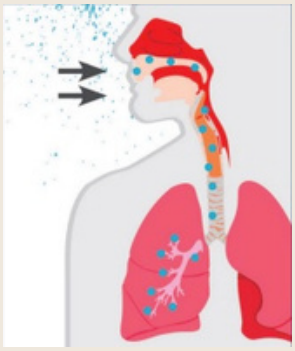
# Legionnaires' Disease

## A Bulletin for Plumbers

Legionnaires' disease is caused by a bacteria called *Legionella*. Inhaling contaminated water can cause a serious lung infection (pneumonia). There is a mild form *Legionella* exposure, which is called Pontiac Fever. People become sick by inhaling contaminated aerosolized water droplets, or mist, that goes into the lungs. Less commonly, if ingested (drinking water), through aspiration, or when water goes down the "wrong pipe." *Legionella* rates have been increasing in Ohio. If you suspect an infection, see your healthcare provider right away.



Note. From *Legionnaires' disease*, by the Centers for Disease Control and Prevention.

**Did you know?**
1 in 10 that become infected, will die

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Note. *Biofilms and drinking water quality*, by Water Quality & Health Council

### What are the symptoms?

- Fever
- Cough
- Shortness of breath
- Muscle aches
- Headache
- Loss of appetite
- Nausea
- Malaise
- Fatigue
- Muscle pain
- Diarrhea
- Confusion

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Note. From *Legionella: History, burden, and trends*, by CDC.

In 1976, participants attending the American Legion convention in Philadelphia fell ill from a flu-like illness. Investigators suspect the cooling system fans released contaminated mist on to the sidewalks. This mist was drawn through a vent & eventually inhaled by the participants which lead to the infection. A total of 182 people became ill and 29 people died. In 1977, the bacteria was named *Legionella pneumophila*.

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| | PONTIAC FEVER | LEGIONNAIRES' DISEASE |
|---|---|---|
| Caused by Legionella? | Yes | Yes |
| Serious | No, symptoms are mild | Yes |
| Treatment | No | Yes, antibiotics |
| Onset | Few hours to 3 days after exposure | 2-14 days after exposure, sometimes longer |
| Contagious | No | Generally, no. Cases are extremely rare |

### Who is at risk?

*Anyone can be affected but there are some people that have a higher risk of getting very sick*

- Over 50 years of age
- Current or former smoker
- People with chronic lung disease like COPD or emphysema
- Anyone who has a weak immune system
- Those with cancer
- People diagnosed with diabetes, kidney or liver failure

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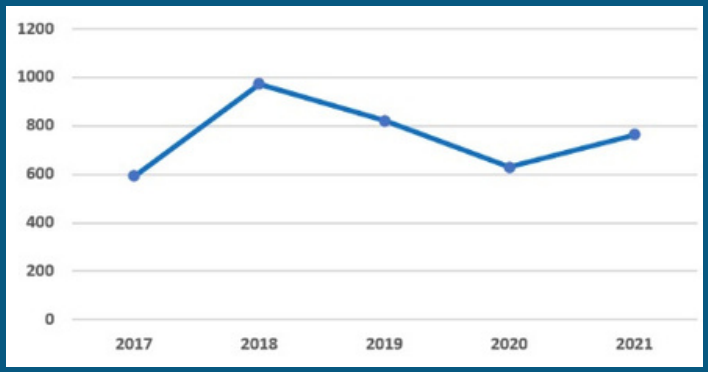
### Legionellosis cases in Ohio




"Legionellosis" includes Legionnaires' Disease, Pontiac Fever, and other *Legionella* infections

### Risk for human disease occurs with the following:

**Amplification**
*Growth of Legionella*

**Aerosolization**
*Transportation of bacteria into the air*

**Transmission**
*Inhalation into lungs*

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Note. From *Could Legionnaires' disease be lurking in your hot tub?* by Water Hygiene Centre

## Where can *Legionella* grow?

- Cooling towers (centralized air-cooling systems)
- Large complex plumbing systems
- Decorative water features (fountains)
- Hot tubs
- Hot water tanks & heaters
- Showers/sink faucets
- Windshield wiper fluid
- Freshwater lakes & streams*

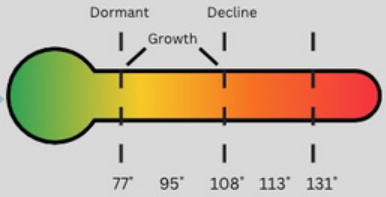
**Generally, quantities of Legionella found in natural bodies of water (lakes, streams) are not sufficient to cause disease.* 3,8

Note. From *Prevent Legionella in Cooling Towers*, by State Industrial.

## Conditions that increases growth of *Legionella:*

### Warm temperatures

Below 77˚F, *Legionella* does not grow but does not die. *Legionella* can survive up to 158˚F. The ideal temperature for growth is between 77˚ and 113˚.




Note. *What is biofilm?* by Boston Drain Company

### Stagnation

Biofilms protect *Legionella* and can dislodge with construction or disruption of water flow causing a downstream infection.

### Organic matter

Presence of organic matter like scale or sediment in water provides nutrients for bacterial growth and decreases residual disinfectant in the water.

Note. *3 reasons your tap water looks rusty*, by All American Plumbing, Heating, Air

### Residual disinfectant

Disinfectants can break down in high temperatures or increase in organic matter an increase growth of *Legionella*.

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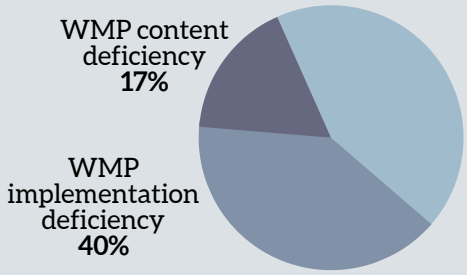
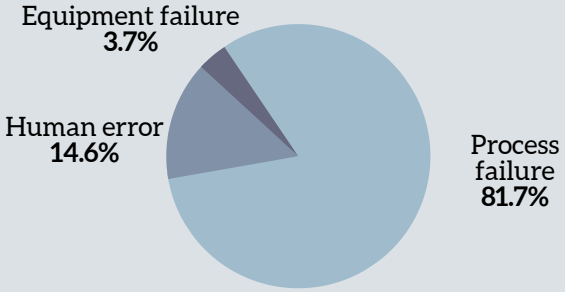
## Most common causes of *Legionella* outbreaks

### Amongst WMP deficiencies




WMP = Water Management Program

### Amongst environmental deficiencies

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## Additional resources

**Recommendations for Flushing & Disinfection**
Unoccupied-partially occupied buildings

**Guidance for Premise Plumbing Water Service Restoration**

**Controlling *Legionella* in potable water**

## Temperature and the effect on Legionella

| EFFECT | TEMPERATURE | TIME (MINUTES) |
|---|---|---|
| Growth range | 77˚-113˚F | |
| Ideal growth range | 90˚-108˚F | |
| Survives but does not grow | 118˚-122˚F | |
| 90% kill rate | 122˚F | 18-124 |
| | 140˚F | 2 |
| Dies almost immediately | 158˚F | |
| Dormant | < 68˚F | |

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## References


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