ID: 33919248
Infectious Diseases, Chronic Disease - Host Site Description
Guam Department of Public Health and Social Services

Assignment Location: Hagatna, CA-GU
Guam Department of Public Health and Social Services
Office of Epidemiology and Research

Primary Mentor: Patrick P Sotto, BS, MPH
Territorial Epidemiologist
Guam Department of Public Health and Social Services

Secondary Mentor: W. Thane Hancock, MA, MD, MPH
USAPI Regional Epidemiologist (Chief Epidemiology Field Officer)
US Centers for Disease Control and Prevention

Work Environment
100% In-person

Assignment Description

The Fellow will be stationed under the direct supervision of the Territorial Epidemiologist/Administrator, in the Office of Epidemiology and Research, under the Division of Public Health. The Fellow will also work closely with the Career Epidemiology Field Officer to administer epidemiologic support to the other islands who request it. The day-to-day activities include maintaining or improving the current surveillance systems, performing statistical analyses, engaging with healthcare providers and community partners to provide epidemiologic guidance. The Fellow may be involved in high-level/leadership meetings and discussions with the Chief Public Health Officer, Director of the Department of Public Health and Social Services, members of the community, and the Governor's Office. The Fellow will also work with CDC PHAP assigned to the department, as well as with other interns, practicum students, or program fellows that may be based in the Department. Although the primary responsibilities of the Fellow will be on gaining experience in applied epidemiology, the fellow may also be requested to support the Department in activities that lead to the Departments accreditation. Fellow will be afforded opportunities to lead regional meetings, such as the reconvening of the monthly regional calls - EPI Rounds. The Fellows main assignment will be to (1) examine available data on multi-drug resistant organisms (MDRO) affecting Guam for the past 10 years (and historically) from annual summaries, as well as the most current data from morbidity and lab reports in the NEDDS system, and from all hospitals reporting to the DPHSS, and (2) develop evidenced-based protocols and programmatic strategies to address the public health.

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

Microsoft Excel, R Studio (or R), ArcGIS Dashboard, PowerBI, ESSENCE/syndromic surveillance, NBS/National Electronic Disease Surveillance System, National Healthcare Safety Network, SPSS, hospitals/clinics lab and morbidity reports.

Projects

Surveillance Activity Title: Enhancing surveillance for carbapenem-producing organisms in Guam

Surveillance Activity Description:
Antimicrobial resistance (AMR) poses a challenge for Guam. Multiple resistant organisms have been reported by health providers to DPHSS since 2009, and MRSA since 1996. Overall patterns since 2009 show a significant increase since 2009 for Acinetobacter, Escherichia and Pseudomonas and MRSA, which accounts for most drug-resistant organisms. Guam experienced its first outbreak of carbapenemase-producing carbapenem-resistant enterobacterales in 2023 and

therefore, AMR surveillance has become a top priority given this new risk of carbapenemase-producing organisms (CPO). With the previous CSTE AEF, Guam began official participation in the Antimicrobial Resistance Laboratory Network. Guam is also limited in its understanding of the magnitude of AMR within the region, given the expansive patient-sharing network that extends into Southeast Asia, primarily the Philippines, as well as those patients received from neighboring US Affiliated Pacific Islands (USAPI). Based on the work of the CSTE AEF from cohort 21, priority for Guam is to be able to conduct phenotypic testing for CRE, CRAB, and CRPA. This would allow for our epidemiological team to take action while waiting on the genotypic results. Based on the evidence, our team hypothesized that the majority of CPO cases in Guam are NDM (given Hawaii and Asia/Southeast Asia's epi, and the two cases identified). We identified a number of CRAB cases and one of our most recent CPO case identified was a CRAB OXA-23-like. Concerning yeast-species level identification, although, there are no reported cases of C. auris, have been detected as well. However, Guam does not perform yeast-identification at species level, which hinders surveillance efforts in the event of any new outbreaks.

