# Legionnaires' Disease Surveillance Summary Report, United States

# 2018–2019

Centers for Disease Control and Prevention
National Center for Immunization and Respiratory Diseases

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[*] Cases of disease due to *Legionella* are reported to NNDSS as legionellosis, which includes Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis, but are referred to as Legionnaires' disease in this figure or table (because almost all legionellosis cases reported in the United States are Legionnaires' disease cases).

[§] Only cases of Legionnaires' disease reported to SLDSS are included in this figure or table.

[±] All cases of legionellosis (i.e., Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis) reported to SLDSS are included in this figure.

## Background

The objective of this report is to provide a descriptive summary of the reporting and burden of Legionnaires' disease within the United States (U.S.) in 2018 and 2019. Legionellosis is an illness caused by the bacterium *Legionella* that most commonly presents as Legionnaires' disease, a severe pneumonia. Pontiac fever, a milder illness without pneumonia, is less commonly reported. Extrapulmonary legionellosis, infection with *Legionella* outside the lungs, is rare. Legionnaires' disease is confirmed by appropriate laboratory testing in a patient with compatible clinical findings. Most Legionnaires' disease cases are confirmed with a positive urinary antigen test (UAT); fewer cases are confirmed through other methods, including isolation of *Legionella* by culture (1,2).

*Legionella* typically is transmitted to people through inhalation of aerosolized water containing *Legionella,* or less commonly via aspiration of water containing *Legionella* (3,4). People most susceptible to Legionnaires' disease include those with advanced age, weakened immune systems, or chronic medical conditions (5). Collecting and reporting information about potential exposures in patients with Legionnaires' disease is important for finding the source of infection and helping to prevent additional cases. Exposure to large, complex building water systems that are not adequately managed increases a person's risk for acquiring Legionnaires' disease (6,7).

The majority of recognized Legionnaires' disease outbreaks are associated with travel accommodations (e.g., hotels, resorts, cruise ships) or healthcare settings (e.g., hospitals, long-term care facilities) (7). Travel, particularly lodging in public accommodations, has been shown to be a risk factor for Legionnaires' disease (8,9). Healthcare facilities frequently undergo construction and plumbing changes, and they often have aerosol-producing devices such as cooling towers, decorative fountains, and other devices unique to healthcare facilities (e.g., respiratory therapy equipment, hydrotherapy tubs, heater-cooler units) (6). Other potential settings for exposure to *Legionella* include assisted or senior living facilities, workplace environments, and the general community. The number of outbreaks reported annually to the National Outbreak Reporting System nearly quadrupled from 2009 through 2017 (10).

## Case definition

Legionellosis case criteria defined in the 2009 Council of State and Territorial Epidemiologists (CSTE) Position Statement were in effect during 2018–2019 (1). Legionnaires' disease is characterized by fever, myalgia, cough, and clinical or radiographic pneumonia. Pontiac fever is characterized by a milder influenza-like illness without pneumonia. Extrapulmonary legionellosis indicates *Legionella* infection outside the lungs, such as endocarditis or a wound infection. To be considered confirmed, a case must be clinically compatible and fulfill at least one of the confirmatory laboratory criteria (i.e., positive UAT, isolation of *Legionella* by culture, or a 4-fold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1). Please refer to **Definitions** in the Technical Notes for additional case status and laboratory criteria.

**Note:** The Centers for Disease Control and Prevention's case report form captures legionellosis syndrome (i.e., Legionnaires' disease, Pontiac fever, or extrapulmonary legionellosis). Because no standardized name or case definition for extrapulmonary legionellosis existed prior to the 2019 CSTE case definition change, some cases that are not extrapulmonary legionellosis are incorrectly reported here as such.

## Data sources

For this surveillance report, data from two surveillance systems (the National Notifiable Diseases Surveillance System (NNDSS) and the Supplemental Legionnaires' Disease Surveillance System (SLDSS)) were combined to provide a more comprehensive understanding of the national burden of Legionnaires' disease.

## *NNDSS*

The Centers for Disease Control and Prevention (CDC) coordinates collection of data on all notifiable diseases, including Legionnaires' disease, from across the United States through NNDSS. NNDSS is a passive surveillance system for case-level data. Clinicians and laboratories report cases to local or state health departments, who then investigate the cases and report selected data to CDC. For this report, NNDSS data are limited to Legionnaires' disease case counts, basic demographics, date of disease occurrence, and jurisdiction of residence.

The *Summary of Notifiable Infectious Diseases—United States* (hereafter referred to as the *Morbidity and Mortality Weekly Report (MMWR)* annual report) reports the official statistics for U.S. Legionnaires' disease cases reported to NNDSS prior to 2016 (https://www.cdc.gov/mmwr/mmwr_nd/index.html). Provisional NNDSS data on reported notifiable infectious diseases for all years are published weekly on CDC WONDER (https://wonder.cdc.gov/nndss/nndss_weekly_tables_menu.asp), and finalized, yearly summary data for years after 2015 are published annually on CDC WONDER (https://wonder.cdc.gov/nndss/nndss_annual_tables_menu.asp). Jurisdictions may report cases of any case status (i.e., confirmed, probable, suspect, and unknown) to NNDSS, but only confirmed cases of Legionnaires' disease from the 50 U.S. states, the District of Columbia, and New York City were included in *MMWR* annual reports and on CDC WONDER from 2000 through 2019, with the following exceptions:

- During 2000, 2002, and 2003, Legionnaires' disease cases with probable, suspect, and unknown case status were also included.
- During 2001, Legionnaires' disease cases with probable and unknown case status were also included.
- During 2000–2001, Legionnaires' disease cases were not reportable in Oregon and West Virginia.
- During 2004–2012, Legionnaires' disease cases with unknown case status reported from California were also included.
- During 2011–2012, Legionnaires' disease cases were not reportable in the District of Columbia.

Learn more about reported cases of infectious diseases at https://www.cdc.gov/nndss/data-statistics/infectious-tables/about.html.

### LEGIONNAIRES' DISEASE VS. LEGIONELLOSIS

Because NNDSS does not capture type of legionellosis diagnosis, it cannot distinguish clinical syndromes (Legionnaires' disease vs Pontiac fever vs extrapulmonary legionellosis). For this reason, CDC has used the term "legionellosis" historically for surveillance purposes (when referring to NNDSS data). However, approximately 98% of legionellosis cases reported to SLDSS, which does capture diagnosis data, are Legionnaires' disease (11,12). Furthermore, because Legionnaires' disease can be associated with substantial mortality (while Pontiac fever is self-limited), prevention efforts are often designed with Legionnaires' disease in mind. Accordingly, we refer here to cases of legionellosis reported to NNDSS as "Legionnaires' disease" instead of "legionellosis," and, unless otherwise specified, SLDSS data in this report are limited to cases of Legionnaires' disease.

However, this decision does not indicate that Pontiac fever is considered inconsequential. Outbreaks of Pontiac fever can be large and can place burden on the medical system. Furthermore, Pontiac fever can signal the presence of conditions that support *Legionella* growth and transmission, and environmental sources that lead to cases of Pontiac fever are often also associated with cases of Legionnaires' disease.

## *SLDSS*

SLDSS, a voluntary, passive surveillance system for case-level data, includes additional information not reported to NNDSS. SLDSS captures disease severity indicators, exposure history information, and laboratory diagnostic test results. While not all jurisdictions consistently report to SLDSS, reporting completeness has improved over time (13). SLDSS facilitates rapid recognition of clusters of cases among persons from different jurisdictions who have recently dispersed from a point source of *Legionella* and became ill in their respective jurisdictions of residence.

# Highlights

## Case count and incidence trends over time

From 2000 through 2019, a total of 82,352 confirmed Legionnaires' disease cases were reported to NNDSS from 52 U.S. jurisdictions. The crude national incidence rate peaked in 2018 at 3.04 cases per 100,000 population and increased 6.5-fold from 0.42 per 100,000 persons in 2000 to 2.71 per 100,000 persons in 2019 (Figure 1). There were 9,933 confirmed Legionnaires' disease cases reported to NNDSS in 2018 and 8,890 cases reported in 2019. Cases reported to NNDSS from 24 jurisdictions in 2019 may be incomplete due to the COVID-19 pandemic (https://wonder.cdc.gov/nndss/static/2019/annual/2019-table2i.html).

## Seasonality

Case month was based on *MMWR* week (assigned variably by reporting jurisdictions based on disease onset date, date of case report to state or local public health, date of case report to CDC, or some other jurisdiction-defined date), and was unevenly distributed, with more cases assigned to weeks in summer and fall versus winter and spring (Figure 2).

## Geographic distribution

For 2018 and 2019, the incidence of reported Legionnaires' disease cases tended to be higher in jurisdictions in the East North Central (Illinois, Indiana, Michigan, Ohio, Wisconsin), Middle Atlantic (New York City, New York State, New Jersey, Pennsylvania), and New England (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) U.S. Census Bureau divisions. (Figures 3a/3b).

- **2018:** The jurisdictions with the highest number of confirmed Legionnaires' disease cases reported to NNDSS included, in order, Ohio, New York (state), New York City, Pennsylvania, and Michigan (Table 1).
- **2019:** The jurisdictions with the highest number of confirmed Legionnaires' disease cases reported to NNDSS included, in order, Ohio, Illinois, New York (state), Pennsylvania, and Michigan (Table 1).

## Demographic characteristics

### *Age*

Most cases occurred in persons ≥50 years of age, and incidence increased with age (Table 2 and Figure 4a).

- **2018:** The majority (81%) of reported cases occurred in persons ≥50 years of age; persons ≥85 years of age had the highest rate of disease, with an incidence rate of 9.53 cases per 100,000 persons (Table 2).
- **2019:** Similar to 2018, the majority (82%) of reported cases occurred in persons ≥50 years of age; persons ≥85 years of age had the highest rate of disease, with an incidence rate of 8.83 cases per 100,000 persons (Table 2).

### *Sex*

Males accounted for the majority of the confirmed cases reported to NNDSS and also had a higher rate of disease (Table 2 and Figure 4b).

- **2018:** Males accounted for 63% of cases, with a rate of 3.91 per 100,000 persons (Table 2).
- **2019:** Males accounted for 63% of cases, with a rate of 3.45 per 100,000 persons (Table 2).

### *Race*

Most cases reported to NNDSS occurred in White persons; however, incidence was higher in Black or African American persons (Table 2 and Figure 4c).

- **2018:** 61% of reported cases were in persons of White race, with an incidence rate of 2.38 per 100,000 persons. In contrast, 23% were in those of Black or African American race, with an incidence rate of 4.86 per 100,000 persons (Table 2).

- **2019:** 62% of reported cases were in persons of White race, with an incidence rate of 2.15 per 100,000 persons. In contrast, 20% were in those of Black or African American race, with an incidence rate of 3.77 per 100,000 persons (Table 2).

### *Ethnicity*

Of cases reported to NNDSS from the 52 jurisdictions in 2018 and 2019, 22% were missing ethnicity data. Non-Hispanic persons accounted for the majority of the cases for which this information was available (Table 2 and Figure 4d). Among all cases, including those missing ethnicity data,

- **2018:** 7% were in persons of Hispanic ethnicity (Table 2).
- **2019:** 7% were in persons of Hispanic ethnicity (Table 2).

## Comparison between NNDSS and SLDSS

The distributions of demographic characteristics were similar for persons with confirmed Legionnaires' disease reported to NNDSS compared to those reported to SLDSS (Figures 4a–4d).

## Legionellosis syndrome

Nearly all cases submitted to SLDSS were categorized as Legionnaires' disease (99% in 2018, and 98% in 2019) rather than Pontiac fever or extrapulmonary legionellosis (Figures 5a/5b).

- **2018:** 9,108 confirmed legionellosis cases were reported to SLDSS from 52 jurisdictions: 8,999 (99%) were Legionnaires' disease, 77 (1%) were Pontiac fever, 18 (<1%) were extrapulmonary legionellosis, and 14 (<1%) did not specify legionellosis syndrome (Figure 5a).
  - The case fatality rate (CFR) was 6% for Legionnaires' disease cases, 4% for Pontiac fever cases, 11% for extrapulmonary legionellosis cases, and 7% for cases that did not specify legionellosis syndrome (Figure 5a).
- **2019:** 7,408 confirmed legionellosis cases were reported to SLDSS from 52 jurisdictions: 7,238 (98%) were Legionnaires' disease, 97 (1%) were Pontiac fever, 42 (1%) were extrapulmonary legionellosis, and 31 (<1%) did not specify legionellosis syndrome (Figure 5b).
  - The CFR was 7% for Legionnaires' disease cases, 5% for Pontiac fever cases, 12% for extrapulmonary legionellosis cases, and 6% for cases that did not specify legionellosis syndrome (Figure 5b).

## Complete reporting jurisdictions

- **2018:** The following 42 jurisdictions reported ≥90% of their confirmed NNDSS legionellosis cases to SLDSS: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New York (state), New York City, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, and Wyoming.
  - 8,764 confirmed Legionnaires' disease cases were reported to SLDSS from these 42 complete reporting jurisdictions, accounting for 97% of all 8,999 confirmed Legionnaires' disease cases reported to SLDSS from the 52 U.S. jurisdictions in 2018 (Figure 5a).
- **2019:** The following 38 jurisdictions reported ≥90% of their confirmed NNDSS legionellosis cases to SLDSS: Alabama, Alaska, Arizona, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New York (state), New York City, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wyoming.

- 6,955 confirmed Legionnaires' disease cases were reported to SLDSS from these 38 complete reporting jurisdictions, accounting for 96% of all 7,238 confirmed Legionnaires' disease cases reported to SLDSS from the 52 U.S. jurisdictions in 2019 (Figure 5b).

## Sources of exposure

SLDSS captures detailed exposure history within the 10 days before symptom onset, including exposure to a healthcare setting, travel history, and exposure to an assisted or senior living facility (See Definitions in the Technical Notes for more detail).

- **2018:** 8,764 confirmed Legionnaires' disease cases were reported to SLDSS from the 42 complete reporting jurisdictions: 1,584 patients (18%) had a healthcare exposure, 1,279 patients (15%) had a travel exposure, 326 patients (4%) had an assisted or senior living facility exposure, and 5,886 patients (67%) had "none of these" exposures (Figure 6a and Table 3).
  - Distribution of demographic characteristics varied by exposure category (Table 4a).
- **2019:** 6,955 confirmed Legionnaires' disease cases were reported to SLDSS from the 38 complete reporting jurisdictions: 1,284 patients (18%) had a healthcare exposure, 1,156 patients (17%) had a travel exposure, 203 patients (3%) had an assisted or senior living facility exposure, and 4,559 patients (66%) had "none of these" exposures (Figure 6b and Table 3).
  - Distribution of demographic characteristics varied by exposure category (Table 4b).

### *Healthcare exposure*

Of the Legionnaires' disease cases reported to SLDSS from the 42 complete reporting jurisdictions in 2018 and 38 complete reporting jurisdictions in 2019, 18% were in patients who reported a healthcare exposure (Figure 6a, Figure 6b, and Table 3) (See **Definitions** in the Technical Notes for more detail).

- **2018:** Of the 1,584 confirmed Legionnaires' disease cases in patients with any healthcare exposure reported to SLDSS from the 42 complete reporting jurisdictions, 204 (13%) were definite healthcare-associated cases, and 1,380 (87%) were possible healthcare-associated cases (Figure 6a and Table 5a).
  - Of the 204 confirmed Legionnaires' disease cases in patients with definite healthcare association, 128 (63%) were in patients who reported exposure to a long-term care facility, and 38 (19%) were in patients who reported exposure to a hospital (Table 5a).
  - Of the 1,380 confirmed Legionnaires' disease cases in patients with possible healthcare association, 519 (38%) were in patients who reported exposure to a clinic, 459 (33%) were in patients who reported exposure to a hospital, and 168 (12%) were in patients who reported exposure to a long-term care facility (Table 5a).
- **2019:** Of the 1,284 confirmed Legionnaires' disease cases in patients with any healthcare exposure reported to SLDSS from the 38 complete reporting jurisdictions, 192 (15%) were definite healthcare-associated cases, and 1,092 (85%) were possible healthcare-associated cases (Figure 6b and Table 5b).
  - Of the 192 confirmed Legionnaires' disease cases in patients with definite healthcare association, 95 (49%) were in patients who reported exposure to a long-term care facility, and 36 (19%) were in patients who reported exposure to a hospital (Table 5b).
  - Of the 1,092 confirmed Legionnaires' disease cases in patients with possible healthcare association, 427 (39%) were in patients who reported exposure to a hospital, 376 (34%) were in patients who reported exposure to a clinic, and 111 (10%) were in patients who reported exposure to a long-term care facility (Table 5b).

