Surveillance for Babesiosis —

United States, 2020

Annual Summary

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Main Findings for 2020

- For 2020, CDC received reports for a total of 1,827 cases of babesiosis in the US, a 24% decrease from the total of 2,418 cases for 2019
- Babesiosis was a reportable disease in 40 states and the District of Columbia (DC) in 2020; 24 (60%) of the 40 states notified CDC of at least 1 case
- Most of the reported cases (98%; n = 1,789/1,827) were in residents of 10 states where tickborne transmission of *Babesia* parasites is well established (the Northeast and upper Midwest: Connecticut, Maine, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Rhode Island, Vermont, and Wisconsin)
- COVID-19 likely had an impact on public health activities including case identification and case investigations, as well as possibly impacting transmission rates

Background

Babesiosis
Babesiosis is caused by protozoan parasites of the genus *Babesia*, which infect red blood cells. *Babesia* parasites are usually transmitted to humans by tick bites but can also be transmitted by blood transfusion or congenitally (mother to child) (1–3).

Most human cases of *Babesia* infection in the United States are caused by the parasite *Babesia microti*. Occasional U.S. cases caused by other species (types) of *Babesia* have been found (4, 5). *Babesia microti* is most commonly spread by *Ixodes scapularis* ticks (also called blacklegged ticks or deer ticks) primarily in the Northeast and upper Midwest, especially in New England, New York State, New Jersey, Wisconsin, and Minnesota (1, 6–8). Babesiosis is spread by young nymph ticks which are often found in woods, brushy areas, or grass during warmer months (spring and summer). The ticks are very small (about the size of a poppy seed); because of their small size infected people might not remember having a tick bite.

Many people who are infected with *Babesia microti* are asymptomatic. Some people develop flu-like symptoms such as fever, chills, sweats, headache, body aches, loss of appetite, nausea, or fatigue. Babesiosis can also cause severe complications such as hemolytic anemia, a very low platelet count (thrombocytopenia), malfunction of the vital organs (acute respiratory failure, congestive heart failure, and renal failure) and death (7).

Babesiosis can be a severe, life-threatening disease (1, 7), particularly in people who:
- do not have a spleen or have had their spleen removed;
- have a weak immune system for other reasons (such as cancer, lymphoma, or AIDS);
- have other serious health conditions (such as liver or kidney disease); or
- are elderly.

Surveillance
CDC has conducted surveillance for babesiosis in the United States since January 2011, when babesiosis became a nationally notifiable condition. The babesiosis case definition used for surveillance purposes is available online (https://ndc.services.cdc.gov/case-definitions/babesiosis-2011/) and is summarized in **Table 1**. Health departments in states where babesiosis is reportable notify CDC of cases that meet the definition via the **National Notifiable Diseases Surveillance System (NNDSS)**

Health departments submit additional information about reported cases using the CDC Case Report Form (CRF) **Babesiosis CRF [PDF, 2 pages, 650 KB]**; data are requested about risk factors for infection,

clinical manifestations, and laboratory results. Of note, for some cases, requested data elements may be incomplete or missing. For example, data regarding clinical manifestations are collected as distinct questions, resulting in differences in the denominator across each sign/symptom. For more information, visit **babesiosis surveillance and case reporting**. Healthcare providers, laboratories, and the general public should contact their state health department for information about reporting cases of babesiosis.

The number of states in which babesiosis is a reportable condition may change from year to year as additional states begin conducting surveillance. Cases are reported by state and county of residence, which is not necessarily where the exposure occurred. Changes in the number of reported cases do not necessarily represent true changes in disease incidence; ascertainment, reporting, and investigation of cases are subject to clinician awareness and public health agency resources, which may vary from year to year in and among states.

This summary focuses on babesiosis cases reported for surveillance year 2020; some data from previous years (2011–2019) are included to show differences from year to year. Babesiosis surveillance data also are presented in CDC's **Morbidity and Mortality Weekly Report (MMWR)** weekly and annual summaries of nationally notifiable diseases. National surveillance data for 2011 and a 5-year summary (2011–2015) were published previously (8, 9), and an analysis of trends in reported babesiosis cases from 2011-2019 has been published (10). Because of differences in the timeline for finalizing data in the annual surveillance datasets, data provided in this summary may differ slightly from those previously published. Of note, the year in which a case is counted in national surveillance summaries is assigned by the health department and might reflect the year of symptom onset, diagnosis, or of reporting to or by the health department.

COVID-19 and case reporting
During the 2020 reporting year, reporting jurisdictions faced challenges related to the COVID-19 pandemic that could have impacted data completeness such as the diversion of staffing and other resources from babesiosis surveillance activities. Data from states may be missing or incomplete due to the impact of COVID-19 on health department activities. Impact on the data could include case counts as well as specific case data such as onset date, symptoms reported and risk factors.

2020 babesiosis surveillance summary

Geographic distribution
In 2020 CDC was notified of a total of 1,827 cases of babesiosis by 24 of the 40 states in which babesiosis was a reportable condition (60%) (**Table 2**). This was a 24% decrease from the total of 2,418 cases for 2019 (**Figure 1**). For 2020, 98% (n =1,789/1,827) of the reported cases were residents of 10 states (Connecticut, Maine, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Rhode Island, Vermont, and Wisconsin). Tickborne transmission of *Babesia* parasites is well established in parts of these states. Differences within and among states in the distributions of reported cases by place of residence are evident in the county-level maps for 2020 (**Figure 2**) and the 9 prior years (2011–2019) in which national surveillance was conducted (**Appendix**). Among the 164 counties with at least 1 reported case of babesiosis for 2020, 101 counties (61%) reported 1–5 cases, 16 counties (10%) reported 6–10 cases, 22 counties (13%) reported 11–20 cases, and 26 (16%) had >20 reported cases. The number of counties reporting greater than 20 cases decreased from 36 in 2019 to 26 in 2020. The 26 counties with >20 cases reported were in Massachusetts (n=9), New York (n=8), Rhode Island (n=4), Connecticut (n=3), and New Jersey (n=2). Many cases in states without well-established local transmission of babesiosis had documented travel to areas with established local transmission.

Babesiosis by demographics
The majority of case-patients in the United States were older, with a median age of 65 years (range: <1–96 years; n = 1,827). The age distributions for 2020 and the 9 previous years were similar (**Figure 3**), with the largest number of cases reported in persons aged 60–69 years. As in previous years, among the 1,818 case-patients for whom data on sex were available in 2020, 63% (n = 1,143) were male and 37% (n=675) were female. Most people identified as white non-Hispanic (56%, n=1019)), 5% as Hispanic (n=99), 3% asian/pacific islander (n=50), 2% black non-Hispanic (n=29), and 33% (n=609) had an unknown or unreported race and ethnicity.

Seasonality
Most case-patients reported getting sick during the spring or summer months, which is consistent with tick activity. Data on month of symptom onset were available for 90% of case-patients (n = 1,418/1,827). The proportion of case-patients with reported symptom onset during June–August has remained consistent from year to year since 2011 (**Figure 4**).

Symptoms and fatal cases
Among the case-patients for whom data were available, fever was the most frequently reported sign or symptom (80%; n = 1,306/1,641 patients), followed by myalgia (muscle aches) (63%; n = 913/1,452), headache (55%; n= 804/1,453), chills (58%; n = 772/1,338), joint pain (48%, n=621/1288), thrombocytopenia (low platelet count) (62%; n = 556/892), and anemia (60%; n = 548/910).

For 2020, 753 (46%) people were hospitalized for at least 1 day; hospitalization data were available for 1,636 case-patients. These data are consistent with previous years; overall for 2011–2020, data were available for 14,926 case-patients (85% of the total of 17,614), 6,820 (46%) of whom had reportedly been hospitalized for at least 1 day. In 2020, 11 cases died with 5 deaths occurring in New Jersey, 2 in Massachusetts, 2 in Rhode Island, 1 in New York, and 1 in Maine; with an overall death rate of 1%.

Epidemiologic factors
Babesiosis is primarily transmitted via tick bites but can also be transmitted through blood transfusions, transplants, and from mother to child (congenitally). In 2020, of the 839 case-patients for whom data were available, 334 (40%) recalled having a tick bite in the 8 weeks before symptom onset. In 2020 there were no reports of babesiosis in blood recipients that were classified by the reporting state as transfusion associated.

