

Lyme Disease – local epidemiology, tick surveillance and clinical management

Attention: Physicians, Emergency Departments, Infection Control Practitioners, Walk-In Clinics/Urgent Care Clinics, Nurse Practitioners

Date: August 28, 2014

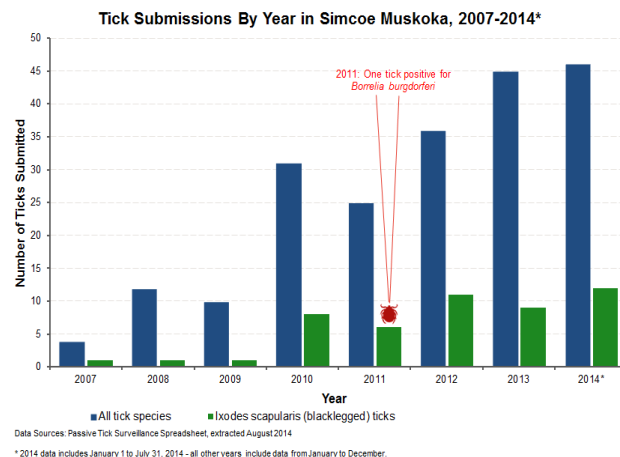
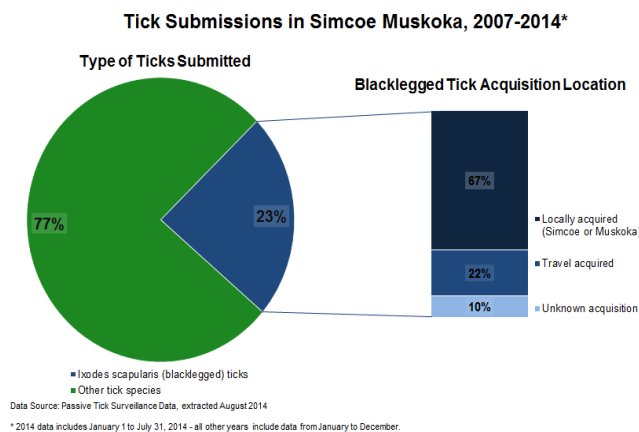
The purpose of this fax is to provide Health Care Providers (HCP) in Simcoe County and the District of Muskoka, the current epidemiology for Lyme Disease (LD) based on passive tick surveillance and received reports of the disease. Included in this document are resources which may be useful for the HCP and patients.

A full list of resources for LD are available through our primary care portal at www.smdhu.org/PCPortal with the direct link at <http://www.simcoemuskokahealth.org/JFY/PCPortal/PCPCategories/InfectiousDiseases/LymeDisease.aspx>

Local and Provincial Statistics

Tick surveillance:

Since 2007, 208 ticks have been submitted to Simcoe Muskoka District Health Unit (SMDHU) for testing. Tick submissions have increased each year with only 4 ticks submitted in 2007 and 45 in 2013. For 2014, 45 ticks have been submitted to date. **Of the ticks submitted since 2007, 23% have been *Ixodes scapularis* (blacklegged) ticks, a known vector for LD.** The majority (67%) of these ticks have been locally acquired. Only one of these ticks has tested positive for *Borrelia burgdorferi* (in 2011), the agent responsible for LD. **Ticks may be submitted through SMDHU for identification and testing for LD if appropriate.**



Current identified endemic areas:

The Canadian perspective may be found at the Public Health Agency of Canada website at: <http://www.phac-aspc.gc.ca/id-mi/tickinfo-eng.php#sec-2.2>

For Ontario, see the Public Health Ontario Technical Report: Update on Lyme Disease Prevention & Control: <http://www.publichealthontario.ca/en/eRepository/PHO%20Technical%20Report%20-%20Update%20on%20Lyme%20Disease%20Prevention%20and%20Control%20Final%20030212.pdf>

Endemic areas in Ontario have been identified as:

- Western Ontario close to Lake of the Woods
- Pointe-Pelee National Park
- Rondeau Provincial Park
- Turkey Point Provincial Park
- Long Point peninsula including Long Point Provincial Park and the National Wildlife area
- Wainfleet bog near Welland on the Niagara peninsula.
- Prince Edward Point and parts of the Thousand Islands National Park
- Risk areas are locations around Kingston and in the Saint Lawrence valley that extend north east towards Ottawa

