

## Summary and Action Items

Vector-borne diseases (VBDs) are more common in summer months. The most common VBDs reported in Illinois include West Nile virus (WNV), Lyme disease and Rocky Mountain spotted fever (RMSF). This health alert serves to remind healthcare providers to consider tick and mosquito borne diseases in their differential diagnoses when assessing patients with possible exposure to VBDs. The purpose of this health alert includes the following:

1. Review common exposures and provide further information about the geographic distribution of common VBDs.
2. Address reporting requirements including importance of exposure and travel history

## Background

Vector-borne diseases are on the rise nationwide, with a tripling of cases since 2004. As the temperature rises, mosquitoes and ticks become active, increasing risk for human infections. Numerous VBDs are seen in Illinois, including WNV, with 176 human cases reported in 2018. Lyme disease is mostly found in the northern part of Illinois (276 reported human cases in 2018), and RMSF is found in the southern part of the state (150 reported human cases in 2018). Newly emergent tick-borne diseases include Heartland and Bourbon viruses, with two and zero human cases reported in 2018, respectively.

## Potential Exposures

Ticks and mosquitoes have unique habitats, but both vectors are primarily active in the warmer months until temperatures reach freezing. Tick habitats include grassy, brushy, or wooded areas with leaf litter and are found throughout Illinois. Mosquitoes often live and lay eggs near stagnant water.

Below are links to websites that outline geographic distributions of common VBDs:

- Illinois data on Lyme and RMSF exposure areas: [IDPH Lyme disease Webpage](#)
- National data on the geographic distribution of Lyme Disease: [CDC Lyme Map](#). Of note, Illinois is considered a low incidence Lyme Disease state, and Wisconsin has a high incidence of Lyme disease.
- National data on the geographic distribution of RMSF: [CDC RMSF Map](#)

## Symptoms

Symptoms of vector-borne diseases can be similar in many instances, and can include fever, rash, headache, arthralgia, myalgia, and neurologic symptoms (stiff neck, altered mental status, seizures, limb weakness, meningitis, encephalitis, or acute flaccid paralysis). However, VBDs may have very distinct symptoms unique to each disease. Below is a list of all the reportable VBDs with links for their symptoms:

Tick-borne Diseases: [Anaplasmosis](#), [Babesiosis](#), [Ehrlichiosis](#), [Lyme disease](#), [Rocky Mountain spotted fever](#), [Heartland virus](#), and [Bourbon virus](#).

Mosquito-borne Diseases: [California Serogroup virus diseases, including California encephalitis, Jamestown Canyon, Keystone, La Crosse, Snowshoe hare, and Trivittatus viruses](#), [Chikungunya](#), [Dengue](#), [Eastern Equine encephalitis](#), [Malaria](#), [Powassan virus](#), [St. Louis encephalitis](#), [West Nile virus](#), [Western Equine Encephalitis](#), and [Yellow Fever](#).

## Transmission

VBDs are transmitted to humans primarily from the bite of an infected mosquito or tick. Other modes of transmission may include blood transfusion, organ or tissue transplant, or possibly a lab exposure. Zika may be transmitted sexually or from a pregnant woman to her infant at or around the time of birth.

## Diagnosis

Providers should consider testing for relevant tick-borne illnesses when their patients have compatible clinical symptoms and have spent time in typical tick habitats (e.g., hunters, hikers). Each tick-borne disease has a different geographic distribution. Thus, identifying not only the type of exposure, but where the exposure occurred, helps to determine which diseases are more likely.

Healthcare professionals suspecting a VBD in their patients should contact their LHD to report the case. When reporting cases, clinicians will need to provide information on the clinical presentation, including symptom onset, as well as exposure and travel histories. Physicians evaluating patients with suspected tick-borne illness who have been treated with the appropriate antibiotics and show no clinical response should consider testing for Heartland and Bourbon viruses.

