Public Health Ontario | Santé publique Ontario

TECHNICAL NOTES

Health Care-Associated Infection Query

Updated: September 2025

Introduction

In 2008, the Ministry of Health and Long-Term Care (MOHLTC) (now the Ministry of Health) amended the Public Hospitals Act requiring hospitals to report on patient safety indicators related to health care-associated infections. Starting in September 2008 for *Clostridioides difficile infections (CDI; formerly called Clostridium difficile infections)* and December 2008 for vancomycin resistant enterococcus (VRE) and methicillin resistant *Staphylococcus aureus* (MRSA) bacteremias, all public hospitals in Ontario were required to report aggregate cases of new infections to MOHLTC. These data are summarized in the reports provided in Health Care-Associated Infection (HAI) Query.

Metrics

Case Count

Total number of new nosocomial cases of CDI / MRSA bacteremia / VRE bacteremia associated with the reporting facility in the reporting period.

Rates

Crude incidence rates that show the number of new nosocomial cases of CDI / MRSA bacteremia / VRE bacteremia for every 10,000 patient days. Rates are calculated as follows:

$$\frac{\text{Total number of new nosocomial cases of CDI / MRSA bacteremia / VRE bacteremia associated with the reporting facility in the reporting period}}{\text{Total number of patient days spent in hospital for a reporting period}^{\text{Ŧ}}} \times 10{,}000$$

Average Rate

- 12 Month Moving Rate: The average rate in the previous 12 months, based on a 12-month window for CDI and four-quarter window for MRSA bacteremia and VRE bacteremia.
- **Previous Year's Average Rate:** Average rate in the previous calendar year, defined as January to December.

Standard Deviation

The average spread or dispersion around the mean rate, i.e., data values will lie somewhere above or below the average that has been calculated from all the values.

Data Sources

For data up to fiscal year 2023/24:

Ontario. Ministry of Health and Long-Term Care, Health Analytics & Insight Branch. Self-reporting initiative (SRI) [data files]. Toronto, ON: King's Printer for Ontario; 2024 [received 2014-2024].

For data from fiscal year 2024/25 onwards:

Ontario. Ministry of Health. Health data collection system (HDCS) [data file]. Toronto, ON: Ontario. Ministry of Health [producer]; Armonk, NY: Cognos Analytics [distributor]; 2025 [received2024-].

Case Definitions

Clostridioides difficile Infection (CDI):

- Laboratory confirmation of a positive toxin assay (A/B) for *Clostridioides difficile* together with diarrhea; or, visualization of pseudomembranes on sigmoidoscopy or colonoscopy, or histological / pathological diagnosis of pseudomembranous colitis.
- New nosocomial cases associated with the reporting facility: The infection was not present on admission (i.e., onset of symptoms > 72 hours after admission) or the infection was present at the time of admission but was related to a previous admission to the same facility within the last 4 weeks and the case has not had CDI in the past 8 weeks. Patients less than one year of age are excluded.

Methicillin resistant Staphylococcus aureus (MRSA) bacteremia:

- MRSA are strains of *Staphylococcus aureus* that have a minimum inhibitory concentration (MIC) to oxacillin of ≥4mcg/ml or contain the mecA gene coding for penicillin binding protein 2a (PBP 2A). They are resistant to all of the beta-lactam classes of antibiotics. A case is a patient identified with laboratory confirmed bloodstream infection with MRSA. A blood stream infection is a single positive blood culture for MRSA. A subsequent MRSA bacteraemia in the same patient is considered a new episode, and counted as such, if the original infection had been successfully treated with clinical resolution and more than six weeks have elapsed since the completion of the antimicrobial treatment of the original bacteraemia.
- New nosocomial cases of MRSA associated with the reporting facility: The infection was not present on admission (i.e. the onset of symptoms occurred >72 hours after admission) or the infection was present on admission but related to a previous admission to the same facility within the last 72 hours.

Vancomycin resistant enterococcus (VRE) bacteremia:

- VRE have a minimal inhibitory concentration (MIC) to vancomycin of ≥ 32 mcg/ml. They contain the resistance genes VAN-A or VAN-B. A case is a patient identified with laboratory confirmed bloodstream infection with Vancomycin-resistant Enterococci. A blood steam infection is a single positive blood culture for VRE. A subsequent VRE bacteraemia in the same patient is considered a new episode, and counted as such, if the original infection had been successfully treated with clinical resolution and more than six weeks have elapsed since the completion of the antimicrobial treatment of the original bacteraemia.

- New nosocomial cases of VRE associated with the reporting facility: The infection was not present on admission (i.e. the onset of symptoms occurred >72 hours after admission) or the infection was present on admission but related to a previous admission to the same facility within the last 72 hours.

Data Caveats and Limitations

- CDI has been reported on a monthly basis since September 2008, while both MRSA and VRE bacteremias have been reported on a quarterly basis since December 2008.
- Only new nosocomial cases associated with the reporting facility and publically reported by hospitals in Ontario are included.
- Results are presented by hospital grouping including:
  - Ontario Hospital Association (OHA) Hospital type (acute teaching, large community, small community, complex continuing care & rehabilitation, and mental health facilities)[1]
  - Per cent of cases seen over 65 years of age (0 to 34.99%, 35 to 49.99% and 50% or more)
  - Bed size (<100 beds, 100 to 249 beds, 250+ beds)
- Assignment of hospital groupings were determined by the Health Analytics Branch, Ministry of Health.
- Rates may vary depending on a number of factors such as hospital type and size, complexity of care provided by the hospital, laboratory testing methods and the proportion of at-risk patients treated. These factors should be considered when making direct comparisons between facilities.
- The information is provided on an “as-is” basis. PHO cannot and does not warrant or represent that the information is accurate, complete, reliable or current.
- Since only hospitals with an in-patient population are required to report cases, data will be missing for hospitals that primarily serve an outpatient population. Hospitals that were newly opened or closed during the report period will have data missing for the periods where they were not operational.
- Hospital changes may occur during the reporting period (for example, change in hospital name). These changes are documented by the Health Analytics Branch, Ministry of Health and shared to Public Health Ontario along with the hospital self-reported data. Only the most recent available information will be reflected in HAI Query.

References

1. Ontario Hospital Association (OHA). Ontario's hospitals [Internet]. Toronto, ON: OHA; [cited 2024 Oct 10]. Available from: https://www.oha.com/about-oha/Ontario-Hospitals

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Technical notes: health care-associated infection query. Toronto, ON: King's Printer for Ontario; 2025.

How to Cite This Tool

Generic Citation

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Example Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Health care-associated infection query >> exact title of chart in sentence case [Internet]. Toronto, ON: King's Printer for Ontario; c2025 [modified 2025 Jan 21; cited 2025 Aug 15]. Available from: https://www.publichealthontario.ca/en/Data-and-Analysis/Health-Care-Associated-Infections/HAI-Query

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