



Indiana State
Department of Health

Redesigning and Updating the Indiana State Department of Health Zoonotic and Vector-Borne Disease Website

By Crystal Drakes, DVM

MPH candidate

07/29/2019

A little about myself...



A few questions before we start:

How many of you use your state's department of health website? And how often?

- I use it once or twice a week
- I use it once or twice a month
- I used it once for a special project
- Wait, there is a state department of health website?



Questions:

If you had to get information about human or animal infectious diseases, what is your first internet source?

- ▶ CDC: Centers for Disease Control and Prevention
- ▶ Online scientific journal source (Pubmed, Science Direct, Google Scholar, JAVMA)
- ▶ Web search engine (Google, Bing, Yahoo)
- ▶ State Department of Health Website

Introduction

► Zoonotic Diseases

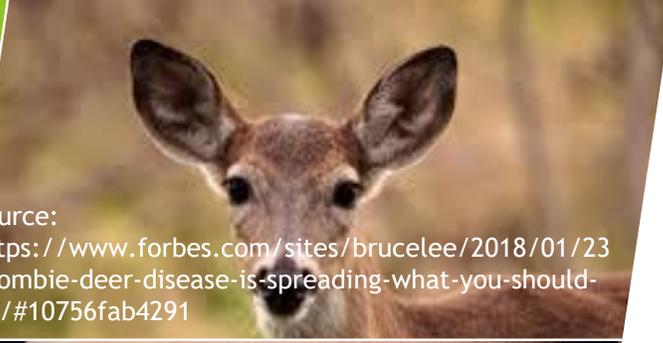
- Infections that spread between animals and humans (CDC 2018)
- Caused by bacteria, fungi, protozoa, parasites, and viruses
- Spread via direct contact, indirect contact, food-borne, and vector borne
e.g. Lyme Disease, Rabies, Baylisascaris larva migrans, Malaria, etc.



Source: <https://www.in.gov/isdh/28011.htm>



Source: <https://www.in.gov/isdh/28005.htm>



Source: <https://www.forbes.com/sites/brucelee/2018/01/23/zombie-deer-disease-is-spreading-what-you-should-do/#10756fab4291>



Source: <https://www.in.gov/isdh/28011.htm>

Information on zoonotic diseases

- ▶ Zoonotic diseases can be mild to serious, potentially deadly (ISDH, 2017c)
- ▶ Sources of information about zoonotic diseases:
 - ▶ Centers for Disease Control and Prevention (CDC): applies to entire United States
 - ▶ Indiana State Department of Health (ISDH): applies to Indiana state
 - ▶ Portal that houses the ISDH Zoonotic and Vector-Borne Disease website
 - ▶ List of mosquito-borne, tick-borne, and other zoonotic diseases
 - ▶ List of organisms that cause diseases, tips for prevention, guides for international travelers, and pests of public health significance



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Epidemiology Resource Center
(ERC)

Data Analysis and Risk Factors ▾

Surveillance Systems and Informatics ▾

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Infectious Disease Epidemiology ▾

Zoonotic and Vectorborne Epidemiology / Entomology ▾

TB/Refugee Health ▾

International Travel ▾

Epidemiology Resource Center

ERC

Definition

Epidemiology "eh-pi-dee-me-ology" is the study of health factors in human and animal populations. It includes collecting, analyzing, and sending out public health information and investigating public health threats. These activities help determine causes of disease and effective disease prevention. Epidemiology also plays a key role in forming and implementing public health policy.



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Zoonotic & Vector-Borne Disease Home

Diseases

Pests

Yellow Fever Vaccination Clinics

[EPIDEMIOLOGY RESOURCE CENTER \(ERC\)](#) / [ZOOONOTIC AND VECTORBORNE EPIDEMIOLOGY / ENTOMOLOGY](#) / [ZOOONOTIC & VECTOR-BORNE DISEASE HOME](#)

Zoonotic & Vector-Borne Disease Home

We are working hard to update these webpages. Please check back frequently for updates.

