Legionnaires' Disease History in Maryland

Legionella is not a new or emerging issue in Maryland, it is a well-documented, recurring public-health risk with a clear history of illness, death, and costly remediation across the State. Since the 1980s, Maryland has experienced repeated outbreaks and detections in hospitals, senior living facilities, hotels, schools, correctional institutions, courthouses, and state office buildings. The largest early outbreak occurred in 1988 at a rehabilitation hospital, and throughout the 1990s Maryland reported hundreds of confirmed cases, with documented fatalities across more than twenty counties. Since then, outbreaks and detections have continued with troubling regularity, including fatal cases linked to hotels, long-term care facilities, and public buildings, as well as repeated findings of Legionella bacteria in state-owned and leased facilities across the State between 2019 and 2025. These incidents have resulted in building closures, emergency responses, litigation, long-term health consequences for affected individuals, and significant public expense.

Current regulatory priorities remain misaligned with public-health risk. Legionella, is one of the deadliest waterborne pathogens, with fatality rates commonly cited at 10% overall and substantially higher among vulnerable populations. Legionella is transmitted through inhalation of water vapor containing the bacteria or through aspiration when water is swallowed and "goes down the wrong pipe." Legionella risk management has largely been deferred to building owners, voluntary guidance, and reactive outbreak response. The predictable result is continued detection, repeated remediation, and escalating costs. This is precisely why Maryland must act proactively and align regulatory attention with actual public-health risk.

The Source To Tap Solution

The Source

CDC outbreak summaries and after-action reports repeatedly identify water main breaks, pressure loss, boil-water advisories, treatment upsets, and storm-related disruptions as triggering events of Legionella outbreaks, especially in hospitals and large buildings. During storms or utility disruptions (like main breaks or pressure loss), biofilm is physically disturbed and mobilized inside distribution pipes. When pressure drops or flow reverses, chunks of biofilm containing Legionella are scoured from pipe walls and pushed downstream into buildings**,** where they enter plumbing systems, storage tanks, and fixtures.

Although building owners control internal plumbing, water utilities control the baseline conditions that determine whether pathogens can survive at all, including disinfectant residual, water chemistry, and biological stability. Building owners are legally prohibited from altering those upstream conditions and must accept and distribute the water as delivered. When utilities provide water with insufficient or unstable disinfectant residual, they effectively shift preventable risk downstream while retaining exclusive control over the tools needed to mitigate it.

This history aligns with long-standing scientific understanding. As early as 2000, the Maryland Scientific Working Group to Study Legionella in Water Systems in Healthcare Institutions recognized that Legionella is often introduced into institutional plumbing systems through municipal water, that municipal systems do not routinely screen for Legionella. Once introduced into building plumbing, particularly hot water systems maintained at lower temperatures to reduce

scalding risk, Legionella can persist and multiply. More recently, in November 2023, a subject-matter working group of EPA's National Drinking Water Advisory Council reached conclusions consistent with this body of evidence, recommending that EPA raise the national minimum disinfectant residual requirement from the current "detectable" standard and consider a minimum specific value of up to 0.5 mg/L for free chlorine and 0.7 mg/L for chloraminated systems.

The Tap

ASHRAE is the American Society of Heating, Refrigerating and Air-Conditioning Engineers, a global professional organization that develops science-based engineering standards for buildings and environmental systems. ASHRAE 188 is a national consensus standard developed by ASHRAE that establishes minimum requirements for managing Legionella risk in building water systems. It does not regulate utilities or mandate specific disinfectant levels; instead, it requires certain buildings to identify, monitor, and control conditions inside their plumbing systems that allow Legionella to grow and spread.

ASHRAE 188 requires covered buildings to implement a Water Management Program (WMP). That program includes identifying hazardous water systems (like hot water systems, cooling towers, decorative fountains, spas), setting control limits for temperature and disinfectant, monitoring those controls, documenting corrective actions, and assigning responsibility. The standard is risk-based and process-oriented, it focuses on managing conditions, not eliminating bacteria entirely.

