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ENHANCED EPIDEMIOLOGICAL SUMMARY

Chlamydia in Ontario: Focus on 2022

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Purpose

The purpose of this annual report is to summarize data on trends over time, age and sex, geography, site of infection and testing for confirmed cases of chlamydia in Ontario with a focus on cases reported in 2022. This report includes the most current information available from Ontario's integrated Public Health Information System (iPHIS) as of **September 18, 2023**. Cases meeting the provincial confirmed chlamydia case definition are included in this report.

Surveillance data for chlamydia reported between 2020 and 2022 should be interpreted with caution due to changes in the availability of health care, health seeking behaviour, public health follow-up, and case entry during the COVID-19 pandemic.

Highlights

Trends over Time

- The provincial incidence of laboratory-confirmed chlamydia infections increased steadily between 2013 and 2019, before decreasing in 2020 and 2021 followed by a slight increase in 2022 that has remained below incidence in 2019 (pre-pandemic).
  - Observed decreases in the incidence of chlamydia from 2020 to 2022 likely reflect the impacts of the COVID-19 pandemic and should be interpreted with caution.
- Between 2013 and 2022, females consistently accounted for more than half of all chlamydia cases reported in Ontario (average: 58.3%; range: 54.6%-61.5%). However, the proportion of male cases has been increasing in recent years from 38.5% in 2013 to 45.1% in 2022.
- In each of the last 10 years, the incidence rate of chlamydia was between 1.2 to 1.5 times higher among females compared to males (Figure 1).

Age and Sex

- In 2022, the highest incidence rate of chlamydia infections was reported among females aged 20-24 years, followed by females aged 15-19 years, and males aged 20-24 years (Figure 2).

Geography

- Northwestern Health Unit consistently reported the highest annual incidence rate of chlamydia between 2018 and 2022. Toronto Public Health reported the second highest incidence rate of chlamydia in 2019, 2021 and 2022 (Table A1).

Site of Infection

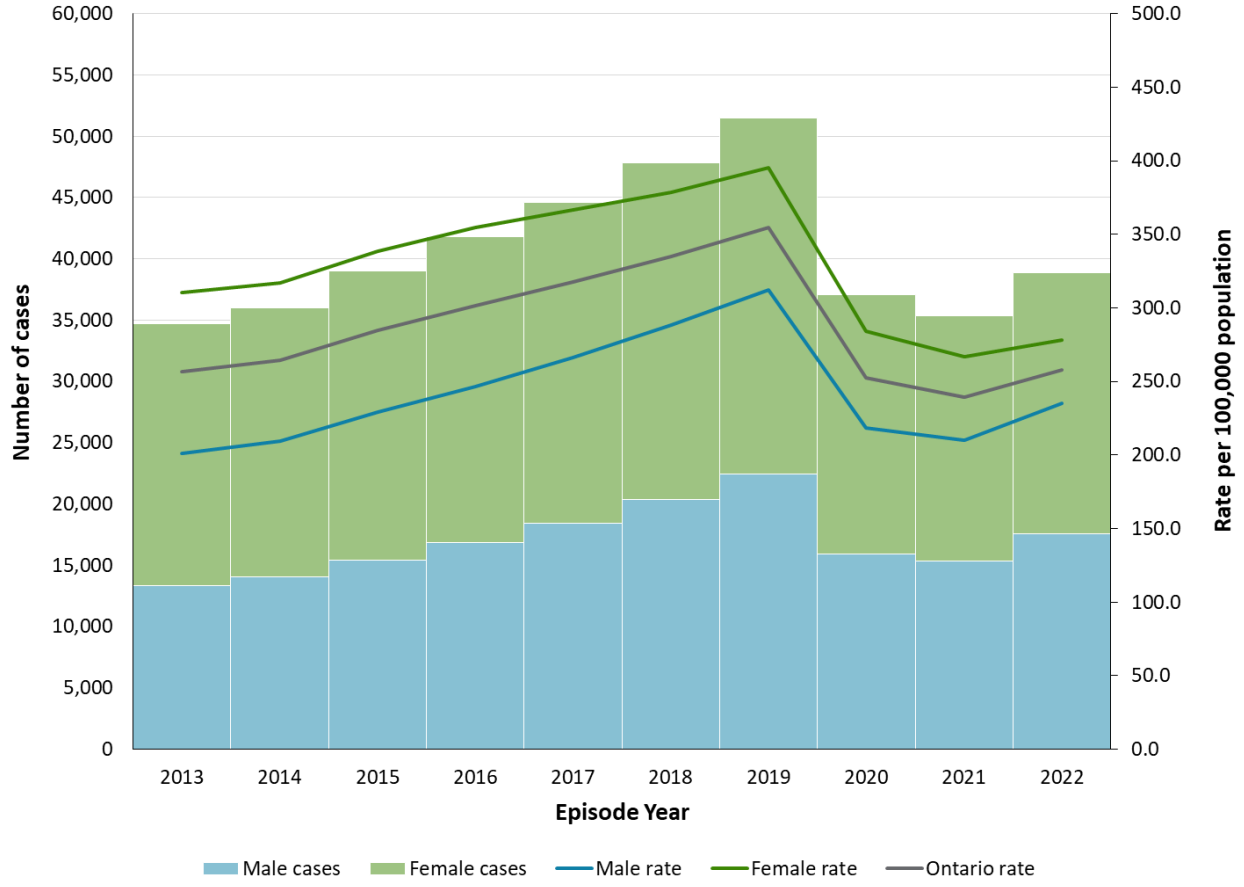
- The majority (98.1%; 19,764/20,138) of chlamydia infections among females were detected in specimens collected from urogenital sites only.
- Among males, 78.4% (12,987/16,562) of chlamydia infections involved urogenital sites only; however, 19.8% (3,281/16,562) involved extra-genital sites, with rectal being the most common (80.3%; 2,636/3,281) (Table 2).

