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TECHNICAL NOTES

Infectious Disease (ID) Query Data Caveats

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Introduction

When interpreting data from ID Query, the following data caveats should be considered where applicable. Additional information about the data used to produce the tables and rates in ID Query is available in the metadata file.

General Notes

- ID Query includes confirmed and probable cases of diseases of public health significance reported by public health units (PHUs) in Ontario through the integrated Public Health Information System (iPHIS) and the Public Health Case and Contact Management Solution (CCM).
- Case counts extracted from iPHIS are current as of the most recent Wednesday at 7:00 a.m. Includes data from the last 10 years and current year to the most recent Wednesday.
- iPHIS is a dynamic disease reporting system which allows ongoing updates to data previously entered. As a result, data extracted from iPHIS represent a snapshot at the time of extraction and may differ from previous or subsequent reports.
- As of June 2, 2024, entry and reporting of specific COVID-19 data shifted back to iPHIS with a focus on entering COVID-19 cases with fatal outcomes and outbreaks. ID Query only presents historical COVID-19 cases from CCM up to June 1, 2024.
- The data only represent cases reported to public health and recorded in iPHIS and CCM. As a result, all counts will be subject to varying degrees of underreporting due to a variety of factors, such as disease awareness and medical care seeking behaviours, which may depend on severity of illness; access to medical care; clinical practice; and changes in laboratory testing[1] and reporting.
- Only provincial case classifications as listed in the Ontario Ministry of Health surveillance case definitions[2] are included in the report counts. Cases are excluded if they do not meet the provincial case classifications that were in effect at the time that they were reported.
- Changes to provincial surveillance case definitions and disease classifications have occurred over the years. Cases are classified in iPHIS and CCM according to the Ontario Ministry of Health surveillance case definitions[2] used at the time the case was identified. Please note that the case definitions available in Appendix 1 under the Infectious Diseases Protocol represent the most recent definitions, and cases reported in prior years may have been classified according to different case definitions or disease classifications which may impact analysis of trends. The Document History within each Appendix 1 (case definitions and disease-specific information) provides a document history of all changes from 2013 onwards. Some of the disease-specific case definition changes are outlined in broad terms below. Public Health Ontario (PHO) has also

produced the report Factors Affecting Reportable Diseases in Ontario[3] which is available with an appendix[4] online to help with interpreting trends over time.

- Cases are reported based on 'episode date', with the exception of CPE, HIV, AIDS and TB. The episode date is an estimate of the onset date of disease for a case. In order to determine this date, the following hierarchy is in place in iPHIS: Onset Date > Specimen Collection Date > Lab Test Date > Reported Date. If an onset date exists it will be used as the episode date. If not available, then the next available date in the hierarchy will be used. For congenital rubella syndrome, the 'episode date' is the case's date of birth. In CCM the episode date is simply the earliest of onset date, collection date, and reported date with no hierarchy applied.

- In CCM, episode date is based on the best estimate of the date of disease onset. This date is calculated based on either the date of symptom onset, specimen collection/test date for the COVID-19 test, or the date the COVID-19 case was reported to public health (not the specimen collection/test date). While the COVID-19 cases in ID Query are attributed to a particular year using this episode date hierarchy, PHO's Ontario Respiratory Virus Tool (ORVT) uses the date the COVID-19 case was reported to public health to place the data in time. In addition, the ORVT presents COVID-19 cases by surveillance weeks which correspond to the FluWatch Public Health Agency of Canada (PHAC) influenza surveillance weeks. Aggregated counts in the ORVT are presented by the surveillance period (approximately September 1 of one year to August 31 of the following year). Therefore, total annual cases in ID Query will differ from those that can be derived from the ORVT.

- Refer to the Infectious Diseases Query Metadata for Cognos data extraction report logic.[5]

- Orientation of case counts by geography is based on the Diagnosing Health Unit in iPHIS and Permanent Health Unit (DHU) in CCM. DHU will be used to denote both Diagnosing Health Unit and Permanent Health Unit in this document. DHU refers to the case's PHU of residence at the time of illness onset and not necessarily the location of exposure. Cases for which the DHU was reported as MOHLTC-PHD in iPHIS or MOH-PHO in CCM (to signify a case that is not a resident of Ontario) or an invalid PHU value (i.e., Muskoka Parry Sound) have been excluded from all analyses in ID Query.

- Cases for which the Disposition Status was reported as **entered in error, does not meet definition, duplicate-do not use**, or any variation on these values have been excluded.

- Duplicate case records may be included if they were not identified and resolved at either the local or provincial level prior to data extraction from iPHIS or CCM.

