

2025-00073 Grandview 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 April 4, 2025, SNHD received a call from individual A regarding being diagnosed with LD after a February 2025 trip to Las Vegas, NV. Individual A reported a stay at The Grandview at Las Vegas (9940 S Las Vegas Blvd, Las Vegas, NV 89183) during their incubation period (2-14 days prior to symptom onset). SNHD initiated an investigation of the reported illness.

On April 17, CDC notified SNHD of a case of LD in individual B who traveled to Las Vegas and reported staying at The Grandview during their incubation period. Confirmation of individual A's diagnosis was received from CDC on April 24, 2025.

SNHD Environmental Health (EH) and Disease Surveillance and Control (DSC) personnel conducted a site visit at The Grandview on April 29. Environmental sample results received on May 12, 2025, reported detection of *Legionella sp.* in 5 of 17 samples assessed.

On May 14, 2025, SNHD received a call from a companion of individual C who was reported to be diagnosed with LD after a stay at the same property during their incubation period. Another companion of the caller, individual D, was also reported to have symptoms suggestive of legionellosis. The next day, the local health department of individual C was able to confirm the diagnosis, and the investigations were elevated to an outbreak response on May 15, 2025.

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 Grandview between 2/1/25 and 5/31/25 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*
5. *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 and trimethoprim-sulfamethoxazole are alternative drugs (Red Book, 30th edition 2015).*

Probable Legionnaires' Disease Case

A person who stayed overnight, or worked at least one shift, at Grandview between 2/1/25 and 5/31/25 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 Grandview between 2/1/25 and 5/31/25 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 Grandview between 2/1/25 and 5/31/25 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 to prepare 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 "The Grandview 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 survey tool and an SNHD information phone number. Hotel management notified guests whose stay included the evening of March 27, 2025, up to June 6, 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 The Grandview.

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.

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.

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

Environmental Investigation

Environmental Health (EH) staff conducted a site evaluation of The Grandview at Las Vegas over the course of three days: 4/29/25, 5/1/25, and 5/7/25. During this time, EH met with hotel management, reviewed the water management documents for the property, surveyed the water systems, and collected samples.

DSC staff were present during the site visit to identify rooms associated with confirmed cases 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.³

Water samples and swab samples from water fixtures were collected from the rooms where individuals A, C, and D stayed, the distal rooms in the same water systems, and the hot water returns. Samples from public areas such as the pool, spa, ice machines, and cooling towers were also collected. A total of 38 samples were collected and submitted to Southern Nevada Public Health Laboratory (SNPHL).

Results of Investigation

Epidemiologic Results

DSC received 44 responses to the online Alchemer survey. Most respondents were alerted to the survey either by a news release (N = 18 / 41%) or the guest/staff notifications disseminated by The Grandview (N = 16 / 36%), who reported sending out 779 emails (2.1% response rate). A notice for housekeeping staff was posted in the office where staff receive the keys for rooms assigned. Staff were also notified during morning staff meetings on May 23 and 24, 2025, where 190 to 197 employees attended per meeting. There were an additional eight Grandview employees that worked in Tower 3 and Tower 8 that were notified individually. Guest notifications ended on June 6th, 2025, when follow-up environmental samples all came back non-detect for *Legionella*.

DSC identified 16 total cases of legionellosis associated with this outbreak (**Figure 1**). Disease onsets ranged from February – May 2025. There were seven cases of LD (3 confirmed, 4 probable) and nine probable cases of PF. The median age at symptom onset of LD case patients was 57.5 years, with a range of 21–81 years (**Appendix Table 1**); the median age of PF case patients was 35 years, with a range of 12-78 years (**Appendix Table 2**).

Laboratory Results

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

Environmental water sampling results from The Grandview at Las Vegas are indicated in **Table 1**. *Legionella* species were detected in water samples collected from The Grandview on April 29 and May 1, 2025.

Table 1. Environmental water sampling results.