Testing

- Between 2013 and 2022, an average of 274,463 specimens were tested annually for chlamydia by Public Health Ontario (PHO) using nucleic acid amplification tests (NAATs). During this time period, the overall test positivity decreased from 6.0% in 2013 to 5.3% in 2022.
- For males, an average of 106,151 specimens were tested annually between 2013 and 2022 (range: 82,255-166,256) and the test positivity ranged from 5.8% to 8.5% (average: 7.3%).
- For females, an average of 164,961 specimens were tested annually between 2013 and 2022 (range: 109,362-190,343) and the test positivity ranged from 4.7% to 5.3% (average: 5.1%) (Figure 4).

Trends over Time

Figure 1. Chlamydia cases and rate (per 100,000 population) by year and sex*: Ontario, 2013-2022



Data sources: Cases: Integrated Public Health Information System (iPHIS) [database]. Population Estimates: Statistics Canada.
Note: *Excludes cases that did not identify as male or female.

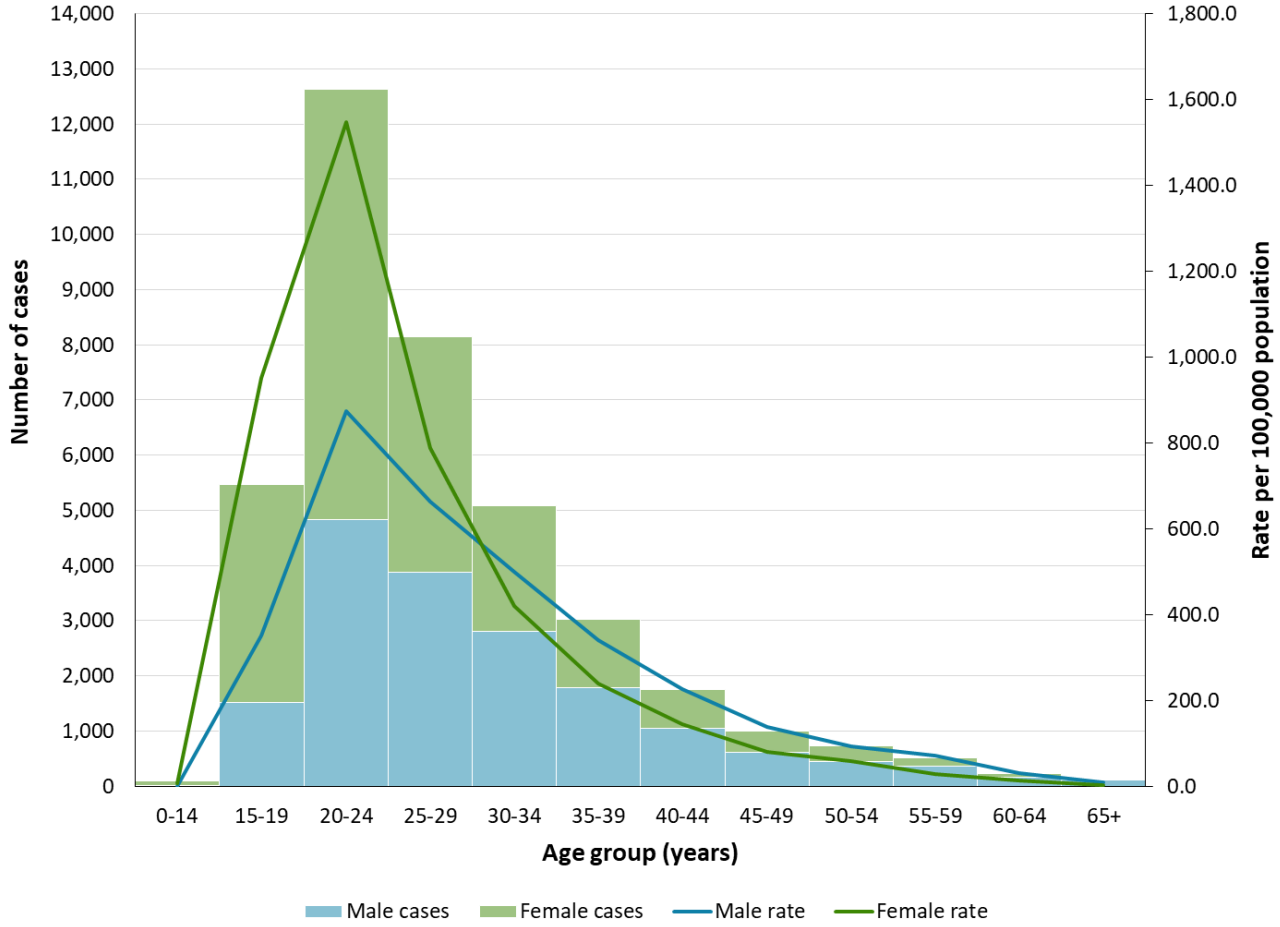
Age and Sex

Table 1. Chlamydia cases by age group and sex: Ontario, 2022 (n=38,943)

Demographic characteristic	2022
Mean age (years)	28.3
Median age and inter-quartile range (years)	25.6 (21.5-32.4)
Age group	**n (%)**
<20 years	5,586 (14.3%)
20 – 29 years	20,855 (53.6%)
30 – 39 years	8,122 (20.9%)
40 – 49 years	2,769 (7.1%)
50 – 59 years	1,244 (3.2%)
60 – 69 years	312 (0.8%)
70+ years	52 (0.1%)
Unknown	3 (<0.1%)
Sex	**n (%)**
Male	17,571 (45.1%)
Female	21,258 (54.6%)
Transgender	64 (0.2%)
Other	12 (<0.1%)
Unknown	38 (0.1%)

