



# Beyond Legionellosis

Minimizing Patient Risk with ANSI/ASHRAE Standard 514

# Learning Objectives

1. **Review** the reasons for publishing ANSI/ASHRAE Std 514, including additional hazards beyond *Legionella*.
2. **Assess** clinically significant microbial hazards and their link to waterborne disease outbreaks.
3. **Distinguish** between the requirements of ANSI/ASHRAE Std 514 and ANSI/ASHRAE Std 188.
4. **Discuss** key questions for a water management team (WMT) aligning with ANSI/ASHRAE Std 514.

# Presenters



**Cole Kirmes**

Business Development  
Manager, Phigenics

[ckirmes@phigenics.com](mailto:ckirmes@phigenics.com)

757.718.3635



**Margaret Jasinski**

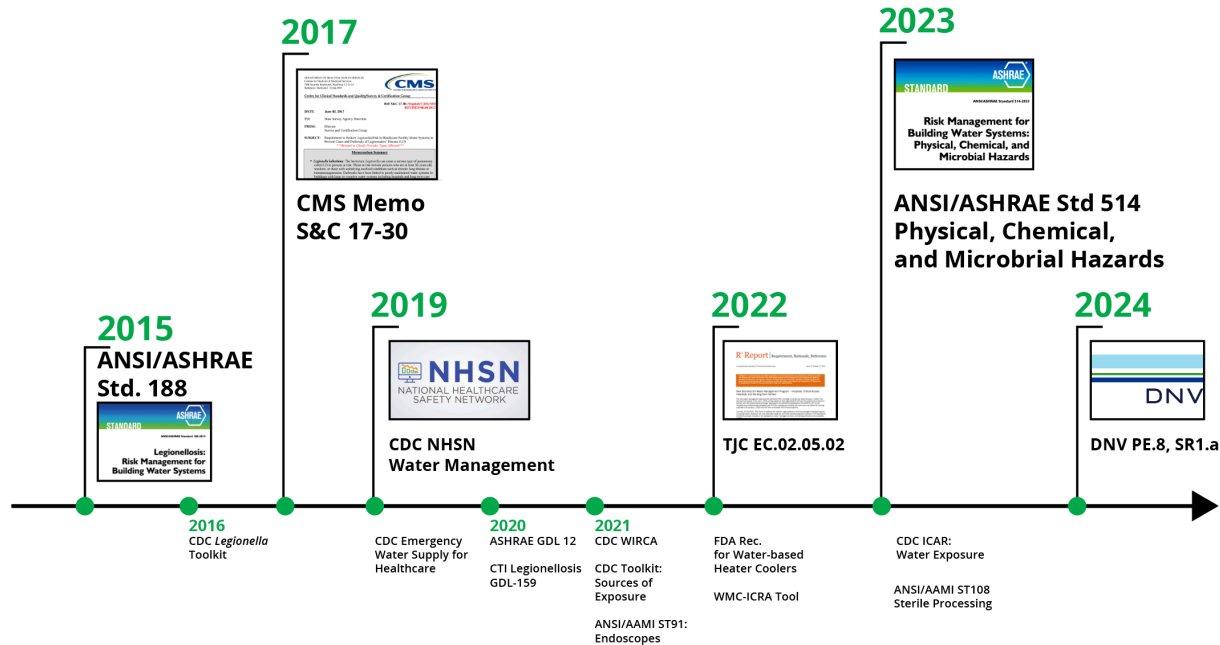
Director of Business  
Development, Phigenics

[mjasinski@phigenics.com](mailto:mjasinski@phigenics.com)

630.981.1929

# Why was ANSI/ASHRAE Std. 514 Published?

# Timeline for key industry guidance on water management in healthcare



# Goals of Water Management Programs

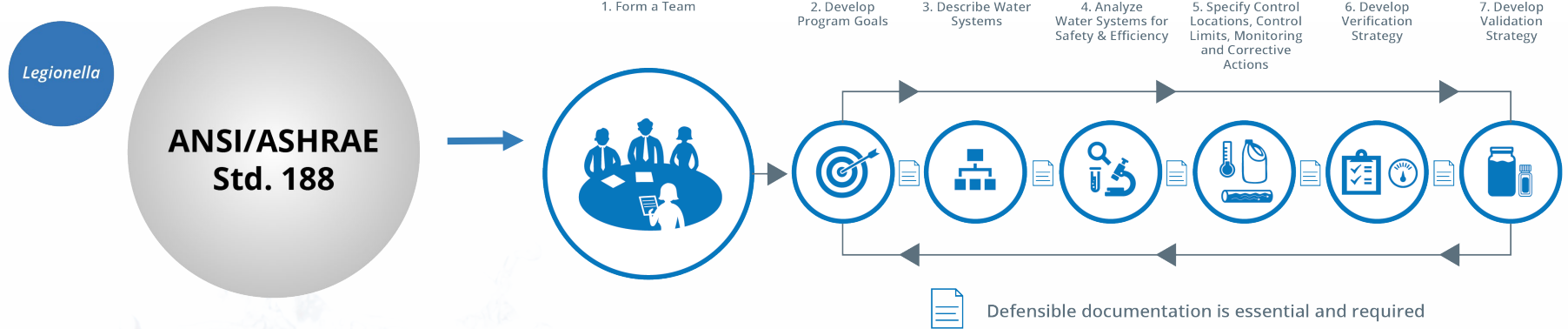
- ✓ **Keep Patients Safe** from acquiring Legionellosis
- ✓ **Achieve Compliance** with accreditation and survey requirements (CMS/TJC/CDCNHSN)
- ✓ **Drive Defensibility** with documentation



