

The Registered Persons Database (RPDB) vs. Statistics Canada, Census Counts: Why the Ontario Community Health Profiles Partnership (OCHPP) Project Uses RPDB instead of Census as the Source for Population (Denominator) Data

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Background

The Ontario Community Health Profiles Partnership (OCHPP) hosts and maintains a freely accessible website to make detailed, area-level health data available to everyone: www.ontariohealthprofiles.ca. Our goal is to support action to reduce health inequities in Ontario. The OCHPP team has a long history and experience of developing small areas and generating health data at small and large areas for Ontario including neighbourhoods (local area) and larger areas such as 5 Ontario Health Interim and Transitional Regions (Interim Regions), 14 Ontario Local Health Integration Networks (LHINs) and 76 Sub-Regions. Among our 1000s of users are health planners, health agencies, researchers, students and universities. Member partners of OCHPP include community health centres, research institutes, Local Health Integration Networks, municipal planning agencies and public health units.

Data sources for OCHPP

Through a unique data sharing partnership, OCHPP most exclusively accesses health data from various sources stored at ICES to calculate rates for health conditions, system contact, screening etc. The methods used to calculate the numerator and denominator of a rate depend on the condition or indicator being measured. An essential component of any calculation is the estimate of the size of the population at risk. So the key questions are: *How is the size of the population estimated? And what source does OCHPP use for population estimates?*

Two main population sources

There are two main sources that provide the most reliable estimates of Ontario's population. For purposes of OCHPP reporting, we use the Registered Persons Database (RPDB) as the source (denominator) for all of our health-related indicators. While another major source for identifying the population (denominator) is Statistics Canada's Census counts (Census), the OCHPP has determined that *the RPDB provides a more consistent measure for the calculation of rates for health indicators and conditions*. We explain why and provide examples to illustrate.

RPDB

The RPDB (database) provides basic demographic information about anyone who has ever received an Ontario Health Insurance Plan (OHIP) card. OHIP cards include a unique Health Card Number (HCN) to identify a person's age, sex and address, including postal code. The postal codes used at ICES come mainly from HCNs. Information from the health card is stored in the RPDB. Health cards are *usually* renewed every 5 years, a process that helps to ensure that information in the system is periodically refreshed, such as address, for example, should a person move and update the card within that time frame. The system may also be updated more frequently if an individual interacts with the healthcare system between renewal periods. This allows for a more current source of location-based data for health reporting.

To best match a postal code of an Ontario Health Insurance Plan (OHIP) card holder to their corresponding Census (i.e. Dissemination Area), health geography (Interim Region, LHIN, Sub-Region) or

“neighbourhood” location, OCHPP pairs Canada Post’s Postal Code Conversion File Plus (PCCF+) with a de-identified registry of OHIP information. To determine Ontario’s RPDB population within a particular year – or to best align health indicators with the years where specific data are available or most current – OCHPP methods filter the registry to ensure that the selected population includes only those persons who have a valid Ontario Health Insurance Plan card and who were alive and eligible for coverage during the specified reference period. These results are further adjusted to approximate the distribution of Ontario’s population. This process of filtering, sorting and organizing the de-identified health card database files before using PCCF+ to link postal codes to geography can change the year-over-year RPDB population count, or re-distribute the Dissemination Area assignments of health card users, particularly in smaller or more rural areas (such as neighbourhoods). Changes are less evident at larger scales, like LHINs or Interim Regions, but may be more pronounced in some age groups. These changes occur in addition to natural fluctuations in population that occur over time.

Longitudinal analysis should be done with caution. Comparison of year-over-year rates may be appropriate – where both the numerator and the denominator are sourced from the RPDB population – but counts alone are likely to be misleading or create erroneous interpretations. Similarly, it is not recommended to use RPDB population counts to track population change over time within a specific area; the RPDB is intended to mirror the population distribution of the Census, not to provide an independent measure of population change.

Census

Another source of data on where people live can come from Statistics Canada (Stats Can). Stats Can collects data on individuals living in Canada through the Census, a survey conducted every 5 years. Stats Can reports who lives in a given area *at one point in time – i.e. based on the information an individual provides when completing the Census.*

RPDB vs. Census

While at the provincial level, the number of people we identify in the RPDB as living in Ontario does not differ much from Census estimates, differences are more pronounced at smaller areas such as neighbourhoods or local areas. This particular issue is most evident in areas of high migration where we have observed large differences in rates using RPDB vs. the Census in part due to population mobility.

For example, in some areas of Ontario, particularly in larger urban centres, newcomers to the area often settle first “downtown” but over time, may move from downtown to outlying areas. The majority of people who move do not change or update their health card until renewal time so they stay in the RPDB with their original health card information including the address and postal code of their “downtown” address.

The same is true of Census population counts: when someone moves, they are still considered living at their original address and comprise the population of that area until the next Census is taken (every 5 years).

However, in both cases, this movement of people can affect rates depending on the population source used to calculate those rates.

How does this affect rates?

As a first principle, in order to calculate *the most accurate* rates for a given health indicator, we must ensure that we are counting the *same people in the numerator and the denominator.*

When calculating the majority of the indicators for OCHPP, we use multiple data sources for our numerators that collect data using the HCN, such as OHIP, Canadian Institutes for Health Information (CIHI), National Ambulatory Care Reporting System (NACRS), disease registries, etc. When we use the RPDB as the denominator and to calculate rates, we are therefore using the same source for both the numerator (HCN) as the denominator (HCN/RPDB).

If when calculating rates, we use a different source for the denominator i.e. Census than we do for the numerator this can – and in our experience has – result in an over- or under-estimation of the indicator, as shown in the following example:

An example of calculating rates using RPDB vs. Census

Question/Health Outcome: What is the rate of mammogram screening among women ages 50-69 in small area X:

RPDB as population source

If the RPDB identifies 1,000 women aged 50-69 as living in an identified small area and 100 women of that age were screened we would get a rate of 10%.

Census as population source

However if we used Statistics Canada Census estimates, say 800 women aged 50-69 – we would get a rate of 12.5% for the same screening $[(100/800)*100]$.

A complicating feature of this mixed-sources approach is that the 100 women that were screened may not necessarily be a subset of the 800 women that Stats Can identified as living in that area.

Conclusion

If we use RPDB for both numerator and denominator, although there is the possibility for error – as we have explained previously – the error for both the numerator and the denominator is the same. By using the RPDB, we ensure a more consistent methodology is applied to report the rates.

Limitations

- The postal code information in the RPDB may not be accurate. However, as explained, since this source of error is the same for both the numerator and denominator, using the RPDB provides more reliable, accurate rates;
- There are people who have health card numbers and their information is in the RPDB, but they do not currently live in Ontario. This may inflate the denominator. While this is correct, we try to exclude them by using their date of last contact (DOLC) with the health system using their OHIP card. At OCHPP, we currently exclude all individuals who did not have any contact with the health care system during the last 10 years.
- For some indicators, such as premature mortality, the methodology used by OCHPP to determine deaths may result in the undercount of deaths for some age groups that may not have valid OHIP numbers (health cards). For example, deaths of newborns may have the most undercount as application for a health card (health card number, HCN) would not have been completed for babies who die within one day or shortly after birth. We advise our users to take this limitation into account when using premature mortality (deaths before 74 years of age) given the missing counts in the age range less than one year

How this change affects OCHPP indicators

To date, most indicators on the OCHPP website used Census data as the population source. The impact of changing from Census to RPDB for all indicators remains to be seen and won't be understood until we generate at least one more round of updated data for all indicators. We will then be able to determine how and if the rates differ from previous years within the context of trends over time.