ID: 73418718
Infectious Diseases - HAI, Infectious Diseases - Host Site Description
Hawaii Department of Health

Assignment Location: Honolulu, US-HI
Hawaii Department of Health
Disease Outbreak Control Division

Primary Mentor: Garret Hino Jr., PharmD, BCIDP
Acting HAI/AR Program Manager
Hawaii State Department of Health

Secondary Mentor: Nicole Mintz, MPH, CIC
NHSN Epidemiologist
Hawaii State Department of Health

Work Environment
Hybrid

Assignment Description

The CSTE Fellow will be assigned to Healthcare-Associated Infections (HAI) Program, within the Disease Outbreak Control Division (DOCD). The HAI Program Manager and Pharmacist, Dr. Garret Hino, Jr., will be primarily responsible for mentorship, support, and guidance. The current NHSN Epidemiologist and former CSTE AEF Fellow, Nicole Mintz, will be the secondary mentor, and will guide the fellow through a collaborative onboarding process and will serve as the senior epidemiologist overseeing tasks, activities, and projects assigned to the fellow. Hawaii is fortunate to have our State Epidemiologist, Dr. Sarah Kemble, as the third mentor. Her role will be to review projects and provide guidance, as well as foster connections with public health opportunities across the islands.

The fellow will gain immense exposure to HAI subject areas including infection prevention and control (IPC), multidrug-resistant organism (MDRO) outbreak investigation and response, and the entire data lifespan from collection and cleaning to analysis and visualization. In the initial onboarding period, the fellow will be introduced to public health experts across the Division including those from the Health Data Informatics Office, the Disease Investigation Branch, the Immunizations Branch, and the Office of Rapid Epidemiologic Response and Health Equity. The fellow will also be introduced to those outside of our division with whom we work collaboratively, including those from the State Laboratories Division, Environmental Health, Clean Water Branch, Chronic Diseases, and the Office of Public Health Preparedness and Response. We have created a flexible timeline for the first 8 weeks of the fellowship to introduce training materials and smaller hands-on projects about the core principles of HAI, MDROs, IPC, and healthcare epidemiology. By the 8-week point or when the fellow feels ready, we will begin working on the surveillance system evaluation. The fellow's weekly activities include project work, meeting with mentors, attending HAI team meetings, and field outings to meet with other public health branches. On a monthly basis and after a thorough training, the fellow will serve as the "Officer of the Day", managing and addressing public inquiries, exposing them to a variety of disease topics.

The fellow will gain field work experience through healthcare facility outreach and response efforts during outbreaks of healthcare-associated infections. The fellow will work closely with the epidemiologists and infection preventionists on these investigation and response efforts to mitigate ongoing outbreaks and prevent future outbreaks. The fellow will also work with our external healthcare partners through multiple collaboratives and work groups established by our HAI/AR program by providing education, resources, and support. Through these established networks, the fellow can look forward to creating a lasting impact within our healthcare facilities by identifying meaningful action items through their data analysis and project.

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Both mentors will meet regularly with the Fellow to introduce and integrate them into DOCD and ensure that the environment is and remains conducive to optimal professional development. Together, the mentors will commit to working closely with the Fellow and meeting with them as often as needed initially to help develop the Fellow's plan and facilitate progress on their primary project as well as review data and questions related to other projects and activities. Regular meetings will evaluate progress and ensure that activities are appropriate and realistic to achieving the Fellow's broader goals. The mentors and relevant staff will also be available for consultation as needed.

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

The fellow will gain access to a wide variety of data sources including the National Healthcare Safety Network (NHSN), the Hawaii electronic surveillance system for reportable communicable disease (MAVEN), data from the State Laboratories Division (SLD), and the REDCap platform. Furthermore, the use of publicly available datasets, such as those from the Centers for Medicare & Medicaid Services (CMS), will be encouraged. The surveillance coordinators at the Department of Health will aid in using these platforms for certain conditions, such as foodborne illness cases and influenza reports.

For data cleaning, analysis, and visualization, the fellow will have access to Microsoft Office products, R, SAS, Epi Info 7, PowerBI, ArcGIS, and training materials and opportunities. Statistical consultation is available (i.e., biostatistician, senior epidemiologist).

