



# **Brief Overview: Health Risks from Legionella and a Framework for Public Policy**

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May 5, 2021

Testimony for Pennsylvania Democratic Policy Committee Hearing



## Dr. Hung Cheung, MD, MPH, FACOEM

As one of the nation's foremost experts in his field, Dr. Cheung has led hundreds of environmental and toxicological investigations, protecting thousands of occupants and saving organizations millions of dollars.

A former Maryland State Medical Director, he is a faculty member at the University of Pennsylvania, Perelman School of Medicine. As a Fellow of the American College and Environmental Medicine, he is nationally-recognized as an expert in Respiratory Environmental Medicine, Plant and Indoor Environmental Quality, Risk Communication and Medical Advisory Services. Board Certified in both Internal Medicine and Preventive Medicine, he holds a Masters in Public Health from Johns Hopkins and has a medical degree from the University of Maryland.

He is in demand as a lecturer in prevention and remediation, as a scientific expert in legal and administrative proceedings, and has provided expert technical testimony to legislatures. Such activities include serving with the Maryland Governor's Task Force on Indoor Air Quality, the Baltimore City Healthy Homes Advisory Board and completing a major epidemiological investigational study for the Department of Defense.

"My philosophy is preventive," says Dr. Cheung. "Organizations need to design and develop policies that prioritize root causes to help prevent exposures, injuries and illnesses. Once we discover the root cause of a problem – using good science – we can create an action plan to prevent it from happening again."



# Legionella Basics



# Background

## *Legionella* bacteria

- Waterborne bacteria causes Legionnaires' Disease
- 60+ species, 70+ serogroups that can cause disease
- Found readily in water (surface, ground) and soil
- Commonly found in source water and throughout water systems that serve residents and consumers
- Grows best in slime, sediment, and biofilms

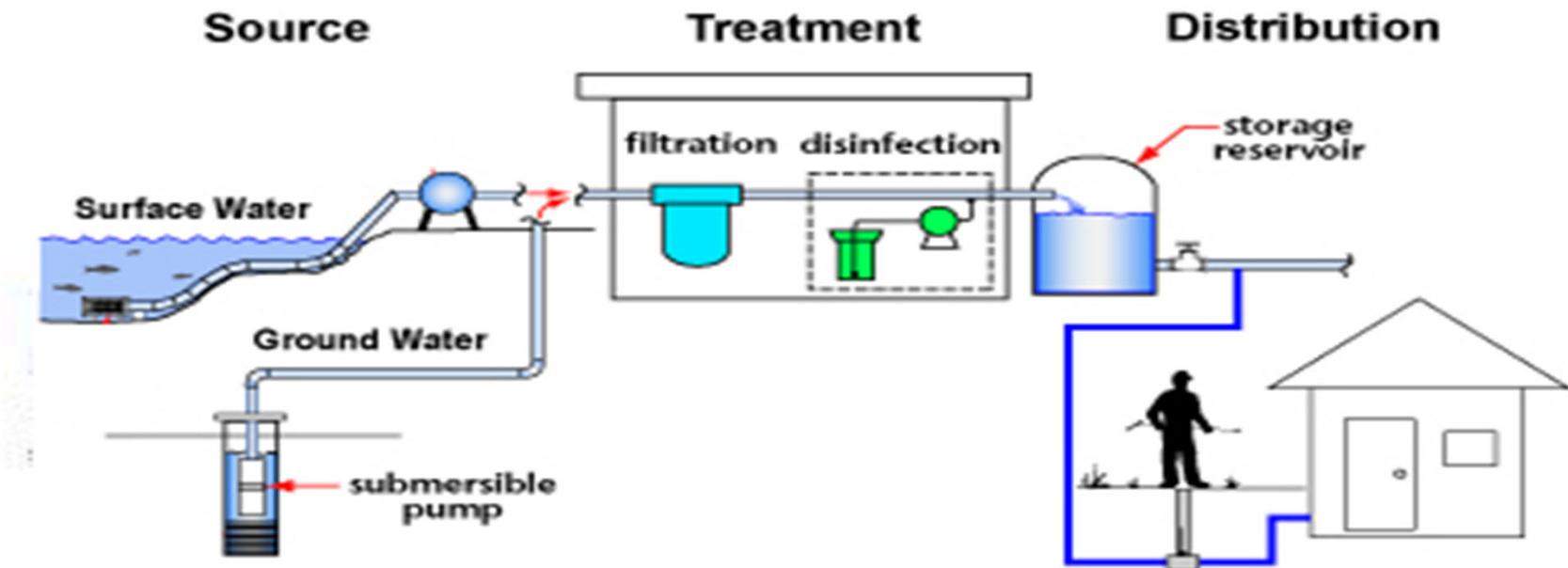
## Risk Factors for Legionnaires' Disease

- Smokers
- Elderly (Age 50 or older)
- Lung or kidney disease
- Diabetes
- Cancer
- Weakened immune system due to medications or disease

## Mode of Transmission

- Waterborne sources
- Inhalation of aerosolized *Legionella* contaminated water droplets
- Aspiration or choking of drinking *Legionella* contaminated water
- Handling *Legionella* contaminated soil
- Surgical wounds treated with *Legionella* contaminated potable water

## Pathway Illustrating How *Legionella* Waterborne Pathogens Are Introduced to and Flow through Water Systems











# **Sound Public Policy Prioritizes Root Cause Solutions to Legionnaires' Disease**

## Key Perspectives to Guide Public Policy

- 96% of Legionnaires cases are individual, sporadic – not outbreaks
  - Seldom investigated
  - Daily, routine water immersion and exposure in homes a key, overlooked concern
  - Emphasizes critical importance of legionella-free and contaminant-free incoming water
  - Makes water utility treatment and distribution a priority
  - Increase public education and awareness to protect the most vulnerable
- Public policy should prioritize root causes and cost-effective prevention
  - Outbreaks tend to influence away from root cause solutions
  - Start with source water, treatment and distribution.
  - Resolve to upgrade water system infrastructure
  - Proactive public communications by water utilities of water system disruptions (maintenance, flooding, construction) that can release legionella and disruptive contaminants that affect consumers
- Public policy litmus test: how does the proposal address the 96% of cases that are sporadic individual cases

## Example of Sound Policy

- Illinois Water Guidelines – 2019
  - Water age monitoring and flushing
  - Water storage management practices
  - Controlling food sources for legionella (Nitrification Action Plans)
  - Proactive communications of disruptions
  - Minimum disinfection level at all points of distribution