



2025-00074 South Point Legionellosis Outbreak

Disease Surveillance and Control | Las Vegas, NV

Background

Legionellosis is a human disease caused by gram-negative bacteria in the genus *Legionella*.¹ These bacteria live in freshwater environments, especially complex engineered water systems that serve large facilities like hotels. Infections generally occur when susceptible individuals inhale or aspirate aerosolized droplets of water contaminated with *Legionella* bacteria. Showers, hot tubs, misters, cooling towers, hot water tanks, and decorative water features are common exposure sites.

Legionellosis has two principal presentations: 1) Legionnaires' Disease (LD) and 2) Pontiac Fever (PF). LD is a severe illness clinically distinguished by pneumonia, with acute respiratory symptoms including dyspnea, cough, and chest pain. The incubation period of LD ranges from 2–14 days and the mortality rate is approximately 10%. Due to the severity of LD, the Centers for Disease Control and Prevention (CDC) define an outbreak “as two or more cases associated with the same possible source during a 12-month period.”² PF is typically milder and presents with symptoms such as fever, chills, malaise, and myalgia. PF incubates more rapidly (within several hours – 3 days) and tends to be a self-limiting illness. People living with respiratory disease (i.e. emphysema or chronic obstructive pulmonary disease) or immunodeficiency, people who smoke, and people of advanced age are at increased risk of both forms of legionellosis.

The Southern Nevada Health District (SNHD) investigates suspected legionellosis outbreaks to determine the scope of illnesses, identify potential sources of infection, interrupt ongoing disease transmission, and remediate likely exposure methods with the goal of protecting the public health of residents and visitors in Clark County, NV.

Initiation of Investigation

On September 26, 2024, SNHD was notified by CDC of a confirmed case of LD in individual A, who reported travel to Las Vegas, NV. This individual reported staying at South Point Hotel Casino & Spa (9777 S Las Vegas Blvd, Las Vegas, NV 89183) during their incubation period (2-14 days prior to symptom onset). SNHD Environmental Health (EH) and Disease Surveillance and Control (DSC) personnel conducted site visits at South Point on October 10 and 14, 2024. On October 28 the Southern Nevada Public Health Laboratory (SNPHL) reported detection of *Legionella sp.* in water samples obtained October 14, 2024. South Point initiated remediation of facility water systems in response to these results.

On April 30, 2025, CDC notified SNHD of a confirmed case of LD in individual B who traveled to Las Vegas in February 2025 and reported staying at South Point during their incubation period. EH and DSC confirmed the stay and collected environmental water samples during site visits on May 7–8, 2025. DSC elevated the investigation to an outbreak response on May 15, 2025, when Southern Nevada Public Health Laboratory (SNPHL) reported detecting *Legionella sp.* in the water samples.

Investigation Methods

Epidemiologic Investigation

DSC staff set the primary objectives of the investigation and response to identify additional cases, mitigate environmental sources with EH guidance, and prevent primary and secondary morbidity. DSC also established case definitions for case finding activities.

Clinical and demographic data resulting from case finding activities were collected in the SNHD EpiTrax surveillance and outbreak management system and analyzed in R (Version 4.5.0).

Final Outbreak Case Definitions

Confirmed Legionnaires' Disease Case

A person who stayed overnight, or worked at least one shift, at South Point between 8/14/24 and 6/16/2025 and:

- Became ill (with symptoms of pneumonia) between two days after arriving and fourteen days after leaving, **AND** met one of the following clinical criteria:
 1. Received care (as an inpatient or outpatient) for one or more symptoms consistent with pneumonia (fever equal or greater than 101° F, chills, cough, fatigue, or weakness) **OR**
 2. Received antimicrobial treatment* that is effective against *Legionella* and another pneumonia causing organism was not isolated **OR**
 3. Had radiographically confirmed pneumonia

AND had positive laboratory testing for *Legionella pneumophila* by one of the following methods:

1. Isolation of any *Legionella* organism from lower respiratory secretions, lung tissue, pleural fluid, or extrapulmonary site;
2. Detection of any *Legionella* species from lower respiratory secretions, lung tissue, pleural fluid, or extrapulmonary site by a validated nucleic acid amplification test;
3. Detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents;
4. Fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1 using validated reagents

If any criteria for the definition are unknown (e.g., receipt of antibiotics) and the case otherwise meets the definition, assume that the missing criteria exists for investigation purposes.

