"Coming out of our Shells" - Afternoon Agenda

9:00am Welcome & FOCA Updates

10:00am Annual General Meeting

10:30am Refreshment Break

11:00am 2022 FOCA Achievement Award

11:30am Land Use Planning in a Bill 23 World

12:00pm Lunch Break

1:00pm Create a Climate-Ready Property

1:20am FireSmart Community Principles

1:40pm Tick Talk: Lyme Disease in Ontario

2:00pm Biodiversity and Resiliency

2:30pm Question & Answer Session

3:00pm Wrap Up & End





Manisha Kulkarni

Canadian Lyme Disease Research Network









Université d'Ottawa University of Ottawa



BACKGROUND



Université d'Ottawa | University of Ottawa

TickEncounter Resource Center Ixodes scapularis (Blacklegged ticks or Deer ticks)





Dermacentor variabilis (American Dog ticks)



Common tick species in Ontario

- Ixodes scapularis, aka deer tick or blacklegged tick
- Dermacentor
 variabilis, aka
 American dog tick or
 wood tick



med.uOttawa.ca

The blacklegged tick (Ixodes scapularis)



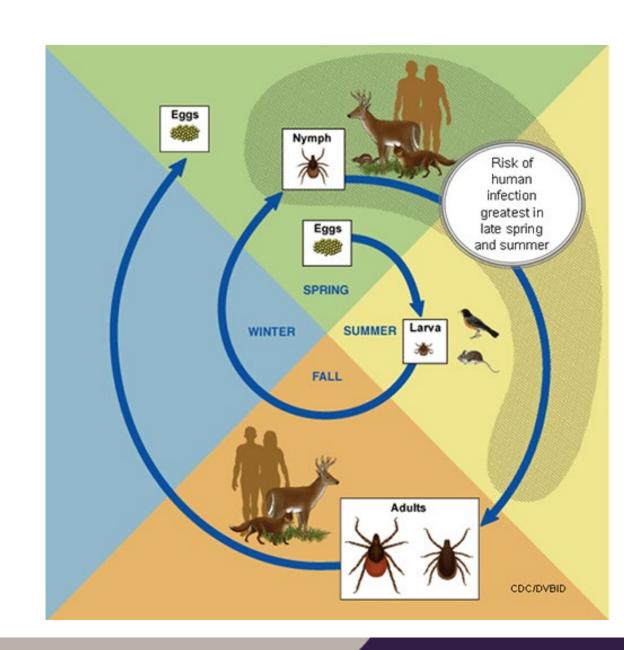


- Vector of Lyme disease in eastern Canada
- Mainly found in deciduous or mixed forests
- Mainly found in areas with white-tailed deer and small mammal hosts
- Cannot fly or jump find host by 'questing'



What is Lyme disease?

- Tick-borne bacterial disease with rodent intermediate hosts
- Blacklegged tick vectors (*Ixodes* scapularis) have a two-year life cycle with four life stages
- Highest risk of human infection in late spring and summer months



Université d'Ottawa University of Ottawa

Blacklegged ticks seek hosts by "questing"





Mice and chipmunks serve as hosts for juvenile ticks (larvae and nymphs)







Université d'Ottawa University of Ottawa



White-tailed deer serve as hosts for adult ticks



Lyme disease risk factors



 Tick life cycle, distribution and spread



Pathogen dynamics

 Pathogen transmission cycle, animal reservoirs





Human exposure

Tick

ecology

 Exposure to ticks, preventive measures





Lyme disease







Presentation [timeframe]	Features	
Early localized disease (ELD) [days to weeks]	erythema migrans (EM) skin rash (occurs in 70% of cases), fever, headache, myalgia, joint symptoms	
Early disseminated disease [weeks to months]	multiple EM, arthritis, meningitis, facial nerve palsy and, rarely, heart block	WHOVATION FOR A HEALTHI
Late disease [months to years]	large joint arthritis, and less frequently neurological manifestations	u Ottawa Faculté de médecine Faculty of Medicine
d.uOttawa.ca		INNOVATION POUR UN MONTH

Why is Lyme disease emerging in Canada?

