

# Ticks and Lyme Disease



**Know the Bug**  
**Know the Bite**  
**Know What to Do**

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# Know the Bug

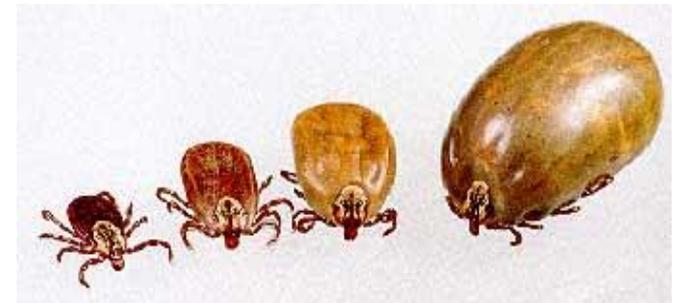
## **Black-legged tick (*Ixodes scapularis*)**

- Likes sandy soil, bushy wooded area, hardwood trees, rivers, boggy areas
- May carry bacteria that causes Lyme disease



## **American dog tick**

- Likes long grassy areas
- May carry organisms that causes Rocky Mountain spotted fever and Tularemia



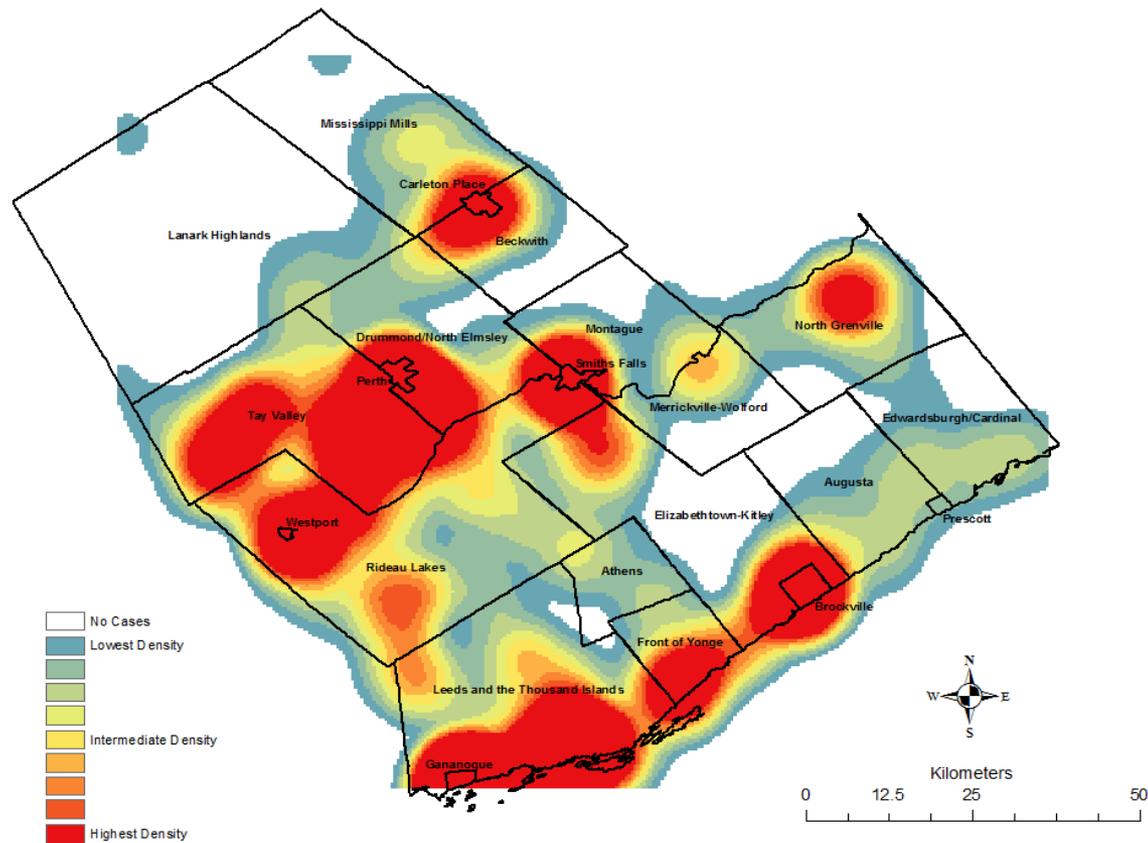
# Ixodes scapularis



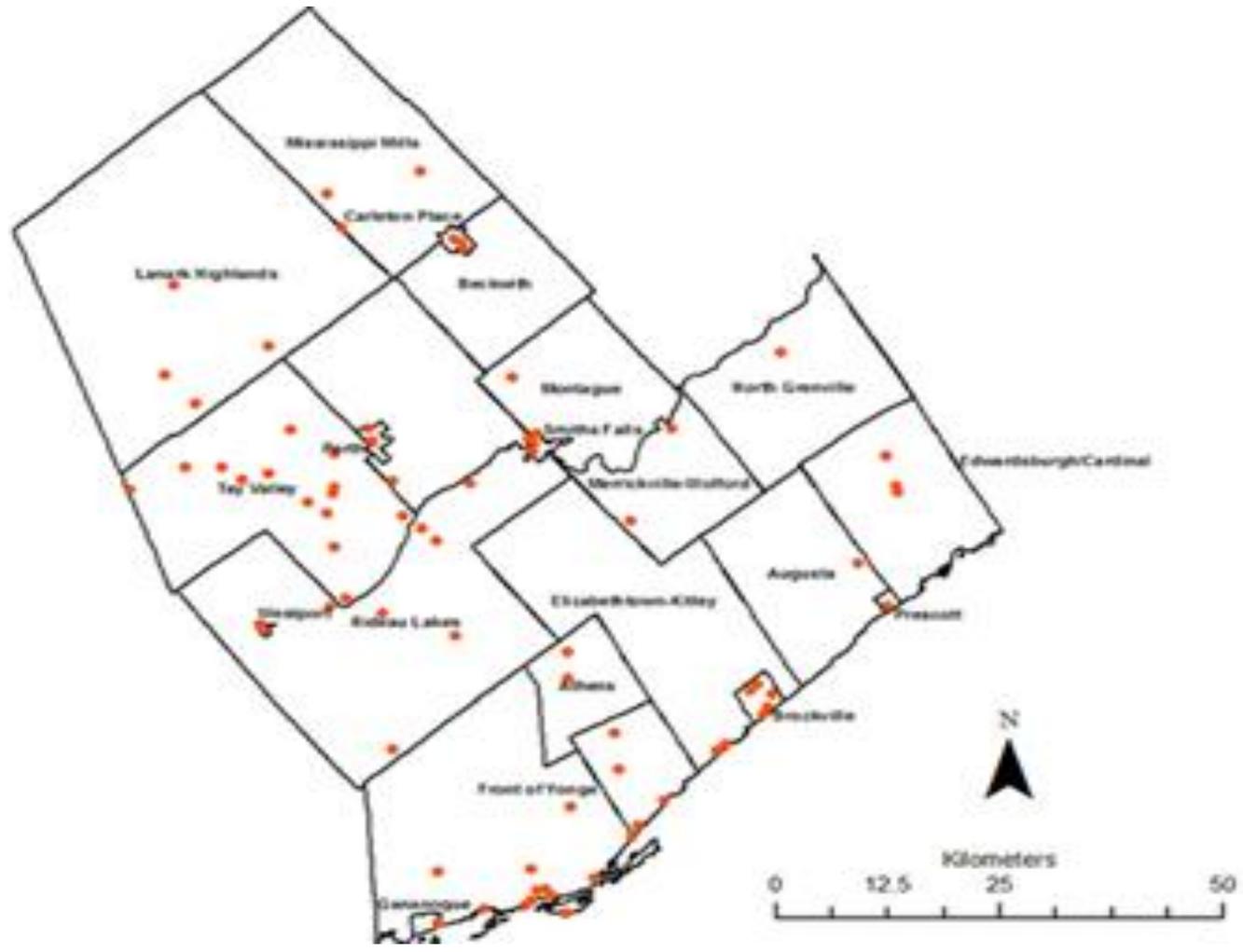
