



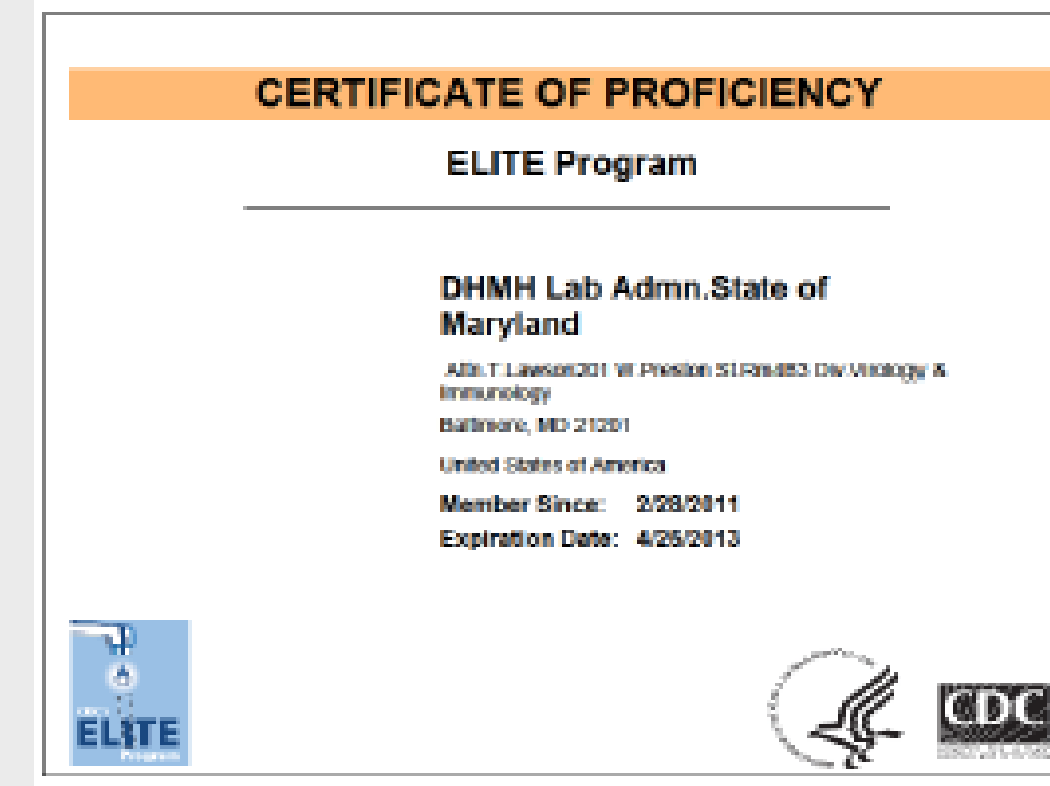
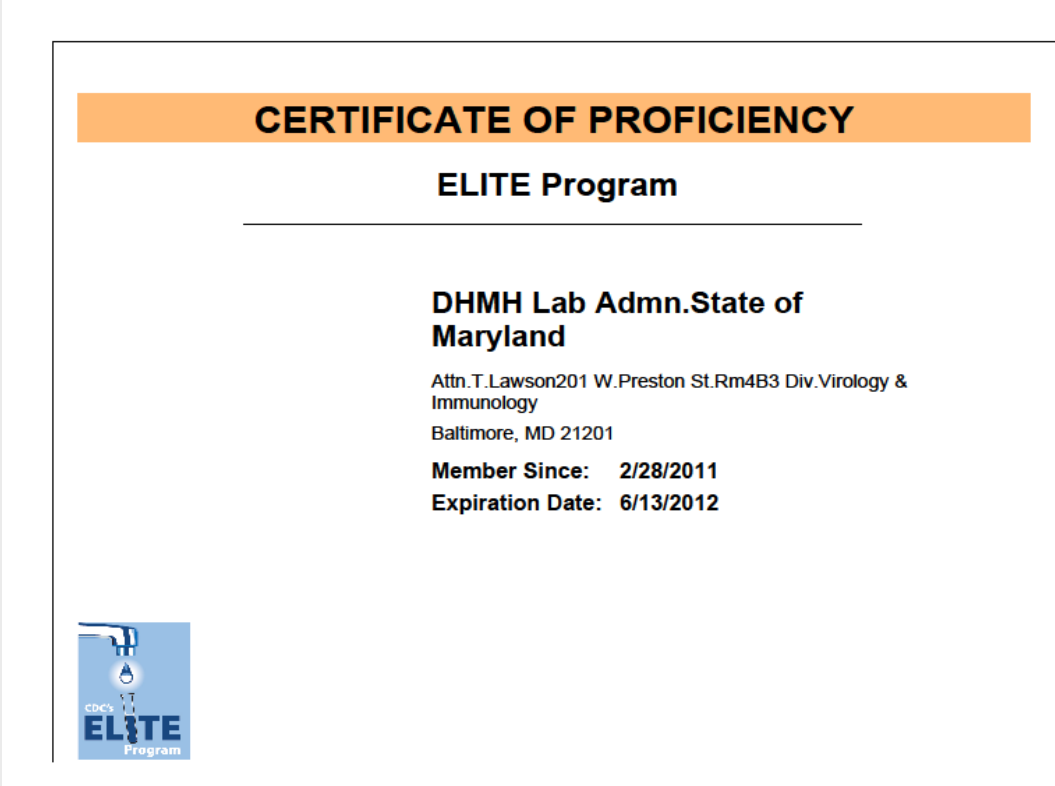
# IDENTIFICATION AND ISOLATION OF LEGIONELLA FROM ENVIRONMENTAL WATER SAMPLES IN THE STATE OF MARYLAND: A 2011 THREE MONTH ANALYSIS OF UNUSUAL ACTIVITY MARKED BY THREE MULTI-REGION LEGIONELLA SPECIES OUTBREAKS