- ID Query is intended to be a data exploration tool based on data reported by PHUs to PHO. As a result, PHO cannot and does not warrant or represent that the data generated by this tool are accurate, complete, reliable or current. Therefore, the application and use of these data is the responsibility of the user and PHO assumes no liability resulting from any such application or use.

- If your PHU chooses to use Ontario data from ID Query in publicly-facing information products (e.g., interactive web tools), please include the following note:

    - These data originate from iPHIS and were extracted by PHO. The data are dynamic and intended to provide information on emerging trends in diseases of public health significance but are considered preliminary pending verification. Use with caution.

- For years in which population estimates were not available at the time of data extraction, the population projection was used to calculate disease rates.
- Rates calculated elsewhere for neonatal and congenital diseases may differ from those calculated in ID Query, as ID Query uses population estimates and projections, rather than live birth estimates (which may be used elsewhere) as denominators to calculate all rates.
- Cases of recently reported diseases that are rare (e.g., chancroid, hemorrhagic fever, Lassa fever, plague, psittacosis, rubella, tetanus, tularemia, etc.) should be interpreted with caution, as follow-up and verification by PHUs may still be in progress and may result in updates to the iPHIS records.
- Due to the impact of the COVID-19 pandemic on testing and reporting of diseases of public health significance in Ontario interpret data for 2020 through 2023 with caution.

Disease Specific Interpretation Notes and Caveats

Enteric Diseases

- Provincial analyses of enteric disease cases typically include only confirmed cases, due to the limited number of probable and/or suspect cases reported and variability in reporting across PHUs.
- **Verotoxin-producing *E. coli* (VTEC) infection indicator conditions, including Haemolytic Uraemic Syndrome (HUS):** While all VTEC (including non-O157 VTEC) must be reported in Ontario, stool samples are not routinely screened for non-O157 VTEC at front line laboratories and very few cases of HUS are reported in the absence of laboratory confirmed O157 VTEC. Case counts reported under this case definition are, therefore, most representative of O157 VTEC incidence in Ontario.

Vectorborne Diseases

- **Anaplasmosis:** As of July 1, 2023, anaplasmosis was added to the list of diseases of public health significance. Therefore, case counts of anaplasmosis in 2023 only represent a partial year.
- **Babesiosis:** As of July 1, 2023, babesiosis was added to the list of diseases of public health significance. Therefore, case counts of babesiosis in 2023 only represent a partial year.
- **Powassan virus:** As of July 1, 2023, Powassan virus was added to the list of diseases of public health significance. Therefore, case counts of Powassan virus in 2023 only represent a partial year.

Zoonotic Diseases

- Provincial analyses of most zoonotic disease cases (which include anthrax, brucellosis, Hantavirus pulmonary syndrome, plague, psittacosis/ornithosis, Q fever, rabies, trichinosis and tularemia) typically include only confirmed cases, due to the limited number of probable and/or suspect cases reported and variability in reporting across PHUs.
- Due to small counts of zoonotic diseases, the impact of surveillance case definition changes is unlikely to greatly influence interpretation of the trends observed. Refer to the surveillance case definition files for the latest version of the case definitions along with a history of all changes from 2013 onwards.

- ***Echinococcus multilocularis:*** As of May 1, 2018, *Echinococcus multilocularis* (EM) was added to the list of diseases of public health significance. Therefore, case counts of EM in 2018 only represent a partial year.

Vaccine Preventable Diseases

- Provincial analyses of vaccine-preventable diseases typically include case classifications that are reportable at the provincial level (refer to Appendix 1 – or Table if included under general caveats)[2]. An exception is for measles, rubella and congenital rubella syndrome where probable cases are typically excluded from provincial analyses despite being reportable at the provincial level since strict criteria are required to identify cases under Canada's elimination status; probable measles cases from the 2024-25 multi-jurisdictional outbreak were included.

- Reporting on probable cases for some diseases was instituted following case definition change on April 28, 2009, because cases that previously met the confirmed case definition were subsequently required to be reported as probable. To facilitate trending over time, probable cases should be included as of April 28, 2009, for pertussis, mumps, *Haemophilus influenzae* (Hi), and invasive meningococcal disease.

- **Chickenpox (varicella):** In Ontario, cases of varicella are reported both individually and in aggregate numbers. Cases reported in aggregate have been excluded from ID Query as they are not reliably reported.

