



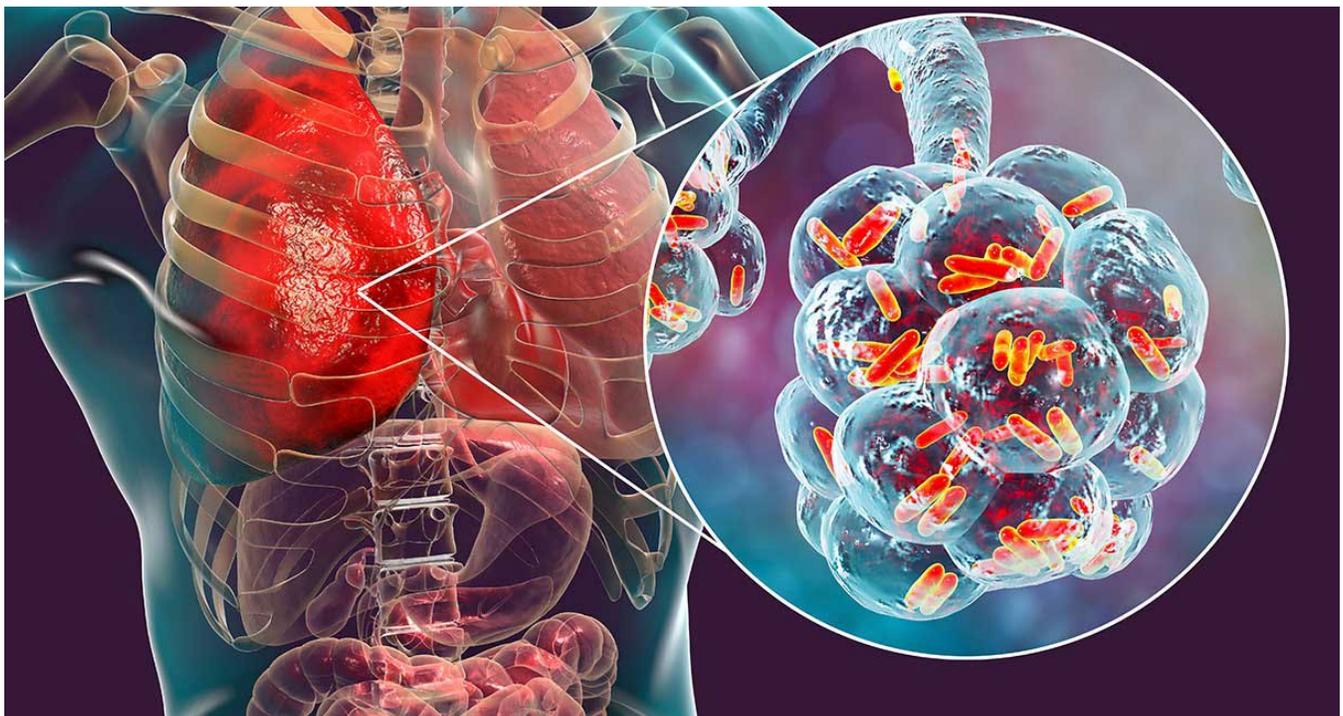
DELAWARE HEALTH AND SOCIAL SERVICES

Division of Public Health

Health Systems Protection Section

State of Delaware Division of Public Health
Health Systems Protection
Environmental Hazards and Toxicology
***Legionella* Disease Guidance for Surveillance, Investigation and Prevention**

Issue Date: May 25, 2022



Balentine, Jerry R., "Legionnaires' disease lungs". emedicine health, 18 April, <<http://www.cdc.gov/legionella/index.html>>.

Table of Contents

- 1. Introduction**
 - a. Purpose
 - b. Background
 - c. Goals
 - 2. Investigation**
 - a. What is the Investigation?
 - b. CDC Environmental Assessment
 - c. Facility Planning/Water Management Program
 - d. Laws and State Regulations
 - e. ASHRAE Standards and Guidelines
 - 3. Laboratory Testing Guidelines**
 - 4. Remediation/Prevention**
 - 5. Who do you Contact?**
 - 6. Point of Communications Flow Chart**
 - 7. References**
 - 8. Contributors**
-

1. INTRODUCTION

a. Purpose

Currently, Delaware does not have a comprehensive surveillance system for the detection of *Legionella* bacteria. There is a need to develop a multi-sectional coordination process. Data obtained from the State of Delaware and Center for Disease and Control Prevention (CDC) surveillance efforts suggest that there is an increasing incidence of Legionnaires' Disease (LD) that can affect public health. In 2018, Delaware reported 46 confirmed cases of *Legionella* Disease. No resources were invested toward identifying the sources of infection.

b. Background

What are Legionella bacteria?

