Legionellosis

Legionellosis is a Class B Disease and must be reported to the state within one business day.

Legionellosis (*Legionella*) is an infection caused by the bacterium, *Legionella*, which resides primarily in aqueous environments. Occurring naturally in fresh water environments, like lakes and streams. There are at least 20 species of *Legionella* that have been implicated in human disease, but the majority of infections in the U.S. are due to *Legionella pneumophila* serogroup 1.

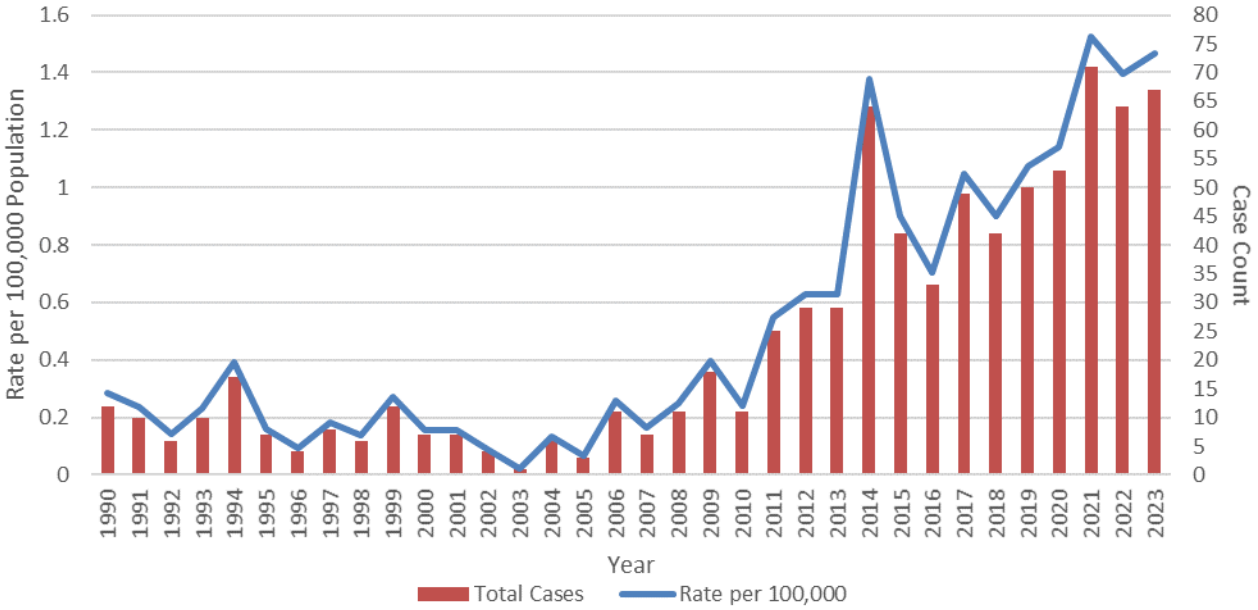
Three presentations of the disease exist. The more severe form, Legionnaires' disease, so named because of a large outbreak that occurred at a meeting of the American Legion in 1976, is characterized by pneumonia. Pontiac fever is a milder form of the disease, characterized by fever and muscle ache. Extrapulmonary legionellosis is when disease occurs at sites outside the lungs (for example, associated with endocarditis, wound infections, and other extrapulmonary sites). Smokers, persons with chronic lung disease, and the immunosuppressed are considered to be at highest risk of contracting legionellosis.

Legionellosis most commonly occurs as isolated cases, but outbreaks occasionally are identified, usually associated with warm water aerosols (the organisms thrive at 20°C to 45°C) originating from complex water systems such as cooling towers, whirlpool spas, plumbing systems, etc. Nosocomial infections also occur and give rise to the highest proportion of fatal cases. Person-to-person transmission does not take place.

Incidence

According to the Centers for Disease Control and Prevention (CDC), nearly 10,000 cases were reported in 2018. The CDC believes the true prevalence is closer to 1.8-2.7 times higher than what is reported. Incidence rates of *Legionella* in Louisiana have steadily increased. Infrequent use of cultures may have a negative effect on recognition of infections caused by *Legionella* species, but outbreaks of *Legionella pneumophila*, serogroup 1 may be more easily recognized because of the use of non-invasive tests such as the urine antigen test. With the exception of the 1989 outbreak, there has been a generally increasing trend in legionellosis reports since 1990, with 67 cases reported in 2023 (Figure 1).