Table 1. National surveillance case definition for babesiosis*

Clinical evidence	**Objective** One or more of the following: fever, anemia, or thrombocytopenia. **Subjective** One or more of the following: chills, sweats, headache, myalgia, or arthralgia.
Epidemiologic evidence for transfusion transmission	For the purposes of surveillance, epidemiologic linkage between a transfusion recipient and a blood donor is demonstrated if all of the following criteria are met: **In the transfusion recipient** Received one or more red blood cell (RBC) or platelet transfusions within 1 year before the collection date of a specimen with laboratory evidence of *Babesia* infection; **and** At least one of these transfused blood components was donated by the donor described below; **and** Transfusion-associated infection is considered at least as plausible as tickborne transmission; **and** **In the blood donor** Donated at least one of the RBC or platelet components that was transfused into the above recipient; **and** The plausibility that this blood component was the source of infection in the recipient is considered equal to or greater than that of blood from other involved donors. (More than one plausible donor can be linked to the same recipient.)
Laboratory criteria for diagnosis	**Laboratory confirmatory** Identification of intraerythrocytic *Babesia* organisms by light microscopy in a Giemsa, Wright, or Wright-Giemsa–stained blood smear; **or** Detection of *Babesia microti* DNA in a whole blood specimen by polymerase chain reaction (PCR); **or** Detection of *Babesia* spp. genomic sequences in a whole blood specimen by nucleic acid amplification; **or** Isolation of *Babesia* organisms from a whole blood specimen by animal inoculation. **Laboratory supportive** Demonstration of a *Babesia microti* indirect fluorescent antibody (IFA) total immunoglobulin (Ig) or IgG antibody titer of ≥1:256 (or ≥1:64 in epidemiologically linked blood donors or recipients); **or** Demonstration of a *Babesia microti* immunoblot IgG positive result; **or** Demonstration of a *Babesia divergens* IFA total Ig or IgG antibody titer of ≥1:256; **or** Demonstration of a *Babesia duncani* IFA total Ig or IgG antibody titer of ≥1:512.

Case classification	
Confirmed	A case that has confirmatory laboratory results and meets at least one of the objective or subjective clinical evidence criteria, regardless of the mode of transmission (can include clinically manifest cases in transfusion recipients or blood donors).
Probable	A case that has supportive laboratory results and meets at least one of the objective clinical evidence criteria (subjective criteria alone are not sufficient); **or** A case that is in a blood donor or recipient epidemiologically linked to a confirmed or probable babesiosis case (as defined above) **and** Has confirmatory laboratory evidence but does not meet any objective or subjective clinical evidence criteria; **or** Has supportive laboratory evidence and might or might not meet any subjective clinical evidence criteria but does not meet any objective clinical evidence criteria.

*Available at https://ndc.services.cdc.gov/case-definitions/babesiosis-2011/

Table 2. Number and incidence of reported cases of babesiosis, by state and year, 2011–2020*

State‡	2011		2012		2013		2014		2015		2016		2017		2018		2019		2020†	
	No.	Rate§	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Alabama	1	<0.1	0	0	0	0	1	<0.1	2	<0.1	0	0	1	<0.1	0	0	0	0	0	0
Alaska§	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arizona	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	0	0	0	0	0
Arkansas	—	—	—	—	—	—	—	—	0	0	1	<0.1	0	0	2	<0.1	1	<0.1	0	0
California	1	<0.1	4	<0.1	3	<0.1	3	<0.1	5	<0.1	3	<0.1	4	<0.1	6	<0.1	2	<0.1	1	<0.1
Colorado§	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Connecticut	74	2.1	123	3.4	268	7.5	205	5.7	328	9.1	322	9	309	8.6	248	6.9	323	9.0	151	4.2
Delaware	1	0.1	0	0	2	0.2	1	0.1	1	0.1	2	0.2	4	0.4	3	0.3	3	0.3	4.0	0.4
District of Columbia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	0.3	0	0	0	0
Florida	—	—	—	—	—	—	—	—	—	—	—	—	9	<0.1	19	<0.1	24	<0.1	2	<0.1
Georgia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	0	1	<0.1	0	0
Hawaii§	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Idaho§	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Illinois	—	—	—	—	—	—	1	<0.1	3	<0.1	2	<0.1	0	0	1	<0.1	1	<0.1	5	<0.1
Indiana	0	0	1	<0.1	1	<0.1	0	0	0	0	0	0	1	<0.1	1	<0.1	0	0.00	1	<0.1
Iowa	—	—	—	—	—	—	—	—	—	—	—	—	2	0.1	0		0		1	<0.1
Kansas	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0	0	0	0	0	0
Kentucky	—	—	—	—	—	—	—	—	0	0	0	0	0	0	0	0	0	0	0	0
Louisiana	—	—	—	—	2	<0.1	0	0	1	<0.1	0	0	1	<0.1	1	<0.1	0	0	1	<0.1
Maine	9	0.7	10	0.8	36	2.7	42	3.2	55	4.1	82	6.2	118	8.8	101	7.5	138	10.3	66	4.8
Maryland	4	0.1	3	0.1	9	0.2	2	<0.1	4	0.1	6	0.1	5	<0.1	7	0.1	7	0.1	9	0.1
Massachusetts	208	3.1	261	3.9	417	6.2	535	7.9	444	6.5	517	7.6	591	8.6	527	7.6	636	9.2	580	8.3
Michigan	0	0	0	0	2	<0.1	2	<0.1	3	<0.1	2	<0.1	3	<0.1	1	<0.1	1	<0.1	0	0
Minnesota	73	1.4	41	0.8	64	1.2	49	0.9	45	0.8	50	0.9	60	1.1	49	0.9	55	1.0	—	—
Mississippi§	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Missouri	—	—	—	—	—	—	—	—	—	—	1	<0.1	0	0	0	0	3	<0.1	0	0
Montana	—	—	—	—	—	—	0	0	0	0	1	0.1	0	0	0	0	0	0	0	0
Nebraska	0	0	1	0.1	1	0.1	0	0	0	0	1	0.1	0	0	0	0	0	0	0	0
Nevada§	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
New Hampshire	13	1	19	1.4	22	1.7	42	3.2	53	4	13	1	78	5.8	37	2.7	63	4.6	28	2.0
New Jersey	166	1.9	92	1	171	1.9	159	1.8	281	3.1	174	1.9	193	2.1	247	2.8	236	2.6	237	2.6

New Mexico§	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
New York	418	2.1	253	1.3	534	2.7	471	2.4	581	2.9	430	2.2	696	3.5	641	3.3	663	3.4	461	2.3
North Carolina§	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
North Dakota	1	0.1	0	0	1	0.1	0	0	3	0.4	1	0.1	0	0	1	0.1	0	0.0	0	0.0
Ohio	—	—	—	—	—	—	1	<0.1	2	<0.1	—	—	1	<0.1	4	<0.1	4	<0.1	1	<0.1
Oklahoma§	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oregon	1	<0.1	0	0	0	0	1	<0.1	2	<0.1	2	<0.1	5	0.1	2	<0.1	2	<0.1	4	0.1
Pennsylvania§	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rhode Island	73	6.9	56	5.3	142	13.5	172	16.3	190	18	155	14.7	161	15.2	165	15.6	158	14.9	193	17.6
South Carolina	—	—	—	—	1	<0.1	3	0.1	2	<0.1	2	<0.1	2	<0.1	1	<0.1	0	0	0	0
South Dakota	—	—	—	—	1	0.1	1	0.1	0	0	0	0	0	0	0	0	0	0	1	<0.1
Tennessee	1	<0.1	0	0	0	0	0	0	1	<0.1	1	<0.1	1	<0.1	1	<0.1	1	<0.1	1	<0.1
Texas	—	—	—	—	1	<0.1	1	<0.1	1	<0.1	1	<0.1	0	0	2	<0.1	2	<0.1	3	<0.1
Utah	—	—	—	—	—	—	0	0	0	0	0	0	1	<0.1	1	<0.1	0	0	0	0
Vermont	2	0.3	2	0.3	6	1	3	0.5	9	1.4	15	2.4	22	3.5	21	3.4	34	5.4	16	2.5
Virginia	—	—	—	—	—	—	—	—	—	—	—	—	0	0	5	<0.1	1	<0.1	3	<0.1
Washington	0	0	0	0	1	<0.1	4	0.1	2	<0.1	0	0	1	<0.1	0	0	1	<0.1	0	0
West Virginia	—	—	—	—	0	0	0	0	0	0	0	0	1	0.1	1	<0.1	0	<0.1	0	0
Wisconsin	80	1.4	45	0.8	76	1.3	43	0.7	56	1	68	1.2	88	1.5	64	1.1	58	1.0	57	1.0
Wyoming	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	<0.1
Total¶,#	1,126	0.8	911	0.6	1,761	1	1,742	0.8	2,074	0.9	1,909	0.8	2,358	0.9	2,161	0.77	2,418	0.86	1827	0.65

* Year as reported by the health department

† Cases were reported by state of residence, which was not necessarily the state of exposure.