Legionella bacteria species are gram-negative bacteria that includes the species *Legionella pneumophila*, causing legionellosis (illnesses caused by the bacteria). *Legionella* bacteria can be found naturally in freshwater but can become most harmful when found in aquatic systems.

Description of the Illness

Legionellosis was recognized following a pneumonia outbreak at the 1976 American Legion convention in Philadelphia, Pennsylvania. The illnesses associated with the exposure to *Legionella* bacteria are *Legionella* Disease, a severe and potentially fatal form of pneumonia, and Pontiac fever, a milder and "flu-like" illness without pneumonia. Persons most susceptible to these illnesses include adults over 50 years of age, smokers, and those with chronic lung disease or weak immune systems.

For more, see:

<https://www.cdc.gov/legionella/about/causes-transmission.html>

<https://www.cdc.gov/legionella/downloads/fs-legionnaires.pdf>

<https://www.who.int/en/news-room/fact-sheets/detail/legionellosis>

Modes of Transmission

Legionella bacteria can be found in building systems and can become a major health concern. Outbreaks have shown connections with contaminated plumbing

systems. These systems include showerheads and sink faucets, cooling towers, hot tubs, decorative fountains/water features, and hot water tanks. If persons at risk breathe in aerosolized water containing the bacteria, infection can result.

For more, see:

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

Incubation Period

The incubation period for Legionnaire's Disease ranges from two to 14 days (average five to six days) from the time of exposure to the development of symptoms.

c. Goals

- To expand the capacity coordination process for the surveillance and detection of *Legionella* bacteria disease
- Reduce health risk to the public and to identify sources of exposure
- Educate people of the Delaware community of potential exposure to *Legionella* bacteria, its growth, and the impact it can have on the community

2. INVESTIGATION

a. What is the investigation?

The investigation process involves detailed steps that enable public health officials to control, monitor and reduce *Legionella* bacteria prevalence and exposure. All cases of *Legionella* Disease require an epidemiological investigation to identify potential sources of exposure. Two or more cases of *Legionella* Disease linked in time and place may require further investigation and involvement of stakeholders and community partners.

Steps involved in a full investigation:

- The epidemiologist will investigate all positive laboratory results of *Legionella* bacteria species received in the Delaware Electronic Reporting Surveillance System (DERSS).
-

- The epidemiologist will review clinical information and determine if the case meets the CDC case definition.
 - A case interview will be conducted within 24 hours of initial report to gather information about possible exposures and risk factors.
 - The CDC Case Report Form will be completed by the epidemiologist and sent to the CDC *Legionella* Disease Branch via email and DERSS
 - If a source is identified, the epidemiologist will notify the *Legionella* Disease Advisory Committee of the findings from the investigation within 24 hours to discuss further actions.
 - Upon detection of additional cases linked in place and time, a retrospective review of the cases in the health department surveillance database will be performed to identify earlier cases with possible exposures to the same setting or geographic area.
 - If a cluster or outbreak is suspected, a line list of cases associated with the common exposure setting or geographic area will be developed.
 - Conduct active case finding by collaborating with appropriate parties to identify additional cases (e.g., through retrospective review of medical or laboratory records, client rosters, etc.).
 - Coordinate testing for *Legionella* bacteria on suspect cases using both culture of lower respiratory secretions on media that supports growth of *Legionella* bacteria and the *Legionella* bacteria urinary antigen test.
 - Obtain post-mortem specimens, when applicable.
 - Consider recommendations for restricting water exposures or other immediate control measures.
 - Facilitate environmental assessment to evaluate possible environmental exposures.
 - Facilitate environmental sampling, as indicated by the environmental assessment.
 - Make recommendations for remediation of possible environmental source(s), if indicated.
 - Develop a risk communications plan.
 - Determine how long heightened disease surveillance and environmental sampling should continue to ensure the outbreak is over.
 - Work with appropriate parties to develop or review and possibly revise the water management program.
 - Subtype and compare clinical and environmental isolates, if available.
-

- Follow up to assess the effectiveness of implemented measures to control the hazard.

b. CDC Environmental Assessment

The CDC's environmental assessment tool assists in the environmental component of *Legionella* Disease outbreak investigation. This tool is used to help determine whether to conduct *Legionella bacteria* environmental sampling and to gain a thorough understanding of a facility's water system. The assessment should be performed on-site by an epidemiologist and an environmental scientist.