# Water Management Programs

Based on ANSI/ASHRAE Std. 188

## 7 STEPS OF THE WATER MANAGEMENT PROGRAM



# Health risks beyond *Legionella*

## Growing concerns for waterborne disease

# The growing burden of waterborne diseases

**7.15M**

Illnesses

**6,630**

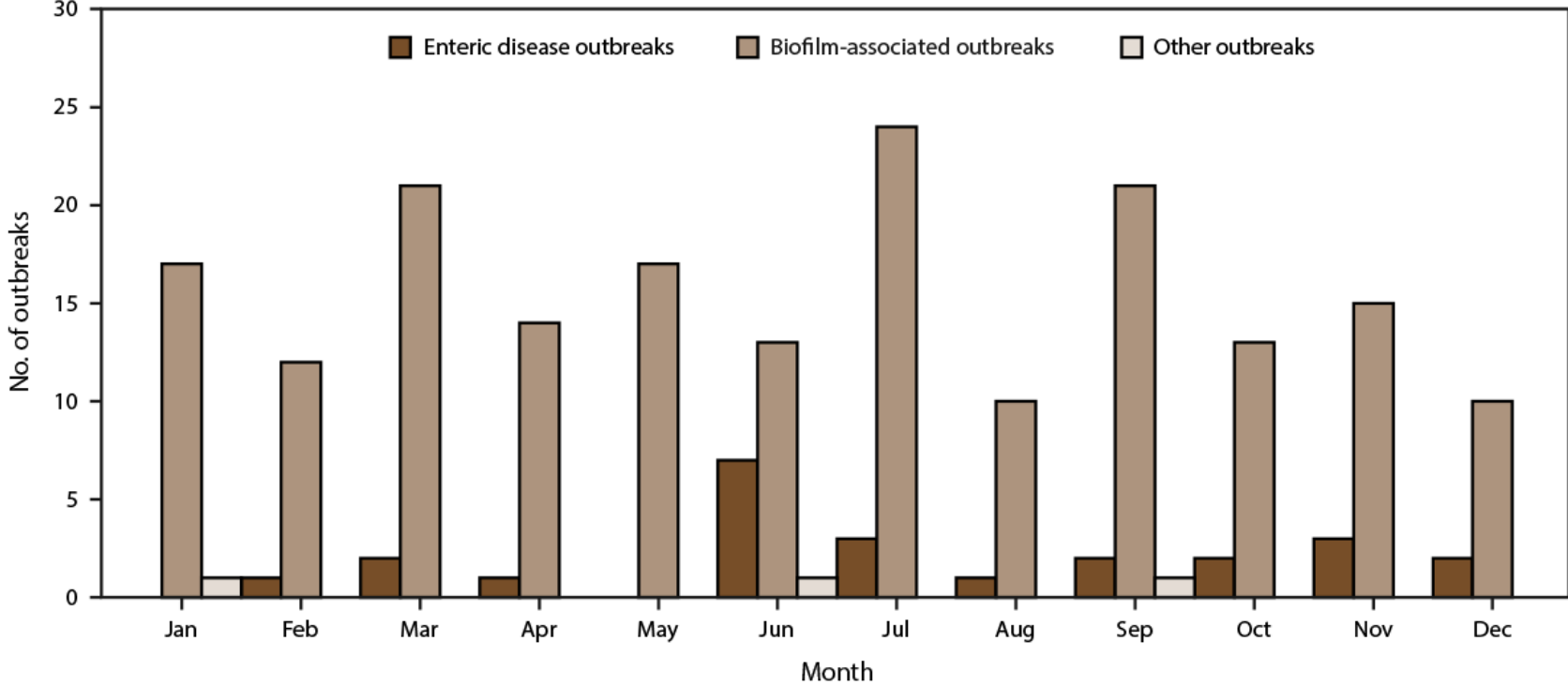
Deaths

**\$3.3**

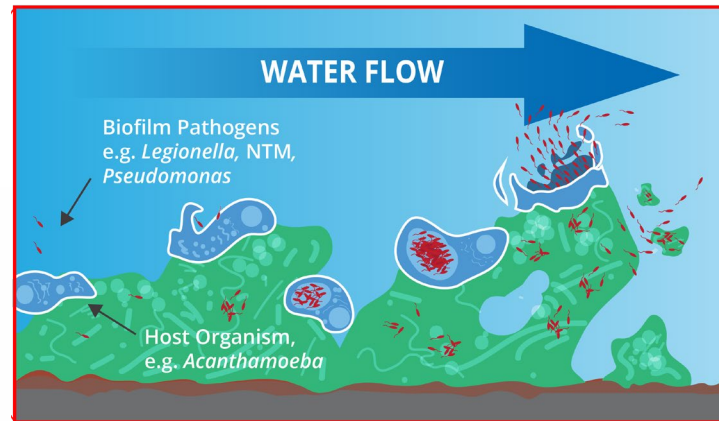
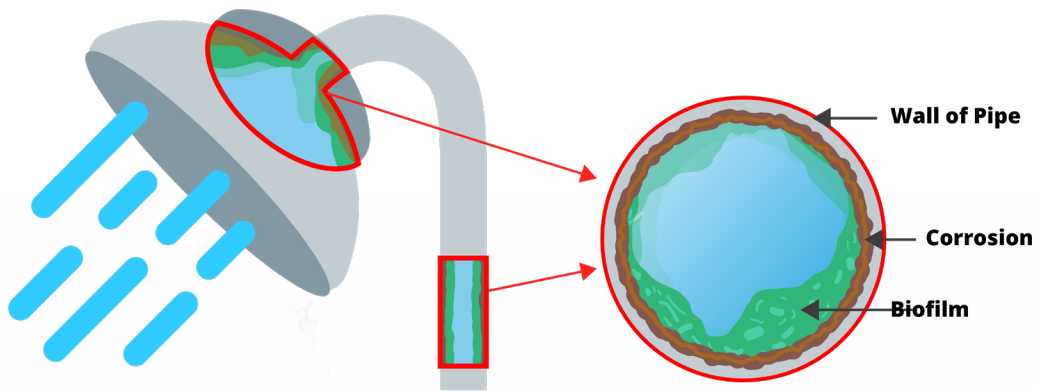
Billion