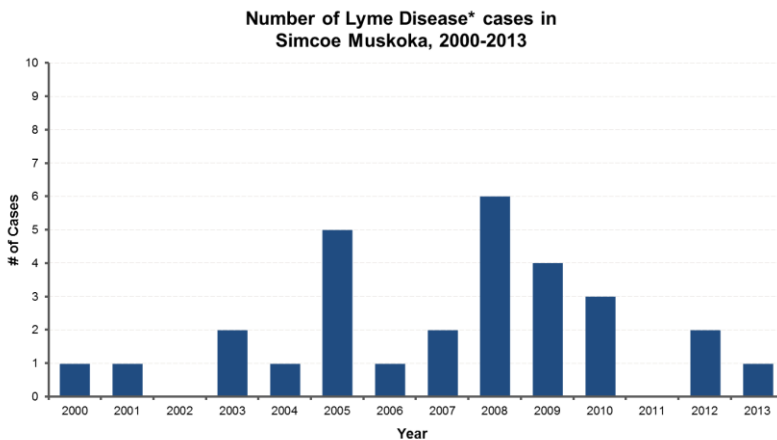
Reported Human Cases

The number of LD cases (Figure 1) in Simcoe Muskoka has varied between zero and six cases each year since 2000. In 2013, one case of LD was reported in Simcoe Muskoka, with an exposure source outside of Canada. Thus far in 2014, two cases of LD have been reported, both with exposures to endemic areas. LD cases in Simcoe Muskoka have been reported across all ages, with an age range from 3 to 70 years old. The majority of Simcoe Muskoka cases have been male (63%).

According to the best available data, approximately one third of Simcoe Muskoka cases since 2005 may have been locally acquired, even though there are no endemic areas in Simcoe Muskoka. The other two thirds were likely acquired in other areas of Ontario or outside of Ontario. Of those that may have been acquired locally, exposure sites have included locations across both Simcoe County and the District of Muskoka. (See Figure 2 below)

The incidence rate (Figure 3) of LD for Simcoe Muskoka for 2013 is 0.19 cases per 100,000 population. Ontario's incidence rate for LD was 1.32 cases per 100,000 population in 2013. In recent years, Ontario's incidence rate appears to be increasing.¹

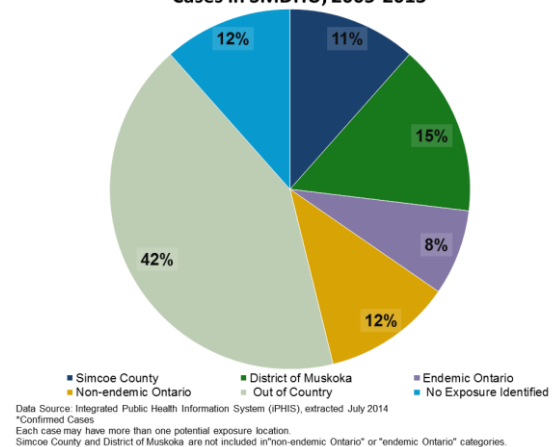
Figure 1 – Number of LD cases



Data Sources: Integrated Public Health Information System (IPHIS), extracted April 2014
 * Confirmed Cases

Figure 2 – Identified Exposures

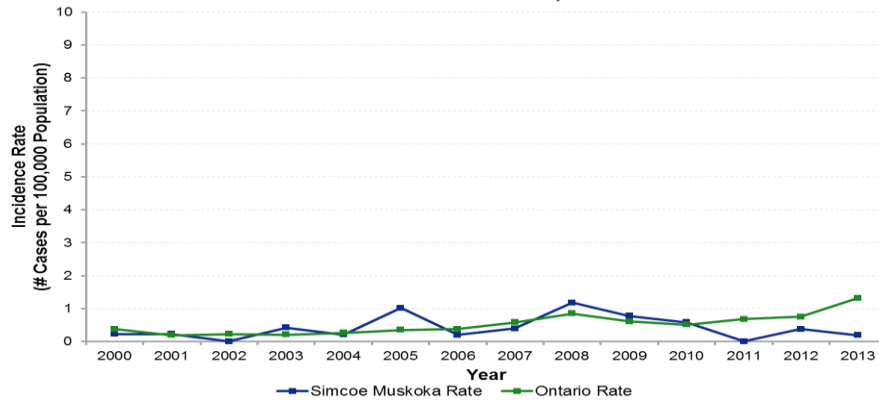
Identified Exposure Locations for Lyme Disease* Cases in SMDHU, 2005-2013



Data Source: Integrated Public Health Information System (IPHIS), extracted July 2014
 *Confirmed Cases
 Each case may have more than one potential exposure location.
 Simcoe County and District of Muskoka are not included in "non-endemic Ontario" or "endemic Ontario" categories.

