

Michigan Zoonotic and Vector-borne Disease
SURVEILLANCE SUMMARY, 2014



TICKBORNE DISEASES

LYME DISEASE

Lyme disease (LD) is the most commonly reported vector-borne disease in the United States; over 30,000 cases were reported nationally in 2012¹. In the U.S. cases tend to be geographically focused in the northeastern and north-central United States, but Lyme disease is also endemic and expanding in Michigan. In 2014, 128 human cases were reported with most Michigan exposures occurring in the Upper Peninsula and western Lower Michigan.

The tick vector, *Ixodes scapularis* (blacklegged tick), is now endemic in the western Lower Peninsula along Lake Michigan, and the highest tick populations occur among coastal communities. Although rare, *I. scapularis* is also responsible for transmitting other diseases to humans including anaplasmosis, babesiosis, deer-tick virus, and a recently discovered novel Ehrlichia species in Michigan.

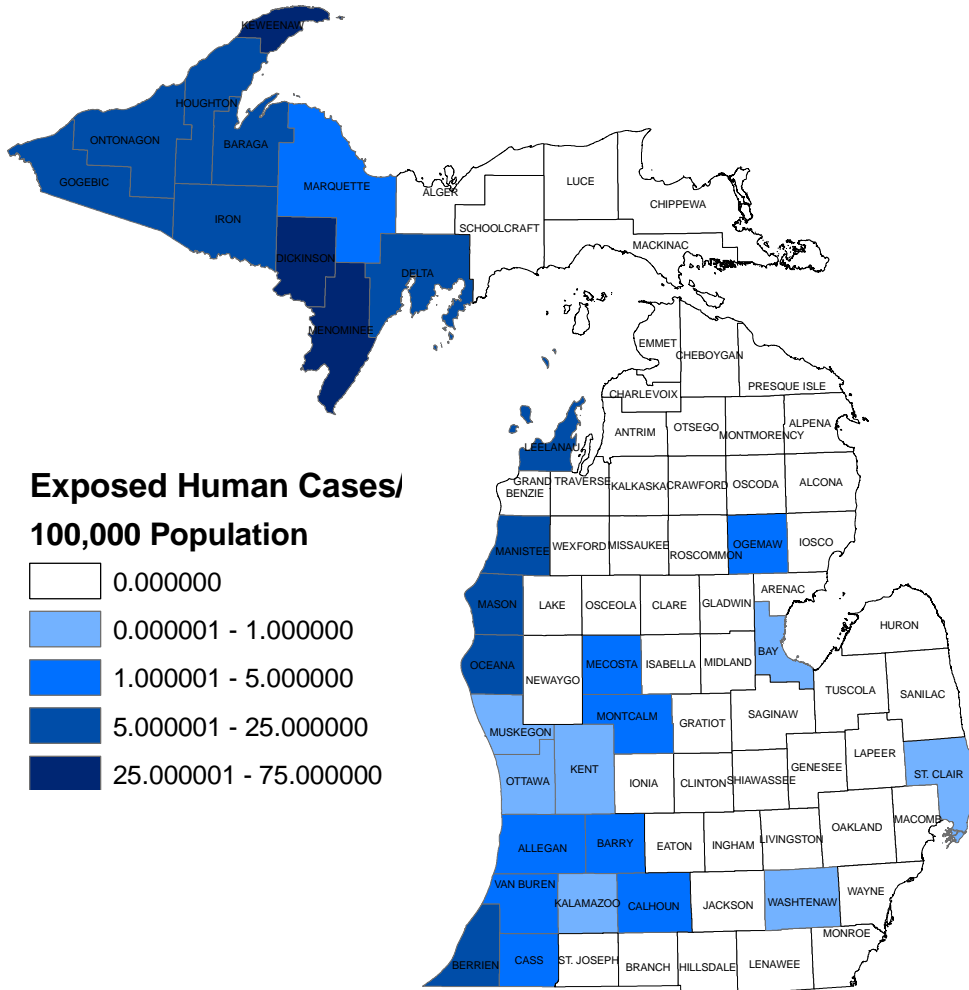
In 2014, MDHHS conducted human case surveillance and field ecologic surveillance for blacklegged ticks in the state with the help of its partners, including Michigan State University, Michigan's Departments of Natural Resources, and Agriculture and Rural Development. Educational materials will continue to be updated and made available to the public via the MDHHS "Emerging Diseases" Website.