**Recommended treatment is either a respiratory fluoroquinolone, such as levofloxacin which is effective against *Legionella* or a macrolide (azithromycin). Doxycycline is an alternative agent³.*

Probable Legionnaires' Disease Case

A person who stayed overnight, or worked at least one shift, at South Point between 8/14/24 and 6/16/2025 and:

- Reported symptoms between two days after arriving and fourteen days after leaving, **AND** met one of the following clinical criteria
 1. Received care (as an inpatient or outpatient) for fever equal or greater than 101° F and one or more symptoms consistent with pneumonia (chills, cough, fatigue, or weakness) and received antimicrobial treatment* that is effective against *Legionella* and another pneumonia causing organism was not isolated (such as *S. pneumoniae*), but did not have a radiological test for pneumonia **OR**
 2. Had clinical or radiographic pneumonia.

Confirmed Pontiac Fever Case

A person who stayed overnight, or worked at least one shift, at South Point between 8/14/24 and 6/16/2025 and:

- Became ill between 5 hours after arriving and 3 days after leaving, **AND** had a fever and one or more of the following symptoms: chills, cough, myalgia, or fatigue **AND** had positive confirmatory laboratory testing by one of the following methods:
 1. Isolation of any *Legionella* organism from lower respiratory secretions, lung tissue, pleural fluid, or extrapulmonary site **OR**
 2. Detection of any *Legionella* species from lower respiratory secretions, lung tissue, pleural fluid, or extrapulmonary site by a validated nucleic acid amplification test **OR**
 3. Detection of *Legionella pneumophila* serogroup 1 antigen in urine using validated reagents **OR**
 4. Fourfold or greater rise in specific serum antibody titer to *Legionella pneumophila* serogroup 1 using validated reagents.

Probable Pontiac Fever Case

A person who stayed overnight, or worked at least one shift, at South Point between 8/14/24 and 6/16/2025 and:

- Became ill between 5 hours after arriving and 3 days after leaving, **AND** had a fever and one or more of the following symptoms: chills, cough, myalgia, or fatigue **AND** had negative or no laboratory testing for *Legionella pneumophila* serogroup 1 in urine using validated reagents, **AND**
 1. Had no positive tests for other URI agents in the appropriate time frame **OR**
 2. Did not seek medical care at the time of illness but reported having a fever and one or more of the following symptoms: chills, cough, myalgia, or fatigue.

Case Finding

DSC began case finding efforts on May 15, 2025. A meeting with the resort was scheduled, SNHD's Office of Communications was notified, and an online survey tool was developed to help identify cases of Legionnaires' disease and Pontiac fever.

SNHD provided guest and staff notification letters on May 20, 2025, for distribution by South Point management. The notification letters explained the possible exposure risk and recommended individuals seek medical attention if they developed symptoms suggestive of legionellosis. The

notification contained the link to an online Alchemer survey tool and an SNHD information phone number. Hotel management notified guests who stayed at the hotel and staff who worked during the exposure period from April 16, 2025 to June 16, 2025, and staff who were working during this exposure period.

A news release notifying the public about the investigation was issued on May 22, 2025. A secure notification was distributed to public health professionals through the CDC Epidemic Information Exchange (Epi-X) on June 3, 2025, requesting health departments to report to SNHD suspected or confirmed cases of legionellosis in persons with recent travel history to South Point.

Rocky Mountain Poison and Drug Safety (RMPDS) was activated to accept any calls regarding the investigation. SNHD developed a frequently asked questions (FAQ) document that was shared with RMPDS. Callers reporting illness were encouraged to seek medical attention as well as complete the online survey tool.

Environmental Investigation

Environmental Health (EH) staff conducted a site evaluation of South Point over the course of two days: 05/07/2025, and 05/08/2025. During this time, EH met with hotel management, discussed the implementation of water management documents for the property, surveyed the water systems, and collected samples.

DSC staff were present during the site visit to identify case rooms for EH to include in their sampling process. Environmental water collection and sampling conducted by SNHD utilized the CDC's "Protocol for collecting environmental samples for *Legionella* culture during a cluster or outbreak investigation or when cases of disease may be associated with a facility" as a guide.⁴ Water samples and swab samples from water fixtures were collected from the rooms where the individual stayed in, the distal rooms in the same water systems, the hot water return, and cooling tower. A total of 19 samples were collected and submitted to Southern Nevada Public Health Laboratory (SNPHL).

Laboratory Investigation

Clinical laboratory confirmation of Legionnaires' Disease was accomplished via urinary antigen test to detect *Legionella pneumophila* serogroup 1 antigen. All clinical lab results were generated in the local health jurisdiction of case patients.

SNHD EH collected environmental water and swab samples from the property and submitted to SNPHL, an ELITE (Environmental Legionella Isolation Techniques Evaluation Program) certified laboratory, for *Legionella* culture testing. South Point used a third-party water management consultant to collect and test additional environmental samples.