# Know the Bug: Migration



# LGL Lyme Disease reported case density distribution (2010-2017).

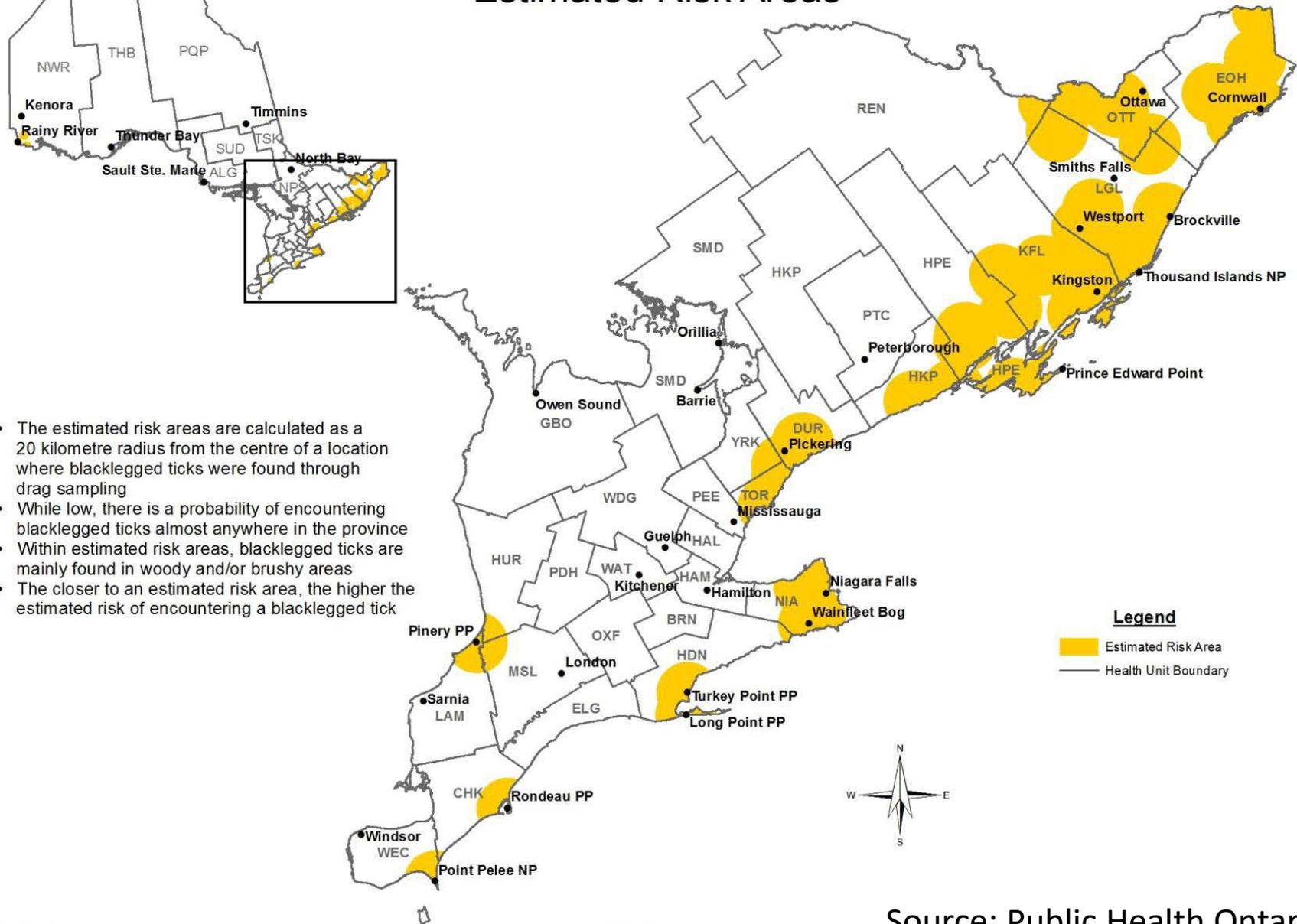


# Residence of people diagnosed with Lyme Disease 2018



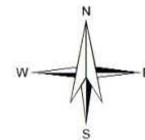
# Ontario Lyme Disease Map 2017

## Estimated Risk Areas



- The estimated risk areas are calculated as a 20 kilometre radius from the centre of a location where blacklegged ticks were found through drag sampling
- While low, there is a probability of encountering blacklegged ticks almost anywhere in the province
- Within estimated risk areas, blacklegged ticks are mainly found in woody and/or brushy areas
- The closer to an estimated risk area, the higher the estimated risk of encountering a blacklegged tick

**Legend**  
 Estimated Risk Area  
 Health Unit Boundary



# LGL Tick Monitoring

- Spring and fall by Public Health Inspectors
- Drag with nets and collect ticks
- Sent to laboratory for analysis for type of tick, presence of microbes of concern to humans.
- In 2017, Johnstown, Irish Lake, Toledo, and Perth Wildlife Conservation Centre, Hill Island in Thousand Islands.
- All five locations showed evidence of ticks being present, and 30% of the ticks carried the *B. Burdorferi* bacteria across all sites.



