Will Legionnaires' disease be the next U.S. epidemic?

Cristina Attfield

Data Sources:

National Outbreak Reporting System (NORS)

Centers for Disease Control (CDC)

Enforcement and Compliance History Online (Echo)

Environmental Protection Agency (EPA)

Census State Population

Wonder.cdc.gov

What is Legionnaires' disease?

- Legionellosis is a bacterial disease caused by Legionella that can present as either Legionnaires' disease or Pontiac fever. Legionella is a type of bacterium found naturally in freshwater environments, like lakes and streams.

- Legionella was discovered after an outbreak in 1976 among people who went to a Philadelphia convention of the American Legion. Those who were affected suffered from a type of pneumonia (lung infection) that eventually became known as Legionnaires' disease.

- It's important to note, that most cases of Legionnaires' disease can be cured by antibiotics.

Source: https://www.cdc.gov/legionella/about/history.html

Symptoms

Legionnaires' disease is very similar to other types of pneumonia (lung infection), with symptoms that include:

- Cough
- Shortness of breath
- Fever
- Muscle aches
- Headaches

Source: https://www.cdc.gov/legionella/about/signs-symptoms.html

Risk Factors:

- People 50 years or older
- Current or former smokers
- Chronic lung disease
- Immune system disorders due to disease or medication
- Cancer
- Underlying illnesses such as diabetes, kidney failure, or liver failure

Source: https://www.cdc.gov/legionella/about/signs-symptoms.html

How it spreads

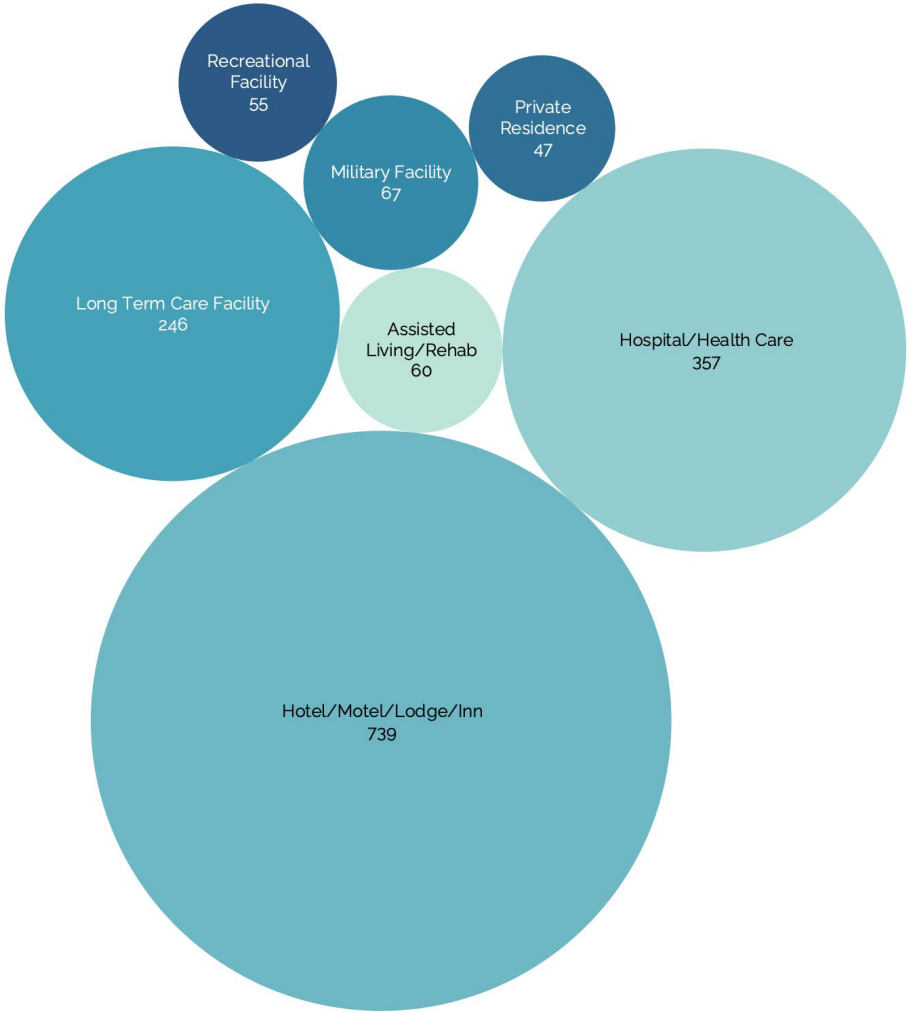
- After Legionella grows and multiplies in a building water system, water containing Legionella then has to spread in droplets small enough for people to breath in. People can get Legionnaires' disease or Pontiac fever when they breathe in small droplets of water in the air that contain the bacteria.

