

**ID: 34201666**

**Infectious Diseases - Foodborne, Infectious Diseases - Host Site Description**

**Los Angeles County Department of Public Health**

**Assignment Location:** Los Angeles, US-CA  
Los Angeles County Department of Public Health  
Acute Communicable Disease Control Program

**Primary Mentor:** Jemma Alarcon, MD, MPH  
Medical Director, Food and Water Safety Unit  
Los Angeles County Department of Public Health

**Secondary Mentor:** Marifi Pulido, PhD, MPH  
Epidemiologist, Food and Water Safety Unit  
Los Angeles County Department of Public Health

**Work Environment**

Hybrid

**Assignment Description**

The Los Angeles County Department of Public Health (LAC DPH) is the agency with primary responsibility for foodborne disease detection and outbreak investigations in LAC. LAC DPH serves a large and diverse population of over 10 million residents, one of the largest local departments of public health in the United States. LAC residents report over 90 languages as their primary spoken language; 48% of our residents are Hispanic, 28% White, 16% Asian, and 8% Black. Significant housing disparities and income inequality exists with 14% of LAC residents living in poverty in 2023. One of the DPH's top priorities is to advance health equity. Foodborne illnesses contribute to considerable morbidity in our jurisdiction, accounting for more than 5,000 confirmed reportable foodborne disease cases in 2023. The reported foodborne disease cases included over 1,400 Salmonella cases, 689 Shiga toxin-producing Escherichia coli (STEC) infections, and 2,766 Campylobacter cases. An average of 25 foodborne outbreaks are reported annually, not including 45 Salmonella and 47 Shigella/STEC local clusters identified via whole genome sequencing (WGS) in 2023. Increases to epidemiologic staff dedicated to Salmonella surveillance and outbreak response are needed. Reports of waterborne pathogens significantly increased in 2023, compared to 2019. Cyclospora case reports doubled (N=65). Cryptosporidium and Giardia case reports each increased over 40% to 259 and 859 cases, respectively. A current challenge to waterborne surveillance and response is the need to fund an epidemiologist whose primary role is to oversee these pathogens. The size of the County and high burden of disease make surveillance and outbreak response challenging. There are over 25,000 food retail establishments across LAC. LAC DPH conducts over 55,800 restaurant inspections and 13,250 food market inspections annually. Many people in Los Angeles eat at small restaurants and street food vendors with poor record keeping, making food tracing difficult. Also, Angelenos are highly mobile and travel outside the county and to Mexico, bringing back cheeses and other homemade delicacies that may increase their risk of exposure to foodborne illnesses.

The CSTE fellow will be an integral part of the team and participate in surveillance activities, outbreak investigations, cluster investigations, and webinars and conference calls with the California Department of Public Health (CDPH), the Food and Drug Administration (FDA) and the Centers for Disease Control & Prevention (CDC).

The CSTE fellow will:

- Participate in routine disease surveillance of a set of reportable conditions that will likely include Brucellosis and Listeria. This includes reviewing reports of illness to determine whether additional follow-up is needed, reviewing medical records, contacting laboratories for isolates to be forwarded to the Public Health Laboratory, and interviewing the suspect cases for more detailed demographic, medical, and exposure history.

**ID: 34201666**

**Infectious Diseases - Foodborne, Infectious Diseases - Host Site Description**

**Los Angeles County Department of Public Health**

- Support and often lead foodborne outbreak investigations. This involves the monitoring of foodborne illness complaints submitted by the public regarding restaurants and catered events where patrons may have been exposed to contaminated food, interviewing potential cases and controls, interviewing food handlers, coordinating the collection of stool specimens and their delivery to the LAC Public Health Laboratory, entering and analyzing data, and writing the final outbreak report.
- Lead the investigation of Salmonella and Shigella clusters identified via Whole Genome Sequencing. This involves analyzing cluster data - including local and national databases (e.g. SEDRIC), reviewing case report forms to assess for common exposures, and re-interviewing cases if needed.

**Describe Statistical and Data Analysis Support, Such as Databases, Software, and Surveillance Systems Available to the Fellow**

The fellow will have access to the LAC-DPH electronic surveillance system IRIS (Integrated Reporting, Investigation and Surveillance System). They will use Microsoft Access, Microsoft Excel, REDCap, and SAS software for data management and analysis.