What We Do

Mosquitoes and Mosquito-Borne Illnesses

A variety of diseases may be spread by mosquitoes in Indiana and abroad.

[Diseases](#) | [Types of Mosquitoes](#) | [Prevention](#) | [For International Travelers](#)

Ticks and Tick-Borne Illnesses

A variety of diseases may be spread by ticks in Indiana and abroad.

Problems with the website

- ▶ Outdated data
- ▶ Irrelevant data
- ▶ Information needed to be better organized
- ▶ Lack of pictures

Inbox

On June 21, 2017, ISDH met with Indiana Lyme Connect, a Lyme advocacy group, to discuss several concerns. One concern they had was that the website was outdated. Here is their feedback:

- The website map identifies the counties where blacklegged ticks are found doesn't impart a sense of risk. It's also unclear how recent the data is.

Counties with *Ixodes scapularis*
(Deer Tick) Identified



JEN

JEN BROWN, DVM, MPH, DACVPM
State Public Health Veterinarian

Epidemiology Resource Center
Indiana State Department of Health
317.233.7272 office

<https://outlook.office.com/owa/projection.aspx>

- The prevention information on the website, wh useful, might benefit from reorganization.
 - Specifically, discuss permethrin ahead of information on repellents.
 - With regard to repellents it's important to offer alternatives to DEET. Picaridin is equally safe and effective as is lemon eucalyptus oil, which is preferred by peop who want to avoid chemicals by using natural products.
 - A link to the Tick Management Handbook Dr. Kirby Stafford of the Connecticut Agricultural Experiment Station, New Hav would be helpful.
<http://www.ct.gov/caes/lib/caes/document ublications/bulletins/b1010.pdf>
 - Appropriate pictures might be nice.

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Image provided by Jennifer Brown, DVM, MPH, DACVPM

Purpose of my field experience project:

- ▶ Redesign and provide up-to-date information on the Epidemiology Resource Center website of the Indiana State Department of Health (ISDH)
 - ▶ Zoonotic and Vector-Borne Epidemiology/ Entomology pages
- ▶ Update datasheets for the tick-borne and mosquito-borne disease pages
- ▶ Have pages reviewed and edited by ISDH staff also working on project
- ▶ Publish pages onto the website to be accessed by the general public.

Study location

Indiana State Department of Health located on 2N Meridian Street, Indianapolis, Indiana



Research Tasks

- ▶ Get familiar with ISDH Zoonotic and Vector-Borne Epidemiology Webpages
- ▶ General web searches- search results seen by the public
- ▶ Google searches with the terms “ISDH” and “Indiana State Department of Health”
- ▶ Identify the main Uniform Resource Locator (URL)



List of diseases

Tick-Borne Disease

- ▶ Anaplasmosis
- ▶ Babesiosis
- ▶ Ehrlichiosis
- ▶ Heartland virus
- ▶ Lyme disease
- ▶ Powassan virus
- ▶ Rocky Mountain Spotted Fever
- ▶ Tularemia

Mosquito-Borne diseases

- ▶ California serogroup viruses
- ▶ Chikungunya virus
- ▶ Dengue virus
- ▶ Eastern equine encephalitis virus
- ▶ La Crosse virus
- ▶ Malaria
- ▶ St. Louis encephalitis virus
- ▶ West Nile virus
- ▶ Yellow fever virus
- ▶ Zika virus

List of Tick Species:

- *Amblyomma americanum* (Lone Star tick)
- *Dermacentor variabilis* (American Dog tick)
- *Ixodes scapularis* (Black legged tick)
- *Rhipicephalus sanguineus* (Brown Dog tick)



Source:
<https://www.in.gov/isdh/28009.htm>



Source:
<https://www.in.gov/isdh/28010.htm>



Source: <https://www.in.gov/isdh/28005.htm>



Source:
<https://www.in.gov/isdh/28021.htm>

Standardized templates for disease pages

- ▶ Brief description of the disease
- ▶ Transmission information
- ▶ Signs and symptoms
- ▶ Data and statistics



