



Alliance to Prevent Legionnaires' Disease

FREQUENTLY ASKED
QUESTIONS:
**LEGIONNAIRES' DISEASE
PREVENTION EFFORTS**

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1 QUESTION: Is Legionnaires' disease an airborne illness?

ANSWER: Legionnaires' disease is NOT an airborne illness. Rather, it is categorized as a waterborne illness. Legionnaires' disease is caused by the *Legionella* bacteria which live in natural waters and the biofilm that coats the inside of man-made water systems – including water distribution systems and building plumbing systems. Legionnaires' disease can be contracted when someone inhales or aspirates (goes “down the wrong pipe” while drinking) contaminated water droplets.

2 QUESTION: Are cases of Legionnaires' really on the rise or is there simply a greater awareness about the disease?

ANSWER: According to Dr. Thomas Frieden, former Director of the Centers for Disease Control and Prevention (CDC), “the number of people diagnosed with Legionnaires' disease has been increasing” with the number of diagnoses quadrupling from 2000 to 2014, and currently averaging around 5,000 per year in the U.S.ⁱ This rise is attributed to a number of factors including an aging infrastructure that provides a favorable environment for biological growth and is more easily disrupted causing regular releases of bacteria and human exposure, and water and energy conservation strategies that contribute to water stagnation in the system and favorable temperatures for bacterial growth. The CDC cites aging infrastructure as a contributor to increased growth of *Legionella* bacteria due to the corrosion of drinking water pipes which stimulates *Legionella* growth due to a loss of disinfectantⁱⁱ.

3 QUESTION: Of Legionnaires' cases, how many are sporadic (single) vs outbreaks?

ANSWER: In its June 2016 Vital Signs report, the CDC summarized its review of reported legionellosis cases during 2000–2014. During that time, the CDC found that only four percent of reported cases were outbreak-associated.ⁱⁱⁱ In other words, 96 percent of reported cases were sporadic or unique unrelated cases. A 2014 study of water samples drawn by scientists from 68 water taps across the United States, found that 47 percent harbored traces of *Legionella pneumophila*.^{iv} This is why it is critical that public officials and water utilities monitor and improve the public water systems to help prevent *Legionella* from entering our homes and the buildings we visit.

A study published in the New England Journal of Medicine, which investigated sporadic Legionnaires' disease cases, also found a genetic match between patient samples and samples taken from the patient's home potable (drinking) water system in 40 percent of cases.^v

4 QUESTION: When a Legionnaires' disease outbreak occurs, should investigators always assume a single source is to blame?

ANSWER: Following a review of outbreaks in New Jersey, the New Jersey Department of Health published a study which concluded that “public health investigators should not exclude the community water system from consideration as the disease transmission vector.” Specifically, the study suggests that “there is a need to update and expand the standard dogma, that water heaters, indoor plumbing, and source water are the reservoirs of *Legionella*, while community outbreaks require an air-dispersal source. Public health investigators should not exclude the community water system from consideration as the disease transmission vector, especially when a standard common source is not found.”^{vi}

In addition, the World Health Organization categorizes source water quality as a risk factor for *Legionella* bacteria growth and notes that the make-up water for buildings and building equipment “will usually come directly from a municipal or well supply. However, sometimes a holding tank is used.” Therefore, if the water supply is in fact infected, it will seed buildings and equipment with these bacteria.^{vii} While it is important to in-

investigate fixtures that aerosolize water, it is equally important to address the water that feeds into that equipment to ascertain and address the source of the *Legionella* bacteria.

When investigations are performed by local health officials, the Alliance to Prevent Legionnaires' Disease urges comprehensive investigations to include testing of the public water system, water from homes and residences in the area, an examination of any disruptions to the water system (flooding, maintenance, main breaks, construction, etc.), building inactivity records (potential stagnant water risk), and other investigation tools and guidelines to assess ALL possible sources.

5 QUESTION: Can disruptions to the water distribution system affect Legionnaires' disease case rates?

ANSWER: According to the CDC, about 35 percent of all Legionnaires' disease outbreaks can be attributed to events which take place outside of the building, like changes in water quality and disruptions due to construction or water main breaks.^{viii} Given that there is no requirement for water operators to test for *Legionella* bacteria in the water distribution system outside of buildings, prevention efforts are being missed and the public remains at risk for unnecessary infection. The United States Environmental Protection Agency cites potable (drinking) water as “the most important source of *Legionella*.”^{ix} This suggests that the quality of water should be monitored and properly disinfected against *Legionella* bacteria before it has an opportunity to enter homes and buildings.