Source: CDC MMWR — Surveillance of Waterborne Disease Outbreaks Associated with Drinking Water — United States, 2015–2020

# Figure 2. Surveillance of Waterborne Disease Outbreaks Associated with Drinking Water — United States, 2015–2020, CDC

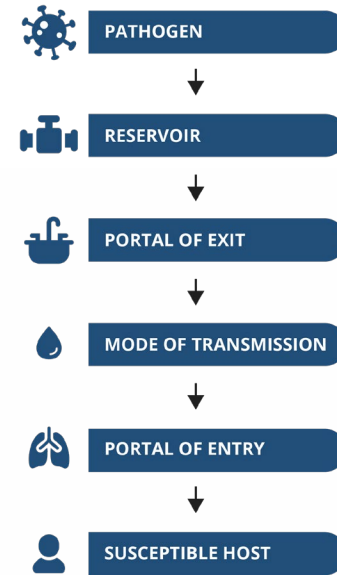
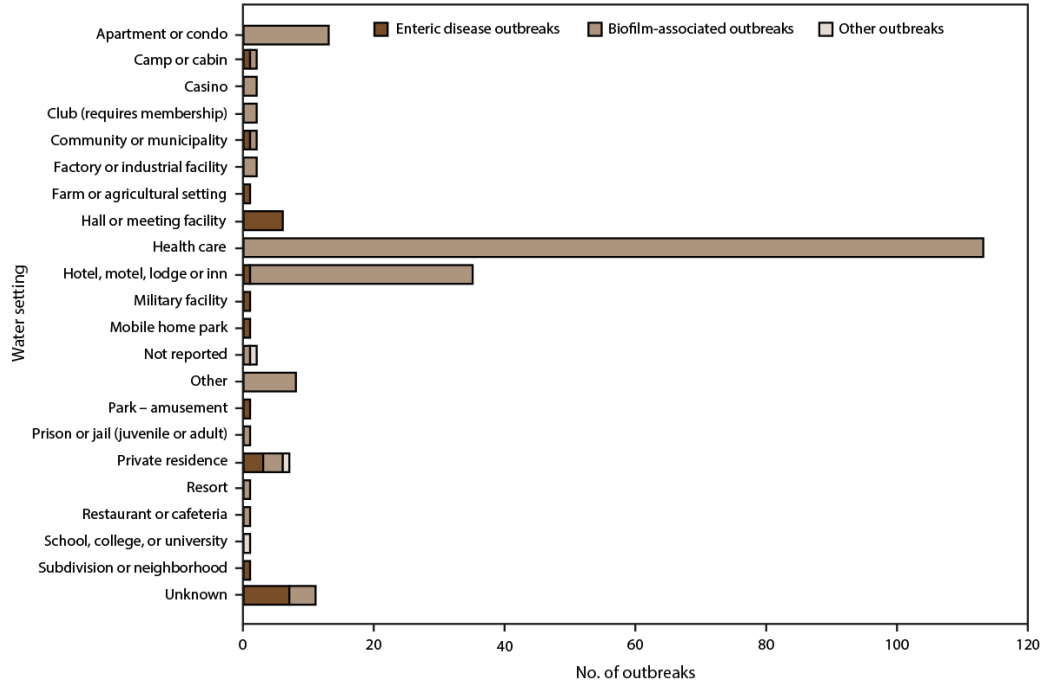


# Biofilm Pathogen Lifecycle



"94% of all deaths are caused by diseases from pathogens that live in biofilm nontuberculous mycobacterial infection [NTM], Legionnaires' disease, and *Pseudomonas* pneumonia, and *Pseudomonas* septicemia." - CDC, 2024

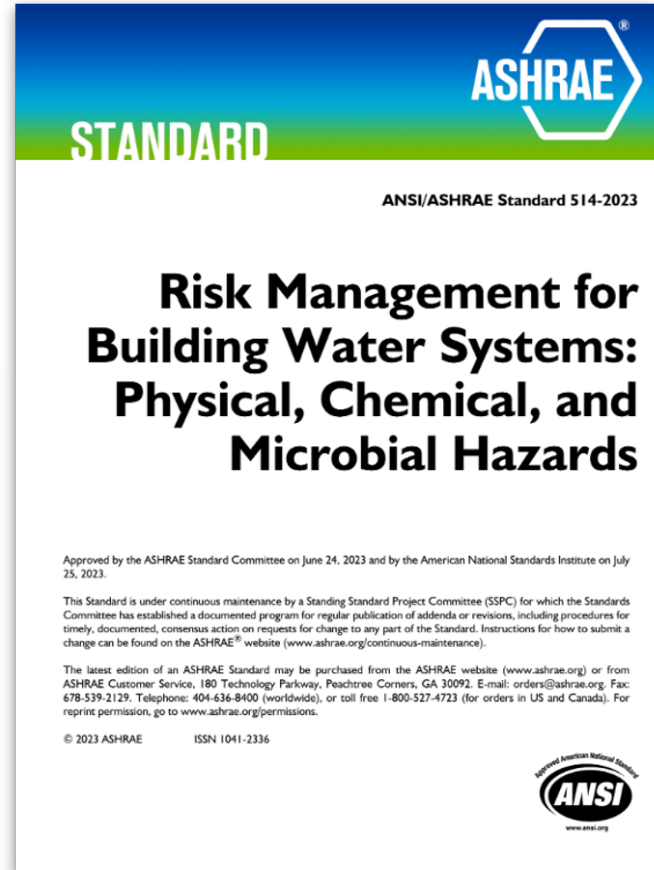
# Figure 3. Number of reported drinking water-associated outbreaks, by water setting of exposure.