Source:
http://www.state.in.us/isdh/files/Summer_2014_Newsletter.pdf



Source:
<http://www.pffp.iupui.edu/about/student-successes/potts-emily.shtml>

Review of pages by ISDH staff members: content review committee

- ▶ Jennifer Brown: State Public Health Veterinarian
- ▶ Emily Potts: Zika Clinical Coordinator
- ▶ Taryn Stevens: Zoonotic/Vector-borne Epidemiologist
- ▶ Bryan Price: Senior Medical Entomologist
- ▶ Lee Green: Medical Entomologist
- ▶ Doug Ginder: Medical Entomologist
- ▶ Jeanette McCanc: Medical Entomologist

Development of pages

- ▶ Developed presentation style that could be used for all disease pages
- ▶ Entomologists provided pictures of the parasites
- ▶ After initial editing, pages were revised by staff
- ▶ Dr. Jennifer Brown and Dr. Taryn Stevens made last review
- ▶ Reviewed pages were submitted to state epidemiologist Pam Pontones, and deputy state epidemiologist, Dr. Eric Hawkins to ensure information was relevant
- ▶ Pages finally submitted to the ISDH Office of Public Affairs for approval
- ▶ Dr. Taryn Stevens will post the pages to the websites

Results

Preliminary user testing showed that navigating the webpages was challenging

- ▶ Several pages were duplicated
- ▶ Information was outdated
- ▶ Some pages were blank
- ▶ Broken webpages
- ▶ Disclaimer: “We are working hard to update the content on this page. Please check back soon for more current information”

ISDH Home

About the Agency +

Contact & Information +

Forms +

Public Records Requests

Divisions

Drug Overdose Prevention

Epidemiology Resource Center (ERC)

Health and Human Services +

Health Care Quality & Regulatory +

Healthy Hoosiers Foundation

[ISDH HOME](#) » ERROR - PAGE NOT FOUND

ERROR - PAGE NOT FOUND

The Indiana State Department of Health has made major improvements to our Web site!

If you have navigated here via a bookmark or link from an outside Web site, please note that our Web site structure has recently changed, and many sections have moved. Please explore our site from our [home page](#).

Many of the areas you want are directly linked to from the left-side navigation. If you do not see what you're looking for there,

- Try either the [Health Information by Topic - A-Z](#) or [Reports and Statistics - A-Z](#) lists, or
- Try using the Search box at the top of the page to find the new locations of your favorite pages.

Please take the time to get to know us again, as we believe the new navigation and structure will lead to a better overall user experience.

If you are still unable to locate the information you need, please contact the program area for that section. Please refer to the organizational chart within [Contact Information](#).



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Eastern Equine Encephalitis Virus



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Malaria

Information

[Malaria Quick Fact](#)

Other Websites

- [CDC Malaria Website](#)
- [World Health Organization Malaria Website](#)

Page last updated: August 1, 2016

Page last reviewed: August 1, 2016

Content review committee

- ▶ Commented on the pages
- ▶ Made suggestions about content
- ▶ Corrected scientific details
- ▶ Offered more data as it pertained to Indiana
 - ▶ Alex Bowland, MPH: detailed Lyme disease surveillance data from 2009-2015
 - ▶ Specific for Indiana residents
- ▶ Made information more relatable to the public
- ▶ Provided pictures for webpages

Disease pages: Today

- ▶ All of the tick-borne diseases and tick species web pages have been updated and can be reached through the Zoonotic and Vector-Borne Epidemiology/ Entomology menu
<https://www.in.gov/isdh/25521.htm>
- ▶ Corrections to broken links and redundant pages for the mosquito-borne disease web pages still need to be made
- ▶ Pages expected to be functioning in the next few months.

Tick-borne/Mosquito-borne Disease pages: outline

- ▶ Immediate description
- ▶ Transmission
- ▶ Signs and symptoms
- ▶ Diagnosis
- ▶ Treatment
- ▶ Prevention
- ▶ Statistics
- ▶ Resources
- ▶ Information for providers
- ▶ Pictures

DISEASES

Every year, tens of thousands of Americans will get sick from diseases spread between animals and people. These are known as zoonotic diseases. Zoonotic means infectious diseases that are spread between animals and people. Zoonotic diseases are caused by harmful germs like viruses, bacterial, parasites, and fungi.