**Projects**

**Surveillance Activity Title: Foodborne and Waterborne Disease Surveillance**

*Surveillance Activity Description:*

The fellow will participate in disease surveillance of a set of reportable conditions. For Shigella and Salmonella, the fellow will provide support and review case report forms submitted by public health nurses. For Listeria, Vibrio and Brucella, the fellow will conduct the case interviews and obtain medical and laboratory records for review. The fellow will analyze surveillance data to identify clusters and/or outbreaks.

*Surveillance Activity Objectives:*

Objectives: The primary objective of this activity is for the fellow to become familiar with routine passive surveillance. The fellow will learn about similarities and differences in the exposure data collected for the different pathogens.

Deliverables: By the end of their first year the fellow will have reviewed or completed at least 20 case report forms for Salmonella, Shigella, Listeria, Vibrio and Brucella cases. The fellow would have also utilized Whole Genome Sequencing data to identify at least 2 Salmonella or Shigella clusters and reviewed the associated case report forms to assess common exposures and next steps in the investigation.

*Surveillance Activity Impact:*

Routine surveillance is key to public health work. It allows for the identification of disease baselines and trends. Surveillance also allows to understand disease dynamics, outbreaks and the risk factors for disease transmission.

**Surveillance System Evaluation Title: Evaluation of Electronic Laboratory Reporting (ELR) System**

*Surveillance System Evaluation Description:*

The fellow will implement a surveillance system evaluation of our Electronic Laboratory Reporting (ELR) System. They will use the CDC guidelines for evaluation surveillance systems (<https://www.cdc.gov/mmwr/preview/mmwrhtml/00001769.htm>) and assess the system's:

**ID: 34201666**

**Infectious Diseases - Foodborne, Infectious Diseases - Host Site Description**

**Los Angeles County Department of Public Health**

Simplicity

Flexibility

Acceptability

Sensitivity

Predictive value positive

Representativeness

Timeliness

The ELR system is a digital platform that allows laboratories to electronically transmit infectious disease test results directly to public health departments. Although quite robust and, overall, effective, there are many challenges to the system given that LAC serves almost 10 million residents.

*Surveillance System Objectives:*

Objectives: The primary objective of this activity is for the fellow to become familiar with the challenges and opportunities of having a large number of labs reporting diseases to LAC DPH. The fellow will learn about the wide geographic range of laboratories (some outside the state) and how this may affect isolate culture/confirmatory testing at LAC Public Health Laboratory and in turn surveillance data.

Deliverables: By the end of this activity the fellow will be able to describe the current ELR processes and provide at least 3 recommendations to improve data timeliness and/or completeness.

*Surveillance System Impact:*

The Unit will benefit from learning about the current ELR laboratory geographic landscape and where some of the challenges and opportunities exist to improve the current reporting system. Given that a majority of the diseases the unit oversees need confirmatory testing to meet case definitions and for whole genome sequencing, it is important to know where some of these labs are located and ways to improve reporting and submission of isolates to our public health laboratory.

**Major Project Title: Salmonella cluster investigations**

*Major Project Description:*

In 2024, approximately 46 local clusters of Salmonella were identified via Whole Genome Sequencing in LAC. Cluster investigation includes reviewing case report forms, creating and implementing hypothesis-generating questionnaires, re-interviewing cases if needed, and analyzing exposure data to determine if an outbreak should be opened. If an outbreak investigation is opened, the fellow will lead the investigation and also be responsible for data analysis and writing a final outbreak report. The fellow would collaborate with a full-time Research Analyst that oversees Salmonella surveillance across LAC. They would also assist CDPH and the CDC with multi-county or multi-state clusters.

*Major Project Objectives:*

Objectives: The fellow will become familiar with SEDRIC, a national database where Whole Genome Sequencing data is shared to investigate multijurisdictional clusters. They will also become familiar with local surveillance and laboratory workflows.

Deliverables: The fellow will develop criteria for opening outbreak investigations after reviewing clusters. They will investigate at least 5 Salmonella clusters per year and present findings at weekly team meetings.

