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TECHNICAL NOTES

Ontario Antibiogram

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Background

Antibiograms are a summary of the cumulative susceptibility of bacterial isolates to specific antibiotics in a given hospital or region. Antibiograms are an antimicrobial stewardship strategy used to guide choice of empiric therapy and track resistance patterns.

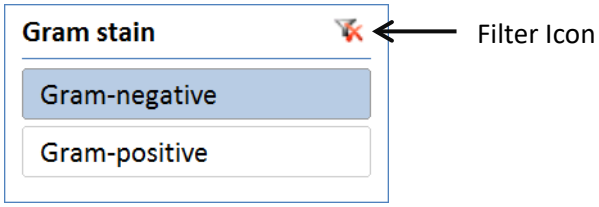
Aggregate, cumulative susceptibility data at a regional level is required for improved surveillance of antimicrobial resistance and is necessary to support the development of regional empiric antibiotic prescribing guidelines, particularly for smaller facilities with low numbers of isolates. In Ontario, antimicrobial susceptibility data from hospitalized patients is currently housed at several laboratories across the province, with no centrally accessible repository of data. Antibiogram data is available from the private laboratory LifeLabs for outpatients and long-term care (LTC) residents stratified by Local Health Integration Network (LHIN), but has previously been lacking for hospitals.

The Ontario Antibiogram provides provincial susceptibility data by setting (hospital, LTC, and outpatient), age group, and specimen source (urine, blood, and respiratory).

General Notes

Navigating the Antibiogram

Antibiogram data can be stratified by either gram-negative, gram positive or combined, as well as by year, setting, age group, sex, and specimen source. The slicer will highlight the selected data as blue. To clear the stratification and show all data, click on the filter icon.



Isolate Counts

Susceptibility is provided for organisms with 30 or more cultures. Organisms with less than 30 isolates should be interpreted with caution as there may be imprecision in the estimated susceptibility. The number of isolate counts tested for each organism-drug combination are provided in a separate tab “Isolate Count Tested”.

Time Range

Laboratory test results between January 1, 2016 and June 30, 2024 were included.

Data Source

The Ontario Laboratory Information System (OLIS) provides hospital inpatient, LTC, and outpatient laboratory culture results for over 95% of clinical microbiology laboratories in Ontario. To avoid bias by repeated testing, only the first culture result per patient per organism per year was selected.

Patient Population

Culture data were obtained from linked Ontario-wide administrative datasets housed at ICES (formerly known as the Institute for Clinical Evaluative Sciences). ICES is an independent, non-profit research institute whose legal status under Ontario's health information privacy law allows it to collect and analyze health care and demographic data, without consent, for health system evaluation and improvement. Urine culture and susceptibility data were obtained from Ontario Laboratory Information System (OLIS), with over 95% of laboratories reporting their data to OLIS. Demographics data were collected from the Registered Persons Database (RPDB), CIHI Discharge Abstract Database (DAD), and Continuing Care Reporting System – Long Term Care (CCRS-LTC). These datasets were linked using unique encoded identifiers and analyzed at ICES.

Organisms

Different phenotypes of bacterial species were combined (e.g. E. coli includes ESBL and non-ESBL). Organisms are separated by species (e.g., *Klebsiella pneumonia, Klebsiella oxytoca*) and less common species were grouped by genus (e.g., *Klebsiella sp.* Other).

Susceptibility

Susceptibility ranges from 0-100% and is colour coded in the antibiogram (Red for 0-59%, Yellow for 60-79%, Green for 80% or greater, with darker shading towards 0% (dark red) and 100% (dark green)).

Navigating the Antibiogram

Urinary antibiogram data can be stratified by year, health care setting (hospital inpatient, LTC, outpatient), age group (<20, 20-59, 60+), sex, and specimen source. The slicer will highlight the selected data as blue. To clear the stratification and show all data, click on the filter icon.

Data Limitations

Due to variations in antibiogram formatting and laboratory reporting practices, there is heterogeneity in the data OLIS receives from laboratories (i.e., data are limited by laboratory testing policies and coding practices).

Please note that all 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.

For specific questions about specific local susceptibility data, consult your microbiology laboratory.

Missing Data

Susceptibility results are limited by what laboratories report to clinicians, so suppressed results not reported are not available. However, when susceptibility results were missing, rule-based imputation

(i.e., intrinsic resistance and cross-resistance between classes) and model-based imputation (i.e., logistic regression based on non-missing data from the cohort including age, sex, setting, region, organism, and susceptibility results for other antibiotics) was used to extrapolate to missing results.

Queries about the Ontario Antibiogram

For additional questions about the Ontario Hospital Antibiogram or to provide your data, please contact asp@oahpp.ca.

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