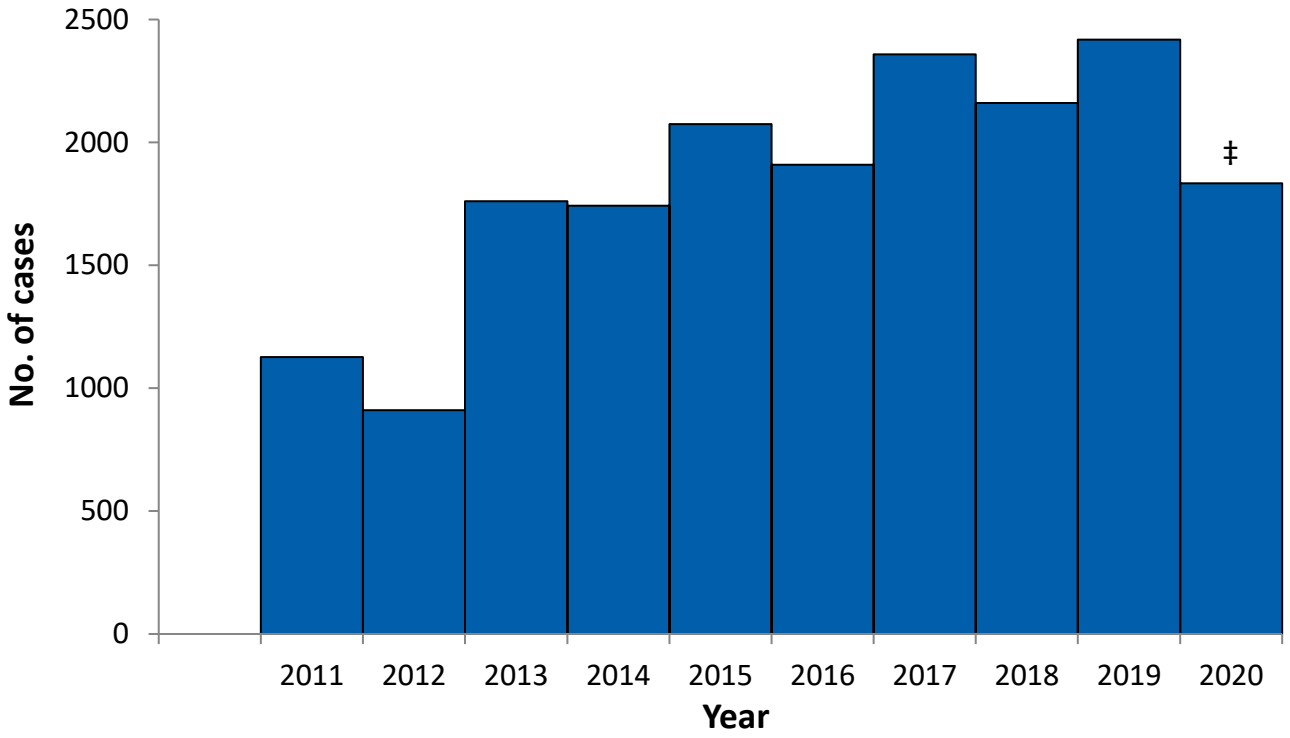
‡ Rate per 100,000 population (11)

§ Babesiosis is not a reportable condition by law in these states

¶ The denominators for calculations of total incidence rates included only the populations of states in which babesiosis was a reportable condition during the pertinent year

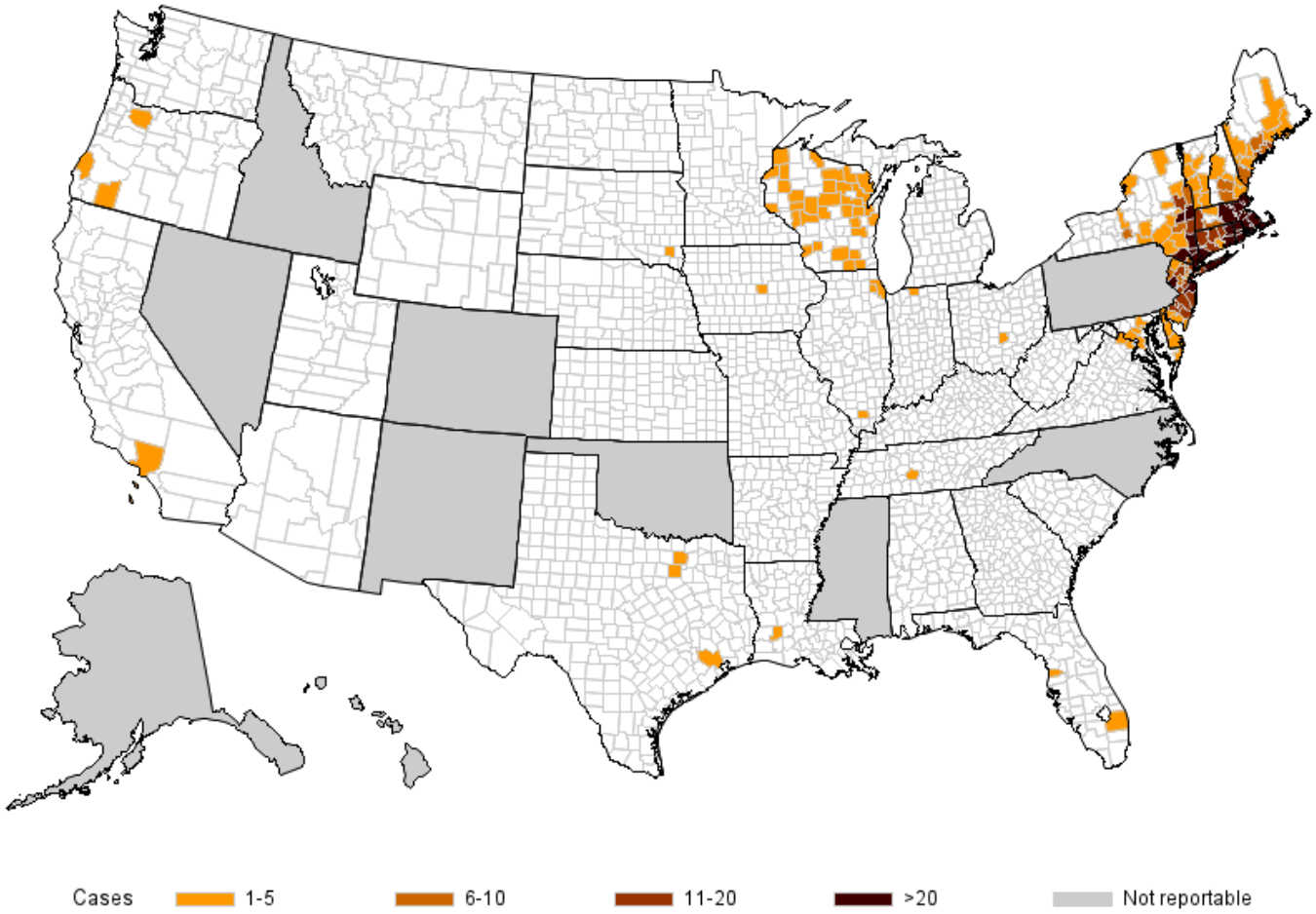
2020 data may be lower or higher than previous years. COVID-19 likely had an impact on public health activities including case identification, case investigations, as well as possibly impacting transmission rates. This may reflect the impact of isolation and prevention measures, whether people sought health care when they were ill, and other changes in behavior during the COVID-19 pandemic period.