Projects

Surveillance Activity Title: Wastewater Surveillance of Carbapenemase-Producing Organisms (CPOs) and Candida auris in Nursing Homes

Surveillance Activity Description:
The Hawaii State Lab Division (SLD) have identified four healthcare facilities in Honolulu County which have agreed to participate in wastewater surveillance (WWS) for the detection of pathogens shed in resident waste. The testing targets include five carbapenemase resistance genes (VIM, OXA-48, IMP, NDM, KPC) and Candida auris (C.auris). Correlating resistant pathogens detected in facility wastewater to residents is still a relatively new surveillance methodology, and the implications of detection in facility wastewater are not yet clearly established. The Healthcare Associated Infections Program of the Hawaii State Department of Health - Disease Outbreak Control Division plan to conduct concurrent Point Prevalence Surveys (PPS) among high-risk residents in their respective facilities to correlate findings from wastewater collection. A PPS is a systematic assessment conducted in healthcare settings to determine the prevalence of multidrug-resistant organisms (MDROs) among patients at a specific point in time, targeting carbapenemase-producing organisms (CPOs) and C. auris. Screening for CPOs involve rectal swabs while screening for C. auris involve either axilla or groin swabs from consenting patients. These epidemiologically significant organisms have limited treatment options, high mortality rates, and can spread via direct/indirect contact from infected/colonized individuals. PPS are important due to their role in guiding infection control strategies, optimizing antimicrobial use, preventing the spread of resistant organisms within healthcare facilities, and is a recommended activity by the Centers for Disease Control and Prevention (CDC).

The Fellow will work with the antimicrobial resistance epidemiologist, the HAI outbreak epidemiologist, the HAI/AR program manager, and external partners to establish a protocol for wastewater surveillance including frequency, action based on results, and communication templates. SLD will collect samples from wastewater on regular intervals and test for CPOs and Candida auris. Based on findings, the Fellow can implement the relevant steps based on the response

protocol created. Surveillance data from wastewater may be used as a proxy to determine when colonization screening may be indicated in the nursing homes attached to the wastewater system.

Surveillance Activity Objectives:
The objective of establishing wastewater surveillance for CPOs and Candida auris is to test a new surveillance methodology for these highly concerning pathogens. This will provide insights into antimicrobial resistance among some of our most vulnerable community members; those residing in nursing homes. The deliverables include a testing protocol, communication materials to explain the project in accessible language to community members, and interpretation of surveillance results with a summary of actions taken and outcomes following results.

Surveillance Activity Impact:
Wastewater surveillance of CPOs and Candida auris will give the DOH a better understanding of the prevalence of these organisms among our vulnerable communities, safety of nursing home residents, and possible need for colonization screening or infection prevention and control interventions.

Surveillance System Evaluation Title: Evaluation of the Catheter-Associated Urinary Tract Infection (CAUTI) Data from Acute Care Hospitals in Hawaii reported to National Healthcare Safety Network (NHSN)

Surveillance System Evaluation Description:
The Fellow will conduct a surveillance system evaluation of National Healthcare Safety Network (NHSN) data. The Fellow will evaluate Catheter-Associated Urinary Tract Infection (CAUTI) surveillance for the attributes designated in the CDC guide for evaluating surveillance systems. The NHSN Epidemiologist will assist the fellow in gaining access to NHSN, while the fellow completes CDC trainings on CAUTI and NHSN. The fellow will work through defining CAUTI, mapping the NHSN surveillance system and its stakeholders, and exporting CAUTI data for the timeframe of interest. Based on the findings, the fellow will perform an external data validation, in which they will collaborate with one or more hospitals to examine their data collection process and identify any areas for improvement. Since NHSN is a robust system, the surveillance system evaluation may be expanded to include other HAIs as there are five other HAI reported events within NHSN to evaluate. Depending on interest, the Fellow will be encouraged to submit their findings within the surveillance system evaluation by completing an abstract and poster/oral presentation at a conference hosted by a professional organization (e.g., CSTE, APIC, APHA). The Fellow will be invited to present their findings to our division, as well as to the HAI Advisory Committee, which convenes bi-annually.

