

Kentucky *Legionella* Outbreak Part 1

A Local Health Department
Perspective



Helping Lexington be well.

Introductions



- Kala Adams, MSW, CSW, Infectious Disease, Environmental Health and Preparedness Manager
- Erin Hudson, RS, Senior Environmental Health Specialist
- Hollie Sands, MPH, Infectious Disease Team Leader & Regional Epidemiologist
- Kara Stanfield, RS, Environmental Health Specialist

Learning Objectives



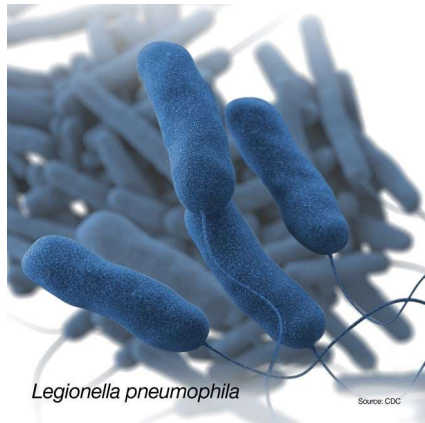
- Describe the multiple-discipline complexity of a recreational water source *Legionella* outbreak
- Explain how critical communication between local and state agencies is essential through the entire process of a *Legionella* outbreak.

Financial Statement

There is NO financial disclosure or conflicts of interest with the presented materials in this presentation



What is *Legionella*



- *Legionella* is a bacteria found in natural fresh water environments
- It only becomes a health concern when bacteria can grow and spread in human-made building water systems
 - Shower heads and sink faucet
 - Cooling towers
 - Hot Tubs or Spas
 - Decorative fountains and water features
 - Hot water tanks and heaters
 - Large, complex building systems





How does *Legionella* spread?

- *Legionella* grows and multiplies in a water system
- Water containing *Legionella* can spread in droplets small enough for people to breath in
- In general, people do not spread Legionnaires' Disease to other people
- *The ideal temperature for Legionella grow and multiply is between 77°F-113°F*



People at Increased Risk



- Most healthy people exposed to *Legionella* do not get sick
- People at increased risk include:
 - Individuals over the age of 50 years
 - Current or former smokers
 - People with chronic lung disease
 - People with a weakened immune system
 - People with cancer
 - People with other underlying health conditions
 - Diabetes
 - Kidney or Liver disease



Signs & Symptoms

- Legionnaires' Disease is similar to other types of pneumonia
- Symptoms usually begin 2-14 days after exposure to the bacteria, but can take longer
- Acute onset of a lower respiratory illness
- Symptoms can include:
 - Cough
 - Shortness of breath
 - Fever
 - Muscle aches
 - Headaches
 - Nausea
 - Diarrhea
 - Abdominal pain



The 2023 *Legionella* Outbreak



- This started in early July 2023
- Keep in mind- This was 4th of July week.

DUN
DUN
DUN



Setting the Scene- Lexington, KY



Sunday July 2, 2023

- A major storm swept through central Kentucky
- Numerous showers and thunderstorms developed
- Two EF-1 Tornadoes touched down in our area
- We had reports of major wind damage in the area





Monday July 3, 2023

EPIDEMIOLOGY (EPI)

- At noon, EPI was notified of 3 persons hospitalized related to *Legionella* over the weekend
 - Local infectious disease doctor had linked the patients to a particular setting and water source
 - By the end of the day, only one case was able to be interviewed
 - Suspected outbreak was assumed, but not determined
- State Reportable Disease was notified of a possible outbreak

ENVIRONMENTAL HEALTH (EH)

- EH was notified by EPI of the possible *Legionella* outbreak linked to a specific setting and water source
- This particular water source is regulated by LFCHD/local health department
- Inspection of the facility was conducted
 - Due to the storm the previous day causing debris in the spa, it had been drained prior to inspection
 - The pool had followed procedures for hyperchlorination
 - Pool logs were incomplete



