

SURVEILLANCE REPORT

Candida auris in Ontario: January 1, 2017 – December 31, 2024

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Introduction

Candida auris (C. auris) is an emerging drug-resistant fungal pathogen (yeast) typically resistant to azoles (e.g., fluconazole), often resistant to polyenes (e.g., amphotericin B) and with variable but rising resistance to echinocandins (e.g., caspofungin) in some regions.¹ Since its first detection globally in 2009,² this organism has spread to all continents. The first case of multi-drug resistant *C. auris* was identified in Canada in 2017.³ There are four major distinct genetic clades of *C. auris*, with unique epidemiology and pathophysiology, all of which have been identified in Canada.⁴

C. auris can cause a range in severity of infection, but the overall mortality rate associated with this organism is high at 30-70%.⁵ *C. auris* preferentially colonizes the skin over mucous membranes which can facilitate its transmission. The organism can be challenging to identify which may further lead to its insidious spread. Its propensity to survive on inanimate surfaces and the development of resistance to topical disinfection agents may be additional reasons that this organism is an increasingly common cause of difficult-to-manage nosocomial outbreaks.⁶

Given the rising rates of infection internationally, resistance to first line antimicrobial options, and high mortality rate, *C. auris* was designated a Disease of Public Health Significance (DOPHS) in Ontario as of January 1, 2025.

To provide initial data on this organism, this report describes the epidemiology of *C. auris* in Ontario from January 1, 2017 to December 31, 2024 using laboratory data from Public Health Ontario (PHO).

Highlights

- *C. auris* is a fungal pathogen that is often multi-drug resistant, associated with high rates of mortality and is an increasing cause of nosocomial outbreaks.
- Based on laboratory data from Public Health Ontario during the period of 2017-2024, there were 22 cases of *C. auris* identified in Ontario from 20 unique patients. Twelve patient cases were identified via diagnostic testing and 10 patient cases via surveillance testing. Two individuals that were initially identified as colonized went on to develop an infection with *C. auris*.
- Of the 20 patients with *C. auris* identified, 17 had susceptibility testing performed. 16 of 17 (94%) isolates were fluconazole resistant, 6 of 17 (35%) were resistant to amphotericin B and none were resistant to caspofungin or other echinocandins.
- While the number of reported cases in Ontario is currently low, this underscores the importance of ongoing surveillance as well as robust infection prevention and control and antimicrobial stewardship practices to mitigate the further spread and emergence of this drug-resistant pathogen.

Trends Over Time

- Between 2017 and 2024, 20 patient cases of *C. auris* were reported. Of these, 12 were identified via diagnostic testing and 8 from individuals with positive surveillance tests. Among the infection cases, 2 patients had prior positive screening tests in the preceding year before progressing to infection. (Figure 1)
- The number of isolates is too low to identify any notable trends, however numerically there is an increasing number of cases recently with the majority of cases in the most recent years of the report (2022-2024). At this time, it is not clear whether the increased number reported *C. auris* cases reflects true changes in its incidence or increased awareness and testing for this potential pathogen.
- These findings are consistent with unpublished national data for the period of 2017-2022 from the Public Health Agency of Canada, where the highest reported number of cases in Canada is from 2022 with a total of twelve cases reported nationally.
- The increased number of cases is even more profound in the United States, where there were 171 clinical cases of *C. auris* in 2017, compared to 2928 in 2022.⁷



Figure 1: Number of Individuals with Culture-Positive C. auris Laboratory Results by Year

Note: Testing was considered surveillance/screening if indicated on the requisition or if *C. auris* was obtained from a skin/mucosal membrane swab; testing was categorized as diagnostic if obtained from clinical specimens (e.g. blood, sputum, urine etc.) and were not part of antimicrobial resistant organism screening programs. Two individuals had positive *C. auris* surveillance tests performed prior to positive *C. auris* clinical specimens. Year was assigned using specimen collection date if available, and specimen login date otherwise. Data source: Public Health Ontario Laboratory Information Management System

Demographic Characteristics of C. auris Cases

The majority of cases were identified in older adults with 16 (80%) reported in patients aged 60 years or older. Most cases (16, 80%) were reported in males (<u>Table 1</u>). Geographically, most cases were identified in Peel Public Health Unit (7, 35%) and Toronto Public Health Unit (5, 25%).