These germs can cause many different types of illnesses in people and animals ranging from mild to serious illness and even death. Some animals can appear healthy even when they are carrying germs that can make people sick. Visit the [CDC Zoonotic Disease webpage](#) for more information.

Mosquito-Borne Diseases	Tick-Borne Diseases	Zoonotic Diseases
California serogroup viruses	Anaplasmosis	Anthrax
Chikungunya virus	Babesiosis	Arenaviruses
Dengue virus	Ehrlichiosis	Baylisascaris larva migrans
Eastern Equine Encephalitis virus	Heartland virus	Brucellosis
La Crosse virus	Lyme disease	Hantavirus
Malaria	Powassan virus	Leptospirosis
St. Louis Encephalitis virus	Rocky Mountain Spotted Fever	Plague
West Nile virus	Tularemia	Psittacosis
Yellow Fever virus		Q Fever
Zika virus		Rabies
		Trichinellosis
		Tularemia

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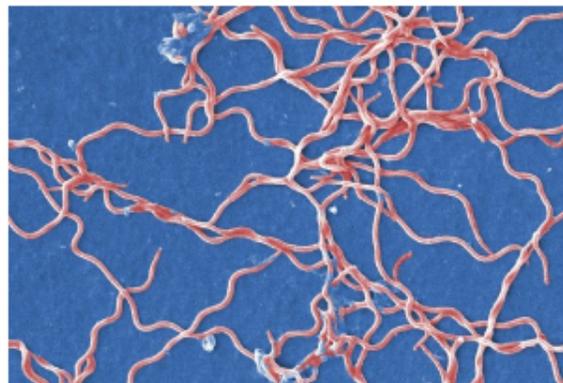
TB/Refugee Health ▾

International Travel ▾

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Lyme Disease

Lyme disease is an infection caused by the bacterium *Borrelia burgdorferi*, which is transmitted in Indiana by the bite of an infected [blacklegged tick](#) (*Ixodes scapularis*). Lyme disease is the most commonly reported tick-borne disease in Indiana in the United States. Typical symptoms include fever, headache, fatigue, and a skin rash with a characteristic “bull’s-eye” appearance. If left untreated, infection can spread to joints, the heart, and the nervous system.



Borrelia burgdorferi. Photo: Janice Haney Carr, Centers for Disease Control and Prevention.



Transmission

The Lyme disease bacterium is transmitted in Indiana by the [blacklegged tick \(*Ixodes scapularis*\)](#). In most cases, an infected tick must be attached to the body for at least 36–48 hours before the bacterium can be transmitted. Most humans are infected through the bites of immature ticks called nymphs, which are extremely small (less than 2 mm) and difficult to see. In Indiana, nymphs are most active during spring and summer. Adult ticks, which are most active during the late summer and fall, can also transmit Lyme disease bacteria.

Signs and Symptoms

Signs and symptoms of Lyme disease usually appear within 3–30 days of a bite from an infected tick. People in the early stages of illness can experience flu-like symptoms, such as:

- Fever
- Chills
- Headache
- Fatigue
- Muscle and joint aches
- Swollen lymph nodes

Approximately 70–80% of Lyme disease patients will experience a characteristic “bull’s-eye” or erythema migrans (EM) skin rash. The EM rash expands gradually over a period of days and may reach a diameter of 12 inches or more. It may feel warm to the touch, but is rarely itchy or painful. EM rashes typically first appear at the site of the tick bite, but may appear on any area of the body.



Erythema migrans rash. Photo: James Gathany, Centers for Disease Control and Prevention.

Later signs of Lyme disease can include arthritis with severe joint pain and swelling, complications affecting the nervous system (e.g., facial palsy), and heart problems (e.g., irregular heartbeat).