### *Travel exposure*

Of the Legionnaires' disease cases reported to SLDSS from 42 complete reporting jurisdictions in 2018 and 38 complete reporting jurisdictions in 2019, 15%–17% were in patients who reported travel exposure (Figure 6a, Figure 6b, and Table 3) (see **Definitions** in the Technical Notes for more detail).

- **2018:** Of the 1,279 confirmed Legionnaires' disease cases in patients with travel exposure reported by the 42 complete reporting jurisdictions, 818 patients (64%) reported at least one public accommodation, 354 patients (28%) reported private accommodations only, and 107 patients (8%) reported accommodations of unknown type (Table 3).
- **2019:** Of the 1,156 confirmed Legionnaires' disease cases in patients with travel exposure reported by the 38 complete reporting jurisdictions, 765 patients (66%) reported at least one public accommodation, 261 patients (23%) reported private accommodations only, and 130 patients (11%) reported accommodations of unknown type (Table 3).

### *Assisted or senior living facility exposure*

Of the Legionnaires' disease cases reported to SLDSS from the 42 complete reporting jurisdictions in 2018 and 38 complete reporting jurisdictions in 2019, 3%–4% were in patients who reported an assisted or senior living facility exposure (Figure 6a, Figure 6b, and Table 3) (see **Definitions** in the Technical Notes for more detail).

- **2018:** Of the 326 confirmed Legionnaires' disease cases in patients with an assisted or senior living facility exposure reported to SLDSS from the 42 complete reporting jurisdictions, 202 patients (62%) had exposure to an assisted living facility, and 102 patients (31%) had exposure to a senior living facility (Table 3).
- **2019:** Of the 203 confirmed Legionnaires' disease cases in patients with an assisted or senior living facility exposure reported to SLDSS from the 38 complete reporting jurisdictions, 101 patients (50%) had exposure to an assisted living facility, and 76 patients (37%) had exposure to a senior living facility (Table 3).

## Hospitalizations and outcomes

Overall, nearly all patients diagnosed with Legionnaires' disease were hospitalized for treatment regardless of age or exposure (Tables 6a/6b and Figure 7). Overall, the CFR for Legionnaires' disease was 6%–7% (Figures 5a/5b) and varied by age and exposure (Figures 6a/6b, Tables 6a/6b, and Figure 8).

### *Hospitalizations*

#### By exposure category

- **2018:** The rate of hospitalization for treatment of Legionnaires' disease ranged from 94%–96% by exposure category (Table 6a).
- **2019:** The rate of hospitalization for treatment of Legionnaires' disease ranged from 93%–96% by exposure category (Table 6b).

#### By age group

- **2018:** Of the 8,764 confirmed Legionnaires' disease cases reported to SLDSS from the 42 complete reporting jurisdictions in 2018, 8,396 (96%) patients were hospitalized for Legionnaires' disease treatment; percentage of patients hospitalized ranged from 95%–100% across different age groups (Figure 7). Hospitalization rates may be unstable in age groups 0–9, 10–15, and where age is missing due to low case counts (N≤31); therefore, caution should be used when interpreting these rates.
- **2019:** Of the 6,955 confirmed Legionnaires' disease cases reported to SLDSS from the 38 complete reporting jurisdictions in 2019, 6,642 (95%) patients were hospitalized for Legionnaires' disease treatment; percentage of patients hospitalized ranged from 33%–96% across different age groups (Figure 7). Hospitalization rates may be unstable in age groups 0–9, 10–15, and where age is missing due to low case counts (N≤19); therefore, caution should be used when interpreting these rates.

### *Outcomes*

#### By exposure category

- **2018:** The CFR was 10% for Legionnaires' disease cases in patients with a healthcare exposure (26% for definite and 7% for possible healthcare-associated Legionnaires' disease), 3% for Legionnaires' disease cases in patients with a travel exposure, 9% for Legionnaires' disease cases in patients with an assisted or senior living exposure, and 6% for Legionnaires' disease cases in patients with "none of these" exposures (Figure 6a, Table 6a).
- **2019:** The CFR was 10% for Legionnaires' disease cases in patients with a healthcare exposure (21% for definite and 9% for possible healthcare-associated Legionnaires' disease), 3% for Legionnaires' disease cases in patients with a travel exposure, 12% for Legionnaires' disease cases in patients with an assisted or senior living exposure, and 7% for Legionnaires' disease cases in patients with "none of these" exposures (Figure 6b, Table 6b).

#### By age group

- **2018:** Of the 8,764 confirmed Legionnaires' disease cases reported to SLDSS from the 42 complete reporting jurisdictions in 2018, the overall CFR was 6% (Figure 5a), ranging from 0%–18% across different age groups (Figure 8). CFRs may be unstable in age groups 0–9, 10–15, and where age is missing due to low case counts (N≤31); therefore, caution should be used when interpreting these rates).
- **2019:** Of the 6,955 confirmed Legionnaires' disease cases reported to SLDSS from the 38 complete reporting jurisdictions in 2019, the overall CFR was 7% (Figure 5b), ranging from 0%–14% across different age groups (Figure 8). CFRs may be unstable in age groups 0–9, 10–15, and where age is missing due to low case counts (N≤19); therefore, caution should be used when interpreting these rates).

## Diagnostic methods

Most confirmed Legionnaires' disease cases (97%) were diagnosed by UAT (Table 7). Among the Legionnaires' disease cases confirmed through positive culture, *L. pneumophila* was the most common species identified.

# Technical Notes

## Table and figure organization

Tables and figures in this report are organized by surveillance system and content. Tables 1–2 and Figures 1–3 were created using data from NNDSS exclusively. Cases of legionellosis in these tables and figures are referred to as Legionnaires' disease (for further explanation refer to text box in the **Background**). Figures 4a–4d were created using data from both NNDSS and SLDSS. Cases of legionellosis from NNDSS in Figures 4a–4d are referred to as Legionnaires' disease for the reasons discussed above; because syndrome of legionellosis is specified for SLDSS, data for SLDSS in Figures 4a–4d are limited to cases of Legionnaires' disease. Figures 5–8 and Tables 3–7 were created using data from SLDSS exclusively. These tables and figures present SLDSS data limited to cases of Legionnaires' disease except where noted. Only data for confirmed cases are presented in this report.

Figures 5a–5b include all cases of legionellosis (i.e., Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis) to illustrate the distribution of reporting by cases of different legionellosis syndrome and by completeness of reporting by jurisdiction.

## Methods

### *Data collection*

This surveillance report presents descriptive epidemiologic findings from NNDSS and SLDSS. Data were compiled from cases reported to either surveillance system from the 50 U.S. state, District of Columbia, and New York City health departments. The surveillance population includes residents of these 52 U.S. jurisdictions diagnosed with Legionnaires' disease in 2018 and 2019.

Public health officials electronically report cases to NNDSS. NNDSS data for year 2018 were published November 4, 2019, and data for year 2019 were published May 24, 2021. Cases reported after the closeout date for a year's dataset contribute to case counts for the following year regardless of the year in which they occurred (e.g., cases with symptom onset in 2018 reported to CDC after the closeout date for 2018 contributed to the 2019 case count). Cases reported to NNDSS from 24 jurisdictions in 2019 may be incomplete due to the COVID-19 pandemic (https://wonder.cdc.gov/nndss/static/2019/annual/2019-table2i.html).

Public health officials use the SLDSS Legionellosis Case Report Form (available at https://www.cdc.gov/legionella/downloads/case-report-form.pdf), or the equivalent state-specific case report form, to capture demographic, clinical, exposure, and reporting details for routine surveillance purposes. For 2018 and 2019, SLDSS includes data from cases reported as of November 3, 2022. The COVID-19 pandemic may have affected jurisdictions' abilities to report Legionnaires' disease cases to SLDSS for 2019.

Data from NNDSS are used to describe Legionnaires' disease trends by year, seasonal patterns by month, regional differences by jurisdiction of residence, and incidence rates by demographic characteristics. Incidence rate was calculated by dividing the number of confirmed Legionnaires' disease cases reported to NNDSS by the total resident population estimate or by a specific demographic population estimate as the denominator for 2018 or 2019, multiplied by 100,000. CDC's National Center for Health Statistics, in collaboration with the U.S. Census Bureau, determines postcensal estimates of resident population by year, jurisdiction, county, age, sex, race, and ethnicity. Population estimates for jurisdictions as of July 1, 2020, are available through the National Vital Statistics System (available at https://www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm).

Data from SLDSS are used to describe exposure settings that are potential sources of Legionnaires' disease infections (i.e., healthcare, travel, and assisted or senior living) during the 10 days before symptom onset; clinical categorization of legionellosis (i.e., Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis); CFRs;

hospitalization; patient outcome; and diagnostic methods. CFRs were calculated as the number of reported confirmed Legionnaires' disease case deaths divided by the number of patients with Legionnaires' disease and the same exposure history (See Definitions in the Technical Notes for more detail).

SAS 9.4 was used for data analysis for both systems (SAS Institute, Cary, NC).

## Complete reporting jurisdictions

NNDSS is considered the "gold standard" for case counts because almost all diagnosed Legionnaires' disease cases are reported to NNDSS (5); however, NNDSS captures only basic demographic information. SLDSS collects additional data including exposure history, disease severity indicators, and diagnostic laboratory testing results. Completeness of reporting of cases to SLDSS varies by jurisdiction and year. Because data from the jurisdictions with more complete reporting are more representative, this report restricts most SLDSS analyses to jurisdictions that reported at least 90% of confirmed NNDSS cases to SLDSS (Figures 6–8, Tables 3–6). These jurisdictions are referred to as complete reporting jurisdictions.

## Time period and setting

Reported confirmed cases of Legionnaires' disease in NNDSS are based on case entry into the database as of the closeout date (typically June 30 of the following year) (Figures 1–2). Cases reported after a given year's NNDSS database is closed can no longer be added to that year's database and can only contribute to case counts for the following year, regardless of the year in which that case occurred. In NNDSS, month is calculated based on the *MMWR* week assigned to that case by the reporting jurisdiction (available at https://ndc.services.cdc.gov/wp-content/uploads/2021/02/MMWR_Week_overview.pdf) (Figure 2).

Reported cases in SLDSS are based on case year, defined as the year of symptom onset, when available. Date of symptom onset is self-reported by the patient as the date signs and symptoms of Legionnaires' disease first occurred, or deferred to the judgement of the clinicians providing care and the public health officials performing the interviews. If onset date is not stated, case year for confirmed cases is determined by the earliest available of the following dates: date of positive laboratory test (by either UAT, culture, or 4-fold rise in antibody titer to *Legionella pneumophila* serogroup 1); date patient was hospitalized for treatment of Legionnaires' disease; or date case was first reported to public health at any level.

The population for this report includes residents from 52 U.S. jurisdictions (50 U.S. states, New York City, and District of Columbia). Resident jurisdiction is defined as the state, or jurisdiction, of usual residence of each case at the time of disease onset as reported to NNDSS (Figures 3a/3b) (available at https://ndc.services.cdc.gov/wp-content/uploads/2021/02/11-SI-04.pdf). New York City and New York State health departments report independently to both surveillance systems; data from these jurisdictions are mutually exclusive in this report, such that New York City data are not included in the New York State data. Map shading of confirmed cases of Legionnaires' disease reported to NNDSS by resident jurisdiction was determined by calculating individual jurisdictions' incidence rates and shading by quintile of the distribution (Figures 3a/3b).

## Definitions

### Case status

CSTE criteria in effect during 2018 and 2019 were used to define and classify cases (1). This report includes confirmed cases only. To be considered confirmed, a case must occur in a person with a clinically compatible illness and at least one of the confirmatory laboratory criteria (i.e., positive UAT, isolation of *Legionella* by culture, or a 4-fold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1) (1). CSTE defines a suspect case as a clinically compatible illness that meets at least one of the presumptive (suspect) laboratory

criteria (i.e., a 4-fold or greater rise in antibody titer to multiple species or specific species or serogroups of *Legionella* other than *Legionella pneumophila* serogroup 1, or a positive detection of specific *Legionella* antigen or staining of the organism by direct fluorescent antibody staining or immunohistochemistry, or by a validated nucleic acid assay) (1). Most cases submitted to NNDSS and SLDSS were categorized as confirmed (98%–99%).

### Demographic characteristics

Selected demographic characteristics include age at onset, sex, race, and ethnicity. For both surveillance systems, age is categorized in 10-year periods until age 79 (then 80–84 and ≥85 years of age) (Tables 2 and 4a/4b and Figure 4a). Sex is reported by the health department completing the case investigation as either female or male (Tables 2 and 4a/4b and Figure 4b). NNDSS uses bridged-race categories that include American Indian or Alaska Native, Asian or Pacific Islander, Black or African American, or White (Table 2 and Figure 4d) (available at https://www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm). SLDSS categorizes race as American Indian or Alaska Native, Asian, Black or African American, Hawaiian Islander or Pacific Islander, White, or multiple races (Figure 4c). For both systems, Hispanic ethnicity is restricted to Hispanic or Latino, or not Hispanic or Latino, and is independent of race (Tables 2, Table 4a/4b, and Figure 4d).

### Exposure categories

To assess potential sources of *Legionella* infection, SLDSS data were limited to confirmed Legionnaires' disease cases reported from complete reporting jurisdictions in 2018 and 2019 (Figures 6a/6b and Table 3).

SLDSS captures Legionnaires' disease-specific data including exposure history within the 10 days before symptom onset. Exposure to a healthcare setting, travel history, and exposure to an assisted or senior living facility are captured. The exposures are not mutually exclusive; multiple exposure types can occur during the exposure period. Cases without reported exposure to a healthcare setting, travel history, and exposure to an assisted or senior living facility are categorized as "none of these" (Figures 6a/6b and Table 3).

#### Healthcare exposure

Cases in patients who reported visiting, working in, or staying in a healthcare setting during the 10 days before date of symptom onset are classified as cases with a healthcare exposure. Because healthcare facilities often have large, complex water systems and aerosol-generating devices, healthcare exposure is a risk factor for Legionnaires' disease. Patients in healthcare settings often also have personal risk factors for Legionnaires' disease, such as advanced age, weakened immune systems, and chronic medical conditions (11). For the purpose of Legionnaires' disease surveillance, the CDC definition for healthcare facility does not include assisted living facilities, senior living facilities, prisons, or group homes.

Cases in patients with a healthcare exposure are categorized by healthcare setting and exposure type. Healthcare setting includes the following mutually exclusive categories: hospital, long-term care facility, clinic, other, and more than one type of setting. Examples of "Other" healthcare settings include diagnostic centers, disability service centers, eye centers, laboratories, and pharmacies. Healthcare exposure type includes the following mutually exclusive categories: inpatient, outpatient, visitor or volunteer, employee, and more than one type of healthcare exposure (Table 3).

For confirmed Legionnaires' disease cases in patients with a healthcare exposure, cases are classified as definite or possible healthcare-associated. Definite healthcare-associated cases include Legionnaires' disease in those who spent the entire 10 days before date of symptom onset in a healthcare facility. Possible healthcare-associated cases include Legionnaires' disease in those who spent a portion of the 10 days before date of symptom onset in a healthcare facility, and thus another setting could have been the source (Figures 6a/6b and Tables 5a/5b).

A patient with Legionnaires' disease who spent the entire exposure period in multiple healthcare facilities (i.e., someone transferred between healthcare facilities) would be considered a definite healthcare-associated case for

surveillance purposes. Cases in patients who reported a visit to a healthcare setting in the 10 days before date of symptom onset and did not indicate definite or possible healthcare associations were categorized as possible healthcare associations.

