ID: 34564076
Infectious Diseases, Infectious Diseases - Foodborne - Host Site Description
County of San Diego

Assignment Location: San Diego, US-CA
County of San Diego
Division of Global Migration Health/ Southern Border Health and Migration Branch &
Epidemiology & Immunization Services Branch

Primary Mentor: Michelle Sandoval-Rosario, DrPH, MPH, CPH
Branch Chief
Centers for Disease Control and Prevention

Secondary Mentor: Adriana Villasenor, PhD, MPH
Senior Epidemiologist
County of San Diego, Health and Human Services Agency

Work Environment
Hybrid

Assignment Description

The CSTE Fellow will work on projects with both agencies (EISB and SBHMB), some as collaborations and others as separate projects. The two supervisors coordinate closely to ensure the fellow's work plan covers all fellowship activities and does not become overburdening. The fellow will also have the opportunity to work with the California Office of Border and Binational Health, a state office based in San Diego, through projects with EISB or SBHMB. The fellowship focus will be on infectious disease surveillance, outbreak investigations, binational and mobile populations, travelers' border health analyses, and preparedness and response activities. The fellow will participate in EISB's phone duty rotations, receiving local disease reports and queries from medical providers and the community during business hours. The fellow may also be on phone duty rotation during business hours for the port health stations and support TB referrals through our transnational CureTB program. The CureTB program ensures continuity of care for people with tuberculosis who move to and from the U.S. by coordinating binational case management and treatment referrals. In addition, the fellow will also work with our Mexico Office and support surveillance and epidemiology activities. The fellow will have access to CDC national datasets to conduct complex epidemiologic analysis.

Day-to-day activities: Prioritizes reports for action, discussion, and monitoring in accordance with protocols. Develops and implements project plans and activities. Participates in and leads outbreak investigations and responses. Analyzes data and creates posters and oral presentations, writes manuscripts, attends educational sessions and staff meetings, and meets with supervisors, team leads, epidemiology colleagues, and project partners. The fellow will have the opportunity to participate in protocol development, policy analysis, and interagency engagement. Across all activities, the fellow will have opportunities to collaborate with relevant teams and staff at SBHMB and EISB.

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

SBHMB maintains the Port Health Activity Reporting System (PHARS) and the CureTB database. DGMH has a data team with specialists in innovative techniques, evaluation, and informatics. Through the larger CDC network, access is available to the Geospatial Research, Analysis, and Services Program (GRASP) and to specific national datasets (e.g., the National Immunization Survey, the California Health Interview Survey, the Farmworker Health Survey, and the National Notifiable Disease Surveillance System). SBHMB has a growing footprint in data visualization and analysis, using Power BI and other relevant platforms to monitor infectious diseases in the border region. San Diego County maintains a reportable disease data system, several syndromic surveillance systems, an electronic laboratory reporting system,

and access to electronic health record systems. In addition to standard Windows software, fellows can access SPSS, SAS, R, and Power BI, Excel, and Access. Both CDC and EISB can provide biostatistical consultation and support.

Projects

Surveillance Activity Title: Epidemiology of Shiga Toxin-Producing Escherichia coli (STEC) and Assessment of Laboratory Testing Methods in San Diego County

Surveillance Activity Description:
Enteric co-infections, cases involving two or more enteric pathogens, are often identified through routine surveillance for enteric diseases, including Shiga Toxin Producing Escherichia coli (STEC). Classification of these depends on diagnostic test performance and current case definitions. In the U.S., most Shiga toxin-producing infections are caused by STEC, but infections from Shiga toxin-producing Shigella are increasing. When Shiga toxin or its genes are detected by culture-dependent diagnostic tests (CIDTs), cases should be classified as STEC or Shigella based on culture results. However, limitations such as specimen availability and viability, or limited lab capacity, may prevent culture confirmation. As a result, some cases are recorded as co-infections for surveillance purposes, even if only one pathogen is truly present. Accurate identification of true enteric co-infections is critical because they may increase the risk of severe complications and adverse outcomes. The aims of this surveillance activity are to characterize the rate of true enteric co-infections and to identify opportunities to improve co-infection detection and classification within existing surveillance systems.