**ID: 34201666**

**Infectious Diseases - Foodborne, Infectious Diseases - Host Site Description**

**Los Angeles County Department of Public Health**

*Major Project Impact:*

Whole Genome Sequencing is a key aspect of food safety surveillance and regularly leads to contaminated food recalls. Prior investigations of local Salmonella clusters have led to successful outbreak investigations and the identification and removal of sick food handlers.

**Additional Project #1 Title: Epidemiology of Giardia in Los Angeles County**

**Project #1 Type: Surveillance Activity**

*Project #1 Description:*

LAC investigates over 800 cases of Giardia every year. Demographic trends and available literature note a likely sexual transmission route. The fellow will explore epidemiological features of this population. They will conduct matching at the patient level using surveillance data for other enteric diseases, including Shigella, which is currently emerging as an extensively drug resistant pathogen in the Men that have Sex with Men Community. Matching with HIV and other sexually transmitted diseases surveillance databases at LAC will also be conducted.

*Project #1 Objectives and Expected Deliverables:*

Objectives: Become familiar with epidemiological and demographic features of Giardia cases in LAC. Understand how foodborne and waterborne diseases may also be transmitted sexually. Learn about risk of developing drug resistance for pathogens affecting vulnerable populations.

Deliverables: Analyze epidemiological and demographic features of Giardia cases from 2019 - 2024. Conduct matching at the patient level using other enteric disease surveillance databases and SAS. Analyze findings from data after matching with surveillance datasets that include HIV and other sexually transmitted infections. Write an abstract and possible manuscript of their findings.

*Project #1 Impact:*

Understanding characteristics of those affected by Giardia will guide public health interventions including education of the public and healthcare providers. It will also enhance our understanding of the interaction of different enteric pathogens and dual diagnoses.

**Additional Project #2 Title: Foodborne outbreak description and trend analysis**

**Project #2 Type: Major Project**

*Project #2 Description:*

Each year the Unit investigates an average of 25 foodborne outbreaks. The fellow would develop and implement an in-depth analysis of outbreak characteristics and trends over the past 3 years. The fellow would explore questions including: 1) For outbreaks where an enteric pathogen was identified, was a food handler linked to the outbreak? 2) Are there food items more commonly implicated in different outbreaks? 3) Are there locations at LAC where outbreaks are more prevalent?

*Project #2 Objectives and Expected Deliverables:*

Objectives: The fellow will have an in-depth understanding of outbreak investigations and outcomes at LAC. They will also learn about enteric pathogen testing and challenges that exist with culture versus culture-independent diagnostic testing.

Deliverables: The fellow will develop and implement an analysis of foodborne outbreak investigations from 2022 - 2024. They will identify whether particular food items are implicated across outbreaks and geographic prevalence of outbreaks across LAC.

**ID: 34201666**

**Infectious Diseases - Foodborne, Infectious Diseases - Host Site Description**

**Los Angeles County Department of Public Health**

*Project #2 Impact:*

Findings will guide development of public health interventions including education and trainings. They may also help in guiding updates to investigation protocols and resource allocation.

**Please Describe the Fellow's Anticipated Role in Preparedness and Response Efforts – Include Activities and Time Allocation (Required Competency of Fellowship)**

The fellow will participate in high consequence pathogen response trainings and activities. This will include visiting the Los Angeles Airport Quarantine Station and learning about steps required for the release of botulism anti-toxin.

The fellow will also participate in tabletop exercises to test current emergency response protocols and attend mandatory trainings related to preparedness and response to emergency situations such as earthquakes, fires, and active shooters.

**Please Describe the Fellow's Anticipated Role in Cluster and Outbreak Investigations – Include Activities and Time Allocation (Required Competency of Fellowship)**

In addition to routine surveillance, the primary role of the Unit is to investigate foodborne and waterborne clusters and outbreaks. The fellow would participate in these investigations at least 50% of their time. Activities would include reviewing food born illness complaints, developing data collection tools, interviewing cases and controls, interviewing food workers, coordinating stool specimen collection, entering and analyzing the data, completing the California state form for reporting outbreaks, and analyzing cluster and outbreak data to write a final outbreak investigation report.