For more, see:

<https://www.cdc.gov/legionella/health-depts/environmental-inv-resources.html>

<https://www.cdc.gov/legionella/downloads/legionella-environmental-assessment-p.pdf>

<https://www.cdc.gov/legionella/videos.html>

c. Facility Planning/Water Management Program (WMP)

The prevention of legionellosis and minimizing the growth of *Legionella* bacteria starts with taking the appropriate measures to ensure that building owners and managers properly maintain building water systems. Having an effective WMP allows facilities to identify perilous conditions and take steps to diminish the growth and transmission of *Legionella* bacteria and other waterborne pathogens.

According to the CDC, there are four major principles of an effective water management:

1. Maintaining water temperatures outside the ideal range for *Legionella* bacteria growth
2. Preventing water stagnation
3. Ensuring adequate disinfection
4. Maintaining devices to prevent scale, corrosion, and biofilm growth, all of which provide a habitat and nutrients for *Legionella* bacteria

For more, see:

<https://www.cdc.gov/legionella/wmp/overview.html>
<https://www.cdc.gov/legionella/downloads/toolkit.pdf>
<https://www.cdc.gov/grand-rounds/pp/2019/20190501-Legionnaires-Disease.html>
<https://www.cdc.gov/nceh/ehs/elearn/prevent-LD-training.html>

d. Laws and State Regulations

Federal Requirements to Reduce Legionella Bacteria Risk

The Centers for Medicare & Medicaid Services (CMS) released a [memo](#) stating that healthcare facilities should develop and adhere to American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)-compliant water management programs. CMS has revised this memo, as of July 2018, to clarify expectations for providers, accrediting organizations, and surveyors.

For more, see:

<https://www.cdc.gov/legionella/wmp/healthcare-facilities/federal-requirement.html>

Communicable Disease Reporting in Delaware

All Delaware physicians, laboratories and other health care providers are required by regulations to report patients with legionellosis to the Office of Infectious Disease Epidemiology. Both lab-confirmed and clinical diagnoses are reportable.

For more, see:

<https://dhss.delaware.gov/dhss/dph/dpc/rptdisease.html>

<https://dhss.delaware.gov/dhss/dph/epi/files/morbiditycard.pdf>

<https://www.cdc.gov/legionella/resources/guidelines.html>

e. The ASHRAE Standards and Guidelines

ASHRAE was founded in 1894. It is a global society whose focus is on building systems, energy efficiency, indoor air quality, refrigeration, and sustainability. ASHRAE Standard 188 is intended for use by owners and managers of human-

occupied buildings and those involved in centralized building water systems and components. The purpose of this standard is to establish minimum legionellosis risk management requirements for building water systems.

For more, see:

[ASHRAE Standard 188](#)

<https://www.cdc.gov/legionella/health-depts/ashrae-faqs.html>

3. LABORATORY TESTING GUIDELINES

The CDC offers resources to assist state and local public health laboratories in enhancing their *Legionella* Disease testing and outbreak response measurements. Specifically, the Developing Legionnaires' Disease Laboratory Response Plan (LDLRP) [toolkit](#) was designed as a roadmap for laboratories to prepare ahead of a *Legionella* Disease investigation.

The toolkit includes:

- A checklist to help laboratory staff and leadership assess current *Legionella* bacteria testing capacity
- Templates for identifying response team and determining roles and responsibilities
- Templates for a plan to test clinical specimens and environmental samples in your laboratory
- Templates for a plan to refer samples to an outside laboratory
- A sample LDLRP
- An example response scenario with a sample workflow and timeline
- Sample worksheets to document laboratory results
- Example instructions for specimen storage and shipping

For more, see:

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

4. REMEDIATION/PREVENTION

When comprehensive sampling and testing has been conducted and all sample results are negative upon review, no further remediation activities are required. All facilities should be proactive and proceed with implementing and/or updating their WMP.

In the case that the sampling yields any positive results, the facility should immediately implement short-term remediation action to minimize *Legionella* bacteria growth and transmission. Following the short-term remediation activities, the facility must implement long term activities to prevent re-colonization of *Legionella* bacteria. Facilities must work with appropriate [consultants](#) (engineer, industrial hygienist, plumber, etc.), with *Legionella* bacteria expertise, to tailor remediation to structural characteristics of the facility and overall remediation options.

