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SURVEILLANCE REPORT

Pertussis in Ontario

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This report includes the most current information available from Ontario's integrated Public Health Information System (iPHIS) as of **September 9, 2025**.

Introduction

This report describes the epidemiology of pertussis disease activity in Ontario in 2024, including case characteristics and case counts/incidence rates by age group and geography. Trends over time for the years 2007 to 2023 are also included.

Pertussis is an endemic disease in Ontario characterized by low level activity and occasional cyclical increases every 2-6 years.[1,2] Pertussis is underdiagnosed and underreported in Ontario and is a common and often unrecognized cause of persistent cough in adolescents and adults.[1,3] Pertussis is of most concern for infants as they are at the highest risk of severe disease.

Ontario has two routine immunization programs for pertussis.[4] The primary childhood series includes four doses given between two and 18 months of age with booster doses given at four, 14 and 24 years of age. There is also a program for pregnant people with vaccine administration offered in every pregnancy, ideally between 27 to 32 weeks of gestation. Additionally, pertussis vaccines may also be publicly funded as part of an outbreak response if indicated. Information on pertussis immunization coverage can be found in Public Health Ontario's Immunization Data Tool.[5]

Pertussis cases greatly declined during the COVID-19 pandemic. As the pertussis-causing bacteria (*Bordetella pertussis*) is transmitted via person-to-person respiratory droplets generated through coughing or sneezing, it was expected that COVID-19 public health measures such as reduced contacts, physical distancing and masking would have an impact on transmission. However, it was not known to what extent the observed case decline was due to public health measures and possible changes in healthcare seeking behaviours, testing, case reporting, case follow up or other unknown factors.

Following the COVID-19 pandemic, many global jurisdictions experienced a resurgence of pertussis, including Canada, the USA and many other countries within the Americas and Europe, Australia, and China.[6-11] This resurgence is thought to be due to a variety of factors, including increased in-person socialization, waning immunity, reduced immune stimulation due to fewer immune challenges during the pandemic, lower immunization coverage and wider intervals between doses, and in some areas, changes in circulating strains and reduced antibiotic susceptibility.[10,11]

Overview

- Ontario experienced a widespread increase of pertussis activity in 2024, the highest observed since 2007.
- There were 1,740 cases (1,488 confirmed and 252 probable) of pertussis reported in Ontario in 2024, with an incidence rate of 11.2 cases per 100,000 population (Figure 1).
- Monthly counts from May through November were above the five-year pre-pandemic average plus two standard deviations, with cases peaking in July. (Figure 2).
- Most cases were among children (Table 1) and consistent with previous years, the highest age group-specific rates in 2024 were among the youngest age group (<1 year) and 10-14 year olds (82.8 and 59.2 per 100,000, respectively). All age group-specific rates exceeded their respective five year pre-pandemic average rates (Figure 3).
- The 1,740 cases were identified from 28 of Ontario's 29 public health units (Figure 4).

Trends Over Time

- The case count and rate in 2024 were the highest that have been observed during the surveillance period of 2007-2024; with 1,740 cases identified (11.2 cases per 100,000 population).
- Annual trends in pertussis case counts and rates have fluctuated greatly over time (Figure 1) which is consistent with the cyclical nature of pertussis.
- Ontario had the lowest recorded case counts and rates during the height of the COVID-19 pandemic (2020-2021), with case counts and rates being particularly low for 2021 (n=16, 0.1 cases per 100,000 population).
- Case counts and rates began to increase again in 2022, similar to pre-pandemic trends.

Case Characteristics

- Females accounted for 56.4% (981/1,740) of all cases in 2024 (Table 1).
- Cases ranged in age from 1 day to 89 years with a median age of 13 years.
- Most cases (n=1,256; 72.2%) were under the age of 18 and 125 (7.2%) cases were less than one year of age (Table 1).
- The 10-14 year old age group had the highest number of cases with 476, representing 27.4% of all pertussis cases reported to date.
- All age group-specific rates have exceeded their respective five year pre-pandemic average rates (Figure 3). The highest age group-specific rates in 2024 so far are among the youngest age group (<1 year) and 10-14 year olds, which are consistent with previous years.