Figure 1. Number* of reported cases of babesiosis, by year, 2011–2020†



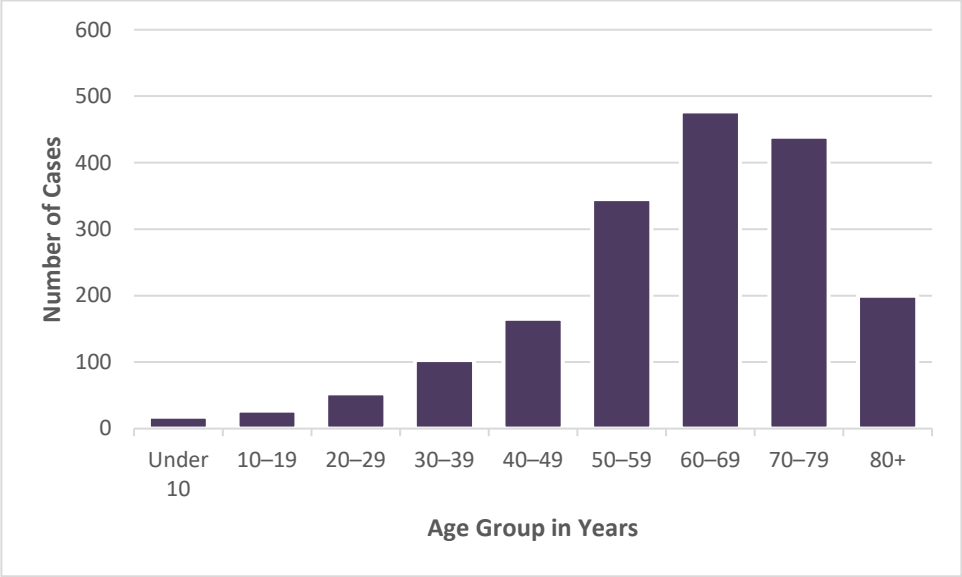
* A total of 18,294 cases of babesiosis were reported (2011, n = 1,126; 2012, n = 911; 2013, n = 1,761; 2014, n = 1,742; 2015, n = 2,074; 2016, n = 1,909; 2017, n = 2,358; 2018, n = 2,161; 2019, n = 2,418; 2020, n = 1,834).
† Year as reported by the health department.
‡ 2020 data may be lower or higher than previous years. COVID-19 likely had an impact on public health activities including case identification, case investigations, as well as possibly impacting transmission rates. This may reflect the impact of isolation and prevention measures, whether people sought health care when they were ill, and other changes in behavior during the COVID-19 pandemic period.

Figure 2. Number* of reported cases of babesiosis, by county of residence — 40 states, 2020†,‡



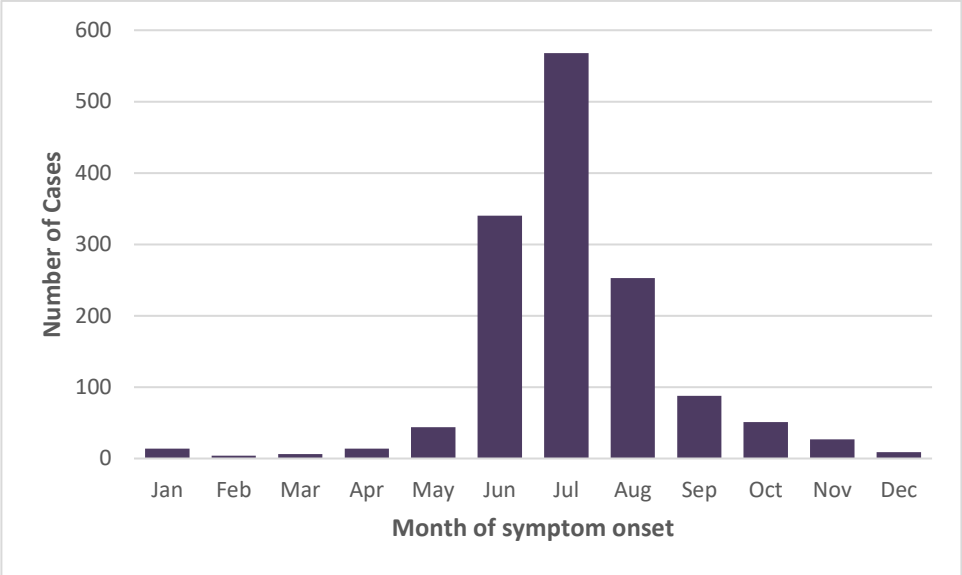
* N = 1,826; county of residence was known for all but 1 (<1%) of the 1,827 total case-patients. See the Appendix for the maps for surveillance years 2011–2019.
† Year as reported by the health department.
‡ 2020 data may be lower or higher than previous years. COVID-19 likely had an impact on public health activities including case identification, case investigations (limited case investigations or none), as well as possibly impacting transmission rates. This may reflect the impact of isolation and prevention measures, whether people sought health care when they were ill, and other changes in behavior during the COVID-19 pandemic period.

Figure 3. Number of reported cases of babesiosis, by age group* in years, 2020†,‡



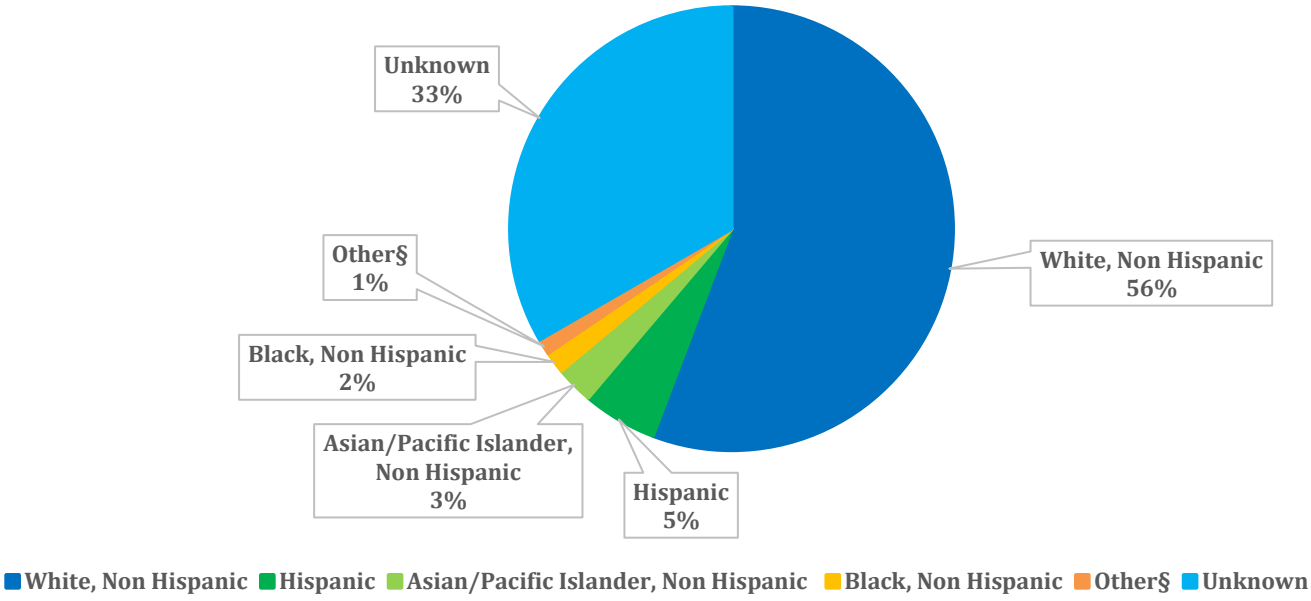
* Data on age were available for most case-patients (2020, n = 1,827).
† Year as reported by the health department.
‡ 2020 data may be lower or higher than previous years. COVID-19 likely had an impact on public health activities including case identification, case investigations, as well as possibly impacting transmission rates. This may reflect the impact of isolation and prevention measures, whether people sought health care when they were ill, and other changes in behavior during the COVID-19 pandemic period.