- Legionnaires' disease does not spread person to person.

Source: https://www.cdc.gov/legionella/about/causes-transmission.html

Legionnaires' disease outbreak top locations

Outbreaks are commonly associated with buildings that have complex water piping systems.



Common sources

Legionella can become a health concern when it grows and spreads in human-made building water systems like:

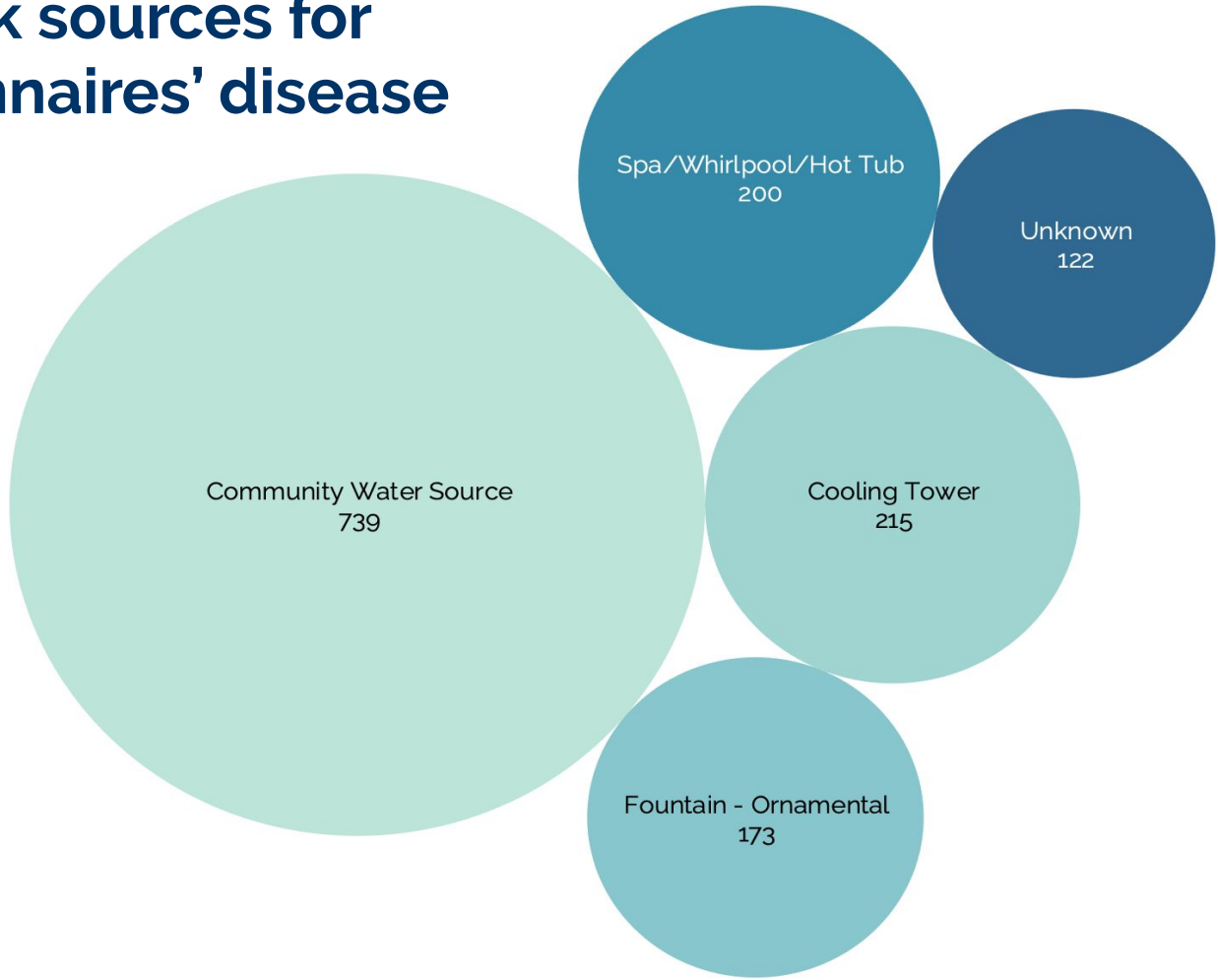
- Showerheads and sink faucets
- Cooling towers (structures that contain water and fan as part of centralized air cooling systems for building or industrial processes)
- Hot tubs that aren't drained after each use
- Decorative fountains and water features
- Hot water tanks and heaters
- Large plumbing systems