- ***Haemophilus influenzae*, all types (Hi):** Significant changes to the reporting requirements for *Haemophilus influenzae* (Hi) took effect as of May 1, 2018. Therefore, users are advised against comparing trends before and after May 1, 2018, as these data are not comparable. Prior to May 1, 2018, only serotype b was reportable and was thus the only serotype reflected in trends of Hi. As of May 1, 2018, all serotypes (a, b, c, d, e, f, non-typeable, and undifferentiated) were added to the list of diseases of public health significance and were thus all included in trends of Hi. Furthermore, changes were made to the case definition such that some cases previously reported as a probable case of Hi (serotype b) were subsequently required to be reported as a confirmed case of Hi. Serotype information should be considered when conducting an epidemiological analysis of Hi in Ontario to differentiate between vaccine and non-vaccine serotypes. However, serotype data are not currently available through ID Query. Interpretation of data prior to 2012 must be made with caution, as this was prior to detailed provincial follow-up. Case counts for Hib presented in ID Query (which are derived solely using iPHIS data) may not be consistent with case counts presented in historical surveillance products published by PHO, which may use iPHIS data linked to PHO Laboratory data. The use of additional data from PHO Laboratory is to identify additional confirmed cases of disease and/or obtain serotype information.

- **Invasive meningococcal disease:** Serogroup information should be considered when conducting an epidemiological analysis of invasive meningococcal disease in Ontario as vaccine programs have impacted serogroup distribution. Serogroup data are not currently available through ID Query. Case counts for IMD presented in ID Query (which are derived solely using iPHIS data) may not be consistent with case counts presented in historical surveillance products published by PHO, which may use iPHIS data linked to PHO Laboratory data. The use of additional data from PHO Laboratory is to identify additional confirmed cases of disease and to ensure accurate reporting of serogroup data.

- **Invasive pneumococcal disease:** Serotype information should be considered when conducting an epidemiological analysis of invasive pneumococcal disease in Ontario to differentiate between vaccine and non-vaccine serotypes. Serotype data are not currently available through ID Query.

- **Measles:** Measles was eliminated from Canada in 1997, but following a prolonged multi-jurisdictional outbreak that began in 2024, Canada lost its elimination status in 2025. The outbreak was declared over in Ontario in October 2025, but ongoing measles activity continues due to outbreak cases in other jurisdictions and the importation of cases from parts of the world where the disease remains endemic. Exposure data, including case travel information, are currently not available through ID Query. Users should be aware that enhanced surveillance activities to document the elimination of measles commenced in 2012 which may impact trend analyses.

- **Pertussis:** Users should be aware that pertussis follows a cyclical incidence pattern with peaks observed every three to five years. Changes to laboratory testing may also impact temporal trends; testing by polymerase chain reaction (PCR), a more sensitive diagnostic tool, was first implemented in 1998, followed by real-time PCR in 2005. Effective 2009, the minimum threshold used to determine a positive PCR result was increased, leading to a reduction in the number of positive cases identified through PCR.

- **Rubella and congenital rubella syndrome:** Rubella and congenital rubella syndrome (CRS) have been eliminated from Canada since 2005 and 2000, respectively. Despite elimination, Ontario has had rare cases due to travel to other parts of the world where the disease remains endemic. Exposure data are currently not available through ID Query. Users should also be aware that although the practice is discouraged, some PHUs may enter reactive prenatal serology results as a confirmed rubella case until case investigation is completed and the case is reclassified as 'does not meet'. Users should also be aware that enhanced surveillance activities to document the elimination of rubella commenced in 2012 which may impact trend analyses.

Sexually Transmitted Infections and Blood Borne Infections

- **Chancroid:** No confirmed cases of chancroid have been reported in Ontario since 1997. Since this disease is so rare in Ontario, for any case of chancroid that is reported and entered in iPHIS, PHO contacts the PHU to verify the diagnosis.

- **Chlamydia:** A probable case definition was added in 2014 to include epidemiologically-linked cases with clinical manifestation in the absence of lab confirmation. Provincial analyses of trends over time typically exclude probable cases due to the limited number of cases reported under this case classification. Changes in screening guidelines and testing practices have had an impact on case incidence over time. Chlamydia remains largely underreported, likely due to the large proportion of cases that are asymptomatic.

- **Gonorrhea:** A probable case definition was added in 2014 to include epidemiologically-linked cases with clinical manifestation in the absence of lab confirmation. Provincial analyses of trends over time typically exclude probable cases due to the limited number of cases reported under this case classification. Changes in screening guidelines and testing practices, as well as evolving resistance to various first-line treatments, have had an impact on case incidence over time. Gonorrhea remains largely underreported, likely due to the large proportion of cases that are asymptomatic.

- **Group B streptococcal disease, neonatal:** Provincial analyses of trends over time typically exclude probable cases due to the limited number of cases reported under this classification.

- **Hepatitis B, acute:** ID Query includes acute cases (confirmed or probable) of Hepatitis B.

