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; 49% of our residents are Hispanic, 25% White, 15% Asian, and 8% Black. Significant housing disparities and income inequality exists with 13% of LAC residents living in poverty from year to year. One of the DPH's top priorities is to advance health equity. Foodborne and waterborne illnesses contribute to considerable morbidity in our jurisdiction, accounting for more than 11,000 confirmed reportable foodborne disease cases in 2025. Foodborne disease cases included over 2,100 Salmonella cases, nearly 700 Shiga toxin-producing Escherichia coli (STEC) infections, and over 2,800 Campylobacter cases reported. Waterborne disease cases included nearly 400 Cryptosporidia cases and over 700 Giardia cases. An average of 25 foodborne outbreaks is reported annually, not including 61 Salmonella and 48 Shigella/STEC local clusters identified via whole genome sequencing (WGS) in 202. Increases to epidemiologic staff dedicated to Salmonella surveillance and outbreak response are needed. 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 of 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 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.
- 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. They will also experience first-hand the benefits and limitations of using passive surveillance systems to identify and respond to outbreaks.

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 serves to understand disease dynamics, outbreaks and the risk factors for disease transmission.

Surveillance System Evaluation Title: Evaluation of Foodborne Outbreak Identification across Los Angeles County

Surveillance System Evaluation Description:
The fellow will implement a surveillance system evaluation of our Foodborne Outbreak Identification 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:

- Simplicity
- Flexibility
- Acceptability

- Sensitivity
- Predictive value positive
- Representativeness
- Timeliness

The Food and Water Safety Unit identifies outbreaks in a variety of ways including from public notifications (via the Foodborne Illness Reporting system), from public health nurses conducting case interviews, from physicians and other healthcare professionals and by analyzing enteric bacteria's whole genome sequences. 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 current methods to identify foodborne outbreaks. The fellow will learn about the challenges and opportunities offered by the current methods to identify foodborne outbreaks and how they affect outbreak investigation and public health responses.

Deliverables: By the end of this activity the fellow will be able to describe the current ways foodborne outbreaks are identified and provide at least 3 recommendations to improve outbreak identification timeliness and/or sensitivity.

Surveillance System Impact:
The unit will benefit from learning about the different challenges and opportunities the current methods to identify foodborne outbreaks offer. It will be helpful to learn of areas where timeliness and sensitivity can improve. Given that a majority of the cases are identified via passive surveillance, it will also be helpful to learn of the impact that active contact tracing has in case identification.

Major Project Title: Salmonella cluster investigations

Major Project Description:
In 2025, approximately 61 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, be responsible for data analysis, and write 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.

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.

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Additional Project #1 Title: Foodborne Illness Reports Description and Trend Analysis
Project #1 Type: Major Project

Project #1 Description:
Each year the Unit investigates an average of 2,500 Foodborne Illness Reports (FBIRs). The fellow would develop and implement an in-depth analysis of FBIRs to assess, among other variables: 1) Geographic trends, 2) Descriptive statistics from patrons submitting reports, and 3) Analysis of types of restaurants reported.

Project #1 Objectives and Expected Deliverables:
Objectives: The fellow will have an in-depth understanding of FBIR reports and variables used to investigate outbreaks. They will also identify geographic clusters, most common reported restaurants and characteristics of patrons using the FBIR system.

Deliverables: The fellow will develop and implement quantitative and qualitative analyses of FBIR reports from 2025 - 2026. They will identify the top 5 geographic areas that report FBIRs and the type of restaurants most often mentioned as part of an FBIR.

Project #1 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.

Additional Project #2 Title: Improving identification of Hemolytic Uremic Syndrome in Los Angeles County
Project #2 Type: Major Project

Project #2 Description:
Every year LAC DPH investigates 650 cases of Shiga toxin-producing E. coli (STEC) and identifies an average of 4 Hemolytic Uremic Syndrome (HUS) cases. The literature notes that 5% to 15% of STEC cases, a majority from O157, develop HUS. The fellow will aid in the creation and implementation of improved HUS Surveillance by 1) Using syndromic surveillance to identify historical and current HUS cases, this will include patient-level review of data and 2) Developing a protocol and REDCap survey to text patients identified as having STEC at one, two and three week intervals after their case was identified (HUS develops on average 1 week after STEC onset).

Project #2 Objectives and Expected Deliverables:
Objectives: Become familiar with epidemiological and demographic features of STEC and HUS cases in LAC. Develop improved surveillance methods to capture HUS cases that have been identified as being infected with STEC. Learn about Syndromic Surveillance, REDCap and texting methods to enhance current surveillance practices.

Deliverables: Analyze likely HUS cases identified from Syndromic Surveillance from 2023 - present. Develop a protocol to deploy REDCap survey via text to patients at one, two, and three week intervals after they were identified as having STEC via Electronic Laboratory Reporting (ELR) to assess for HUS. Analyze findings from data. Write an abstract and possible manuscript of their findings.

Project #2 Impact:
This project may lead to improved surveillance practices to identify HUS among patients infected with STEC in Los Angeles County. It will also help to improve understanding of changing physician antibiotic prescription practices and possible changes in HUS epidemiology. Findings will guide outreach and education efforts for the public and healthcare professionals.

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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 final outbreak investigation report, as needed.