

Expanding Vector-Borne Disease Risk and Surveillance Findings: 2025 Tick and Mosquito Updates

To: Chair and Members of the Board of Health

Meeting Date: April 1, 2026

Report No. **BH.01.APR0126.R07**, Pages: 11

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Recommendations

It is recommended that the Board of Health receive this report for information.

Key Points

Surveillance and Case Updates

- Forty-six confirmed/suspected Lyme disease cases (up from 32 in 2024) and two confirmed anaplasmosis cases were recorded among WDG residents in 2025.
- The first confirmed detection of *Babesia spp.* (the bacteria causing babesiosis) and *Borrelia burgdorferi* (causing Lyme Disease) was recorded in ticks within WDG via active surveillance efforts.
- Increased tick activity has led to the expansion of Ontario risk zones to include southern Wellington County, the City of Guelph and most of Dufferin County.
- Where acquisition data is clear, many WDG cases were suspected to be acquired on rural private property in north and central Dufferin County.

Education and Outreach Initiatives

- A new WDG Public Health website page on *Insects, animals and bites* offers localized data and guidance.
- Continued collaborations with the University of Guelph and other partners supports surveillance, data sharing and education.
- In 2025, there were 270 public tick submissions via the online tool (up from 224 in 2024), supporting quick identification and tick bite action to prevent Lyme disease incidence in WDG.
- Public presentations were provided upon request, including to local libraries and hobby groups across WDG.
- In collaboration with the University of Guelph, WDG Public Health hosted the annual series of in-person workshops on tick identification for professionals across the province.

Background

Vector-borne diseases (VBDs) remain a growing public health concern in Wellington-Dufferin-Guelph (WDG) and across Ontario. Among the most pressing VBDs in Ontario are Lyme disease and West Nile virus (WNV), with additional concern emerging around diseases such as anaplasmosis, babesiosis and Eastern Equine Encephalitis virus (EEEV), which are increasingly being detected or considered emerging threats within Ontario.^{1,2,3}

The spread and intensification of these diseases are closely tied to climate change, which is contributing to longer warm seasons and milder winters. These environmental changes are supporting overwintering success among disease-carrying ticks and mosquitoes, allowing them to increase in abundance and leading to greater human-vector contact.^{1,2,5}

For instance, blacklegged ticks (*Ixodes scapularis*) – the primary vector of Lyme disease, anaplasmosis and babesiosis – have expanded into new areas across WDG, a pattern supported by both passive public submissions and active field surveillance conducted by WDG Public Health. These trends reflect broader ecological shifts occurring across southern Ontario and highlight the importance of localized surveillance to understand regional risk.^{2,4,5}

WNV remains a persistent threat across the province, typically transmitted by *Culex pipiens/restuans* mosquitoes, which are well-adapted to urban environments.¹ Though often asymptomatic, WNV infection can lead to severe neurological illness in a small proportion of cases, particularly among older adults and those with underlying health conditions, reinforcing the need for ongoing monitoring and prevention efforts even in years with low reported human cases.¹

WDG Public Health continues to respond using an integrated surveillance, control, and education program to mitigate VBD risks. These initiatives encompass passive and active tick monitoring, mosquito surveillance and targeted larviciding of catch basins to reduce breeding mosquito populations, as well as public education campaigns, and collaborations with local municipalities and community partners. Building on 2024’s findings and public engagement, 2025 saw an increase in surveillance efforts and public interest in VBDs, supporting continued monitoring and adaptation of local prevention and control activities.

Discussion

Tick Surveillance and Disease Trends

Passive Surveillance

The passive surveillance program continues to demonstrate public engagement, with 260 submissions received via the online tick identification tool – a 25 percent increase over 2024. Many of these submissions (112, 44 percent) were blacklegged ticks, of which **~70 percent were engorged adult female ticks**, indicating a higher potential for disease transmission (**Figure 1**). This pattern has important public health implications, as engorged adult female ticks are more likely to have fed long enough to transmit pathogens and reflects sustained environmental suitability for tick survival and reproduction. These trends also reflect increased vector presence in WDG and growing public awareness and use of the online tick submission tool.

