

## Elevated tickborne disease activity in N.J. & the detection of emerging tickborne pathogens in ticks

Date: June 2, 2023

**Public Health Message Type:**  Alert  Advisory  Update  Information

**Intended Audience:**  All public health partners  Healthcare providers  Infection preventionists  
 Local health departments  Schools/Childcare centers  ACOs  
 Animal health professionals  Other:

### **Key Points:**

- Healthcare providers should be aware of recent trends in tickborne illness in N.J. and maintain a heightened clinical suspicion for these diseases in persons with clinically compatible symptoms. NJDOH provides information on surveillance of tickborne diseases, including new/emerging diseases in the state, as well as resources for tickborne disease testing and prevention.
- Tick bite-related emergency department visits have been elevated this spring in N.J. and particularly in the central eastern part of the state.
- Rare viral tickborne illnesses, including Bourbon and Heartland viruses, as well as Powassan virus have been identified in ticks collected in N.J. While no human cases of Heartland or Bourbon virus have been detected yet in N.J., there have been 15 cases of Powassan virus infection, including several fatalities reported in N.J. since 2013.
- The first established population of the Gulf Coast tick in N.J. was reported in Salem County in 2022 and tick testing identified the presence of *Rickettsia parkeri*, which is the pathogen responsible for *Rickettsia parkeri* rickettsiosis. Established tick populations infected with *R. parkeri* have also been reported in Staten Island. *R. parkeri* infection is often characterized by an eschar at the site of the tick bite.
- Tick testing suggests that *Ehrlichia ewingii*, in addition to *E. chaffeensis*, may be important human pathogens. Molecular testing for both *E. chaffeensis* and *E. ewingii* is available as a panel at Mayo Laboratories and ARUP and may be available at other laboratories. PCR tests are most sensitive in the first week of illness and decrease in sensitivity following the administration of appropriate antibiotics (within 48 hours).
- Tick testing has identified several ticks coinfecting with more than one pathogen (e.g., *Borrelia burgdorferi* and *Babesia microti*), which could have treatment implications.
- NJDOH can assist healthcare providers with no-cost testing for Powassan, Bourbon, and Heartland viruses, as well as with species-specific molecular testing for *Rickettsia parkeri* and other Spotted Fever Group Rickettsioses.
- CDC offers several free clinical training modules on their [Tickborne Disease Continuing Education](#) page with CME and CNE credits.

### **Actions:**

- Review signs, symptoms, testing and treatment recommendations for tick-borne diseases; the CDC [Tickborne Diseases of the United States](#) is a useful resource for this information.

- Contact NJDOH to request testing for Powassan, Heartland, and Bourbon viruses and to request *Rickettsia parkeri* testing in eschar samples. Download and submit the NJDOH Arboviral Testing Request Worksheet or the Spotted Fever Group Rickettsiosis test request, located online at <http://www.nj.gov/health/cd/topics/vectorborne.shtml> under ‘Laboratory Testing and Guidance.’
- Consider species-specific PCR testing for suspected ehrlichiosis, particularly if testing is within the first 2 weeks of onset and within 48 hours of antibiotic administration.
- Remind patients to consistently take steps to prevent tick bites and share NJDOH and CDC prevention resources and materials.

### **Resources:**

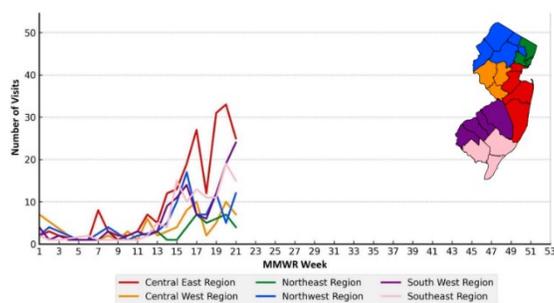
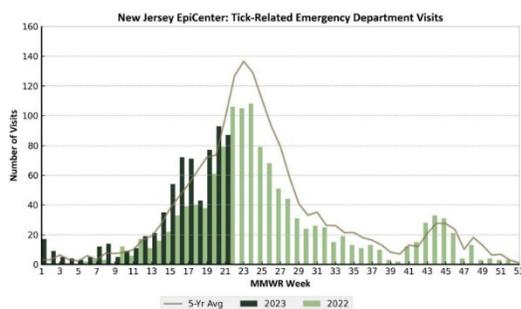
- NJDOH weekly Vector-borne Disease Surveillance Reports <https://www.nj.gov/health/cd/statistics/arboviral-stats/>
- Governor Murphy proclaimed May 2023 as [Tickborne Disease Awareness Month](#) in New Jersey, although ticks are a concern year round. NJDOH has many educational resources on tick bite prevention and tickborne diseases that can be shared with patients on the ‘[Fight the Bite, NJ!](#)’ page ([www.nj.gov/health/cd/topics/vectorborne.shtml](http://www.nj.gov/health/cd/topics/vectorborne.shtml)).
- CDC [Tickborne Diseases of the United States](#)
- [Lyme Disease Prophylaxis After Tick Bite](#)

### **Contact Information:**

- Communicable Disease Service Vector-borne Disease Team, [CDSVectorTeam@doh.nj.gov](mailto:CDSVectorTeam@doh.nj.gov)
- The Communicable Disease Service at (609) 826-4872 during business hours

## **Tickborne Diseases in N.J. and Activity Levels**

NJDOH has identified recent increases in tick bite-related emergency department visits in all regions of the state, particularly in the central eastern part of the state. This trend is expected, as tick exposures in N.J. generally increase during spring and summer months, although the number of emergency department visits this spring was higher than what has been seen in recent years. Tickborne diseases are reported throughout the year in N.J., but health care providers should have a heightened clinical suspicion for tickborne diseases especially between spring and fall.



