



Ticks are active in Ohio from early spring until late autumn. People working and playing outdoors in wooded or weedy areas may be exposed to ticks and possibly tick-borne diseases such as Rocky Mountain spotted fever, Lyme disease and ehrlichiosis. Not all tick species carry and transmit every disease, so it is important to identify ticks to better estimate disease risk.

Rocky Mountain Spotted Fever (RMSF)

Rocky Mountain spotted fever (RMSF) has been found in 71 of Ohio's 88 counties. Almost half of all cases have been reported from three counties; Clermont, Franklin and Lucas. From 2000-2008, there were 141 cases of RMSF reported from Ohio and there have been 19 deaths from the disease since 1964. In 2009, Ohio reported 18 cases (Figure 1). The cases are seasonal with dates of onset from April through October.

RMSF is caused by the bacterium, *Rickettsia rickettsii*. Larval and nymphal ticks become infected with *R. rickettsii* while feeding on blood from an infected host and a female tick can transmit *R. rickettsii* to her eggs through a process called transovarial transmission. Once infected, the tick can carry the pathogen for life. The bacteria are transmitted through tick saliva while feeding. It usually takes several hours of attachment and feeding for the bacteria to be transferred to the host. Only one to three percent of the tick population carries *R. rickettsii* (even in areas where the majority of human cases are reported); so risk of exposure to an infected tick is low.

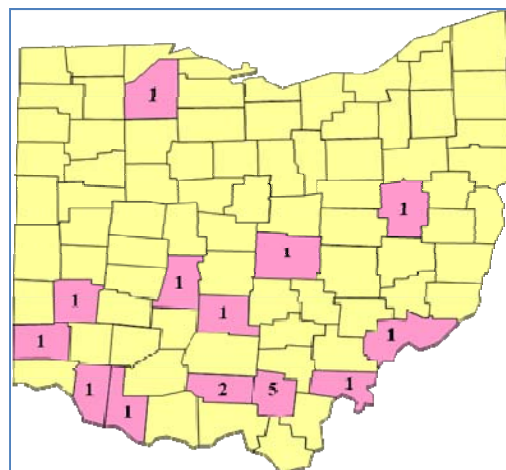


Figure 1: Rocky Mountain Spotted Fever 2009
Total: 18 human cases

Symptoms and Treatment of RMSF

The incubation period for RMSF is two to 14 days after tick bite or contact. Symptoms include a sudden onset of fever, headache and flu-like symptoms, often followed by the characteristic spotted rash. The rash first appears at the wrists and ankles and may spread to the torso, palms and soles if not treated. When the disease is diagnosed early, it is treated with antibiotics (usually a tetracycline). If left untreated, it can be fatal and the fatality rate in the United States is four percent.

Vector of RMSF

The American dog tick, *Dermacentor variabilis*, is the primary vector of RMSF in the eastern United States (Figure 2). In Ohio, this tick is widespread and abundant. The American dog tick is most active from April through July. This tick will bite and feed on any available mammal, including humans.



Figure 2: *Dermacentor variabilis* Photo courtesy of Cornell University



Zoonotic Disease Program

Bureau of Disease Investigation and Surveillance, Ohio Department of Health

<http://www.odh.ohio.gov/odhPrograms/dis/zoonoses/vbdp/vbtick.aspx>

Phone: (614) 752-1029 • Toll-free Ohio (888) 722-4371 • E-mail: zoonoses@odh.ohio.gov

Lyme Disease

In 2009, Ohio reported 60 cases of Lyme disease to the Centers for Disease Control and Prevention (Figure 3). Since 1990, Ohio has reported 992 cases from 83 of 88 counties.

Lyme is the most commonly reported vector-borne disease in the United States with 20,000 cases reported each year. Mid-Atlantic and New England states reported more than 80 percent of the total U.S. cases, mostly in New York, New Jersey and Pennsylvania.

Data from the past 10 years show that almost half of Ohio's cases of Lyme disease had no travel history. This means people are acquiring Lyme disease in Ohio, despite the fact that the tick responsible for the disease is rarely found here. The Ohio Department of Health will continue surveillance for this disease and its vector in addition to educating Ohio residents about disease prevention and treatment.

