

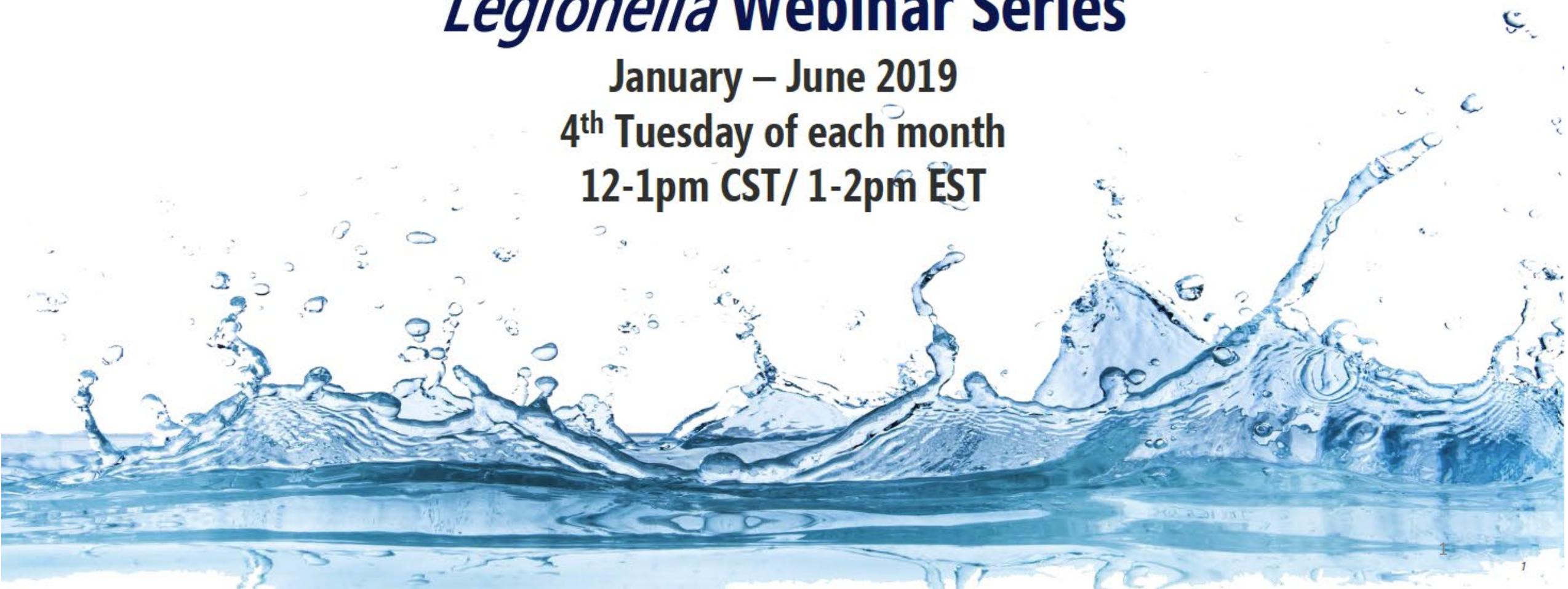


# *Legionella* Webinar Series

January – June 2019

4<sup>th</sup> Tuesday of each month

12-1pm CST/ 1-2pm EST



Raise awareness of **legionellosis** and prevention through **water management programs**.

Provide Tennessee healthcare facilities with information and resources to develop and implement water management programs.

Jan 22: **Introduction to Healthcare - Associated Legionellosis**

Feb 26: **Water Management Programs**

Mar 26: **Developing a Water Management Program**

Apr 23: **Healthcare Experiences with Water Management Programs**

May 21: **What to Expect in an Outbreak**

Jun 25: **Review Resources and Healthcare Implications**

# Reminders

- **Webinars recorded, available online**
  - Previous webinar recording, slides, resources
  - <https://tha.com/events-education/legionella-webinar-series/>
- **Phone lines muted during webinar**
- **Questions taken at end**
  - Type in chat box

