

## Salmonellosis in Connecticut, 2020

*Salmonella* are bacteria that can cause illness in humans called salmonellosis. Most cases of salmonellosis occur through consumption of contaminated food or water (1). Live poultry can act as a reservoir of *Salmonella* and have been associated with annual national outbreaks (2). Illness is mainly characterized by symptoms of gastroenteritis and their consequences in afflicted individuals. While salmonellosis is reported year-round, there is particularly high incidence during the summer months (3). This analysis was prompted by news reports of an increase in live backyard poultry sales during the early stages of the SARS-CoV-2 pandemic, which may have led to an increase of poultry-associated salmonellosis.

In Connecticut, public health surveillance of *Salmonella* is conducted by the Yale Emerging Infections Program (EIP) on behalf of the Connecticut Department of Public Health (CT DPH). Active laboratory surveillance for *Salmonella* is conducted based on detection in stool, urine, blood, and other bodily fluids followed by case interview using a standardized questionnaire. The case interview includes questions about exposure to live poultry.

Connecticut *Salmonella* surveillance data during 2014-2019 were used to determine expected *Salmonella* incidence and compared to 2020 incidence. The Centers for Disease Control and Prevention (CDC) provided a dataset of all Connecticut cases linked to annual national backyard poultry outbreaks during 2014- 2020. Live-poultry exposure associated cases were defined as individuals who self-reported exposure to live poultry within 7 days of illness onset. National backyard poultry outbreak associated cases were individuals who, prior to 2018, were linked by pulse-field gel electrophoresis (PFGE) or, more recently, by whole genome sequencing (WGS) to the national poultry outbreak serotypes.

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The expected number of outbreak cases, using the exposure cases as a reference, and the actual number of cases associated with backyard poultry outbreaks during 2014 -2019 were compared to those reported in 2020.

Analyses were performed using all *Salmonella* cases, and exposure cases and outbreak cases, to identify changes in laboratory-confirmed *Salmonella* incidence. Further analyses were done on both groups to determine whether there were changes in demographic characteristics, temporal distribution, and relative and absolute changes in incidence.

There was a decrease in overall incidence of reported Connecticut *Salmonella* cases from an annual average of 467.9 cases reported during 2014-2019 to 330 cases during 2020. Most of the decrease occurred during the months of March-May (Figure, page 17). Statistically significant changes were observed in demographic characteristics of cases. During 2020, 49% of cases were  $\geq 45$  years of age, an increase from 41% during 2014-2019 ( $p=0.01$ ). The percentage of individuals identifying as non-Hispanic White decreased from 61.3% to 53.3% ( $p=0.005$ ).

There was an increase in live-poultry exposure associated cases from an annual average of 4.0% in 2014 – 2019 to 8.8% in 2020 ( $p<0.001$ ), with more cases reporting exposure to live poultry in 2020 (29) than expected (18.8) based on the previous 6 years. The temporal distribution of national backyard

### CONTACT INFORMATION

Connecticut Department of Public Health  
Infectious Diseases Division  
410 Capitol Avenue/MS#11FDS  
Hartford, CT 06134  
Phone: 860-509-7995  
Fax: 860-509-7910

poultry outbreak associated cases shifted from early summer to late summer and early fall (Figure). Of those reporting live poultry exposure in Connecticut during 2020, 90.0% reported exposure to chickens and 16.7% to ducks, which was a slight change from previous years.

### Reported by

*L. Kasper, MPH, J. Hadler, MD, MPH, Connecticut Emerging Infections Program at the Yale School of Public Health.*

