

Tick-borne Diseases

- 90% of all cases of vector-borne diseases are transmitted by ticks. (<https://publichealth.jhu.edu/2025/tickborne-diseases-in-the-us>). Currently, the overwhelming majority of public health focus is on diseases transmitted by mosquitoes.
- Ecosystem changes driven by environmental factors have resulted in expansion of tick populations in the U.S. and has increased the numbers and types of disease-causing microbes found in ticks and also found in the reservoir hosts of the microbes (mice and other small animals). (<https://academic.oup.com/jme/article-abstract/63/1/tjaf169/8324371?redirectedFrom=fulltext>)
- The prevalence of tick-borne diseases that cause long term chronic illnesses (Lyme disease, babesiosis, and alpha-gal syndrome) are vastly under-reported and therefore the public health and economic burden of these infectious diseases are under-estimated.

Lyme disease

- Lyme disease is by far the most common tick-borne disease and the most common vector-borne disease in the US. Federal programs focused on surveillance, research, and public education on ticks and tick-borne diseases are under-funded, because cases are under-reported and the health and economic burden of these diseases are therefore under-estimated.
- Lyme disease is a driver of chronic illness in the US. Depending on time of diagnosis and first antibiotic treatment of Lyme disease, between 15 – 50% of Lyme disease patients experience long term and debilitating symptoms, which can be disabling.
- The healthcare cost of Lyme-infection associated chronic illness (Lyme-IACI) that can be attributed to false negative lab tests, late diagnosis and ineffective antibiotic treatment is over \$7 billion dollar annually.
- The bacteria that cause Lyme disease (*Borrelia*) can be transmitted from mother to fetus, resulting in adverse outcomes in 50% or more of newly-infected women who do not receive prompt antibiotic treatment (<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0207067>).
- The prevalence and congenital risks of Lyme disease to fetuses, newborns, infants or children who are born to women with Lyme-IACI have not been investigated in humans. Case studies and studies on animals indicate that perinatal transmission poses a significant risk to pregnant women and this deserves more attention from both basic research and public health perspectives. (<https://pmc.ncbi.nlm.nih.gov/articles/PMC10846734/>;
<https://www.frontiersin.org/journals/medicine/articles/10.3389/fmed.2026.1794120/full>)

Other Chronic Illnesses Transmitted by Ticks

- Babesiosis causes disease symptoms similar to malaria. The tick-borne parasite (*Babesia*) that causes this illness can also be transmitted from mother to fetus during pregnancy. *Babesia* may also be transmitted through blood transfusion, posing a risk to blood recipients. While these routes of transmission have been known for over two decades, there has been little public health response. (https://journals.lww.com/infectdis/fulltext/2012/11000/transplacental_transmission_of_human_babesiosis.1.aspx#O2-1-2)
- Alpha-gal syndrome (AGS) is a potentially life-threatening allergic reaction to mammalian meat (beef, pork, dairy, etc.) and to products made from mammals such as the gelatin capsules holding supplements and medications. How many people develop AGS following tick bites is estimated at a half-million, but the CDC acknowledges that the true rate is unknown because it is currently not a nationally notifiable disease. (<https://www.cdc.gov/alpha-gal-syndrome/about/index.html>)