Figure 4. Number of reported cases of babesiosis, by month of symptom onset*, 2020†,‡



* Data on month of symptom onset were available for most case-patients (2020, n = 1,418).
† Year as reported by the health department.
‡ 2020 data may be lower or higher than previous years. COVID-19 likely had an impact on public health activities including case identification, case investigations, as well as possibly impacting transmission rates. This may reflect the impact of isolation and prevention measures, whether people sought health care when they were ill, and other changes in behavior during the COVID-19 pandemic period.

Figure 5. Babesiosis Cases by Reported Race/Ethnicity*, United States, 2020†,‡



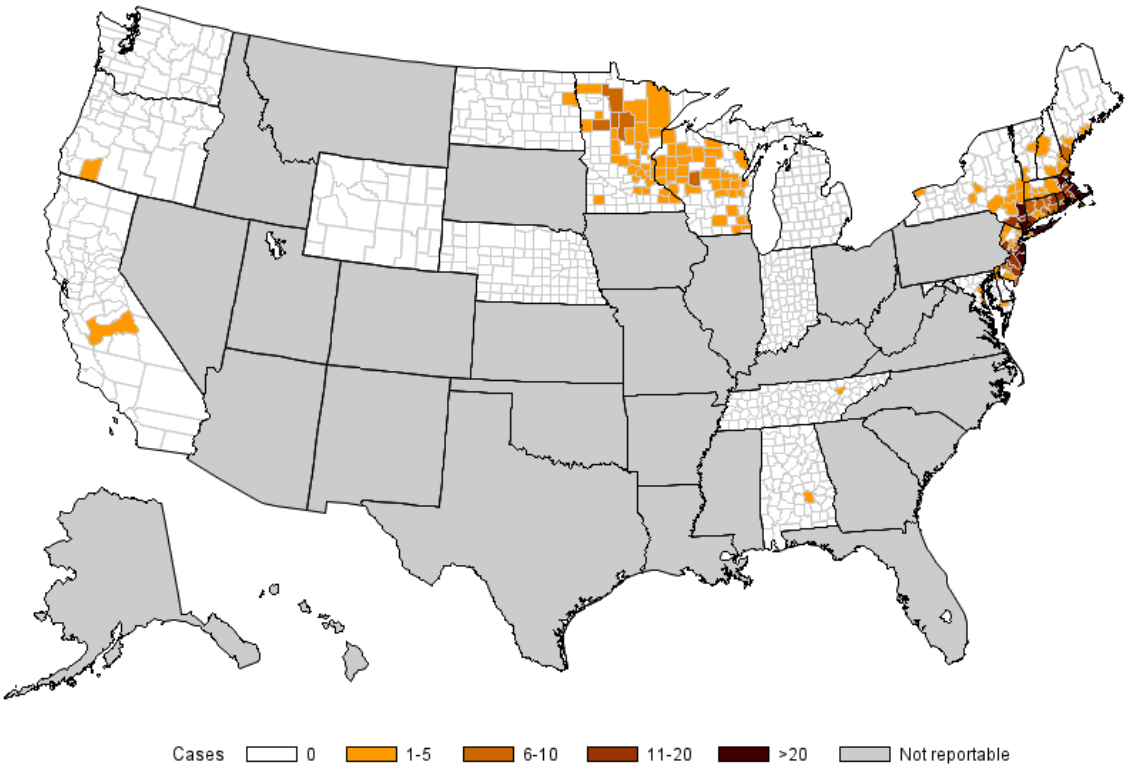
* Data on race and ethnicity were available for 67% of case-patients (2020, n = 1,158).
† Year as reported by the health department.
‡ 2020 data may be lower or higher than previous years. COVID-19 likely had an impact on public health activities including case identification, case investigations, as well as possibly impacting transmission rates. This may reflect the impact of isolation and prevention measures, whether people sought health care when they were ill, and other changes in behavior during the COVID-19 pandemic period.
§The 'Other' category includes case-patients in the following groups: American Indian/Alaska Native and multiple races

References

1. Herwaldt BL, Linden JV, Bosserman E, Young C, Olkowska D, Wilson M. Transfusion-associated babesiosis in the United States: a description of cases. Ann Intern Med 2011;155:509–19.
2. Joseph JT, Purtill K, Wong SJ, et al. Vertical transmission of *Babesia microti*, United States. Emerg Infect Dis 2012;18:1318–21.
3. Fox LM, Wingerter S, Ahmed A, et al. Neonatal babesiosis: case report and review of the literature. Pediatr Infect Dis J 2006;25:169–73.
4. Conrad PA, Kjemtrup AM, Carreno RA, et al. Description of *Babesia duncani* n.sp. (Apicomplexa: Babesiidae) from humans and its differentiation from other piroplasms. Int J Parasitol 2006;36:779–89.
5. Herwaldt BL, de Bruyn G, Pieniazek NJ, et al. *Babesia divergens*–like infection, Washington State. Emerg Infect Dis 2004;10:622–9.
6. Herwaldt BL, McGovern PC, Gerwel MP, Easton RM, MacGregor RR. Endemic babesiosis in another eastern state: New Jersey. Emerg Infect Dis 2003;9:184–8.
7. Wormser GP, Dattwyler RJ, Shapiro ED, et al. The clinical assessment, treatment, and prevention of Lyme disease, human granulocytic anaplasmosis, and babesiosis: clinical practice guidelines by the Infectious Diseases Society of America. Clin Infect Dis 2006;43:1089–134. Erratum in: Clin Infect Dis 2007;45:941.
8. Centers for Disease Control and Prevention. Babesiosis surveillance — 18 states, 2011. Morb Mortal Wkly Rep 2012;61:505–9.
9. Gray EB, Herwaldt BL. Babesiosis surveillance — United States, 2011–2015. MMWR Surveill Summ 2019;68(No. SS-6):1–11. DOI: http://dx.doi.org/10.15585/mmwr.ss6806a1
10. Swanson M, Pickrel A, Williamson J, Montgomery S. Trends in Reported Babesiosis Cases — United States, 2011–2019. MMWR Morb Mortal Wkly Rep 2023;72:273–277. DOI: http://dx.doi.org/10.15585/mmwr.mm7211a1
11. US Census Bureau. Annual estimates of the resident population: April 1, 2010 to July 1, 2018. Washington, DC: US Census Bureau; 2018. https://www.census.gov/newsroom/press-kits/2018/pop-estimates-national-state.html. Accessed on April 1 2020.

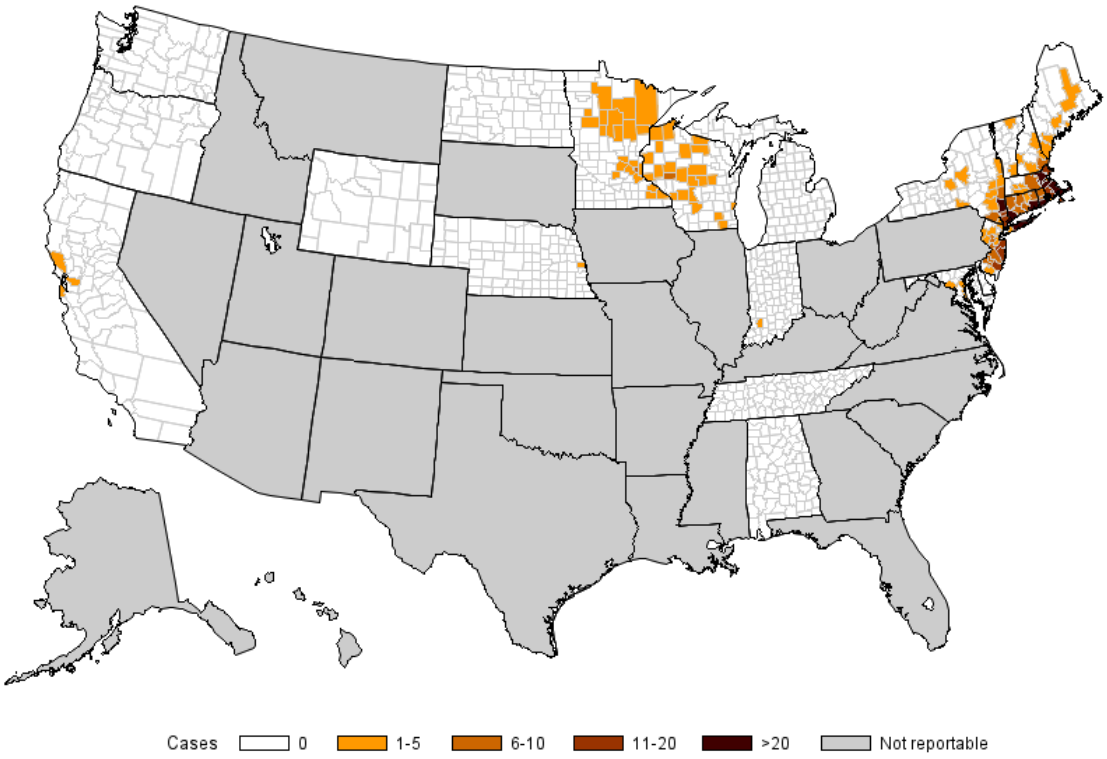
Appendix. Maps for surveillance years 2011–2019