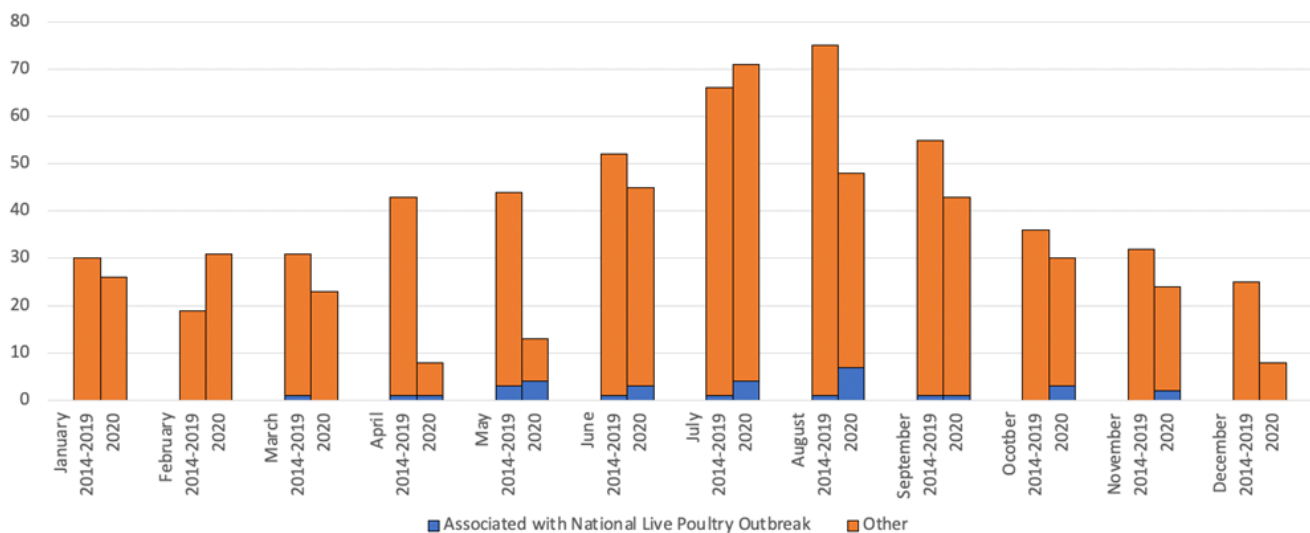
### Discussion

The incidence of reported *Salmonella* cases in 2020 was different than previous years in at least two ways. First, there was an overall decrease in incidence relative to previous years. This decrease was most pronounced during March-May, coinciding with the most restrictive period of the pandemic response. A portion of the decrease in *Salmonella* incidence, especially during April and May, may be due to a hesitancy to seek care for diagnosis and treatment for *Salmonella* symptoms due to fear of contracting COVID-19 and a shift away from in person acute diagnosis and care to telemedicine (4). Given salmonellosis often resolves on its own, individuals who get tested represent a fraction of the population infected, making it challenging to determine the actual number of cases in the population. The COVID-19

pandemic might have exasperated this issue, especially early in the pandemic, when data indicates only more severely ill people sought care in person (4). Another possible contributing factor is that an increased risk of contracting *Salmonella* has been linked to eating at restaurants and social behavior (5); it is possible incidence decreased as a result of closures of restaurants.

Second, despite a decrease in overall numbers of reported cases of salmonellosis, the number of cases who self-reported exposure to live poultry in the 7 days before illness onset was above expected levels from June to October 2020. In previous years, the number and proportion of cases who self-reported live poultry exposure peaked in early summer. In 2020, the greatest absolute increase in the number and proportion of cases reporting live poultry exposure occurred during late summer and early fall, even while numbers of reported salmonella cases were lower than expected. While this increase in live poultry-associated salmonellosis might be related to the reported increase in live backyard poultry sales during the COVID-19 pandemic, it is possible a phenomenon unrelated to the pandemic is occurring and merits continued monitoring. The CDC has recently published recommendations for prevention of salmonellosis among backyard flock owners and stores that display live poultry (2).

**Figure. *Salmonella* cases by month of surveillance year, 2014-19 vs 2020, Connecticut.**



## Key messages for providers

- Ask about exposure to live poultry when taking a medical history of a person with symptoms of bacterial gastrointestinal illness.
- Be aware of CDC guidance for prevention of salmonellosis targeted at backyard poultry flock owners and persons otherwise buying live poultry including chicks and ducklings (2).