ASHRAE 188 applies to large or high-risk buildings, including hospitals, nursing homes, long-term care facilities, hotels, multifamily buildings with centralized hot water, buildings with cooling towers, and buildings housing immunocompromised populations. It generally does not apply to single-family homes or small buildings without complex water systems.

ASHRAE 188 is critical because it addresses the part of the water lifecycle that utilities cannot legally or physically control, water after it enters the building. A true source-to-tap strategy requires both sides to function: utilities deliver biologically stable water with adequate disinfectant to the building, and building owners use ASHRAE 188 to prevent stagnation, loss of residual, and temperature conditions that allow amplification. Without ASHRAE 188, utilities are blamed for problems they cannot fix; without strong source water control, building programs are forced to manage unnecessary upstream risk. Together, they form the only defensible, public-health-based approach to preventing Legionnaires' disease.

The Public Health Risks

The public-health stakes are substantial. A significant portion of Maryland's population falls into groups at elevated risk for severe Legionella outcomes. In 2022, 9.6% of Maryland adults were smokers, a major risk factor for Legionnaires' disease due to impaired lung and immune function. Roughly 30% of Marylanders are over the age of 55, a population with significantly higher hospitalization and fatality rates, and nationally an estimated 6–7% of individuals are immunocompromised due to cancer treatment, transplants, or chronic illness. These overlapping vulnerabilities mean Legionella poses a disproportionate and ongoing risk to Maryland residents.

The Cost to the State of Maryland of Inaction

According to publicly available Board of Public Works records, Maryland has already spent almost $650,000 on Legionella detection and remediation since 2015, a figure that does not capture indirect costs such as lost productivity, medical care, or liability exposure, and does not include any of the recent outbreaks.

Using national cost estimates, Maryland's roughly 207 Legionnaires' disease cases per year since 2015, translate into about $6–$8 million in direct medical costs annually. CDC-linked studies estimate $33,000–$38,000 per hospitalization; using a midpoint of $35,000, the math is straightforward: 207 cases × $35,000 ≈ $7.25 million per year in hospital and emergency department costs alone. If we conservatively assume that only 30% of cases are covered by Medicare or Medicaid (about 62 cases), then 62 × $35,000 ≈ **$2.17 million per year in direct public-payer medical spending in Maryland.**

These figures exclude productivity losses, long-term rehabilitation, and mortality costs, which national models typically show roughly double the total economic burden. In other words, the true annual cost of Legionnaires' disease in Maryland could be above $4-5 million, with a significant share falling directly on public budgets.

This is why prevention is cheaper than the status quo. Even a 25–50% reduction in cases would save $500,000 to over $1 million per year in Medicaid costs alone, before accounting for avoided emergency responses and facility shutdowns. Preventive measures, by contrast, are low-cost, system-wide investments that become routine operations, while the avoided hospitalizations and crisis responses generate reliable, recurring budget savings.

Counter-Arguments

Argument 1: This will put Maryland water utilities out of compliance with MDE and EPA disinfectant-by-products standards.

We analyzed a statewide dataset covering all 451 Maryland's reporting water systems to understand whether utilities could meet HB 204's minimum disinfectant residual requirement while remaining compliant with federal limits on disinfection byproducts (DBPs). The data shows that about seven in ten systems already meet the bill's proposed minimum chlorine standard, at least when tested at the source point, based on their lowest reported levels, and many of the remaining systems are very close. At the same time, 98–99 percent of systems statewide are already in compliance with EPA limits for TTHMs and HAA5s. Importantly, systems that meet the proposed HB 204 residual standard are also overwhelmingly in compliance with federal DBP requirements, demonstrating that these two goals already coexist in Maryland's drinking water systems.