Characteristic	Number of Culture-Positive Individuals
Age Group	
Ages: 0-9	0 (0.0%)
Ages: 10-19	0 (0.0%)
Ages: 20-29	0 (0.0%)
Ages: 30-39	2 (10.0%)
Ages: 40-49	0 (0.0%)
Ages: 50-59	2 (10.0%)
Ages: 60-69	8 (40.0%)
Ages: 70-79	4 (20.0%)
Ages: 80 and Over	4 (20.0%)
Sex	
Female	4 (20.0%)
Male	16 (80.0%)
Public Health Unit	
Eastern Ontario Health Unit	1 (5.0%)
Huron Perth Public Health	1 (5.0%)
Lambton Public Health	1 (5.0%)
Ottawa Public Health	1 (5.0%)
Peel Public Health	7 (35.0%)
Thunder Bay District Health Unit	1 (5.0%)
Toronto Public Health	5 (25.0%)
Wellington-Dufferin-Guelph Public Health	1 (5.0%)
York Region Public Health	2 (10.0%)
Total	20 (100%)

Table 1: Demographic Characteristics of Individuals with C. auris

Note: Excludes public health units without *C. auris* identified. Public health unit was assigned using an individual's residential postal code if provided and submitter postal code otherwise.

Data source: Public Health Ontario Laboratory Information Management System

Travel History

Of the 20 individuals that were culture positive with C. auris, consultation with hospitals revealed:

- 6 individuals had no known recent travel outside of Canada; 5 of these were positive in diagnostic specimens
- 13 patients had recent travel history outside of Canada; 12 of which had received recent medical care in facilities outside of Canada (including the USA, India, South Africa, Caribbean, Kingdom of Saudi Arabia), for one individual it is unknown if they had any medical encounters abroad
- No travel or hospitalization information was available for one individual

Antifungal Susceptibility

Of the 20 patient cases identified in Ontario, 17 had susceptibility testing performed. Sixteen of 17 (94%) were reported as fluconazole resistant, 6 of 17 (35%) were amphotericin B resistant, and none were resistant to echinocandins (<u>Table 2</u>). United States data provide susceptibility estimates on a greater number of isolates. According to the US CDC, about 90% of isolates are resistant to fluconazole, about 30% resistant to amphotericin B, and less than 2% resistant to echinocandins.⁸

Antifungal Agent / Resistance Interpretation	Number of Individuals Tested
Fluconazole	n=17
Non-Resistant	1 (5.9%)
Resistant	16 (94.1%)
Amphotericin B	n=17
Non-Resistant	11 (64.7%)
Resistant	6 (35.3%)
Anidulafungin	n=17
Non-Resistant	17 (100%)
Resistant	0 (0.0%)
Caspofungin	n=16*
Non-Resistant	16 (100%)
Resistant	0 (0.0%)
Micafungin	n=17
Non-Resistant	17 (100%)
Resistant	0 (0.0%)
Total	17 (100%)

Table 2: Antifungal Susceptibility for Identified Cases of C. auris

Note: *One invalid result was excluded for caspofungin. Three individuals did not have antifungal susceptibility testing performed. Resistance interpretations were based on tentative minimum inhibitory concentration (MIC) breakpoints defined by the US Centers for Disease Control and Prevention (CDC). Data source: Public Health Ontario Laboratory Information Management System

Technical Notes

Data Sources

Data for *C. auris* culture identification and associated demographics were extracted from the Public Health Ontario Laboratory Information Management System on January 23, 2025.

Data Caveats

- PHO may not receive all *C. auris* cultures from Ontario laboratories. As such, data may not be a complete representation of *C. auris* identified within the province. However, Public Health Ontario Laboratory data were cross-checked against two other sources of data up to 2022, including the Ontario Laboratories Information System (OLIS) as well as the Antimicrobial Resistance in Common Hospital Pathogens Annual Laboratory Survey. The counts of cases of *C. auris* were similar across all data sources.
- Differentiation between tests completed for the purpose of diagnosing an infection ("diagnostic testing") and tests completed for the purpose to identify colonization ("surveillance testing") should be interpreted with caution. Tests were differentiated using information from laboratory test requisitions, which may not always reflect the true purpose of testing.
- The number of cases of *C. auris* may be an underestimate of the true incidence/prevalence of this organism as screening for this organism is infrequent and inconsistent across hospitals. Less than 20% of hospitals report having a screening policy for *C. auris* which may lead to under-detection.⁹
- At the time of publication, there is a lack of approved breakpoints for interpreting *C. auris* susceptibility to most antifungal agents. However, tentative recommendations were developed by the US Centers for Disease Control and Prevention (CDC) based on breakpoints for other Candida species and expert opinion.⁸

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Citation

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