- Warming temperatures permit expansion of tick vector geographic range into parts of Canada
- Northward transport of ticks by migratory birds
- Expanding range of white-footed mouse and white-tailed deer
- Habitat fragmentation and biodiversity loss



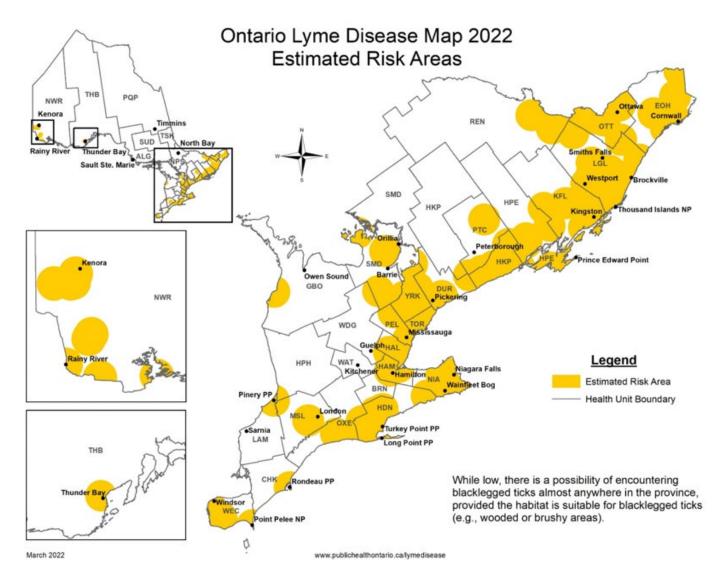


Distribution of blacklegged ticks in the US (CDC)



Where does Lyme disease risk occur in Ontario?





University of Ottawa

Lyme disease (LD) in Ontario

Figure 1: Number of probable and confirmed Lyme disease cases and incidence rate per 100,000 population by year: Ontario, Canada (2012–2017)

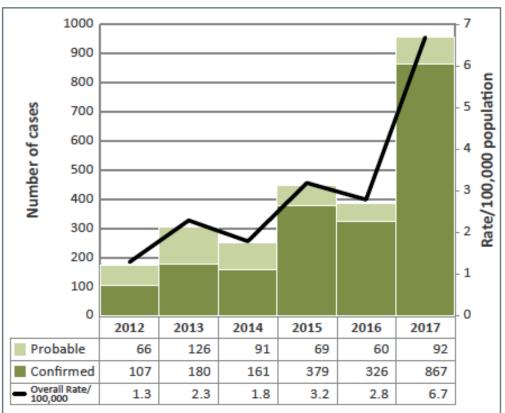
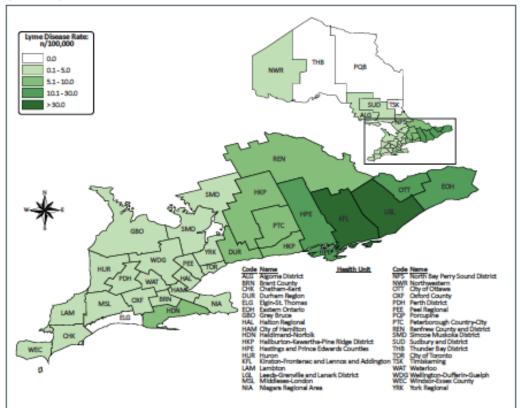


Figure 2: Incidence rate of Lyme disease (per 100,000 population) by public health unit: Ontario, Canada (2017)



Abbreviations: n, number; > superior to

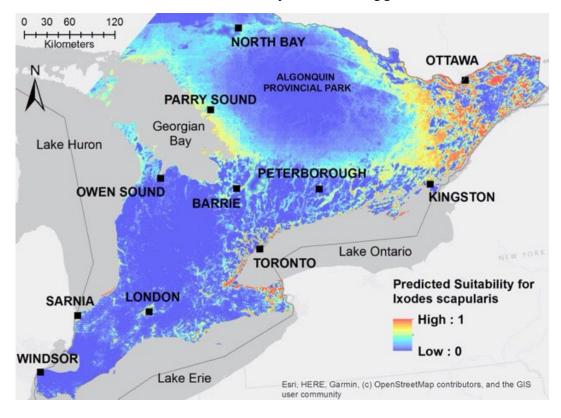


med.uvilawa.ca

Nelder et al. (2018) CCDR 44(10): 231-5

Spread of ticks and Lyme disease in Ontario

Predicted habitat suitability for blacklegged ticks, 2019

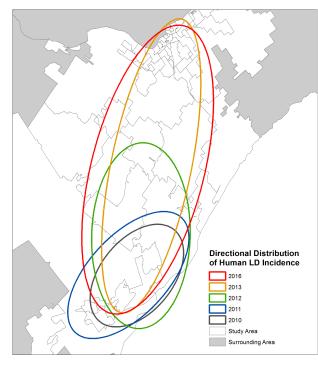


Slatculescu et al. (2020) PLOS One 15(9):e0238126

A northeast expansion of ticks and Lyme disease incidence of 54 km occurred during 2010–2016

The greatest spread observed was in 2011–2013

Highest tick occurrence predicted in forested areas of eastern Ontario and along shores of Great Lakes Annual distribution of human LD incidence in eastern Ontario, 2010-2016



M.A. Kulkarni et al (2019) *Emerging Infectious Diseases*, 25(2):328-332





LYME DISEASE **PREVENTION**



How can you prevent a tick bite?