### Travel exposure

Cases in persons who reported spending at least one night away from home (in the state of residence, another state, or another country) in the 10 days before date of symptom onset, not including nights spent in a healthcare facility or congregate living setting, are classified as having a travel exposure.

Travel exposure is further classified at CDC as either public or private. Public travel includes spending at least one night away from home in the 10 days before symptom onset in a public accommodation (e.g., hotel, motel, resort, cruise, short-term vacation rental, RV park). Because hotels, resorts, and cruise ships often use large, complex water systems and aerosol-generating devices, travel to public accommodations is a known risk factor for exposure to *Legionella*. Private travel includes spending at least one night away from home in the 10 days before symptom onset in a private accommodation (e.g., in the home of family or friends).

Cases may occur in patients with multiple travel locations during the exposure period. If any exposure to a public accommodation occurs, the case is categorized as public travel. Private travel represents exposure to private accommodations only. If a patient has exposure to both private and unknown accommodations, the case is categorized as unknown travel (Figures 6a/6b and Table 3).

### Assisted or senior living facility exposure

Cases in patients who reported visiting or staying in an assisted or senior living facility in the 10 days before symptom onset are classified as having assisted or senior living exposure. Assisted living facilities, by the SLDSS case report form definition, provide custodial care without skilled nursing (e.g., assistance with activities of daily living, like bathing and dressing). Senior living facilities provide independent living for the elderly. Although assisted and senior living facilities are not considered healthcare facilities for Legionnaires' disease surveillance purposes, they often house populations at increased risk for Legionnaires' disease and can have large, complex water systems. For those reasons, these facilities should be considered as likely sources in outbreak investigations and should have water management programs in place.

Assisted or senior living-associated cases are categorized by assisted or senior living setting and exposure type. Setting includes the following mutually exclusive categories: assisted living facility, senior living facility, and both. Exposure type includes the following mutually exclusive categories: resident, visitor or volunteer, employee, and more than one type of exposure (Figures 6a/6b and Table 3).

### "None of these"

"None of these" exposures includes confirmed Legionnaires' disease cases in patients who did not report healthcare, travel, or assisted or senior living facility exposures in the 10 days before symptom onset (Figures 6a/6b and Table 3).

## Hospitalization

Health department staff indicate on the SLDSS case report form whether the patient was hospitalized during treatment for Legionnaires' disease as yes, no, or unknown (Tables 6a/6b and Figure 7). If the patient was admitted to a hospital prior to the date of Legionnaires' disease symptom onset for unrelated reasons, the hospitalization information also contributed to the case having a healthcare exposure.

## Outcome

Health department staff indicate on the SLDSS case report form if the patient survived, died, or was still ill at time of reporting. If this information is unknown, case outcome is indicated as "unknown" (Tables 6a/6b and Figure 8). This data element may not represent the final case outcome, as a patient's condition may change after submission

of case data to SLDSS. Deaths may not have resulted from Legionnaires' disease or Legionnaires' disease alone. CFR refers to the number of reported deaths at time of case report divided by the number of patients with Legionnaires' disease, including those whose outcome is unknown; therefore, true CFRs might be higher than those presented in this report.

### Diagnostic methods

Frequencies for the three laboratory diagnostic methods used to confirm cases of Legionnaires' disease (i.e., UAT, culture, and serology) according to the CSTE definition are listed in Table 7. The preferred diagnostic tests for Legionnaires' disease are the *Legionella* UAT in concert with a culture of lower respiratory secretions (e.g., sputum, bronchoalveolar lavage) on selective media.

## *Interpreting data*

The purpose of this surveillance report is to present descriptive information regarding Legionnaires' disease. Some data from this report can be used to assess disease trends and case counts, but they are not intended to suggest a causal relationship between exposures and Legionnaires' disease. NNDSS data were reported by the jurisdiction of the patient's usual residence at the time of disease onset, which does not necessarily represent the source of exposure to *Legionella*. Since NNDSS and SLDSS are separately managed surveillance systems, state public health offices report Legionnaires' disease cases separately to both systems. Data published in this report may be different from previously published data in *MMWR* for many reasons, including differences in the timing of reports, the data source, or methodology of surveillance.

While the incidence of reported cases of Legionnaires' disease in the United States has increased 6.5-fold from 2000 through 2019, these numbers may underestimate the true incidence, because Legionnaires' disease is likely underdiagnosed. Incomplete reporting to SLDSS makes interpretation of data difficult; findings may not represent the entire country. Only the numbers of cases reported to NNDSS and SLDSS were considered when determining which jurisdictions reported ≥90% of their NNDSS cases to SLDSS. It was assumed that SLDSS data were a subset of NNDSS data; this assumption was not verified for all jurisdictions. Limiting analyses to complete reporting jurisdictions in SLDSS reduced potential bias in SLDSS data. However, due to the different number of jurisdictions that were considered to have complete reporting in 2018 and 2019, interpretations of trends in SLDSS data are challenging, and data may not be directly comparable from year to year. More complete reporting to SLDSS would enhance surveillance quality.

In addition to incomplete reporting, another limitation is the timing of reporting to NNDSS and SLDSS. For cases reported to NNDSS, the case year is determined by the year's dataset to which the case is reported, whereas for SLDSS, the case year is determined by the onset date. To remain consistent with case counts published in *MMWR*, NNDSS analyses in this report include cases by the year of the dataset to which they were reported, rather than the earliest year associated with the case. However, the rate at which cases contributed to the following year's case counts in NNDSS was consistent over the years, and so this may not result in a significant skewing of data. Backlogged cases from 2019 might not have been reported in 2020 at the rate of past years due to the COVID-19 pandemic. In addition, SLDSS case reports are usually submitted at the time of investigation and are not consistently updated for time-dependent variables such as case outcome.

## *Importance of reporting*

Strong surveillance is critical for public health response and understanding the epidemiology as the reported incidence of Legionnaires' disease continues to increase. Prompt reporting of cases with complete exposure information facilitates timely identification of clusters of cases. CDC is uniquely positioned to identify connections among cases that occur in residents of different jurisdictions. However, state and local public health officials are best positioned to systematically track Legionnaires' disease cases and efficiently detect outbreaks

among residents of their respective jurisdictions. Early detection of clusters can lead to faster exposure source identification and expedite interventions to prevent additional cases. Most cases of Legionnaires' disease are not associated with a known outbreak. Complete reporting renders a fuller picture of disease burden and trends and may suggest novel sources of transmission.

### *Prevention*

Regardless of setting or source of exposure to *Legionella*, a comprehensive approach to prevention requires an understanding of the mechanisms by which *Legionella* growth and transmission can occur in building water systems (6). Implementing and maintaining an effective water management program is the principal prevention measure. Rapid case identification with appropriate laboratory testing and prompt intervention may prevent additional cases from occurring (11).

### *Future steps*

Future reports may be modified with additional data from enhanced surveillance systems, with the goal of allowing the public and CDC's partners to better understand the burden, impact, and trends of Legionnaires' disease over time. Beginning in 2020, cases will be defined and classified according to CSTE position statement 19-ID-04.

## Acknowledgements

The findings in this report are based on contributions from the 50 U.S. state, District of Columbia, and New York City health departments.

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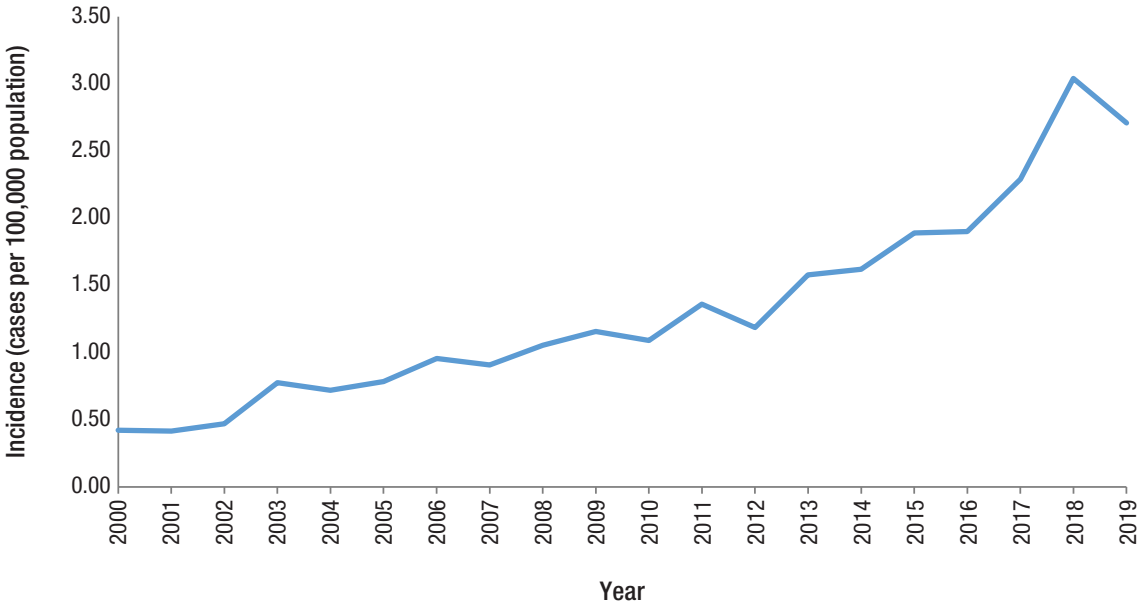
# Section 1: National Notifiable Diseases Surveillance System

NOTE: For accessible versions of tables and figures in this report, visit
https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables/index.html

**Figure 1. Crude incidence[a] rates of reported confirmed cases of Legionnaires' disease[b] by year[c]—NNDSS,[d,e] United States, 2000–2019.**




[a] Crude incidence of cases per 100,000 population (number of confirmed Legionnaires' disease cases reported that year divided by postcensal population estimate for that year times 100,000 population).

[b] Cases of disease due to *Legionella* are reported to NNDSS as legionellosis, which includes Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis, but are referred to as Legionnaires' disease in this figure (because almost all legionellosis cases reported in the United States are Legionnaires' disease cases).

[c] Based on year the case was reported to CDC.

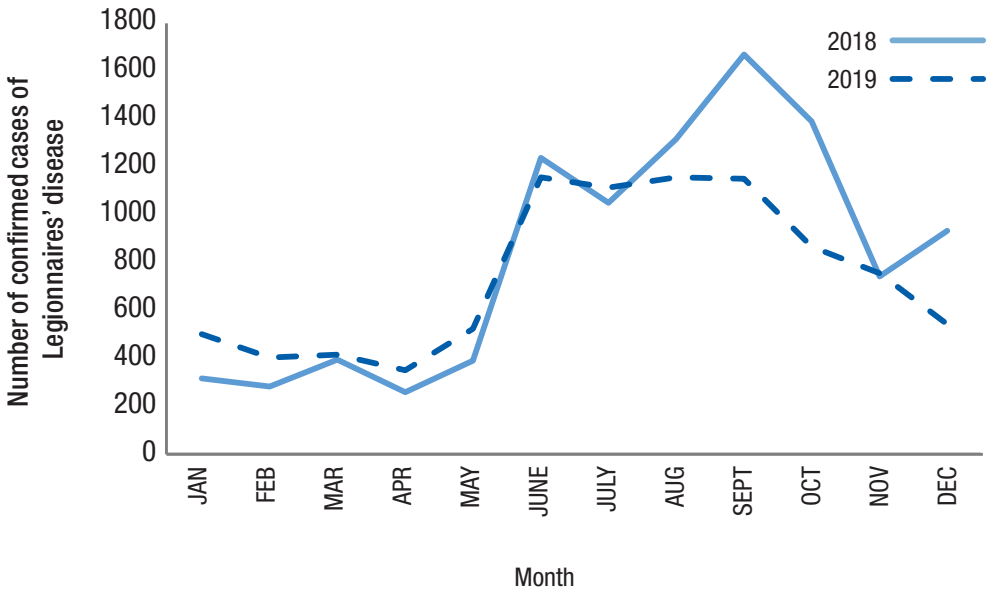
[d] National Notifiable Diseases Surveillance System (NNDSS).

[e] Jurisdictions may report cases of any case status to NNDSS, but only confirmed cases of Legionnaires' disease from the 50 U.S. states, the District of Columbia, and New York City are included in this figure, with the exceptions noted below. National case counts published in the *MMWR* use the same criteria and exceptions.

2000, 2002, and 2003: Legionnaires' disease cases with probable, suspect, and unknown case status were also included.
2001: Legionnaires' disease cases with probable and unknown case status were also included.
2000–2001: Legionnaires' disease cases were not reportable in Oregon and West Virginia.
2004–2012: Legionnaires' disease cases with unknown case status reported from California were also included.
2011–2012: Legionnaires' disease cases were not reportable in the District of Columbia.

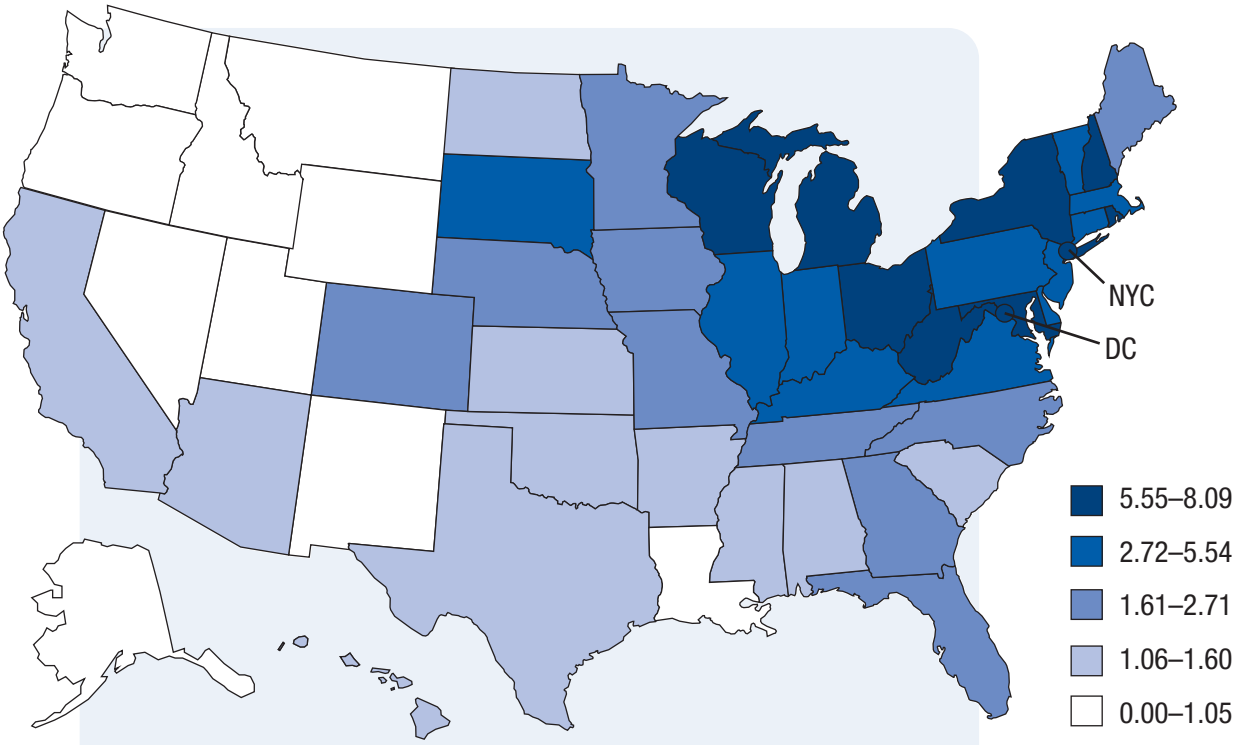
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables/index.html#figure-1

**Figure 2. Number of reported confirmed cases of Legionnaires' disease[a] by month[b] and year[c]—NNDSS,[d] United States, 2018 and 2019.**




[a] Cases of disease due to *Legionella* are reported to NNDSS as legionellosis, which includes Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis, but are referred to as Legionnaires' disease in this figure (because almost all legionellosis cases reported in the United States are Legionnaires' disease cases).
[b] Month is based upon *Morbidity and Mortality Weekly Report* year and week (available at https://ndc.services.cdc.gov/wp-content/uploads/2021/02/MMWR_Week_overview.pdf).
[c] Based on year the case was reported to CDC.
[d] National Notifiable Diseases Surveillance System (NNDSS).
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#figure-2