Immunization Status

- Immunization status was available for a total of 1,514 cases (87.0%) (Table 1). Of these:
  - 482 cases (27.7%) were unimmunized.
  - 1,032 cases (59.3%) were immunized with at least one dose of pertussis-containing vaccine prior to disease onset.
- The previously immunized cases received between one and eight doses of pertussis-containing vaccines prior to disease onset (Table 2).
  - The median time between receiving the most recent pertussis-containing vaccine dose and pertussis disease was 8 years (range 2 weeks to 58 years).

Severity

- Overall, 72 cases (4.1%) had a documented hospitalization in iPHIS (Table 1). Fifty-one of the hospitalizations were among cases aged less than 18 years including 38 cases less than one year of age (range 1 day-51 weeks of age).
  - Five hospitalized cases were admitted to the ICU. Four cases were under one year of age and the fifth case was in an adult aged 50-64 years.
  - Two deaths were reported. Both deaths occurred in hospitalized adult cases.
- There were also 208 cases (12.0%) with a documented emergency department visit (i.e., without an inpatient hospitalization). A total of 145 (69.7%) of these cases were among children (median age 8 years, range 4 weeks to 17 years).

Geography

- Cases were reported from 28 of 29 public health units (Figure 4).
- Although Toronto Public Health (n=234) and Ottawa Public Health (n=192) had high case counts, they had comparatively low rates of 7.1 and 9.4 cases per 100,000 population, respectively.
- Eastern Ontario Health Unit had a high case count (n=157) along with the highest rate of 67.3 per 100,000 population, followed by Northeastern Public Health with a rate of 45.3 cases per 100,000 population.

Characteristics of Pertussis Cases: Ontario, 2024

Table 1A: Classification

Case Characteristics (n=1,740)	n	%
Confirmed	1,488	85.5
Probable	252	14.5

Table 1B: Gender

Case Characteristics (n=1,740)	n	%
Female	981	56.4
Male	757	43.5

Table 1C: Age

Case Characteristics (n=1,740)	n	%
<1 year	125	7.2
1-4 years	211	12.1
5-9 years	258	14.8
10-14 years	476	27.4
15-19 years	224	12.9
20-49 years	310	17.8
50-64 years	84	4.8
≥65 years	52	3.0

Table 1D: Hospitalizations and deaths

Case Characteristics (n=1,740)	n	%
Hospitalized (all cases)	65	4.1
< 1 year old	38	-
1-4 years	6	-
5-9 years	2	-
10-14 years	3	-
15-19 years	2	-
20-49 years	8	-
50-64 years	5	-
≥65 years	8	-
Deaths	**2**	-