To test concerns that modest increases in chlorine could force DBP violations, we evaluated how much "headroom" systems have below federal limits and ran conservative stress-test scenarios assuming small residual increases. Most systems are not close to DBP limits, with average margins of more than 60 units for TTHMs and nearly 50 units for HAA5s. Even under pessimistic assumptions, roughly 95 percent of systems would remain compliant with federal DBP standards. The data also shows no meaningful relationship between higher chlorine residuals and higher DBP

levels statewide. In plain terms, HB 204 improves protection against microbial risks in distribution systems without creating a new DBP compliance problem for Maryland water utilities.

Argument 2: The buildings are the problem.

Building owners and operators unquestionably have a role to play in managing Legionella risk, but as of now, they have all the liability for a problem they do not have all the control of. ASHRAE Standard 188 appropriately establishes a framework for that responsibility. The standard focuses on building water management practices, such as temperature control, minimizing stagnation, maintaining equipment, and responding to identified hazards, that can reduce the amplification of Legionella within building plumbing systems.

However, ASHRAE 188 is not designed to function in isolation, nor can it overcome inadequate water quality at the point of entry. Legionella is a naturally occurring organism that originates in source water and distribution systems; buildings do not create the bacteria. When disinfectant residuals entering a building are weak or inconsistent, even buildings that fully comply with ASHRAE 188 are forced into a reactive and costly cycle of mitigation, relying on superheating, hyperchlorination, frequent testing, and continuous operational intervention simply to compensate for upstream deficiencies.

In that context, placing primary responsibility on building owners without ensuring effective disinfection from utilities turns ASHRAE 188 into an exercise in futility. As stated above, it isn't a surprise that many outbreaks happen following water disruptions at the utility side. The standard works best as part of a source-to-tap approach, where utilities maintain a stable disinfectant residual to limit the introduction and seeding of Legionella, and building operators use ASHRAE 188 to prevent conditions that allow amplification. Without that first line of defense, compliance becomes a perpetual effort to manage risk rather than meaningfully reduce it, shifting costs downstream while leaving the root cause unaddressed.

Further, a building only management approach fails to address home-based exposure risk. A NJ Department of Health study found legionella bacteria is approximately 50% of homes tested. Homeowners must rely on water utility management and treatment of the water entering their plumbing systems to kill legionella bacteria and minimize risks.

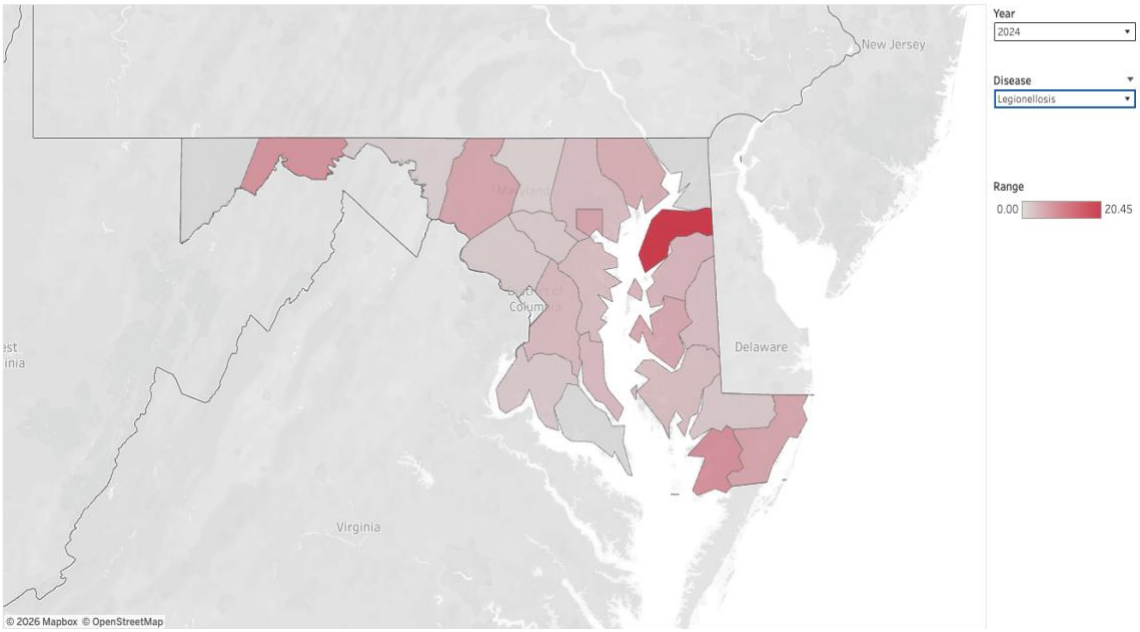
Argument 3: The 'disruption' notice requirements will cause public panic and create liability