Data source: iPHIS

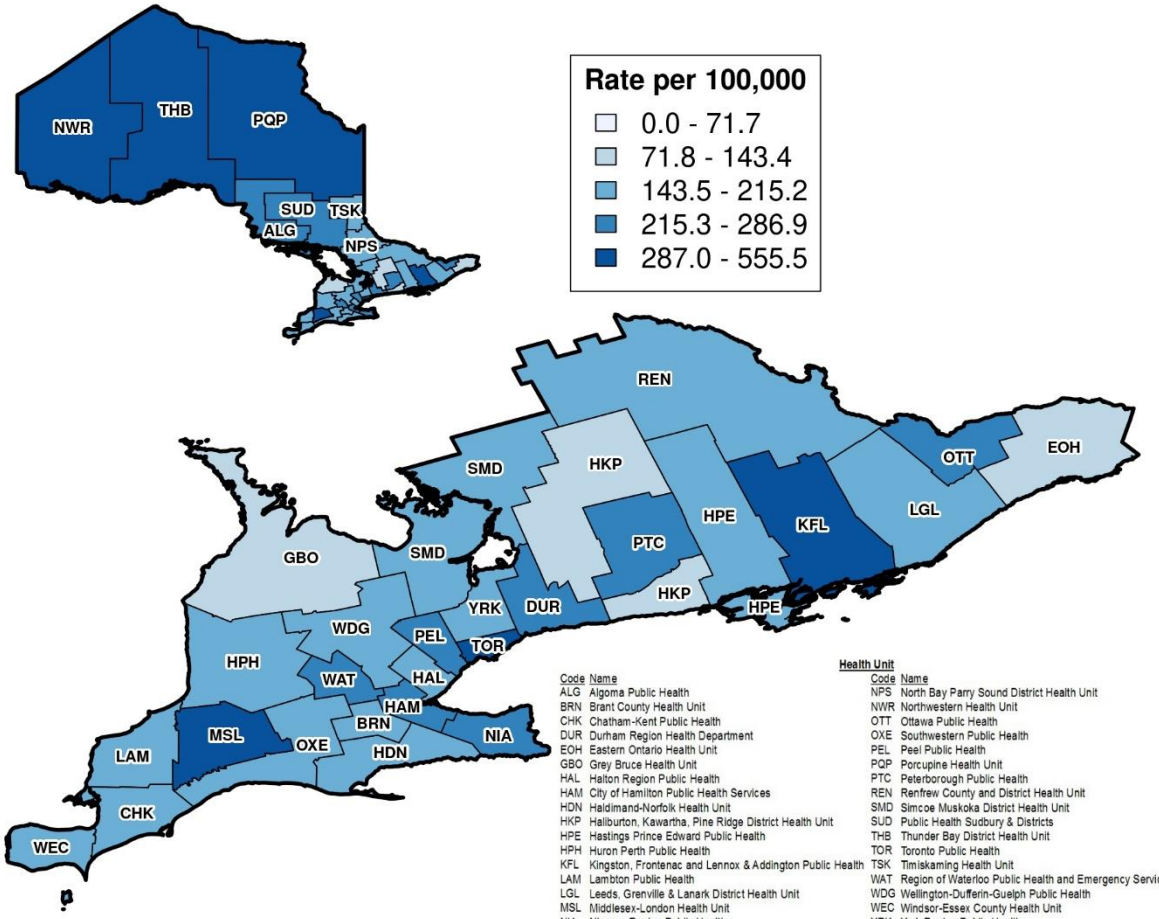
Figure 2. Chlamydia cases and rate (per 100,000 population) by age group and sex*: Ontario, 2022



Data sources: iPHIS; Statistics Canada
Note: *Excludes cases that did not identify as male or female.

Geography

Figure 3. Chlamydia rates per 100,000 population by public health unit: Ontario, 2022



Data sources: iPHIS; Statistics Canada.
Note: Data available in Appendix A: Table A1.