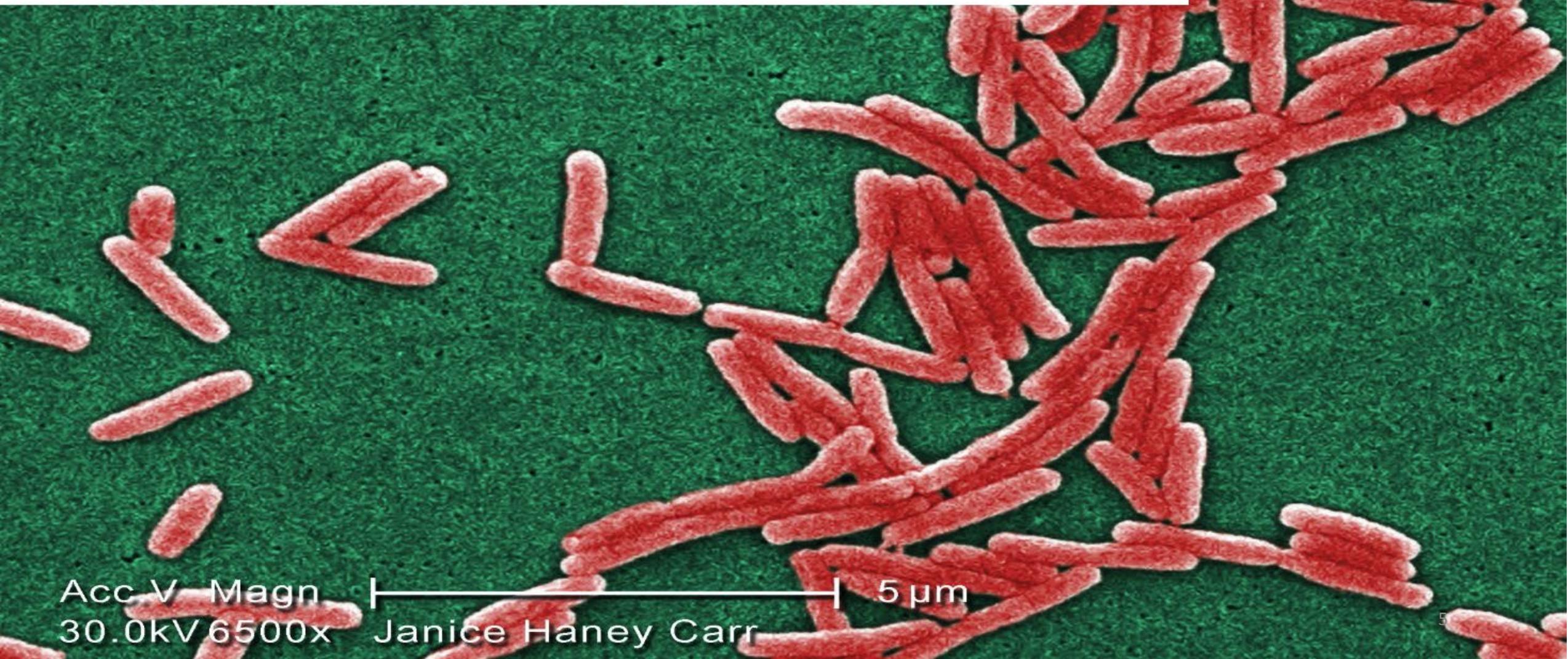
# Webinar 1 Recap

## Introduction To Healthcare – Associated Legionellosis



## Legionellosis is caused by *Legionella* bacteria

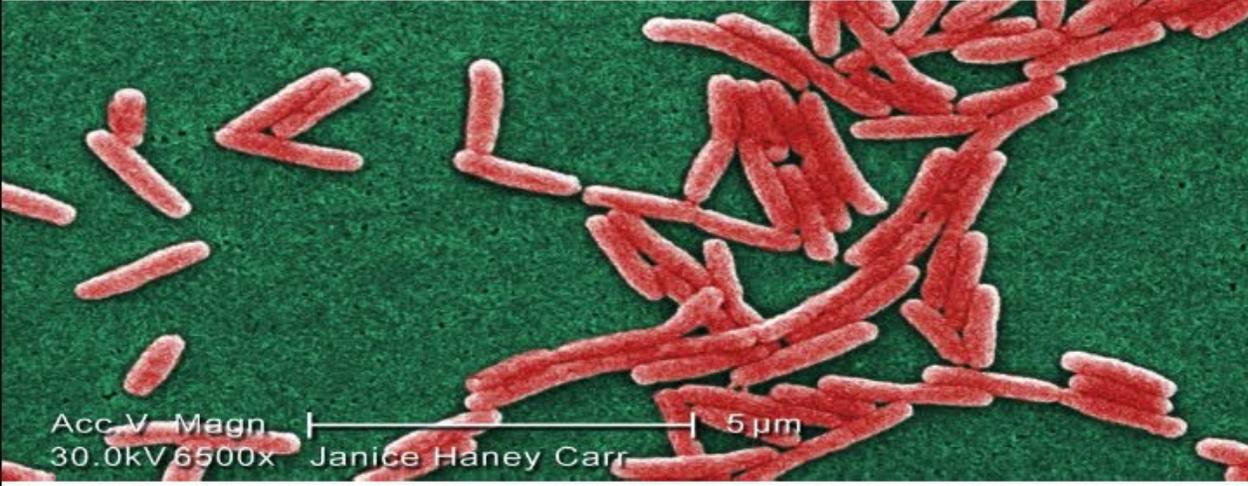
- Gram-negative, aerobic, bacillus
- >60 species



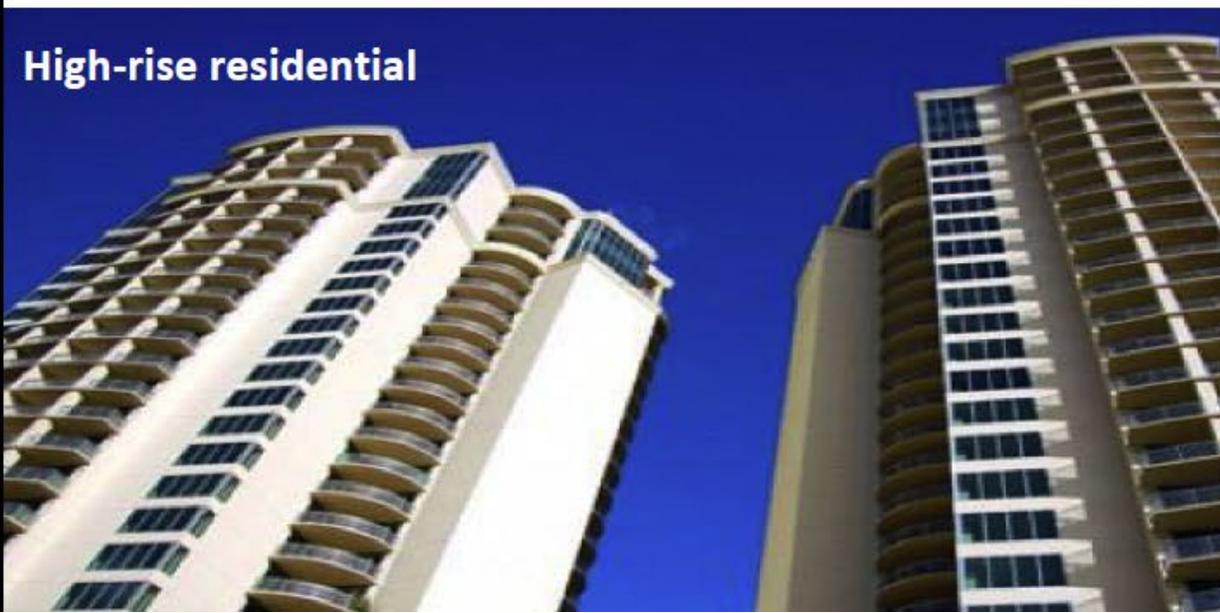
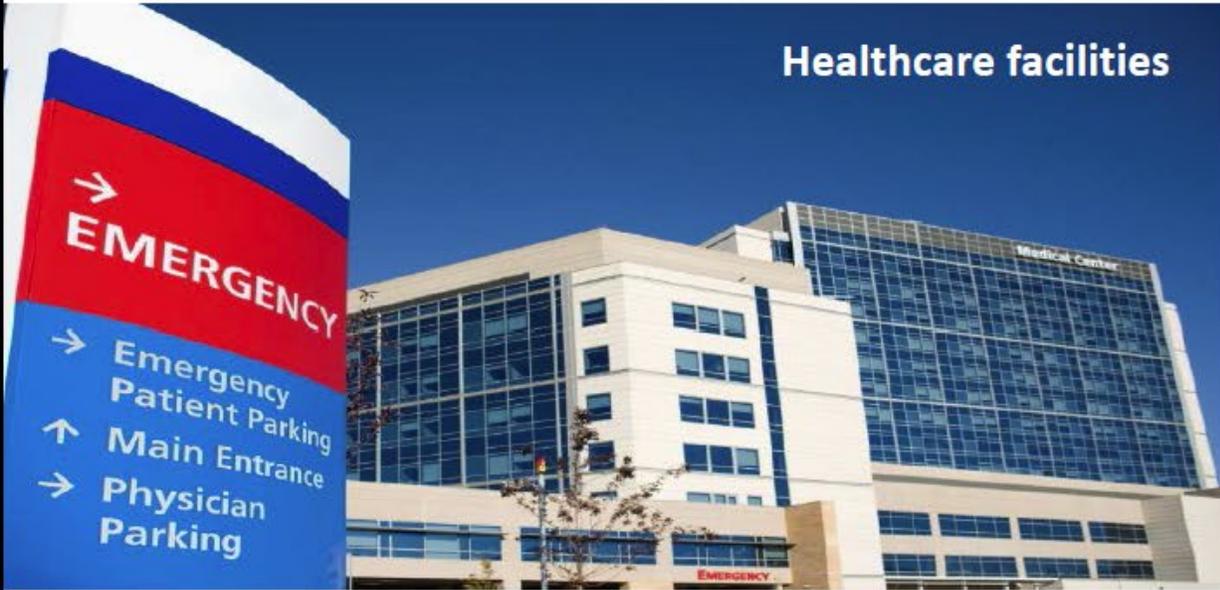
Acc V Magn  
30.0kV 6500x

