

Reproductive & Infant Health

Population Health Status Indicators

Technical Notes

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Introduction

This document contains technical notes regarding the measures presented in Toronto Public Health's (TPH) Reproductive and Infant Health Population Health Status Indicator (PHSI) dashboard. It contains information on data sources, indicator definitions, and analysis details.

For questions, assistance or more information, please contact TPH's Epidemiology and Data Analytics Unit at edau@toronto.ca.

General Notes

The indicators on this dashboard come from the following data sources: the Better Outcomes Registry and Network (BORN) Information Systems (BIS), the Discharge Abstract Database (DAD), and the Ontario Health Insurance Plan (OHIP) Approved Claims file.

Note: This dashboard contains one cross-referenced indicator from the Child and Youth Health dashboard - Enhanced 18-month Well-Baby Visit. Details on this indicator can be found in the technical notes of the [Child and Youth Health dashboard](#).

General Analysis Notes

- Data are tested for statistical significance to determine if there are meaningful differences in the results between population groups (e.g., Toronto compared to the rest of Ontario, or males compared to females).
 - There are various methods that can be used to test for significant differences. For the purposes of this analysis, significant differences were estimated using overlapping confidence intervals (CIs). Although this method is conservative and most appropriate when comparing mutually exclusive groups, it was chosen as an objective means of drawing conclusions on population-based data.
 - Since CIs have the same theoretical underpinnings as p-values, CIs can be used to approximate significance testing at the 5% level. The CI and point estimate of two groups can be compared to determine whether there is a significant difference between the groups, depending on if there is overlap. Three situations can arise:
 1. The 95% CI of one rate contains the point estimate of the other rate. This implies a p-value >0.05 and thus, no significant difference between the two rates.
 2. The 95% CIs do not overlap. This implies a p-value <0.05 and thus, there is a significant difference between the two rates.
 3. The 95% CIs overlap but the 95% CI of one rate does not include the point estimate of the other. This is an ambiguous situation, and it is not possible to ascertain the p-value without carrying out a formal statistical test of significance. In the absence of testing (due to the impracticality of it in our work), the rates are considered to have no significant difference. This approach is a conservative means to compare two rates without a formal statistical test.
- Various comparator groups are used depending on the stratification.
 - For regional comparisons, the comparator group is Toronto.

- For sub-Toronto geography comparisons, the comparator group is Toronto overall.
- For socio-demographic characteristic comparisons, the comparator group is the group with the most favourable outcome for a given indicator. For example, the group with the highest percentage of optimal fruit and vegetable consumption would be the comparator group. The exception to this is income group analysis; for these analyses, the comparator group is the highest income group (e.g., quintile 5).
- Key findings are summarized in highlights. The aim was to use an approach of non-stigmatization, statistical significance, and relevance when selecting and summarizing the highlights. They should not be considered exhaustive.
- The term “women” is used throughout this tool to be consistent with the underlying data sources. People with various gender identities can get pregnant and have children and are included in these data.

Trends Over Time

- Wherever possible, a ten-year time trend analysis is displayed. Some indicators in this dashboard come from the Better Outcomes Registry and Network (BORN) Information System. For this data source, 2013 is the first full year of data available, therefore a ten-year time trend was not possible, and a nine-year trend is displayed.

Regional Comparison

- Wherever possible, Toronto is compared to the rest of Ontario (Ontario with Toronto removed), rather than 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. The rest of GTA includes Halton, York, Durham, and Peel regions.
- Data for Toronto are compared to the following regions where possible:
 - GTA, excluding Toronto;
 - Ontario, excluding Toronto;
 - Highest and lowest Ontario Public Health Unit (PHU).
- Data are presented for the PHUs with the highest and lowest rates, where they are reportable.
 - Where Toronto is the highest or lowest PHU, only Toronto is presented to avoid duplication on the dashboard, i.e., if Toronto is the highest PHU, there is no “highest PHU” value presented, and if Toronto is the lowest PHU, there is no “lowest PHU” value presented.