2011: Number* of reported cases of babesiosis, by county of residence — 22 states†



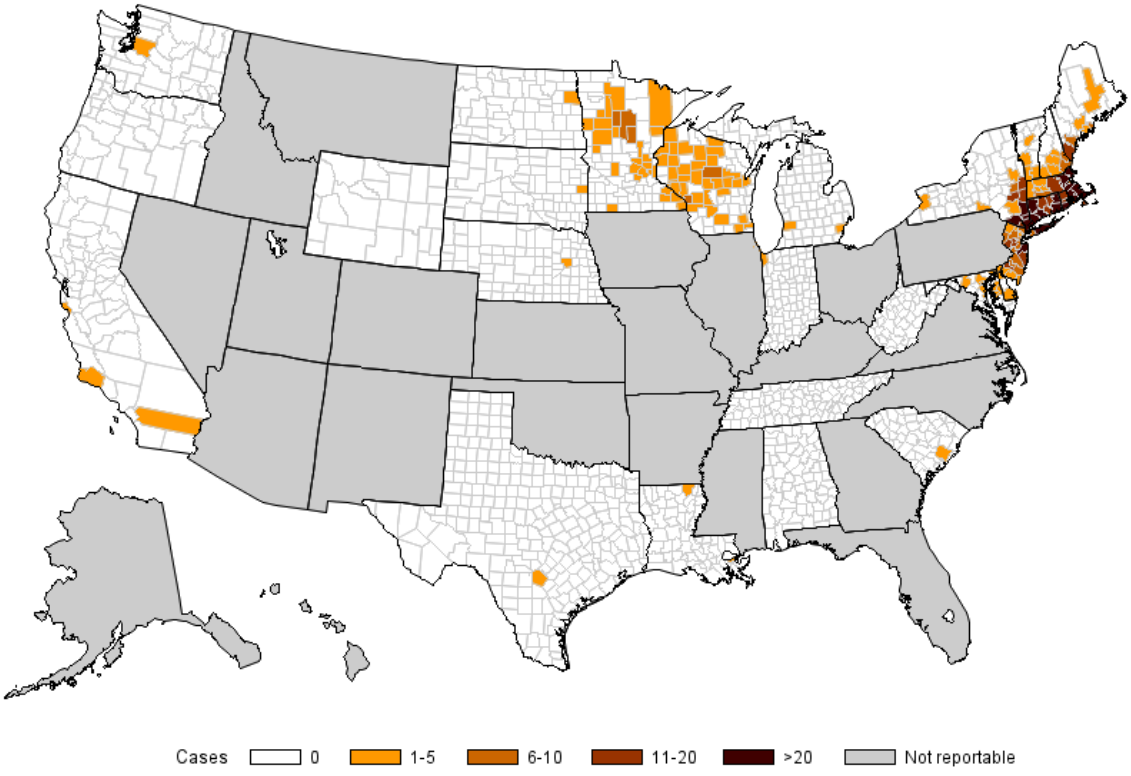
* N = 1,117; county of residence was known for all but 9 (1%) of the 1,126 total case-patients.
† Year as reported by the health department.

2012: Number* of reported cases of babesiosis, by county of residence — 22 states†



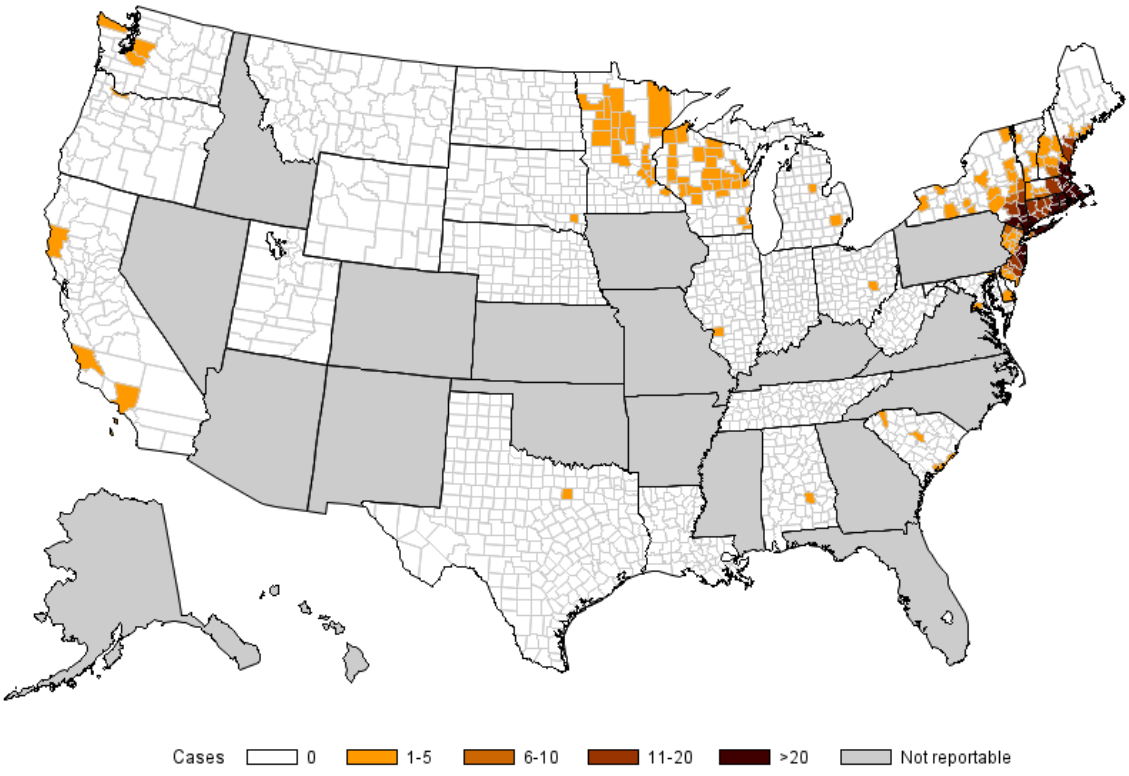
* N = 904; county of residence was known for all but 7 (1%) of the 911 total case-patients.
† Year as reported by the health department.