Classic erythema migrans rash

Facial palsy

Swollen knee



Diagnosis

Diagnosis of Lyme disease is based upon the patient's signs and symptoms, a history of possible exposure to ticks, and appropriate laboratory testing. Early recognition of symptoms is important for prompt diagnosis and treatment. If you think that you have Lyme disease, contact your health care provider.

People who have removed an attached tick sometimes wonder if they should have it tested for tick-borne diseases. Although some laboratories offer this testing, ISDH does not recommend it. If the tick tests positive, it does not necessarily mean that you have been infected; if the tick tests negative, it may provide a false sense of security because you may have been unknowingly bitten by a different tick that was infected.

Treatment

Patients treated with appropriate antibiotics in the early stages of Lyme disease usually recover rapidly and completely. Most patients are treated for Lyme disease with a short course of oral antibiotics; however, intravenous treatment may be needed for more severe cases, such as people with complications affecting the heart or nervous system.

Post-Treatment Lyme Disease Syndrome

Some patients may continue to have non-specific symptoms such as fatigue, pain, and joint and muscle aches that persist for months after treatment. This is called post-treatment Lyme disease syndrome, or PTLDS. The cause of PTLDS is unknown.

Prevention



Prevention

There is currently no Lyme disease vaccine available for human use. The best way to prevent Lyme disease is to avoid tick bites. Please see our [tick prevention page](#) for more information.

For more information about Lyme disease, please visit the [CDC Lyme Disease webpage](#).

Statistics

For Lyme disease statistics in Indiana, please visit our [Lyme Disease Statistics page](#).

National statistics for Lyme disease can be found at the [CDC Lyme Disease Data and Statistics webpage](#).

Resources

[Indiana Tick Trail Sign](#)

[CDC Educational Materials](#)

[Lyme Disease Quick Facts](#)

Information for Providers

For Lyme disease diagnosis, treatment, and testing information, [click here](#).

[Health advisory from ISDH on RMSF and other tick-borne diseases.](#)

[Tickborne Diseases of the United States.](#)

Types of ticks: outline

- ▶ Scientific name/ common name
- ▶ Geographic distribution
- ▶ Life cycle
- ▶ Associated diseases
- ▶ Prevention (of tick-borne diseases)
- ▶ Images of ticks



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Maps and Statistics

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We are working hard to update these webpages. Please check back frequently for updates.

What We Do

Mosquitoes and Mosquito-Borne Illnesses

A variety of diseases may be spread by mosquitoes in Indiana and abroad.

[Diseases](#) | [Types of Mosquitoes](#) | [Prevention](#) | [For International Travelers](#)

Ticks and Tick-Borne Illnesses

A variety of diseases may be spread by ticks in Indiana and abroad.

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Zoonotic Pests and Diseases

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Pests

A variety of diseases may be spread by mosquitoes, ticks, and animals.

Mosquitoes

- [Aedes albopictus](#)
- [Culex species](#)
- [Anopheles species](#)

[Diseases](#) | [Prevention](#) | [For International Travelers](#)

Ticks

- [Amblyomma americanum \(Lone Star tick\)](#)
- [Dermacentor variabilis \(American dog tick\)](#)
- [Ixodes scapularis \(Blacklegged tick\)](#)
- [Rhipicephalus sanguineus \(Brown dog tick\)](#)

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Ixodes scapularis

Common name: Blacklegged tick

Blacklegged Tick (*Ixodes scapularis*)