128



"In 2014, 128 human cases were reported with most Michigan exposures occurring in the Upper Peninsula and western Lower Michigan."

Michigan 2014 Lyme Disease Activity



late-April

Environmental sampling confirms the beginning of blacklegged tick activity in 2014.

late-May

Conclusion of 30-site statewide tick survey for blacklegged ticks.

mid-July

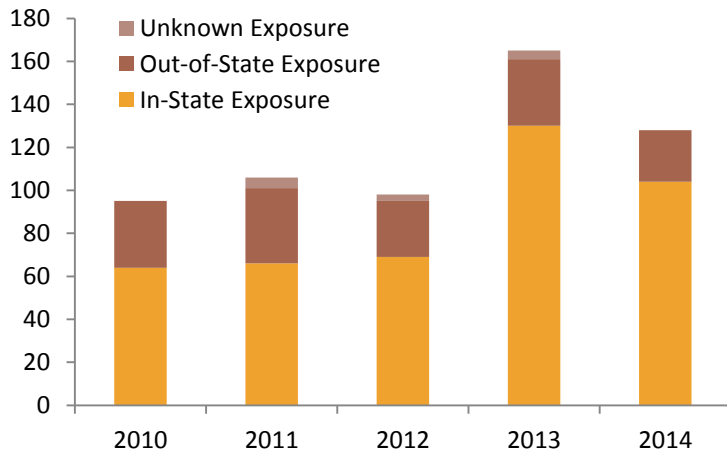
Lyme disease human cases peak. Peak cases are associated with nymphal stage ticks.

early-November

Blacklegged ticks found in Ingham County. This is a substantial shift in the geographic range of potential LD risk in Michigan.

2014 LYME DISEASE DATA

Michigan Lyme Disease Cases, 2010--2014



EPI SNAPSHOT 2014

Cases (N=128)

- ➡ 104 reported in-state exposure
- ➡ 24 reported out-of-state exposure

Age

Range: 2 – 84 years

Median: 40 years

Race/Ethnicity

86% Caucasian, non-Hispanic

EPI SNAPSHOT 2014

Incidence of locally acquired Lyme disease:

Full State:

1.04 cases/100,000 pop.

Upper Peninsula:

15.44 cases/100,000 pop.

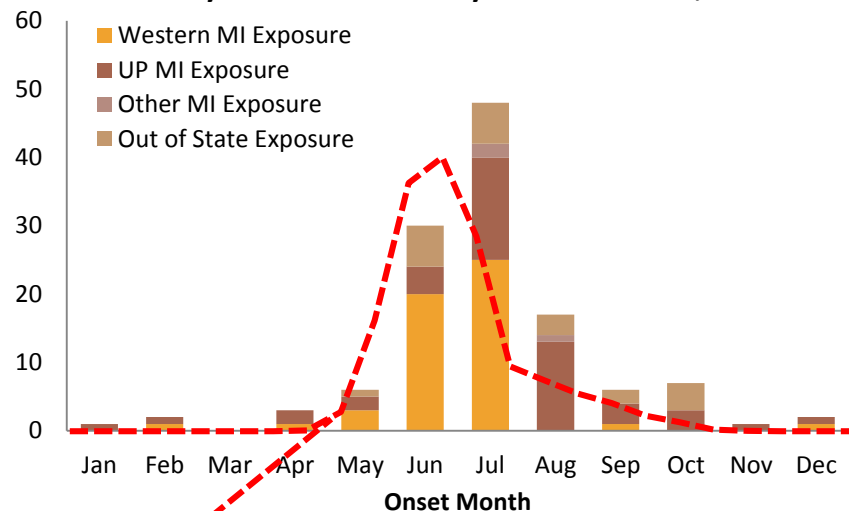
Western Lower Peninsula:

2.36 cases/100,000 pop.

Counties outside of western UP/LP regions:

0.05 cases/100,000 pop.

MI Lyme disease cases by month of onset, 2014



Peak transmission season for Lyme disease in Michigan is associated with nymphal stage blacklegged ticks. Approximately the size of a poppy seed, these ticks are active from May through August, and peak in June. Frequent tick checks are important during this time of year as prompt removal of ticks is preventive of Lyme disease.