Sub-Toronto Geography

- Data are reported by sub-Toronto geography where possible. Analyzing data by geography allows us to assess and identify patterns in health status at more granular levels. This understanding supports planning and provision of public health services for residents living in different areas of the city.
- Data are analyzed by the City of Toronto’s 158 neighbourhoods wherever possible.
 - The City of Toronto is divided into neighbourhoods to support social service planning, data collection and analysis. Prior to 2022, there were 140 Toronto

- Neighbourhoods and due to population growth, some of these neighbourhoods were split, resulting in 158 official neighbourhoods.
- For more information about the 158 Toronto Neighbourhoods, refer to [About Toronto Neighbourhoods](#).
- Where a high proportion of neighbourhoods need to be suppressed (e.g., due to small counts), sub-Toronto geographical analysis for that indicator is not conducted.
- Where 30% or more ($\geq 30\%$) of sub-Toronto geographical areas need to be suppressed, sub-Toronto geographical analysis for that indicator is not conducted.
- Neighbourhood analyses are based on combined years of data in order to obtain a sample size large enough to analyze at smaller geographic levels. By combining years of data, changes over time in and between geographic areas may be hidden.

Socio-demographic Characteristics

- Data are reported by socio-demographic characteristics, where possible. Analyzing data by socio-demographic groups helps to identify and monitor differences in health status between groups, including health inequities. This understanding supports planning and provision of public health services for specific populations.
- The indicators contained in this dashboard come from administrative data sources rather than survey data. These sources have limited socio-demographic variables. As such, key socio-demographic stratification is not possible/ available for these indicators (e.g., ethno-racial identity, immigration status, etc.).
- Income analysis included in this dashboard are based on area-level assignment of income rather than direct measure of individuals' income. Therefore, these analyses are subject to ecological bias. See the *income quintile* information in the glossary section for specifics on this methodology.

Glossary

- **Income Quintiles** are five groups, each containing approximately 20% of the population. They 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), using income tax filer data. 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.
- **Gestational Age** is calculated as the interval between the date of delivery of the fetus or newborn and the first day of a woman's last normal menstrual period. Full-term pregnancies average about 40 weeks (37 completed weeks to 42 completed weeks).
- **Live Birth** is the complete expulsion or extraction from its mother of a product of conception irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life such as a heartbeat, umbilical cord pulsation, or definite movement of voluntary muscles, whether the umbilical cord has been cut or the placenta is attached. A live birth is not necessarily a viable birth.
- **Multiple Birth** refers to the birth (live or stillbirth) of more than one child during a single delivery.
- **Parity** refers to the number of times a woman has given birth to date.

- **Primiparous** refers to a woman who has given birth for the first time.
- **Multiparous** refers to a woman who has previously given birth to at least one child.
- **Singleton Birth** refers to the birth (live or stillbirth) of one child during a single delivery.

Data Source Notes

Two data sources were used for birth data: the Better Outcome Registry and Network (BORN) Information Systems (BIS) and the Discharge Abstract Database (DAD). Depending on the indicator, some data were only available through one source, or it was deemed appropriate to use one data source over the other. For a more detailed discussion of the strengths and limitations of each source, please see the [Association of Public Health Epidemiologists \(APHEO\) - 10 Reproductive Health Core Indicators Documentation Report](#).

Better Outcomes Registry and Network (BORN) Information Systems (BIS)

- BORN is Ontario's pregnancy, birth and childhood registry and network. Data is sourced from birthing hospitals, midwifery practice groups, Expanded Midwifery Care Models, birthing centres, fertility clinics, prenatal and newborn screening laboratories, follow-up clinics, clinical programs, and primary care organizations.
- Time trends for BORN indicators are provided for 2013 onwards. Although the BIS was launched in April 2012, data may not be complete for some elements in that first year.
- Geography is assigned based on the infant's residence at the time of birth, not the location of birth. The majority of the time, but not always, the infant's residence is the same as the mother's residence.
- Births to Ontario mothers that occur out-of-province are not included in the data.
- Data are from the BORN public health unit Analytics Cube, which is based on submitted data only, and includes both acknowledged and unacknowledged data. As such, the numbers are subject to change as organizations continue to submit, acknowledge, and fix errors in their data. The exception to this is certain elements of the gestational diabetes analysis which were extracted from the Standard Reports. See the Indicator Notes within the Indicator Information section for details on this.
- Analyses exclude birth records with missing information. Similarly, the neighbourhood and income analyses excluded birth records that did not have available dissemination area information and could not be linked to a Toronto census tract or neighbourhood.
- Caution should be taken when interpreting data where the percentage of "missing data" for a particular element was $\geq 10\%$. For these values, the data are presented with a caution statement. Data are suppressed where missing data is $\geq 30\%$ for a particular element.
- To reduce the risk of re-identifying individuals, cells of five or less were suppressed.