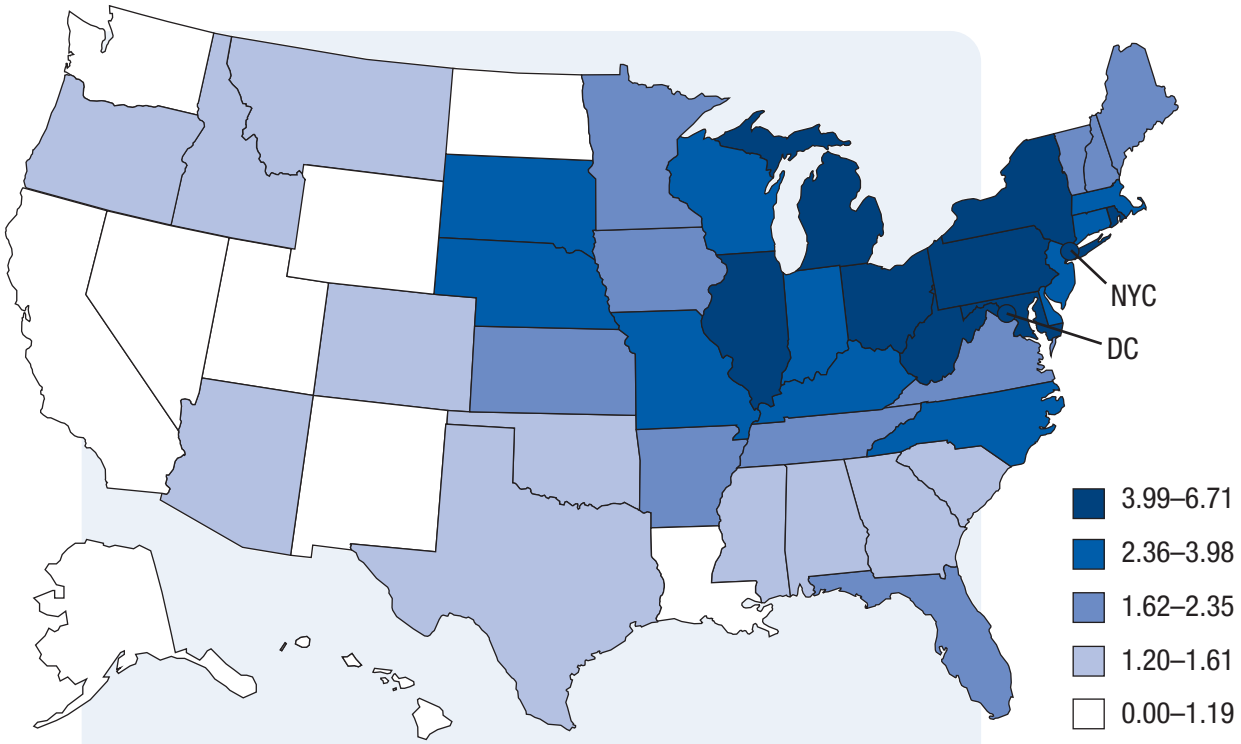
**Figure 3a. Crude incidence[a] rates of reported confirmed cases of Legionnaires' disease[b] by jurisdiction of residence[c]—NNDSS,[d] United States, 2018.[e,f]**




| | | | | | |
|---|---|---|---|---|---|
| Alabama | 1.55 | Louisiana | 0.90 | Ohio | 7.96 |
| Alaska | 0.41 | Maine | 2.54 | Oklahoma | 1.60 |
| Arizona | 1.16 | Maryland | 5.97 | Oregon | 0.74 |
| Arkansas | 1.53 | Massachusetts | 5.34 | Pennsylvania | 4.98 |
| California | 1.15 | Michigan | 6.34 | Rhode Island | 6.89 |
| Colorado | 1.93 | Minnesota | 2.71 | South Carolina | 1.24 |
| Connecticut | 5.54 | Mississippi | 1.37 | South Dakota | 3.75 |
| Delaware | 4.76 | Missouri | 2.45 | Tennessee | 2.52 |
| D.C. | 8.09 | Montana | 0.94 | Texas | 1.45 |
| Florida | 2.33 | Nebraska | 2.23 | Utah | 1.05 |
| Georgia | 1.72 | Nevada | 0.53 | Vermont | 2.72 |
| Hawaii | 1.19 | New Hampshire | 5.68 | Virginia | 2.77 |
| Idaho | 0.86 | New Jersey | 4.15 | Washington | 0.72 |
| Illinois | 4.00 | New Mexico | 1.05 | West Virginia | 7.14 |
| Indiana | 3.72 | New York | 6.91 | Wisconsin | 5.70 |
| Iowa | 2.00 | New York City | 7.79 | Wyoming | 0.35 |
| Kansas | 1.41 | North Carolina | 1.66 | | |
| Kentucky | 3.27 | North Dakota | 1.32 | | |

[a] Crude incidence of cases per 100,000 population (number of confirmed Legionnaires' disease cases reported that year divided by postcensal resident jurisdiction population estimate for that year times 100,000 population).
[b] Cases of disease due to *Legionella* are reported to NNDSS as legionellosis, which includes Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis, but are referred to as Legionnaires' disease in this figure (because almost all legionellosis cases reported in the United States are Legionnaires' disease cases).
[c] Jurisdiction of the patient's "usual residence" at the time of disease onset.
[d] National Notifiable Diseases Surveillance System (NNDSS).
[e] Based on year the case was reported to CDC.
[f] Shading represents quintiles of incidence rates.
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#figure-3a

**Figure 3b. Crude incidence[a] rates of reported confirmed cases of Legionnaires' disease[b] by jurisdiction of residence[c]—NNDSS,[d] United States, 2019.[e,f]**




| | | | | | |
|---|---|---|---|---|---|
| Alabama | 1.47 | Louisiana | 1.07 | North Dakota | 1.18 |
| Alaska | 0.27 | Maine | 2.23 | Ohio | 6.71 |
| Arizona | 1.28 | Maryland | 4.51 | Oklahoma | 1.31 |
| Arkansas | 2.18 | Massachusetts | 3.58 | Oregon | 1.30 |
| California | 1.14 | Michigan | 5.52 | Pennsylvania | 4.52 |
| Colorado | 1.56 | Minnesota | 2.09 | Rhode Island | 4.54 |
| Connecticut | 3.34 | Mississippi | 1.58 | South Carolina | 1.30 |
| Delaware | 3.58 | Missouri | 2.98 | South Dakota | 2.59 |
| D.C. | 5.79 | Montana | 1.31 | Tennessee | 2.18 |
| Florida | 2.08 | Nebraska | 2.38 | Texas | 1.45 |
| Georgia | 1.61 | Nevada | 0.81 | Utah | 1.19 |
| Hawaii | 0.78 | New Hampshire | 2.35 | Vermont | 1.92 |
| Idaho | 1.40 | New Jersey | 3.58 | Virginia | 2.23 |
| Illinois | 4.85 | New Mexico | 1.00 | Washington | 1.00 |
| Indiana | 3.91 | New York | 5.45 | West Virginia | 4.57 |
| Iowa | 2.15 | New York City | 5.35 | Wisconsin | 3.98 |
| Kansas | 2.27 | North Carolina | 2.90 | Wyoming | 0.52 |
| Kentucky | 2.71 | | | | |

[a] Crude incidence of cases per 100,000 population (number of confirmed Legionnaires' disease cases reported that year divided by postcensal resident jurisdiction population estimate for that year times 100,000 population).
[b] Cases of disease due to *Legionella* are reported to NNDSS as legionellosis, which includes Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis, but are referred to as Legionnaires' disease in this figure (because almost all legionellosis cases reported in the United States are Legionnaires' disease cases).
[c] Jurisdiction of the patient's "usual residence" at the time of disease onset.
[d] National Notifiable Diseases Surveillance System (NNDSS).
[e] Based on year the case was reported to CDC.
[f] Shading represents quintiles of incidence rates.
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#figure-3b

**Table 1. Number of reported confirmed cases of Legionnaires' disease[a] by jurisdiction of residence[b] and year[c]—NNDSS,[d] United States, 2018 and 2019.**

| Jurisdiction | 2018 (Total= 9,933) | | 2019 (Total= 8,890) | |
|---|---|---|---|---|
| | N | % | N | % |
| Alabama | 76 | 0.8 | 72 | 0.8 |
| Alaska | 3 | 0.0 | 2 | 0.0 |
| Arizona | 83 | 0.8 | 93 | 1.1 |
| Arkansas | 46 | 0.5 | 66 | 0.7 |
| California | 453 | 4.6 | 451 | 5.1 |
| Colorado | 110 | 1.1 | 90 | 1.0 |
| Connecticut | 198 | 2.0 | 119 | 1.3 |
| Delaware | 46 | 0.5 | 35 | 0.4 |
| D.C. | 57 | 0.6 | 41 | 0.5 |
| Florida | 496 | 5.0 | 448 | 5.0 |
| Georgia | 181 | 1.8 | 171 | 1.9 |
| Hawaii | 17 | 0.2 | 11 | 0.1 |
| Idaho | 15 | 0.2 | 25 | 0.3 |
| Illinois | 509 | 5.1 | 614 | 6.9 |
| Indiana | 249 | 2.5 | 263 | 3.0 |
| Iowa | 63 | 0.6 | 68 | 0.8 |
| Kansas | 41 | 0.4 | 66 | 0.7 |
| Kentucky | 146 | 1.5 | 121 | 1.4 |
| Louisiana | 42 | 0.4 | 50 | 0.6 |
| Maine | 34 | 0.3 | 30 | 0.3 |
| Maryland | 361 | 3.6 | 273 | 3.1 |
| Massachusetts | 368 | 3.7 | 247 | 2.8 |
| Michigan | 633 | 6.4 | 551 | 6.2 |
| Minnesota | 152 | 1.5 | 118 | 1.3 |
| Mississippi | 41 | 0.4 | 47 | 0.5 |
| Missouri | 150 | 1.5 | 183 | 2.1 |
| Montana | 10 | 0.1 | 14 | 0.2 |
| Nebraska | 43 | 0.4 | 46 | 0.5 |
| Nevada | 16 | 0.2 | 25 | 0.3 |
| New Hampshire | 77 | 0.8 | 32 | 0.4 |
| New Jersey | 369 | 3.7 | 318 | 3.6 |
| New Mexico | 22 | 0.2 | 21 | 0.2 |
| New York City | 654 | 6.6 | 446 | 5.0 |
| New York State | 770 | 7.8 | 606 | 6.8 |
| North Carolina | 173 | 1.7 | 305 | 3.4 |

| Jurisdiction | 2018 (Total= 9,933) N | % | 2019 (Total= 8,890) N | % |
|---|---|---|---|---|
| North Dakota | 10 | 0.1 | 9 | 0.1 |
| Ohio | 930 | 9.4 | 785 | 8.8 |
| Oklahoma | 63 | 0.6 | 52 | 0.6 |
| Oregon | 31 | 0.3 | 55 | 0.6 |
| Pennsylvania | 638 | 6.4 | 579 | 6.5 |
| Rhode Island | 73 | 0.7 | 48 | 0.5 |
| South Carolina | 63 | 0.6 | 67 | 0.8 |
| South Dakota | 33 | 0.3 | 23 | 0.3 |
| Tennessee | 171 | 1.7 | 149 | 1.7 |
| Texas | 415 | 4.2 | 421 | 4.7 |
| Utah | 33 | 0.3 | 38 | 0.4 |
| Vermont | 17 | 0.2 | 12 | 0.1 |
| Virginia | 236 | 2.4 | 191 | 2.2 |
| Washington | 54 | 0.5 | 76 | 0.9 |
| West Virginia | 129 | 1.3 | 82 | 0.9 |
| Wisconsin | 331 | 3.3 | 232 | 2.6 |
| Wyoming | 2 | 0.0 | 3 | 0.0 |
| TOTAL | 9,933 | 100.0 | 8,890 | 100.0 |

[a] Cases of disease due to *Legionella* are reported to NNDSS as legionellosis, which includes Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis, but are referred to as Legionnaires' disease in this table (because almost all legionellosis cases reported in the United States are Legionnaires' disease cases).
[b] Jurisdiction of the patient's "usual residence" at the time of disease onset.
[c] Based on year the case was reported to CDC.
[d] National Notifiable Diseases Surveillance System (NNDSS).
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#table-1

**Table 2. Number, percent, and crude incidence[a] rates of reported confirmed cases of Legionnaires' disease[b] by demographic characteristics and year[c]—NNDSS,[d] United States, 2018 and 2019.**

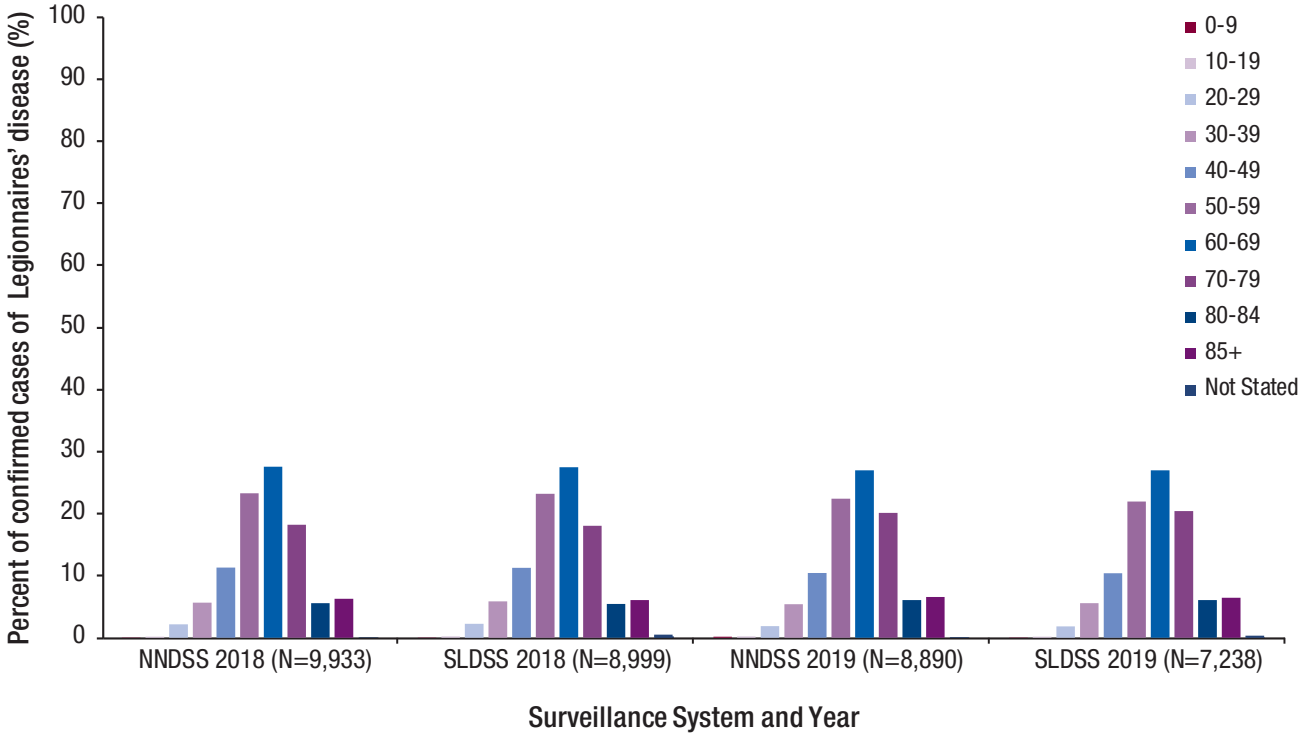
| | 2018 | | | 2019 | | |
|---|---|---|---|---|---|---|
| Characteristic | N | % | Rate[a] | N | % | Rate[a] |
| Age | | | | | | |
| 0–9 | 3 | 0.0 | 0.01 | 12 | 0.1 | 0.03 |
| 10–19 | 16 | 0.2 | 0.04 | 17 | 0.2 | 0.04 |
| 20–29 | 213 | 2.1 | 0.47 | 164 | 1.8 | 0.36 |
| 30–39 | 558 | 5.6 | 1.28 | 478 | 5.4 | 1.08 |
| 40–49 | 1,120 | 11.3 | 2.77 | 925 | 10.4 | 2.29 |
| 50–59 | 2,308 | 23.2 | 5.40 | 1,990 | 22.4 | 4.70 |
| 60–69 | 2,732 | 27.5 | 7.31 | 2,393 | 26.9 | 6.30 |
| 70–79 | 1,805 | 18.2 | 7.98 | 1,784 | 20.1 | 7.53 |
| 80–84 | 553 | 5.6 | 9.03 | 537 | 6.0 | 8.50 |
| 85+ | 623 | 6.3 | 9.53 | 583 | 6.6 | 8.83 |
| Not stated | 2 | 0.0 | N/A | 7 | 0.1 | N/A |
| Sex | | | | | | |
| Female | 3,637 | 36.6 | 2.19 | 3,256 | 36.6 | 1.95 |
| Male | 6,289 | 63.3 | 3.91 | 5,574 | 62.7 | 3.45 |
| Not stated | 7 | 0.1 | N/A | 60 | 0.7 | N/A |
| Race | | | | | | |
| American Indian/Alaska Native | 49 | 0.5 | 1.02 | 25 | 0.3 | 0.52 |
| Asian/Pacific Islander | 117 | 1.2 | 0.54 | 159 | 1.8 | 0.72 |
| African American/Black | 2,251 | 22.7 | 4.86 | 1,763 | 19.8 | 3.77 |
| White | 6,037 | 60.8 | 2.38 | 5,483 | 61.7 | 2.15 |
| Other[e] | 495 | 5.0 | N/A | 494 | 5.6 | N/A |
| Not stated | 984 | 9.9 | N/A | 966 | 10.9 | N/A |
| Ethnicity | | | | | | |
| Hispanic | 646 | 6.5 | 1.09 | 588 | 6.6 | 0.97 |
| Non-Hispanic | 7,110 | 71.6 | 2.66 | 6,376 | 71.7 | 2.38 |
| Not stated | 2,177 | 21.9 | N/A | 1,926 | 21.7 | N/A |
| Total | 9,933 | 100.0 | 3.04 | 8,890 | 100.0 | 2.71 |