5 μm  
Janice Haney Carr

***Legionella* bacteria are found naturally in the environment**



# Certain conditions in large, complex water systems can lead to *Legionella* amplification



# Certain devices can lead to aerosolization of water containing *Legionella*



# *Legionella* can be transmitted to susceptible hosts and cause disease



Age > 50 years



Smoking



Weakened immune system



Chronic disease



# Infection with *Legionella* is called legionellosis

Pontiac  
fever

Legionnaires' disease

Extrapulmonary  
disease

## Pontiac fever

- **Mild, self-limited illness**
- **Symptoms: fever, malaise, chills, fatigue, headache**
- **No respiratory symptoms or abnormal findings on chest x-ray**
- **Mean incubation period: 36h (1-3 days)**



Fever/Chills



Headache



Fatigue/Malaise

## Legionnaires' disease

- **Wide range of illness severity**
- **Symptoms: fever ( $>39^{\circ}\text{C}$ ), cough, shortness of breath, gastrointestinal symptoms (diarrhea, nausea, vomiting, abdominal pain), malaise, neurologic signs**
- **Abnormal radiographic findings on chest x-ray**
- **Incubation period: 2-10 days**
- **Case Fatality Rate: ~10%**



Fever/Chills



Cough/Dyspnea

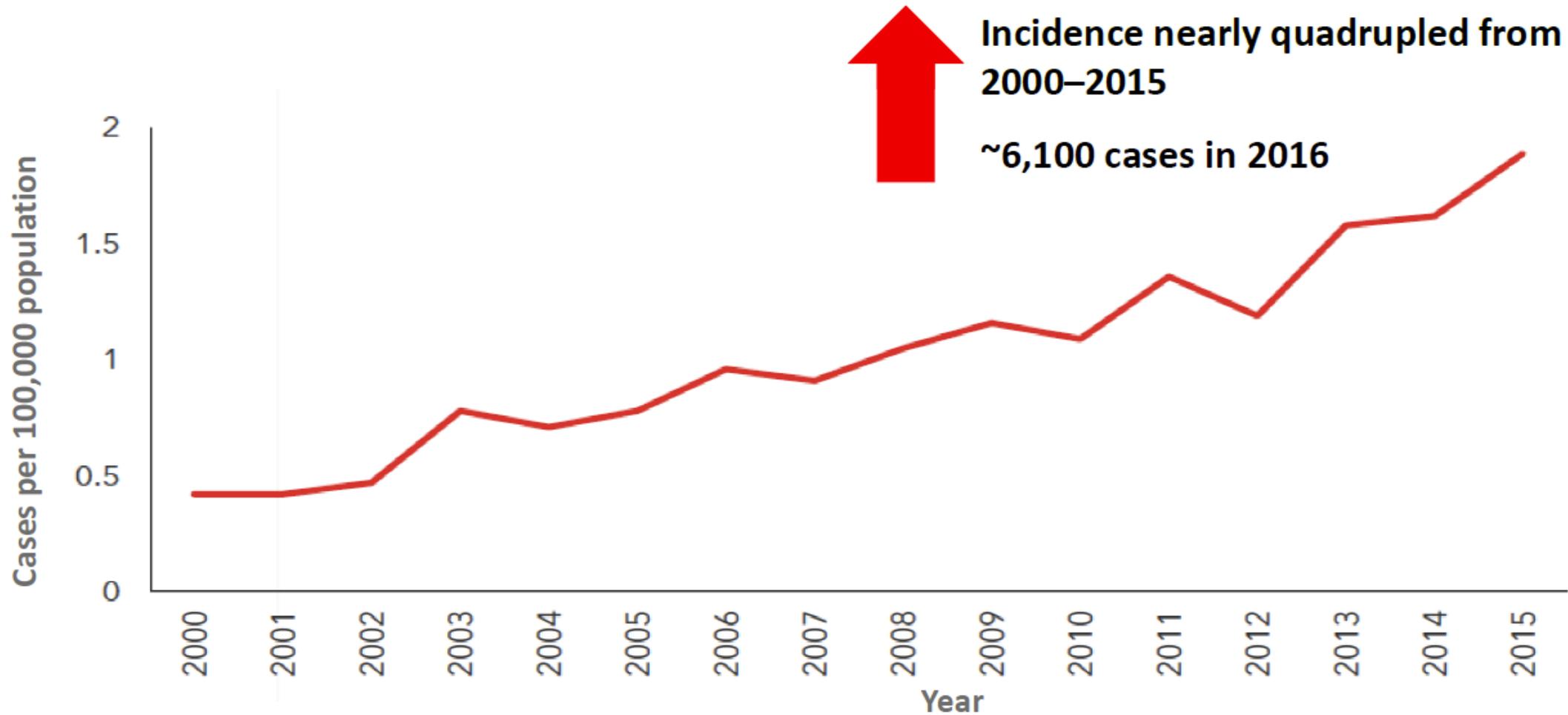


Vomiting/Diarrhea



Confusion/AMS

# Incidence of legionellosis is rising in the US

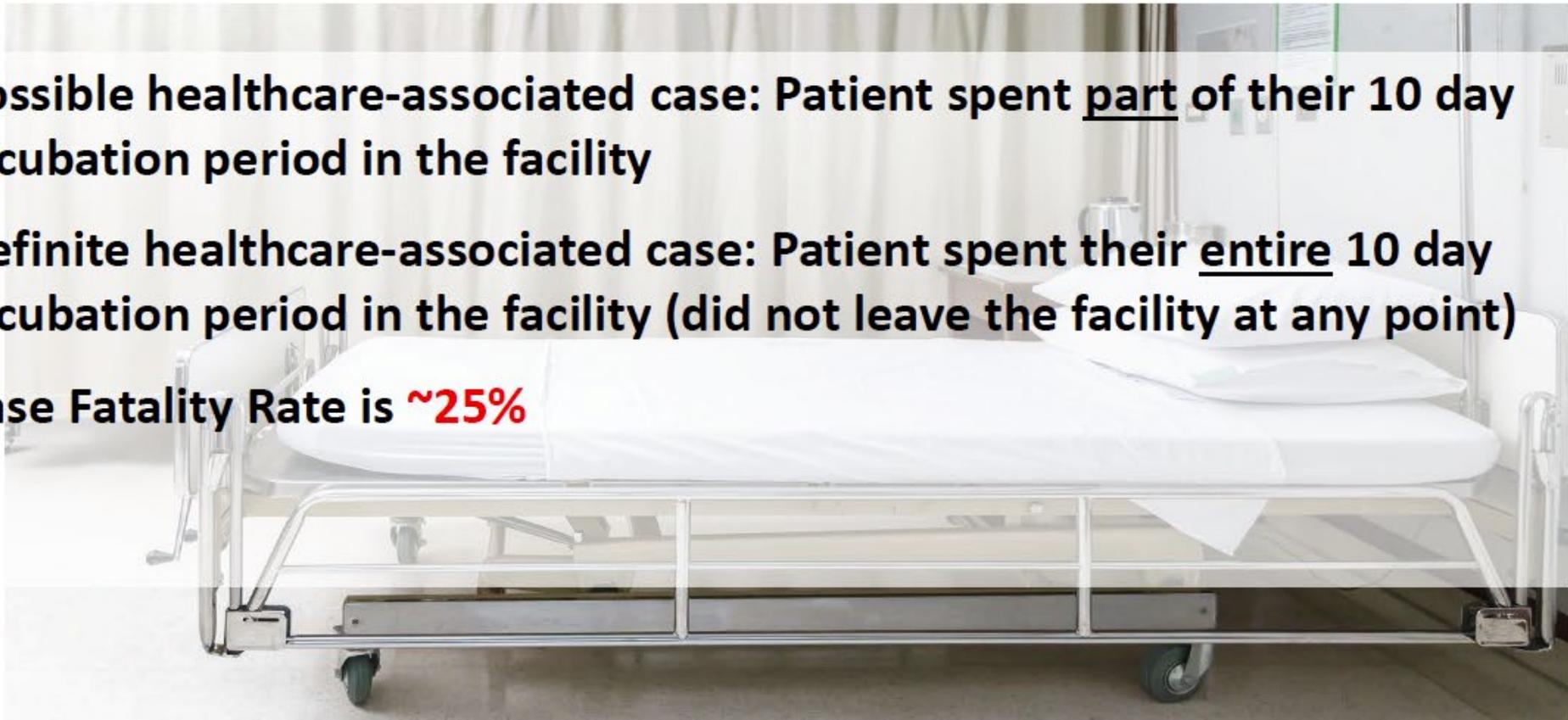


