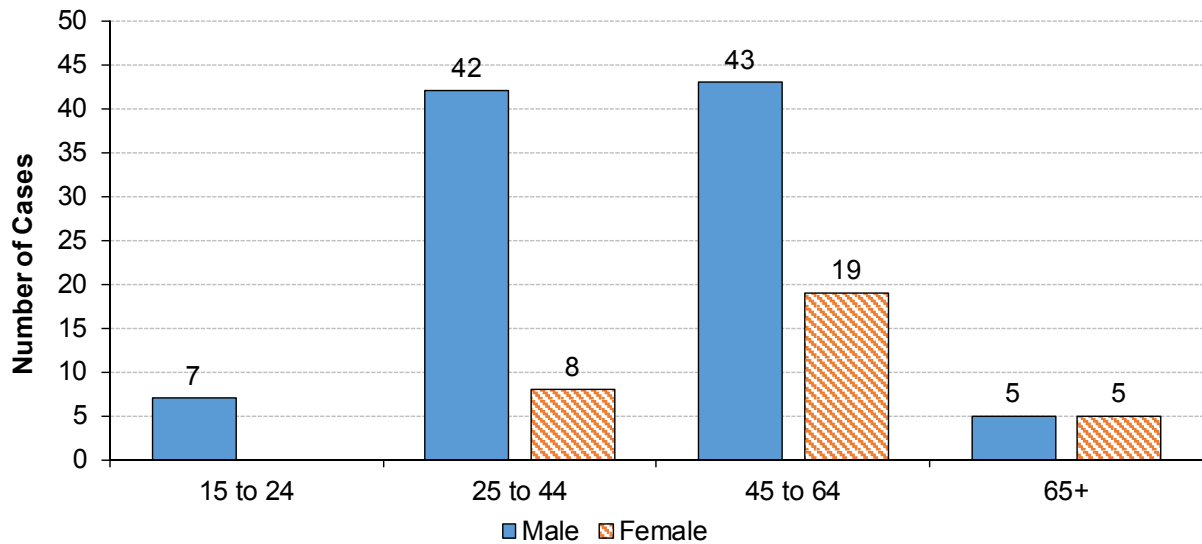


*The number of cases for those aged 0 to 14, and females aged 15 to 24 has been suppressed for privacy concerns.

Data Sources: Hospitalizations, see Data Notes.

Figure 4 shows the number of opioid overdose deaths for Toronto residents by age and sex. The majority of opioid overdose deaths were males and occurred in the 25 to 44 and 45 to 64 age groups.

Figure 4: Number of Opioid Overdose Deaths by Age and Sex, Toronto, 2015



*The number of cases for those aged 0 to 14, and females aged 15 to 24 has been suppressed for privacy concerns.

Data Sources: Deaths, see Data Notes.

Drug Types

In 2015, fentanyl replaced oxycodone as the most commonly present drug type in opioid overdose deaths in Toronto.

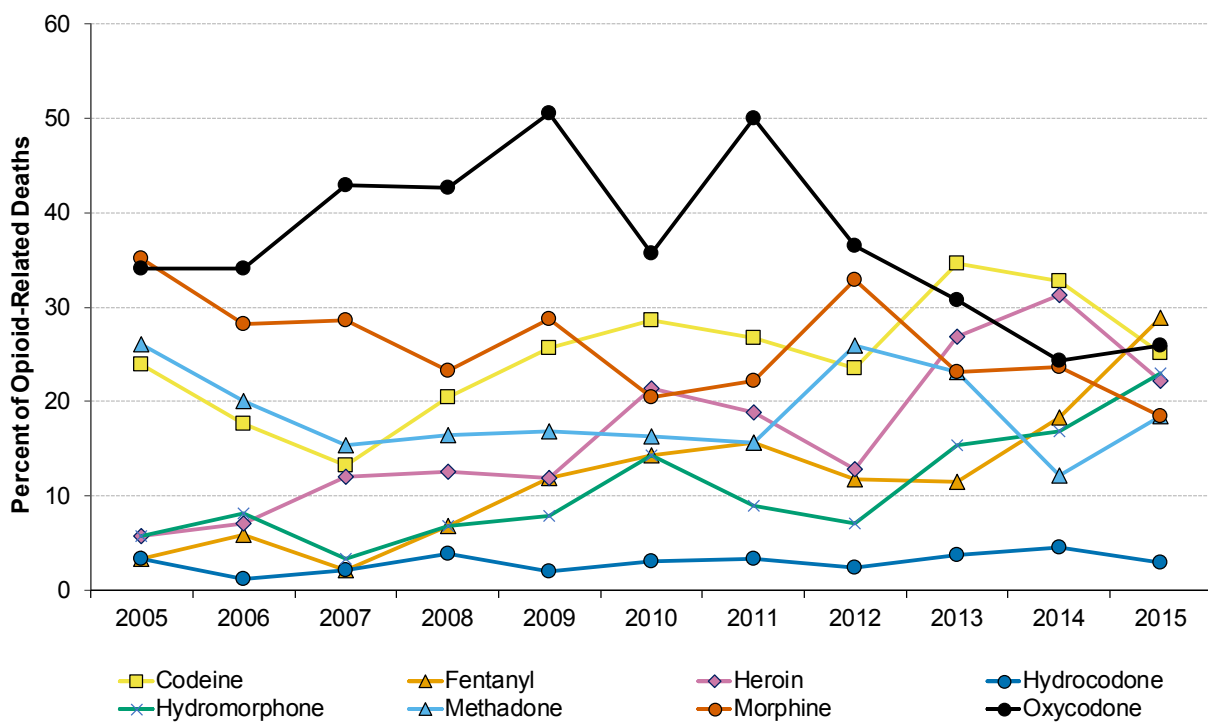
Figure 5 shows the percent of opioid overdose deaths for Toronto residents by drug type from 2005 to 2015. Drug categories are not mutually exclusive and multiple drugs may have been present in a single death.