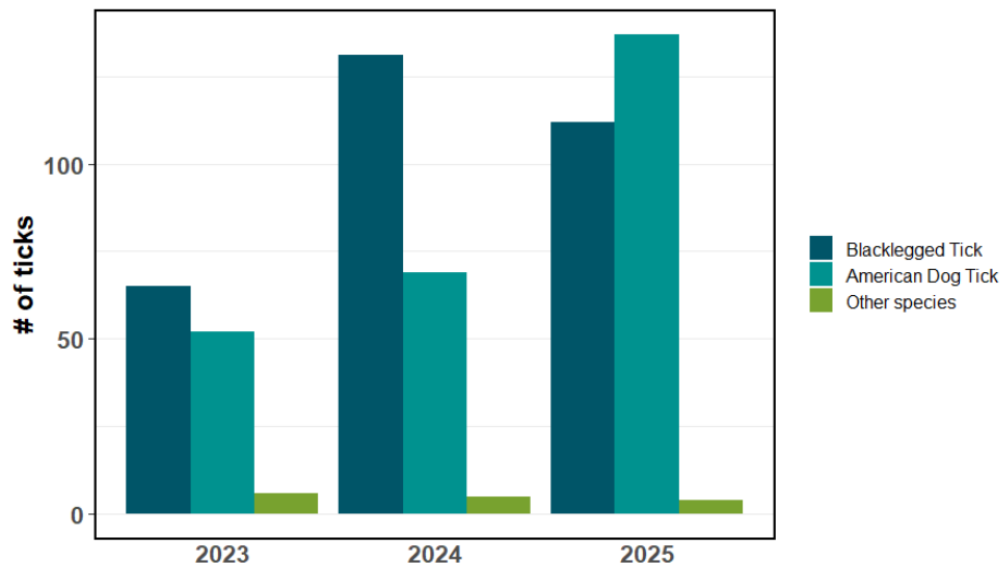


Figure 1. Number of ticks submitted to WDG Public Health’s Online Tick Identification Tool and breakdown of species identified, 2023-2025. In 2025, Blacklegged Ticks accounted for 44 percent of ticks identified, with American Dog Ticks accounting for 54 percent.

Residents accessing the tool were generally new users, having not submitted a tick to WDG Public Health in the past. Submissions by new users accounted for 93 percent of all submissions in 2025, with only 18 of the 260 submissions that year originating from repeat submitters or individuals submitting more than one tick at a time. This pattern was consistent in earlier years, with new users accounting for ~97 percent of submissions in 2024 and 2023. The decrease in 2025 is largely attributed to a few individuals submitting multiple ticks throughout the year or on behalf of clients.

Active Surveillance and New Established Risk Areas

WDG Public Health conducted tick dragging in May and October 2025 at multiple sites in Wellington, Dufferin and Guelph (Figure 2), identifying blacklegged ticks at Starkey Hill Conservation Area and Hockley Valley Provincial Nature Reserve in both months and establishing a 20 km radius of each area as an established risk area (Figure 3), as well as in Preservation Park within the City of Guelph. The data collected through these active surveillance efforts supports improvement of provincial and federal monitoring of tick-borne disease risks and provides up-to-date information on risk areas in WDG, supporting WDG Public Health in sharing localized guidance that helps residents protect themselves and their loved ones.



Figure 2. Left – Active surveillance tick dragging in Preservation Park, Guelph. Centre – Prime blacklegged tick habitat in Preservation Park, Guelph. Right – an adult female blacklegged tick collected from Starkey Hill Conservation Area, Puslinch, in October 2025.

Some of the ticks collected during October sampling were also found to be positive for *Babesia*, the parasite responsible for babesiosis, and for *Borrelia burgdorferi*, the bacterium that causes Lyme disease, confirming the local presence of multiple pathogens with the potential to cause disease and emphasizing the evolving complexity of tick-borne disease risk in WDG. These results indicate that the WDG area may be transitioning from a low-risk zone to one with established endemic transmission of tick-borne pathogens, highlighting the need for sustained, proactive surveillance and timely public education to help residents recognize, prevent and respond to tick exposures.