Due to the stated challenges, it is important for Guam to establish and expand its laboratory capabilities to respond to outbreaks in a timely and effective manner. Currently, Guam is engaged in shipping samples to regional Antimicrobial Resistant Laboratory Network (ARLN) laboratories and the CDC as needed. A rapid turnaround will ensure timely intervention and help in patient treatment plans. As such, the Fellow will be tasked with conducting an evaluation of the current surveillance mechanisms in place to reduce to time from suspicion to confirmation and response.

Surveillance Activity Objectives:
The project objectives are to understand the barriers for collecting candidate specimen for ARLN testing and confirmation, to resolve those barriers and improve response time, and to finalize the standard operating procedures associated with ARLN testing.

Surveillance Activity Impact:
Participation in ARLN is effective for passive surveillance but timing constraints poses a barrier to understanding the extent of transmission within the facilities. Thus, it is Guam's priority to continue submitting isolates to determine a baseline threshold for testing needs and to inform future funding requests to support laboratory testing capacity as a necessity for responding to MDROs. Until then, Guam continues to work with the clinical laboratories to improve screening for isolate candidates and the following actions have been taken: 1) Through the process of improving the information-sharing environment, particularly between DPHSS and the three major hospitals (GMHA, GRMC, and Department of Defense), DPHSS has successfully established a symbiotic relationship such that these major acute care hospitals actively seek out potential isolate candidates for submission, rather than DPHSS passively surveilling for candidates. This nurtures a stronger working relationship between the health department and the acute care hospitals suitable for more rapid identification and detection of novel MDROs. This also allows for immediate bi-directional access for each entity to provide/request technical and epidemiologic support for ARLN and other lab testing needs. 2) DPHSS initiated its MDRO response measures through collaboration with the infection control offices at both GMHA and GRMC. The sophistication of the MDRO response strategies supported the need to work directly with the hospitals clinical laboratories (at the approval of the infection control office) to further streamline isolate selection, but most importantly, isolate preservation. Recognizing that most culture results experience delayed reporting to the department, DPHSS saw the necessity to request the preservation of select isolates until a new submission can be made to ARLN.

Surveillance System Evaluation Title: Enhancing foodborne illness and outbreak surveillance in Guam

Surveillance System Evaluation Description:
Guam's foodborne surveillance system and epidemiology response has systematically improved due to critical public health infrastructure advancements employed during the COVID-19 pandemic. The expansion of surveillance, investigation, and laboratory testing capabilities strategically addressed gaps across epidemiologic and laboratory

domains. In November 2024, DPHSS was alerted to an incident involving approximately 30 Japanese high school students experiencing episodes of vomiting on a flight departing from Tamuning, Guam to Narita, Japan. A comprehensive investigation was immediately employed to determine potential etiologies (e.g., foodborne, waterborne, other) given the limited amount of clinical information acquired. While no etiology for the outbreak has been identified, several gaps in epidemiologic and environmental health responses have been revealed. The fellow will perform an system evaluation using several frameworks, both qualitative and quantitative. The evaluation will assess for current limitations and propose recommendations for enhancing the foodborne epidemiology program.

Surveillance System Objectives:
The expected deliverables will be an improved foodborne illness and outbreak response manual that reconciles the principles of epidemiology with the local regulatory requirements of environmental health. The expectation will also be to coordinate a seamless process for ensuring foodborne-related cases, either laboratory or complaint-based, are rapidly investigated. The fellow will also explore the feasibility of developing a dashboard that overlays laboratory-confirmed foodborne cases with syndromic surveillance and environmental health inspections.

Surveillance System Impact:
Foodborne illnesses often go underreported in Guam. This unique approach at using a compendium of surveillance systems to develop a more sensitive detector system will improve the quality of Guam's existing foodborne disease program. This project will help inform the response interventions deployed by the Department while simultaneously expanding knowledge of local foodborne illness epidemiology.

Major Project Title: Retrospective analysis of antimicrobial resistant organisms in Guam.