\*ASHRAE 514 Figure C-1 Chain of Infection

Source: CDC MMWR — Surveillance of Waterborne Disease Outbreaks Associated with Drinking Water — United States, 2015–2020

# What does ANSI/ASHRAE Std 514 add to guidance from ANSI/ASHRAE Std 188?



2023

# ASHRAE 514



4

Compliance



5

General Requirements



6

Requirements for Building Water Systems



7

Requirements for Designing and Documenting Building Water Systems



8

Requirements for Healthcare Facilities



9

Normative References

Appendices

2021

# ASHRAE 188

4

Compliance

5

Building Survey

6

General Requirements

7

Requirements for Building Water Systems

8

Requirements for Designing Building Water Systems

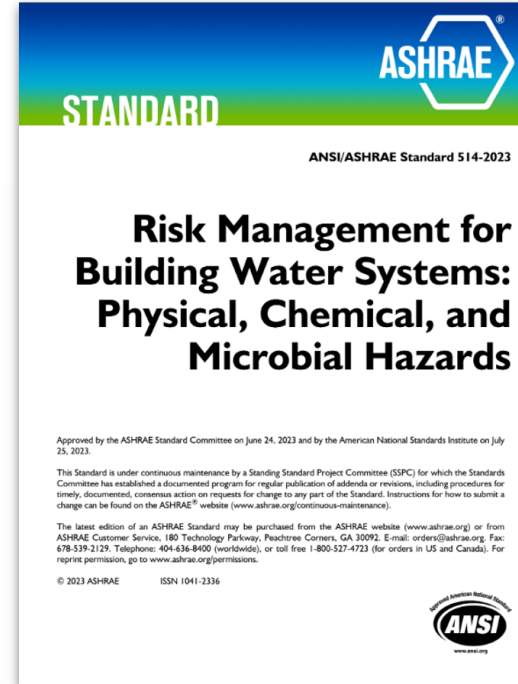
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References

Appendices

# What's Covered in the Standard?

- Provides recommendations for managing **microbial, physical, and chemical hazards**
- Requirements for the development of water management programs, **from design and construction to occupancy, including renovations.**
- **514 mandates the use of ANSI/ASHRAE Standard 188 with regards to legionellosis risk management.**



## Section 5: General Requirements

### Section 5

- Team shall review and update the Program annually to incorporate changes
- Team shall review the scope of work, determine the risk, and revise the WMP in places where the Team determines that revisions should be made.