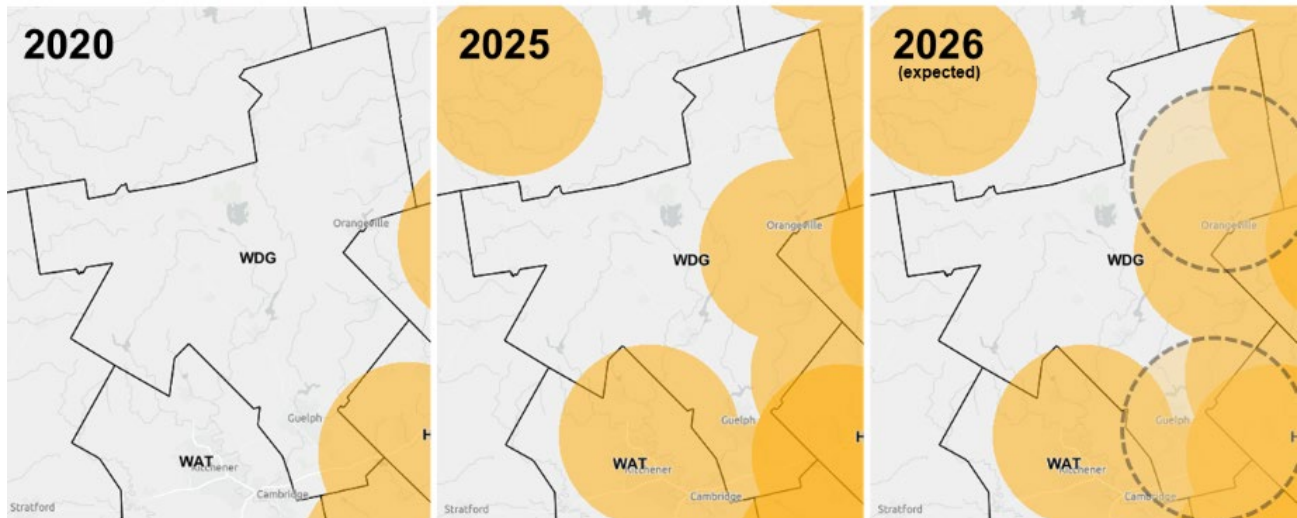


Figure 3. Expanding risk zones for blacklegged ticks in WDG from 2020 to 2026. 2026 (expected) panel determined from newly identified risk areas from WDG Public Health’s Active Surveillance activities in 2025. Adapted from the Blacklegged Tick Established Risk Areas map as part of Public Health Ontario’s Vector-Borne Disease Tool.

Source: Ontario Blacklegged Tick Established Risk Areas 2025, Public Health Ontario ⁴

Tick-borne Disease Trends

Confirmed and probable cases of Lyme disease in WDG residents rose to 42 in 2025 (up from 32 in 2024), continuing the upward trajectory consistent with provincial trends (**Figure 4**). WDG also documented two confirmed cases of anaplasmosis, an emerging tick-borne illness in Ontario recently added as a Disease of Public Health Significance. Local transmission was unlikely in both cases, instead attributed to exposure in eastern Ontario, where the bulk of anaplasmosis cases have occurred. However, ~46 percent of the Lyme disease cases are suspected to have been acquired in WDG, with the other ~54 percent unknown or linked to travel outside of WDG. This local acquisition rate is an important indicator of increased endemic risk and supports the need to treat WDG as an area of growing concern for tick-borne disease exposure. As local tick populations continue to expand and carry a greater diversity of pathogens, it is becoming increasingly important for public health to prioritize early detection, prevention education and clinician awareness to ensure timely diagnosis and treatment.