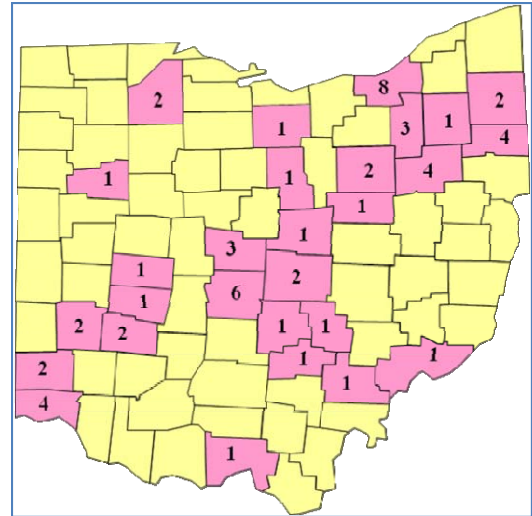


Figure 3: Lyme Disease 2009
Total: 60 human cases

Symptoms of Lyme Disease

The first sign of a Lyme disease infection, seen in 60 to 80 percent of cases, is the characteristic “bull’s-eye” rash called erythema migrans (EM). The rash develops at the site of tick attachment and usually appears seven to 14 days after tick exposure. EM rashes must be diagnosed by a doctor. Other symptoms may include muscle aches, general tiredness, fever, swollen glands, headache and joint pain.

Treatment of Lyme Disease

Lyme is a bacterial disease caused by *Borrelia burgdorferi*, a spirochete-type bacterium. In the early stages, the disease is treated with antibiotics and patients usually recover quickly and completely. Late-stage disease may require longer antibiotic treatment and some patients experience persistent or recurrent symptoms. Having Lyme disease once **does not** protect against reinfection, and reinfection cases have been reported.



Figure 4: *Ixodes scapularis*

Vector of Lyme Disease

In the eastern United States, Lyme disease is transmitted by the black-legged tick, *Ixodes scapularis*, also known as the “deer tick” (Figure 4). This tick is rarely found in Ohio (Figure 5). The nymphal ticks are active in late spring and summer when human populations are outdoors and likely to be exposed.

These ticks are found in areas of deciduous forest, especially those with a leaf litter habitat on the ground. The leaf litter provides protection from the elements and when removed, tick populations may be reduced by 70 to 100 percent.

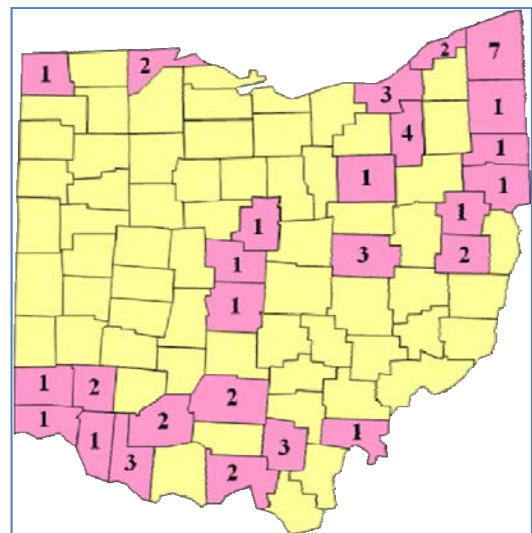


Figure 5: *Ixodes scapularis* in Ohio 1987-2009
Total: 50 ticks identified from 26 counties

Ehrlichiosis and Anaplasmosis

Ehrlichiosis and anaplasmosis are tick-borne diseases caused by several species of bacteria. These bacteria are transmitted through the bite of a tick and cause disease in humans and animals such as dogs, cattle, sheep and horses. Ehrlichiosis and anaplasmosis are transmitted by *different* ticks.

Ehrlichiosis is transmitted by the Lone Star tick, *Amblyomma americanum*, (Figure 6) and is caused by the bacteria *Ehrlichia chaffeensis* and *Ehrlichia ewingii*. White-tailed deer are a major host for this tick and are a natural reservoir of the bacteria.

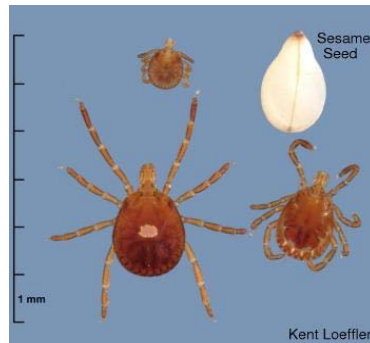


Figure 6: *Amblyomma americanum*



Figure 7: *Ixodes scapularis*

Photos courtesy of Cornell University

Lone Star ticks are common in the southeastern United States and are becoming more common in Ohio, especially southern Ohio. They are active from late May until the end of summer. Eleven human cases were reported in 2009 (Figure 8).

Anaplasmosis, formerly known as Human Granulocytic Ehrlichiosis, is transmitted by the deer tick, *Ixodes scapularis*, (Figure 7) which is also the vector for Lyme disease. Anaplasmosis is caused by the bacteria *Anaplasma phagocytophilum*. Deer and wild rodents are the likely reservoirs for the bacteria.

Symptoms of Ehrlichiosis and Anaplasmosis

The bacteria that cause ehrlichiosis and anaplasmosis are different, but their symptoms are similar and may be confused with common infections such as influenza. For ehrlichiosis, disease onset typically occurs five to 10 days after a tick bite. For anaplasmosis, onset may begin up to three weeks after a tick bite. Initial symptoms of both diseases may include fever, headache and muscle aches. Other symptoms may include nausea, joint pain, chills, confusion and sometimes a rash.