Source: https://www.cdc.gov/legionella/about/causes-transmission.html

Top water outbreak sources for contracting Legionnaires' disease

Community water sources include:

- **Showerheads**
- **Sink faucets**



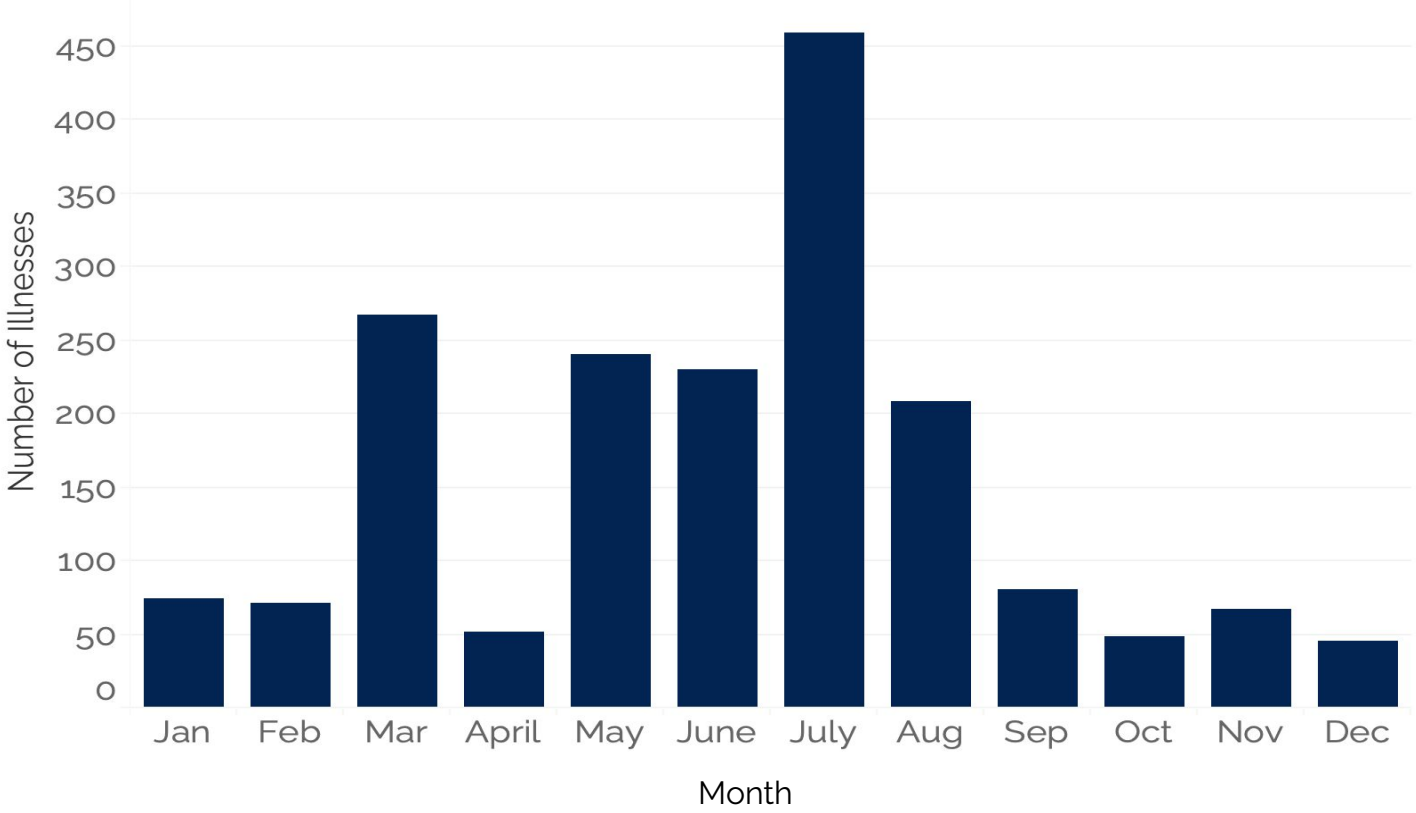
Conditions for Legionella growth

Legionella grows best within a certain temperature range (77-108 ˚F). To keep water outside the range for Legionella growth, it is important to keep cold water cold and keep hot water hot.