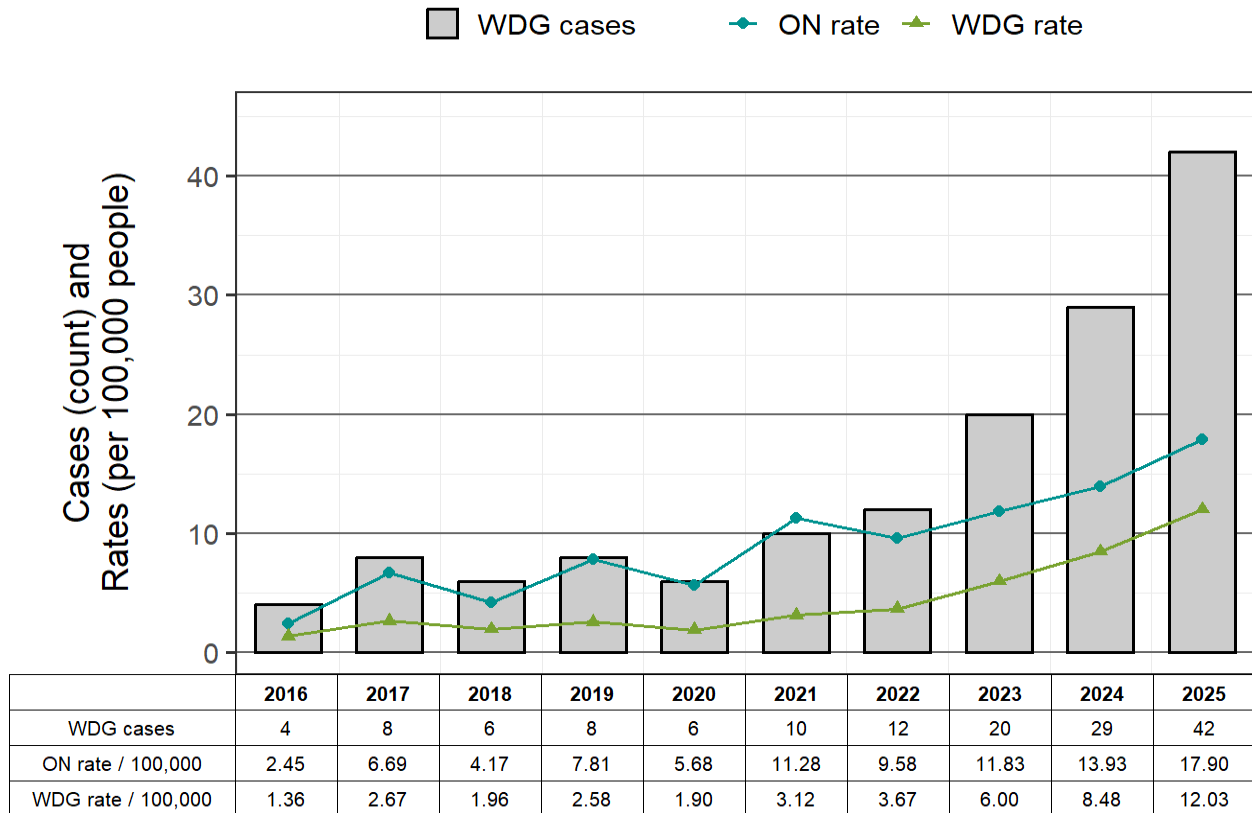


Figure 4. Case rates for confirmed cases of Lyme disease in Ontario and WDG, 2016-2025.

Among the ~21 cases that were locally acquired or suspected to have been acquired in WDG, 15 (71 percent) were likely to have been acquired on private property in north Dufferin. This finding points to an important limitation of active surveillance, which is primarily conducted on public lands, and may not fully capture tick presence and exposure risk on private rural properties where many residents live and work. This pattern is supported by dog surveillance data, which show substantially higher seropositivity for *Borrelia burgdorferi* among dogs in the L9V postal code area – covering parts of Mono, Melancthon and Mulmur – compared with the rest of WDG. These animal data reflect exposure to *B. burgdorferi* rather than clinical disease and may be limited due to lack of information on timing and location of exposure.

Despite these limitations, the alignment between human Lyme disease cases and canine exposure patterns points to shared environmental risk in these rural settings and points to the need for targeted prevention and awareness efforts in these communities, especially for dog owners.

Consistent with a One Health approach, WDG Public Health routinely reviews companion animal surveillance data in collaboration with veterinary partners and provincial data sources to better understand emerging risk patterns across species. Integrating human, animal, and environmental data strengthens local risk assessment and supports more geographically targeted prevention, surveillance and outreach strategies.

Tick Identification Workshops

WDG Public Health continues to be a provincial leader in tick identification training, addressing a critical gap for professional development in public health. In 2025, 35 public health professionals from across the province attended the in-person training session held at the University of Guelph. This session was led by WDGPH’s highly skilled Public Health Inspectors, reinforcing the Agency’s pioneering role in VBD work across the province.

Mosquito Surveillance and Disease Trends

Surveillance and Vector Activity

In 2025, WDG Public Health maintained its annual WNV management program. Adult mosquito trapping was conducted between June 9 and September 22, 2025 across 12 sites, with a total of 184 traps submitted for analysis. A total of 309 mosquito pools were tested for WNV, of which two pools tested positive for WNV in Wellington North and Centre Wellington.