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## Babesiosis Surveillance – Connecticut, 2015 – 2019

Babesiosis is a tick-borne disease caused by microscopic parasites that infect red blood cells (1) and is the second most commonly reported tick-borne disease in Connecticut. Although there are over 100 species of tick-borne parasites that can cause babesiosis, *Babesia microti* is the most frequently found species in the United States that affects people. Babesiosis is primarily spread by the bite of an infected *Ixodes scapularis*, blacklegged tick; however, less commonly, *B. microti* can be transmitted through blood transfusion, and transplacentally from an infected mother to her baby during pregnancy or delivery (1,2). Most healthy individuals infected with *B. microti* are asymptomatic. Others can develop flu-like symptoms including fever, chills, sweats, myalgia, and weakness. It can be life threatening in the elderly, people who are immunocompromised

or have serious underlying health conditions, and people without a spleen (asplenia). General laboratory findings include decreased hematocrit due to hemolytic anemia, and thrombocytopenia.

In Connecticut, the first cases of babesiosis were reported in 1988 (3). Babesiosis has been a physician reportable disease since 1989, and *Babesia* a laboratory reportable finding since 1990. In 2011, babesiosis became a [nationally notifiable disease](#) (4). The Connecticut Department of Public Health (DPH) uses the babesiosis [national surveillance case definition](#), that combines laboratory, clinical, and epidemiologic information, to classify cases.

Due to the need for clinical information to determine case classification, DPH conducts follow up on all positive results meeting the national surveillance case definition laboratory criteria for diagnosis. Supplemental forms, and letters requesting full completion and return, are mailed to ordering providers and hospital Infection Control Practitioners.

During 2015-2019, the number of reports received annually by DPH increased 80% from 766 to 1380 (Figure). Follow up was conducted on 5260 reports with supportive or confirmatory laboratory results. Supplemental forms were returned for 3893 (74%) and included 1219 (31%) confirmed cases, 304 (8%) probable cases, and 2370 (61%) were classified as not a case (Figure). The remaining 1367 were classified as suspect. Further analyses were conducted by grouping confirmed and probable classifications for a total of 1523 cases.

Babesiosis incidence rates ranged from 6.9 (2018) to 9.2 (2015) cases per 100,000 population, with an annual average of 8.5 cases per 100,000 population. Windham and New London counties had the highest incidence and accounted for an annual average 36% of statewide cases.

Cases ranged from 0-98 years with 27% of cases occurring among those aged 60-69; 982 (65%) were male. Of the 1523 cases, race information was available for 1452 (96%) with 1170 (81%) White, 35 (2%) Black African American, 31 (2%) Asian, 22

(2%) Other, 3 (<1%) American Indian Alaskan Native, 3 (<1%) Native Hawaiian Pacific Islander, 188 (13%) Unknown. Ethnicity was available for 1425 (94%) cases; 96 (7%) identified as Hispanic/Latino, 1140 (80%) were non-Hispanic/Latino, and 189 (13%) unknown. Although cases were reported throughout the year, 80% were reported during the months of June- August.

The following signs and symptoms were reported among cases: 1088 (71%) fever, 847 (56%) myalgia, 782 (51%) thrombocytopenia, 742 (49%) chills, 727 (48%) headache, 712 (47%) anemia, 655 (43%) arthralgia, 496 (33%) sweats, and 260 (17%) had other conditions and most cases reported having multiple symptoms; 543 (36%) were hospitalized. The median hospital stay was 4 days (range: 1–37 days) and 4 (<1%) deaths were reported. In 2015, babesiosis was identified in two neonates (5).

The American Red Cross screens blood donations and reports donors identified to have a positive NAAT test for babesiosis. During 2015-2019, DPH received 421 reports of blood donors with positive *Babesia* screenings. Data linking blood donation to a case were not available as DPH did not receive any reports of confirmed or probable cases that were recipients of blood,

organ, or tissue products, and no organ donors were identified (6). Blood donation was not reported from provider offices, which suggests this information was not available or not collected.