Surveillance Activity Objectives:
The objectives of this project are to conduct a comprehensive descriptive epidemiologic analysis of STEC cases, examining demographic, temporal, and geographic trends to understand patterns of disease occurrence; quantify and characterize co-infections reported with STEC by determining their frequency, identifying types of co-infecting pathogens, and assessing potential risk factors; evaluate laboratory testing and reporting practices by reviewing current testing methods and protocols for STEC and co-infecting pathogens to identify gaps, inconsistencies, and opportunities for improvement; and develop actionable insights and disseminate findings through an internal report summarizing key results and an abstract or manuscript for presentation at scientific or public health venues.

Surveillance Activity Impact:
This project will strengthen the understanding of STEC epidemiology and co-infection patterns by leveraging data from the local electronic disease registry. The findings will provide critical insights into disease burden, laboratory testing methods, and surveillance gaps. These results may inform recommendations to improve laboratory testing protocols, enhance case investigation procedures, and guide public health interventions to reduce morbidity associated with STEC and related enteric infections.

Surveillance System Evaluation Title: Evaluation of a Binational Variable Implementation and Use within the National Notifiable Disease Surveillance System

Surveillance System Evaluation Description:
In 2013, the CSTE recommended that CDC's National Notifiable Diseases Surveillance System (NNDSS) incorporate a binational case variable to identify cases associated with Mexico and Canada, and, when possible, individual jurisdictions integrate this variable into their electronic reportable disease surveillance systems. In 2016, CDC's National Notifiable Disease Surveillance System (NNDSS) incorporated the binational variable, called Binational Reporting Criteria (BRC), into CDC's guidance for states disease notifications to CDC; it allows jurisdictions to select all binational elements that apply to a given case. There are additional NNDSS variables with binational implications, such as Country of Birth, Country of Exposure, and Country of Usual Residence. All of these variables can facilitate the identification of and response to binational cases and outbreaks in local and state systems that may require public health action.

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Although the binational variable largely characterizes potential exposure (past or future), at the local and state levels, it also reflects a need to communicate or collaborate with Mexico or Canada. The 4 U.S. states bordering Mexico have had enhanced resources to advance binational case surveillance and reporting with Mexico through the Binational Border Infectious Disease Surveillance Program, while other states have not.

Surveillance System Objectives:
The fellow will collaborate with CDC to describe the implementation and use of binational and related variables at the national level and to characterize the reported binational cases in non-border and border states. Identify key users and non-users in areas with large Mexican-born and Canadian-born populations to assess utility and, if needed, modify the BRC; and determine areas for improvement in jurisdictional outreach and education regarding the use of binational and related variables in case notifications. Consider developing additional CSTE recommendations/position statements to advance implementation and use. Provide detailed recommendations for improved data visualization within CDC NNDSS's binational dashboard.

Surveillance System Impact:
The BRC and related variables are important for understanding binational disease burden in border and non-border regions and for focusing binational public health efforts and responses. The BRC variable enables bilateral/trilateral participation by North American countries in response to shared cases and outbreaks to support effective disease control. May be used for rapid detection of binational cases in local and state electronic disease surveillance systems to facilitate collaboration/communication with Mexican and Canadian counterparts for response and control measures. Earlier detection of outbreaks or disease trends helps document the binational burden of notifiable infectious diseases and may support resource advocacy.

The results of the assessments will inform next steps to advance implementation of the binational variable and improve the public health response to binational cases involving Mexico and Canada.