Mosquito Control and Larviciding

To reduce mosquito breeding and mitigate WNV risk, WDG Public Health (through a contractor) applied larvicide to 105,550 roadside catch basins over four rounds of treatment in 2025. This represents a continued year-over-year increase in catch basins requiring treatment due to population growth and new subdivision development across the region (**Table 1**). In addition, larviciding was conducted in 69 municipally-owned catch basins on residential properties and 113 non-roadside basins in parks and green spaces.

Table 1. Year over year increase in catch basins requiring WNV treatment in WDG, 2022-2025.

Year	# of catch basins treated	# of rounds	Estimated # of treatments per round	Increase in treatments per round (total treatments)
2022	103,492	4	25,873	N/A
2023	103,696	4	25,924	+51 (+204)
2024	105,024	4	26,256	+332 (+1328)
2025	105,732	4	26,433	+177 (+708)

Eastern Equine Encephalitis virus (EEEV):

While no EEEV-positive pools were detected in 2025, two equine cases of EEEV were confirmed in Wellington County, indicating local transmission risk. No *Culiseta melanura* (the primary enzootic vector responsible for maintaining EEEV in the environment) were captured in WDG traps. However, known EEEV bridge vectors, including *Aedes vexans* and *Coquillettidia perturbans*, represented a combined 53 percent of all mosquito species identified through trapping. In addition, one human case of EEEV was reported in the neighbouring Hamilton region. Given the severity of EEEV infection and the presence of both equine cases and bridge vector species in the region, ongoing surveillance remains critical to support early detection, risk assessment and timely public health response.

West Nile virus (WNV) cases in WDG:

In 2025, three confirmed or suspected cases of WNV were reported to WDG Public Health among WDG residents. The identification of human cases, together with WNV-positive mosquito pools, indicates active viral circulation within the region. Continued mosquito surveillance and larviciding, combined with public education on personal protective measures, remain essential to reducing the risk of WNV infection and supporting early identification of disease trends.

Insects, animals and bites: all you need to know about protecting yourself from VBDs in WDG

WDG Public Health's new [Insects, animals and bites](#) section of the redesigned website is now a central resource for timely, localized public health guidance on VBDs. It includes:

- practical tips for tick and mosquito bite prevention;
- guidance on when and how to seek medical care following exposures;
- connection to WDGPH's [Online Tick Identification Tool](#); and
- information to support community readiness as emerging threats like babesiosis, anaplasmosis, and Rocky Mountain spotted fever (RMSF) become more relevant in the WDG region.

A key feature is the [Zoonotic and Vector-borne Diseases Dashboard](#), which offers local data on:

- human cases of Lyme disease, WNV, and other reportable VBDs;
- positive tick and mosquito test results from active surveillance; and
- animal case data (e.g., canine Lyme disease exposure).

Next Steps: Addressing Emerging Risks in 2026 and Beyond

With the detection of new tick-borne pathogens (e.g., *Babesia spp.* and *Borrelia burgdorferi* in WDG ticks), WDG Public Health is transitioning from response to proactive risk management. The following priorities will guide the VBD program into 2026 and beyond:

- **Targeted, Data-Driven Active Surveillance:** Surveillance will expand in rural areas and public-use greenspaces newly identified as risk zones. Summer sampling for American Dog Ticks will be added to monitor Rocky Mountain Spotted Fever (RMSF) vectors.
- **Rural Outreach and Engagement:** Recognizing that many tick-borne infections in WDG are suspected to be acquired on rural private properties, WDG Public Health will strengthen partnerships with rural municipalities and agricultural communities to enhance awareness, reporting and prevention efforts.
- **Monitoring of Emerging Diseases:** Building on 2025's findings, the program will continue surveillance for *Borrelia*, *Babesia*, *Anaplasma*, and other emerging tick- and mosquito-borne pathogens, ensuring local data supports timely public health action.
- **Expanded Educational Partnerships:** Through the school-based citizen science initiatives and partnerships with the University of Guelph and Public Health Agency of Canada, WDG Public Health will continue to train professionals, engage youth and broaden awareness of VBD risks.

This forward-looking, data-driven strategy ensures WDG Public Health remains equipped to address the growing complexity of vector-borne disease risks, shaped by climate change, land use and increased human-animal interactions.

Health Equity Implications

VBDs do not affect all populations equally. Certain groups – rural residents, low-income individuals, outdoor workers, individuals experiencing homelessness, non-English speakers – may face disproportionate risk and barriers to prevention or treatment.