# Healthcare-Associated Legionellosis

## Definition:

A case of legionellosis reporting exposure to a healthcare facility during the 10 days before their illness onset

- Possible healthcare-associated case: Patient spent part of their 10 day incubation period in the facility
- Definite healthcare-associated case: Patient spent their entire 10 day incubation period in the facility (did not leave the facility at any point)
- Case Fatality Rate is **~25%**



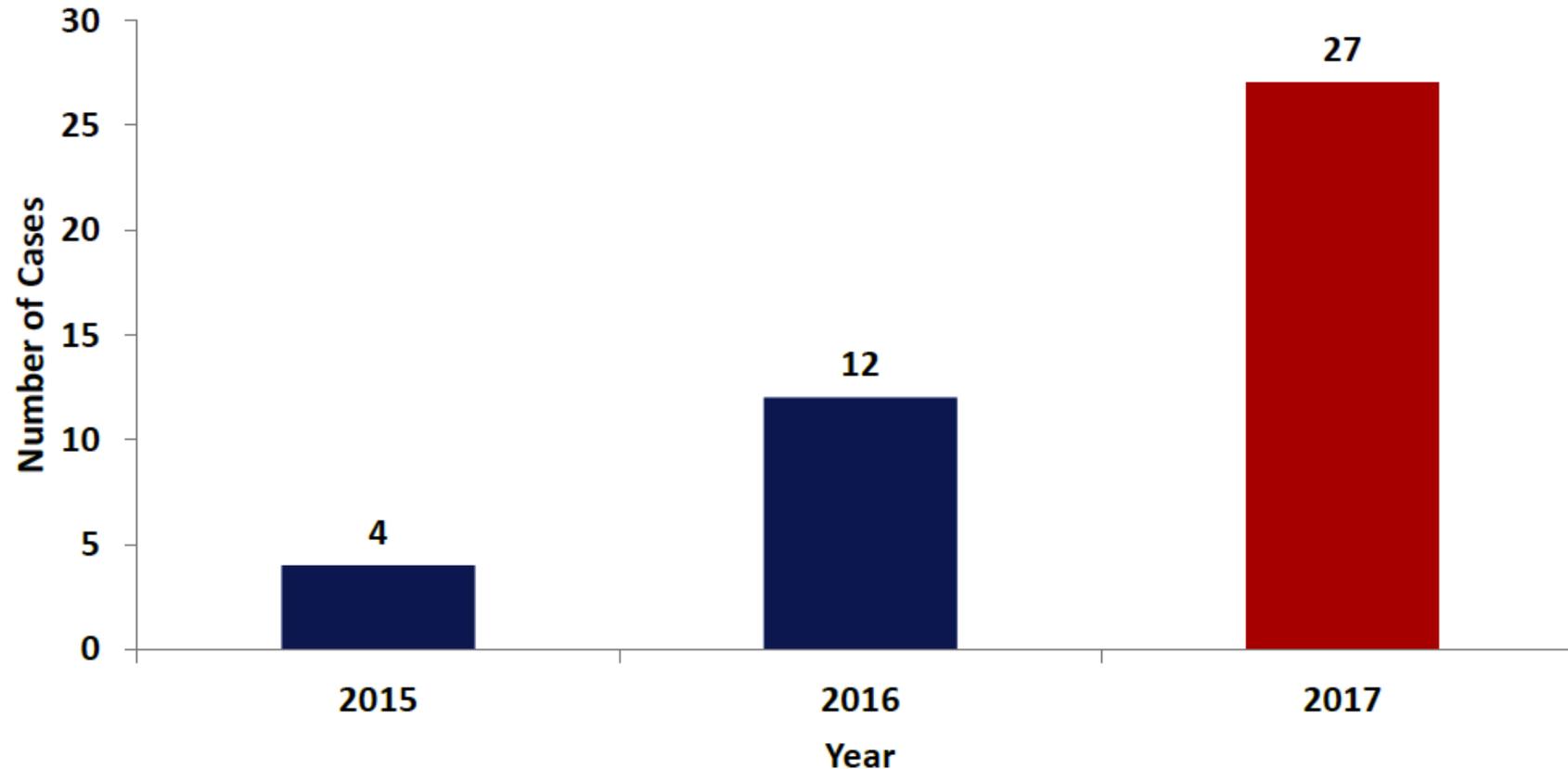
# Healthcare-Associated Legionellosis in TN



**1 in 8 (13%)** cases of legionellosis were healthcare-associated

# Healthcare-Associated Legionellosis in TN

- The number of possible or definite healthcare-associated legionellosis cases has increased > 6-fold in the last 3 years



# Outbreaks of legionellosis occur in healthcare settings

*Clinical Infectious Diseases*

INVITED ARTICLE



HEALTHCARE EPIDEMIOLOGY: Robert A. Weinstein, Section Editor

## Healthcare Outbreaks Associated With a Water Reservoir and Infection Prevention Strategies

Hajime Kanamori,<sup>1,2</sup> David J. Weber,<sup>1,2</sup> and William A. Rutala<sup>1,2</sup>

<sup>1</sup>Division of Infectious Diseases, University of North Carolina School of Medicine, and <sup>2</sup>Hospital Epidemiology, University of North Carolina Health Care, Chapel Hill