**Laboratory Testing:** IDPH Laboratory will perform Chikungunya, Dengue, and Zika molecular and antibody testing for qualifying patients with prior authorization for testing. **Healthcare providers must contact their local health department to obtain prior authorization to test for these pathogens at the IDPH Laboratory.**

Testing for all other VBD pathogens should be done via commercial laboratories. In select cases where the infecting pathogen cannot be determined, e.g., due to high cross-reactivity, **and with prior authorization from the local health department**, testing of acute and convalescent-phase VBD specimens can be performed at CDC. Testing of tick-borne pathogens at CDC requires prior approval from CDC, so LHDs should contact IDPH CD Vector Program staff to facilitate testing approval. Commercial labs should report positive or equivocal test results to IDPH. Specimens requiring confirmation testing at CDC should be forwarded by commercial labs to the IDPH Chicago Lab for routing to CDC.

For additional information on appropriate Lyme Disease diagnostic testing, please see the [Lyme Disease Testing Guidance](#).

## Prevention

The best way to protect yourself from vector-borne diseases is to prevent tick and mosquito bites. Easy ways to do this include the following: use of [EPA-approved insect repellents](#) with 20% or more DEET, picaridin, or IR3535 on exposed skin; wear light colored long-sleeved shirts and long pants; treat clothing with permethrin; tuck pants into socks and wear boots without eyelets; walk in the middle of trails; use tick and mosquito preventives on your pets; and check yourself, your pets and gear for ticks when coming in from outdoors.

For more detailed information, please visit the CDC [Division of Vector-Borne Diseases](#) website for protection measures against mosquitoes, ticks and other arthropods.

## IDPH and LHD Response

LHDs collect complete travel histories and exposure information from providers during their investigations of each case. The three travel questions in the Epidemiologic Data section of

I-NEDSS should be answered in full. If the case had no travel or travel history is unknown, please select the appropriate answer from the I-NEDSS dropdown menu. Exposure information should be reported as described below.

### **Tick Habitat:**

Was the patient in a potential or known tick habitat? please answer Yes or No. If yes, the Tick Habitat detail page must be completed as follows:

Dates: report the date patient entered the tick habitat and the date patient left the tick habitat.

Type of tick Habitat: please select from the I-NEDSS dropdown menu, one or more tick habitats the case may have been in the two weeks (30 days for Lyme) prior to symptom onset. Please note the address should be provided for the selection Own Property.

Name and address with city, county, state of specified location: please provide specific address of tick habitat for exposures that occur in Illinois. If specific address is unknown, provide city and/or county. If out of state, please document city, state and/or country.

### **Tick Bite:**

Was there a recognized tick bite? please answer Yes or No. If yes, the Tick Bite detail page must be completed as follows:

When was there a tick bite? please provide date first observed

Where was the tick bite obtained? please select all the places the case had been at the time of the tick bite from the I-NEDSS dropdown menu, e.g., campground, forest or nature preserve, etc.

Name and address of specific location(s): please provide specific address. If unknown or out of state, please provide city, state and/or country.

### **Contact**

Healthcare providers should contact their local health departments to report suspect cases of vector-borne illness, and to discuss consideration of confirmation testing at IDPH or CDC.

For additional information regarding human vector-borne disease surveillance, local health departments should contact Debbie Freeman ([Debbie.Freeman@Illinois.gov](mailto:Debbie.Freeman@Illinois.gov)) or Jonathan Popovitch ([Jonathan.Popovitch@Illinois.gov](mailto:Jonathan.Popovitch@Illinois.gov)) at IDPH Communicable Disease Control Section.

### **Additional Resources**

For additional information on vector-borne diseases, visit the following links:

[IDPH - West Nile virus](#), and [WNV Surveillance](#)

[IDPH - Lyme disease](#)

[IDPH – Rocky Mountain spotted fever](#)

[CDC Tickborne Diseases of the United States, A Reference Manual for Healthcare Providers](#)

[CDC Division of Vector-Borne Diseases \(DVBD\) A-Z Topics Index](#)

### **Target Audience**

Local Health Departments, Infectious Disease Physicians, Hospital Emergency Departments, Infection Preventionists, Health Care Providers, and Laboratories

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