Site of Infection

Table 2. Chlamydia cases by site of infection and sex*: Ontario, 2022

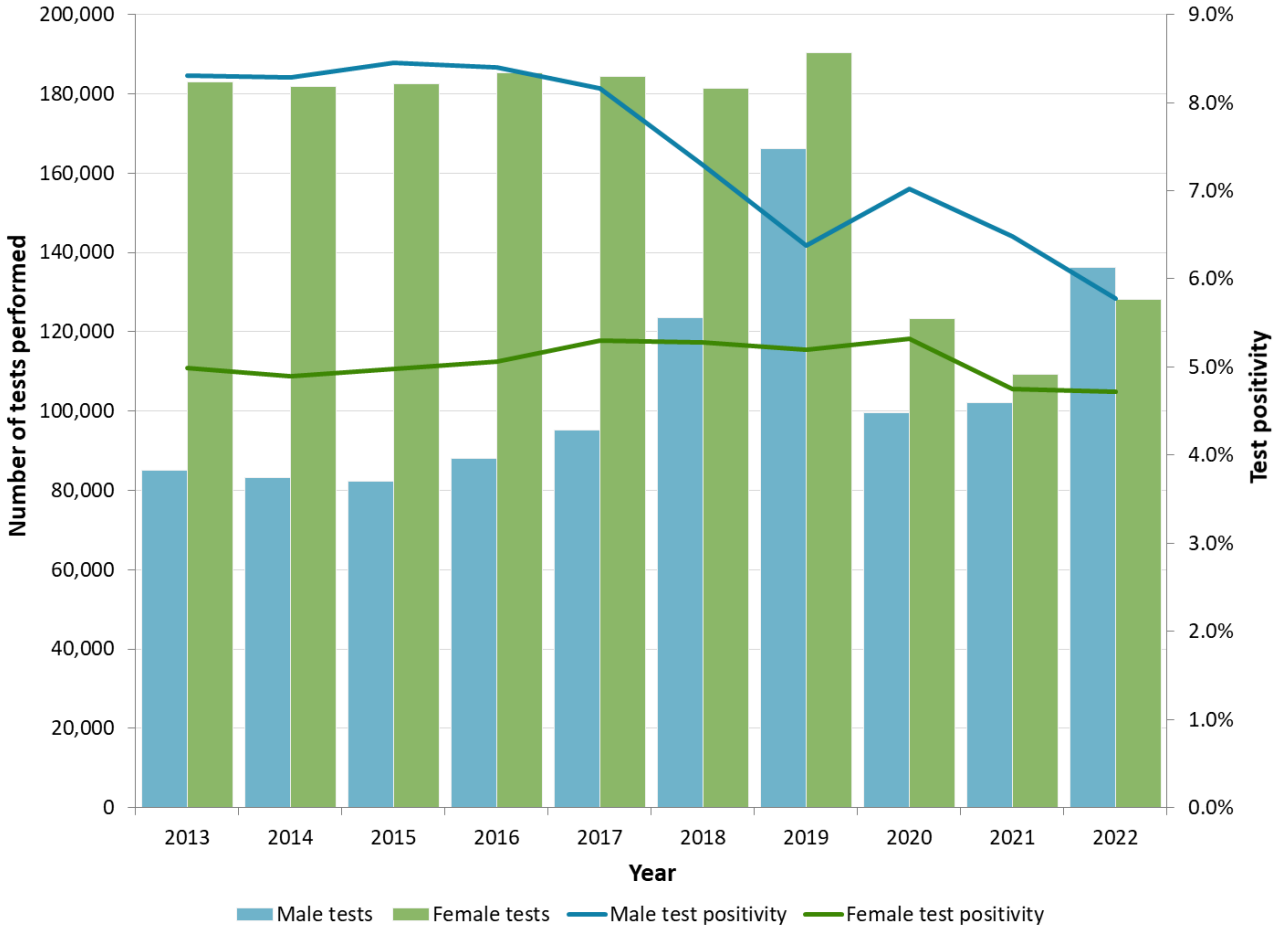
Site of infection	Male n (%)	Female n (%)	Total n (%)
Urogenital only**	**12,987 (78.4%)**	**19,764 (98.1%)**	**32,751 (89.2%)**
Extra-genital only	**3,281 (19.8%)**	**178 (0.9%)**	**3,459 (9.4%)**
Rectal	2,636 (80.3%)	47 (26.4%)	2,683 (77.6%)
Pharyngeal	315 (9.6%)	128 (71.9%)	443 (12.8%)
Both rectal and pharyngeal	330 (10.1%)	3 (1.7%)	333 (9.6%)
Urogenital and extra-genital	**294 (1.8%)**	**196 (1.0%)**	**490 (1.3%)**
Total†	**16,562 (100.0%)**	**20,138 (100.0%)**	**36,700 (100.0%)**

Data source: iPHIS

Note: *Excludes cases that did not identify as male or female. **Includes urethral, urine, vaginal (females only), and cervical (females only). †Includes only cases with a urogenital and/or extra-genital site of infection entered in iPHIS. Excludes 2,129 cases (among males and females) that had a site of infection that was not a urogenital and/or extra-genital site (n=1,663) or had no site of infection entered in iPHIS (n=466).

Testing

Figure 4. Number of nucleic acid amplification tests (NAATs) performed by PHO and test positivity for *C. trachomatis* by year and sex*: Ontario, 2013-2022



Data source: PHO Laboratory Information Management System (LIMS).
Note: *Excludes cases that did not identify as male or female. Includes all NAATs performed on cervical, urethral, vaginal, urine, rectal, pharyngeal specimens and a small number of other sites; rectal and pharyngeal specimens accepted for NAAT since April 2018.

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 18, 2023.**
- 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.