Thomas Lawson, Leena Trivedi and Maria Paz Carlos

Maryland Department of Health and Mental Hygiene, Laboratories Administration, Division of Virology and Immunology

## BACKGROUND

The Maryland Department of Health and Mental Hygiene (MD DHMH) Laboratories Administration identified a three month period of unusual environmental *Legionella* species outbreak activity from multiple regions with associated cases of morbidity and mortality within the State of Maryland. Legionella is a reportable disease under the Code of Maryland Regulations (COMAR 1010.06.01.03. Reportable Diseases, Conditions, Outbreaks, and Unusual Manifestations; Submitting Clinical Materials). The MD DHMH Laboratories is the only certified laboratory within the State of Maryland for the CDC ELITE Program (Environmental Legionella Isolation Techniques Evaluation), which certifies the laboratory in the isolation of *Legionella* from water samples.



## OBJECTIVE

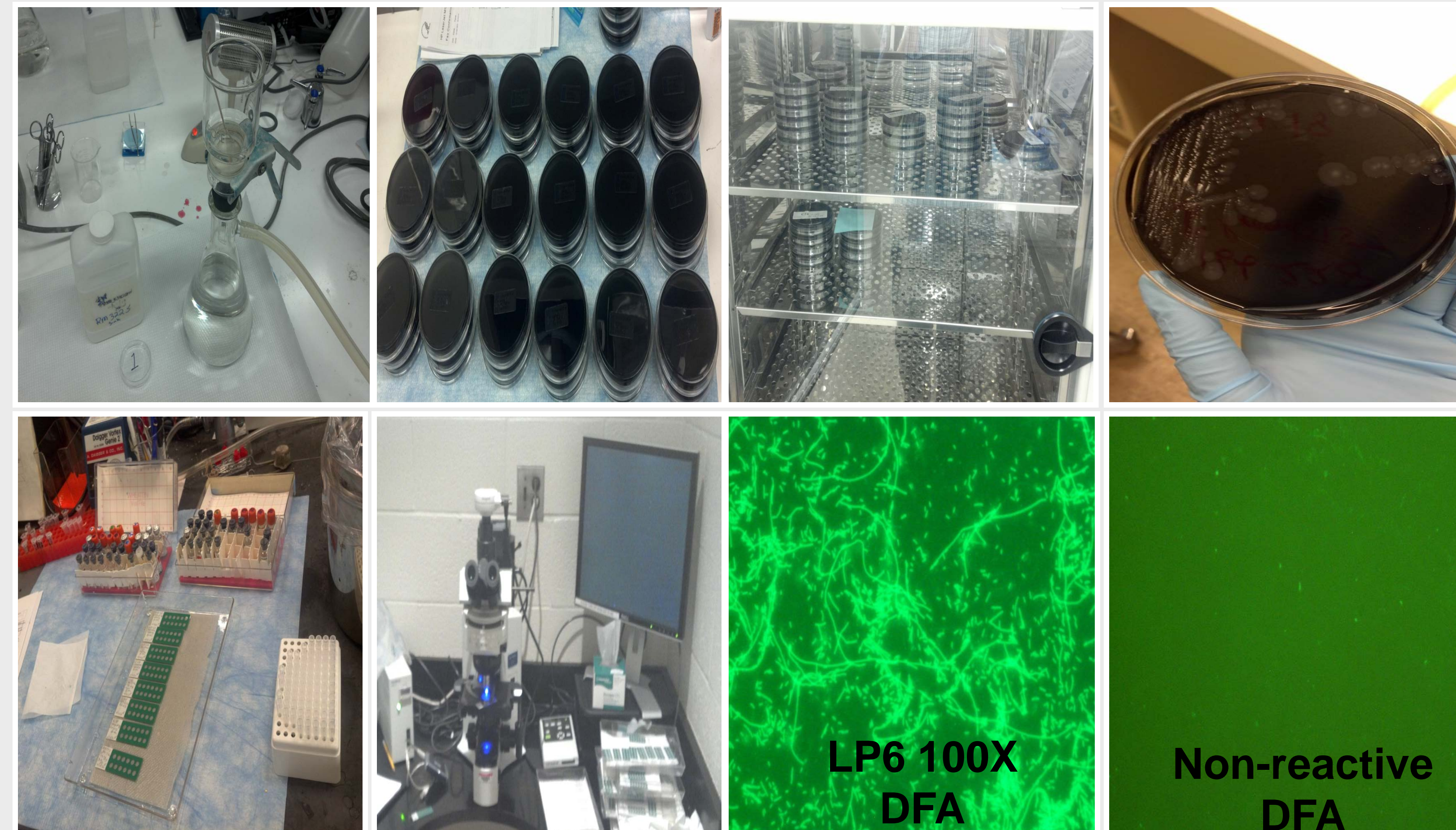
Since *Legionella* from community water sources can be epidemiologically linked with Legionnaires' disease, the MD DHMH laboratories isolate *Legionella* culture from environmental water sources and detect *Legionella* species and serogroups to identify potential environmental sources of pathogenic *Legionella*. This study evaluated the identification and isolation of *Legionella* species in the State of Maryland environmental water samples and swabs collected during a 2011 three month period that included an unprecedented three multi-region *Legionella* species outbreak scenario with associated cases of morbidity and mortality.