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Tuesday July 4, 2023



LFCHD was closed for the holiday



Wednesday July 5, 2023

Epidemiology

- We were notified of an additional case that was linked to the same setting and water source
- Meeting was then set up with KDPH and LFCHD

Environmental Health

- Asked the facility to close the spa and pool as we continue to investigate
- Facility closed voluntarily



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Thursday July 6, 2023

Epidemiology

- Continued investigation and surveillance of cases
- Letter was sent to local providers and infection prevention and control departments
- Local Health Alert Network (HAN) alert was issued to look for additional cases
- Worked with our internal Communications team for public health messaging
- Went with EH to conduct testing and additional surveillance by talking with facility management

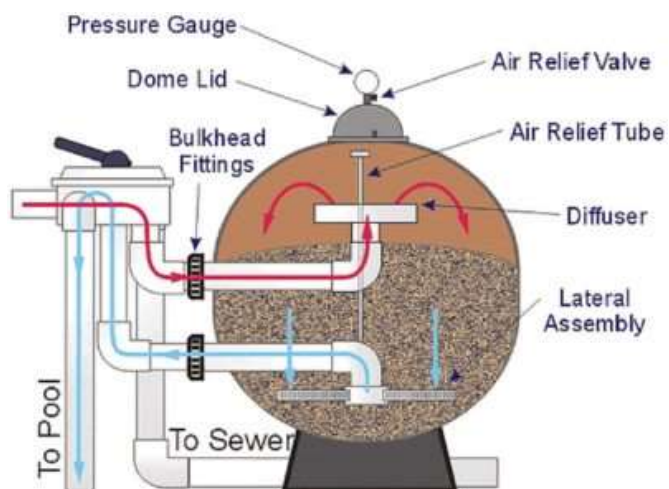
Environmental Health

- Specimen collection from facility from both the pool and spa
- Water source indefinitely closed voluntarily
- Specimen was submitted to the state lab



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Our Collection Samples



POOL FILTER SAND

This pool filter sand is specifically designed to meet the standards for all brands of pool filters. We have upgraded our production with new robotics and screening technologies to make the highest quality sand for pool filters. Always follow manufacturers recommendation for the amount of sand to add to your filter.

WHAT WE GOT

- All Jets (8)
- One inlet
- Backwash line
- Spa 1L Bulkwater
- Pool 1L Bulkwater
- Spa filter water and sand

WHAT WE DID NOT

- Scum line
- Pool Inlets
- Pool filter water and sand
- Additional Pool Samples

Epidemiology & Environmental Health Investigation & Specimen Collection

- The Epidemiology and Environmental investigations were conducted simultaneously
- Both EPI and EH worked collaboratively to conduct the site visits and collect specimens
- This allowed for further investigation to occur at the site
 - Additional information that was important for the investigation was obtained as a result
- Gave an opportunity for each division to learn about the other's processes
- Both teams knew **VERY LITTLE** about *Legionella* specimen collection as a whole
 - We adopted the objective... **LET'S LEARN TOGETHER**