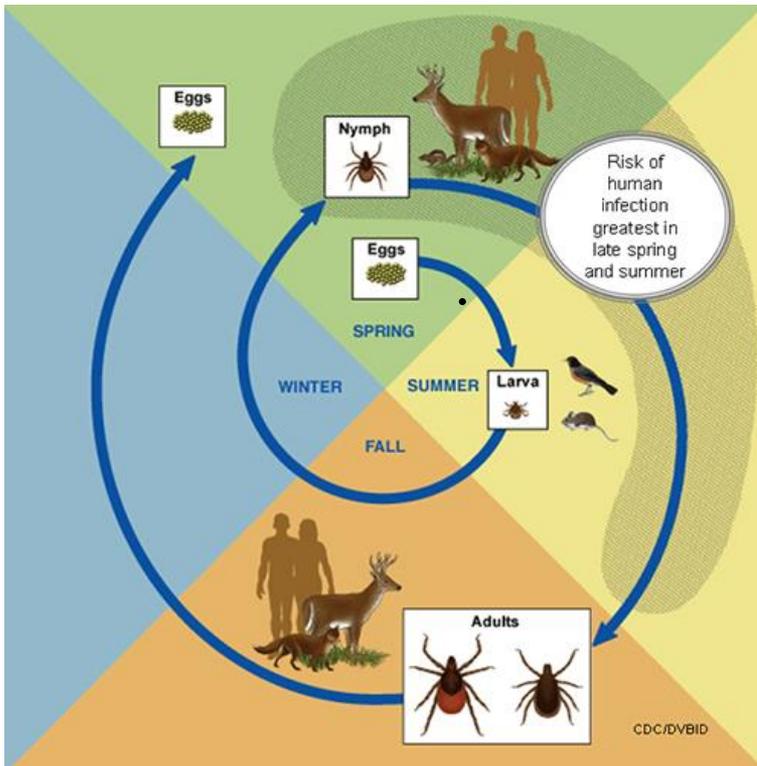
# Know the Bug

- Ticks cannot fly, they do not jump and do not move large distances along the ground
- Typically seek a host by climbing vegetation (such as grass, bushes or shrubs along forest edges), and wait for a suitable host to come in contact with them
  - Most ticks require from 3 to 7 days to feed fully
  - Once engorged, they drop from the host (animal/person)