Table 1E: Immunization Status

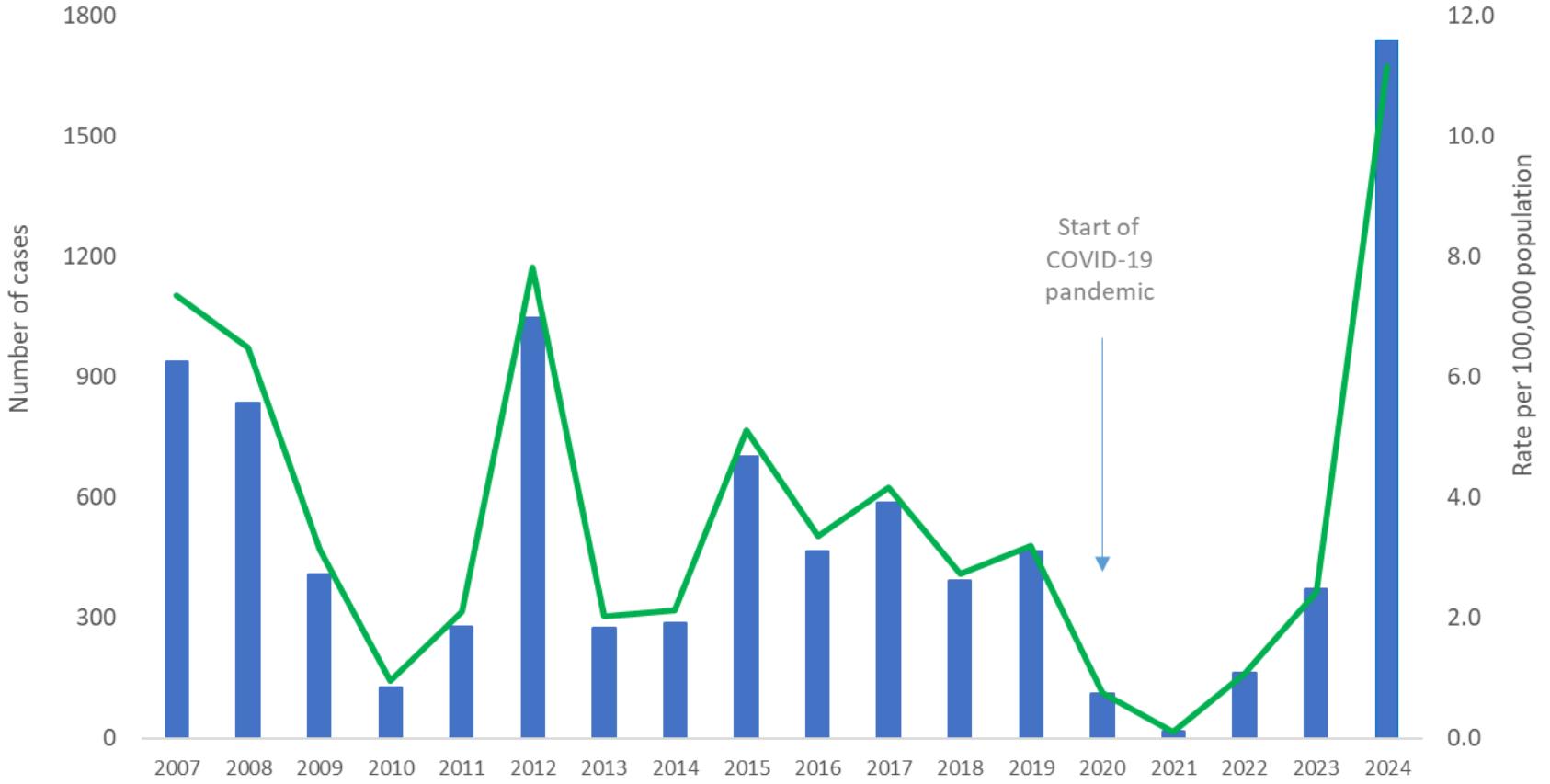
Case Characteristics (n=1,740)	n	%
Not documented (i.e., unknown)	226	13.0
Unimmunized	482	27.7
Immunized	1,032	59.3

Table 2: Number of Pertussis Cases Who Were Immunized Prior to Onset* and Number of Doses Received, by Age Group: Ontario, 2024

Age Group	# Immunized Cases (n)	# Doses Received – Median	# Doses Received – Range
< 1 year	14	1	1-3
1-4 years	49	4	1-6
5-9 years	135	5	1-6
10-14 years	413	5	1-6
15-19 years	195	5	1-7
20-49 years	198	5	1-7
50-64 years	16	1	1-8
65 years	8	1	1-4

*Vaccine dose(s) considered valid when received at least two weeks prior to disease onset.

Figure 1: Pertussis Case Counts and Incidence Rates per 100,000 Population: Ontario, 2007–2024



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Cases	939	837	407	125	279	1,049	274	288	702	466	587	392	465	110	16	162	372	1,740
Rate	7.4	6.5	3.1	1.0	2.1	7.8	2.0	2.1	5.1	3.4	4.2	2.7	3.2	0.7	0.1	1.1	2.4	11.2

Figure 2: Number of Pertussis Cases by Month: Ontario, 2022, 2023 & 2024 and Pre-Pandemic 5-year Average (2015-2019)