Surveillance System Objectives:
The objective of the CAUTI surveillance system evaluation is for the fellow to describe the system, use data to determine the strengths and weaknesses of the system, and interpret these results to make evidence-based recommendations on how to improve the CAUTI surveillance in the state. The Fellow will create three primary deliverables, a report detailing the surveillance system, a two-pager or abstract, and a presentation slide deck. Working with mentors, the Fellow will develop a sampling frame, potentially conduct site visits, and disseminate results.

Surveillance System Impact:
This evaluation will provide recommendations for better CAUTI surveillance in Hawaii hospitals. Patients with CAUTIs are at an increased risk for antimicrobial resistance which can become a financial burden to healthcare facilities due to the prolonged duration of stay and additional care required. With improved data streams, this activity will ease the burden of tracking and reporting on facilities, allow for more targeted prevention efforts, and improve the quality and safety of healthcare received.

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Major Project Title: Understanding Demographic Disparities among Persons Infected With Carbapenemase-Producing Organisms in Hawaii

Major Project Description:
Antibiotic-resistant infections, including those caused by New Delhi Metallo-β-lactamase (NDM)-producing Carbapenem-Resistant Enterobacterales (CRE), pose a growing public health threat in Hawaii. The prevalence of NDM among CRE isolates increased significantly from 5% in 2017 to 46% in 2022. A review of 34 NDM-positive cases from 2020 to 2023 identified Escherichia coli, Klebsiella pneumoniae, and Enterobacter cloacae as the most common organisms, with 62% of isolates derived from urine samples. Most cases occurred in older males, with 56% identifying as Asian, including 32% of Filipino descent. Key risk factors included invasive procedures (52%), urinary catheter use (48%), and international travel (36%). The disproportionate number of cases among Filipinos highlights the need for an in-depth evaluation of social determinants of health that may be barriers to care among Hawaii s cases of carbapenemase-producing organisms (CPOs). The fellow will collaborate closely with the antimicrobial resistance (AR) epidemiologist to identify additional data sources and variables of interest. Working alongside other HAI and DOCD staff, the fellow will help develop an analysis plan and determine the most appropriate statistical methods for the study.

Major Project Objectives:
The fellow will work to collect additional information via medical records and/or identify other sources of patient information. Additional variables of interest include primary language, socioeconomic status, residential zip code, insurance status, health literacy, occupation, and history of receiving health care outside of Hawaii. The fellow will work with the data collected to perform an analysis to identify high-risk populations and additional trends among the different racial and ethnic groups. After completion of data analysis, the fellow may write a manuscript and put together a presentation which can be used to share project outcomes at the HAI/AR monthly meetings or other meetings of interest.

Major Project Impact:
The fellow will learn to conduct interviews and/or collect data from different sources. The interview process will provide outreach to the cases that have been affected by these public health threats and understand some of the barriers that may be affecting their healthcare.

Additional Project #1 Title: Improving Response to Carbapenemase Producing Organism (CPO) Case Investigations
Project #1 Type: Surveillance Activity

Project #1 Description:
The current surveillance system for carbapenemase-producing organisms (CPOs) comprises three key components: detection, notification, and response. Detection involves measuring the time from antimicrobial susceptibility testing (AST) to Polymerase Chain Reaction (PCR) confirmation of CPOs. Notification tracks the reporting of lab-confirmed CPO cases to the HAI/AR branch. Response ensures that transmission-based precautions are implemented promptly in healthcare facilities to prevent further spread. A recent evaluation of the CPO surveillance system identified missing data as a significant limitation. CPOs are a nationally notifiable condition but have not yet been made reportable on the State level. Currently, CPO confirmations are communicated via email to the AR epidemiologist or program manager from the Hawaii State Lab, and lab requisition forms are uploaded to SharePoint. Case investigations require communication with the affiliated facility staff, a review of medical records and the collection of relevant data, which are recorded on a case investigation form and entered into MAVEN. The Fellow will collaborate with the AR epidemiologist to gain a thorough understanding of the case investigation protocol. Together, they will work to revise the case investigation form and implement strategies to improve data completeness, enhancing the overall effectiveness of the surveillance system.