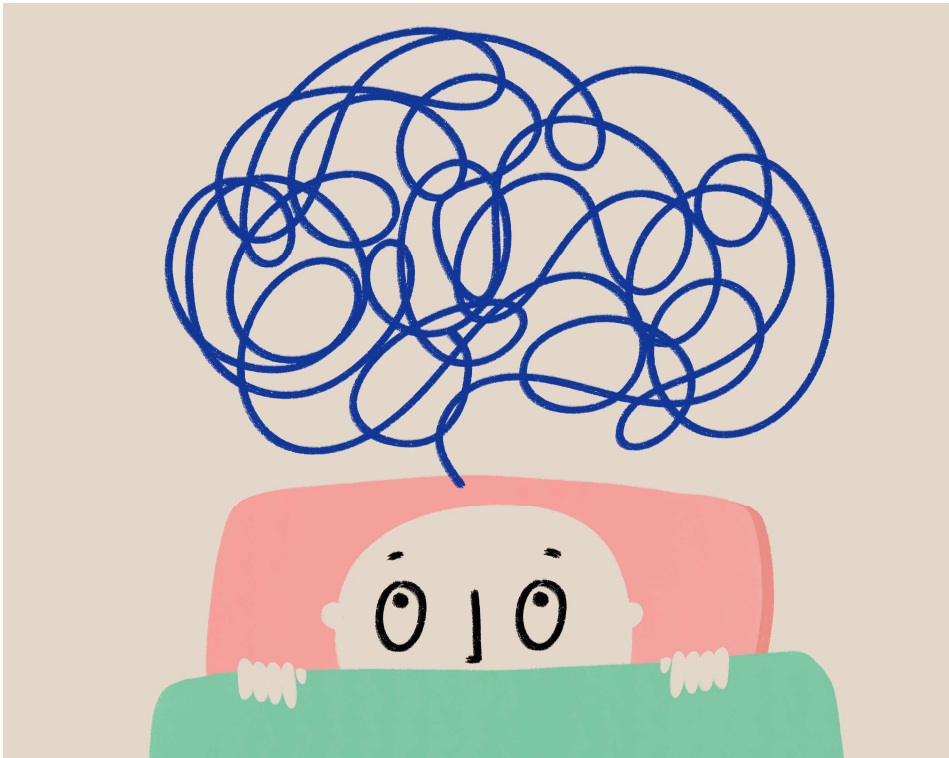


What did Epidemiology know?



- 4 cases were identified
 - All male, between 30-55 years of age (avg. 40 years old)
 - All Fayette County Residents
- Earliest symptom onset date was June 17, 2023
 - Symptom duration averaged 12 days (range 6-24 days)
- Symptoms include:
 - Fever, between 101°-103°F
 - Chills
 - Body Aches
 - General Fatigue

What did Epidemiology know?



- All cases hospitalized for an average of 7 days (range 3-11 days)
 - One case was admitted to the ICU
- Exposure
 - 3 cases used the spa frequently, as early as Memorial Weekend
- Attack rate unknown

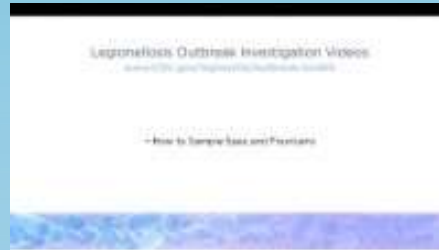
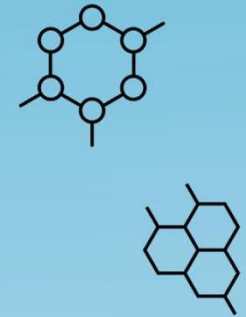


Environmental Health Experience

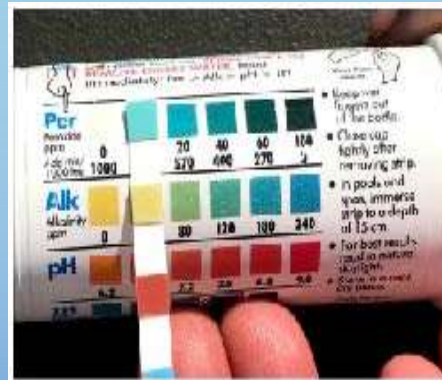
- LFCHE staff had never sampled water for *Legionella*
- State lab was not able to test for Legionella prior to July 2023
- Environmental Health staff watched CDC video to collect water samples for *Legionella*
- We watched the video many times on the way to pick up collection kits, and had printed instructions
- We asked the state lab for guidance and help on what we needed to do