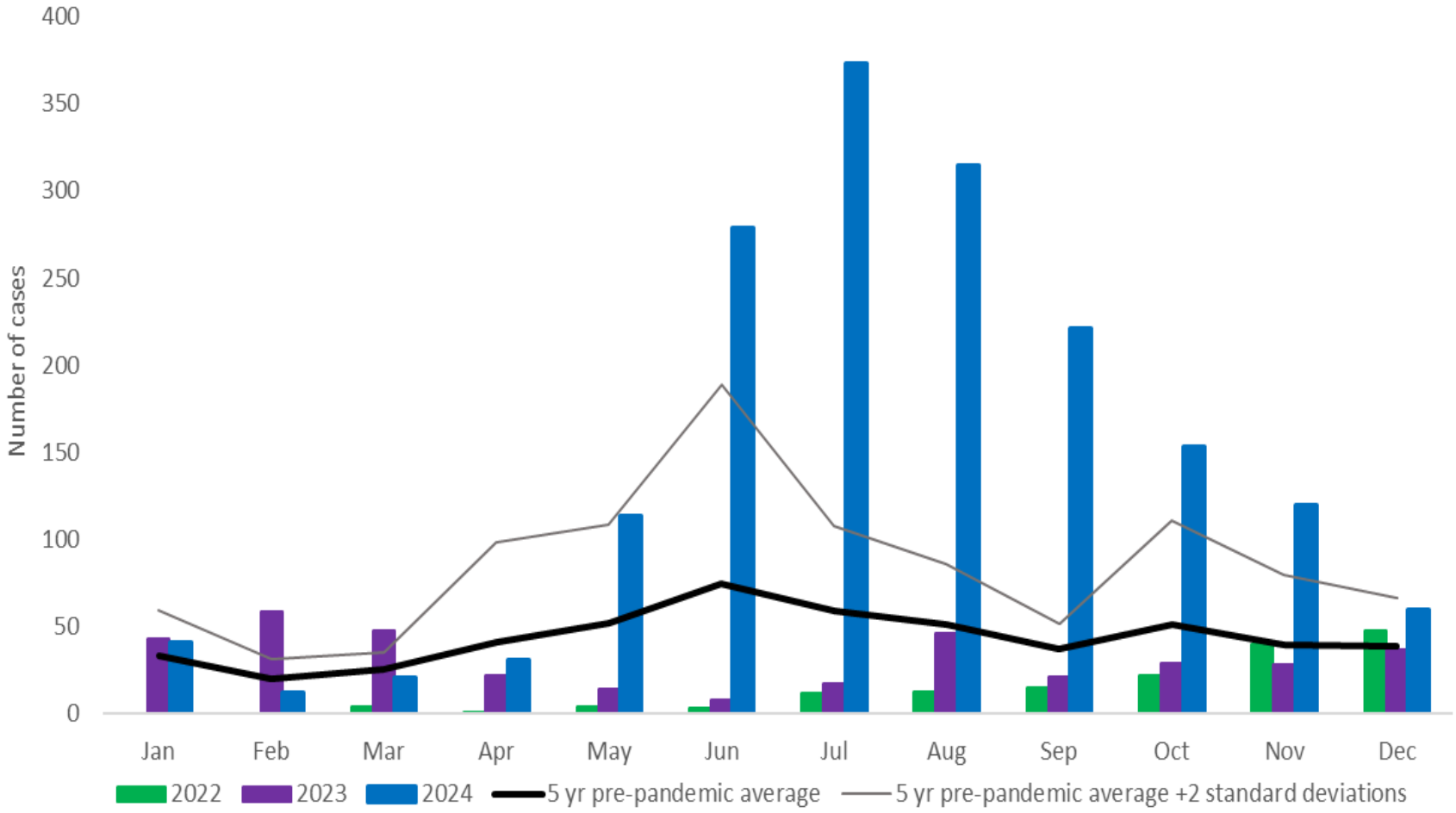