LABORATORY DATA

- Data were extracted from the Public Health Ontario Laboratory Information Management System (LIMS) on **August 9, 2023.**

ONTARIO POPULATION DATA

- Ontario population estimate data were sourced from Statistics Canada: Population estimates 2001-2022: Table 1 annual population estimates by age and sex for July 1, 2001 to 2022, health regions, Ontario [unpublished data table]. Ottawa, ON: Government of Canada; 2023 [received March 13, 2023].

Data Caveats

IPHIS

- Data reported between 2020 and 2022 should be interpreted with caution. Both testing and iPHIS data entry practices were likely impacted by the COVID-19 pandemic response.
- These data only represent laboratory-confirmed cases of chlamydia reported to public health and recorded in iPHIS. As a result, all case counts are 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, clinical practices, and changes in laboratory testing and reporting behaviours.
- Only chlamydia cases meeting the confirmed case classification as listed in the Ontario MOH surveillance case definitions are included in the reported case counts. Provincial surveillance case definitions available online under the Infectious Diseases Protocol are the most current.
    - 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.

- Cases of chlamydia are reported based on the Episode Date, which is an estimate of the onset date of disease for a case. In order 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.
    - 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.
- The following values for sex are derived from the data entered in the Gender field of iPHIS: MALE, FEMALE, TRANSGENDER, OTHER, UNKNOWN. Counts or rates presented as 'Total' include all of these values; however, for sex-specific rates or proportions, only Male and Female counts are included as denominators are not available for the other values.
    - Note: Cases reported as Transgender include both transgender males and transgender females as it is not possible to further distinguish based on iPHIS data.
- The potential for duplicate case records exists because duplicate sets were not identified and excluded unless they were already resolved at either the local or provincial level prior to data extraction from iPHIS.
- Extra-genital infections of chlamydia are reported based on the body site of the positive laboratory specimen. Note, however, that not all cases of chlamydia have a body site entered in iPHIS.

LABORATORY INFORMATION MANAGEMENT SYSTEM

- Laboratory data only represent testing performed at PHO. Data shown are based on unique specimens and may over-represent case counts due to submission of multiple samples per patient in a given year. These data do not include testing performed at community laboratories throughout the province that conduct a large proportion of testing for chlamydia NAAT in Ontario.
    - Data do not represent unique individuals and instead represent all isolates, meaning that an individual who is tested for *Chlamydia trachomatis* from more than one site (e.g., pharyngeal and rectal) and/or on more than one occasion in a calendar year, will have all tests captured in these data. This is true for all negative and positive tests.
- Test positivity for chlamydia is calculated as the number of specimens positive for *C. trachomatis* divided by the total number of specimens tested for *C. trachomatis*.
- Rectal and pharyngeal specimens have been accepted for NAAT since April 2018. This may have contributed to the increase in NAATs completed in 2019.
- On December 1, 2021, the Roche assay was implemented for NAAT. The change in assay made it no longer possible to request only *C. trachomatis* or *N. gonorrhoeae* testing. Therefore, any impacts to NAAT testing after this date would have an impact on the testing of both *C. trachomatis* and *N. gonorrhoeae.*

- Login date was used to assign year of test.
- Demographic information are obtained from paper requisitions accompanying the patient specimen and is thus subject to transcription errors.

Appendix A

Table A1. Chlamydia cases and rate (per 100,000 population) by public health unit: Ontario, 2018-2022