Major Project Description:
Although the Guam Department of Public Health and Social Services currently receives morbidity reports from Guam Memorial Hospital Authority, and clinical laboratory results from the islands private laboratory and the Guam Regional Medical City, the mechanism does not fully capture urgent threats being monitored nationally and globally. Thus, the surveillance approach requires further strategic design and refinement to better track trends in resistance throughout the island. The fellow will assess the current surveillance reporting mechanisms specific to HAI/AR and recalibrate as needed; onboard the public hospital to submitting isolates for ARLN; reestablish NHSN access and utility within the health department; create a logic model to support the future evaluation of the surveillance system as the system progresses. This project will inform the identification of locally relevant priority antimicrobial resistant pathogens. This will incorporate the epidemiologic assessment but also economical, logistical, and overall challenges posed by detection of a patient with an infected (or colonized) with a resistant organism. This project will also be complemented by the development of Guam's Multi-drug Resistant Organism (MDRO) Containment Plan and Prevention Plan.

Major Project Objectives:
The objectives of this project are to utilize available data to identify and tier the priority multi-drug resistant organisms (MDRO) to align with Guam's MDRO Containment Plan and Prevention Plan. The project will consider the clinical and socioeconomic impact of major MDROs detected in Guam to inform local priorities and interventions. An epidemiologic report, strategic plan, and standard operating procedure for response and prevention activities will be developed by the end of the Fellow's program year.

Major Project Impact:
Establishing priority organisms will inform the response efforts employed by both the Department as well as the healthcare facility. The epidemiologic report will characterize the high-risk groups admitted to the hospital and inform the implementation of a targeted testing strategy designed to prevent introduction of priority organisms prior to

admission to the hospital. The public health impact will be reduced morbidity and mortality attributed to priority antimicrobial resistant organisms and reduced socioeconomic impact of healthcare associated infections.

Additional Project #1 Title: Analysis and publication of annual BRFSS SAQ results
Project #1 Type: Surveillance Activity

Project #1 Description:
The Behavioral Risk Factor Surveillance System (BRFSS) is Guam's leading population-based health survey and a key tool for understanding the health behaviors, needs, and priorities of our community. The results of BRFSS are actively cited in academia and public health projects and programs. While the results of the BRFSS Core questions are publicly available, the State Added Questions (SAQs) are housed offline and would require additional data cleaning and analysis. This project goal of this project is to perform a comprehensive analysis of BRFSS data including the SAQs, summarize the results and present them in a more meaningful and public-friendly report.

Project #1 Objectives and Expected Deliverables:
The Fellow will work closely with the BRFSS team, including the vendor who administers the survey, to prepare a comprehensive annual BRFSS report upon closeout of the calendar year. The report will describe the data collected from the survey, including the State Added Questions. The Fellow will also draft a technical resource to inform a methodological approach to selecting SAQs and present the approach to the BRFSS Advisory Board.

Project #1 Impact:
The public health impact will be the publication and dissemination of vital BRFSS data collected annually to the community and public health partners. Analysis of BRFSS data presents a wholistic approach to informing a range of public health activities that address the underlying risk factors driving Guam's diabetes epidemic and other non-communicable disease morbidities

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

The Fellow will help the Territorial Epidemiologist and Career Epidemiology Field Officer continue work in building preparedness and response competencies amongst the local agency as well as with the Office of Epidemiology and Research. This includes activities requiring engaging with other public health programs, external partners, and possible PHAP/assignees. The Fellow will work with TE in coordinating an in-person workshop to asset map and evaluate technical capacity to develop a center for health security. The Fellow will participate in outbreak investigations. Fellow will support and facilitate finalization of multiple response plans and accompanying exercises such as Communicable Disease Response Plan, Pandemic Plan, Vaccine Preventable Disease Outbreak Manual, and the Guam Field Epidemiology Manual.

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

When the need arises the Fellow will actively support response activities and outbreak investigations. The Fellow may lead an outbreak investigation with the guidance of the TE and CEFO. Subject to funding availability, the Fellow may accompany the CEFO to support outbreak investigations in USAPIs requesting support.