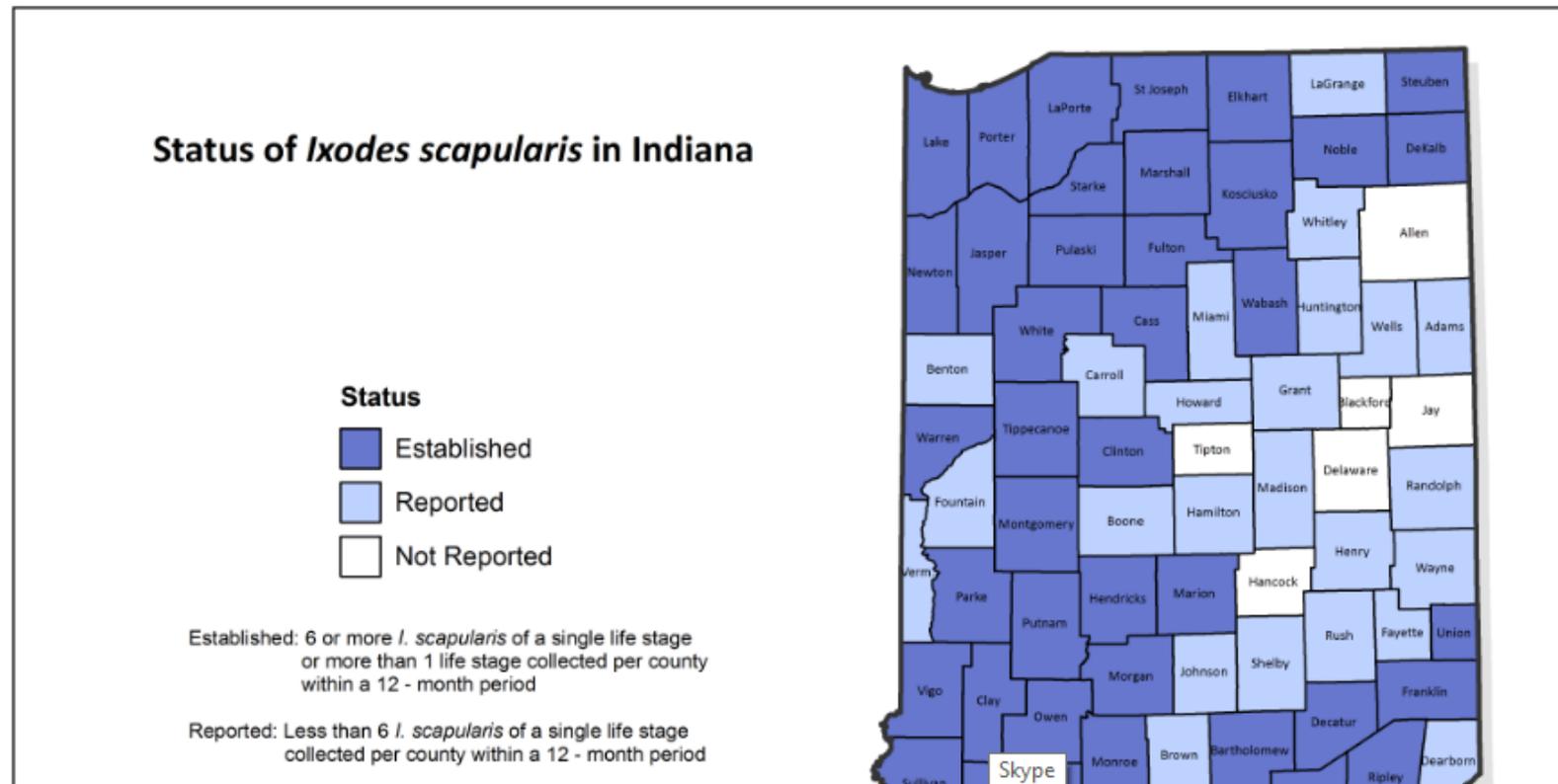


Graphic: Centers for Disease Control and Prevention.