Major Project Title: One Health Public Health System

Major Project Description:
One Health is a term referring to the ancient concept that the health of people, animals, plants, and our shared environment is all connected. EISB's One Health Epidemiology Program (OHEP) is led by a multidisciplinary team at the County of San Diego whose aim is zoonotic disease prevention and addressing other One Health concerns with community partners and stakeholders. We recognize wildlife as essential for healthy ecosystems and for their role as sentinels for our environment. The fellow would assist in ongoing projects such as designing zoonotic prevention disease resources, zoonotic disease surveillance, zoonotic disease investigation and response, and community outreach with relevant communities at greatest risk

Major Project Objectives:
The objective of the project is to develop and enhance the capacity for surveillance and response in the County of San Diego. Data analysis deliverables would include descriptive epidemiology, frequency of animal health diseases collected in San Diego County, and the analysis of risk/transmission factors related to human/animal health and data interpretation. The fellow would also gain experience in the One Health approach to disease control and learn practicalities in developing systems to interface human and veterinary surveillance systems.

Major Project Impact:
This will help to prioritize the development of disease protocols and procedures, and investigation guidelines. The goal is to leverage the relationships between human and animal health to promote a healthy community and environment for the residents of San Diego County.

The public health impact is expected to be substantial, as the interface between human and animal health is gaining attention and relevance locally and globally. Thus, developing a health department's capacity for One Health surveillance strategies is expected to be foundational in understanding and responding to the human-animal interface locally, and may be a model of other health authorities looking to develop similar systems.

Additional Project #1 Title: Port Health Activity Reporting System (PHARS)
Project #1 Type: Surveillance System Evaluation

Project #1 Description:
The CDC Port Health Activity Reporting System (PHARS) is a vital surveillance system that enables Port Health Station staff to capture illness notifications received from health departments and other public health partners. This system serves as both a repository and a case management tool for illness response and public health interventions. The fellow will have the opportunity to analyze cases and evaluate the PHARS system for notifications related to San Diego, El Paso, and other Port Health Stations concerning individuals with, or suspected of having, infectious diseases and a history of travel. This analysis is part of a broader effort to determine whether there has been an increase in infectious diseases, specifically tuberculosis (TB) and malaria, reported in the southern border region.

The fellow will conduct a comprehensive evaluation of the PHARS system, including data quality and completeness, user acceptability, the types of partners and agencies that notify Port Health Stations, and the consistency of notifications across health departments and border states. Additionally, the fellow will assess disease notification trends to identify patterns and public health responses.

Project #1 Objectives and Expected Deliverables:
The objectives and expected deliverables include the following: 1) Evaluate the quality and completeness of data captured within the PHARS system. 2) Assess user acceptability and engagement with the PHARS system among Port Health Station staff. 3) Identify the types of partners and agencies that contribute notifications to the PHARS system. 4) Analyze disease notification trends, focusing on TB and malaria, to determine any increases or declines in reported cases and barriers to notification. 5) Investigate specific border-crossing populations that may be contributing to changes in disease incidence.

Project #1 Impact:
The findings from this evaluation will provide critical insights into the effectiveness of the PHARS system in capturing and managing illness notifications. By identifying trends and potential increases in infectious diseases, the evaluation will inform targeted public health interventions and resource allocation. Additionally, enhancing the quality and completeness of data will improve the PHARS system's overall functionality, provide insights into barriers to notification, and ultimately lead to better health outcomes for populations at risk along the southern border.

Additional Project #2 Title: Medical tourism Impact
Project #2 Type: Surveillance Activity

Project #2 Description:
The growth of medical tourism has led to an increase in U.S. citizens seeking medical care abroad due to lower costs, greater accessibility, or cultural preferences, but it has also resulted in a rising number of complications upon their return. This project focuses on understanding the burden of medical tourism complications on U.S. citizens who travel to Mexico and Latin America for medical procedures. Burden of Medical Tourism Complications on US Citizens. The project will be led by the fellow, who will collaborate with the CDC's Event-Based Surveillance (EBS) Team (Global Health Center, GHC) and DGMH Travelers Health Branch to collect and analyze secondary data from EBS and other available data.

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Project #2 Objectives and Expected Deliverables:
This data will help assess the scope and impact of medical tourism-related complications, such as infections, surgical issues, or post-treatment medical conditions, on U.S. citizens. By identifying the prevalence and types of complications, the project aims to provide valuable insights into the risks U.S. citizens face when seeking medical care abroad, to improve the management of these cases upon return to the U.S., and to inform communication efforts to increase awareness among travelers.