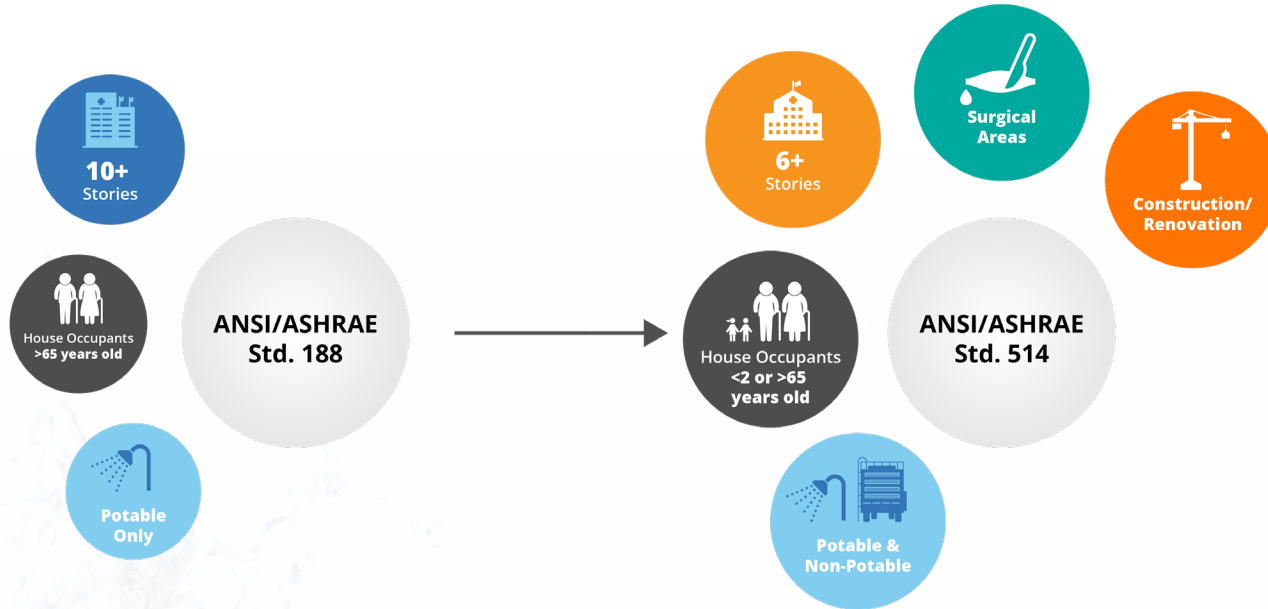


# What is the \_\_\_\_\_ required to do?

|                 | <b>Building Designer</b>                                   | <b>Building Owner</b>   | <b>Healthcare facilities</b>              |
|-----------------|--|---|---|
| Comply with 188 | ✓  | ✓   | ✓   |
| Survey          | New buildings<br>Renovations<br>Additions<br>Modifications | Annually<br><br>Before occupancy of:<br>New Buildings<br><br>Before construction<br>begins on:<br>Renovations<br>Additions<br>Modifications | New and existing<br>healthcare facilities |
| Requirements    | Section 7  | Section 5<br>Section 6 (appl. sections)   | Section 8<br>Section 6 (appl. sections)   |

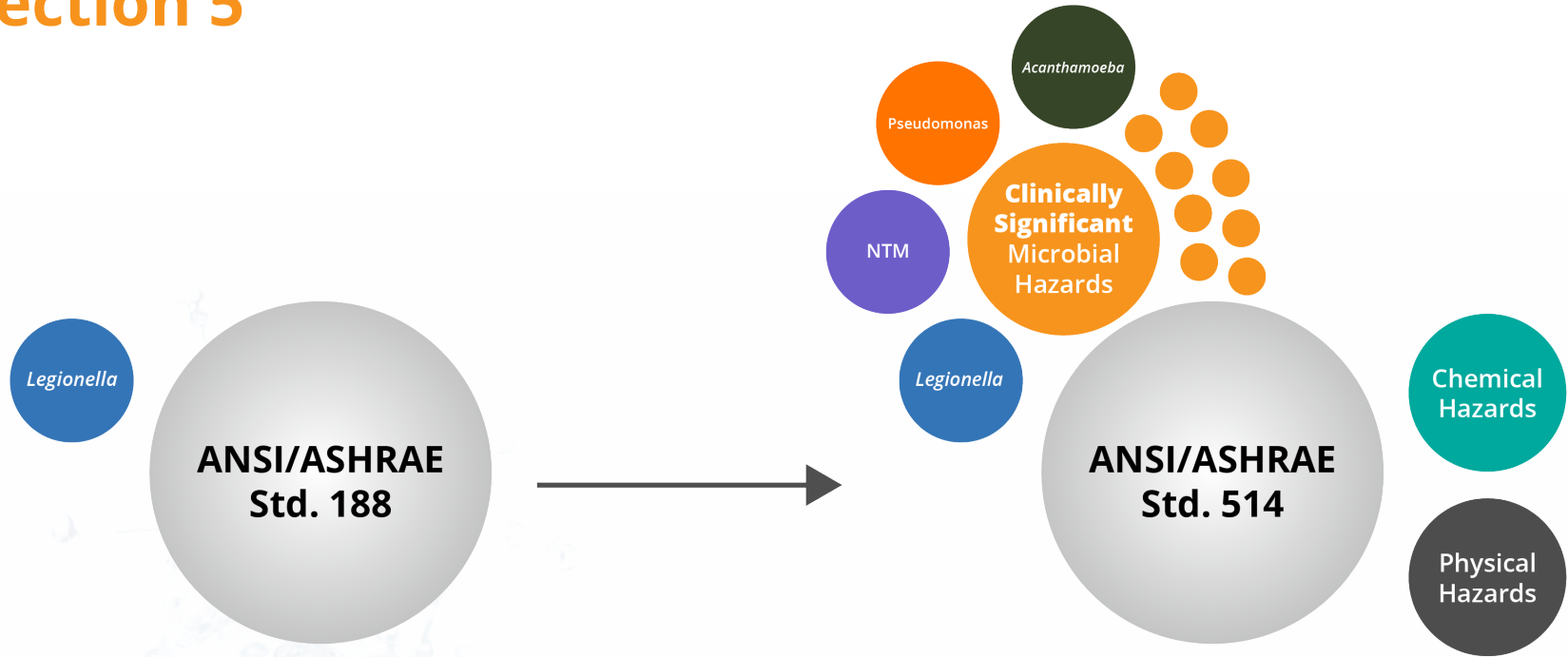
# Expanding building profiles, areas, and activities

## Section 4



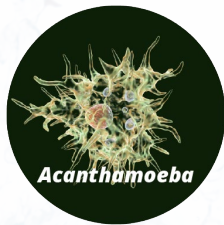
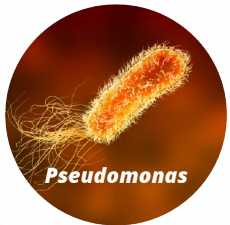
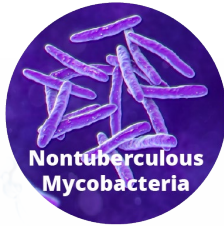
# ASHRAE 514 expands the breadth and depth of the hazards of concern and the diseases they cause

## Section 5

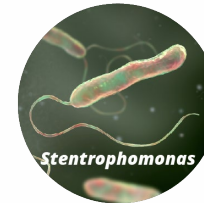
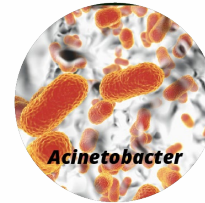