# Know the Bug

## Life Cycle of the Black-legged Tick

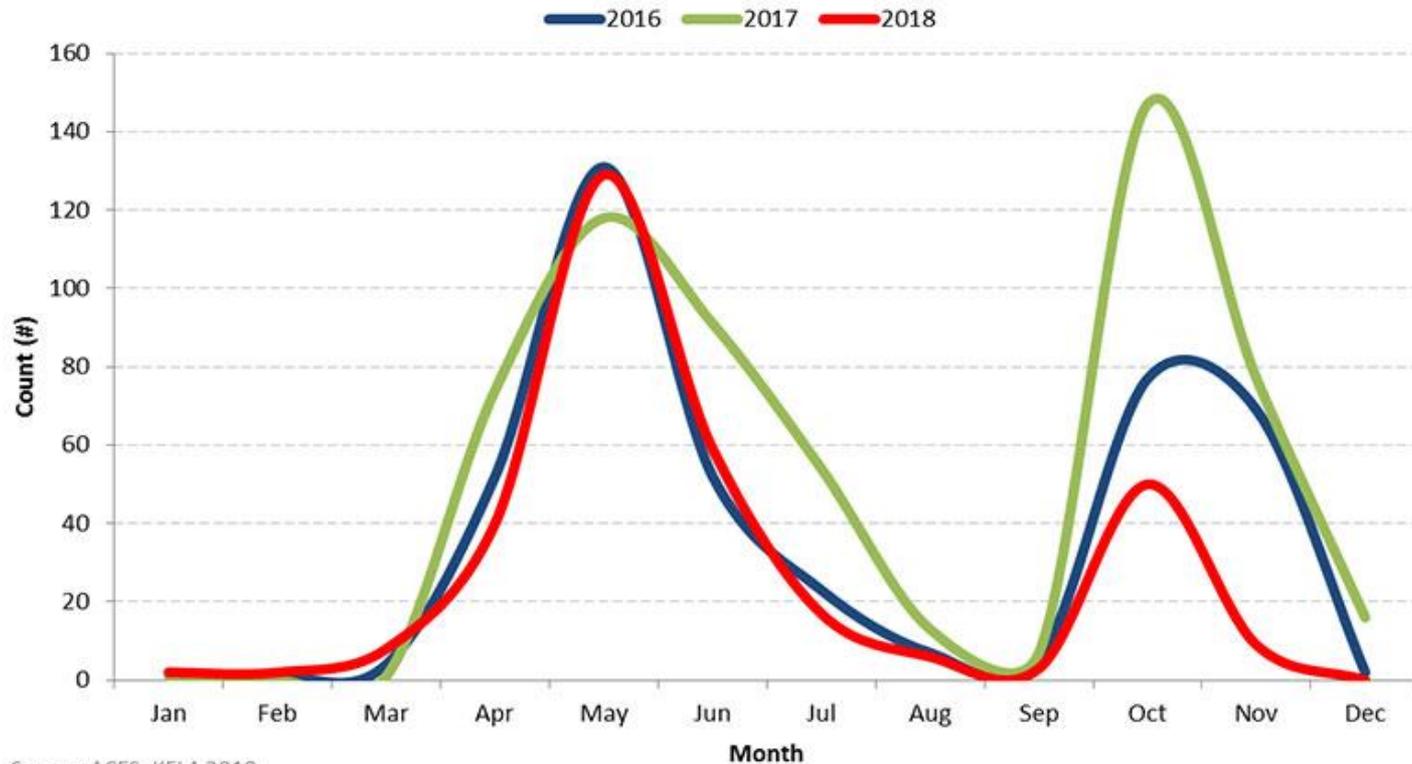


- Life cycle of the black-legged tick takes 2 years
- In the **spring** eggs are laid.
- Eggs hatch into **larva in Aug./Sept.** (survive in leaf cover over winter)
- Larvae have one feeding and molt into **nymphs next spring.** (1st tick blood meal)
- Nymphs that have had a blood meal will molt into an **adult** male or female tick in **fall.** (2<sup>nd</sup> tick blood meal)
- In the **fall the females** find a host to feed on, mate and in the Spring **lays around 3000 eggs** and dies. (3<sup>rd</sup> tick blood meal)
- Adult ticks that do not feed in the fall will be dormant over winter in leaf cover, then **feed and mate in the spring,** lay eggs and die.
- During the **blood meals may become infected** with the bacteria that causes Lyme Disease



# Monthly tick-related visits to ER

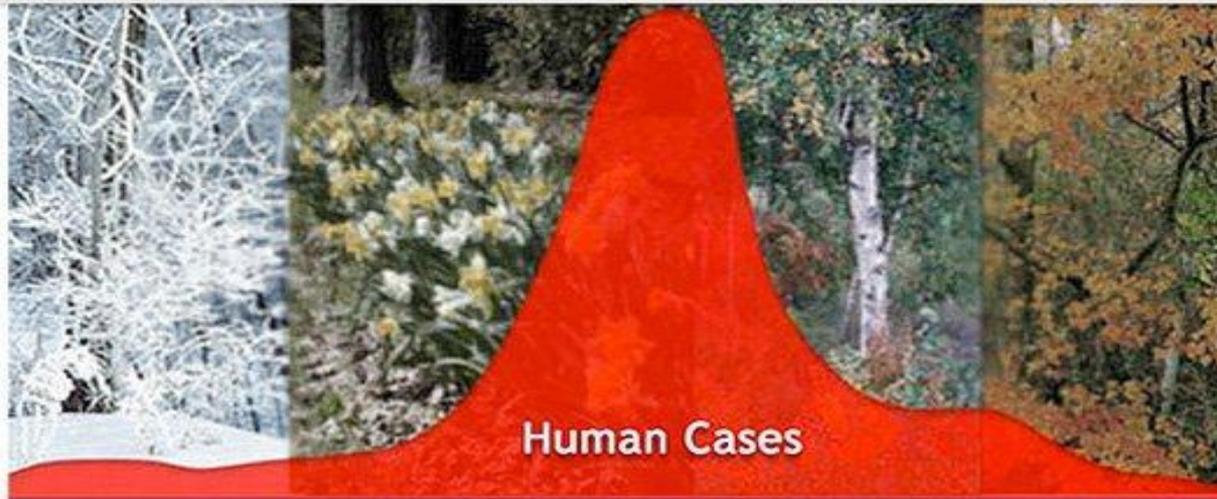
Monthly tick-related ED visits for LGLDHU (2016-2018)