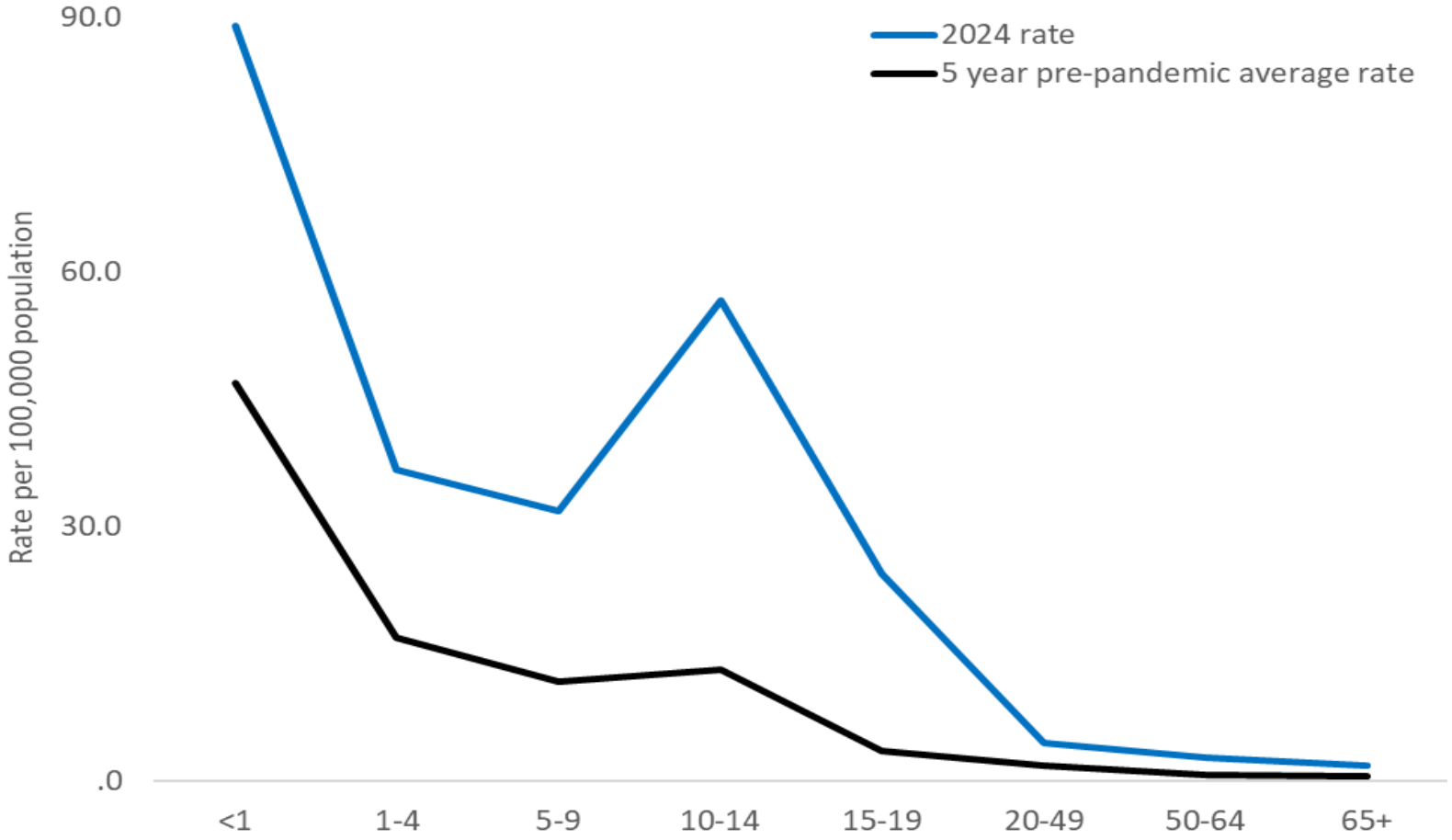