Results of Investigation

Epidemiologic Results

DSC received 82 responses to the online Alchemer survey. Most respondents were alerted to the survey either by a news release (n = 34 / 41.5%) or the guest/staff notifications disseminated by South Point (n = 25 / 30.5%), who reported sending out 3,056 letters. Each housekeeping staff was

also given the letter and an in-person meeting was held May 22, 2025. Guest notifications ended on June 4, 2025, when follow-up environmental samples tested by a third-party consultant for the facility all came back non-detect for *Legionella*.

DSC identified 34 total cases of legionellosis associated with this outbreak (**Figure 1**). Disease onsets ranged from August 2024 through June 2025. There were six cases of LD (2 confirmed, 4 probable) and 28 probable cases of PF. The median age at symptom onset of LD case patients was 65 years, with a range of 52–72 years (**Appendix Table 1**); the median age of PF case patients was 55 years, with a range of 17-74 years (**Appendix Table 2**).

Laboratory Results

Legionella pneumophila serogroup 1 antigen was detected in urine samples from two ill patients (LD confirmed, **Figure 1**).

Environmental water sampling results from South Point are indicated in **Table 1**. *Legionella* species were detected in water samples collected from South Point on October 14, 2024, May 7, and May 8, 2025.

Table 1. SNHD environmental water sampling

Date of sampling	Number of samples detecting <i>Legionella</i> spp.
10/10/2024	0 of 4
10/14/2024	1 of 5
05/07/2025	2 of 7
05/08/2025	3 of 12

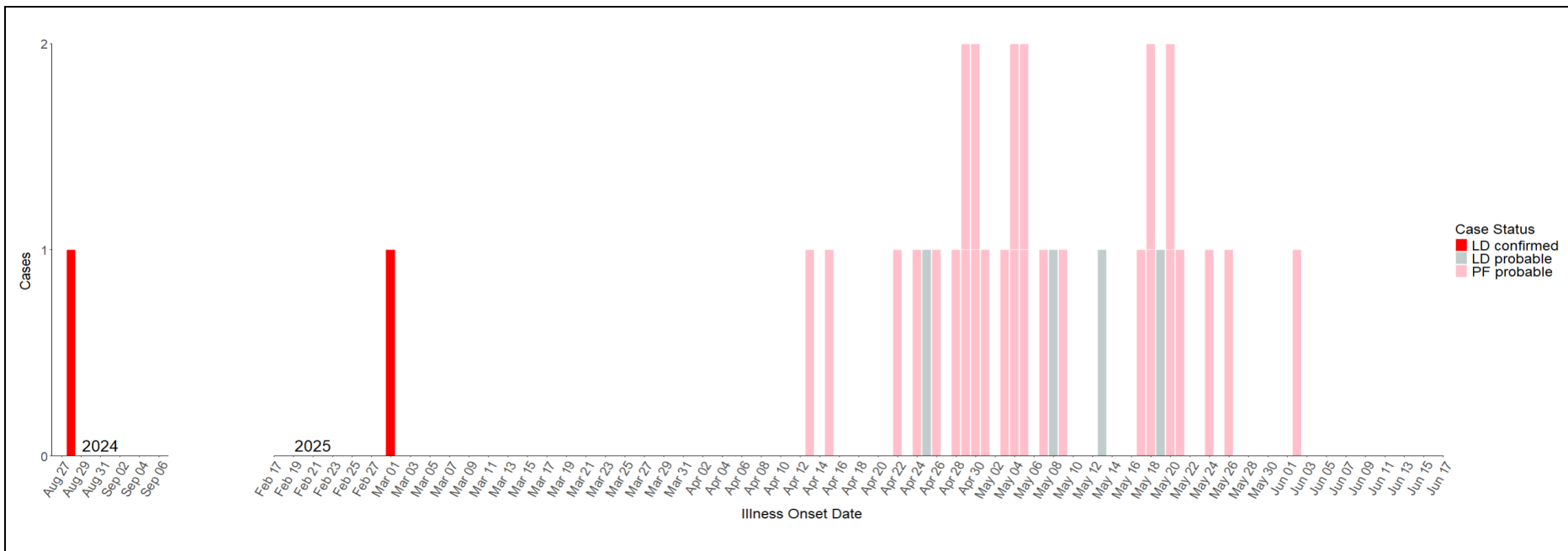


Figure 1. Epidemic curve of Legionellosis cases at South Point, August 2024 – June 2025.

Environmental Results

Evaluation of the property's water management documentation revealed that no written water management program existed, although a third-party consultant was providing routine water testing for the property. EH worked with hotel management to develop a written water management program to reduce the risk of future *Legionella* colonization of the building water systems. After positive environmental sample laboratory results were received, EH followed up with hotel management to discuss water system remediation methods. South Point utilized increased chlorination as well as targeted flushing from 5/26/25-5/27/25 to remediate their affected water systems. After remediation, the facility complied with the post-remediation sampling protocol to ensure the remediation was effective in bringing *Legionella* concentrations down to non-detect levels.