- **Hepatitis B, chronic:** ID Query includes chronic cases of hepatitis B. The provincial case definition for chronic hepatitis B was released in 2012. When a case progresses from acute to chronic infection, PHUs create a chronic carrier case, in addition to the existing acute confirmed case. Therefore, counts of acute and chronic hepatitis B cases are not mutually exclusive and have not been summed, as this would result in double-counting of some cases.

- **Hepatitis C:** An updated case definition was put in place in 2018. For ID Query all confirmed cases of hepatitis C virus are included. The counts in ID Query reflect all cases with a positive antibody test result and therefore include people with newly acquired infections, previously acquired/unspecified infections regardless of RNA status. These counts include spontaneously resolved infections, those who received effective anti-viral therapies leading to a sustained virological result (i.e. cure) and those with ongoing infection. Incidence of hepatitis C infections represents cases reported to public health in a given year, although infection may have taken place in a prior year.

- **HIV/AIDS:** Individuals with laboratory-confirmed HIV infection are entered in iPHIS as an HIV/AIDS carrier with a classification of 'Carrier'. If an individual infected with HIV develops one or more AIDS indicative diseases, and this information is reported to the PHU, they are subsequently updated to a case with a classification of 'Confirmed'. To obtain the total number of HIV cases in a given time period, all HIV/AIDS carriers classified as ‘Carrier’ and cases classified as Confirmed' in iPHIS were combined. Reported incidence for HIV represents positive tests identifying newly reported HIV infections in the given year, although infection may have taken place in the past. HIV diagnosis may be coincident with AIDS diagnosis in the same year, and as such may be included in counts for both in a given year. HIV cases are counted based on the ‘Encounter Date’ while AIDS cases are counted based on the ‘Diagnosis Date’ (the date the individual was diagnosed with AIDS) entered in iPHIS. From 2009 onwards, a positive lab confirmation of HIV is required for entry of a confirmed HIV/AIDS case and the list of AIDS indicative diseases was expanded to include additional diseases. With HIV cases, the potential for duplicates exists due to the option of anonymous testing, which can impact provincial case counts. AIDS case counts are based on the first AIDS diagnosis in a patient.

- **Ophthalmia Neonatorum:** From 2009 onwards, a probable case classification was added for ophthalmia neonatorum to capture cases with clinical evidence and maternal laboratory confirmation of *Neisseria gonorrhoeae* or *Chlamydia trachomatis* in the absence of laboratory evidence for the infant. In addition, conjunctivitis was removed from the required criteria for confirmed cases.

- **Syphilis:** Confirmation of syphilis staging takes time. As a result, case counts for syphilis do not start to become stable for at least three months. For example, syphilis case counts for January only start to stabilize in April. Infectious neurosyphilis cases along with cases in primary, secondary and early latent syphilis stages are captured under the grouping of infectious syphilis.

- **Congenital syphilis and syphilitic stillbirth**: As of August 5, 2025, new case definitions for probable early congenital syphilis, confirmed late congenital syphilis, confirmed syphilitic stillbirth, and probable syphilitic stillbirth were implemented in Ontario. Therefore, case counts in 2025 only represent a partial year.

Respiratory Diseases

- **Blastomycosis:** As of May 1, 2018, blastomycosis was added to the list of diseases of public health significance. Therefore, case counts of blastomycosis in 2018 only represent a partial year.

- **Coronavirus disease 2019 (COVID-19):** As of July 1, 2024, coronavirus disease 2019 (COVID-19) has been listed as its own disease of public health significance.[6] These data include all cases of COVID-19 from January 22, 2020, up to June 1, 2024, as extracted from CCM and analyzed by PHO. Due to changes in the Ministry of Health's guidance on testing and case, contact and outbreak management, case counts in this report are an underestimate of the true number of individuals who had COVID-19 in Ontario. As such, data should be interpreted with caution. The ORVT on PHO's website provides additional data on measures of COVID-19 activity (e.g. cases, outbreaks etc.) in Ontario.

- **Diseases caused by a novel coronavirus (including Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS)):** Diseases caused by a novel coronavirus were added to the list of diseases of public health significance on January 22, 2020. No cases of a non-SARS-CoV-2 novel coronavirus have been reported in Ontario during the years presented in ID Query (i.e., 2015-2025).

- **Group A streptococcal disease, invasive:** Provincial analyses of trends over time typically exclude probable cases due to the limited number of cases reported under this case classification. In December 2014, pneumonia was removed from the case definition as a criterion for evidence of severity. As well, the probable case definition was removed. The confirmed case definition was amended to capture cases with laboratory evidence (GAS isolates) from non-sterile sites and evidence of severity. This may lead to an increase in confirmed cases.

