

ENHANCED EPIDEMIOLOGICAL SUMMARY

Anaplasmosis and Babesiosis in Ontario: 2023

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Introduction

In eastern Canada, blacklegged ticks (*Ixodes scapularis*) transmit a number of tick-borne diseases (TBDs). Warming temperatures and land use changes are anticipated to aid blacklegged tick range expansion and increase the risk of human infection with tick-borne pathogens.¹ Along with *Borrelia burgdorferi* (bacterium that causes Lyme disease), blacklegged ticks can transmit other pathogens including *Anaplasma phagocytophilum* (anaplasmosis), *Babesia microti* and other *Babesia* spp. (babesiosis), and Powassan virus (Powassan virus infection). On July 1, 2023, the Ontario Ministry of Health (MOH) designated anaplasmosis, babesiosis and Powassan virus as three new tick-borne Diseases of Public Health Significance (DoPHS)²⁻⁴, in addition to Lyme disease which has been a reportable disease in Ontario since 1988.⁵

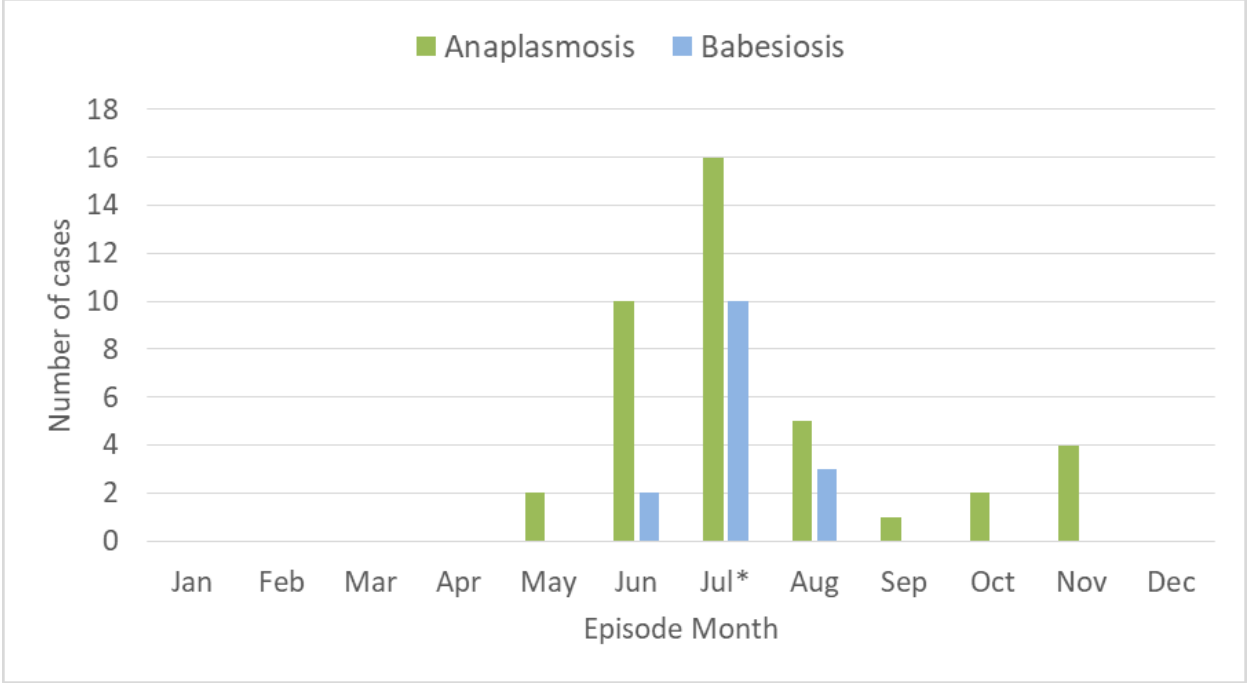
Public Health Ontario (PHO) developed this Enhanced Epidemiological Summary to raise awareness of anaplasmosis and babesiosis epidemiology among Ontario public health partners and healthcare providers. The purpose of this report is to describe the epidemiology of the new tick-borne DoPHS, and identify where cases are occurring within Ontario (i.e. reported locations of exposures) from January 1, 2023 through December 31, 2023. While these diseases became reportable on July 1, 2023, this report includes cases from January 1, 2023 as illness onset occurred prior to July 1 for some cases. No probable or confirmed cases of Powassan virus disease were reported during this time.