Transparency isn't panic, it's risk management. The bill defines "disruption in the water distribution system" (including treatment switches, pressure drops below 20 psi, lead service line replacements, etc.) and requires notices that include context and duration guidance. That lets hospitals, nursing homes, and other high-risk facilities take reasonable short-term precautions (flushing protocols, point-of-use filters, etc.) during known vulnerability windows. Those who are most vulnerable will not take these notices lightly. And there are steps homeowners can take if there are increased risks from a system disruption. This includes avoiding showers, using purified water, changing water filters, running taps and showers to avoid stagnation and keeping water heater temperature high enough to kil legionella, among others. Knowledge is power. It will not cause panic, it will provide increased protections.

Appendix

Cases of Selected Notifiable Conditions Reported in Maryland*

Case Rates per 100,000 Population by Jurisdiction



Cases of Selected Notifiable Conditions Reported in Maryland*

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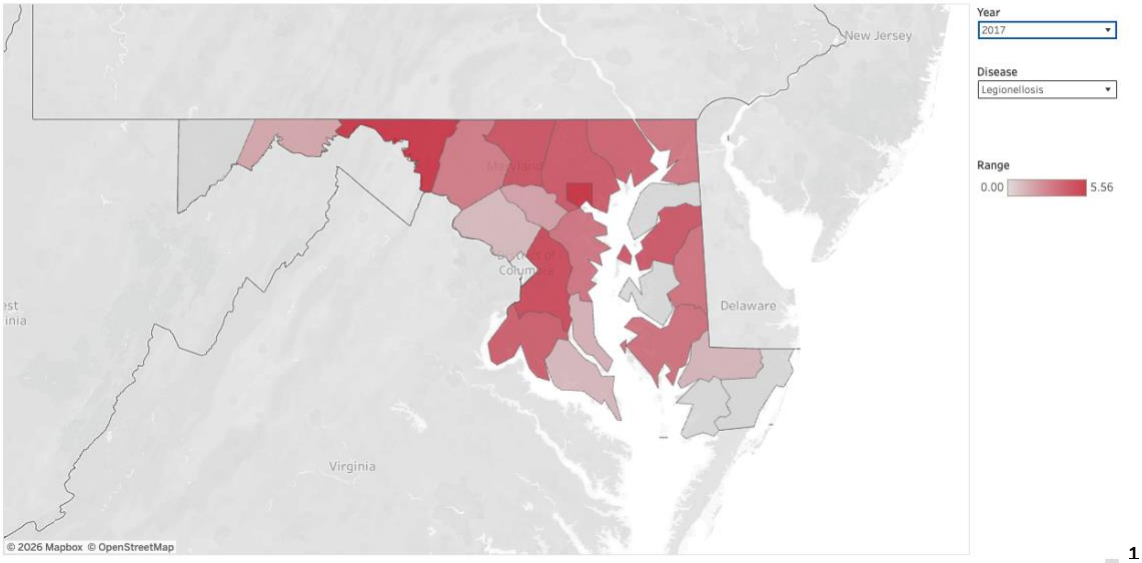

[1] A CDC notifiable condition is a disease or health issue that healthcare providers and labs are legally required to report to public health officials, allowing agencies like the Centers for Disease Control and Prevention (CDC) (CDC) to track, monitor, and control threats to the public's health, especially those that are severe, contagious, or frequent.