Figure 3 – Incidence Rate of LD

**Incidence Rate of Lyme Disease* in
Simcoe Muskoka and Ontario, 2000-2013[^]**



Data Sources: Integrated Public Health Information System (PHIS), extracted April 2014
Reportable Disease Information System (RDIS) and PHIS data posted on PublicHealthOntario.ca e-portal
Population Estimates&Projections, Intellihealth, extracted September 2013

* Confirmed Cases

[^] The 2013 rate is based on the projected population rather than the estimated population.

Signs & Symptoms:

Early symptoms of LD usually occur within one to two weeks after a tick bite. However, symptoms can occur within three days or as late as one month after the initial bite. Signs and symptoms include: fever, headache, muscle and joint pains, fatigue and a skin rash, typically one that looks like a red “bull’s eye” (called *erythema migrans*). **Not all patients with LD will develop the “bull’s eye” rash.** As the illness progresses additional symptoms may include: numbness or tingling, swollen lymph nodes, skin rash, cognitive dysfunction (brain fog) or dizziness, nervous system disorders, arthritis/arthritis symptoms (muscle and joint pain) and abnormal heartbeat.

Diagnostics:

Serology testing can be ordered from the Public Health Ontario Laboratories to aid in diagnosing LD, but where appropriate, treatment may be initiated where there is high clinical suspicion based on signs and symptoms, combined with the epidemiology of LD vectors where the bite took place.

For blood specimen collection for serology, please refer to

http://www.publichealthontario.ca/en/ServicesAndTools/LaboratoryServices/Pages/Lyme_Disease_Serology.aspx

For further information on the tests, see Labstract: Lyme Disease IgG/IgM at:

http://www.publichealthontario.ca/en/eRepository/LAB_SD_088_LymeDisease_IgGIgM_C6peptide_assay_BorreliaBurgdorferi.pdf

Role of Antibiotics from Public Health Agency of Canada:

<http://www.phac-aspc.gc.ca/id-mi/tickinfo-eng.php#sec-1.8>

Post-Exposure antibiotic therapy:

Prophylaxis may be considered in exposures in the ‘known endemic’ areas (see above). While there is no consensus on post-exposure prophylaxis, some experts recommend that doxycycline can be offered as a single dose of 200 mg (or 4.4 mg/kg for people weighing less than 45 kg, to a maximum dose of 200 mg) for children ≥ 8 years of age who have been bitten in an area with hyper endemic infection. Prophylaxis can be started within 72 hours after removal of a feeding blacklegged tick, even if it’s been attached for ≥ 36 hours. There is no data on the use of amoxicillin as an alternate prophylactic antibiotic in younger children.

Treatment:

Treatment regimens listed in the following table are for localized (early) LD. Treatment guidelines for patients with disseminated (early and late) LD are outlined in the reference belowⁱⁱ.

These regimens are guidelines only and may need to be adjusted depending on a patient's age, medical history, underlying health conditions, pregnancy status or allergies. Consult an infectious disease specialist, as needed for the most current treatment guidelines or for individual patient treatment decisions.

Age Category	Drug	Dosage	Maximum	Duration in Days(Range)
Adults	Doxycycline	100 mg, p.o., q 12 h.	N/A	14 (14-21)
	Cefuroxime axetil	500 mg, p.o., q 12 h	N/A	14 (14-21)
	Amoxicillin	500 mg, p.o., q 8 h	N/A	14 (14-21)
Children	Amoxicillin	50 mg/kg per day p.o., divided in 3 doses	500 mg per dose	14 (14-21)
	Doxycycline	4 mg/kg per day p.o., divided into 2 doses	100 mg per dose	14 (14-21)
	Cefuroxime axetil	30 mg/kg per day p.o., divided into 2 doses	500 mg per dose	14 (14-21)

Note:

1. For patients intolerant of amoxicillin, doxycycline, and cefuroxime axetil, the macrolides azithromycin, clarithromycin, or erythromycin, may be used, although they have lower efficacy. Patients treated with macrolides should be closely observed to ensure resolution of clinical manifestations.
2. Doxycycline is contraindicated in children younger than 8 years of age and in pregnant or lactating women. Amoxicillin is the drug of choice for children younger than 8 years of age and pregnant or lactating women.

Although timely treatment with a recommended 14-21 day course of antibiotics is effective to treat LD in most cases, some LD patients have persistent symptoms following treatment. Research continues into the causes of these persistent symptoms and methods of treatment.

ⁱHealthStats (Local health and disease trends), SMDHU webpage:
<http://www.simcoemuskokahealthstats.org/topics/infectious-diseases/i-p/lyme-disease>

ⁱⁱWormser, et al., 2006. <http://cid.oxfordjournals.org/content/43/9/1089.full#F5>