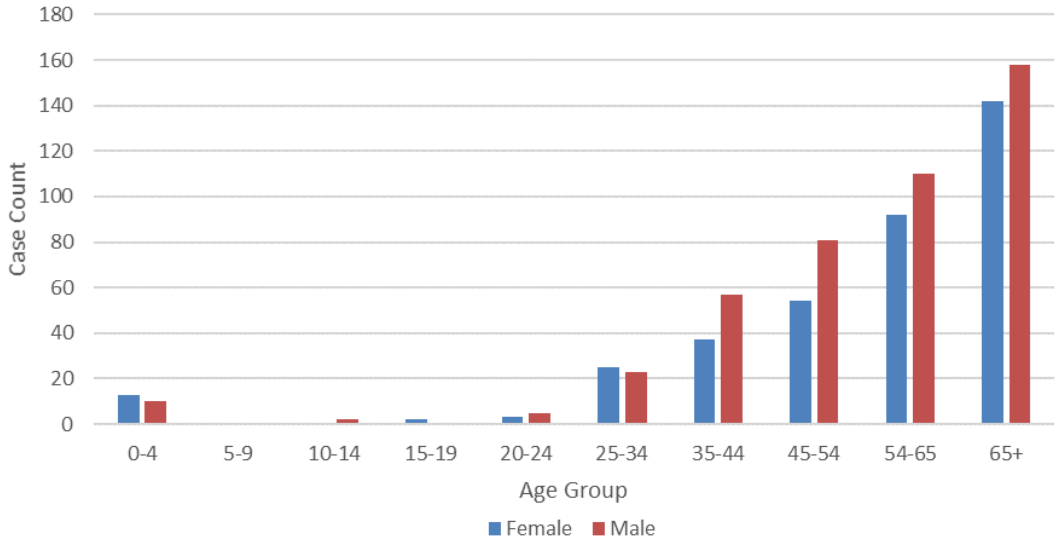
Figure 1: Reported *Legionella* Cases and Incidence Rates per 100,000 Population Louisiana, 1990-2023



Age, Sex and Race

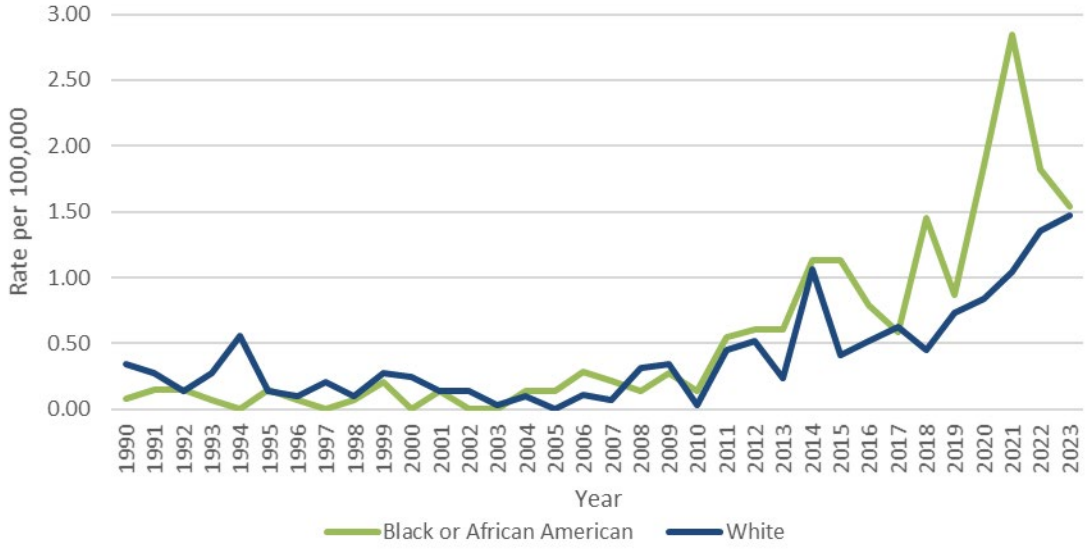
Legionella cases occur more often among males than females. *Legionella* can affect people of all ages, but the majority of cases occur in people who are middle-aged or older (Figure 2).

Figure 2: Reported *Legionella* Cases and Average Incidence Rates per 100,000 Population by Sex and Age - Louisiana, 1990-2023



There was no significant difference in incidence rates between races until 2011, where the incidence rate for African Americans began to rise (Figure 3). However, race is not always included in case reports.