Remediation options can include:

- Superheating and flushing the potable water system
- Hyper-chlorinating the potable water system
- Flushing unused plumbing outlets
- Draining and scrubbing devices

For more, see:

<https://www.cdc.gov/legionella/wmp/hotTub-operators.html>

<https://www.cdc.gov/healthywater/pdf/swimming/resources/operating-public-hot-tubs-factsheet.pdf>

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

<https://www.cdc.gov/legionella/downloads/fs-legionella-clinicians.pdf>

[Legionella Environmental Assessment Form \(LEAF\) \(cdc.gov\)](#)

[Tap Water Quality and Infrastructure Discussion Guide for Investigation of Potential Water-Associated Infections in Healthcare Facilities \(cdc.gov\)](#)

https://www.who.int/water_sanitation_health/emerging/legionella.pdf

[Technologies for Legionella Control in Premise Plumbing Systems: Scientific Literature Review \(epa.gov\)](#)

5. Who do you contact?

Delaware Division of Public Health
Health Systems Protection
417 Federal Street
Dover, DE 19901
302-744-4546 Normal business hours.
302-744-4700 After hours

Email: legionellaresourceaccount@delaware.gov

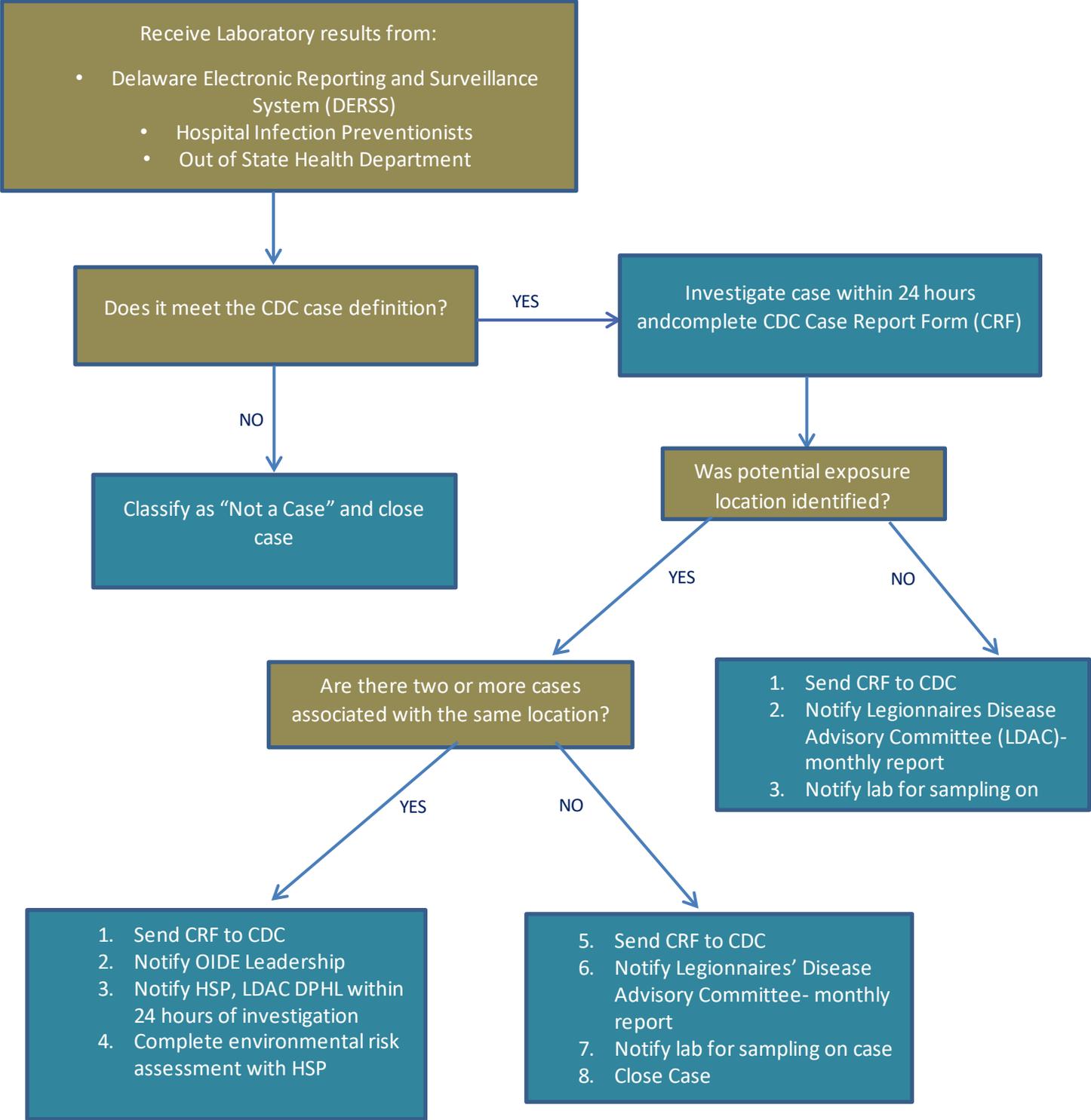
Office of Infectious Disease Epidemiology
Office of Environmental Hazards & Toxicology