From 2006 to 2012, oxycodone was the most common drug present in opioid overdose deaths. However, in recent years, codeine, fentanyl and heroin have been detected in a larger proportion of opioid overdose deaths.

In 2015, fentanyl was present in 29% of deaths, followed by oxycodone in 26% of deaths, codeine in 25%, and hydromorphone in 23% and heroin in 22%.

In Ontario in 2015 (not shown), the top three drugs present in opioid overdose deaths were fentanyl (30%), hydromorphone (28%) and oxycodone (24%).

Figure 5: Percent of Opioid Overdose Deaths by Drug Type, Toronto, 2005 to 2015



Data Sources: Deaths, see Data Notes.

Regional Comparisons

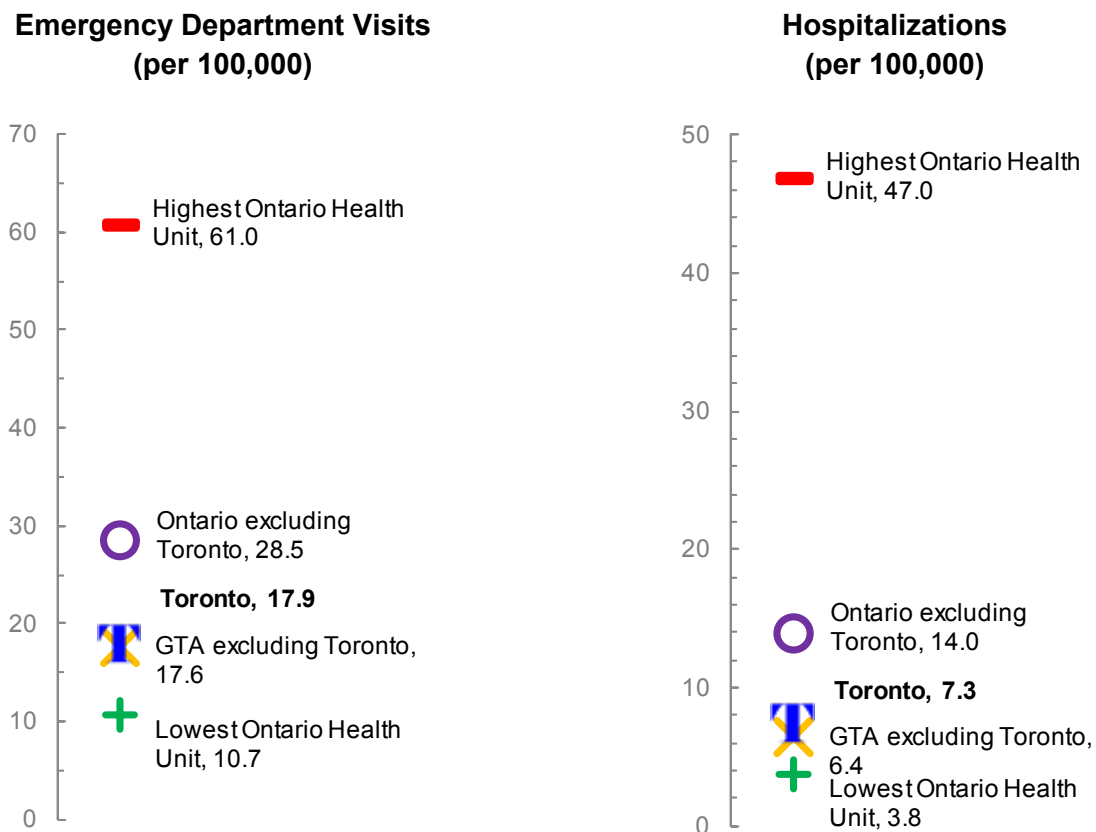
When compared with Ontario, the rate of overdose deaths in Toronto is similar. However Toronto sees lower rates of opioid overdose emergency department visits and hospitalizations than the rest of Ontario.

Figures 6a and 6b below show the rates of opioid overdose emergency department visits and hospitalizations for Toronto residents in 2015 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.

Rates of emergency department visits and hospitalizations for Toronto residents were significantly lower compared to the rest of Ontario and the health units with the highest rates. Compared to the rest of the GTA, Toronto's emergency department visit and hospitalization rates were not significantly different.