Abc generic_year.csv Disease	Abc Measure Names	# Measure Values
Legionellosis**	2024	188.000
Legionellosis**	2023	170.000
Legionellosis**	2022	203.000
Legionellosis**	2021	213.000
Legionellosis**	2020	184.000
Legionellosis**	2019	273.000
Legionellosis**	2018	361.000
Legionellosis**	2017	187.000
Legionellosis**	2016	142.000
Legionellosis**	2015	153.000

[2]

[2] https://health.maryland.gov/phpa/OIDEOR/CIDSOR/Pages/disease-conditions-count-rates.aspx

Alliance to Prevent Legionnaires' Disease

LEGIONNAIRES' DISEASE
LINES OF PREVENTION

#1 EDUCATION

The general public, building owners and health care professionals need **more information** on *Legionella* bacteria and how it may cause Legionnaires' disease. There are many myths surrounding the disease, so up-to-date and accurate information is crucial to reduce its incidence and increase prevention. Knowledge of the origins and exposure points of *Legionella* throughout the water system help us to understand how best to prevent its spread.

#2 SOURCE WATER TREATMENT

The water we use, collected from lakes, rivers and reservoirs, is known as **source water**. Source water naturally contains bacteria and nutrients. To protect public health it is treated and filtered* to limit the levels of contaminants, per the Safe Drinking Water Act.

* New York City does not filter 90% of its water, having been given an exemption from the EPA if the water meets certain criteria, including residual disinfectant concentrations, and not being identified as a source of a waterborne disease outbreak.

#3 PUBLIC WATER DISTRIBUTION SYSTEMS

After collection and treatment, source water enters the **public water system**. Opportunities exist for *Legionella* and other bacteria to colonize and reproduce in the public water system. Pipe biofilm and corrosion, potential low chlorine levels and stagnant water all contribute to growth. It is critical to design, manage and maintain new distribution systems, as well as upgrade and repair older ones, to limit the growth of bacteria.v

#4 RESIDENTIAL WATER SYSTEMS

Most of our water use is in our very own homes. According to the CDC, 96% of all Legionnaires' Disease cases are individual and sporadic—not associated with an outbreak. That's why a focus on the consistent delivery of contaminant-free water to residents and raising awareness of the risks at home are so critical, especially to protect the immunocompromised. Every day we use water to shower and bathe, drink, clean, irrigate, and live. Water quality issues impacting homes, and associated risks, must be broadly understood and managed.

#5 BUILDING WATER SYSTEMS

Multi-story buildings are at greater risk of water-borne bacteria than smaller buildings, as the complexity of their piping provides more opportunity for bacterial growth. The exposure points in a **building water system** are numerous, from showers, baths and drinking water to ice machines, faucets, and cooling equipment. A multi-disciplinary team has developed ASHRAE Standard 188 for risk management of building water systems.

#6 WATER EQUIPMENT MANAGEMENT

Proper selection, placement, maintenance, treatment, monitoring, and management of **water-based equipment**, such as medical equipment, humidifiers, misters, hot tubs and pools, can further reduce the risk of exposure to waterborne Legionella bacteria.

#7 INVESTIGATION PROTOCOL

When Legionnaires' disease clusters or outbreaks are reported, it is crucial to determine the point of exposure by testing all water sources within the water system.* When the exposure point is found, it can be treated to stop the spread. Prematurely ending an investigation with the first positive sample may lead to further outbreaks which could occur unexpectedly, even months later, as multiple exposure points to bacteria are possible within one water system. Failure to test throughout the system may result in inconclusive or incorrect findings, or mis-identification of the source of the bacteria that caused the illness.

*Currently, single cases are rarely investigated, except in healthcare facilities.

#8 ONGOING RESEARCH

As Legionnaires' disease is a relatively newly discovered disease, ongoing **research** is imperative to better understand its causes, prevention and treatment. **New** studies and their findings are published periodically and it is important that this new information is communicated to dispel myths with proven measures for combatting the disease.

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