[a] Crude incidence of cases per 100,000 population (number of confirmed Legionnaires' disease cases reported that year divided by postcensal population estimate for that year times 100,000 population).
[b] Cases of disease due to *Legionella* are reported to NNDSS as legionellosis, which includes Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis, but are referred to as Legionnaires' disease in this table (because almost all legionellosis cases reported in the United States are Legionnaires' disease cases).
[c] Based on year the case was reported to CDC.
[d] National Notifiable Diseases Surveillance System (NNDSS).
[e] Other race includes individuals that did not identify with races listed.
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#table-2

## Section 2: National Notifiable Diseases Surveillance System comparison with Supplemental Legionnaires' Disease Surveillance System

NOTE: For accessible versions of tables and figures in this report, visit
https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables/index.html

**Figure 4a. Percent of reported confirmed cases of Legionnaires' disease[a] by age group and year[b]—NNDSS[c] and SLDSS,[d] United States, 2018 and 2019.**




[a] Cases of disease due to *Legionella* are reported to NNDSS as legionellosis, which includes Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis, but are referred to as Legionnaires' disease in this figure (because almost all legionellosis cases reported in the United States are Legionnaires' disease cases). SLDSS data are limited to cases of Legionnaires' disease in this figure.

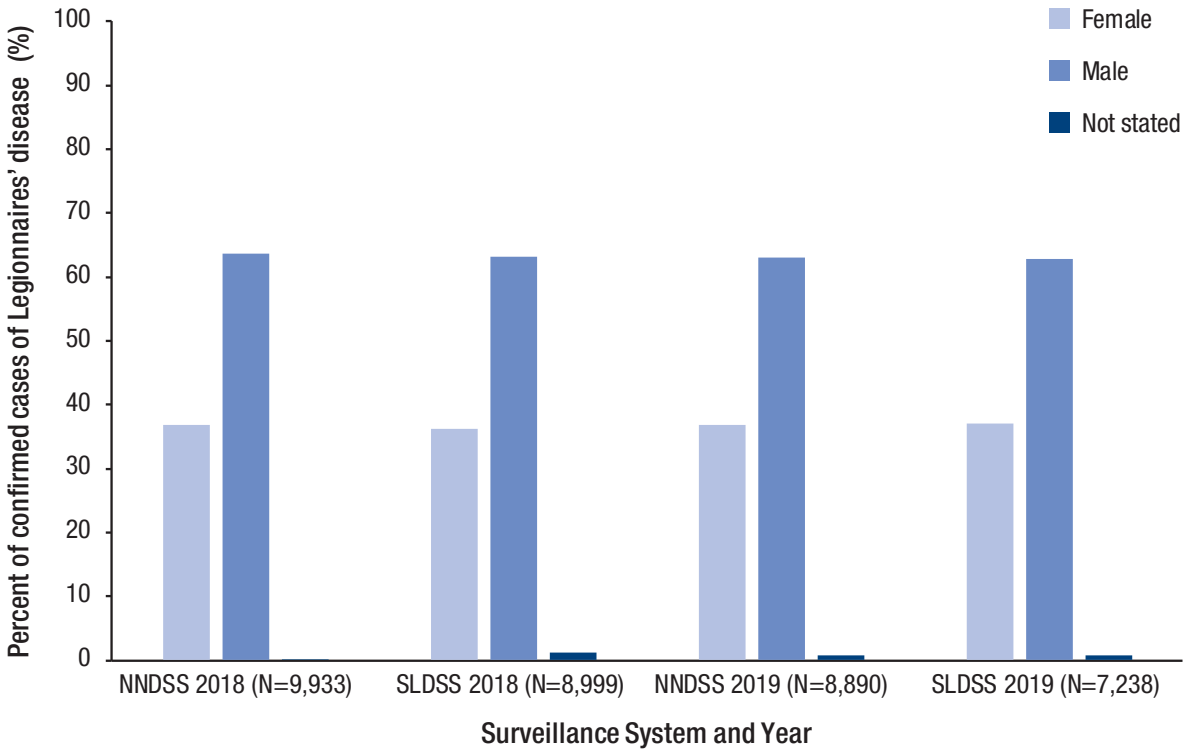
[b] Based on year the case was reported to CDC in NNDSS and year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.

[c] National Notifiable Diseases Surveillance System (NNDSS).

[d] Supplemental Legionnaires' Disease Surveillance System (SLDSS).

Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#figure-4a

**Figure 4b. Percent of reported confirmed cases of Legionnaires' disease[a] by sex and year[b]—NNDSS[c] and SLDSS,[d] United States, 2018 and 2019.**




[a] Cases of disease due to *Legionella* are reported to NNDSS as legionellosis, which includes Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis, but are referred to as Legionnaires' disease in this figure (because almost all legionellosis cases reported in the United States are Legionnaires' disease cases). SLDSS data are limited to cases of Legionnaires' disease in this figure.

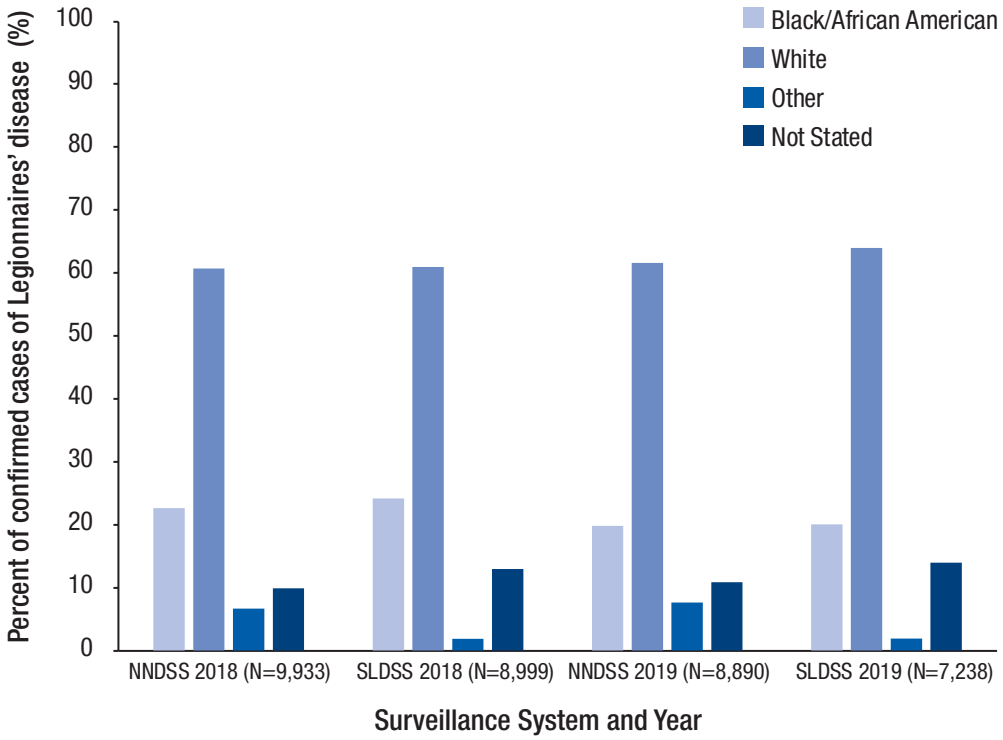
[b] Based on year the case was reported to CDC in NNDSS and year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.

[c] National Notifiable Diseases Surveillance System (NNDSS).

[d] Supplemental Legionnaires' Disease Surveillance System (SLDSS).

Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#figure-4b

**Figure 4c. Percent of reported confirmed cases of Legionnaires' disease[a] by race[b] and year[c]—NNDSS[d] and SLDSS,[e] United States, 2018 and 2019.**




[a] Cases of disease due to *Legionella* are reported to NNDSS as legionellosis, which includes Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis, but are referred to as Legionnaires' disease in this figure (because almost all legionellosis cases reported in the United States are Legionnaires' disease cases). SLDSS data are limited to cases of Legionnaires' disease in this figure.

[b] In NNDSS, Other includes American Indian/Alaska Native, Asian/Pacific Islander, and individuals that did not identify with either race in NNDSS. In SLDSS, Other includes American Indian/Alaska Native, Asian, Hawaii/Pacific Islander, and individuals that identified with multiple races.

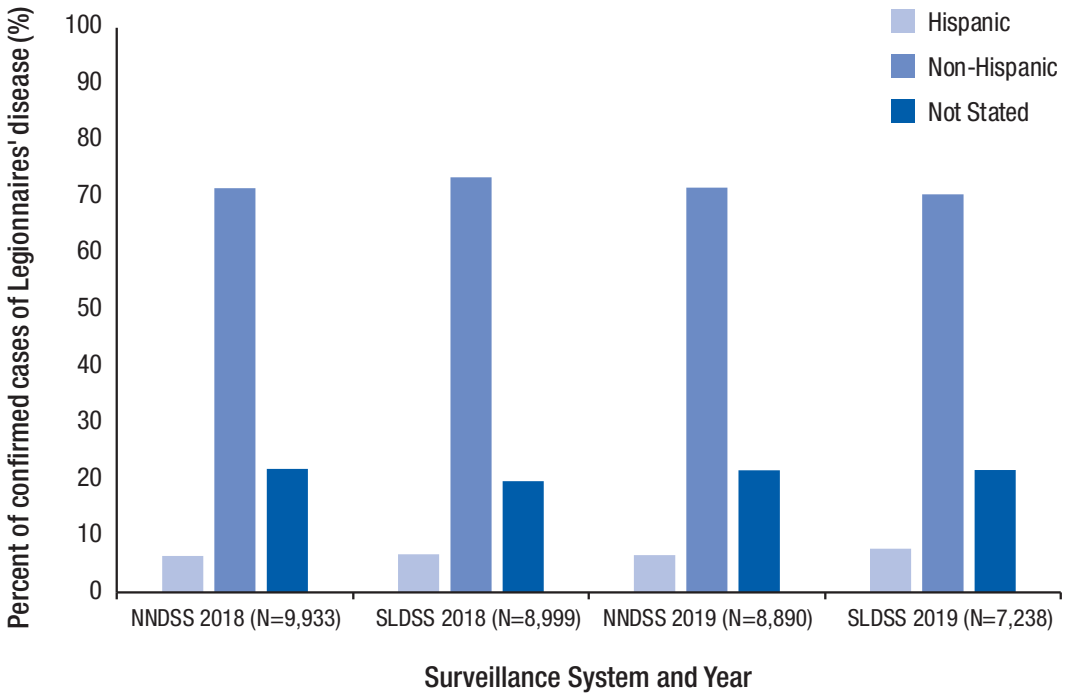
[c] Based on year the case was reported to CDC in NNDSS and year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.

[d] National Notifiable Diseases Surveillance System (NNDSS).

[e] Supplemental Legionnaires' Disease Surveillance System (SLDSS).

Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#figure-4c

**Figure 4d. Percent of reported confirmed cases of Legionnaires' disease[a] by ethnicity and year[b]—NNDSS[c] and SLDSS,[d] United States, 2018 and 2019.**




[a] Cases of disease due to *Legionella* are reported to NNDSS as legionellosis, which includes Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis, but are referred to as Legionnaires' disease in this figure (because almost all legionellosis cases reported in the United States are Legionnaires' disease cases). SLDSS data are limited to cases of Legionnaires' disease in this figure.

[b] Based on year the case was reported to CDC in NNDSS and year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.

[c] National Notifiable Diseases Surveillance System (NNDSS).

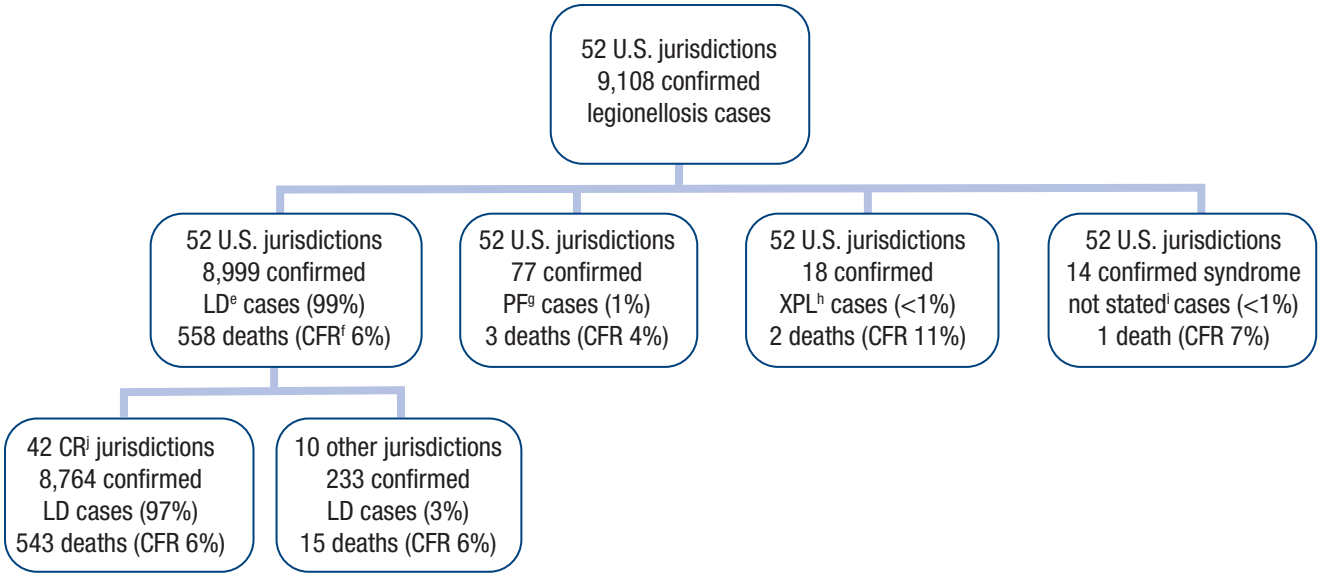
[d] Supplemental Legionnaires' Disease Surveillance System (SLDSS).

Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#figure-4d

# Section 3: Supplemental Legionnaires' Disease Surveillance System

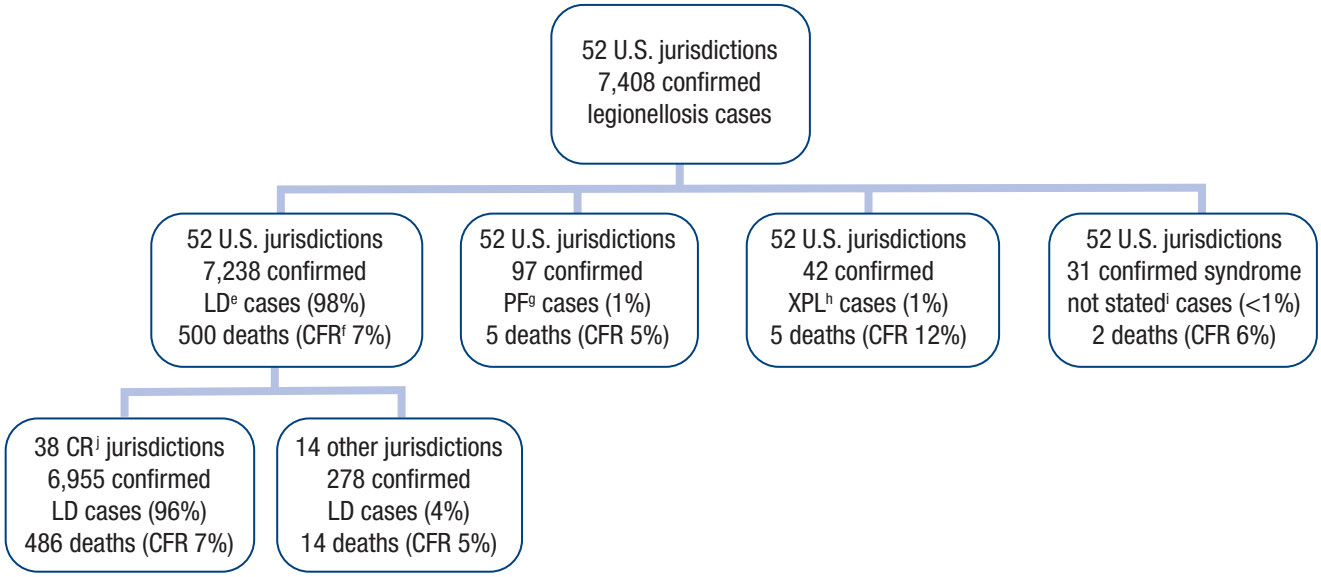
NOTE: For accessible versions of tables and figures in this report, visit
https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables/index.html

**Figure 5a. Reported confirmed cases of legionellosis[a] by syndrome and completeness of jurisdictional reporting[b]—SLDSS,[c] United States, 2018.[d]**



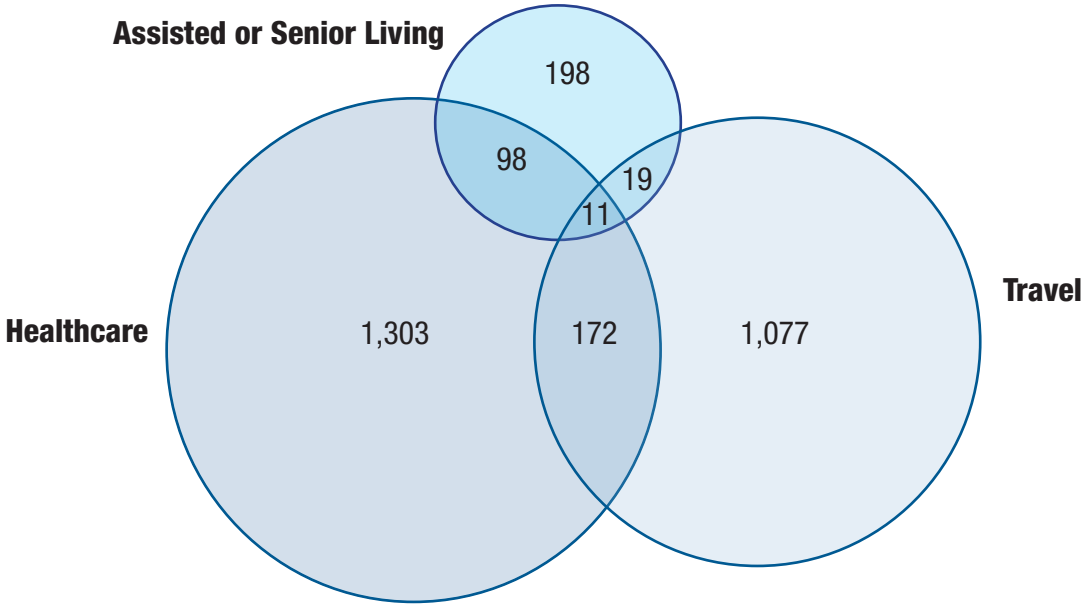

[a] Legionellosis includes Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis.
[b] 42 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS in 2018: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New York (state), New York City, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, and Wyoming.
[c] Supplemental Legionnaires' Disease Surveillance System (SLDSS).
[d] Based on year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.
[e] Legionnaires' disease.
[f] CFR: Case fatality rate calculated as the number of reported confirmed case deaths divided by the number of patients with the same legionellosis syndrome.
[g] Pontiac fever.
[h] Extrapulmonary legionellosis.
[i] While legionellosis consists of Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis, syndrome was not specified for some cases.
[j] Complete reporting.
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#figure-5a

**Figure 5b. Reported confirmed cases of legionellosis[a] by syndrome and completeness of jurisdictional reporting[b]—SLDSS,[c] United States, 2019.[d]**




[a] Legionellosis includes Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis.
[b] 38 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS in 2019: Alabama, Alaska, Arizona, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New York (state), New York City, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wyoming.
[c] Supplemental Legionnaires' Disease Surveillance System (SLDSS).
[d] Based on year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.
[e] Legionnaires' disease.
[f] CFR: Case fatality rate calculated as the number of reported confirmed case deaths divided by the number of patients with the same legionellosis syndrome.
[g] Pontiac fever.
[h] Extrapulmonary legionellosis.
[i] While legionellosis consists of Legionnaires' disease, Pontiac fever, and extrapulmonary legionellosis, syndrome was not specified for some cases.
[j] Complete reporting.
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#figure-5b

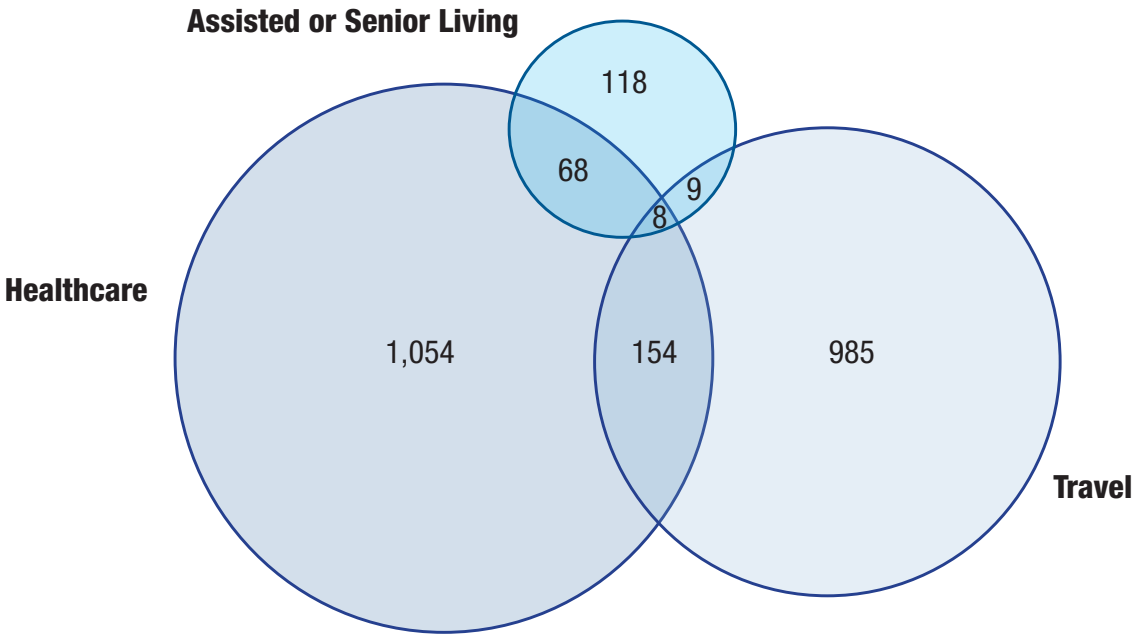
**Figure 6a. Number of reported confirmed cases and deaths of Legionnaires' disease by exposure category[a]—SLDSS,[b] complete reporting jurisdictions,[c] 2018.[d]**




| Exposure category | Cases (Total = 8,764) N | Cases (Total = 8,764) % | Deaths (Total= 719) N | Deaths (Total= 719) CFR[e] |
|---|---|---|---|---|
| Any healthcare | 1,584 | 18.1 | 156 | 9.8 |
| Definite healthcare | 204 | 2.3 | 53 | 26.0 |
| Possible healthcare | 1,380 | 15.7 | 103 | 7.5 |
| Any travel | 1,279 | 14.6 | 35 | 2.7 |
| Any assisted or senior living | 326 | 3.7 | 30 | 9.2 |
| None of these | 5,886 | 67.2 | 342 | 5.8 |

[a] Exposure categories are not mutually exclusive. A patient may report multiple exposures in the 10 days before date of symptom onset. Exposure categories:
**Healthcare:** A patient who visited, worked, or stayed in a healthcare setting in the 10 days before date of symptom onset.
**Travel:** A patient with a history of spending at least one night away from home (in the state of residence, another state, or another country) in the 10 days before date of symptom onset, not including nights spent in a healthcare facility.
**Assisted or senior living facility:** A patient who visited, worked, or stayed in a senior or assisted living facility in the 10 days before date of symptom onset.
**None of these:** A patient without reported healthcare setting, travel, or senior or assisted living facility exposure in the 10 days before date of symptom onset.
[b] Supplemental Legionnaires' Disease Surveillance System (SLDSS).
[c] Complete reporting jurisdictions in 2018: 42 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New York (state), New York City, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, and Wyoming.
[d] Based on year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.
[e] CFR: Case fatality rate calculated as the number of reported confirmed Legionnaires' disease case deaths divided by the number of patients with Legionnaires' disease and the same exposure history.
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#figure-6a

**Figure 6b. Number of reported confirmed cases and deaths of Legionnaires' disease by exposure category[a]—SLDSS,[b] complete reporting jurisdictions,[c] 2019.[d]**




| Exposure category | Cases (Total = 6,955) N | Cases (Total = 6,955) % | Deaths (Total = 639) N | Deaths (Total = 639) CFR[e] |
|---|---|---|---|---|
| Any healthcare | 1,284 | 18.5 | 134 | 10.4 |
| Definite healthcare | 192 | 2.8 | 41 | 21.4 |
| Possible healthcare | 1,092 | 15.7 | 93 | 8.5 |
| Any travel | 1,156 | 16.6 | 35 | 3.0 |
| Any assisted or senior living | 203 | 2.9 | 25 | 12.3 |
| None of these | 4,559 | 65.5 | 311 | 6.8 |

[a] Exposure categories are not mutually exclusive. A patient may report multiple exposures in the 10 days before date of symptom onset. Exposure categories:
**Healthcare:** A patient who visited, worked, or stayed in a healthcare setting in the 10 days before date of symptom onset.
**Travel:** A patient with a history of spending at least one night away from home (in the state of residence, another state, or another country) in the 10 days before date of symptom onset, not including nights spent in a healthcare facility.
**Assisted or senior living facility:** A patient who visited, worked, or stayed in a senior or assisted living facility in the 10 days before date of symptom onset.
**None of these:** A patient without reported healthcare setting, travel, or senior or assisted living facility exposure in the 10 days before date of symptom onset.

[b] Supplemental Legionnaires' Disease Surveillance System (SLDSS).

[c] Complete reporting jurisdictions for 2019: 38 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS in 2019: Alabama, Alaska, Arizona, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New York (state), New York City, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wyoming.

[d] Based on year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.

[e] CFR: Case fatality rate calculated as the number of reported confirmed Legionnaires' disease case deaths divided by the number of patients with Legionnaires' disease and the same exposure history.

Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#figure-6b

**Table 3. Number of reported confirmed cases of Legionnaires' disease by exposure category[a] and year[b]—SLDSS,[c] complete reporting jurisdictions,[d] 2018 and 2019.**

| | 2018 (Total = 8,764) | | 2019 (Total = 6,955) | |
|---|---|---|---|---|
| Exposure Category | N | % | N | % |
| **Healthcare** | 1,584 | 18.1 | 1,284 | 18.5 |
| **Healthcare facility type** | | | | |
| Hospital | 497 | 31.4 | 463 | 36.1 |
| Long-term care facility | 296 | 18.7 | 206 | 16.0 |
| Clinic | 520 | 32.8 | 381 | 29.7 |
| Multiple | 141 | 8.9 | 154 | 12.0 |
| Other | 11 | 0.7 | 35 | 2.7 |
| Not stated | 119 | 7.5 | 45 | 3.5 |
| **Healthcare exposure type** | | | | |
| Inpatient | 377 | 23.8 | 354 | 27.6 |
| Outpatient | 738 | 46.6 | 541 | 42.1 |
| Visitor | 184 | 11.6 | 132 | 10.3 |
| Employee | 126 | 8.0 | 98 | 7.6 |
| Multiple | 95 | 6.0 | 91 | 7.1 |
| Not stated | 64 | 4.0 | 68 | 5.3 |
| **Travel** | 1,279 | 14.6 | 1,156 | 16.6 |
| Any public accommodation | 818 | 64.0 | 765 | 66.2 |
| Hotel/motel/resort | 804 | N/A | 752 | N/A |
| Cruise ship | 30 | N/A | 20 | N/A |
| All private accommodations | 354 | 27.7 | 261 | 22.6 |
| Unknown travel accommodation type | 107 | 8.4 | 130 | 11.2 |
| **Asssisted or Senior Living** | 326 | 3.7 | 203 | 2.9 |
| **Assisted or Senior Living Facility Type** | | | | |
| Assisted living facility | 202 | 62.0 | 101 | 49.8 |
| Senior living facility | 102 | 31.3 | 76 | 37.4 |
| Both | 5 | 1.5 | 5 | 2.5 |
| Not stated | 17 | 5.2 | 21 | 10.3 |
| **Assisted or Senior Living Exposure Type** | | | | |
| Resident | 192 | 58.9 | 116 | 57.1 |
| Visitor | 79 | 24.2 | 47 | 23.2 |
| Employee | 39 | 12.0 | 18 | 8.9 |
| Multiple | 1 | 0.3 | 1 | 0.5 |
| Not stated | 15 | 4.6 | 21 | 10.3 |
| **None of these** | 5,886 | 67.2 | 4,559 | 65.5 |

[a] Exposure categories (categories are not mutually exclusive):
**Healthcare:** A patient who visited, worked, or stayed in a healthcare setting in the 10 days before date of symptom onset.

**Travel:** A patient with a history of spending at least one night away from home (in the state of residence, another state, or another country) in the 10 days before date of symptom onset, not including nights spent in a healthcare facility. Cases may occur in patients with multiple travel locations during the exposure period. If any exposure to a public accommodation occurs, the case is categorized as public travel. Private travel represents exposure to private accommodations only. If a patient has exposure to both private and unknown accommodations, the case is categorized as unknown travel.

**Assisted or senior living:** A patient who visited, worked, or stayed in a senior or assisted living facility in the 10 days before date of symptom onset.

**None of these:** A patient without reported healthcare setting, travel, or senior or assisted living facility exposure in the 10 days before date of symptom onset.

[b] Based on year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or fourfold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.

[c] Supplemental Legionnaires' Disease Surveillance System (SLDSS).