Highlights

- In 2023, 40 cases of anaplasmosis (17 confirmed and 23 probable) and 15 cases of babesiosis (8 confirmed and 7 probable) were reported in Ontario.
- The majority of anaplasmosis (31, 78%) and babesiosis (15, 100%) cases had episode dates (an estimation of illness onset) from June to August (Figure 1).
- Of the 40 anaplasmosis cases, 34 (85%) reported exposure locations, of which 30 cases reported exposure locations within Ontario. All of the reported Ontario exposures were within the eastern Ontario region (Figure 2, Table 1).
- Of the 15 babesiosis cases, 12 (80%) reported exposure locations, of which 9 reported exposure locations within Ontario. All of the reported Ontario exposures were within southern Ontario (Figure 3, Table 1).
- The majority of anaplasmosis and babesiosis cases were reported among older adults, with 73% (28 cases) and 53% (8 cases) of anaplasmosis and babesiosis, respectively, reported among adults 60 years of age and older (Table 2).

Seasonal Trends

Figure 1: Confirmed and Probable Cases of Anaplasmosis and Babesiosis Reported in Ontario by Episode Month (January 1–December 31, 2023)



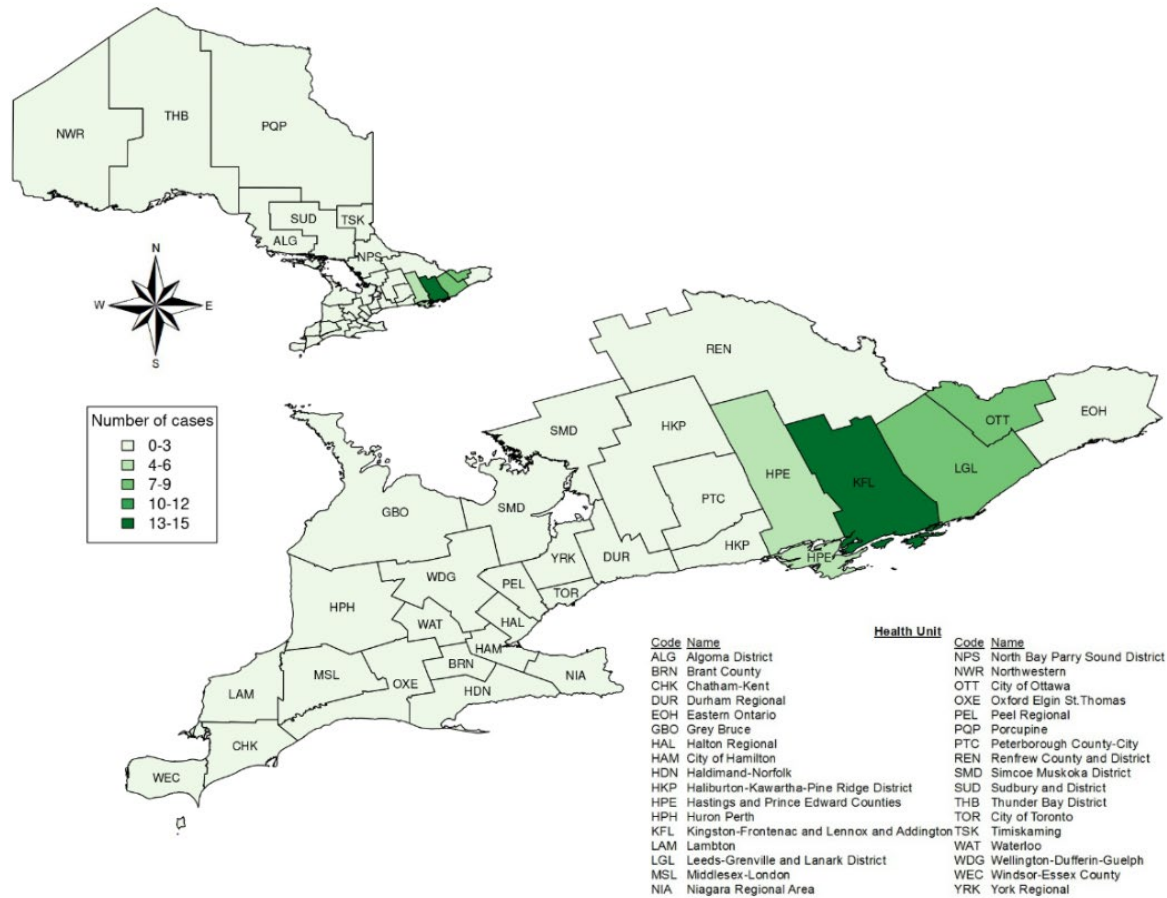
Data source: iPHIS data

Note: Cases are shown by episode month (first available of onset, specimen collection, or reported month).

*Anaplasmosis and babesiosis were designated as diseases of public health significance on July 1, 2023. However, for some cases, onset of illness occurred prior to July 1.

Geographic Distribution

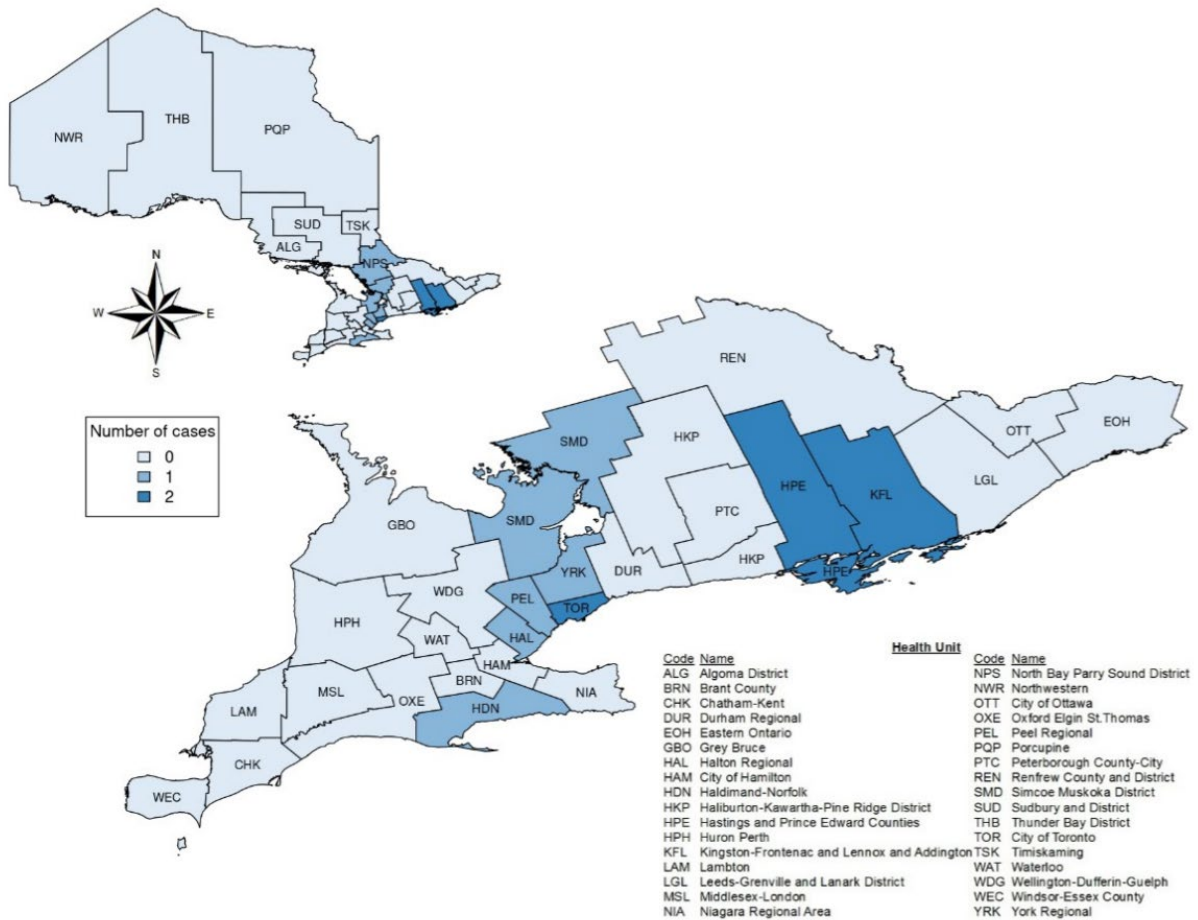
Figure 2: Number of Confirmed and Probable Anaplasmosis Cases by Reported Location of Exposure in Ontario (January 1–December 31, 2023)