Discharge Abstract Database (DAD)

- The Discharge Abstract Database (DAD) captures administrative, clinical, and demographic information on hospital discharges (including deaths, sign-outs and transfers).
- Hospitalization data excludes births which occur outside of hospital which represent 2 to 3.5% of all births to Toronto women each year.
- Births to Ontario mothers that occur out-of-province are not included in the data.

- Analyses exclude birth records with missing information. Similarly, the neighbourhood and income analyses excluded birth records that could not be linked a Toronto census tract or neighbourhood.
- To reduce the risk of re-identifying individuals, cells of less than five were suppressed.

Indicator Information

Alcohol Exposure During Pregnancy

Description:

- The percentage of women with any alcohol exposure during pregnancy.

Data Sources:

- **Numerator and Denominator:** Public Health Unit Analytic Reporting Tool (Cube), BORN Information System (BIS), BORN Ontario. Information accessed on October 25, 2023. [Used in: Trend over Time, Socio-demographic Characteristics.](#)
- **Numerator and Denominator:** Ontario Agency for Health Protection and Promotion (Public Health Ontario). [Snapshots: maternal health snapshot: alcohol exposure during pregnancy >> overall per cent >> 2021 \[Internet\]. Toronto, ON: King's Printer for Ontario; c2023 \[modified 2023 Sept 29; cited 2023 Oct 17\].](#) Used in: Regional Comparison, Overall Findings.
- **Income Quintiles:** Statistics Canada. Table I-13: After-tax low-income status of tax filers and dependents (census family low-income measure, CFLIM-AT) for couple and lone parent families by family composition, 2019. [Used in: Socio-demographic Characteristics \(Income\).](#)

Indicator Notes:

- Alcohol exposure data from BORN are self-reported and thus subject to under-reporting and social desirability bias.
- Sub-Toronto Geography information was not displayed for this indicator due to the required suppression of a high proportion of Toronto neighbourhoods.

Birth Weight for Gestational Age

- Large for Gestational Age
- Small For Gestational Age

Description:

- The number of **large for gestational age (LGA)** singleton live births per 100 singleton live births. LGA refers to babies with birth weights above the 90th percentile of birth weight for babies of the same sex and gestational age.
- The number of **small for gestational age (SGA)** singleton live births per 100 singleton live births. SGA refers to babies with birth weights below the 10th percentile of birth weight for babies of the same sex and gestational age.

Data Sources:

- **Numerator and Denominator:** Public Health Unit Analytic Reporting Tool (Cube), BORN Information System (BIS), BORN Ontario. Information accessed on October 29,

2023. Used in: Trend over Time, Sub-Toronto Geography, Socio-demographic Characteristics.

- **Numerator and Denominator:** Ontario Agency for Health Protection and Promotion (Public Health Ontario). [Snapshots: reproductive health snapshot: large for gestational age; small for gestational age >> overall per cent >> 2021 \[Internet\]. Toronto, ON: King's Printer for Ontario; c2023 \[modified 2022 Sept 30; cited 2023 Jul 10\].](#) Used in: Regional Comparison, Overall Findings
- **Income Quintiles:** Statistics Canada. Table I-13: After-tax low-income status of tax filers and dependents (census family low-income measure, CFLIM-AT) for couple and lone parent families by family composition, 2019. Used in: Socio-demographic Characteristics (Income).