[d] Complete reporting jurisdictions in 2018: 42 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New York (state), New York City, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, and Wyoming.
Complete reporting jurisdictions for 2019: 38 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS in 2019: Alabama, Alaska, Arizona, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New York (state), New York City, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wyoming.

Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#table-3

**Table 4a. Number of reported confirmed cases of Legionnaires' disease by demographic characteristics and exposure category[a]—SLDSS,[b] complete reporting jurisdictions,[c] 2018.[d]**

| | Healthcare (Total = 1,584) | | Travel (Total = 1,279) | | Assisted or senior living (Total = 326) | | None of these (Total = 5,886) | |
|---|---|---|---|---|---|---|---|---|
| Characteristic | N | % | N | % | N | % | N | % |
| Median Age (years) | 65 | N/A | 62 | N/A | 71 | N/A | 61 | N/A |
| Age | | | | | | | | |
| 0–9 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 2 | 0.0 |
| 10–19 | 2 | 0.1 | 3 | 0.2 | 0 | 0.0 | 10 | 0.2 |
| 20–29 | 19 | 1.2 | 24 | 1.9 | 4 | 1.2 | 151 | 2.6 |
| 30–39 | 65 | 4.1 | 76 | 5.9 | 8 | 2.5 | 384 | 6.5 |
| 40–49 | 134 | 8.5 | 152 | 11.9 | 19 | 5.8 | 714 | 12.1 |
| 50–59 | 311 | 19.6 | 287 | 22.4 | 49 | 15.0 | 1,444 | 24.5 |
| 60–69 | 447 | 28.2 | 377 | 29.5 | 72 | 22.1 | 1,576 | 26.8 |
| 70–79 | 356 | 22.5 | 263 | 20.6 | 74 | 22.7 | 964 | 16.4 |
| 80–84 | 109 | 6.9 | 58 | 4.5 | 29 | 8.9 | 301 | 5.1 |
| 85+ | 141 | 8.9 | 35 | 2.7 | 71 | 21.8 | 313 | 5.3 |
| Not stated | 0 | 0.0 | 4 | 0.3 | 0 | 0.0 | 27 | 0.5 |
| Sex | | | | | | | | |
| Female | 670 | 42.3 | 443 | 34.6 | 163 | 50.0 | 2,000 | 34.0 |
| Male | 908 | 57.3 | 828 | 64.7 | 160 | 49.1 | 3,815 | 64.8 |
| Not stated | 6 | 0.4 | 8 | 0.6 | 3 | 0.9 | 71 | 1.2 |
| Race | | | | | | | | |
| American Indian/ Alaska Native | 8 | 0.5 | 4 | 0.3 | 1 | 0.3 | 29 | 0.5 |
| Asian | 17 | 1.1 | 9 | 0.7 | 0 | 0.0 | 68 | 1.2 |
| African American/Black | 376 | 23.7 | 226 | 17.7 | 75 | 23.0 | 1,548 | 26.3 |
| Native Hawaiian/ Other Pacific Islander | 2 | 0.1 | 2 | 0.2 | 0 | 0.0 | 7 | 0.1 |
| White | 1,010 | 63.8 | 855 | 66.8 | 223 | 68.4 | 3,472 | 59.0 |
| Multiple | 2 | 0.1 | 2 | 0.2 | 0 | 0.0 | 8 | 0.1 |
| Not stated | 169 | 10.7 | 181 | 14.2 | 27 | 8.3 | 754 | 12.8 |
| Ethnicity | | | | | | | | |
| Hispanic | 88 | 5.6 | 71 | 5.6 | 15 | 4.6 | 433 | 7.4 |
| Non-Hispanic | 1,196 | 75.5 | 935 | 73.1 | 258 | 79.1 | 4,314 | 73.3 |
| Not stated | 300 | 18.9 | 273 | 21.3 | 53 | 16.3 | 1,139 | 19.4 |

[a] Exposure categories (categories are not mutually exclusive):
**Healthcare:** A patient who visited, worked, or stayed in a healthcare setting in the 10 days before date of symptom onset.
**Travel:** A patient with a history of spending at least one night away from home (in the state of residence, another state, or another country) in the 10 days before date of symptom onset, not including nights spent in a healthcare facility.
**Assisted or senior living:** A patient who visited, worked, or stayed in a senior or assisted living facility in the 10 days before date of symptom onset.
None of these: A patient without reported healthcare setting, travel, or senior or assisted living facility exposure in the 10 days before date of symptom onset.

[b] Supplemental Legionnaires' Disease Surveillance System (SLDSS).

[c] Complete reporting jurisdictions in 2018: 42 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS in 2018: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New York (state), New York City, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, and Wyoming.

[d] Based on year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#table-4a

**Table 4b. Number of reported confirmed cases of Legionnaires' disease by demographic characteristics and exposure category[a]—SLDSS,[b] complete reporting jurisdictions,[c] 2019.[d]**

| | Healthcare (Total = 1,284) | | Travel (Total = 1,156) | | Assisted or senior living (Total = 203) | | None of these (Total = 4,559) | |
|---|---|---|---|---|---|---|---|---|
| Characteristic | N | % | N | % | N | % | N | % |
| Median Age (years) | 66 | N/A | 61 | N/A | 73 | N/A | 62 | N/A |
| Age | | | | | | | | |
| 0–9 | 0 | 0.0 | 1 | 0.1 | 0 | 0.0 | 2 | 0.0 |
| 10–19 | 3 | 0.2 | 3 | 0.3 | 0 | 0.0 | 5 | 0.1 |
| 20–29 | 19 | 1.5 | 20 | 1.7 | 3 | 1.5 | 83 | 1.8 |
| 30–39 | 47 | 3.7 | 74 | 6.4 | 1 | 0.5 | 278 | 6.1 |
| 40–49 | 98 | 7.6 | 148 | 12.8 | 13 | 6.4 | 495 | 10.9 |
| 50–59 | 233 | 18.1 | 259 | 22.4 | 30 | 14.8 | 1,046 | 22.9 |
| 60–69 | 337 | 26.2 | 340 | 29.4 | 42 | 20.7 | 1,212 | 26.6 |
| 70–79 | 313 | 24.4 | 220 | 19.0 | 39 | 19.2 | 899 | 19.7 |
| 80–84 | 91 | 7.1 | 52 | 4.5 | 23 | 11.3 | 275 | 6.0 |
| 85+ | 142 | 11.1 | 32 | 2.8 | 52 | 25.6 | 253 | 5.5 |
| Not stated | 1 | 0.1 | 7 | 0.6 | 0 | 0.0 | 11 | 0.2 |
| Sex | | | | | | | | |
| Female | 580 | 45.2 | 415 | 35.9 | 103 | 50.7 | 1,575 | 34.5 |
| Male | 696 | 54.2 | 730 | 63.1 | 99 | 48.8 | 2,956 | 64.8 |
| Not stated | 8 | 0.6 | 11 | 1.0 | 1 | 0.5 | 28 | 0.6 |
| Race | | | | | | | | |
| American Indian/ Alaska Native | 4 | 0.3 | 2 | 0.2 | 1 | 0.5 | 10 | 0.2 |
| Asian | 20 | 1.6 | 16 | 1.4 | 2 | 1.0 | 64 | 1.4 |
| African American/Black | 235 | 18.3 | 170 | 14.7 | 31 | 15.3 | 1,014 | 22.2 |
| Native Hawaiian/ Other Pacific Islander | 1 | 0.1 | 0 | 0.0 | 1 | 0.5 | 9 | 0.2 |
| White | 874 | 68.1 | 771 | 66.7 | 150 | 73.9 | 2,860 | 62.7 |
| Multiple | 1 | 0.1 | 3 | 0.3 | 0 | 0.0 | 5 | 0.1 |
| Not stated | 149 | 11.6 | 194 | 16.8 | 18 | 8.9 | 597 | 13.1 |
| Ethnicity | | | | | | | | |
| Hispanic | 85 | 6.6 | 88 | 7.6 | 12 | 5.9 | 386 | 8.5 |
| Non-Hispanic | 952 | 74.1 | 820 | 70.9 | 149 | 73.4 | 3,196 | 70.1 |
| Not stated | 247 | 19.2 | 248 | 21.5 | 42 | 20.7 | 977 | 21.4 |

[a] Exposure categories (categories are not mutually exclusive):
**Healthcare:** A patient who visited, worked, or stayed in a healthcare setting in the 10 days before date of symptom onset.
**Travel:** A patient with a history of spending at least one night away from home (in the state of residence, another state, or another country) in the 10 days before date of symptom onset, not including nights spent in a healthcare facility.
**Assisted or senior living:** A patient who visited, worked, or stayed in a senior or assisted living facility in the 10 days before date of symptom onset.
**None of these:** A patient without reported healthcare setting, travel, or senior or assisted living facility exposure in the 10 days before date of symptom onset.

[b] Supplemental Legionnaires' Disease Surveillance System (SLDSS).

[c] Complete reporting jurisdictions for 2019: 38 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS in 2019: Alabama, Alaska, Arizona, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New York (state), New York City, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wyoming.

[d] Based on year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of

reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#table-4b

## Table 5a. Number of reported confirmed cases of healthcare-associated[a] Legionnaires' disease by healthcare facility type and healthcare exposure certainty[b]—SLDSS,[c] complete reporting jurisdictions,[d] 2018.[e]

| | Healthcare exposure certainty | | | | | |
|---|---|---|---|---|---|---|
| | Definite | | Possible | | Total | |
| Facility type | N | % | N | % | N | % |
| Hospital | 38 | 18.6 | 459 | 33.3 | 497 | 31.4 |
| Long-term care facility | 128 | 62.7 | 168 | 12.2 | 296 | 18.7 |
| Clinic | 1 | 0.5 | 519 | 37.6 | 520 | 32.8 |
| Multiple[f] | 33 | 16.2 | 108 | 7.8 | 141 | 8.9 |
| Other[g] | 1 | 0.5 | 10 | 0.7 | 11 | 0.7 |
| Not stated | 3 | 1.5 | 116 | 8.4 | 119 | 7.5 |
| **Total** | **204** | **100** | **1,380** | **100** | **1,584** | **100** |

[a] Healthcare–associated Legionnaires' disease includes both definite and possible cases in patients who worked, visited, or stayed in a healthcare setting for any amount of time in the 10 days preceding symptom onset.
[b] Healthcare exposure certainty defined as:
**Definite** case of healthcare–associated Legionnaires' disease was defined as laboratory-confirmed legionellosis in a patient with exposure to a hospital or long-term–care facility for the entire 10 days preceding symptom onset.
**Possible** case of healthcare–associated Legionnaires' disease was defined as laboratory-confirmed legionellosis in a patient with exposure to a healthcare facility for a portion of the 10 days preceding symptom onset.
[c] Supplemental Legionnaires' Disease Surveillance System (SLDSS).
[d] Complete reporting jurisdictions in 2018: 42 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS in 2018: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New York (state), New York City, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, and Wyoming.
[e] Based on year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.
[f] Multiple indicates more than one type of healthcare facility.
[g] Other facility includes locations such as outpatient laboratories and pharmacies.
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#table-5a

## Table 5b. Number of reported confirmed cases of healthcare-associated[a] Legionnaires' disease by healthcare facility type and healthcare exposure certainty[b]—SLDSS,[c] complete reporting jurisdictions,[d] 2019.[e]

| | Healthcare exposure certainty | | | | | |
|---|---|---|---|---|---|---|
| | Definite | | Possible | | Total | |
| Facility type | N | % | N | % | N | % |
| Hospital | 36 | 18.8 | 427 | 39.1 | 463 | 36.1 |
| Long-term care facility | 95 | 49.5 | 111 | 10.2 | 206 | 16.0 |
| Clinic | 5 | 2.6 | 376 | 34.4 | 381 | 29.7 |
| Multiple[f] | 39 | 20.3 | 115 | 10.5 | 154 | 12.0 |
| Other[g] | 3 | 1.6 | 32 | 2.9 | 35 | 2.7 |
| Not stated | 14 | 7.3 | 31 | 2.8 | 45 | 3.5 |
| **Total** | **192** | **100** | **1,092** | **100** | **1,248** | **100** |

[a] Healthcare–associated Legionnaires' disease includes both definite and possible cases in patients who worked, visited, or stayed in a healthcare setting for any amount of time in the 10 days preceding symptom onset.
[b] Healthcare exposure certainty defined as:
**Definite** case of healthcare–associated Legionnaires' disease was defined as laboratory-confirmed legionellosis in a patient with exposure to a hospital or long-term–care facility for the entire 10 days preceding symptom onset.
**Possible** case of healthcare–associated Legionnaires' disease was defined as laboratory-confirmed legionellosis in a patient with exposure to a healthcare facility for a portion of the 10 days preceding symptom onset.
[c] Supplemental Legionnaires' Disease Surveillance System (SLDSS).
[d] Complete reporting jurisdictions for 2019: 38 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS in 2019: Alabama, Alaska, Arizona, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New York (state), New York City, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wyoming.
[e] Based on year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.
[f] Multiple indicates more than one type of healthcare facility.
[g] Other facility includes locations such as outpatient laboratories and pharmacies.
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#table-5b

**Table 6a. Number of reported confirmed cases of Legionnaires' disease by hospitalization,[a] outcome,[b] and exposure category[c]—SLDSS,[d] complete reporting jurisdictions,[e] 2018.[f]**

| | Healthcare (Total = 1,584) | | Travel (Total = 1,279) | | Assisted or senior living (Total = 326) | | None of these (Total = 5,886) | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Hospitalized | | | | | | | | |
| Yes | 1,526 | 96.3 | 1,226 | 95.9 | 308 | 94.5 | 5,633 | 95.7 |
| No | 55 | 3.5 | 30 | 2.3 | 15 | 4.6 | 131 | 2.2 |
| Not stated | 3 | 0.2 | 23 | 1.8 | 3 | 0.9 | 122 | 2.1 |
| Outcome | | | | | | | | |
| Death | 156 | 9.8 | 35 | 2.7 | 30 | 9.2 | 342 | 5.8 |
| Still ill | 111 | 7.0 | 44 | 3.4 | 21 | 6.4 | 335 | 5.7 |
| Survived | 1,222 | 77.1 | 1,139 | 89.1 | 259 | 79.4 | 4,801 | 81.6 |
| Not stated | 95 | 6.0 | 61 | 4.8 | 16 | 4.9 | 408 | 6.9 |

