

Ticks and disease in Kentucky
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Ticks are external parasites that must have three blood meals during their life in order to develop and reproduce. The common species in Kentucky that bite humans also feed on a range of animal species. Ticks feed slowly. During the several days needed to ingest a blood meal, they may pick up pathogens from infected hosts. Ticks can pass these disease agents to susceptible hosts during their next blood meal. Ticks are common; fortunately, the incidences of tick-borne diseases in the state are very low.

Figure 1. Engorged American dog tick

Significant increases in wildlife populations, expanded ranges of some tick species, development of housing in rural areas, and the popularity of hiking and ecotourism have increased the potential for people to encounter ticks. Awareness and use of preventive measures to reduce exposure while working outdoors or enjoying outdoor activities are keys to reducing tick bites. Use repellents and check yourself frequently for ticks while and after being in areas where they may be active.

Tick-borne diseases

Table 1. Main vectors of tick-borne diseases in Kentucky

Tick	Diseases	Incidence*
American dog tick <i>Dermacentor variabilis</i>	Spotted fever rickettsiosis Tularemia	0.2 to 1.5 KY 0.002 KY
Blacklegged tick <i>Ixodes scapularis</i>	Anaplasmosis Erlchiosis Lyme disease	6.1 US 3.3 to 26 KY 0.3
Lone star tick <i>Amblyomma americanum</i>	Erlchiosis Tularemia Spotted fever rickettsiosis Southern tick associated rash illness (STARI) Red meat allergy	3.3 to 26 KY 0.002 KY 0.2 to 1.5 KY Not available Not available

*Cases/1,000,000 people - data from Centers for Disease Control

Anaplasmosis is a bacteria disease that was recognized in humans in the mid-1990's. Flu-like symptoms may develop 1 to 2 weeks after being feed upon by an infected tick. White-footed mice, short-tailed shrews, and eastern chipmunks are among the reservoir hosts of this disease.

Erlchiosis results from infection by one of several species of bacteria. Mild muscle aches, fatigue, and occasionally severe fever appear within 1 to 2 weeks after a bite by an infected tick. Ticks appear to have to feed for about 24 hours before disease transmission occurs. White-tailed deer, elk, and wild rodents are reservoirs of the disease.

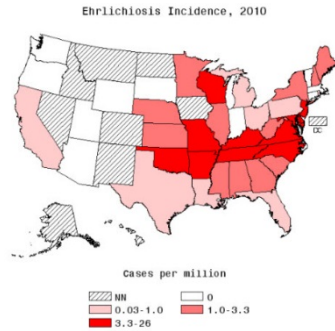


Fig. 1 Ehrlichiosis incidence in US (CDC map)

Lyme disease is caused by a bacterium transmitted by the bite of infected blacklegged ticks. In most cases, the tick must be attached for several hours before transmission occurs. A characteristic bulls-eye rash may accompany the typical flu-like symptoms. If not treated, Lyme disease can spread to the heart, nervous system, and joints. White-footed mice are an important reservoir of the disease.

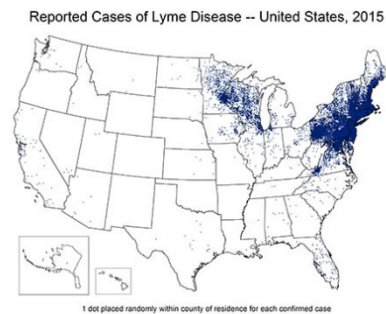


Fig. 2 Reported cases of Lyme disease in the US, 2015 (CDC map)



Red meat allergy may appear as a skin rash or anaphylactic reaction that occurs 3 to 6 hours after eating beef, pork, or lamb. The reaction can occur in people with a history of strong reactions to tick bites (redness and itching at bite sites that last for weeks) or many bites from a single incidence. They produce antibodies to proteins in the saliva of feeding lone star ticks. The common sugar (alpha-gal) that causes the reaction is not present in chicken, turkey, or fish. This antibody has been found in up to 20% of people tested who live where the lone star tick is common.

Figure 2. Female lone star tick

Southern tick-associated rash illness (STARI) produces a rash similar to that of Lyme disease along with flu-like symptoms (fatigue, headache, fever, and joint pain). STARI has not been linked to chronic joint, neurologic, or cardiac symptoms seen with Lyme disease. The cause of STARI is unknown; however, distribution of the disease coincides with the range of the lone star tick.