2013: Number* of reported cases of babesiosis, by county of residence — 27 states†



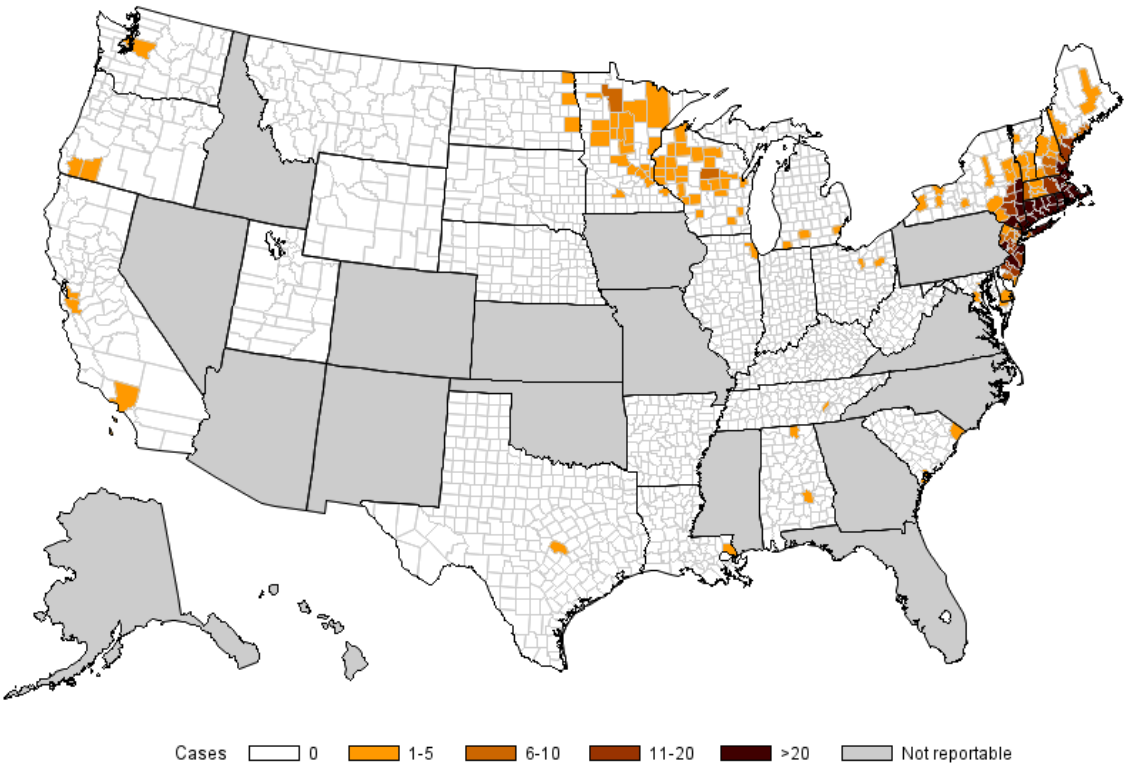
* N = 1,749; county of residence was known for all but 12 (1%) of the 1,761 total case-patients.
† Year as reported by the health department.

2014: Number* of reported cases of babesiosis, by county of residence — 31 states†



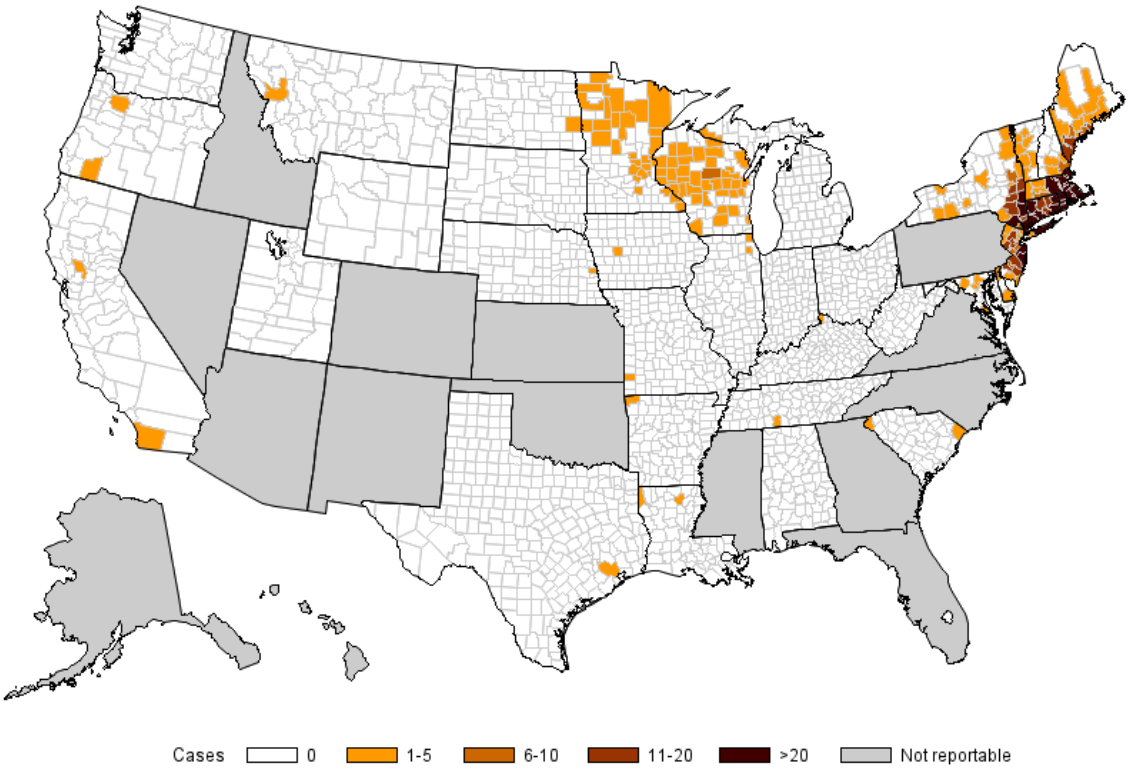
* N = 1,731; county of residence was known for all but 13 (1%) of the 1,742 total case-patients.
† Year as reported by the health department.

2015: Number* of reported cases of babesiosis, by county of residence — 33 states†



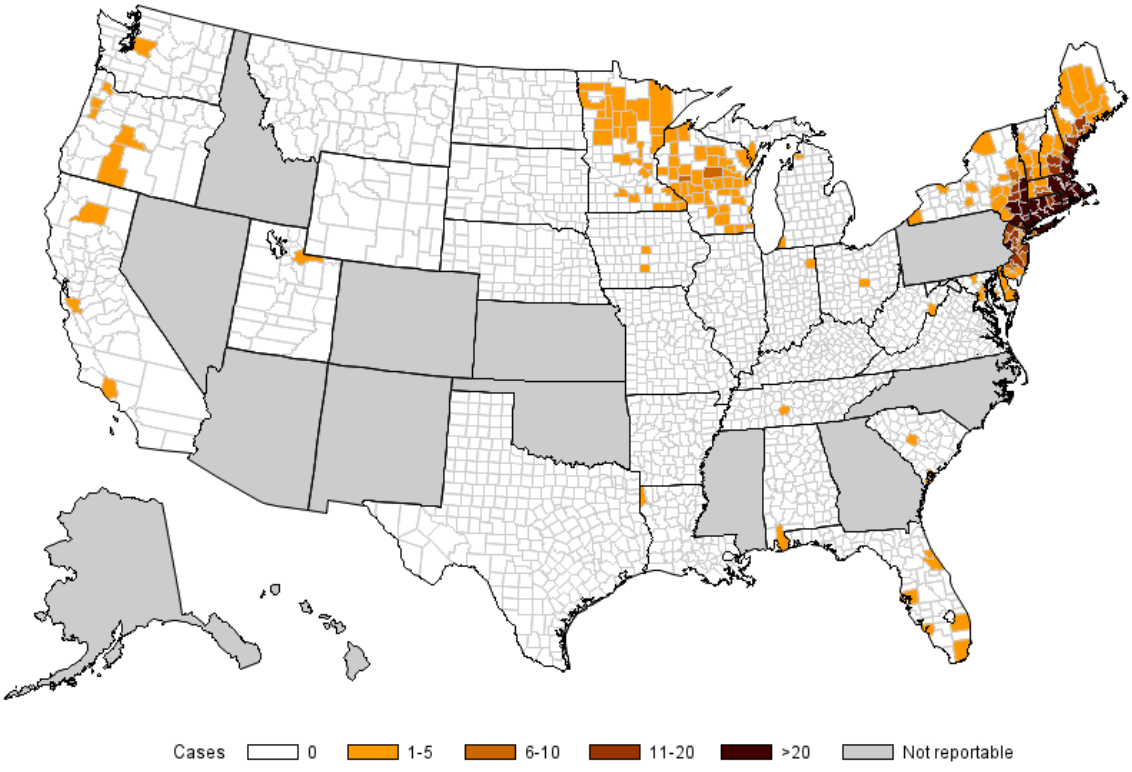
* N = 2,070; county of residence was known for all but 4 (<1%) of the 2,074 total case-patients.
† Year as reported by the health department.