Data source: iPHIS data

Note: Cases can report multiple exposure locations (e.g. multiple different public health units in Ontario). As result there may be more exposure locations reported than the total number of cases.

Figure 3: Number of Confirmed and Probable Babesiosis Cases by Reported Location of Exposure in Ontario (January 1–December 31, 2023)



Data source: iPHIS data

Note: Cases can report multiple exposure locations (e.g. multiple different public health units in Ontario). As a result there may be more exposure locations reported than the total number of cases.

Table 1: Number of Confirmed and Probable Anaplasmosis and Babesiosis Cases by Ontario Public Health Unit of Reported Exposure (January 1–December 31, 2023)

Public Health Unit Name	Anaplasmosis	Babesiosis
Northwestern Health Unit	0	0
Thunder Bay District Health Unit	0	0
TOTAL NORTH WEST	0	0
Algoma Public Health	0	0
North Bay Parry Sound District Health Unit	0	1
Porcupine Health Unit	0	0
Public Health Sudbury & Districts	0	0
Timiskaming Health Unit	0	0
TOTAL NORTH EAST	0	1
Eastern Ontario Health Unit	1	0
Hastings Prince Edward Public Health	2	2
Kingston, Frontenac and Lennox & Addington Public Health	13	2
Leeds, Grenville & Lanark District Health Unit	9	0
Ottawa Public Health	7	0
Renfrew County and District Health Unit	0	0
TOTAL EASTERN	32	4
Durham Region Health Department	0	0
Haliburton, Kawartha, Pine Ridge District Health Unit	0	0
Peel Public Health	0	1
Peterborough Public Health	0	0
Simcoe Muskoka District Health Unit	0	1
York Region Public Health	0	1
TOTAL CENTRAL EAST	0	3

Public Health Unit Name	Anaplasmosis	Babesiosis
Toronto Public Health	0	2
TOTAL TORONTO	0	2
Chatham-Kent Public Health	0	0
Grey Bruce Health Unit	0	0
Huron Perth Public Health	0	0
Lambton Public Health	0	0
Middlesex-London Health Unit	0	0
Southwestern Public Health	0	0
Windsor-Essex County Health Unit	0	0
TOTAL SOUTH WEST	0	0
Brant County Health Unit	0	0
City of Hamilton Public Health Services	0	0
Haldimand-Norfolk Health Unit	0	1
Halton Region Public Health	0	1
Niagara Region Public Health	0	0
Region of Waterloo Public Health and Emergency Services	0	0
Wellington-Dufferin-Guelph Public Health	0	0
TOTAL CENTRAL WEST	0	2

Data source: iPHIS data

Note: Cases can report multiple exposure locations (e.g. multiple different public health units in Ontario). As result there may be more exposure locations reported than the total number of cases.