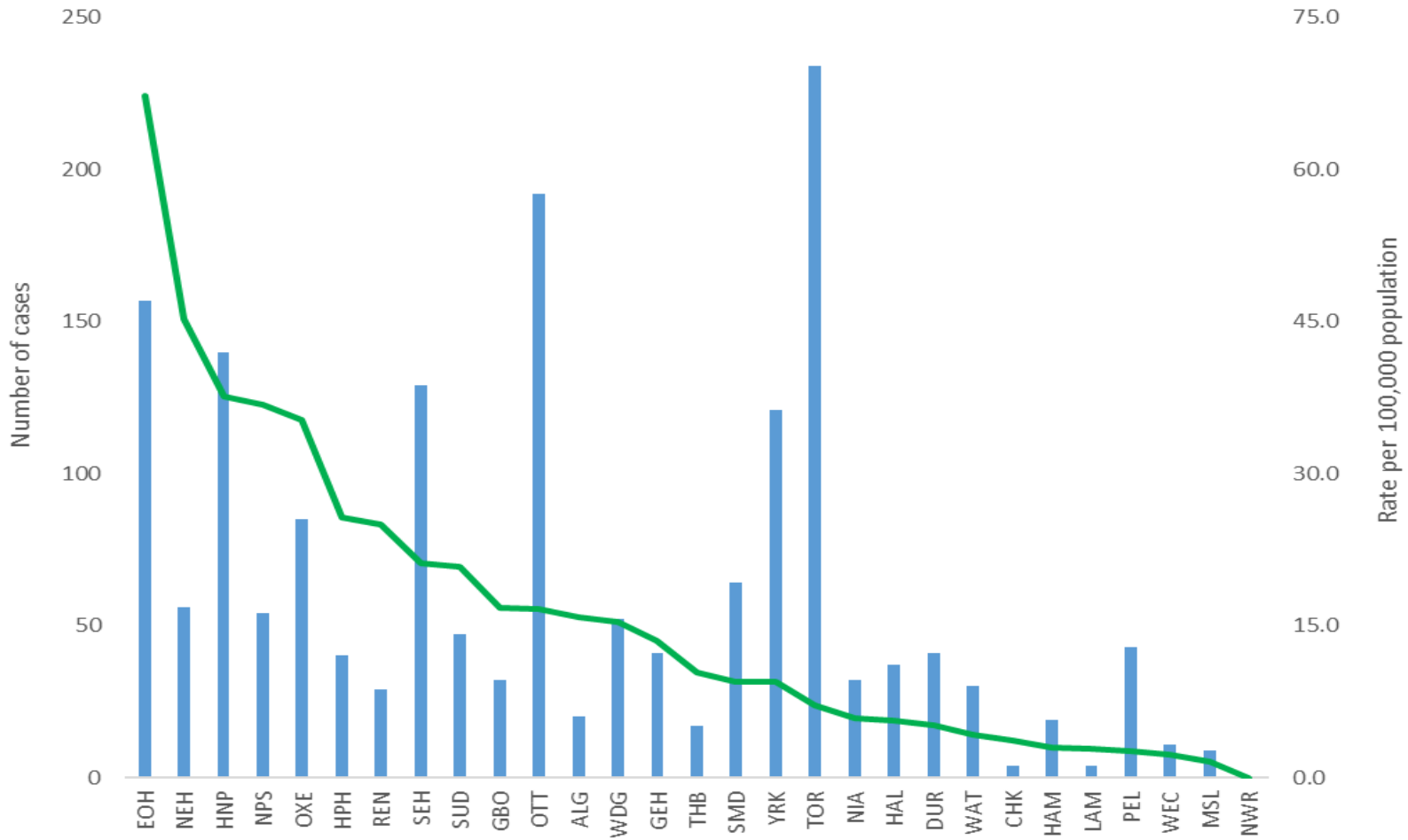