## STUDY DESIGN

The MD DHMH Laboratories Administration Division of Virology and Immunology performed pre-remediation and/or post-remediation testing for three *Legionella* outbreaks in three Maryland regions during the period of October 2011 to December 2011.

## METHODS

For each of the approximate 400 bulk water and swab specimens collected, the laboratory performed sample filtering (bulk water), culture isolation (bulk water and swabs), and strain serotyping by direct fluorescent antibody (DFA) to identify *Legionella* species and serotypes.



## SUMMARY OF RESULTS

Each of the three sites tested positive for detectable levels of *Legionella* species. Sites #1 and #3 contained a combination of *Legionella pneumophila* serogroups 1 and 6 and non-pneumophila *Legionella* species. Site #2 contained *Legionella non-pneumophila* species only.

### SITE 1

*Legionella* outbreak at a nursing center. 35 pre-remediation specimens collected (18 bulk water, 17 swab). RESULTS: 29 specimens tested reactive for *Legionella pneumophila* serogroup 1 (LP1); 3 specimens tested reactive for *Legionella spp.* (non-pneumophila); 3 specimens tested non-reactive for *Legionella*.

### SITE 2

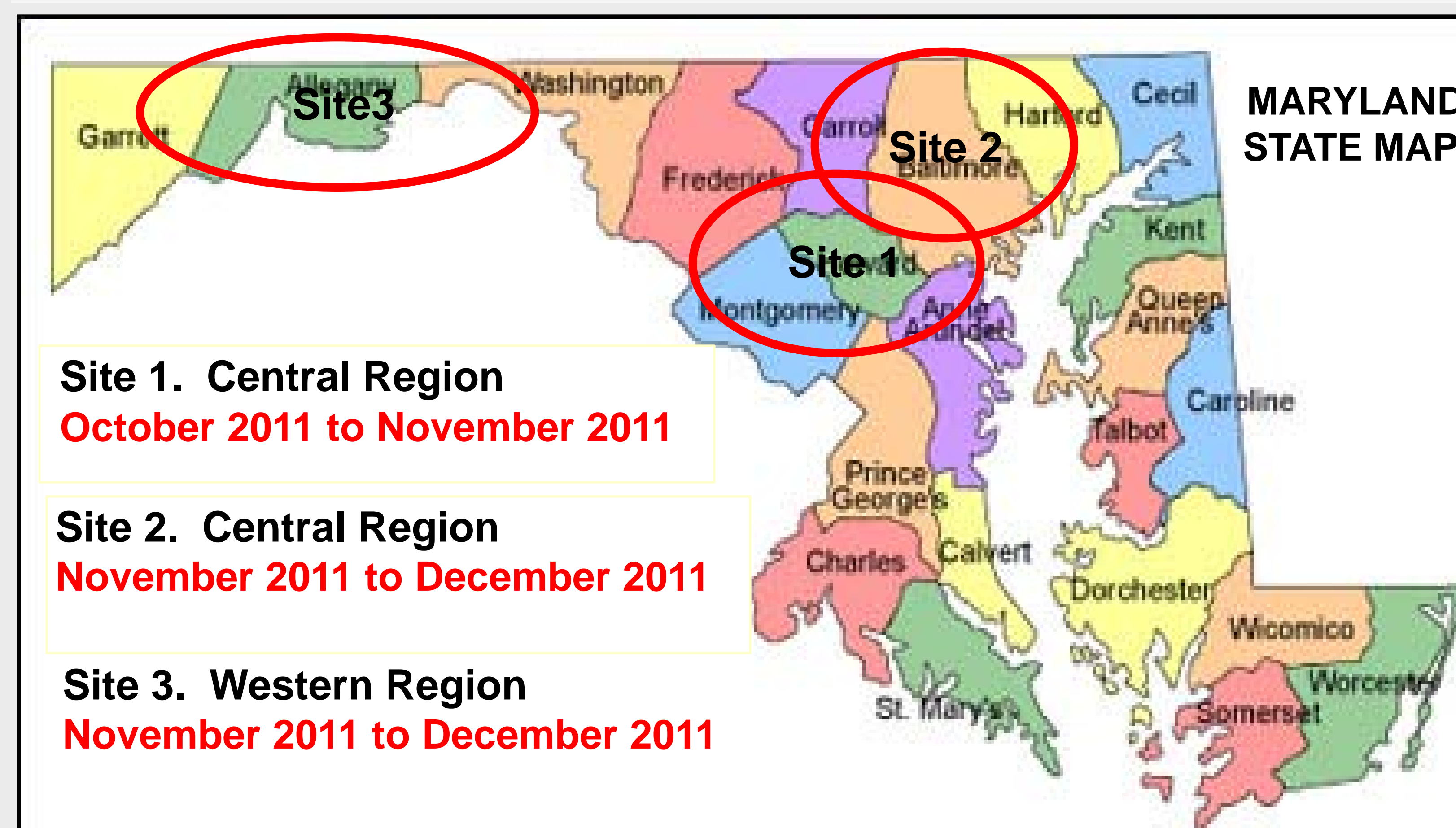
*Legionella* outbreak at assisted living center. 63 pre-remediation specimens collected (32 bulk water, 31 swab) and 40 post-remediation specimens collected (21 bulk water, 19 swab) RESULTS: 23 pre-remediation specimens tested reactive for *Legionella pneumophila* serogroup 6 (LP6); 16 specimens tested reactive for *Legionella spp.* (non-pneumophila); 3 specimens tested reactive for both LP6 and non-pneumophila *Legionella spp.*; 11 specimens tested non-reactive for *Legionella*.

### SITE 3

*Legionella* outbreak at apartment complex. 19 pre-remediation specimens collected (11 bulk water, 8 swab) and 17 post-remediation specimens collected (9 bulk water, 8 swabs). RESULTS: 3 specimens tested reactive for *Legionella pneumophila* serogroup 1 (LP1); 3 specimens tested reactive for both LP1 and non-pneumophila *Legionella spp.*; 13 specimens tested non-reactive for *Legionella*.

## TIMELINE

Environmental *Legionella* Outbreaks in the State of Maryland from October 2011 to December 2011.



## CONCLUSIONS

This study in the State of Maryland may represent an example of the increasing trend of Legionnaires' Disease cases nationwide. Impacts of climate change, status of water pipers, and a growing population of older adults more susceptible to Legionnaires' Disease, may serve as contributing factors. This observed increase of Legionnaires' Disease cases may highlight the need for state as well as national public health programs to revisit current policies and environmental health monitoring efforts to detect pathogenic levels of *Legionella* in water sources.

### DISCLAIMER

The contents of this poster are solely the responsibility of the researchers and do not necessarily represent the official views of the State of Maryland Department of Health and Mental Hygiene Laboratories Administration.