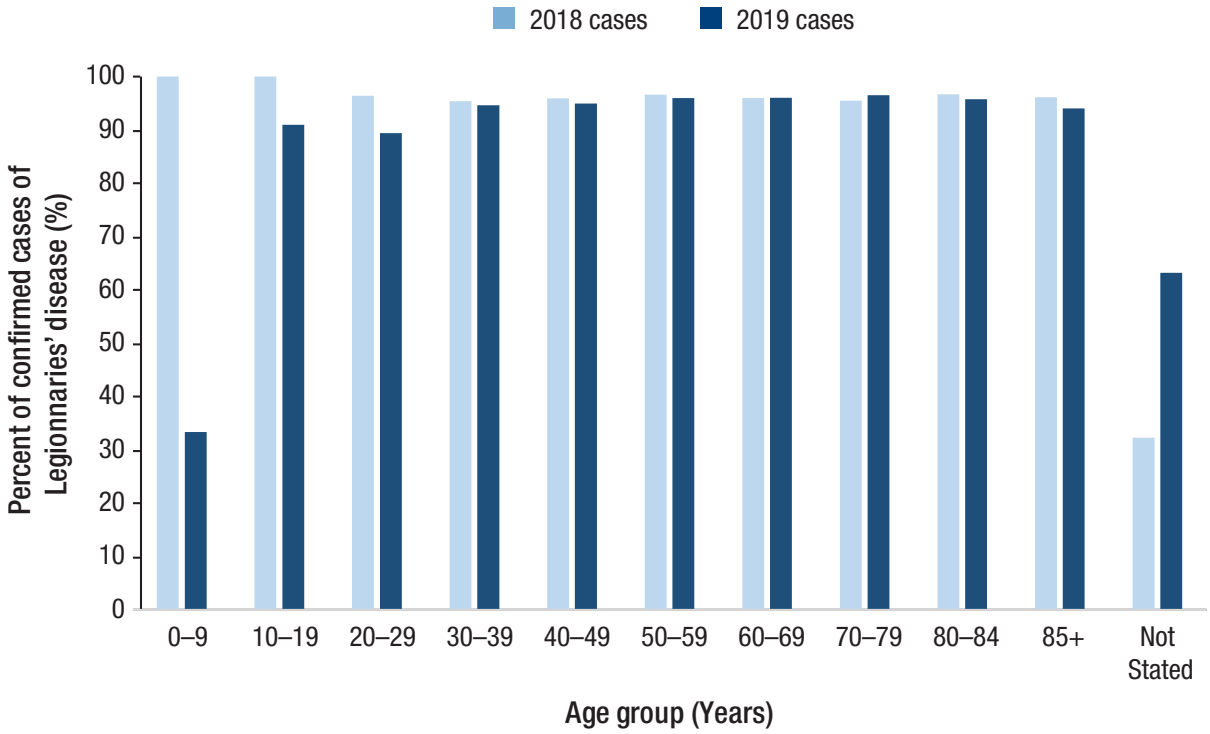
[a] Hospitalization for treatment of Legionnaires' disease.
[b] Outcome at time of case reporting.
[c] Exposure categories (categories are not mutually exclusive):
**Healthcare:** Legionnaires' disease in a patient who visited, worked, or stayed in a healthcare setting in the 10 days before date of symptom onset.
**Travel:** Legionnaires' disease in a patient with a history of spending at least one night away from home (in the state of residence, another state, or another country) in the 10 days before date of symptom onset, not including nights spent in a healthcare facility.
**Assisted or senior living:** Legionnaires' disease in a patient who visited, worked, or stayed in a senior or assisted living facility in the 10 days before date of symptom onset.
**None of these:** A patient without reported healthcare setting, travel, or senior or assisted living facility exposure in the 10 days before date of symptom onset.
[d] Supplemental Legionnaires' Disease Surveillance System (SLDSS).
[e] Complete reporting jurisdictions in 2018: 42 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS in 2018: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New York (state), New York City, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, and Wyoming.
[f] Based on year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#table-6a

**Table 6b. Number of reported confirmed cases of Legionnaires' disease by hospitalization,[a] outcome,[b] and exposure category[c]—SLDSS,[d] complete reporting jurisdictions,[e] 2019.[f]**

| | Healthcare (Total = 1,284) | | Travel (Total = 1,156) | | Assisted or senior living (Total = 203) | | None of these (Total = 4,559) | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Hospitalized | | | | | | | | |
| Yes | 1,231 | 95.9 | 1,075 | 93.0 | 194 | 95.6 | 4,379 | 96.1 |
| No | 43 | 3.3 | 29 | 2.5 | 7 | 3.4 | 116 | 2.5 |
| Not stated | 10 | 0.8 | 52 | 4.5 | 2 | 1.0 | 64 | 1.4 |
| Outcome | | | | | | | | |
| Death | 134 | 10.4 | 35 | 3.0 | 25 | 12.3 | 311 | 6.8 |
| Still ill | 46 | 3.6 | 25 | 2.2 | 10 | 4.9 | 99 | 2.2 |
| Survived | 1,047 | 81.5 | 1,032 | 89.3 | 161 | 79.3 | 3,837 | 84.2 |
| Not stated | 57 | 4.4 | 64 | 5.5 | 7 | 3.4 | 312 | 6.8 |

[a] Hospitalization for treatment of Legionnaires' disease.
[b] Outcome at time of case reporting.
[c] Exposure categories (categories are not mutually exclusive):
**Healthcare:** Legionnaires' disease in a patient who visited, worked, or stayed in a healthcare setting in the 10 days before date of symptom onset.
**Travel:** Legionnaires' disease in a patient with a history of spending at least one night away from home (in the state of residence, another state, or another country) in the 10 days before date of symptom onset, not including nights spent in a healthcare facility.
**Assisted or senior living:** Legionnaires' disease in a patient who visited, worked, or stayed in a senior or assisted living facility in the 10 days before date of symptom onset.
**None of these:** A patient without reported healthcare setting, travel, or senior or assisted living facility exposure in the 10 days before date of symptom onset.
[d] Supplemental Legionnaires' Disease Surveillance System (SLDSS).
[e] Complete reporting jurisdictions for 2019: 38 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS in 2019: Alabama, Alaska, Arizona, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New York (state), New York City, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wyoming.
[f] Based on year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urine antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#table-6b

**Figure 7. Percent of reported confirmed cases of Legionnaires' disease that were treated in hospital[a] by age group and year[b]—SLDSS,[c] complete reporting jurisdictions,[d] 2018 and 2019.**




[a] Hospitalization for treatment of Legionnaires' disease.

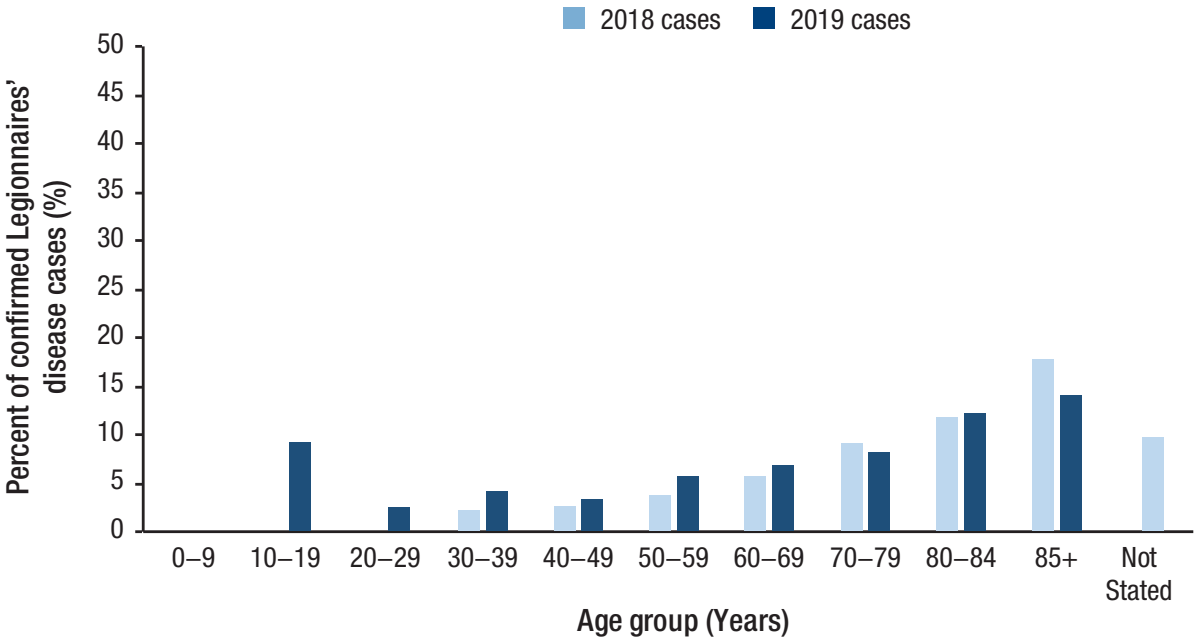
[b] Based on year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.

[c] Supplemental Legionnaires' Disease Surveillance System (SLDSS).

[d] Complete reporting jurisdictions for 2018: 42 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS in 2018: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New York (state), New York City, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, and Wyoming.
Complete reporting jurisdictions for 2019: 38 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS in 2019: Alabama, Alaska, Arizona, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New York (state), New York City, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wyoming.

Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#figure-7

**Figure 8. Percent of reported confirmed cases of Legionnaires' disease resulting in death[a] by age group and year[b]—SLDSS,[c] complete reporting jurisdictions,[d] 2018 and 2019.**



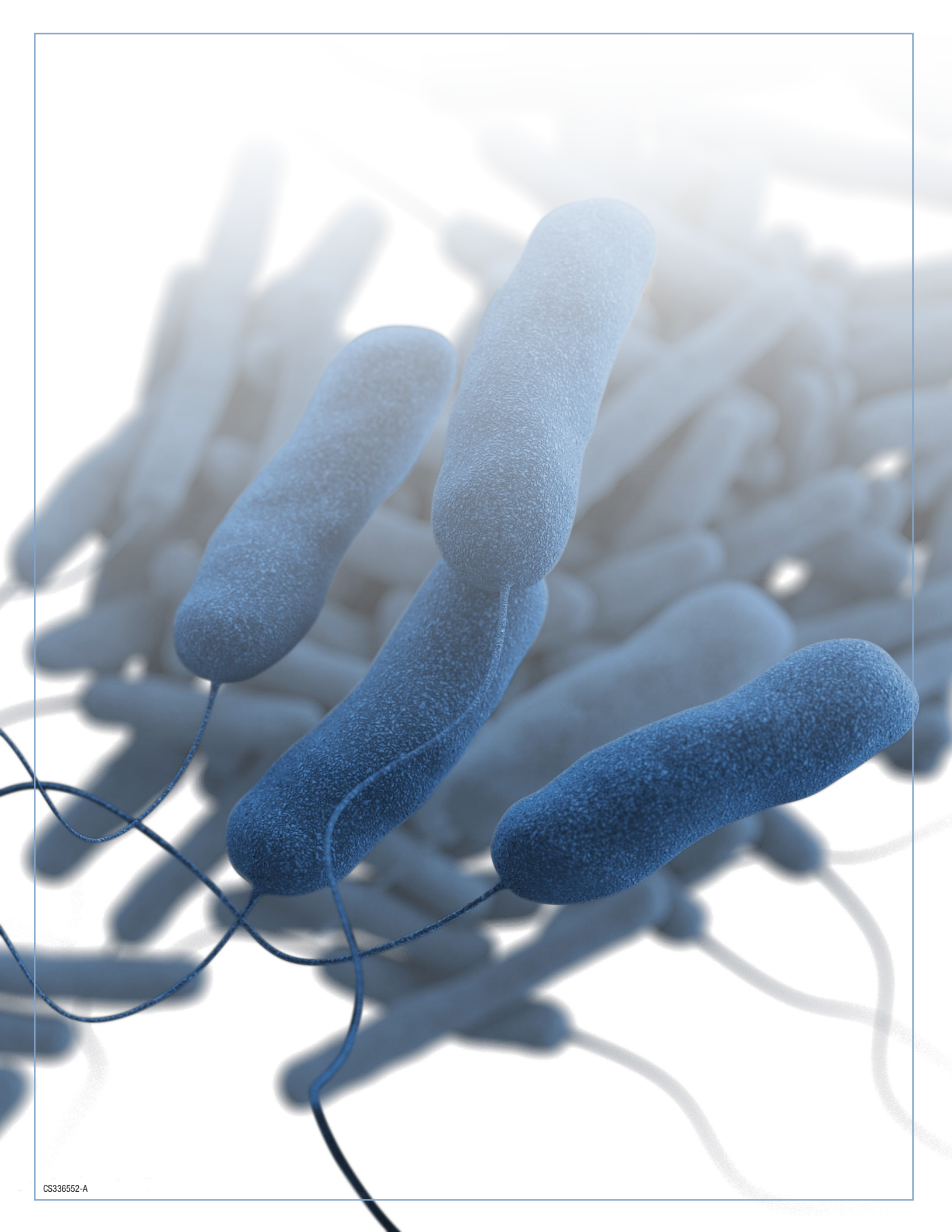

[a] Based on outcome at time of case reporting.
[b] Based on year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.
[c] Supplemental Legionnaires' Disease Surveillance System (SLDSS).
[d] Complete reporting jurisdictions for 2018: 42 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS in 2018: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New York (state), New York City, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, and Wyoming.
Complete reporting jurisdictions for 2019: 38 complete reporting jurisdictions reported at least 90% of confirmed NNDSS cases to SLDSS in 2019: Alabama, Alaska, Arizona, California, Colorado, Connecticut, Delaware, District of Columbia, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New York (state), New York City, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Vermont, Virginia, Washington, and Wyoming.
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#figure-8

**Table 7. Number of reported confirmed cases of Legionnaires' disease by diagnostic testing method[a] and year[b]—SLDSS,[c] United States, 2018 and 2019.**

| | 2018 | | 2019 | | Total | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| **Diagnostic testing method** | | | | | | |
| Urinary antigen test | 8,764 | 97.4 | 6,973 | 96.3 | 15,737 | 96.9 |
| Serology | 6 | 0.1 | 1 | 0.0 | 7 | 0.0 |
| Culture | 363 | 4.0 | 345 | 4.8 | 708 | 4.4 |
| **Culture Site** | | | | | | |
| Respiratory secretion[d] | 285 | 78.5 | 252 | 73.0 | 537 | 75.8 |
| Lung biopsy | 7 | 1.9 | 10 | 2.9 | 17 | 2.4 |
| Pleural fluid | 7 | 1.9 | 1 | 0.3 | 8 | 1.1 |
| Blood | 7 | 1.9 | 4 | 1.2 | 11 | 1.6 |
| Other | 5 | 1.4 | 14 | 4.1 | 19 | 2.7 |
| Not stated | 52 | 14.3 | 64 | 18.6 | 116 | 16.4 |
| **Culture Species** | | | | | | |
| *L. pneumophila* | 253 | 69.7 | 226 | 65.5 | 479 | 67.7 |
| Serogroup 1 | 153 | N/A | 138 | N/A | 291 | N/A |
| Serogroup 3 | 4 | N/A | 3 | N/A | 7 | N/A |
| Serogroup 4 | 1 | N/A | 0 | N/A | 1 | N/A |
| Serogroup 5 | 4 | N/A | 2 | N/A | 6 | N/A |
| Serogroup 6 | 8 | N/A | 4 | N/A | 12 | N/A |
| Serogroup 8 | 1 | N/A | 0 | N/A | 1 | N/A |
| Serogroup 10 | 1 | N/A | 0 | N/A | 1 | N/A |
| Serogroup 15 | 1 | N/A | 0 | N/A | 1 | N/A |
| *L. longbeachae* | 8 | 2.2 | 5 | 1.4 | 13 | 1.8 |
| Serogroup 1 | 1 | N/A | 1 | N/A | 2 | N/A |
| *L. micdadei* | 4 | 1.1 | 5 | 1.4 | 9 | 1.3 |
| *L. bozemanii* | 3 | 0.8 | 5 | 1.4 | 8 | 1.1 |
| Serogroup 2 | 0 | N/A | 1 | N/A | 1 | N/A |
| *L. anisa* | 2 | 0.6 | 1 | 0.3 | 3 | 0.4 |
| *L. feeleii* | 2 | 0.6 | 1 | 0.3 | 3 | 0.4 |
| *L dumoffii* | 1 | 0.3 | 1 | 0.3 | 2 | 0.3 |
| *L. sainthelensi* | 1 | 0.3 | 1 | 0.3 | 2 | 0.3 |
| *L. gormanii* | 0 | 0.0 | 1 | 0.3 | 1 | 0.1 |
| *L. rubrilucens* | 0 | 0.0 | 1 | 0.3 | 1 | 0.1 |
| Not stated | 90 | 24.8 | 102 | 29.6 | 192 | 27.1 |

[a] More than one type of test might apply. Laboratory criteria for diagnosis include the following for confirmed cases:
**Urinary antigen test:** detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents.
**Culture:** isolation of any *Legionella* organism from respiratory secretions, lung tissue, pleural fluid, or other normally sterile site.
**Serology:** 4-fold or greater rise in specific serum antibody titer to *L. pneumophila* serogroup 1 using validated reagents detected 3–6 weeks apart.
[b] Based on year of symptom onset in SLDSS. If onset date was not stated in SLDSS, case year for confirmed cases was determined by the following dates (in order of reporting): positive laboratory date (by either urinary antigen testing, culture, or 4-fold rise of antibody titer against *Legionella pneumophila* serogroup 1); date patient was hospitalized during treatment for Legionnaires' disease; or date case was first reported to public health at any level.
[c] Supplemental Legionnaires' Disease Surveillance System (SLDSS).

[d] Respiratory secretions include sputum, bronchial wash, bronchoalveolar lavage.
Accessible version at: https://www.cdc.gov/legionella/health-depts/surv-reporting/2018-19-report-tables#table-7



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