For example, a large portion of Lyme disease cases in WDG are suspected to be acquired on private rural properties. These settings are not routinely covered by active surveillance, which focuses on public lands, creating blind spots in risk communication and vector presence detection. This gap may disproportionately impact those living and working on farms or in remote areas.

To mitigate these inequities, WDG Public Health is:

- enhancing outreach to rural communities to provide targeted prevention messaging;
- developing accessible educational materials in multiple formats;
- offering printed resources through community partners; and
- engaging schools and youth to promote early and inclusive health education.

These approaches aim to reduce barriers to information and prevention, strengthen community capacity to recognize and respond to VBD risk, and ensure that prevention efforts are inclusive of populations that may be underserved by traditional surveillance and communication methods.

Conclusion

Vector-borne diseases are becoming an increasingly significant public health issue in Wellington-Dufferin-Guelph due to climate-driven changes in tick and mosquito populations, and the emergence of new pathogens. In 2025, WDG Public Health documented rising Lyme disease cases, new detections of *Babesia* in local ticks, and ongoing West Nile virus circulation, underscoring the importance of sustained surveillance and public education.

WDG Public Health continues to enhance its capacity to respond to changing environmental and epidemiological conditions. Public engagement via tools like the online tick submission platform, paired with localized data through the Z/VBD Dashboard, reinforces the agency's role as a provincial leader in VBD risk mitigation and education.

As WDG Public Health prepares for the 2026 surveillance season, priorities – from rural engagement to data-driven active surveillance – will help ensure that residents, clinicians and partners have the information and tools they need to protect themselves and their communities.

Ontario Public Health Standards

Foundational Standards

- Population Health Assessment
- Health Equity
- Effective Public Health Practice
- Emergency Management

Program Standards

- Chronic Disease Prevention and Well-Being
- Food Safety
- Healthy Environments
- Healthy Growth and Development
- Immunization
- Infectious and Communicable Diseases Prevention and Control
- Safe Water
- School Health
- Substance Use and Injury Prevention

2024-2028 WDGPH Strategic Goals

More details about these strategic goals can be found in [WDGPH's 2024-2028 Strategic Plan](#).

- Improve health outcomes
- Focus on children's health
- Build strong partnerships
- Innovate our programs and services
- Lead the way toward a sustainable Public Health system

References

1. Ludwig A, Zheng H, Vrbova L, Drebot MA, Iranpour M, Lindsay LR. Increased risk of endemic mosquito-borne diseases in Canada due to climate change. *Canada Communicable Disease Report*. [Internet]. 2019 [cited 2026 Jan 27]; 45(5). Available from: <https://www.canada.ca/content/dam/phac-aspc/documents/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2019-45/issue-4-april-4-2019/ccdrv45i04a03-eng.pdf>.
2. Bouchard C, Dibernardo A, Koffi J, Wood H, Leighton PA, Lindsay LR. Increased risk of tick-borne diseases with climate and environmental changes. *Canada Communicable Disease Report*. [Internet]. 2019 [cited 2026 Jan 27]; 45(4). Available from: <https://www.canada.ca/content/dam/phac-aspc/documents/services/reports-publications/canada-communicable-disease-report-ccdr/monthly-issue/2019-45/issue-4-april-4-2019/ccdrv45i04a02-eng.pdf>.
3. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Eastern equine encephalitis: history and enhanced surveillance in Ontario. Toronto, ON: Queen's Printer for Ontario [Internet]. 2014 [cited 2026 Feb 4]. Available from: <https://www.publichealthontario.ca/-/media/documents/E/2014/eeev-report.pdf>.
4. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Ontario Vector-Borne Disease Surveillance Dashboard [Internet]. Toronto (ON): King's Printer for Ontario; [cited 2026 Feb 10]. Available from: <https://oahpp.maps.arcgis.com/apps/dashboards/bb2f1ae3ae754de5801142e3569f11bb>
5. Ogden NH, Beard CB, Ginsberg HS, Tsao JI. Possible effects of climate change on Ixodid ticks and the pathogens they transmit: predictions and observations. *J. Med. Entomol.* [Internet]. 2020 [cited 2026 Jan 27]; 58(4):1536-1545. Available from: <https://academic.oup.com/jme/article/58/4/1536/5942051>.