STATEWIDE RISK ASSESSMENT

In 2014, in addition to epidemiologic investigations of reported human illness due to Lyme disease in Michigan, MDHHS and partner agencies conducted statewide field surveys for new or expanding populations of blacklegged ticks.

Tick sampling was conducted by a process called "tick dragging," where ticks are collected from fabric cloths that are passed over vegetation and leaf litter for a predetermined distance. This method is meant to estimate the number of ticks a person would come into contact with while walking along the same route.

36 sites across the Lower Peninsula were sampled for the presence of blacklegged ticks

At **10** sites, new populations of blacklegged ticks, or population expansion was documented.

New detections of blacklegged ticks occurred in:

Clinton County **May, 2014**
Ingham County **October, 2014**
Charlevoix County (Beaver Island) **May, 2015**

To document the geographic risk of tickborne diseases associated with blacklegged ticks, the MDHHS chose field sites based upon suitable environmental factors for ticks, accessibility, historic tick submissions, and visitation by the public.

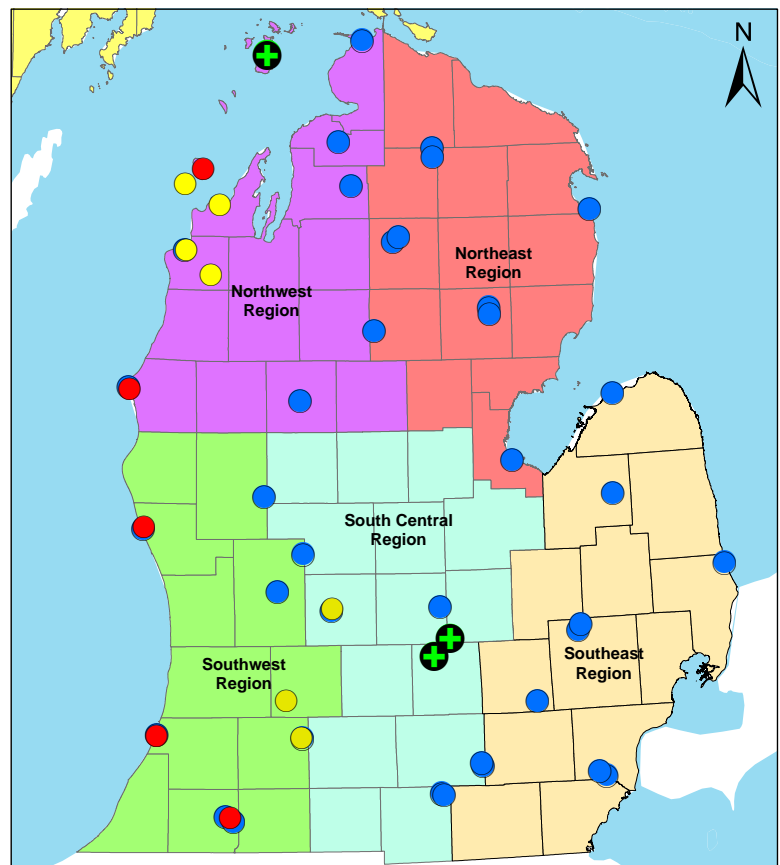
Partner agencies included:

- Michigan State University
- Michigan Department of Natural Resources
- National Park Service staff

The map below shows results of tick presence/absence, by site, of the field survey conducted from April 2014 to May 2015.

Map Legend

- Site where blacklegged ticks are well established.
- Site where blacklegged ticks are increasing.
- ⊕ Site where blacklegged ticks have recently (2014-2015) been discovered.
- Site where no blacklegged ticks were found.



BABESIOSIS

Several other tickborne diseases are associated with the blacklegged tick, and will likely emerge as populations of ticks expand. These tickborne diseases include:

- Anaplasmosis
- **Babesiosis**
- Deer tick virus
- *Ehrlichia muris*-like

First Reported in Michigan:	2014 Cases:
2005	4
2008	2
--	0
2013	0

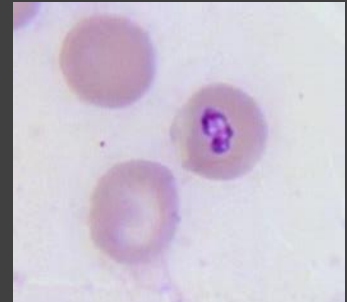
Babesiosis is caused by the protozoal parasite *Babesia microti*, which infects red blood cells. It mainly occurs during warmer months in regions where blacklegged ticks are established. Some people who are infected with *Babesia microti* feel fine and do not have any symptoms. Many people may develop nonspecific flu-like symptoms. Babesiosis may also cause hemolytic anemia leading to jaundice and dark urine. Babesiosis can be severe and life-threatening in people who are elderly, have a weak immune system, have chronic health conditions, or are asplenic.