Project #2 Impact:
This project will strengthen public health surveillance and response related to medical tourism by improving understanding of the frequency, severity, and types of complications experienced by U.S. citizens seeking medical care abroad. Findings will inform and enhance early detection of travel-associated complications, and support targeted risk communication and traveler education efforts.

Additional Project #3 Title: Tuberculosis Transnational Referral Evaluation
Project #3 Type: Other

Project #3 Description:
Over 70% of tuberculosis (TB) patients in the US are foreign-born, and nearly 5% leave the US prior to completing a full course of TB therapy. Completion of TB therapy is a cornerstone strategy for TB elimination in the US and globally. CureTB is a program within SBHMB that works with TB programs across the US and in multiple destination countries to ensure continuity of care for patients who leave the US before completing TB therapy. The program maintains detailed information regarding referred patients and treatment outcomes. The project would involve conducting descriptive analyses of patients referred to CureTB in 2025, examining referral trends and treatment outcomes to inform future activities and enhancements.

Project #3 Objectives and Expected Deliverables:
The key objectives are to assess the breadth of referral sources, destination countries, and treatment outcomes, and to identify trends in 2025 compared to a prior time frame analyzed through 2024, as well as elements that predict successful treatment outcomes. A secondary objective is to provide a general descriptive analysis of patient characteristics referred, including site of disease, drug resistance, and primary language. The fellow will be able to submit an abstract and present findings at national or local conferences as an expected deliverable.

Project #3 Impact:
Few countries have formal systems to refer TB patients to care upon transfer or relocation to destination countries. Understanding the reach of the CureTB system within the US, as well as its utility for timely referral and its ability to capture outcomes, will inform enhancements to the system and promote understanding of how such mechanisms can strengthen TB surveillance and outcome capture in established surveillance systems.

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

SBHMB works with a variety of border partners (e.g. airport authorities, Dept of Homeland Security, health departments, etc.) to develop and exercise Communicable Disease Response Plans (CDRP), standard operational procedures for responding to specific illnesses at the ports of entry, and promotes the development of the US-Mexico illness response plans based on the Technical Guidelines for US-Mexico Coordination. The fellow can be engaged in reviews and revisions of these plans, as well as participate in tabletop exercises. The fellow will also participate in communicable disease response efforts through their Duty Officer rotations with SBHMB Port Health Stations to provide real time response and collaborate in enhancing port health station response protocols.

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The fellow will complete training on port health preparedness and CDC Ready Responder. Working with EISB, the fellow will complete National Incident Management System and Incident Command System training through ICS-400 and will be provided the opportunity to help design, conduct, monitor and report on preparedness exercises that involve local and state partners. The fellow will also participate during their Phone Duty rotation in illness responses as needed and appropriate. It is anticipated that at least 20% of activities would designate to this competency.

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

During their rotation as EISB Phone Duty Staff, the fellow will actively participate in the intake, triage, and investigation of reported disease cases, clusters, and outbreaks. The fellow will be fully trained on relevant disease conditions and integrated into routine phone duty operations, contributing to case assessment, data collection, and coordination with internal and external partners. Based on their interests and program needs, the fellow may lead or assist in specific case, cluster, or outbreak investigations and contribute to the development of abstracts or manuscripts for dissemination of findings. These activities will comprise approximately 20% of the fellow's weekly effort.

In collaboration with the SBHMB, the fellow will support investigations of binational outbreaks and clusters of public health significance across the U.S.-Mexico region. This may include assisting with characterizing cross-border transmission patterns and serving as the SBHMB representative for select investigations as they arise. Through EISB phone duty and SBHMB port health station duty officer rotations, the fellow will gain hands-on experience in frontline outbreak response, including application of federal, state, and local isolation and quarantine protocols. Additional opportunities for epidemiologic analyses may be available depending on outbreak activity and the fellow's interests, including analyses of disease severity, hospitalization, variant emergence, co-infections, and impacts on surveillance systems.