6 QUESTION: In the event of a water disruption like construction, a water main break or heavy rain, is there a risk that the public water source entering the building has been compromised?

ANSWER: According to the CDC, construction, water main breaks and changes in the municipal water quality can all have an impact on the water that enters a building. Vibrations and changes in water pressure can dislodge biofilm, increase sediment, lower disinfection levels, increase density or cloudiness due to stirred up sediment, and release *Legionella* into the water entering your building^x. All of these events increase the likelihood of *Legionella* growth within buildings and even the most robust building water management systems might not sufficiently address the increased risk. To prevent Legionnaires' disease, comprehensive solutions must be employed at all levels of the water distribution system, both inside and outside of buildings and homes. Water utilities should be responsible for delivering consistently high quality water to homes and workplaces and have safeguards in place for continued protections even with interruptions to the supply and distribution system.

Because of this reality, the Alliance strongly supports better communication between utilities and communities in the event of water disruption events that could result in *Legionella* bacteria being released at higher levels into homes and buildings.

7 QUESTION: Is it sufficient to focus prevention efforts exclusively on the fixtures in buildings that are the points of exposure to *Legionella* bacteria by humans?

ANSWER: A single infected public water system can contaminate thousands of premises with *Legionella*; exposing and potentially infecting individuals with the bacteria. It is advantageous to properly control *Legionella* – and all other waterborne illnesses – in a single public water distribution system that is well-managed by knowledgeable experts rather than mandate control of thousands of premise plumbing locations. Especially since homeowners are at risk from public system releases, it's not reasonable or practical to expect each home and building to have the biological and chemical expertise required to control for waterborne threats. Also there is no known solution to account for the inconsistent water quality and unpredictable seeding of the bacteria in their building's complex water system. Better monitoring and control must be put in place at the water utility level.

8 QUESTION: What should be done to address Legionnaires' disease and other waterborne illnesses?

ANSWER: We need to educate the community about the full range of bacterial risks around us and how they can help protect themselves, and what they can do to support comprehensive solutions. *Legionella*, along with numerous other waterborne bacterial threats, is a water management issue – wherever there is water in our systems, homes, or equipment. Municipalities must adopt prevention methods that address sources of *Legionella* outside of the building as a first step, then promote building water management as part of a comprehensive solution to Legionnaires' disease. Incidences of Legionnaires' disease should be thoroughly investigated to help us understand the issue more thoroughly, and we should promote more research that addresses water management from source to consumption.

ⁱTranscript for CDC Telebriefing: New Vital Signs Report - Can effective water management programs prevent building-associated Legionnaires' disease outbreaks? 2016. Retrieved from: <https://www.cdc.gov/media/releases/2016/t0607-legionnaires.html>

ⁱⁱEnviron. Sci. Technol. Lett., 2016. Retrieved from <http://cen.acs.org/articles/94/web/2016/07/Legionnairesoutbreaks-Flint-linked-corrosive-tap.html>

ⁱⁱⁱCDC Vital Signs Morbidity and Mortality Report: Deficiencies in Environmental Control Identified in Outbreaks of Legionnaires' Disease - North America, 2000-2014, 2016. Retrieved from: <https://www.cdc.gov/mmwr/volumes/65/wr/mm6522e1.htm>

^{iv}M.J. Donohue et al. Widespread molecular detection of *Legionella pneumophila* serogroup 1 in cold water taps across the United States. *Environmental Science & Technology*. Published online February 18, 2014. doi: 10.1021/es4055115.)

^vStout, Janet E., et al. Potable water as a cause of sporadic cases of community-acquired Legionnaires' disease. *New England Journal of Medicine*, 1992. Retrieved from: <http://www.nejm.org/doi/pdf/10.1056/NEJM199201163260302>

^{vi}Community Outbreak of Legionellosis and an Environmental Investigation into a Community Water System. 2014, NJ Department of Health

^{vii}Bartram, J.; Chartier, Y; Lee, J.V.; Pond, K. & Surman-Lee, S. 2007. *Legionella* and the prevention of legionellosis. World Health Organization.

^{viii}CDC Vital Signs: legionnaires' disease, a problem for health care facilities, 2017. Retrieved from: <https://www.cdc.gov/vitalsigns/pdf/2017-06-vitalsigns.pdf>

^{ix}Environmental Protection Agency: Water topics. Retrieved from: http://water.epa.gov/action/advisories/drinking/upload/2009_02_03_criteria_humanhealth_microbial_legionellafsf.pdf

^xCDC Toolkit: Developing a Water Management Program to Reduce *Legionella* Growth & Spread in Buildings. Retrieved from: <https://www.cdc.gov/legionella/downloads/toolkit.pdf>