

ID: 59973768

Infectious Diseases, Infectious Diseases - HAI - Host Site Description

Long Beach Department of Health and Human Services

Assignment Location: Long Beach, US-CA
Long Beach Department of Health and Human Services
Communicable Disease Surveillance and Control

Primary Mentor: Elizabeth Marquez, MPH, BS Biology
Senior Epidemiologist
Long Beach Department of Health and Human Services

Secondary Mentor: Nora Balanji, Master of Public Health with Specialization in Epidemiology
Epidemiology Program Supervisor/Communicable Disease Controller
Long Beach Department of Health and Human Services

Work Environment

Hybrid

Assignment Description

The fellow will be placed in the Epidemiology team under the Communicable Disease Surveillance and Control Division of the Long Beach Health Department. The epidemiology team's responsibility is for disease surveillance, detection, and control of the various infectious diseases that affect the local community. The fellow's responsibilities and day-to-day activities include but are not limited to activities related to communicable disease case and outbreak investigation and disease trend surveillance. Additionally, this fellow will learn to update our communicable disease and HIV/STI data dashboards. These tasks will include using databases for different infectious diseases, running statistical analysis from these data, updating case counts, rates, and demographic distribution of communicable diseases, creating geographical maps, and analyzing healthcare-acquired infection rates. The fellows will participate in program specific meetings. Fellow will learn how to use RStudio for data cleaning and analysis and PowerBi and Canva for data visualization. Additionally, the fellow will support with our Healthcare Associated Infections program including reviewing lab reports for reported carbapenem resistant organisms, carbapenemase producing organisms, and *Canida auris*. The fellow will learn proper infection prevention practices for preventing the spread of MDROs to provide guidance to infection preventionists at City hospitals and LTCF and respond to outbreaks at Long Beach healthcare facilities.

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

Statistical Programs: R/RStudio, ArcGIS, Microsoft 365 Suite (Microsoft Word, PowerPoint, Forms, Power Automate, Excel, PowerBI, Illustrator), REDCap, Canva

Surveillance Systems: California Reportable Disease Information Exchange (CalREDIE), CAIR2, Salesforce based CalCONNECT, Snowflake, BioSense/Essence for Syndromic Surveillance, Emergency Management Data Collection System (VEOCI)

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Projects

Surveillance Activity Title: Respiratory Virus Biweekly Surveillance

Surveillance Activity Description:

Continue established respiratory virus (influenza, COVID-19, RSV) weekly surveillance, including downloading the data from the data warehouse, updating R Studio R script as needed, run PowerBi report and update as needed.

Data includes vaccination data, individual case data, syndromic surveillance, and outbreak reports. Analyses and summarize trends to create the report that is shared internally and externally. Fellow will also complete public records requests for all respiratory virus diseases.

Surveillance Activity Objectives:

- Develop RStudio and R coding skills
- Develop PowerBi data analytic skills
- Curate internal and external epi data

Surveillance Activity Impact:

Continue expanded respiratory virus surveillance to inform public health guidance and recommendations. Maintain up-to-date accurate data ready for public data request and internal awareness.

Surveillance System Evaluation Title: Communicable Disease Outbreak Reports and Cluster Analysis Report and Dashboard

Surveillance System Evaluation Description:

The goal of this project is to work with the Communicable Disease Controller, Senior Epidemiologist, and Communicable Disease Investigation Supervisor to review our current communicable disease surveillance practices including triage and disease surveillance. This will also include the frequency we conduct general surveillance reports and communicable disease dashboard refreshes. In collaboration with the Epidemiology Program and the Communicable Disease Investigation team, the fellow will be significantly involved in responding to diverse communicable disease outbreaks. This will give the fellow the opportunity to learn about disease basics including symptoms, incubation period, infectious period, epidemiological linking of case, case definitions, and possible vectors.

Surveillance System Objectives:

- Present a summary of the current surveillance activities and frequency and propose changes as appropriate in alignment with the organization's vision, capacity, and program goals.
- Communicate epidemiologic findings internally and externally in a health literate accessible form
- Present monthly updates during health department communicable disease committee involving multiple stakeholders.
- Participate in emergency management exercises and determine how our surveillance system will play a role in the response.
- Understand regulations and laws affecting epidemiologic activities such as provider and lab reporting requirements in the state and locally and how they impact disease surveillance.
- Learn about the diversity of the population served by the local health jurisdiction to further understand biases, systemic and structural factors affecting health equity to inform surveillance practices.

Surveillance System Impact:

The impact of this review is improved efficacy of the team which in turn improves that teams ability to response to high priority cases and outbreaks.