Date of sampling	Number of samples detecting <i>Legionella</i> spp.
04/29/2025	5 of 17
05/01/2025	3 of 19
05/07/2025	0 of 2

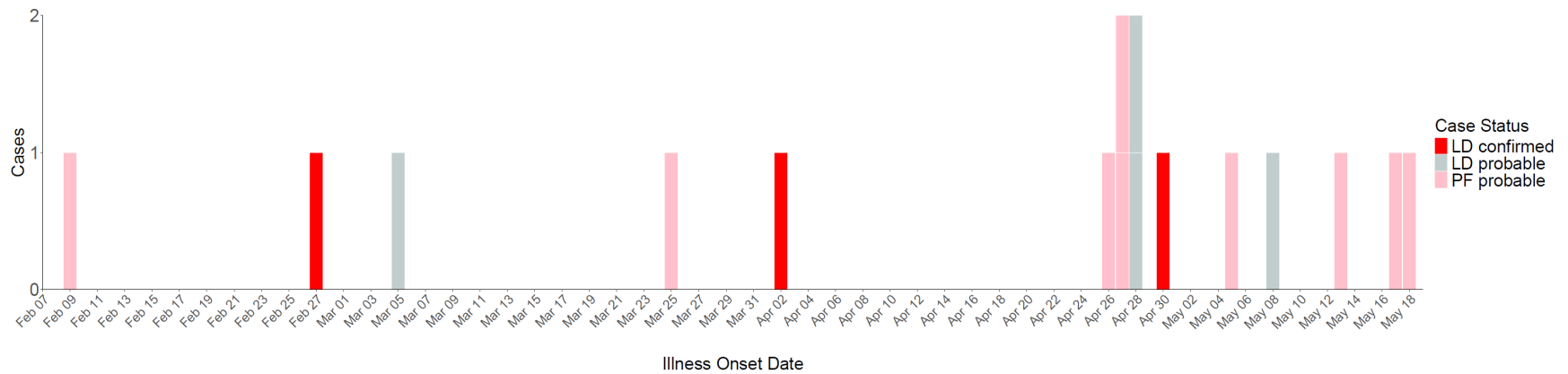


Figure 1. Epidemic curve of Legionellosis cases at The Grandview, February – May 2025.

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 comprehensive written water management program to reduce the risk of future *Legionella* colonization of the building water systems.

After environmental sample laboratory results were received, EH followed up with hotel management to discuss water system remediation methods. The Grandview utilized increased chlorination as well as targeted flushing from 5/14/25-5/21/25 to remediate their affected water systems. After remediation, the facility complied with the post-remediation sampling protocol to ensure the remediation was effective.

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 The Grandview 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 The Grandview within six business days from the first CDC notification. SNHD worked with the Grandview management team to conduct environmental evaluations including sampling for *Legionella*. 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. 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)	
20-24	1 (14.3)
40-44	1 (14.3)
50-54	1 (14.3)
60-64	1 (14.3)
65-69	1 (14.3)
80-84	1 (14.3)
Unknown	1 (14.3)
Birth Sex	
Female	4 (57.1)
Male	3 (42.9)
Race	
Asian	1 (14.3)
Other Race	1 (14.3)
Unknown	2 (28.6)
White	3 (42.9)
Ethnicity	
Hispanic or Latino	1 (14.3)
Not Hispanic or Latino	4 (57.1)
Unknown	2 (28.6)

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

Category	n (%)
Age Group (years)	
10-14	2 (22.2)
20-24	1 (11.1)
30-34	1 (11.1)
35-39	2 (22.2)
40-44	1 (11.1)
45-49	1 (11.1)
75-79	1 (11.1)
Birth Sex	
Female	6 (66.7)
Male	2 (22.2)
Unknown	1 (11.1)
Race	
Declined to Answer	2 (22.2)
Other Race	1 (11.1)
White	6 (66.7)
Ethnicity	
Hispanic or Latino	3 (33.3)
Not Hispanic or Latino	6 (66.7)