CDC Video



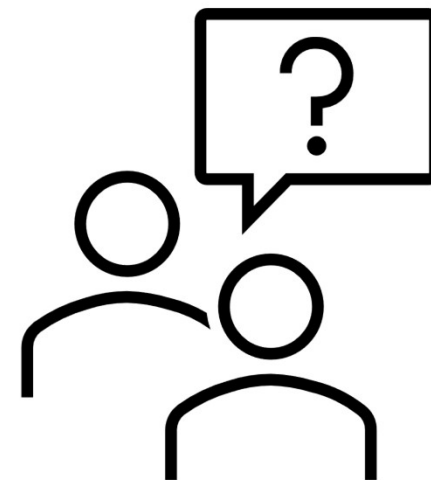
- Test Kits vs. Strips
- Sodium Thiosulfate
- Filters



We still had questions



- What testing items do we need and how many should we request?
 - Number of jets
 - Pool and Spa
- Are there additional supplies we will need
 - Scissors
 - Markers
- Where do we test exactly
 - We asked the lab and they could provide us with little information
 - We later found out that they are not allowed to tell us what to do
 - We did not have enough sample containers so we had to prioritize
- How many people will this take
- Are pictures necessary



A lot of questions....



- How do we document what and where we tested... are there official forms?
- How do we label collected samples for the lab... are there official forms and supplies?
- What do we do with the forms and documents once completed?
 - No one in our Health Department had access to the system where samples need to be entered for the lab



Issues & Concerns During Field Testing



- Instructions were to add sodium thiosulfate, but some collection kits already came with pre-measured sodium thiosulfate
- The bulk water collection kit did not have sodium thiosulfate in it. We were unsure of how much to add (collection containers given from the lab were of different sizing)
- How much water should we be adding to the sample containers?
- The swabs that were sent didn't fit into the collection tubes and they would not easily break- We needed scissors



Positive Take-Aways



- We found that the number of people we took to the site was perfect
- It took a TEAM APPROACH to get this done successfully
- We took 4 people
 - 1 EH person to do the collection and swabbing
 - 1 EH person to receive the collection, seal and label the collection kits, take pictures
 - 1 EH person to record the collections and complete paperwork
 - 1 EPI person to provide guidance, and communication to the facility management as well as conduct additional surveillance

Teamwork Makes the Dream Work



- Work simultaneously as Environmental Health and Epidemiology Team
- Conduct sampling and specimen collection and document thoroughly
- It allowed an opportunity to do additional surveillance and learn additional information from the facility regarding other positive patients
- It allowed experts in both EH and EPI to have meaningful conversations and discussions with the facility management and pool management
 - Discussion regarding communication with patrons
 - Discussion about further prevention and outbreaks



Lessons Learned



- Good communication is essential
 - Within your local health department- Environmental, Epidemiology, Communications and Administration
 - With your state health department- Reportable Disease, Environmental and Protection and Lab Services
 - With the facility you are inspecting
 - With local providers
- Just-in-time training for collection techniques and yearly hands-on training for EH and EPI staff on water sampling and investigations for *Legionella*
- Create an SOP for LFCHD process of *Legionella* water sampling and collection for Environmental Health and Epidemiology

What changes did we make?



- Developed SOP's for *Legionella* Sampling & Investigating
- Keep supplies on hand
- Provide regular training for staff
- Incorporate *Legionella* in our yearly "Pool School" to educate and inform Certified Pool Operators
- Really think about the facility you are going to be collecting at to plan for enough supplies (or over order)

Thursday July 13, 2023



- One specimen resulted culture positive for *L. Pneumophila*
- This was collected from the sand filter



What Everyone Wants to Know What Happened?!



- The spa and pool were closed indefinitely
- The requirements to re-open the pool and spa was discussed with the facility
 - Required to have a conference to review and ensure guidelines were followed from the CDC for re-opening
 - Retesting for *Legionella* would have to occur
- Ultimately the facility has chosen to fill the spa and it will become a fire pit
- All persons who were positive for Legionella were able to recover
- The SMOKING GUN- The Source!!!!

THANK YOU

QUESTIONS



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