While Lyme disease is the most frequently diagnosed tickborne illness in New Jersey, cases of anaplasmosis, babesiosis, ehrlichiosis, and Spotted Fever Group Rickettsioses are also common. While still rare, cases of Powassan and hard tick relapsing fever (caused by *Borrelia miyamotoi*) have been

reported in recent years and alpha-gal syndrome, which is a hypersensitivity reaction associated with the lone star tick (also known as red meat allergy) is an additional tickborne concern, particularly in the southern and central parts of the state. While cases of Heartland and Bourbon viruses have not been identified in N.J., the viruses have been identified in ticks collected in Atlantic (Bourbon virus), Monmouth (Bourbon and Heartland virus), and Ocean (Heartland virus) Counties.

Information on tick populations in N.J. is not well known. NJDOH started limited population-based tick surveillance activities in 2021, in collaboration with several county mosquito control agencies. The NJDOH Public Health and Environmental Laboratories provides testing for tickborne disease pathogens.

NJDOH provides data on tickborne diseases in people, as well as information on tickborne pathogens identified in ticks online at <https://www.nj.gov/health/cd/topics/vectorborne.shtml>.

### **Clinical presentations**

Initial symptoms for many tickborne diseases are non-specific – fever, headache, myalgia, arthralgia, malaise. Up to 80% of Lyme disease infections will present with an erythema migrans rash at the site of the tick bite. Powassan virus infection can have severe neurological presentations (e.g., meningitis, encephalitis, acute flaccid paralysis), and can appear similar to neuroinvasive West Nile virus infection. Hard Tick Relapsing Fever (*B. miyamotoi*) can cause relapsing febrile illness and Heartland and Bourbon virus infections present as febrile illnesses often characterized by leukopenia and thrombocytopenia. Antibiotic/antiparasitic medications are available for many tickborne diseases, although no specific treatment exists for tickborne arboviruses.

Lyme disease post-exposure prophylaxis: A single prophylactic dose of doxycycline can reduce the risk of acquiring Lyme disease when the following criteria are met; 1) the patient has been bitten by a blacklegged tick (also known as a deer tick or *Ixodes scapularis*); 2) the tick appears engorged (full of blood, not flat); 3) the treatment can be given within 72 hours of tick removal and; 4) there is no contraindication for the patient to receive doxycycline. Antibiotic treatment following a tick bite is not recommended as a means to prevent other tickborne diseases and conditions; patients who have experienced a tick bite should be advised to monitor themselves and seek care for symptoms of tickborne illness regardless of whether they receive post-exposure prophylaxis for Lyme Disease; coinfection with other tickborne diseases can occur.

### **Public Health Laboratory Clinical Testing Services**

#### **ARBOVIRUSES**

Healthcare providers who would like to request arboviral disease testing should complete the [Arboviral Testing Request worksheet](#) and send via encrypted email to [CDSVectorTeam@doh.nj.gov](mailto:CDSVectorTeam@doh.nj.gov). Arboviral testing can be requested for patients who are hospitalized with neuroinvasive disease (e.g., encephalitis, meningitis, acute flaccid paralysis) of unknown etiology and if an arboviral disease is suspected. In addition, NJDOH encourages healthcare providers to submit specimens for patients presenting with a febrile illness of unknown etiology if an arboviral disease is suspected to detect rare and emerging arboviruses.

**Heartland virus:** Initial symptoms of Heartland virus disease are very similar to those of ehrlichiosis, which include fever, fatigue, anorexia, nausea and diarrhea. Cases have also had leukopenia, thrombocytopenia, and mild to moderate elevation of liver transaminases. Heartland virus disease should be considered in patients being treated for ehrlichiosis who do not readily respond to treatment with doxycycline.

**Bourbon virus**: There have been a limited number of Bourbon virus disease cases identified in the United States. Patients with Bourbon virus have reported fever, fatigue, anorexia, nausea, vomiting, and maculopapular rash. They were also found to have thrombocytopenia and leukopenia. Some of the patients found to be infected with Bourbon virus have died during their acute illness.

### **RICKETTSIAL DISEASES**

There are several pathogenic strains of *Rickettsia* spp. that may impact N.J. residents. Clinicians who would like to request species-specific Spotted Fever Group Rickettsiosis testing in whole blood, eschar swab or rash biopsy specimens at PHEL, please see [Laboratory Testing Guidance: Spotted Fever Group Rickettsiosis](#).