Public Health Unit	2018	2019	2020	2021	2022
Algoma Public Health	260 (223.3)	365 (311.6)	262 (222.7)	320 (272.6)	269 (226.7)
Brant County Health Unit	519 (347.8)	485 (320.3)	355 (231.1)	372 (237.0)	343 (213.5)
Chatham-Kent Public Health	270 (255.3)	297 (280.0)	238 (222.5)	231 (213.8)	232 (212.7)
City of Hamilton Public Health Services	1,793 (316.7)	2,115 (368.2)	1,587 (272.2)	1,549 (263.7)	1,494 (250.2)
Durham Region Health Department	2,292 (334.4)	2,464 (352.9)	1,821 (255.2)	1,547 (212.5)	1,806 (242.2)
Eastern Ontario Health Unit	412 (195.2)	412 (193.0)	292 (135.2)	236 (107.9)	260 (117.2)
Grey Bruce Health Unit	367 (214.4)	436 (251.0)	291 (165.2)	324 (180.5)	253 (138.5)
Haldimand-Norfolk Health Unit	255 (217.8)	263 (221.1)	207 (172.5)	193 (158.0)	189 (152.1)
Haliburton, Kawartha, Pine Ridge District Health Unit	369 (196.1)	391 (206.3)	280 (146.5)	277 (143.1)	215 (109.7)
Halton Region Health Department	1,170 (200.3)	1,289 (215.6)	969 (158.8)	857 (139.0)	910 (145.1)
Hastings Prince Edward Public Health	514 (304.1)	523 (306.2)	438 (253.4)	337 (193.0)	328 (184.9)
Huron Perth Health Unit	269 (187.9)	329 (227.4)	265 (181.1)	274 (184.7)	256 (170.1)
Kingston, Frontenac, Lennox & Addington Public Health	963 (468.5)	973 (468.4)	806 (385.2)	612 (291.2)	756 (353.8)
Lambton Public Health	336 (256.0)	347 (262.3)	210 (158.4)	227 (171.3)	255 (189.8)
Leeds, Grenville and Lanark District Health Unit	345 (196.1)	377 (211.8)	319 (177.4)	275 (151.2)	317 (172.1)
Middlesex-London Health Unit	2,126 (430.6)	2,195 (436.8)	1,574 (308.6)	1,583 (306.8)	1,789 (336.3)
Niagara Region Public Health	1,645 (348.4)	1,727 (361.2)	1,282 (266.1)	1,141 (234.5)	1,242 (250.4)

Public Health Unit	2018	2019	2020	2021	2022
North Bay Parry Sound District Health Unit	446 (345.8)	470 (363.6)	278 (214.3)	290 (221.2)	251 (186.7)
Northwestern Health Unit	541 (665.2)	714 (877.5)	570 (699.9)	423 (516.7)	456 (555.5)
Ottawa Public Health	3,807 (378.9)	3,933 (383.6)	2,605 (249.4)	2,521 (239.5)	3,069 (286.3)
Peel Public Health	4,211 (281.5)	4,976 (324.4)	3,499 (224.5)	3,356 (214.2)	3,912 (244.6)
Peterborough Public Health	621 (423.2)	577 (391.6)	398 (269.2)	302 (203.4)	385 (254.9)
Porcupine Health Unit	414 (486.7)	370 (433.9)	312 (366.9)	283 (334.1)	266 (312.2)
Public Health Sudbury & Districts	792 (388.3)	896 (437.9)	720 (351.0)	571 (277.5)	553 (265.0)
Region of Waterloo Public Health and Emergency Services	1,804 (311.5)	1,956 (329.9)	1,426 (235.8)	1,325 (216.8)	1,387 (218.8)
Renfrew County and District Health Unit	341 (317.5)	279 (258.2)	196 (180.2)	167 (152.1)	172 (155.5)
Simcoe Muskoka District Health Unit	1,589 (273.0)	1,514 (254.8)	1,164 (192.3)	1,206 (195.1)	1,117 (176.1)
Southwestern Public Health	462 (218.0)	477 (221.3)	416 (189.9)	334(149.4)	382(167.2)
Thunder Bay District Health Unit	694 (441.6)	691 (438.4)	488 (310.0)	523 (335.4)	505 (323.3)
Timiskaming Health Unit	77 (227.6)	66 (194.6)	69 (202.9)	65 (189.8)	51 (148.1)
Toronto Public Health	13,920 (477.1)	15,020 (506.9)	10,394 (348.3)	10,375 (351.0)	11,904 (393.4)
Wellington-Dufferin-Guelph Public Health	817 (268.8)	887 (287.8)	652 (208.6)	558 (176.3)	671 (208.6)
Windsor-Essex County Health Unit	873 (207.0)	998 (234.2)	747 (174.7)	741 (173.9)	776 (178.0)
York Region Public Health Services	2,614 (225.1)	2,743 (231.9)	2,010 (167.6)	2,024 (167.5)	2,172 (177.4)
Total	**47,928 (335.0)**	**51,555 (354.5)**	**37,140 (252.2)**	**35,419 (239.2)**	**38,943 (257.7)**

Data sources: iPHIS; Statistics Canada.

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Chlamydia in Ontario: focus on 2022. Toronto, ON: King's Printer for Ontario; 2024.

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