Babesiosis is now a nationally notifiable condition, and reportable in Michigan. Cases should be reported using the Babesiosis specific case investigation form in the Michigan Disease Surveillance System (MDSS). The national case definition can be found at:

www.cdc.gov/nndss/conditions/babesiosis/case-definition/2011/

Symptoms of Babesiosis

- Fever (may come and go)
- Chills and sweats
- Headache
- Body ache
- Nausea
- Fatigue



Blood smear showing larger trophic stage of *Babesia microti* in erythrocyte.
CDC/Dr. George Healy

IMPROVED PROVIDER WEBSITE



The MDHHS has created a new Lyme disease web portal for healthcare providers. www.michigan.gov/lymeinfo includes easy tab navigation and contains the most current information regarding the epidemiology of Lyme disease, prevention, symptoms, diagnostics, and treatment guidelines.

NEW MICHIGAN-SPECIFIC LYME DISEASE CME COURSE

Lyme disease is becoming an increasingly important health issue in Michigan. Due to its recently emerging status in some parts of the state, many healthcare providers may have limited experience when dealing with the disease. The MDHHS has created web-based, CME granting materials regarding Lyme disease in our state specifically targeted for healthcare providers.

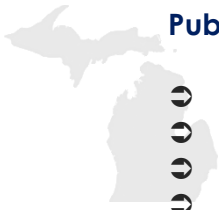


Topics include:

- Identifying common exposures to Lyme disease in MI
- Interpreting patient history, presentation, and/or laboratory testing for Lyme disease diagnosis
- Applying IDSA guidelines for treatment of Lyme disease and tick bites

Registration information can be found at www.michigan.gov/lymeinfo

WHAT CAN BE DONE?



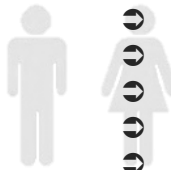
Public Health Agencies can.....

- Monitor Michigan's tick populations
- Maintain Lyme disease surveillance system
- Offer tick identification and testing services to the public
- Make Michigan data publicly available
- Promote tick-borne disease prevention guidance

Health Providers can....

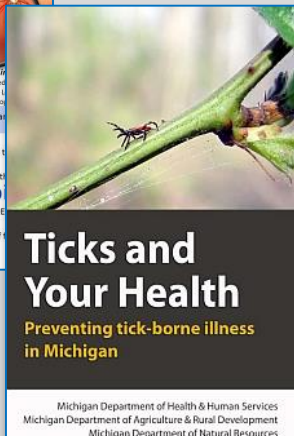
- Review public health data regarding the risk of Lyme disease in Michigan
- View the FREE Michigan Lyme disease continuing medical education activity at: www.michigan.gov/lymeinfo
- Diagnose and treat infections using best practices
- Report cases promptly to your local health department
- Remind patients about the risk of Lyme disease in your area, and ways to prevent infections

Everyone can....



- Inform yourself about where ticks can be encountered in Michigan
- Prevent tick bites by using EPA approved repellents on skin and clothing
- Check yourself and others for ticks regularly after spending time outdoors
- Remove ticks promptly and safely if you have been bitten
- Submit ticks you find on yourself or your pets for identification
- Recognize the symptoms of Lyme disease
- Seek prompt medical care if illness occurs after exposure to ticks

UPDATED GUIDES AND PRINTED RESOURCES



Tick ID Cards are now available for order. This pocket-sized resource provides information on how to identify common Michigan ticks, proper tick removal, and preventing tick bites.

The **Ticks and Your Health** brochure has been updated to include the most up-to-date information about Michigan ticks and tickborne diseases, and is now available online and to order.

Posters, pamphlets, and guides are available to download, print and order via the Communicable Disease Division's publication order form at:

www.michigan.gov/cdinfo