Source: ACES, KFLA 2019



## Seasonal Pattern Of Lyme Disease Cases



Jan Feb Mar Apr May Jun Jul Aug Sept Oct Nov Dec



**Adult Deer Tick**  
Abundant October to May



**Nymphal Deer Tick**  
Abundant May to Late July



**Larval Deer Tick**  
Abundant August to October



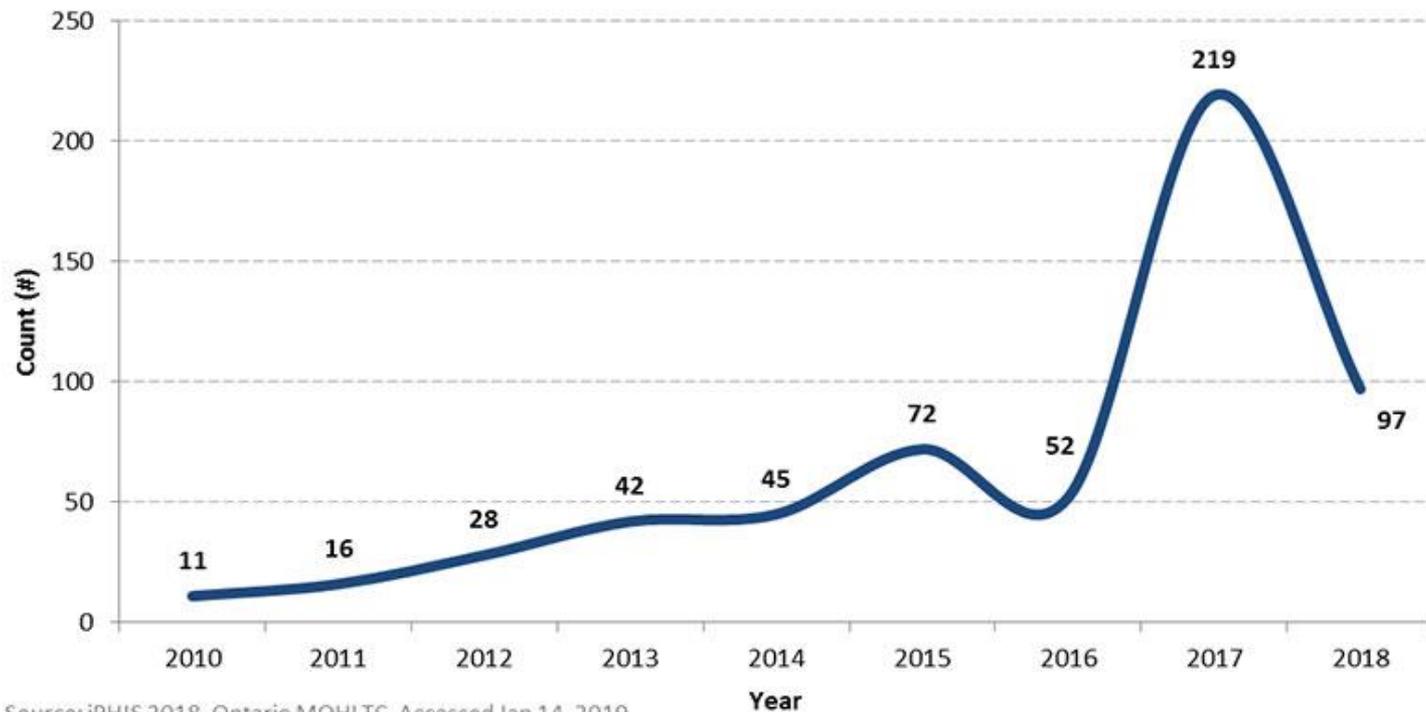
**Adult Deer Tick**  
Abundant October to May