# All the Clinically Significant Microbial Hazards identified by ASHRAE Std. 514

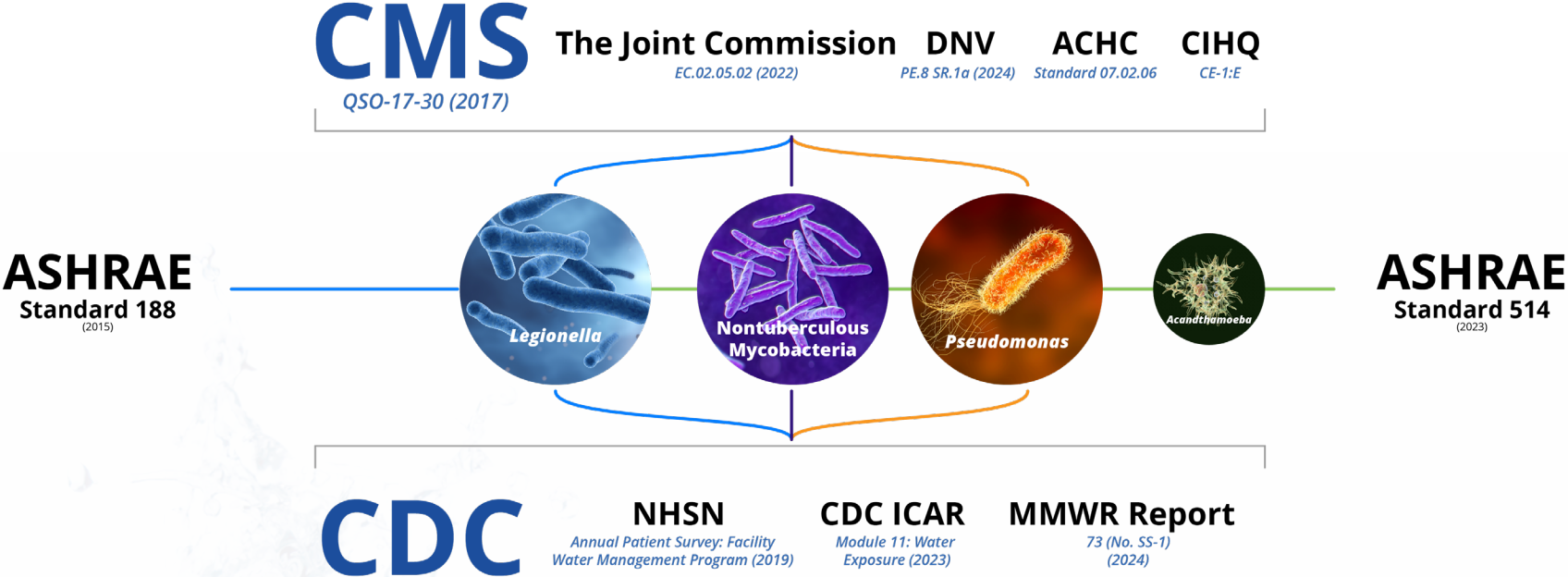
## Primary



## Additional



# Connecting Surveillance, Accreditation, and Standards to Clinically Significant Microbial Hazards





### **CMS Memo S&C 17-30 | Facility Requirements to Prevent *Legionella* Infections**

Facilities must develop and adhere to policies and procedures that inhibit microbial growth in building water systems that reduce the risk of growth and spread of *Legionella* and other opportunistic pathogens in water.



### **Joint Commission Environment of Care Standard EC.02.05.02**

This standard will go into effect January 1, 2022: The organization has a water management program that addresses *Legionella* and other waterborne pathogens.



### **DNV SR.1a | Utility Management System**

The Utility Management System shall have a water management program to reduce the risk of growth and spread of *Legionella* and other opportunistic pathogens in building water systems.



### NHSN Facility Water Management Program (WMP) Survey | Question #74

Does your facility have a water management program (WMP) to prevent the growth and transmission of *Legionella* and other opportunistic waterborne pathogens (for example, *Pseudomonas*, *Acinetobacter*, *Burkholderia*, nontuberculous mycobacteria, and fungi)?

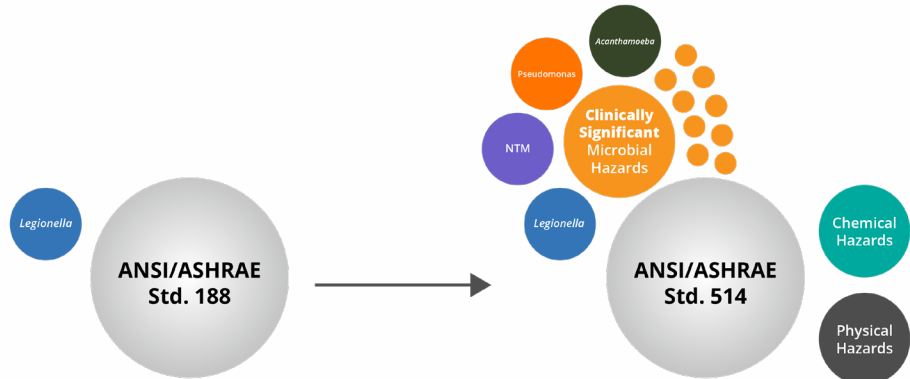


### CDC Infection Control Assessment and Response (ICAR) Program | Question #1

Does your facility have a water management program (WMP) to prevent the growth and transmission of *Legionella* and other opportunistic waterborne pathogens (for example, *Pseudomonas*, *Acinetobacter*, *Burkholderia*, nontuberculous mycobacteria, and fungi)?

