

## TECHNICAL NOTES

# Health Inequities in Singleton Low Birth Weight

## About

This Health Equity Snapshot summarizes how rates of Singleton Low Birth Weight vary across quintiles of marginalization for the province, Local Health Integration Networks (LHINs), and public health units (PHUs). Data are reported by 2 year intervals for the years 2004-2005 to 2016-2017.

This Snapshot reports on seven summary measures of socioeconomic inequality which quantify the differences between quintile specific rates of health status. The summary measures included are:

- Rate Ratio
- Rate Difference
- Relative Index of Inequality (ratio)
- Relative Index of Inequality (mean)
- Slope Index of Inequality Population Attributable Fraction
- Population Impact Number

These seven summary measures are calculated for the four dimensions of the Ontario Marginalization Index (ON-Marg). Provincial and local-level ON-Marg quintile cutoffs are available for:

- Material Deprivation
- Residential Instability
- Dependency
- Ethnic Concentration

For more information on these dimensions, including how they were created and definitions, please [see our FAQs](#).

Data sources, indicator definitions, and health equity analysis methodology are described below.

## Indicator definition: Singleton Low Birth Weight

**Description:** Crude rate of live singleton births less than 2,500g, measured per 100 singleton births. Singleton births refer to births of one child as opposed to twins or multiples. This indicator definition was adapted from the [APHEO Birth Weight Indicator](#).

**Numerator:** Number of singleton live births less than 2,500g.

**Denominator:** Number of singleton live births.

**Exclusions:**

- Multiple births
- Stillbirths
- Records with invalid or missing postal codes.
- Records with invalid or missing birth weight
- Non-Ontario residents
- Cases geocoded to DAs that are not assigned ON-Marg quintile values

**Data Source:**

- Distract Abstract Database, 2004-2017, Ontario Ministry of Health and Long-Term Care, IntelliHEALTH ONTARIO, Date extracted: 2019 Jan 2

## Methodology

The analytic approach taken to calculate the results presented in this snapshot is as follows:

1. Assign cases to a level of marginalization
2. Calculate quintile-specific rates of health status
3. Calculate summary measures of socioeconomic inequality

### 1) Assign cases to a level of marginalization

Individuals who appear in administrative health data are assigned to a level of marginalization using the Ontario Marginalization Index (ON-Marg). ON-Marg is an area-based deprivation index that uses factor analysis of 18 indicators of socioeconomic status to provide measurement of four dimensions of marginalization: 1) residential instability 2) material deprivation 3) dependency and 4) ethnic concentration. See Appendix A for descriptions of the ON-Marg dimensions, or the [Public Health Ontario website](#) for more information.

ON-Marg can be used to assign individual cases to a quintile of marginalization based on the dissemination area (DA) of residence. A DA is a standard census geographic unit with a population of 400 to 700 persons. Two different methods of creating quintiles are used in this analysis:

- **Local cutoffs:** With this method, quintiles are weighted specifically for each individual PHU or LHIN. Each quintile will contain 20% of all dissemination areas within a given PHU or LHIN. This

option should be selected by users who are interested in defining the level of marginalization based on the local population characteristics, rather than population characteristics of Ontario.

- **Ontario cutoffs:** With this method, quintiles are weighted provincially, so that each quintile contains 20% of all Ontario dissemination areas. This means that the distribution of quintiles across sub-provincial geographies such as PHUs and LHINs will not necessarily be equal. This option should be selected by users who are interested in making comparisons between groups defined by a level of marginalization based on the entire province, or for making comparisons between geographies using provincially comparable measures of marginalization.

The Statistics Canada Postal Code Conversion File Plus (PCCF+) is used to geocode cases to DAs based on their postal code. Once cases have been assigned to DAs, ON-Marg is used to assign cases to a level of marginalization for each of the four dimensions, for both local and Ontario cutoffs. To account for changing levels of marginalization over time, health status data is assigned ON-Marg quintile values corresponding to closest version of ON-Marg. For example, 2012-2013 health status data are assigned to 2011 ON-Marg quintiles, while 2014-2015 health status data are assigned to 2016 ON-Marg quintiles.

## 2) Calculate rates

Numerators and denominators were created by aggregating health status data by ON-Marg quintiles.

## 3) Calculate Summary Measures of Inequality

Summary measures of socioeconomic inequality were calculated in SAS to summarize differences in health status across the five quintiles of marginalization. Seven summary measures were calculated for each of the four ON-Marg dimensions using the local and Ontario quintile cutoffs, and for each two year grouping of analysis. The summary measures included in this snapshot are:

**Rate Difference:** The absolute difference in rates of the health outcome between the highest and lowest socioeconomic group (Quintile 5 - Quintile 1).

**Relative Rate:** The relative difference obtained by dividing the rate of the least advantaged group by the rate of the most advantaged group (Quintile 5/Quintile 1).

**The Slope Index of Inequality:** An absolute summary measure of inequality, which represents the slope of the linear regression comparing the mean health outcome in a socioeconomic group to the cumulative percent of the population, ranked by socioeconomic position (from lowest to highest).

**The Relative Index of Inequality (ratio):** A relative summary measure of inequality which represents the predicted value of the health outcome in the hypothetical least advantaged individual divided by the predicted value of the hypothetical most advantaged individual. Predictions are derived using log-linear Poisson regression, based on the methodology outlined in Moreno-Betancur et al. (2015).

**The Relative Index of Inequality (mean):** A relative summary measure of inequality, calculated by dividing the slope index of inequality by the mean rate of the health outcome in the population.

**Population Attributable Fraction:** The projected reduction in the rate of a health indicator if each socioeconomic group experienced the rate of the most advantaged group, expressed as a percentage of the total health outcome.

**Population impact number:** The projected reduction in the number of cases of a health indicator if each socioeconomic group experienced the rate of the most advantaged group, expressed as a count.

More information on [summary measures of inequality can be found here](#). More information on the Relative Index of Inequality (ratio) can be found here:

Moreno-Betancur M, Latouche A, Menvielle G, Kunst AE, Rey G. Relative index of inequality and slope index of inequality: A structured regression framework for estimation. *Epidemiology*. 2015;26(4):518-527.

## Suppression

Due to the replacement of the 2011 long-form census with the National Household Survey, the 2011 version of ON-Marg was derived using alternative administrative data sources. The use of these data sources in 2011 may impact the ability of ON-Marg to analyze trends over time for some sub-provincial geographies. As a result, health equity analysis results have been suppressed for the years 2009-13 for some public health units and Local Health Integration Networks.

Suppression was applied to only those dimensions and geographies susceptible to potential impact from the use of 2011 alternative data sources. The use of these data sources may have changed the quintile of marginalization of some DAs more than expected. DAs that have similar measures of marginalization in both 2006 and 2016, but have divergent measurements in 2011, are considered outliers that may impact trends over time. Health equity analysis results for those geographies and dimensions with a large number of outlier DAs relative to the total number of DAs per geography, weighted by the magnitude of the difference, have been suppressed for the years 2009-13.

## Suggested Citation

### Generic Citation Format:

Author. Content tool: Geographic entity: Title of indicator. Place of publication: Publisher; last updated date [date of access]. Available from: insert URL to page being referenced.

### Example Citation:

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