Geographic distribution

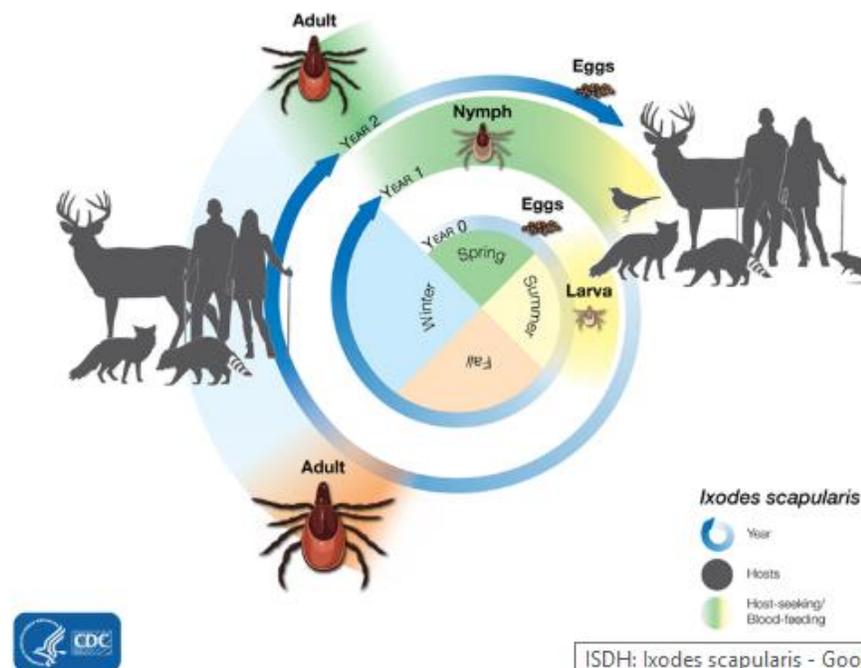
Geographic distribution

Present in most Indiana counties. Widely distributed in the Northeastern and upper Midwestern United States. Click [here](#) to see the geographic distribution of ticks that bite humans in the United States.



Life cycle

The blacklegged tick life cycle consists of four stages (egg, larva, nymph, and adult) and usually takes two years to complete. Each stage, the tick must have a blood meal in order to molt and develop to the next stage. Both nymphs and adults can feed on humans and are capable of transmitting disease. In Indiana, nymphs are most active during spring and summer and adults are most active during the late summer and fall. However, adult ticks may be active any time winter temperatures are above freezing.





Associated diseases

- [Lyme disease](#)
- [Anaplasmosis](#)
- [Babesiosis](#)
- [Powassan virus](#)

Prevention

The best way to prevent diseases associated with blacklegged ticks is to avoid tick bites. Please see our [tick prevention page](#) for more information.

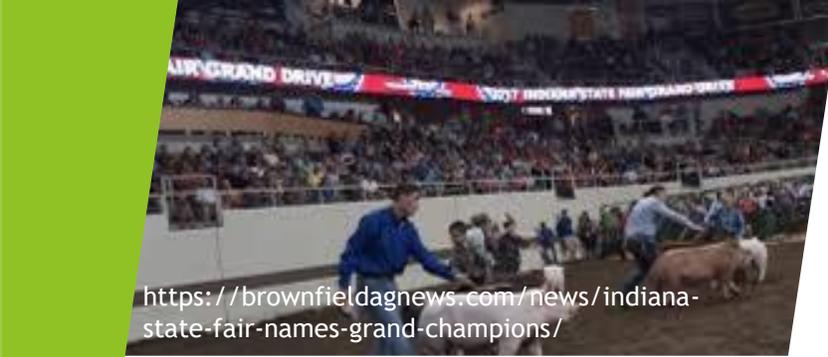
For more information about blacklegged ticks, please visit the [Midwest Center of Excellence in Vector-Borne Disease](#).

Images



Future plans for website

- ▶ Organize surveys to ensure website is user-friendly and easily accessible.
- ▶ Send surveys to public health clinics
- ▶ Surveys for the public
 - ▶ Clients at public health clinics
 - ▶ Attendees at county and state fairs, where at least one ISDH representative is present
 - ▶ Help medical practitioners and the general public realize the existence and value of the website



<https://brownfielddagnews.com/news/indiana-state-fair-names-grand-champions/>



<https://healthcenter.indiana.edu/>



<http://inscopearchive.iu.edu/features/stories/2014-05-01-story-iusm-sb-clinic-inscope.shtml>



<http://www.co.marion.or.us/CS/fair>



Questions?

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