Ehrlichiosis and anaplasmosis may cause severe illness, especially if left untreated, and about half of all patients require hospitalization. The elderly and those with compromised immune systems are at most risk for developing more severe disease. The mortality rate is two to three percent.

Treatment

Ehrlichiosis and anaplasmosis infections are treated with a tetracycline antibiotic, usually doxycycline. Treatment should begin as soon as clinical observations and epidemiological evidence suggest an infection. *Do not* delay treatment until laboratory tests confirm a suspected case. Within 24 to 72 hours of treatment, fever should subside. Failure to respond to antibiotic treatment is evidence *against* an infection.

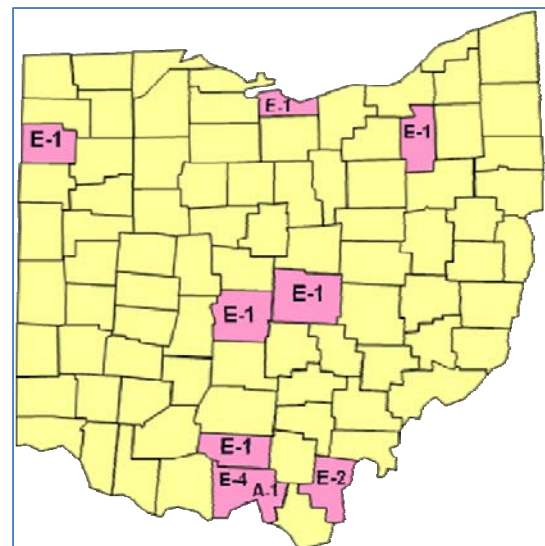
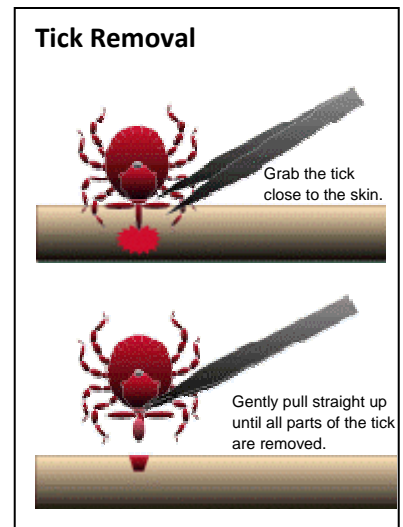


Figure 6: Ohio Cases 2009 Ehrlichiosis (E) 11 cases and Anaplasmosis (A) one case

Tick Identification Service

Tick identification is available through the Zoonotic Disease Program. Proper tick identification is essential in determining the potential risk of infection associated with a tick-borne disease.

- Be careful when removing ticks.
- NEVER attempt to “burn off” a tick with a match.
- After removal, wash the bite site with soap and water and apply an antiseptic.
- Send the tick to the address below. Please make copies of the form below as necessary.



For Health Professionals:

Rocky Mountain Spotted Fever: Suspect cases must be reported by the **end of the work week**. Individual cases must be reported to the local health department (LHD). LHDs report cases to the Ohio Department of Health (ODH) via the Ohio Disease Reporting System (ODRS).

Lyme Disease: Must be reported by the **end of the work week**. Individual cases must be reported to the LHD. LHDs report cases to ODH via ODRS. Please complete the signs and symptoms section and note the geographic location of tick exposure, particularly county.

Ehrlichiosis: Suspect cases of ehrlichiosis must be reported by the **end of the work week**. Individual cases must be reported to the LHD. LHDs report cases to ODH via ODRS.



Tick # _____ Date Received: _____

Lab
Use
Only:

I.D. _____

♂ ♀ N L %

Please provide the following information:

Date collected: _____

Ohio county where tick was acquired: _____

Travel outside Ohio in past two weeks? YES NO Where? _____

Was the tick attached? YES NO

Tick was found on: Human Dog Cat Other: _____

Name: _____

Address: _____

City/State/ZIP: _____

Age: _____ Sex: _____ Phone: _____

Mail results to: (if different from above)

Instructions for submitting ticks:

- 1. Keep ticks alive.** Live ticks are easier to identify.
- 2. Moisten paper strip with one or two drops of water, place tick and paper strip in vial and close tightly.**
- 3. Complete this form and submit it with your tick.**

Ohio Residents, Mail Tick To:

Tick Identification

Zoonotic Disease Program

8955 E. Main St.

Reynoldsburg, Ohio 43068

(614) 752-1029

For information about tick-related diseases, contact us or your local health department, or see the CDC Web site at <http://www.cdc.gov> (type tick into the search bar).