- In warm climates, water in pipes that carry cold water may reach a temperature that allows Legionella to grow.
- It is important to maintain water heaters at appropriate temperatures while following local and state anti-scald regulations.

Source: https://www.cdc.gov/legionella/wmp/overview/growth-and-spread.html

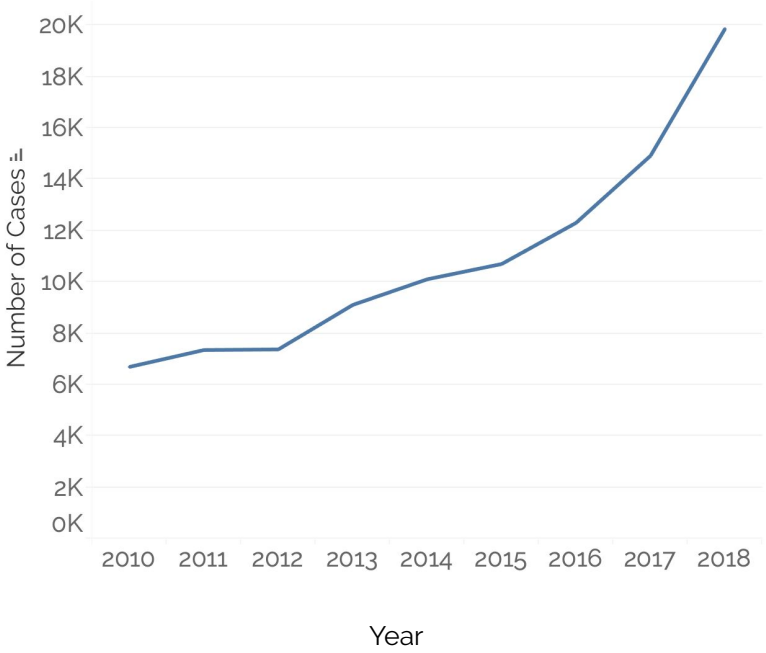
Legionnaires' outbreaks by month from 2010-2017