The actual rates of emergency department visits and hospitalizations occurring at Toronto hospitals is greater than those presented here, as many non-Toronto residents use these facilities.

Figure 6a and b: Rate of Opioid Overdose Emergency Department Visits and Hospitalizations, Selected Regions in Ontario, 2015

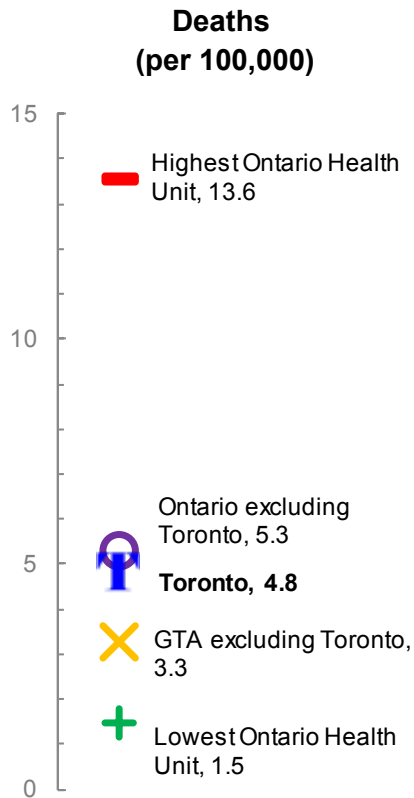


Data Sources: Emergency Department Visits and Hospitalization, see Data Notes.

Figure 6c below shows the rate of opioid overdose deaths for Toronto residents in 2015 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.

Toronto's death rate was significantly lower compared to the health unit with the highest rate. There was no significant difference between the death rates for Toronto compared to the rest of Ontario. However, compared to the rest of the GTA, Toronto's death rate was significantly higher.

Figure 6c: Rate of Opioid Overdose Deaths, Selected Regions in Ontario, 2015



Data Sources: Mortality, see Data Notes.

Data Notes

Notes

- This report using data analyzed and reported by Public Health Ontario. Data for Toronto in this report captures outcomes occurring to Toronto residents, rather than outcomes occurring in Toronto. This report also does not capture overdoses that go untreated or unreported. It is likely that this report underestimates the true burden of opioid overdose outcomes occurring in Toronto.
- Opioid overdose emergency department visits include only unscheduled visits. Both emergency department visits and hospitalizations exclude cases with a query / suspected diagnosis. Cases include ICD-10-CA codes T40.0 (poisoning by opium), T40.1 (poisoning by heroin), T40.2 (poisoning by other opioids), T40.3 (poisoning by methadone), T40.4 (poisoning by other synthetic narcotics), T40.6 (poisoning by other and unspecified narcotics).
- Data on deaths for 2015 is preliminary and subject to change.
- 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.
- 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.
- For the regional comparison section, rates were used as opposed to number of cases, to allow for meaningful comparison across jurisdictions with varying population sizes.
- Information on opioid overdose outcomes for those aged 0 to 14 were suppressed due to counts less than 5. Cases of hospitalizations and deaths for females aged 14 to 25 were also suppressed.
- For deaths where multiple drugs contributed to toxicity, deaths can include multiple opioids as the cause. The percentage attributed to any one opioid is calculated using the total number of unique deaths.
- Deaths where heroin and morphine were both present have only been considered as heroin deaths.
- Drugs not included in the list of opioid types are not currently tested for in Ontario.

Definitions

Opioids include a number of substances (i.e. codeine, fentanyl, heroin, hydrocodone, hydromorphone, methadone, morphine, and oxycodone). This report is not able to distinguish between pharmaceutical and other unregulated formulations of opioids, due to limitations in the data sources.

Opioid overdose visit or admission refers to an emergency department visit or hospitalization with opioid poisoning as a cause. Opioid refers to cases with an International Classification of Diseases-10 code of T40.0 (poisoning by opium), T40.1 (poisoning by heroin), T40.2 (poisoning by other opioids), T40.3 (poisoning by methadone), T40.4 (poisoning by other synthetic narcotics), or T40.6 (poisoning by other and unspecified narcotics).

Opioid overdose death include deaths where opioid toxicity were considered a contributing cause of death. It includes all manners of death, including intentional, accidental and undetermined deaths.

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

Emergency Department Visits: Ambulatory Emergency External Cause, 2003 to 2015.

Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO. Date Extracted: February 2017 by Public Health Ontario. Used in:

- Figures 1, 2a and 3

Hospitalization: Inpatient Discharges 2003 to 2015, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO. Date Extracted: February 2017 by Public Health Ontario
Used in:

- Figures 1, 2b and 4

Mortality: Mortality Data 2003 to 2015, Office of the Chief Coroner for Ontario. Date Extracted: December 2016 by Public Health Ontario. Used in:

- Figures 1, 2c, 5 and 6

Denominator data:

Population for Toronto and Larger Areas: Population Estimates 2003 to 2015, Ontario Ministry of Health and Long-Term Care: IntelliHEALTH ONTARIO. Date extracted: September 2016 by Public Health Ontario. Used in:

- Figures 2a, 2b and 2c

Health Indicator: Opioid Overdose

Category: Substance Use

Prepared: April, 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