Morbidity and Mortality Weekly Report

### *Notes from the Field*

#### Two Cases of Legionnaires' Disease in Newborns After Water Births — Arizona, 2016

Geoffrey Granseth, MPH<sup>1,2</sup>; Rachana Bhattarai, MS<sup>1</sup>;  
Tammy Sylvester, MSN<sup>3</sup>; Siru Prasai, MD<sup>3</sup>; Eugene Livar, MD<sup>1</sup>

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY FEBRUARY 2012, VOL. 33, NO. 2

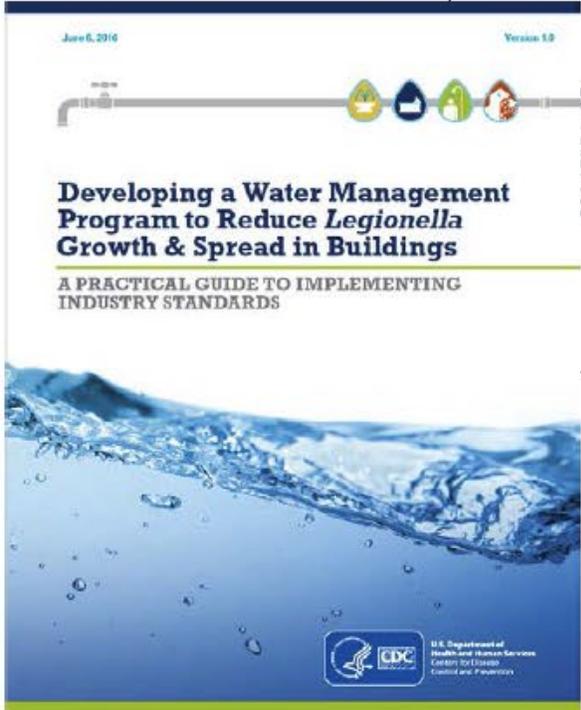
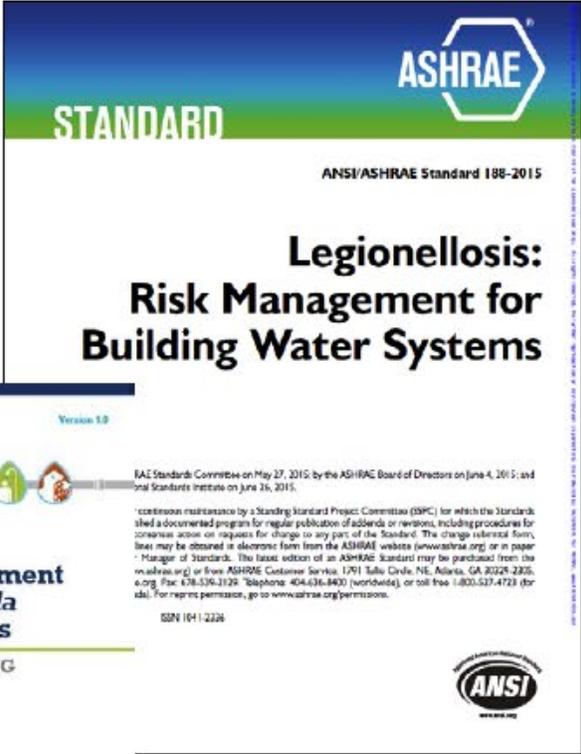
ORIGINAL ARTICLE

### An Outbreak of Legionnaires Disease Associated with a Decorative Water Wall Fountain in a Hospital

Thomas E. Haupt, MS;<sup>1</sup> Richard T. Heffernan, MPH;<sup>1</sup> James J. Kazmierczak, DVM;<sup>1</sup> Henry Nehls-Lowe, MPH;<sup>1</sup> Bruce Rheineck, MS;<sup>1</sup> Christine Powell, BS;<sup>2</sup> Kathryn K. Leonhardt, MD;<sup>3</sup> Amit S. Chitnis, MD;<sup>1</sup> Jeffrey P. Davis, MD<sup>1</sup>

# Outbreaks of legionellosis are preventable

**9 in 10**  
CDC investigations show almost all outbreaks were caused by problems preventable with more effective water management.





# Water Management Programs

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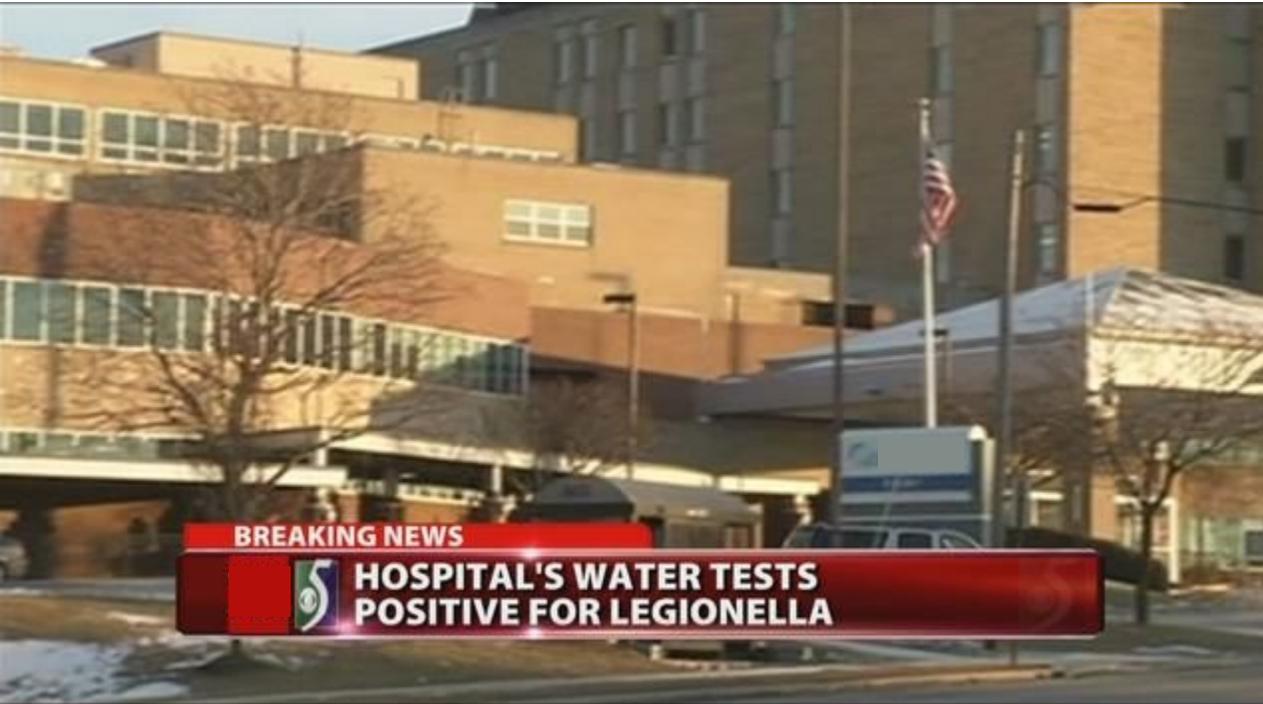


# Water Management Programs

## Learning Objectives:

- Describe the importance of water management programs for the prevention of legionellosis.
- Outline the purpose of water management programs
- Discuss the main components of water management programs
- Review industry standards and CMS requirements for water management programs

# Importance of Water Management Programs



## Outbreak Response at Pittsburgh VA Hospital

\$10M in safety upgrades planned for 2 campuses, testing, mapping of pipes ← Legionnaires' disease linked to deaths. **\$ 10 Million** d Legionella Oakland and "The first time Congress heard about this was when we notified them," he said.