- Wear long pants, a long sleeved shirt, shoes and socks to cover exposed skin
- If possible, stay on the trails when hiking in the woods or walking in long grass
- Apply an approved insect repellent containing DEET or icaridin
- Wear clothing treated with permethrin
- Do a "full body" check on yourself, your children, and pets for ticks
- For pet owners, speak with your veterinarian about tick prevention
- Remove ticks as soon as possible







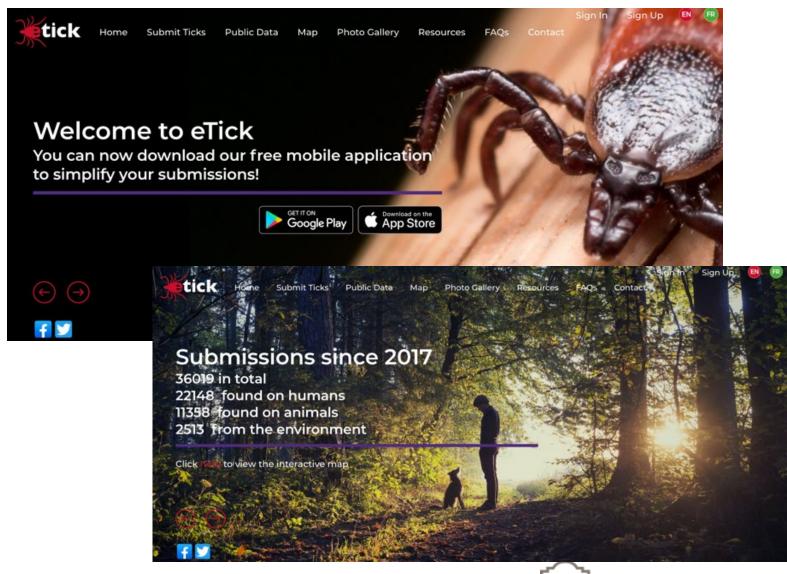




What to do if you find a tick?

eTick.ca is a public platform for image-based identification and population monitoring of ticks in Canada.

The citizen science project eTick.ca invites the public to participate in the monitoring of ticks in Canada by submitting tick photos on eTick.ca for identification by a professional.



https://www.etick.ca/en

Université d'Ottawa | University of Ottawa

u Ottawa

WWOVATION POUR UN

How can you reduce ticks around your property?



From: Stafford K. (2004) Tick Management Handbook. Connecticut Agricultural Experiment Station.

- Keep the grass in your yard maintained
- Remove brush and fallen leaves from the edges of your property
- Clean up areas under and around bird feeders
- Discourage deer from entering your yard
- Use a 1-metre barrier of woodchips or rock to separate woods from lawn

BE TICK-SAFE!

Blacklegged (deer) ticks usually are not out in the middle of your lawn but they thrive where yards border wooded areas, ornamental plantings and gardens, or anywhere it is shaded and there are leaves with high humidity.









Conclusions



- The expansion of blacklegged ticks in Ontario poses increased public health risk due to Lyme and other tickborne diseases
- Ongoing research and surveillance is important to identify risk areas and monitor changes over time and space
- Knowledge of risk areas and uptake of preventive measures is important to reduce individual risk of infection





Who we are: a national network consisting of researchers, patients, public health professionals, healthcare providers, and community stakeholders.

Our aim: to improve the prevention, diagnosis and treatment of Lyme disease in Canada.

What you can do: learn about the latest research, advise research, design strategies, share your experience, and spread knowledge.

JOIN US! www.clydrn.ca







Université d'Ottawa University of Ottawa

Acknowledgements

Kulkarni (INSIGHT) Lab, uOttawa | www.globalhealthepi.com

Collaborators:

Ottawa Public Health
National Capital Commission
PHAC National Microbiology Lab
Canadian Lyme Disease Research Network (CLyDRN)