2016: Number* of reported cases of babesiosis, by county of residence — 35 states†



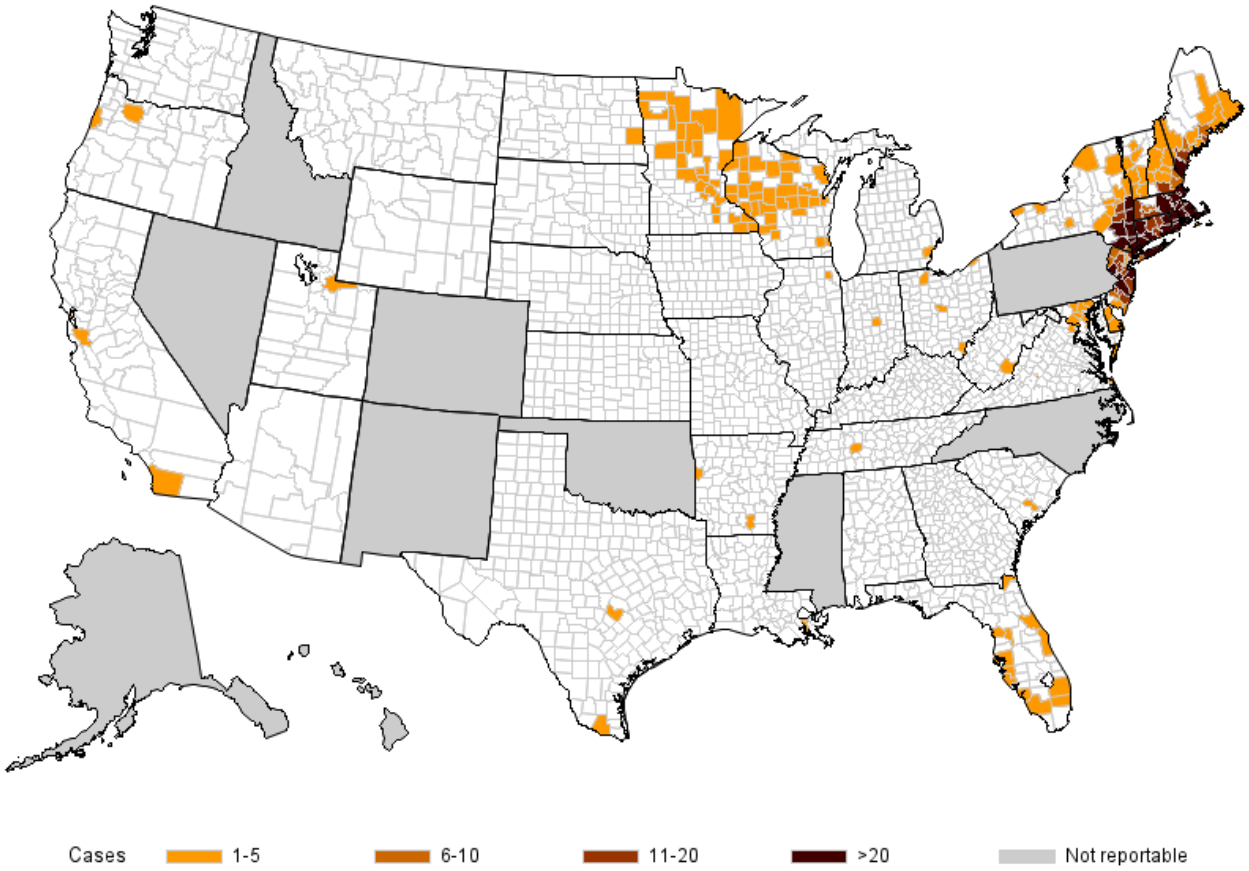
* N = 1,889; county of residence was known for all but 20 (1%) of the 1,909 total case-patients.
† Year as reported by the health department.

2017: Number* of reported cases of babesiosis, by county of residence — 37 states†



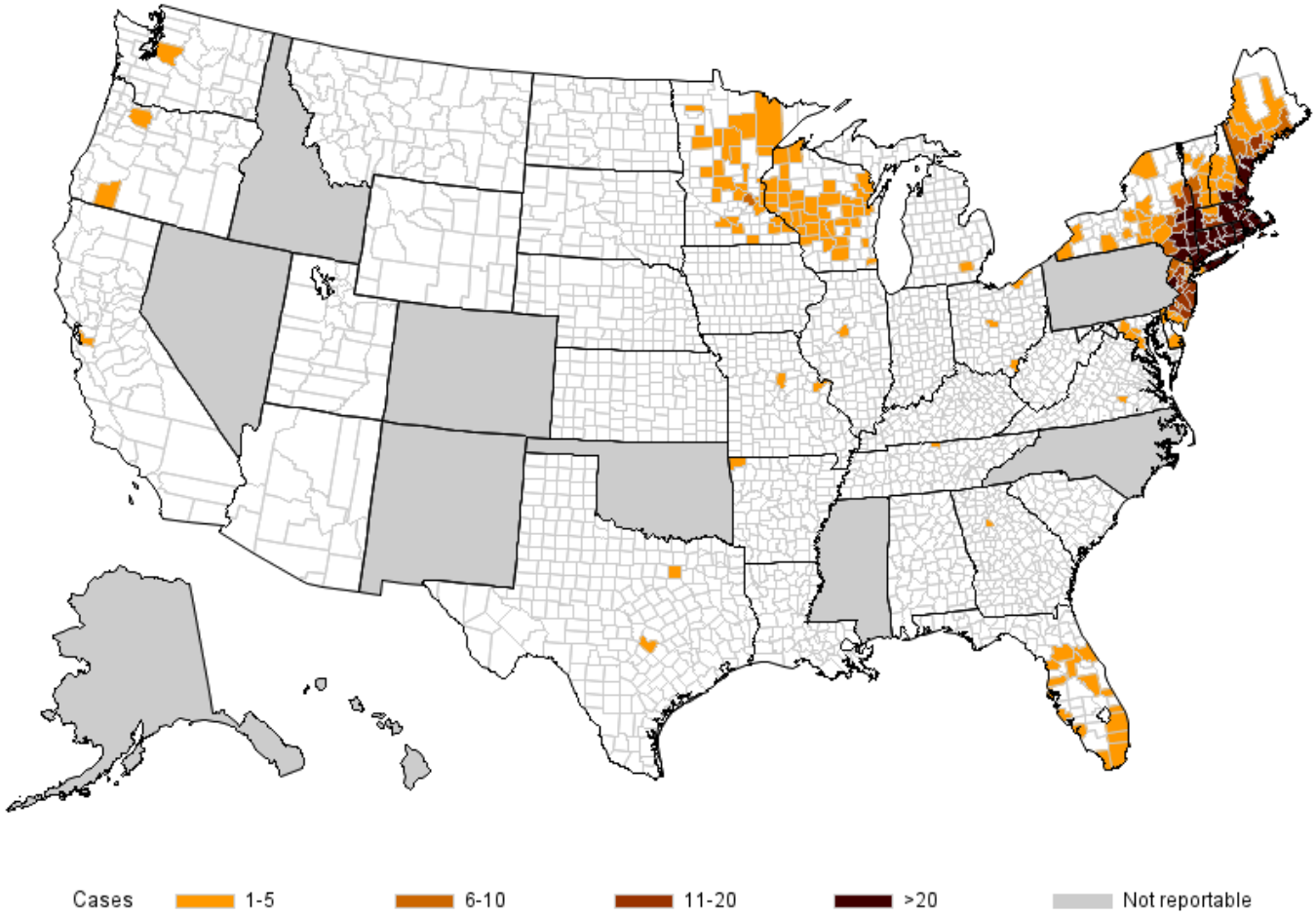
* N = 2,324; county of residence was known for all but 34 (1%) of the 2,358 total case-patients
† Year as reported by the health department.

2018: Number* of reported cases of babesiosis, by county of residence — 40 states†



* N = 2,144; county of residence was known for all but 17 (1%) of the 2,161 total case-patients.
† Year as reported by the health department.

2019: Number* of reported cases of babesiosis, by county of residence — 40 states†



*N = 2,417; county of residence was known for all but 1 (<1%) of the 2,418 total case-patients.
† Year as reported by the health department.