For more, see:

<https://www.cdc.gov/legionella/health-depts/epi-resources/outbreak-investigations.html#considerations>

<https://www.cdc.gov/legionella/health-depts/healthcare-resources/index.html>

6. Point of Communications Flow Chart



REFERENCES

- CDC. (2018). Causes, How it Spreads, and People at Increased Risk. Retrieved from <https://www.cdc.gov/legionella/about/causes-transmission.html>
- Delaware, T. S. of. (n.d.). Communicable Disease Reporting in Delaware. Retrieved from <https://dhss.delaware.gov/dhss/dph/dpc/rptdisease.html>
- CDC. (2018, April 30). Considerations for Public Hot Tub Operators. Retrieved from <https://www.cdc.gov/legionella/wmp/hotTub-operators.html>
- CDC. (2018, April 30). Environmental Investigation Resources. Retrieved from <https://www.cdc.gov/legionella/health-depts/environmental-inv-resources.html>
- CDC. (2018, April 30). Federal Requirement to Reduce *Legionella* Risk. Retrieved from <https://www.cdc.gov/legionella/wmp/healthcare-facilities/federal-requirement.html>
- Guidance to Help Minimize the Risk of Legionellosis. (n.d.). Retrieved from <https://www.ashrae.org/technical-resources/bookstore/ansi-ashrae-standard-188-2018-legionellosis-risk-management-for-building-water-systems>
- CDC. (n.d.). Healthcare Investigation Resources. Retrieved from <https://www.cdc.gov/legionella/health-depts/healthcare-resources/index.html>
- CDC. (2018, April 30). *Legionella* Water Management Programs Overview. Retrieved from <https://www.cdc.gov/legionella/wmp/overview.html>
- CDC. (n.d.). *Legionella*: For Laboratories. Retrieved from <https://www.cdc.gov/legionella/labs/index.html>
-

WHO. (2018, February 16). Legionellosis. Retrieved from <https://www.who.int/en/news-room/fact-sheets/detail/legionellosis>

CDC. (2018, April 30). Legionnaires Disease ASHRAE FAQs. Retrieved from <https://www.cdc.gov/legionella/health-depts/ashrae-faqs.html>

CDC. (2018, April 30). Legionnaires Disease Guidelines, Standards and Laws. Retrieved from <https://www.cdc.gov/legionella/resources/guidelines.html>

CDC. (2018, December 14). Prevent LD Training - Preventing Legionnaires' Disease Training. Retrieved from <https://www.cdc.gov/nceh/ehs/elearn/prevent-LD-training.html>

CDC. (2018, April 30). Sampling/Environmental Assessment Videos. Retrieved from <https://www.cdc.gov/legionella/videos.html>

CDC. (n.d.). Things to Consider: Outbreak Investigations. Retrieved from <https://www.cdc.gov/legionella/health-depts/epi-resources/outbreak-investigations.html#considerations>

EPA. (2016, September). Technologies for *Legionella* Control in Premise Plumbing Systems: Scientific Literature Review. Retrieved from [Technologies for Legionella Control in Premise Plumbing Systems: Scientific Literature Review \(epa.gov\)](#)

CDC. (2019, June 25). Turning the Tide: The Role of Water Management to Prevent Legionnaires' Disease. Retrieved from <https://www.cdc.gov/grand-rounds/pp/2019/20190501-Legionnaires-Disease.html>

7. CONTRIBUTORS

Clover Carlisle, Division of Public, Public Health Laboratory

(clover.carlisle@delaware.gov)

James Hanes, Health Systems Protection, Env. Hazards & Tox.

(james.hanes@delaware.gov)

Kim Hicks, Health Systems Protection

(kim.hicks@delaware.gov)

Jalissia Johnson-Tiggs, Division of Public Health, Office of Disease Epidemiology

(jalissia.johnson@delaware.gov)

Camille Moreno Gorrin, Division of Public Health, Office of Disease Epidemiology

(camille.morenogorrin@delaware.gov)

Kathy Jo Robbins, Division of Public Health, Office of Disease Epidemiology

(kathyjo.robbins@delaware.gov)

Rebecca Voshell, Division of Public, Public Health Laboratory

(rebecca.voshell@delaware.gov)