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Project #1 Objectives and Expected Deliverables:
The primary objective is to revise the current multidrug-resistant organism (MDRO) case investigation form, which is currently six pages long and includes multiple sections. Based on findings from the CPO surveillance system evaluation and practical experience with case investigations, the Fellow will collaborate with the AR epidemiologist to identify sections or questions to retain, remove, or modify.

Potential revisions include converting some sections from checkboxes to free-text fields for more detailed responses. Additions may include a section to capture additional variables of interest and an extra blank page to document communication notes from healthcare personnel. The possibility of adding a direct case interview component to AR investigations will be explored.

Project #1 Impact:
Enhancing data collection processes for CPO case investigations will streamline workflows and improve data completeness. This will allow the HAI Program to effectively investigate clusters and outbreaks due to CPOs and allow for timely mitigation and response to prevent the spread of CPOs in our healthcare facilities.

Additional Project #2 Title: Visualization of Healthcare-Associated Infections (HAI) Data in PowerBI Dashboard
Project #2 Type: Surveillance Activity

Project #2 Description:
Under the supervision of the NHSN Epidemiologist and with help from the PowerBI specialists at DOH, the fellow may expand upon current data dashboard efforts to create and update a comprehensive HAI data visualization that is updated on a quarterly basis following the quarterly NHSN data checks. The project includes exporting data from NHSN, cleaning data in R or SAS, and importing into PowerBI. Next, the fellow will use PowerBI to create a landing page displaying the Standardized Infection Ratios in the state for six reportable HAI conditions of interest, as well as one separate page for each of these conditions. Data from 17 acute care hospitals and 2 critical access hospitals will be utilized. The dashboard will initially be internally facing only, with the option to seek approval to publicize it.

Project #2 Objectives and Expected Deliverables:
The final deliverable will be a data dashboard housed in PowerBI. The objective is to create a mostly automated landing page for visualizing HAI data each quarter to allow the HAI team and partners rapidly and easily view up-to-date data on reportable healthcare-associated infections in the state.

Project #2 Impact:
This data visualization will allow hospital infection preventionists and other stakeholders to see how their data is being used to inform action for the larger healthcare community. Data may be more accessible to healthcare partners that do not have the resources to regularly analyze and visualize their own data. Timely data can help them decide what areas of improvement they may consider addressing within their facility.

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

DOCD works closely with the Office of Public Health Preparedness and Response, which plans preparedness exercises and recruits Department participants and external partners and stakeholders. The Fellow will be encouraged to participate in these exercises. Every year, at least one Community Assessment for Public Health Emergency Response (CASPER) takes place. Former CSTE AEF Fellows, informatics Fellows, and EIS Officers have all taken part. The incoming fellow will be invited to join for data collection, surveying, and report generating for the next CASPER. This includes interviewing members of the public to inquire about food and water storage, personal medication supply, disaster

readiness, and education on what to do in an emergency. Previous fellows participated in responding to the Lahaina wildfires, the Red Hill petroleum spill, and hurricane preparedness surveying.

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

The Fellow will be expected to work with the HAI outbreak epidemiologist to investigate HAI/AR clusters and outbreaks in a variety of healthcare facilities. In collaboration with the AR epidemiologist, the Fellow will learn about Hawaii's Carbapenemase-Producing Organism (CPO) surveillance system and assist with AR case investigations. The Fellow may also have opportunity to assist in preventive or reactive colonization screenings at healthcare facilities.

Additionally, the Fellow will be expected to gain experience in managing and addressing public inquiries during their Officer of the Day monthly assignment. This responsibility will lead to investigating individual cases of infectious diseases and potentially being the lead investigator for a disease outbreak, particularly for an HAI outbreak. Outbreaks that get reported to the Officer of the Day phone line include respiratory illness outbreaks in schools and long-term care facilities, foodborne illness outbreaks at gatherings or restaurants, and water-borne pathogen outbreaks such as legionella.