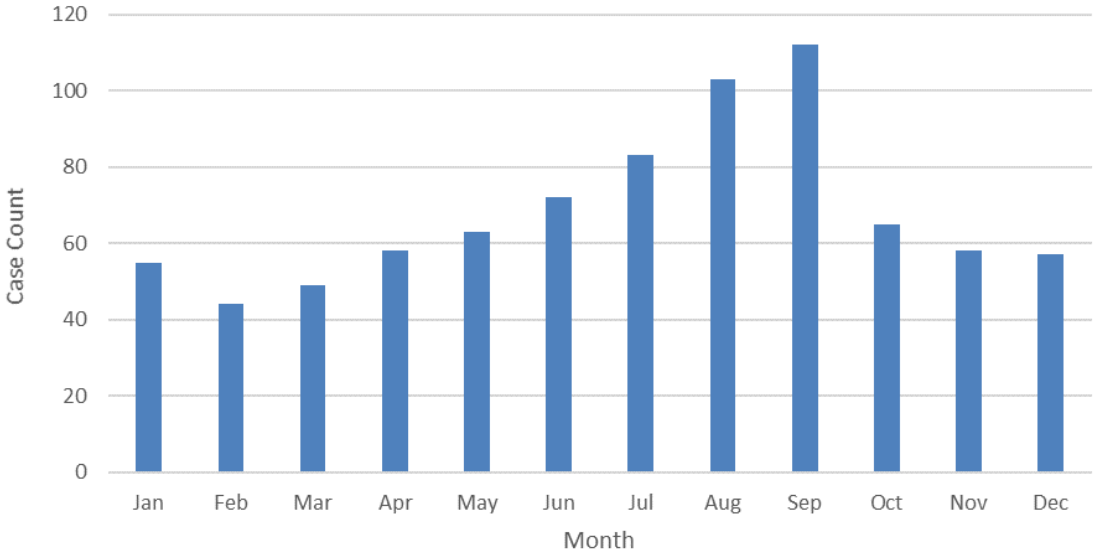
Figure 3: Legionella Incidence Rate by Race - Louisiana, 1990-2023



Seasonality

The CDC reports that more cases are usually found in the summer and early fall. A seasonal variation can be seen among reported cases in Louisiana (Figure 4). Though infection can occur at any point in the year.