- **Influenza:** Provincial influenza data in this tool are incomplete as of March 2020. For seasonal laboratory-confirmed influenza case totals, refer to the ORVT.

- **Legionellosis:** While trends over time have demonstrated a notable increase in legionellosis, this may have been due, in part, to increased use of less invasive diagnostic methods.

- **Tuberculosis:** Confirmed and suspect cases of active tuberculosis (TB) are included in data extracted for ID Query as 'Tuberculosis', while latent TB infections are included as 'Tuberculosis infection, latent'. These data include both culture and clinically confirmed cases of tuberculosis. TB is counted based on 'Diagnosis Date' in iPHIS (the date the individual was diagnosed with active TB), not by symptom onset date. Data are reported by the PHU the individual resides in 'most of the time' and not necessarily the place of TB exposure or acquisition. An annual data cleanup occurs by PHUs across the province to review case counts and key data elements as part of national reporting to the Public Health Agency of Canada (PHAC); however, reporting practices and completeness may vary by PHU. With lower numbers of cases reported in less populous PHUs, the rates for these health units may be highly variable and as such should be reported with caution. Also, since Indigenous persons or persons living on reserves with TB in Ontario fall within the federal jurisdiction of Health Canada, First Nations and Inuit Health Branch (FNIHB), information on these cases may not be consistently reported to PHUs or entered into iPHIS when PHUs are notified.

- **Tuberculosis infection, latent:** A provincial case definition for latent tuberculosis infection (LTBI) was added in 2015.[3] However, prior to and after 2015, PHUs units entered LTBI in accordance with the LTBI chapter of the iPHIS TB user guide so counts should be comparable over time from 2005 onwards. LTBI episodes are counted based on 'Episode Date'; in order to determine this date, the following hierarchy is in place in iPHIS: Onset Date > Specimen Collection Date > Lab Test Date > Reported Date. LTBI episodes generally do not have a diagnosis status reported in iPHIS, however, those with a diagnosis status entered as 'Does Not Meet Definition' are excluded from the counts. The assessment of LTBI varies by health care providers and PHUs. Comparisons of LTBI incidence reported between PHUs and the province should be made with caution.

Other Diseases

- **Encephalitis/meningitis:** This is a non-specific disease category. Encephalitis and meningitis may be caused by any number of viral, bacterial, or other pathogens. In many cases, a causative pathogen may not be identified. If laboratory testing identifies a pathogen that is a disease of public health significance, these cases will be updated in iPHIS such that they are removed from the disease category encephalitis/meningitis and reported via the appropriate disease identified. Within the appropriate disease designated under DOPHS, encephalitis/meningitis can be recorded as a symptom or complication. In the event that the pathogen is not specifically identified, or the pathogen responsible is not reportable under another DOPHS, these cases will remain reported as cases of encephalitis/meningitis. Note that the causative pathogen, even if known, are not included in the ID Query data.
- ***Candida auris* (*C. auris*):** As of January 1, 2025, *Candida auris* (*C. auris*) infection was added to the list of diseases of public health significance. Case counts are based on the episode date and include only confirmed cases.
- **Carbapenemase-Producing Enterobacteriaceae:** Case counts of Carbapenemase-Producing Enterobacteriaceae (CPE) include Carbapenemase-Producing Enterobacteriaceae (CPE) - Infection, Carbapenemase-Producing Enterobacteriaceae (CPE) - Colonization, Carbapenemase-Producing Enterobacteriaceae (CPE) - Unspecified. Where multiple reports with the same carbapenemase are entered in iPHIS for a client, only the first report is included. CPE case counts are based on the earliest specimen collection date following the designation as a disease of public health significance on May 1, 2018 (cases with missing specimen collection dates are excluded). Only confirmed cases of CPE are included in provincial analyses of CPE trends.
- **Creutzfeldt-Jakob Disease:** The counts of Creutzfeldt-Jakob Disease (CJD), All Types represent only those cases reported to PHUs and recorded in iPHIS. These counts are an underestimate because some cases or final case findings may have only been reported to the Public Health Agency of Canada's CJD Surveillance System.
- **Hemorrhagic Fevers:** This refers to a group of illnesses caused mainly by viruses that belong to several different families, including Ebola, Marburg disease, and dengue fever. These viruses are not endemic in Ontario, and as such, cases are rare and travel-associated.
- **Mpox:** As of June 16, 2022, mpox (formerly known as monkeypox) was added to the list of diseases of public health significance. Therefore, case counts of mpox in 2022 only represent a partial year.

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