# Questions your Water Management Team should ask today

# Should our WMP address these additional hazards for patient safety?



# Do we have the right program controls in place? CDC STAR Method



## Sediment & Biofilm

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- Flushing
- Cleaning
- Maintenance



## Temperature

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- Control limits



## Water Age

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- Flushing



## Disinfectant Residual

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- Control Limits

# Is our Validation Strategy being applied in the right place, frequency, method?

**Engages Who**

Infection Prevention/Epidemiology

**Answers Why**

to ensure Patient Safety and maximize Program Defensibility

**Supports What**

Methods  
Locations  
Frequencies

*Environmental Risk Categories - for waterborne pathogen growth and aerosolized water exposure*

| Clinical Risk Categories<br>- susceptibility to<br>waterborne pathogen<br>disease | Environmental Risk Categories - for waterborne pathogen growth and aerosolized water exposure  |  |  |   |
|---|--|--|--|---|
|   | Highest  | High   | Medium   | Low   |
| Highest   | North/D: Central Sterile (Vacant), Oncology (Inpatient),<br><b>Lower A/Bldg H:</b> Radiation Oncology (Low Use)  | <b>East Wing:</b> Ambulatory Surgery, GI, Oral Surgery, <b>East Bldg/F:</b> Surgical ICU, <b>North/D:</b> Cath Lab, <b>Lower A/Bldg H:</b> Medical ICU, PACU/Post-Op, <b>West:</b> NICU, Pediatric ICU | <b>East Wing:</b> Central Sterile (EW), Derm Surgery, MOHS Surgery, Radiation Oncology, <b>East Bldg/F:</b> Central Sterile, <b>MOB:</b> Oncology, <b>North/D:</b> Acute Med/Surg (3N-8N), Vascular IR, <b>Central E:</b> Endoscopy, Pharmacy, Pulmonary Rehab, Dialysis, <b>West:</b> OB OR |   |
| High  | <b>East Bldg/F:</b> Lab (Vacant), <b>Lower A/H:</b> Ambulance Garage, ED, <b>West:</b> OR/Surgery Suite, Birth Center, PEDs, Longterm Rehab  | <b>Central E:</b> Dietary  | <b>East Wing:</b> Wound Healing, <b>East Bldg/F:</b> Blood Draw, <b>MOB:</b> MRI, PEDs, Radiology, Orthopedics, <b>North/D:</b> MRI, Ultrasound, XRay, <b>Central E:</b> CT Scan, Nuclear Medicine, PT (Echo/Gym), <b>West:</b> Pediatric Sedation   |   |
| Medium  | <b>East Wing:</b> Short Stay (2 East), <b>MOB:</b> Employee Health/Vacant Areas  | <b>MOB:</b> Sleep Lab  | <b>MOB:</b> Dermatology, Heart Failure, OB, Ophthalmology, Family Practice, Internal Medicine, Occupational Therapy, Physical Medicine, ENT, <b>North/D:</b> Cardiac Rehab, Infusion Center  |   |
| Low   | <b>East Wing:</b> Staff Locker Rooms (Oral Surg), Vacant/Shell Space, <b>East Bldg/F:</b> Staff Locker Rooms, <b>Lower A/H:</b> Boiler Room (Lockers), <b>Central E:</b> Staff Lockers, <b>West:</b> On-Call | <b>Office Space</b>  | <b>East Wing:</b> Child Welfare, <b>MOB:</b> Legal/Admin, <b>North/D/Central E/West:</b> Admin, <b>West:</b> Auditorium  | <b>East Bldg/F:</b> Mail Room, <b>MOB:</b> LL Offices |