Figure 3: Pertussis Incidence Rates per 100,000 Population by Age Group: Ontario, 2024



	<1	1-4	5-9	10-14	15-19	20-49	50-64	65+
2024 rate	89.1	36.7	31.9	56.7	24.5	4.5	2.8	1.8
5 year pre-pandemic average rate	47.0	16.9	11.8	13.2	3.5	1.8	0.7	0.5

Figure 4: Public Health Unit-Specific Pertussis Incidence Rates and Cases: Ontario, 2024



Technical Notes

Data Sources

Case Data

- The data for this report were based on information entered in the Ontario Ministry of Health (MOH) integrated Public Health Information System (iPHIS) database as of September 9, 2025.
- iPHIS is a dynamic disease reporting system that allows ongoing updates to previously entered data. As a result, data extracted from iPHIS represent a snapshot at the time of extraction and may differ from previous or subsequent reports.

Immunization Data

- In addition to the immunization data from iPHIS, pertussis immunization records were also extracted from Ontario's Digital Health Immunization Repository using the Panorama Enhanced Analytical Reporting tool. Data are current as of December 4, 2024.
- The PEAR data extract was linked to the iPHIS data to create a more robust immunization dataset. This linked dataset was used to assess immunization status and to count the number of valid doses a case had received prior to disease onset. For the 2024 case data, this resulted in an additional 169 cases with immunization records.

Ontario Population Data

Ontario population data were sourced from:

- Population estimates 2007-2024: Statistics Canada. Table 17-10-0157-01: Population estimates, July 1, by health region and peer group, 2023 boundaries [Internet]. Ottawa, ON: Government of Canada; 2025 Feb 19 [extracted 2025 Feb 21]. Available from: https://doi.org/10.25318/1710015701-eng.

Data Caveats

- As of 1 January 2025, Ontario moved from 34 to 29 public health units. The reduction is due to several mergers between public health units: Porcupine Health Unit and Timiskaming Health Unit merged to become Northeastern Public Health (NEH); Brant County Health Unit and Haldimand-Norfolk Health Unit merged to become Grand Erie Public Health (GEH); Haliburton, Kawartha, Pine Ridge District Health Unit and Peterborough Public Health merged to become Haliburton Kawartha Northumberland Peterborough Health Unit (HKNP); and Hastings Prince Edward Public Health, Leeds, Grenville & Lanark District Health Unit and Kingston, Frontenac and Lennox & Addington Public Health joined to become South East Health Unit (SEH).
- **Data reported for 2020-2022 should be interpreted with caution. Both testing and iPHIS data entry practices were likely impacted by the COVID-19 pandemic response.**

- Only pertussis cases meeting the confirmed and probable case classification as listed in the Ontario MOH surveillance case definitions are included in the reported case counts.[2]
    - Changes to provincial surveillance case definitions and disease classifications have occurred over the years and thus may impact the analysis of trends over time. Cases are classified in iPHIS based on the Ontario MOH surveillance case definitions in use at the time the case was identified.
    - PHO's technical report "Factors Affecting Reporting Diseases in Ontario: Case Definition Changes and Associated Trends 1991-2016" and its associated appendix provide more detailed information on this topic. [12]
- Cases of pertussis are reported based on the Episode Date, which is an estimate of the onset date of disease for a case. To determine this date, the following hierarchy exists in iPHIS: Onset Date > Specimen Collection Date > Lab Test Date > Reported Date.
    - For example: If an Onset Date exists, it will be used as the Episode Date. If Onset Date is not available, then the next available date in the hierarchy (i.e., Specimen Collection Date) will be used, and so on.
- Case counts by geography are based on the diagnosing health unit (DHU). DHU refers to the case's public health unit of residence at the time of illness onset or report to public health and not necessarily the location of exposure.
    - Cases for which the DHU was reported as MOHLTC (to signify a case that is not a resident of Ontario) were excluded from this analysis.
- 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, were excluded from this analysis.
- Incidence rates were calculated per 100,000 population.
- The five-year pre-pandemic average and five-year pre-pandemic average plus two standard deviations were used to provide a historical context to pertussis cases in Ontario. They were based on the years 2015-2019 inclusive.
- To determine immunization status of cases, only documented doses of a pertussis vaccine product administered at least 14 days prior to disease onset were included.
- To be considered as a valid hospitalization, a case must have a hospital admission date that is no more than 60 days prior to disease onset or 90 days post disease onset.
- To be considered as a fatal case outcome, a case must have a death recorded that is not classified as "reportable disease was unrelated to cause of death".