## Seasonal Activity Of Deer Tick Life Stages



# Statistics for Reported Lyme Disease

Yearly count of Lyme disease diagnoses:  
LGLDHU (2010-2018) (n = 582)



Source: iPHIS 2018, Ontario MOHLTC, Accessed Jan 14, 2019



# Know the Bite

- Ticks attach to a host via their mouthparts and slowly feed upon their blood for several days
  - When ticks bite, they may secrete or regurgitate small amounts of saliva that contain neurotoxins (anesthesia)
- Bacteria in gut changes so it can survive the tick's saliva
  - Research suggests takes at least 24 - 48 hours
  - Bacteria cannot be passed to host until this occurs thru saliva regurgitation



# Fed versus Unfed



Unfed tick

Fed (engorged) tick



# Know What to Do

## Protect Yourself from tick bites

- ✓ **Tick check**
- ✓ Take a quick shower which may help to remove a tick that hasn't attached itself
- ✓ Put clothes in hot dryer
- ✓ Check and remove ticks from pets



# Know What to Do

## Protect yourself from tick bites

- Stay on paths in brushy, wooded areas
- In areas that are known to have ticks:
  - ✓ wear light-coloured clothing –easier to see ticks
  - ✓ wear long pants,
  - ✓ a long-sleeved shirt,
  - ✓ high socks (with pants tucked tightly under the socks)
  - ✓ wear boots/shoes, not sandals
- ✓ Use a repellent Icaridin or DEET no more than 30% for adults and 10% for children around your pant legs and shoes, and re-apply every 2 hours (avoid your face and any cuts)



# Reduce Ticks Around Your Home

- **Ticks prefer to live in humid, wooded areas.**
- Keep the **grass** in your yard **mowed**.
- **Remove brush and fallen leaves** from the edges of your property, especially if your yard is bordered by woods or fields of tall grass.
- **A border of gravel or wood chips** that creates a physical separation between lawns and wooded areas will help reduce the movement of ticks from their natural habitat into your yard.
- **Clean up areas under and around bird feeders**, to reduce the attraction of small critters such as mice and voles. These mammals help to transport ticks and are necessary hosts for ticks to complete their life cycle.
- Place **children's play structures away from wooded areas** to avoid exposure to ticks.



# Know What to Do

## If You Spot a Tick

- Don't squeeze the tick or try to burn it off or put anything on it
- Grasp the tick by the head as close to your skin as possible.
- Pull it straight out, gently but firmly.
- Use tweezers or tick twister if possible
- Clean and disinfect the bite area – very important!



# Know What to Do

- Mark the date when tick removed and monitor for symptoms within three days to a month or so after the tick bite.
- Consult health care provider if the tick has been on for more than 24 hours, is engorged, and not more than 3 days from tick bite – may recommend prophylaxis (1 dose doxycycline) to stop bacteria from multiplying.



Unfed tick

Fed (engorged) tick



# Lyme Disease

- **Early localized disease**
  - (3 days to 30 days from exposure)
- **Early disseminated disease**
  - (weeks to months after exposure)
- **Late disseminated disease**
  - (weeks to years after exposure)



# Early Localized Lyme Disease

- Three to 30 days, usually 1 to 2 weeks, from exposure
- Erythema migraines (EM) greater/equal to 5 cm in diameter, fever, malaise, headache, myalgia, neck stiffness, fatigue, arthralgia
- Differentiate from early redness at bite site < 5 cm



*photo by N.Y. Medical College*



# Early Disseminated Lyme Disease

- Weeks to months after exposure
- Multiple EM, cranial nerve palsies (Bells' Palsy), lymphocytic meningitis, conjunctivitis, arthralgia, myalgia, headache, fatigue, carditis (heart block)



# Late Disseminated Lyme Disease

- Weeks to years after exposure
- Arrhythmias, heart block, myopericarditis, peripheral neuropathy, meningitis, encephalopathy (i.e., behavior changes, sleep disturbance, headaches), recurrent arthritis affecting large joints (i.e., knees), fatigue





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