# What does expansion entail?

Risk Characterization Matrix = Core Tool for Defensible Validation

## Engages

## Who

Infection Prevention/Epidemiology

## Answers

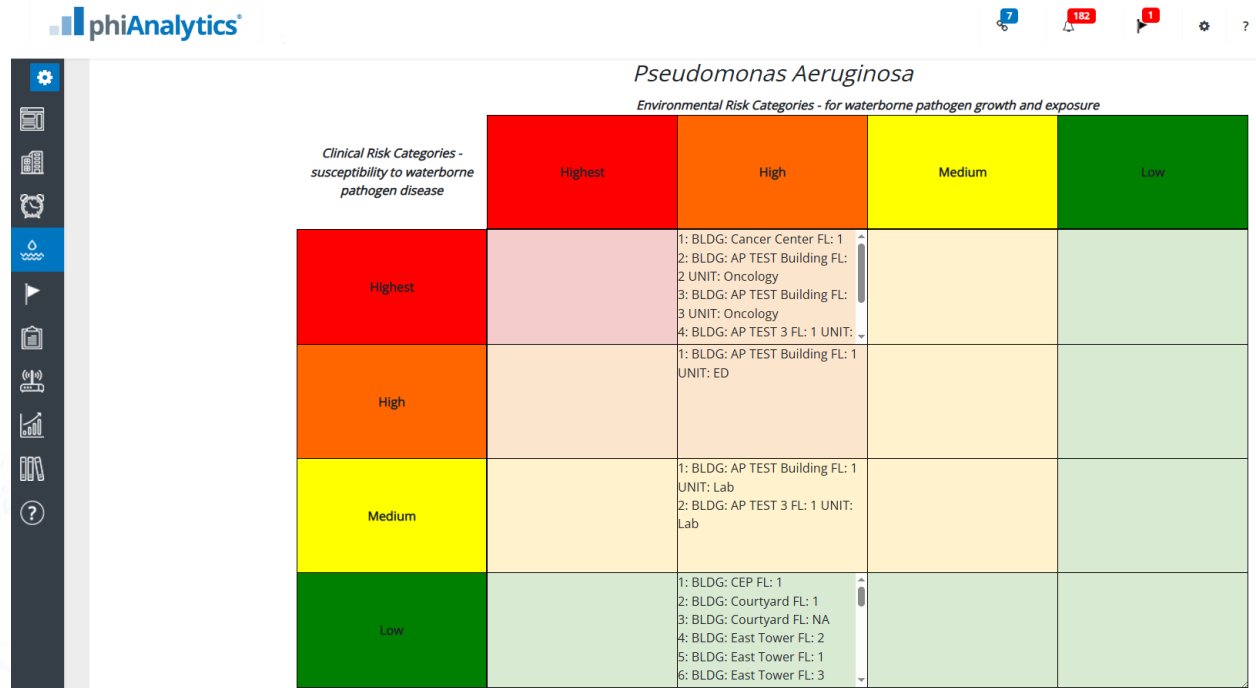
## Why

To ensure Patient Safety and maximize Program Defensibility

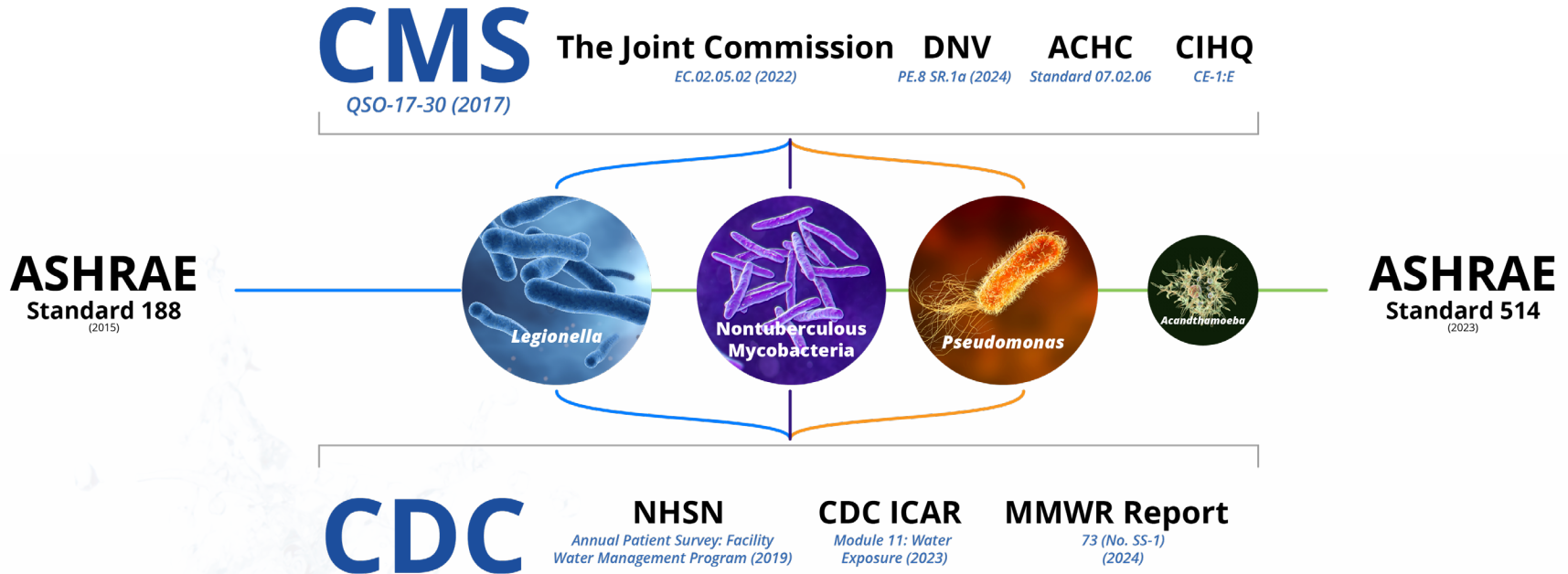
## Supports

## What

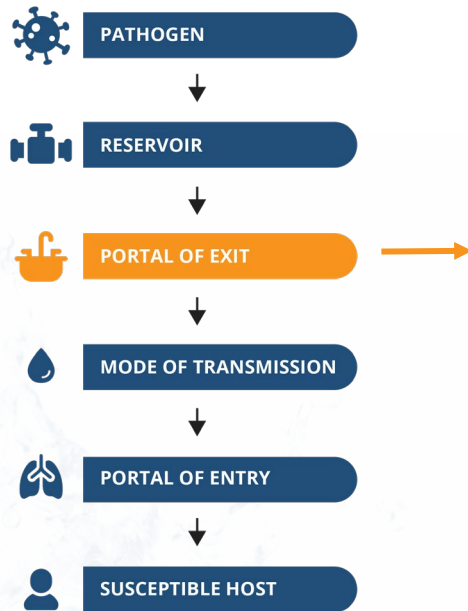
Methods  
Locations  
Frequencies



# Are we addressing the right microbial hazards to align with standards and surveys?



# Advice for Epidemiologists and Clinical Team Members – Get Involved



*“Premise or point of use was the most cited contributing factor type for all biofilm associated pathogen outbreaks and was linked with 287 (73%) individual contributing factors.”*  
- CDC MMWR Report, 3/14/24



ASHRAE 514 Figure C-1 Chain of Infection



# Beyond Legionellosis

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