"As the overseer, I'm not aware of any effort to provide any kind of Legionella outbreak response."



# Importance of Water Management Programs

## People at Risk for Legionnaires' Disease

- Those 50 years or older,
- Current or former smokers,
- People with chronic disease or weakened immune systems.





# Importance of Water Management Programs

**What is Legionella** - bacterium that causes Legionnaires' disease

- occurs naturally in freshwater environments in low amounts
- generally does not lead to disease.
- can pose a health risk when it gets into building water systems.
- has to grow (increase in numbers)
- has to spread through small water droplets (aerosolization) or aspiration (water accidentally goes into the lungs while drinking)



# Importance of Water Management Programs

Healthcare facilities are at increased risk for the growth and spread of Legionella as potable water is the most important source of legionella transmission.

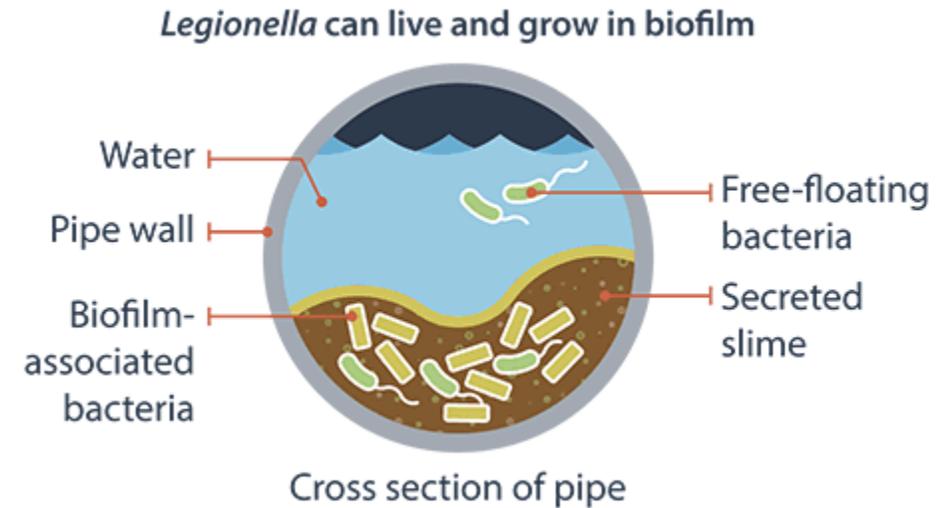
Water management programs are instrumental in the control and prevention of Legionella and other waterborne pathogens.

Fundamental understanding of the importance, components, industry standards and requirements of a water management program is crucial for protecting patients in your facility.

# Importance of Water Management Programs

## Factors That Lead to Legionella Growth

- Construction
- Water main breaks
- Changes in municipal water quality
- Biofilm
- Scale and sediment
- Water temperature fluctuations
- pH fluctuations
- Inadequate levels of disinfectant
- Changes in water pressure
- Water stagnation
- Poor or no PMs





# The purpose of water management programs

Water management programs:

“Identify hazardous conditions and take steps to minimize the growth and transmission of *Legionella* and other waterborne pathogens in building water systems.”

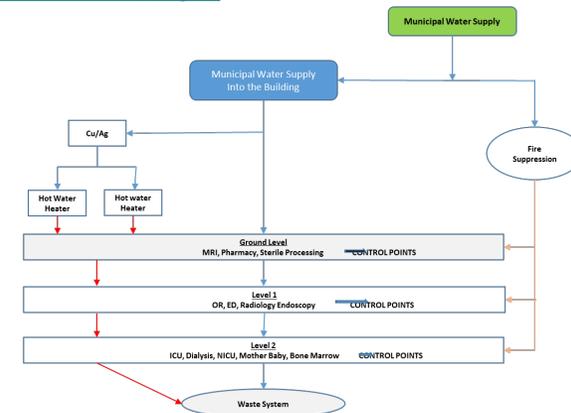
**“Effective WMPs reduce the risk of Legionnaires' disease”**

<https://www.cdc.gov/legionella/wmp/overview.html>

# Main Components of Water Management Programs

1. Establish a water management program team
2. Describe the building water systems using flow diagrams and a written description.
3. Identify areas where Legionella could grow and spread
4. Decide where control measures should be applied and how to monitor them
5. Establish ways to intervene when control limits are not met
6. Make sure the program is running as designed and is effective
7. Document and communicate all the activities

Sample Process Water Flow Diagram





# Main Components of Water Management Programs

## Basic steps for managing Legionella Growth

- Make sure the disinfectant amounts are right
- Make sure water temperatures are right  
(cold water cold  $< 77^{\circ}$  and hot water hot  $> 108^{\circ}$ )
- Prevent stagnation
- Operate and maintain equipment properly
- Monitor external factors

Adapted from <https://www.cdc.gov/legionella/wmp/overview/growth-and-spread.html>

# Main Components of Water Management Programs

Devices where Legionella can grow and/or spread via aerosolization or aspiration:

Hot & cold water storage tanks

Water heaters

Water hammer arrestors

Expansion tanks

Water filters

Electronic and manual faucets

Faucet Aerators & flow restrictors

Showerheads and spray hoses

Pipes, valves, and fittings

Water fountains

Centrally installed misters,

atomizers, air washers, and

humidifiers

Nonstream aerosol-generating

humidifiers

Infrequently used equipment:

Eyewash stations

Ice machines

Hot tubs

Decorative fountains

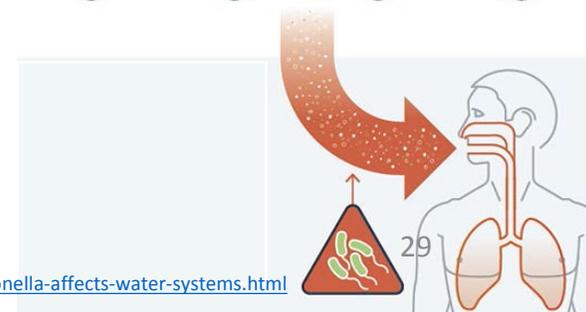
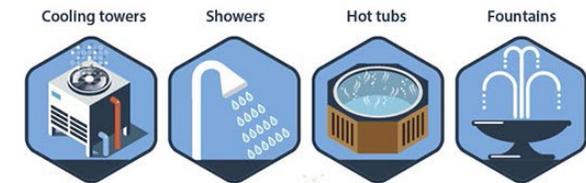
Cooling towers

Medical equipment such as:

CPAP machines,

hydrotherapy equip,

bronchoscopes



Adapted from <https://www.cdc.gov/legionella/wmp/overview/growth-and-spread.html>

<https://www.cdc.gov/legionella/infographics/legionella-affects-water-systems.html>

# CMS requirements and Industry standards for Water Management Programs

DEPARTMENT OF HEALTH & HUMAN SERVICES  
Centers for Medicare & Medicaid Services  
7500 Security Boulevard, Mail Stop C2-21-16  
Baltimore, Maryland 21244-1850

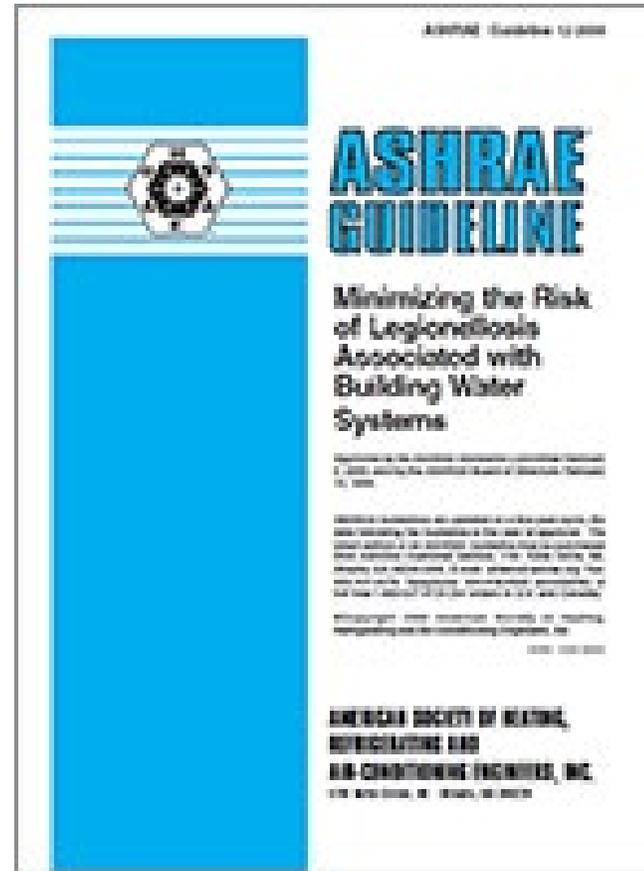


## Center for Clinical Standards and Quality/Quality, Safety and Oversight Group

Ref: **QSO-17-30- Hospitals/CAHs/NHs**  
**REVISED 07.06.2018**

**DATE:** June 02, 2017  
**TO:** State Survey Agency Directors  
**FROM:** Director  
Quality, Safety and Oversight Group (formerly Survey & Certification Group)  
**SUBJECT:** Requirement to Reduce *Legionella* Risk in Healthcare Facility Water Systems to Prevent Cases and Outbreaks of Legionnaires' Disease (LD)

**\*\*\*Revised to Clarify Expectations for Providers, Accrediting Organizations, and Surveyors\*\*\***



**ANSI/ASHRAE Standard 188-2018**  
(Supersedes ANSI/ASHRAE Standard 188-2013)  
Includes ANSI/ASHRAE addenda listed in Annex D

## Legionellosis: Risk Management for Building Water Systems

See Information Annex D for approval dates.

This Standard is under continuous maintenance by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely documentation, consensus action on requests for change to any part of the Standard, the change submittal form, and addenda may be obtained in electronic form from the ASHRAE website ([www.ashrae.org](http://www.ashrae.org)) or in paper form from the Senior Manager of Standards. The latest edition of an ASHRAE Standard may be purchased from the ASHRAE website ([www.ashrae.org](http://www.ashrae.org)) or from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-1205. E-mail: [orders@ashrae.org](mailto:orders@ashrae.org); Fax: 404-529-8174; Telephone: 404-636-8400 (toll-free: 1-800-527-4773) (for orders in US and Canada); For reprint permission, go to [www.ashrae.org/permissions](http://www.ashrae.org/permissions).

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# CMS requirements for water management programs (WMPs)

2017 Centers for Medicare & Medicaid Services survey and certification (S&C-17-30) memo revised 07/06/2018 to:

2017 Centers for Medicare & Medicaid Services Quality, Safety and Oversight (QSO-17-30) memo

DEPARTMENT OF HEALTH & HUMAN SERVICES  
Centers for Medicare & Medicaid Services  
7500 Security Boulevard, Mail Stop C2-21-16  
Baltimore, Maryland 21244-1850



Center for Clinical Standards and Quality/Quality, Safety and Oversight Group

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<https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Downloads/QSO17-30-HospitalCAH-NH-REVISED-.pdf>



# CMS Water management program requirements

Facilities must have water management plans and documentation that, at a minimum, ensure each facility:

- A. Conducts a Facility Risk Assessment – To identify where waterborne pathogens could grow and spread in the facility water system.
- B. Develops and Implements a water management program that:
  1. Considers ASHRAE 188 standard and CDC toolkit
  2. Specifies testing protocols and acceptable ranges for control measures
  3. Documents results of testing and corrective actions taken when control limits are not maintained

**Note: CMS does not require water cultures for Legionella or other opportunistic water-borne pathogens. Testing protocols are at the discretion of the provider.**

<https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Downloads/QSO17-30-HospitalCAH-NH-REVISED-.pdf>



# CDC Water management program key elements:

- Establish a water management program team
- Describe the building water systems using text and flow diagrams
- Identify areas where Legionella could grow and spread
- Decide where control measures should be applied and how to monitor them
- Establish ways to intervene when control limits are not met
- Make sure the program is running as designed and is effective
- Document and communicate all the activities

<https://www.cdc.gov/legionella/wmp/overview.html>

# Industry standards and guidelines for water management programs (WMPs)

## ASHRAE STANDARD:

### ANSI/ASHRAE 188-2015/2018: Legionellosis: Risk Management for Building Water Systems



ANSI/ASHRAE Standard 188-2018  
(Supersedes ANSI/ASHRAE Standard 188-2015)  
Includes ANSI/ASHRAE addenda listed in Annex D

### **Legionellosis: Risk Management for Building Water Systems**

See Information Annex D for approval rules

This Standard is under continuous maintenance by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a structured program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the Standard. The change submittal form, instructions, and deadlines may be obtained in electronic form from the ASHRAE website ([www.ashrae.org](http://www.ashrae.org)) or in paper form from the Senior Manager of Standards. The latest edition of an ASHRAE Standard may be purchased from the ASHRAE website ([www.ashrae.org](http://www.ashrae.org)) or from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-1205. E-mail: [orders@ashrae.org](mailto:orders@ashrae.org); Fax: 404-529-1174; Telephone: 404-634-8900 (worldwide), or toll free 1-800-527-4753 (for orders in US and Canada). For reprinting permission, go to [www.ashrae.org/permissions](http://www.ashrae.org/permissions).