Indicator Notes:

- Two different data sources were used to compile these indicator pages. The two data sources had slightly different inclusion criteria for data analysis. PHO Snapshot data included only hospital births while BORN data included both hospital and home births. These differences resulted in slightly different estimates of the LGA and SGA rates for the same time period.
- The percentile cut-offs for calculating LGA and SGA are based on the [population-based Canadian reference tables](#) developed by Kramer et al. in 2001. The reference tables apply only to singleton births of gestational ages 22 to 43 completed weeks. This limits the analysis to singleton babies born between 22 and 43 weeks of gestation.
- Due to technicalities of the data source, babies born outside of the 22 to 43 weeks of gestation were not removed from the analysis using BORN data. This would have limited impact on the outcome of the analysis as very few babies (less than 0.3%) were born outside of this period.
- Canadian reference birth weight for gestational age percentile cut-offs may misclassify healthy infants of certain ethnicities as SGA. Newborns of parents originating from non-European/Western nations tend to be smaller at birth. However, ethnic-specific birth weight for gestational age cut-offs are currently not available for Ontario in a format that can be used for population health. As a result, public units with large immigrant population (such as Toronto) may observe higher SGA rates and lower LGA rates in comparison to other public health units.

Fertility

- [General Fertility](#)
- [Teen Fertility](#)

Description:

- General Fertility Rate is the number of live births per 1,000 females aged 15 to 49 years during a specified period of time.
- Teen Fertility Rate is the number of live births per 1,000 females aged 15 to 19 years during a specified period of time.

Data Sources:

- **Numerator:** Inpatient Discharges 2013 to 2022, Ontario Ministry of Health, IntelliHEALTH ONTARIO, Date Extracted: August 18, 2023. [Used in: All sections.](#)

- **Denominator:** Population for Toronto and Larger Areas: Population Projections 2022, Ontario Ministry of Health, IntelliHEALTH ONTARIO. Date extracted: September 8, 2023. [Used in: Overall Findings, Trend over Time, Regional Comparison.](#)
- **Denominator:** Population for Toronto: Population Estimates 2013 to 2021, Ontario Ministry of Health, IntelliHEALTH ONTARIO. Date extracted: September 6, 2023. [Used in: Trend over Time.](#)
- **Denominator:** Population for sub-Toronto Geographies: Registered Persons Database (RPDB) 2020 to 2022, Received from Ontario Community Health Profiles Partnership (OCHPP) August 28, 2023. [Used in: Sub-Toronto Geography, Socio-demographic Characteristics.](#)
- **Income Quintiles:** Statistics Canada - Table F-18 annual income estimates for census families and individuals (T1 Family File), 2015. [Used in: Socio-demographic analysis \(Income\).](#)

Indicator Notes:

- Since this indicator requires the number of births by age of mother, and maternal age is not available in the newborn record, the number of deliveries rather than the number of newborns is used.
- For teen fertility, the income analysis is based on combined years of data in order to obtain a sample size large enough at this level. By combining years of data, changes over time in and between geographic areas may be hidden.
- Sub-Toronto Geography information was not displayed for the teen fertility indicator due to the required suppression of a high proportion of Toronto neighbourhoods.
- Births to women under 15 and over 49 years of age were excluded from the analyses.

Gestational Diabetes

Description:

- The percentage of pregnant women with gestational diabetes, a type of diabetes that develops during pregnancy.

Data Sources:

- **Numerator and Denominator:** Public Health Unit Analytic Reporting Tool (Cube), BORN Information System (BIS), BORN Ontario. Information accessed on October 16, 2023. [Used in: Trend over Time, Sub-Toronto Geography, Socio-demographic Characteristics.](#)
- **Numerator and Denominator:** Distribution of gestational diabetes, by insulin-dependence, public health unit and province (Standard Report), BORN Information System (BIS), BORN Ontario. Information accessed on October 16, 2023. [Used in: Overall Findings, Regional Comparison.](#)
- **Income Quintiles:** Statistics Canada. Table I-13: After-tax low income status of tax filers and dependents (census family low income measure, CFLIM-AT) for couple and lone parent families by family composition, 2019. [Used in: Socio-demographic Characteristics \(Income\).](#)

Indicator Notes:

- Data on gestational diabetes in BORN is based on a confirmed diagnosis. Data is primarily extracted from various information sources such as the Ontario Perinatal Records, hospital records, etc. Women may also self-report a confirmed diagnosis of gestational diabetes to the provider.