Figure 4: *Legionella* Cases by Month – Louisiana, 1990-2023



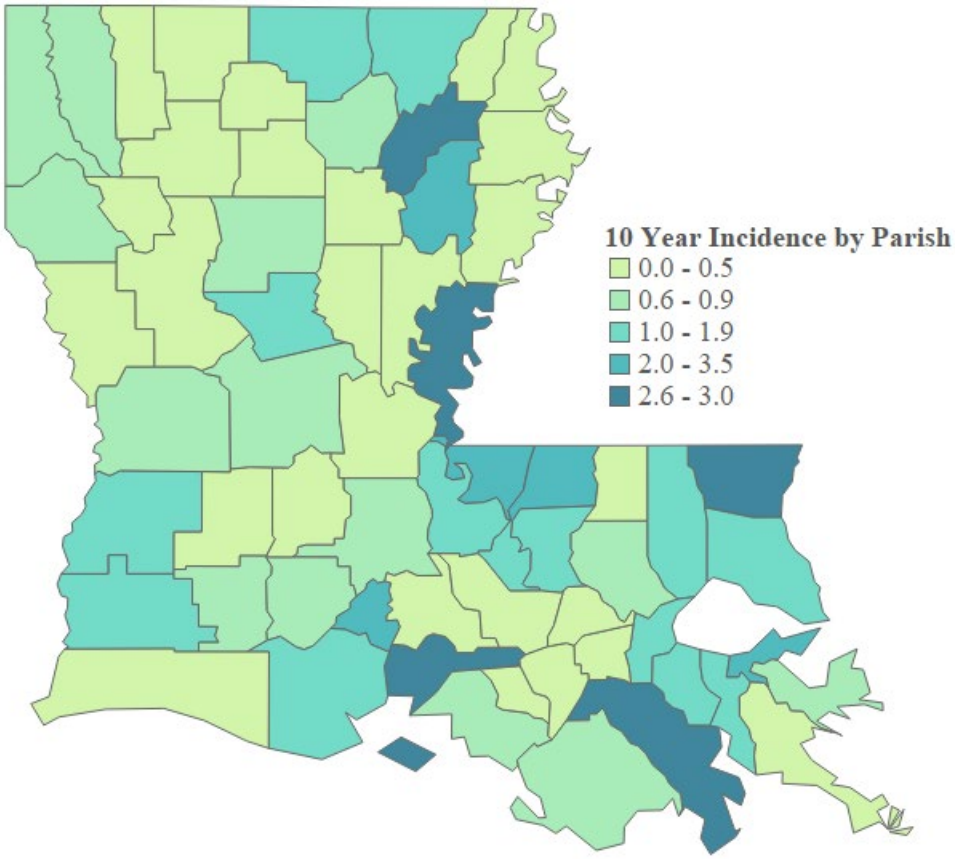
Legionella Cases by Parish

Higher numbers of cases occur in more populated parishes, however the highest case rates per 100,000 population (highlighted in yellow) occur mostly in rural populations (Table 1, Figure 5).

Table 1: *Legionella* Disease Rate per 100,000 Population by Parish – Louisiana, 2014-2023 Compared to Total Number of Cases – Louisiana, 1990-2023

Parish	1990-2023 Cases	10 Year Incidence	Parish	1990-2023 Cases	10 Year Incidence
ACADIA	6	0.66	MADISON	1	0.00
ALLEN	1	0.41	MOREHOUSE	4	1.18
ASCENSION	6	0.32	NATCHITOCHES	2	0.26
ASSUMPTION	2	0.00	ORLEANS	130	2.22
AVOYELLES	2	0.50	OUACHITA	19	0.89
BEAUREGARD	6	1.09	PLAQUEMINES	2	0.00
BIENVILLE	1	0.00	POINTE COUPEE	7	1.87
BOSSIER	14	0.78	RAPIDES	13	0.69
CADDO	29	0.66	RED RIVER	2	0.00
CALCASIEU	40	1.82	RICHLAND	6	2.97
CALDWELL	0	0.00	SABINE	0	0.00
CAMERON	0	0.00	ST. BERNARD	9	0.66
CATAHOULA	0	0.00	ST. CHARLES	6	1.15
CLAIBORNE	0	0.00	ST. HELENA	0	0.00
CONCORDIA	5	2.60	ST. JAMES	1	0.48
DESOTO	3	0.74	ST. LANDRY	10	0.73
EAST BATON	70	1.23	ST. MARTIN	7	0.57
EAST CARROLL	0	0.00	ST. MARY	8	0.80
EAST FELICIANA	4	2.06	ST. TAMMANY	60	1.50
EVANGELINE	1	0.00	ST. JOHN	9	1.89
FRANKLIN	4	2.00	TANGIPAHOA	28	1.13
GRANT	3	1.35	TENSAS	0	0.00
IBERIA	25	2.97	TERREBONNE	26	0.73
IBERVILLE	2	0.32	UNION	6	1.38
JACKSON	0	0.00	VERMILION	8	1.02
JEFFERSON	93	1.62	VERNON	4	0.81
JEFFERSON DAVIS	3	0.63	WASHINGTON	29	2.61
LA SALLE	1	0.00	WEBSTER	4	0.26
LAFAYETTE	32	2.26	WEST BATON	5	1.50
LAFOURCHE	7	2.69	WEST CARROLL	0	0.00
LINCOLN	4	0.21	WEST	5	2.60
LIVINGSTON	20	0.92	WINN	1	0.71

Figure 5: *Legionella* Rate per 100,000 Population by Parish – Louisiana, 2014 - 2023



1989 Washington Parish Outbreak

Between October 10 and November 13, 1989, 33 patients were hospitalized with laboratory-confirmed Legionnaires' disease in Washington Parish. Fourteen persons in the area died of pneumonia during the period of the outbreak. Two of the decedents were autopsied and *Legionella pneumophila* serogroup 1 (Lp-1) was identified in lung specimens from both.

A case-control study of 28 cases and 56 controls demonstrated an association of the disease with shopping at a local grocery. Among confirmed case-patients and controls that shopped at the grocery, significant associations were identified with shopping duration (longer than 30 minutes), and acquiring produce items near an ultrasonic mist machine. The mist machine continually generated an aerosol over one section of the produce display. Lp-1 was eventually isolated from water in the reservoir of the mist machine. A serosurvey revealed that employees of the grocery store in question were more likely than employees of other grocery stores in the area to exhibit elevated antibody titers to *Legionella.* The mist machine was removed from the establishment.