Demographics

Table 2: Characteristics of Confirmed and Probable Anaplasmosis and Babesiosis Cases in Ontario (January 1–December 31, 2023)

Case Characteristic	Anaplasmosis, n (%)	Babesiosis, n (%)
Confirmed cases	17 (42.5)	8 (53.3)
Probable cases	23 (57.5)	7 (46.7)
Total Number of Confirmed and Probable Cases	40	15
Female	10 (25.0)	10 (66.7)
Male	30 (75.0)	5 (33.3)
<18 years of age	0 (0.0)	0 (0.0)
20–29 years of age	0 (0.0)	2 (13.3)
30–39 years of age	1 (2.5)	2 (13.3)
40–49 years of age	3 (7.5)	2 (13.3)
50–59 years of age	7 (17.5)	1 (6.7)
60–69 years of age	13 (32.5)	4 (26.7)
70–79 years of age	13 (32.5)	3 (20.0)
80+ years of age	3 (7.5)	1 (6.7)
Number of hospitalizations	17 (42.5)	6 (40.0)
Number of deaths	0	0

Data source: iPHIS data

Technical Notes

Data sources

- The data for this report are based on information entered in the Ontario Ministry of Health (MOH) integrated Public Health Information System (iPHIS) database as of March 6, 2024.

Data caveats

- The data includes confirmed and probable cases of anaplasmosis and babesiosis. Case are classified as per the current provincial case definitions.²⁻⁴
- 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.
- These data only represent cases and case details (e.g. exposure location) 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 that may depend on severity of illness, clinical practices, and changes in laboratory testing and reporting behaviours.
- The potential for duplicates exists unless they were resolved at the local level prior to data extraction.
- Cases 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.
- Multiple exposure locations can be reported for a case. For example, a single case could report multiple locations within Ontario as well as outside of Ontario or Canada.
- Disease acquisition cannot be attributed to exposure locations reported in iPHIS. Instead exposures represent events reported prior to the onset of illness (i.e. exposures do not demonstrate a causal link).

Methods

- Includes cases with episode dates from January 1 to December 31, 2023, inclusive.
- 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 analyses.
- Cases for which the Diagnosing Health Unit was reported as 'MOHLTC' (to signify a case that is not a resident of Ontario) were excluded.
- Hospitalized cases were defined as those where an admission date was reported.
- Multiple iPHIS fields (e.g. risk factor and exposure fields) were reviewed in order to classify the location of exposure of a case. Locations were classified by public health unit in Ontario. Exposure locations outside of Ontario and/or Canada were not included.
- Only unique exposure locations (i.e., public health unit) were included for a case. For example, if a case reported multiple exposure locations within one public health unit, that exposure was captured only once.

- For cases reporting exposure locations within Ontario as well as outside of Ontario and/or Canada, only the Ontario exposure was included.
- For cases reporting both known and unknown exposure locations, only the known exposure location was included. For example, if a case reported an exposure within Ontario and 'UNKNOWN', only the Ontario exposure was included.

References

1. Ogden NH, Maarouf A, Barker IK, Bigras-Poulin M, Lindsay LR, Morshed MG, et al. Climate change and the potential for range expansion of the Lyme disease vector *Ixodes scapularis* in Canada. *Int J Parasitol.* 2006;36(1):63-70. Available from: <https://doi.org/10.1016/j.ijpara.2005.08.016>
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4. Ontario. Ministry of Health. Infectious diseases protocol. Appendix 1: case definitions and disease-specific information. Disease: Powassan virus infection [Internet]. Toronto, ON: King's Printer for Ontario; 2023 [cited 2024 Mar 13]. Available from: <https://files.ontario.ca/moh-ophs-powassan-en-2023.pdf>
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Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Anaplasmosis and babesiosis in Ontario: 2023. Toronto, ON: King's Printer for Ontario; 2024.

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