- The 2021 rate for gestational diabetes in Toronto used in the overall findings and regional comparison sections of the dashboard is from the Standard Reports available in BORN, whereas data in the other sections is from the BORN public health unit Analytics Cube. Data in the Standard Reports represent all data that has been entered, submitted and acknowledged into the BIS as of the date of extraction, whereas data in the BORN public health unit Analytics Cube is based on submitted data only (which may include both acknowledged and unacknowledged data). As such, the Toronto rate found in the overall findings and regional comparison sections may differ from the Toronto rate found in other sections of the dashboard.

Low Birth Weight

Description:

- The number of low birth weight (LBW) births per 100 live births. LBW is defined as birth weight less than 2,500 grams (5.5 pounds).

Data Sources:

- **Numerator and Denominator:** Inpatient Discharges 2013 to 2022, Ontario Ministry of Health, IntelliHEALTH ONTARIO, Date Extracted: November 22, 2023. [Used in: All sections.](#)
- **Income Quintiles:** Statistics Canada - Table F-18 annual income estimates for census families and individuals (T1 Family File), 2015. [Used in: Socio-demographic analysis \(Income\).](#)

Indicator Notes:

- Low birth weight rates were for all babies and not limited to just singletons.

Mental Health Concern During Pregnancy

- [Anxiety During Pregnancy](#)
- [Depression During Pregnancy](#)
- [Mental Health Concern During Pregnancy](#)

Description:

- The percentage of women who experienced **anxiety** during pregnancy.
- The percentage of women who experienced **depression** during pregnancy.
- The percentage of women who experienced **any mental health concern(s)** during pregnancy. This includes anxiety, depression, history of postpartum depression, addiction, bipolar, schizophrenia, or other.

Data Sources:

- **Numerator and Denominator:** Public Health Unit Analytic Reporting Tool (Cube), BORN Information System (BIS), BORN Ontario. Information accessed on October 17 and 24, 2023. [Used in: Trend over Time, Sub-Toronto Geography, Socio-demographic Characteristics.](#)
- **Numerator and Denominator:** Ontario Agency for Health Protection and Promotion (Public Health Ontario). [Snapshots: maternal health snapshot: anxiety during pregnancy; depression during pregnancy; maternal mental health concern during pregnancy >> overall per cent >> 2021 \[Internet\]. Toronto, ON: King's Printer for Ontario; c2023](#)

[\[modified 2023 Sept 29; cited 2023 Oct 17\]](#). Used in: Regional Comparison, Overall Findings.

- **Income Quintiles:** Statistics Canada. Table I-13: After-tax low income status of tax filers and dependents (census family low income measure, CFLIM-AT) for couple and lone parent families by family composition, 2019. Used in: [Socio-demographic Characteristics \(Income\)](#).

Indicator Notes:

- Maternal mental health variables from BORN capture any maternal mental health concerns during pregnancy, including those pre-existing, diagnosed during pregnancy or active during pregnancy, both diagnosed or self-reported. Maternal mental health variables from BORN are self-reported and, thus, subject to under-reporting and social desirability bias.
- Occurrences of different types of mental health concerns during pregnancy are not mutually exclusive. Therefore, the total number of mental health concerns may be greater than the total number of women with one or more (any) mental health concern(s).

Preterm Birth

Description:

- The number of preterm live births per 100 live births. Preterm birth is defined as birth before 37 completed weeks of pregnancy.

Data Sources:

- **Numerator and Denominator:** Inpatient Discharges 2013 to 2022, Ontario Ministry of Health, IntelliHEALTH ONTARIO, Date Extracted: October 13 and November 13, 2023. Used in: [All sections](#).
- **Income Quintiles:** Statistics Canada - Table F-18 annual income estimates for census families and individuals (T1 Family File), 2015. Used in: [Socio-demographic analysis \(Income\)](#).

Citation for Technical Notes

Toronto Public Health. (2024). Population Health Status Indicator Dashboard: Technical Notes for Reproductive and Infant Health Dashboard. Available from: <https://www.toronto.ca/wp-content/uploads/2024/05/9042-PublicHealthPHSITechNotesReproductiveInfant.pdf>.

Citation for PHSI Reproductive and Infant Health Dashboard

Toronto Public Health. (2024). Population Health Status Indicator Dashboard: Reproductive and Infant Health Dashboard. Available from: <https://www.ontariohealthprofiles.ca/torontohealthstatus/reproductive&infant.php>.