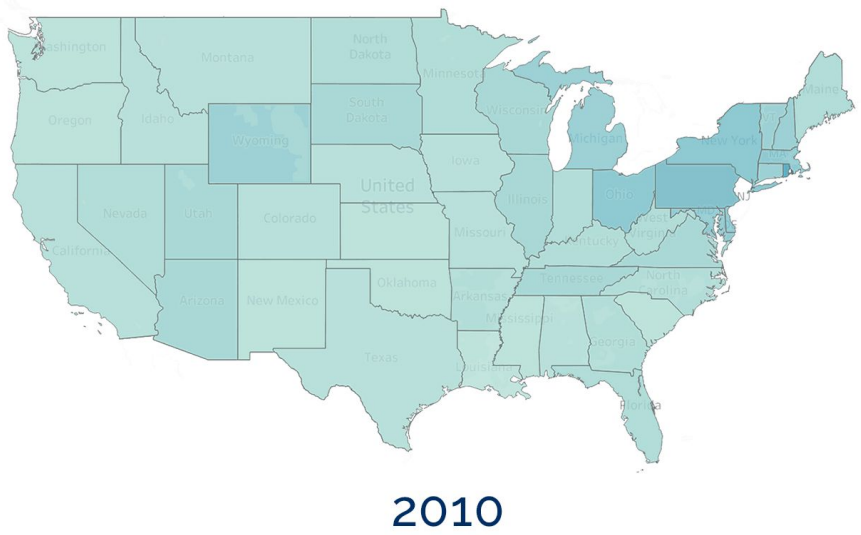
However; Legionnaires' outbreaks only account for 4% of all legionnaires cases.

Legionnaires' cases are on the rise

Number of all reported Legionnaires' cases



Reported Legionnaires' cases per capita 2010 - 2018



SUM(Per Capita)

0.01% 0.80%

What is causing increased cases?

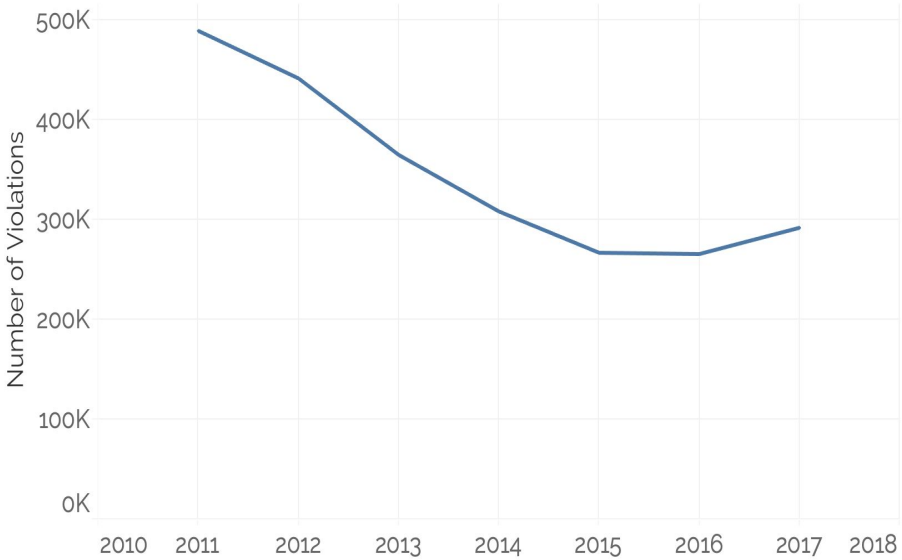
Nobody knows, but there is speculation that rises in Legionnaires' cases could be due to:

- An aging water infrastructure system
- A more vulnerable population
- Increased patient testing
- Warmer weather temperatures including increased rainfall and humidity (weather conditions prime for Legionella colonization)

Could there be a connection to community water system violations?