References

1. Public Health Agency of Canada, National Advisory Committee on Immunization. Pertussis (whooping cough) vaccines: Canadian immunization guide [Internet]. Evergreen ed. Ottawa, ON: Government of Canada; 2018 [modified 2018 Mar; cited 2025 Sep 16]. Part 4, Immunizing agents. Available from: https://www.canada.ca/en/public-health/services/publications/healthy-living/canadian-immunization-guide-part-4-active-vaccines/page-15-pertussis-vaccine.html
2. Ontario. Ministry of Health. Ontario public health standards: requirements for programs, services, and accountability. Infectious disease protocol. Appendix 1: case definitions and disease specific information. Disease: Pertussis (whooping cough). Effective: May 2022 [Internet]. Toronto, ON: Queen's Printer for Ontario; 2022 [cited 2025 Sep 16]. Available from: https://files.ontario.ca/moh-ophs-pertussis-whooping-cough-en-2022.pdf
3. Ebell MH, Marchello C, Callahan M. Clinical diagnosis of Bordetella pertussis infection: a systematic review. J Am Board Fam Med. 2017;30(3):308-19. Available from: https://doi.org/10.3122/jabfm.2017.03.160330
4. Ontario. Ministry of Health. Publicly funded immunization schedules for Ontario. Effective: June 2022 [Internet]. Toronto, ON: Queen's Printer for Ontario; 2022 [cited 2025 Sep 16]. Available from: https://www.ontario.ca/files/2024-01/moh-publicly-funded-immunization-schedule-en-2024-01-23.pdf
5. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Immunization data tool [Internet]. Toronto, ON: King's Printer for Ontario; 2025 [updated 2025 Feb 7; cited 2025 Oct 17]. Available from: https://www.publichealthontario.ca/en/Data-and-Analysis/Infectious-Disease/Immunization-Tool
6. Centers for Disease Control and Prevention (CDC). Pertussis surveillance and trends [Internet]. Atlanta, GA: CDC; 2025 [cited 2025 Oct 27]. Available from: https://www.cdc.gov/pertussis/php/surveillance/index.html
7. Pan American Health Organization/World Health Organization (PAHO/WHO). Epidemiological alert: increase in pertussis (whooping cough) in the Americas region. 31 May 2025. Washington, DC: PAHO/WHO; 2025. Available from: https://www.paho.org/sites/default/files/2025-05/2025-05-31-epi-alert-pertussis-whooping-cough-final.pdf
8. European Centre for Disease Prevention and Control (ECDC). Increase of pertussis cases in the EU/EEA, 8 May 2024. Stockholm: ECDC; 2024. Available from: https://www.ecdc.europa.eu/en/publications-data/increase-pertussis-cases-eueea
9. Australian Centre for Disease Control. Whooping cough (pertussis) [Internet]. Canberra: Commonwealth of Australia; 2025 [cited 2025 Oct 27]. Available from: https://www.cdc.gov.au/topics/whooping-cough-pertussis
10. Cai J, Liu Q, Chen B, Jiang Y, Zeng X, Huang J, et al. Waning immunity, prevailing non-vaccine type ptxP3 and macrolide-resistant strains in the 2024 pertussis outbreak in China: a multicentre cross-sectional descriptive study. Lancet Reg Health. 2025:60:101628. Available from: https://doi.org/10.1016/j.lanwpc.2025.101628
11. BlueDot Inc. Outbreak insider: whooping cough makes a sweeping global resurgence [Internet]. Toronto, ON: BlueDot Inc.; 2025 [cited 2025 Oct 27]. Available from: https://bluedot.global/whooping-cough-makes-a-sweeping-global-resurgence/

12. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Factors affecting reportable diseases in Ontario: case definition changes and associated trends, 1991-2016 [Internet]. Toronto, ON: Queen's Printer for Ontario; 2018 [cited 2025 Sep 16]. Available from: https://www.publichealthontario.ca/-/media/Documents/F/2018/factors-reportable-diseases-ontario-1991-2016.pdf?rev=ff1672e0c3fb410dbf025ec2b4c88f79&sc_lang=en

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