### Reported by

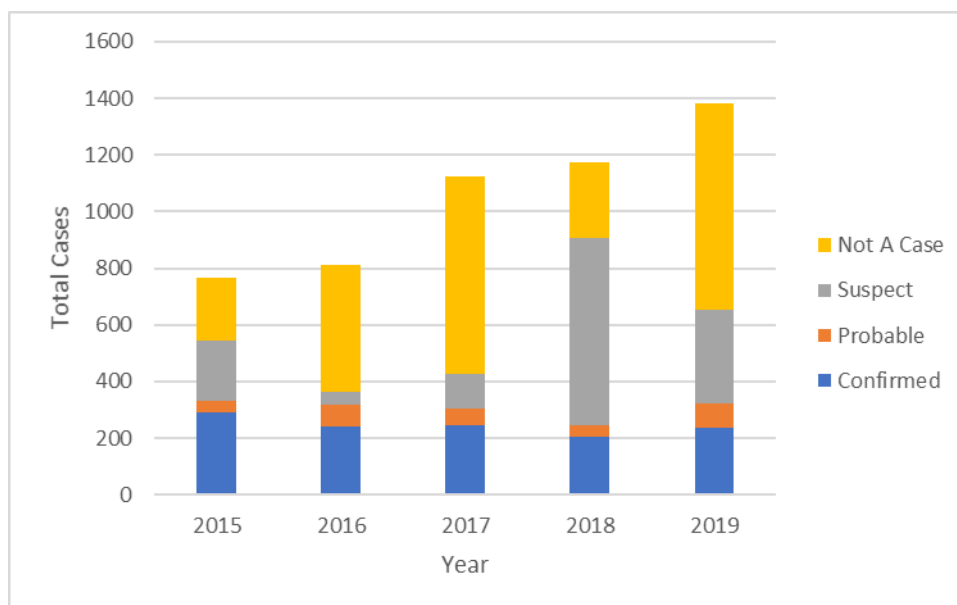
*A Bogacki MPH, J Sun MD PhD, J Mullins DVM MPH PhD, Epidemiology and Emerging Infections Program, Connecticut Department of Public Health.*

### Discussion

The total number of babesiosis reports received by DPH continues to increase annually and is likely due to receipt of more laboratory reports that do not meet the national case definition laboratory criteria for diagnosis. During 2011-2013, the average annual incidence rate for babesiosis was 6.2 cases per 100,000 population and in 2014, fell to 4.8 cases per 100,000 population. During 2015-2019, the average annual incidence rate increased to 8.5 cases per 100,000 population. Surveillance changes may have led to an increase in provider response rate, and subsequent increase in incidence. During 2015-2019, the rate of return for supplemental forms was 74%, versus just over 50% during 2011-2014.

When people are outdoors, steps should be taken to reduce the risk for babesiosis and other tick-borne diseases. Areas where ticks are commonly found,

**Figure. Reported babesiosis cases in Connecticut, 2015-2019.**



such as wooded and tall grassy areas, should be avoided if possible, especially during warmer months. Using personal protective clothing (i.e wearing long sleeve shirts and long pants to decrease the area of exposed skin) and tick repellents according to label instructions is also recommended for all persons when outdoors. It is critical to check for ticks on clothing and skin and to check pets for ticks when returning indoors.

Data show that babesiosis is underreported (7). Babesiosis is transmitted by the same tick species as Lyme disease and anaplasmosis. All three illnesses can cause general flu-like symptoms, share geographic locations, and peak during the summer months. When evaluating patients with flu-like symptoms suggestive of tick-borne illness, especially during the summer months, providers should consider ordering a tick-borne disease panel for purposes of differential diagnosis. DPH encourages providers to complete the necessary reporting forms for all tick-borne diseases, including the supplemental Babesiosis Case Report form and return it to DPH in a timely manner. Completed forms can be mailed to the CT Dept. of Public Health, 410 Capitol Avenue, MS#11EPI, PO Box 340308, Hartford CT, 06134-0308 in an envelope marked “Confidential” or faxed to 860-509-7910. Only one method of reporting is necessary.

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### Connecticut Department of Public Health

Deidre S. Gifford, MD, MPH  
Acting Commissioner of Public Health

Matthew L. Cartter, MD, MPH  
State Epidemiologist

Lynn Sosa, MD  
Deputy State Epidemiologist

### Infectious Diseases Programs

Epidemiology and Emerging Infections  
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Editor: Jocelyn Mullins, DVM, MPH, PhD

Assistant Editor: Matthew L. Cartter, MD, MPH

Assistant Editor/Producer: Starr-Hope Ertel