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Major Project Title: Enhancing Epidemiological Response to Healthcare Associated Infections including Multi-drug Resistant Organisms

Major Project Description:

As multi-drug resistant organisms (MDROs) become increasingly common in southern California, nationally and globally, they pose novel public health challenges to our community. It is important for local health departments to be prepared to rapidly identify and control the spread of these diseases. The fellow's major project will focus on enhancing epidemiological surveillance, facility guidance, investigation, and response to MDROs in Long Beach, specifically in healthcare settings.

Major Project Objectives:

- Develop a comprehensive response plan to MDROs according to risk including facility testing guidance, precautions, and outbreak control methods.
- Continue community partnership with providers, skilled nursing healthcare facilities, acute care facilities, and public health agencies by engaging in dialogue to implement appropriate and effective infection control practices before an outbreak is identified.
- Maintain ethics guidelines, principles, and laws when developing and implementing the response plan.
- Understand funding structure of healthcare facilities, how they interact with public health and serve the community.
- The fellow will develop and implement SMART goals to measure plan effectiveness
- During responses, the fellow will be responsible for curating summary reports throughout and after the response including recommendations and lessons learned.

Major Project Impact:

This project will impact the health departments success and efficiency in responding to HAI and MDRO cases and clusters thus preventing further cases and ensuring the appropriate allocation of limited resources. This project will also result in the development of tangible measures of effectiveness of the response which can be used to justify resources allocated to response.

Additional Project #1 Title: Syndromic Surveillance for Communicable Disease Trends

Project #1 Type: Surveillance Activity

Project #1 Description:

In 2023, the Long Beach Health Department launched its Syndromic Surveillance Program through the CDC's BioSense/Essence platform. Since then, we have onboarded 100% of our hospitals and seek to continue to develop our syndromic surveillance reports. The fellow will work on more traditional communicable disease syndromic surveillance activities including influenza like illness (ILI) and gastrointestinal illness.

Project #1 Objectives and Expected Deliverables:

- Learn the basics of Syndromic Surveillance and manage data available within the system
- Conducts analysis of data using software (RStudio) for data analysis and management including frequencies and descriptive statistics, trend analysis, measures of association, confidence intervals, indexing, and coding
- Review and implement syndrome definitions for overdose, influenza like illness (ILI), gastrointestinal illness, and other conditions
- Create alerts in the ESSENCE platform for signals above threshold. Propose new recommendations or modifications to existing interventions based on surveillance data and alerts
- Inform stakeholders of signals above threshold and participate in response as appropriate. Fellow will develop and design content needed for communication in line with best practices.

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- Curate tailored internal and external syndromic surveillance data reports based on audience, content, and methods for dissemination
- Conduct data validity tests by developing bidirectional communication with acute care community partners.

Project #1 Impact:

This will improve the jurisdictions' ability to identify and respond earlier to potential threats compared to traditional surveillance methods which depend on diagnostic testing and reporting by providers and laboratories. Improved communication with stakeholders and partners for informed decision making.

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

As part of the onboarding process the fellow will be required to take multiple FEMA National Incident Management System (NIMS) trainings in preparation for potential emergencies. The fellow will also have the opportunity to meet the Public Health Emergency Management Team and learn about their logistics and how we collaborate with them during outbreak response and emergencies. For example, in response to the first locally acquired case of dengue virus, our previous fellows had the opportunity to work in collaboration with the PHEM team and canvas the neighborhood providing mosquito education and surveying for other potential cases. During the Summer of 2025, fellows gained hands on experience participating in an emergency response operation alongside PHEM operationalizing FEMA's Incident Command System (ICS) to respond to the city's first measles case since 2019. Currently, as measles cases are increasing nationally and in California our fellows are integrated in response planning and learning about ICS structure.

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

Training at a small local health jurisdiction offers unique opportunities to develop as an epidemiologist through cross-training across multiple specialties including investigating a wide range of disease clusters and outbreaks. The fellow would have the opportunity to learn about outbreak response for a number of diseases including, enteric, vector borne, respiratory, and healthcare associated infections.

During outbreak investigation the fellow will have the opportunity to learn about surveillance case definitions, outbreak definitions, how to develop an epidemiologic curve, interview associated cases or persons of interest, develop tailored interview instruments, geo map cases and analyze the data collected as part of the outbreak investigation. The fellow will also develop the skills to put together outbreak reports using information collected during the cluster and outbreak investigation.

If the opportunity arises, we aim to involve fellows in responding to emerging infectious diseases and public health emergencies. For example, a past CSTE fellow had the opportunity to take on a lead role in interviewing mpox contacts and persons of interest and then got promoted to case interviews during the 2022-2023 multi-national mpox outbreak. This fellow also had the opportunity to interview and monitor avian influenza (HPAI) exposures. Outbreak investigation is anticipated to make-up about 20-50% of the fellow's time depending on need.