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[www.ashrae.org](http://www.ashrae.org)

# Industry standards and guidelines for water management programs (WMPs)

ASHRAE 188 defines:

- Types of buildings and devices that need a water management program
- Minimum components of a water management program
- Devices that need to be controlled in order to prevent the growth and spread of Legionella
- Water management program team members
- When and how often water management programs should be reassessed and updated

It also includes an annex with special considerations, such as clinical surveillance, for healthcare facilities.



# Industry standards and guidelines for water management programs (WMPs)

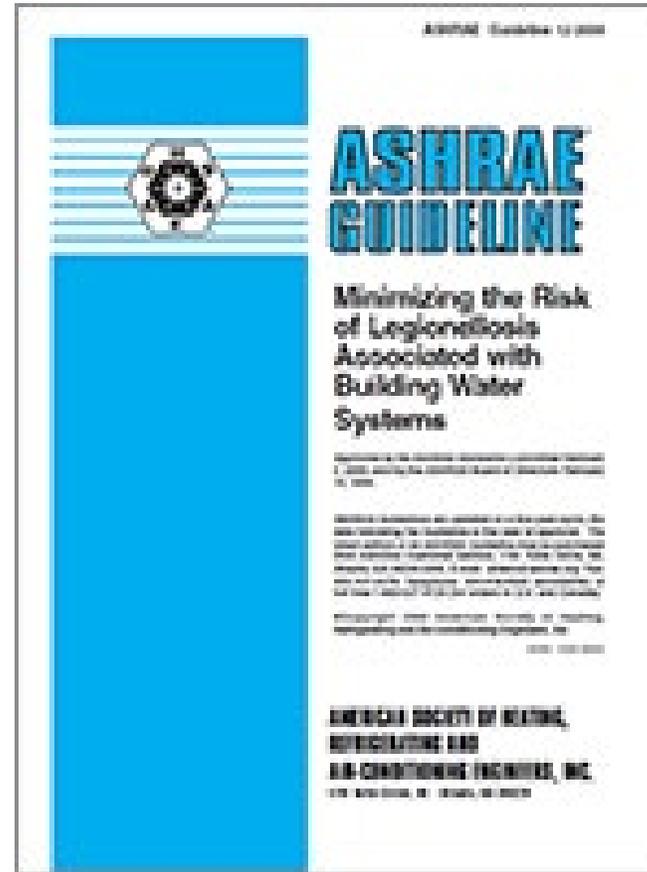
ASHRAE 188 does not provide guidance on target water parameters, such as temperature and disinfectant levels.

ASHRAE 188 also does not describe how to perform emergency remediation or give guidance about what to do if cases of disease are associated with the facility.

# Industry standards and guidelines for water management programs (WMPs)

## ASHRAE GUIDELINE:

ASHRAE Guideline 12-2000 -  
Minimizing the Risk of Legionellosis Associated with Building Water Systems (In final revision/update steps to come out later this year)

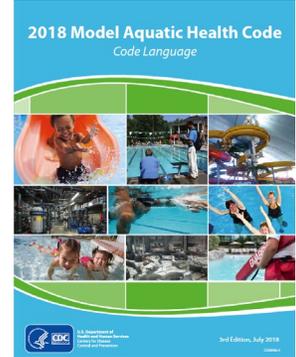
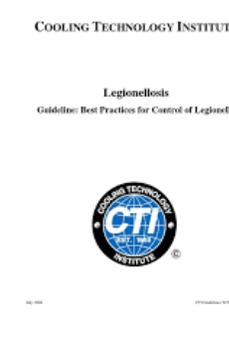
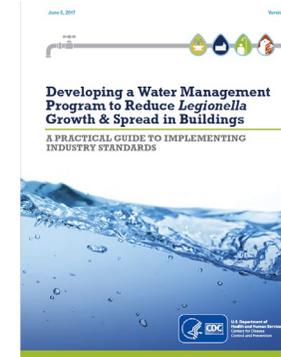


[www.ashrae.org](http://www.ashrae.org)

# Industry standards and guidelines for water management programs (WMPs)

## OTHER GUIDELINES:

- CDC WMP Toolkit: <https://www.cdc.gov/legionella/downloads/toolkit.pdf>
- Cooling Technology Institute. Legionellosis Guideline: Best Practices for Control of Legionella <http://www.cti.org/downloads/WTP-148.pdf>
- Model Aquatic Health Code <https://www.cdc.gov/mahc/pdf/2018-MAHC-Code-Clean-508.pdf>
- Disinfection of Hot Tubs Contaminated with Legionella <https://www.cdc.gov/legionella/downloads/hot-tub-disinfection.pdf>

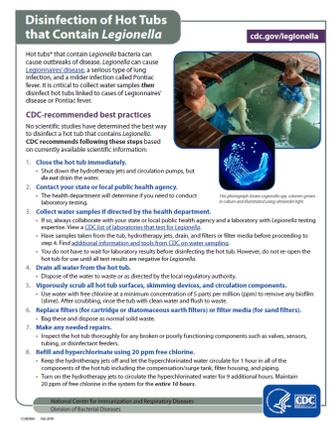


# Industry standards and guidelines for water management programs (WMPs)

## GUIDELINES:

- Disinfection of Hot Tubs Contaminated with Legionella

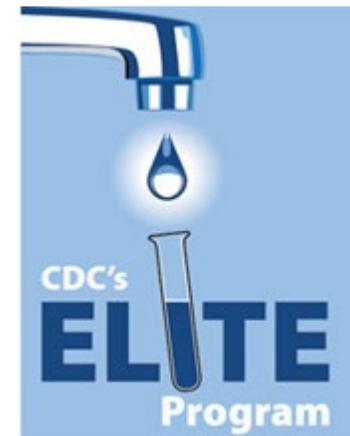
<https://www.cdc.gov/legionella/downloads/hot-tub-disinfection.pdf>



## RESOURCE:

- Laboratory ELITE Program CDC and Wisconsin State Laboratory – Laboratory Certification program for testing for Legionella

<https://www.cdc.gov/legionella/labs/elite.html>



# Industry standards and guidelines for water management programs (WMPs)

ASHE MONOGRAPH:  
Water Management in Health Care Facilities:  
Complying with ASHRAE Standard 188

ASHE Monograph

Water Management  
in Health Care Facilities:  
Complying with  
ASHRAE Standard 188

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[http://www.ashe.org/management\\_monographs/member/pdfs/mg2017platt\\_et\\_al.pdf](http://www.ashe.org/management_monographs/member/pdfs/mg2017platt_et_al.pdf)





# Water Management Programs

Next month is Webinar 3: March 26

Presenters: Shay, Jane

## **Learning Objectives:**

- Creating a water management plan
- Developing a Water Management Program
- Implementing a Water Management Program
- Maintaining a Water Management Program

# Water Management Programs

## Questions?



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**Email: [Legionella.Health@tn.gov](mailto:Legionella.Health@tn.gov)**

**Phone: (615) 741-3738**

**CEDEP On-Call Epidemiologist:  
(615) 741-7247**



**Shay Rankhorn, SASHE, CHFM, CHC**

**432-431-1945**

**<https://tennashe.org/contact.php>**

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