Spotted fevers (a group including Rocky Mountain Spotted Fever (RMSF)) are bacterial diseases transmitted by infected American dog ticks. Typical symptoms include fever, headache, abdominal pain, vomiting, and muscle pain. A rash also may develop. Rocky Mountain spotted fever can be a severe or even fatal illness if not treated in the first few days of symptoms. Reservoir animals include deer mice,

meadow voles, and other small mammals. Less than 1% of American dog ticks are likely to carry the pathogen, even in areas considered highly endemic. Dogs are susceptible to infection but the disease is rarely diagnosed in cats.

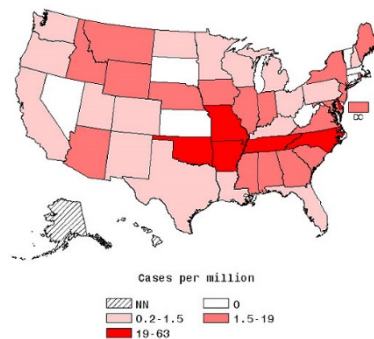


Fig. 3 Annual reported incidence (per million population) for RMSF in the United States for 2010 (CDC map)

Tularemia (rabbit fever) is a rare but potentially fatal bacterial disease of rabbits, hares, and rodents; however, it can infect more than 100 species of wild and domestic animals. American dog ticks and lone star ticks can transmit the disease to humans. In addition, humans can contract tularemia when handling infected animals. Signs and symptoms vary with the method of entry into a person but a fever accompanies all forms. Cats and dogs may contract the disease by eating flesh of infected animals or through tick bites.

Avoiding tick bites

The best strategy to reduce the potential of contracting tick-borne diseases is to avoid tick bites. Here are some tips:

- Avoid walking through uncut fields, brush and other areas likely to harbor ticks. Walk in the center of mowed trails to avoid brushing up against vegetation.
- Use a repellent that contains 20 to 30 percent DEET on exposed skin. Always follow product instructions.
- Use products that contain permethrin to treat clothing and gear, such as boots, pants (especially the cuffs), socks and tents.
- Tuck long pants into your socks and boots. Wearing light-colored pants makes ticks easier to see.
- In areas where there are ticks, check yourself, children and other family members for ticks every 2 to 3 hours and upon returning home from hikes and outdoor activities. Examine behind ears, hair, neck, legs and around the waist.
- If you let your pets outdoors, check them often for ticks. Ticks can “hitch a ride” on your pets, but fall off in your home before they feed. Tick collars, sprays, shampoos, or monthly “top spot” medications help protect against ticks.

Removing an attached tick

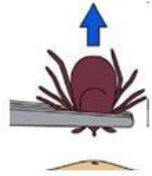
In many cases, infected ticks must be attached and feeding for several hours before a pathogen is passed so prompt removal is very important.

How to Remove a Tick

Step 1: Use fine-tipped tweezers to grasp the tick as close to the skin's surface as possible. The goal is to remove the entire tick including its head and mouth.



Step 2: Pull upward with steady, even pressure. Do not twist or jerk the tick!



Step 3: Clean the bite area and your hands with rubbing alcohol, an iodine scrub, or soap and water.

Figure 3. Remove attached ticks promptly but carefully. (Photo: Centers for Disease Control)

A feeding tick holds itself in place by barbed mouthparts and a type of glue. Grasp it with fine-point tweezers as close to the skin as possible. Pull it straight out gently but firmly. Do not twist or jerk the tick during removal. Afterwards, wash the bite area and your hands thoroughly with soap and water and apply an antiseptic to the bite site.

You can store removed ticks in a sealed plastic bag with the date and location noted. Identification of ticks is available through your local Cooperative Extension Service office.

Testing ticks for disease

Anyone with concerns about exposure to ticks and possible disease transmission should consult their physician to determine the best course of action. Most tick-borne diseases can be averted by early intervention with an antibiotic.

Several laboratories will test ticks for selected diseases. Contact information is available at http://www.tickencounter.org/tick_testing/labs.

Here are some points to consider:

- Testing ticks for disease is not a substitute for diagnosis by a physician. However, the results may be useful in deciding on the value of treatment in the absence of disease symptoms.
- A positive test result for ticks does not mean that disease transmission occurred. An infected tick may not have fed long enough to transfer the pathogen.
- Be sure that you understand the testing capabilities, costs, and proper shipping procedures for samples.

References

Centers for Disease Control - Anaplasmosis <https://www.cdc.gov/anaplasmosis/index.html>

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