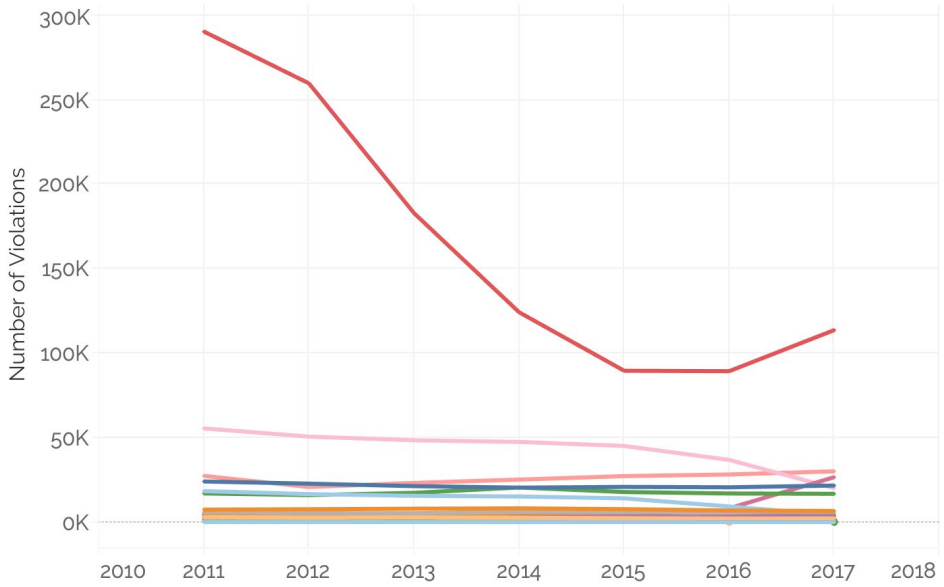
U.S. Community Water System Violations

All Violations



Violations by Type

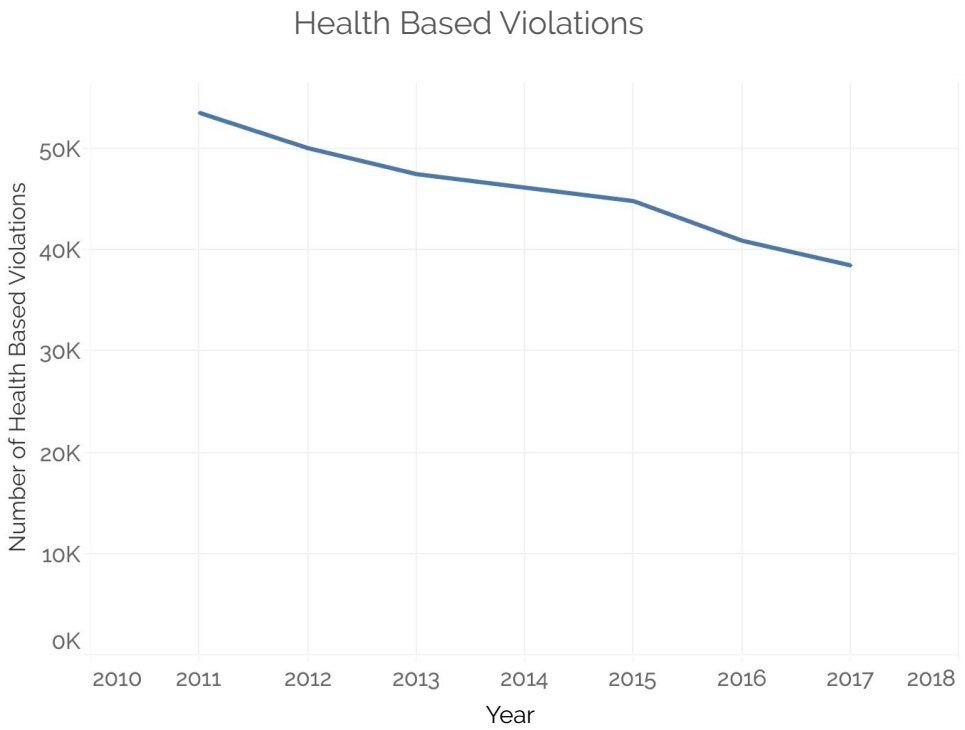
Monitoring, Regular



Health based violations are also going down

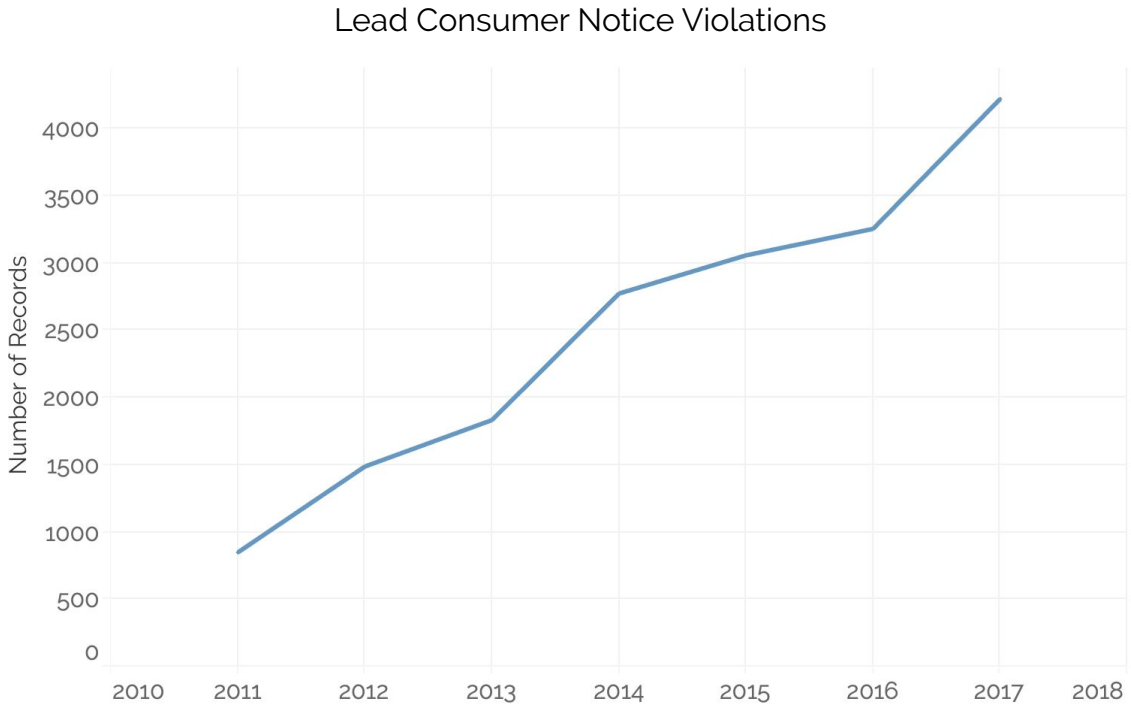
Health based violations fall into three categories:

- Exceedances of the maximum contaminant levels (MCLs)
- Exceedances of the maximum residual disinfectant levels (MRDLs)
- Treatment technique requirements



Source: https://www.epa.gov/sdwa/secondary-drinking-water-standards-guidance-nuisance-chemicals

However, the rate of lead consumer notice violations is rising



While we don’t know what could be causing the increased incidence of legionnaires we do know that:

- Legionnaires’ cases are increasing every year.
- Legionella thrives in warm stagnant water; especially in big buildings with complex piping.

Will legionnaires disease be the next U.S. epidemic?

While typically Legionella has colonized in buildings like hotels and hospitals - office buildings along with other buildings that have been shut down during the Covid-19 pandemic, may now pose a new risk for outbreaks.

Large amounts of water that usually flows from the community water systems and through to buildings and homes have experienced a significant reduction in water pressure, and therefore; can be expected to also have what is referred to as “dead ends” where pockets of water have been sitting stagnant for some time.

Office buildings, hotels, and other large buildings are re-opening at a time favorable to legionella colonization: warm, wet, humid weather.

Those who have recovered from Covid-19 and those who are in the high risk category for Covid-19 are also at risk for contracting Legionnaires' disease.

What can be done to mitigate risks?

- Water flushing in buildings, facilities, and community water system facilities.
- Appropriate level of chlorine in treated water.
- Increased awareness - testing for Legionnaires' disease for those who present symptoms.

Thank you