Discussion/Conclusion

Legionellosis is a nationally notifiable condition in the United States. One in ten people with Legionnaires' disease report travel during their exposure period, and travel associated cases often occur among residents of different states or countries. As a major tourist destination, Las Vegas sees a continuous influx of visitors from across the country and around the world. Large resort properties such as South Point host high volumes of transient guests, making the timely identification and reporting of travel-associated cases challenging. While underreporting from underdiagnosis is not unique to Las Vegas, the scale and mobility of Las Vegas's tourism industry adds an extra layer to surveillance and investigation efforts.

Large resort properties can also have more complex and expansive water systems that require more maintenance. These systems can also include a range of water-based features such as pools, hot tubs, misters, and decorative fountains that may increase the risk of *Legionella* proliferation and aerosolization.

SNHD initiated standard investigation procedures on the day of the first suspected legionellosis report and conducted a site visit at South Point within eight business days from the first CDC notification. SNHD worked with the South Point management team to conduct environmental evaluations including sampling for *Legionella*. After the second case and positive EH testing, guests who were potentially exposed were also notified by the property.

Mitigation Measures and Recommendations

An effective water management program is the principal safeguard against *Legionella* exposure and subsequent infection. Great care should be taken to ensure that complex institutional water supply systems do not become colonized with *Legionella* bacteria, and if they do, that this colonization is detected and remediated immediately. Adequate water chlorination, effective maintenance of temperatures >50 °C in hot water systems, and in some cases microbicidal treatment and/or filtration are primary modes of prevention. Mechanical agitation, such as through system flushing, can also help dislodge biofilm-associated *Legionella* bacteria in water pipes.

Exposure to aerosol-producing appliances, like water misters, fountains, and hot tubs, should be considered a risk-factor for legionellosis, especially for people living with medical issues that affect

the respiratory or immune systems. Educating the public about the clinical characteristics of and risk factors for legionellosis can help raise awareness and improve diagnosis and reporting.

Legionnaires' disease is often underdiagnosed. Encouraging health care providers to increase testing for *Legionella* when treating a patient with pneumonia due to an unknown pathogen could improve patient outcomes and inform public health investigations.

References

1. Hicks, L. (2015). Legionellosis. In Heymann, D. (Ed.) *Control of Communicable Diseases Manual* (20th ed., pp 334-337). Washington, D. C.: APHA Press.
2. Centers for Disease Control and Prevention (2024). *Public Health response for legionnaires' disease*. Available at: <https://www.cdc.gov/investigate-legionella/php/public-health-strategy/index.html> (Accessed July 10, 2025).
3. Medscape (2024). *Legionnaires Disease Treatment and Management, Antibiotic Therapy*. Available at: <https://emedicine.medscape.com/article/220163-treatment#d11> (Accessed August 12, 2025).
4. Centers for Disease Control and Prevention (2024). *Sampling Procedure and Potential Sampling Sites: Protocol for collecting environmental samples for Legionella culture during a cluster or outbreak investigation or when cases of disease may be associated with a facility*. Available at: <https://www.cdc.gov/investigate-legionella/media/pdfs/cdc-sampling-procedure.pdf> (Accessed July 10, 2025).

Appendix

Appendix Table 1. Demographic characteristics of Legionnaires' Disease case patients.

Category	n (%)
Age Group (years)	
50-54	1 (16.7)
60-64	1 (16.7)
65-69	1 (16.7)
70-74	1 (16.7)
Unknown	2 (33.3)
Birth Sex	
Female	3 (50)
Male	2 (33.3)
Unknown	1 (16.7)
Race	
Black or African American	1 (16.7)
Other Race	1 (16.7)
Unknown	1 (16.7)
White	3 (50)
Ethnicity	
Hispanic or Latino	1 (16.7)
Not Hispanic or Latino	4 (66.7)
Unknown	1 (16.7)

Appendix Table 2. Demographic characteristics of Pontiac Fever case patients.

Category	n (%)
Age Group (years)	
15-19	1 (3.6)
20-24	2 (7.1)
35-39	1 (3.6)
40-44	4 (14.3)
45-49	1 (3.6)
50-54	4 (14.3)
55-59	3 (10.7)
60-64	4 (14.3)
65-69	4 (14.3)
70-74	3 (10.7)
Unknown	1 (3.6)
Birth Sex	
Female	21 (75)
Male	7 (25)
Race	
Native Hawaiian or Other Pacific Islander	1 (3.6)
Mixed Race	2 (7.1)
Other Race	3 (10.7)
White	22 (78.6)
Ethnicity	
Hispanic or Latino	2 (7.1)
Not Hispanic or Latino	25 (89.3)
Other Ethnicity	1 (3.6)