

New Concerns for *Legionella* after Coronavirus: Reopening Buildings

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In a nutshell...

One result of the sweeping closures of buildings during the COVID-19 pandemic is a sharp increase in stagnant water and conditions that can support *Legionella* growth in building water systems. This article highlights steps that CDC recommends to be taken when reopening and reoccupying buildings.

Millions of Americans are beginning to return to their former workplaces. This means opening buildings that have sat completely or mostly empty for weeks or months. When properties are closed for an extended period, for any reason, unsafe building water system conditions can develop. These can pose serious health risks. Harmful microorganisms, particularly [Legionella bacteria](#), can grow in the stagnant water supply, which is a concern for safely reopening buildings after coronavirus. This looming issue has been featured in recent [science](#) and [mainstream](#) news.

Water Use and Stagnation

When a building is not in use and its water system is not actively maintained, stagnant water fills the pipes, equipment, and any storage tanks. The disinfectant residual, [typically chlorine or chloramine](#), decays and disappears, which is needed to control microbial contamination. Hot water systems can cool to temperatures in the *Legionella* growth range of 77–108°F (25–42°C). The extent of stagnation will vary between buildings based on a variety of factors. These include the length of closure, size of the building and number of occupants, complexity and condition of the water system, and whether maintenance had been performed during the shutdown.

Utilities are responsible for delivering treated and disinfected drinking water to a property. But it is the responsibility of the owner or manager to ensure the safety of water within a building. Fortunately, the U.S. Centers for Disease Control and Prevention (CDC) has recommended steps to address water safety when reopening buildings and to help protect their occupants. These will apply to businesses, government facilities, schools, and other buildings as they begin to reopen.

Legionella and Legionnaires' Disease

Inhaling water droplets containing this bacteria can cause [Legionnaires' disease](#), a serious and often deadly form of pneumonia. Most healthy people exposed to *Legionella* do not get sick. People at increased risk include those with compromised immune systems, persons with a chronic lung disease, the elderly, and current or former smokers—groups already at increased risk for coronavirus (COVID-19). *Legionella* is common in warm, freshwater environments like lakes and streams. But it can also be found in building water systems, ranging from cooling towers to plumbing to hot tubs and spas. This is because *Legionella* survive and thrive in slimy layers inside wet pipes and fixtures. Called [biofilms](#), these can harbor and protect *Legionella* and other microorganisms from residual disinfectants. Stagnant, warm water containing little or no residual disinfectant greatly increases the risk of Legionnaires' disease for building



Lower photo credit:
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occupants. The threat from Legionnaires' disease may be compounded because its victims tend to share similar symptoms as coronavirus patients, including cough, chills, and fever, making [misdiagnosis a possibility](#).

Guidance for Reopening Buildings

To help avoid an increase in Legionnaires' disease as Americans return to work, CDC has recently updated their online [Guidance for Building Water Systems](#). It outlines steps to take during and before reopening a building to reduce risk from mold as well as *Legionella*. Each step includes additional recommended actions and considerations. The updated guidance also provides links to additional resources.

1. Develop a comprehensive water management program¹ for each building water system
2. Ensure water heaters are properly maintained and temperature set to at least 140 °F (60 °C)
3. Flush the water system through all points of use, such as taps, floor drains, toilets, and showers, to replace all piped and stored water with fresher water with a residual disinfectant
4. Clean and scrub decorative water features like fountains to ensure they are free of slime or biofilm; refill with fresher water with a residual disinfectant
5. Ensure hot tubs and spas are clean and safe for use; see also the WQ&HC article, "[How to Shut Down or Reopen a Hot Tub or Spa during the Coronavirus Pandemic](#)."
6. Ensure cooling towers are clean and well-maintained
7. Ensure safety equipment, such as fire sprinklers and eye wash stations, are clean and safe for use
8. Maintain building water systems such as by checking temperatures and residual disinfectant levels

New resources are becoming available on how to reopen buildings and to manage dormant building water systems. For example, the Canadian Water and Wastewater Association (CWWA) just released a helpful [fact sheet and checklist](#) for building owners/operators. It includes recommended actions to take *during* a period of extended shutdown or low use as well as for *reopening* a closed building. CWWA emphasizes the importance of cleaning, regular flushing, and maintaining adequate hot water temperatures to deter growth of *Legionella*. The fact sheet also notes that "shock chlorination" by a trained water professional may need to be considered for complex systems with storage tanks or for buildings serving particularly vulnerable populations. This involves temporarily disinfecting and flushing the system with a concentrated chlorine solution.

Idle building wastewater systems also need to be flushed to ensure wastes are washed away. Of course, appropriate personal protective equipment, such as gloves, masks, and eye protection, should be used while performing most of the above actions to reopen buildings.

Final Thoughts

As we look forward to life and work after the coronavirus pandemic, we should remain vigilant about *Legionella* and Legionnaires' disease. Respiratory disease is definitely something we are all thinking about as we return to our workplaces. Waterborne respiratory disease risks such as from *Legionella* can be reduced with a smart building water flushing, cleaning, and monitoring program.

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Guidance for Reopening Small Buildings

For small buildings like places of worship, first, check CDC's [general guidance](#) for cleaning and disinfecting public spaces, workplaces, businesses, schools, and homes. While using appropriate personal protective equipment, flush the building's water system until the hot water reaches its maximum temperature. Hot water heaters and other water-using devices, such as ice machines, may require additional cleaning steps. For example, draining the hot water heater or discarding old ice per manufacturers' instructions.

www.waterandhealth.org

¹ A water management program helps building owners identify, assess the risks, and manage water system conditions that support *Legionella* growth. For further information, see <https://www.cdc.gov/legionella/wmp/toolkit/index.html>.