

ID: 59737072

Wastewater Surveillance, Infectious Diseases - COVID-19 - Host Site Description

State of Hawaii Department of Health

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

Primary Mentor: Alden Henderson, PhD, MPH
epidemiologist
Hawaii Department of Health

Secondary Mentor: Doris Di, PhD
Wastewater microbiologist
Hawaii Department of Health

Work Environment

Hybrid

Assignment Description

1. DOCD. Fellow's focus will be on wastewater surveillance. This would include analyzing and reporting, biweekly, the wastewater testing results on a dashboard. Fellow will assist in creation and maintenance of dashboard which will include using and creating appropriate infographics and uploading data. Fellow will rotate in other branches to familiarize them with other aspects of public health. These include immunization, respiratory diseases, food and water borne diseases, hospital acquired infections, and preparedness and response. Fellow will have opportunity to join responses to disease clusters and outbreak and participate in seminars, webinars, and trainings.
2. SLD. Fellow will be a member of the Wastewater Surveillance Team, Medical Microbiology Branch, State Laboratories Division, Hawaii State Department of Health. The responsibilities of the team are to conduct wastewater samples testing for emerging infectious diseases and antimicrobial resistance agents using digital PCR (dPCR) and next generation sequencing and to work with epidemiologists to understand the public health significance of these findings. The wastewater samples are collecting from utilities such as wastewater treatment plants (WWTPs), long-term care facilities, and correctional facilities across the State of Hawaii. Fellow's day-to-day activities include gaining familiarity with collection and testing wastewater samples, generating data, interpreting data, presenting data, attending weekly meeting, bridging epidemiology and laboratory issues related to wastewater testing and surveillance. Participate in discussions on the public health significance of the wastewater results.

Suggested initial work schedule to be two days with epidemiologists, two days with laboratory scientist, and one day telework. This schedule may change to accommodate project activities.

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

1. DOCD has a statistician on staff that will provide support to the fellow. STATA and R are available on the DOH network. The fellow will be the focus for the wastewater surveillance system and will rotate with the group responsible for the notifiable disease surveillance system and become familiar with MAVEN.
2. SLD. Mentor will assist fellow to access CDC NWSS data base to abstract WWS data and use R software to generate graphs and reports.

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Projects

Surveillance Activity Title: Using wastewater to conduct surveillance of respiratory viruses

Surveillance Activity Description:

- Collect and process wastewater samples,
- Analyze samples by D-PCR to identify respiratory viruses,
- Interpret data and write and present surveillance report,
- Evaluate the wastewater surveillance system,
- Report information to public, health professionals, and wastewater utilities,
- Create dashboards to timely display wastewater data.

Surveillance Activity Objectives:

Objectives: determine the public health significance of respiratory viruses in wastewater

Deliverables: 1) identify and measure respiratory viruses in wastewater samples, 2) write abstracts of their work and present results at local and national conferences, 3) write manuscript on presence of respiratory viruses in wastewater, 4) create dashboard to display information from wastewater surveillance.

Surveillance Activity Impact:

Contribute to the knowledge of the public health significance of respiratory viruses in wastewater

Surveillance System Evaluation Title: Paper to Pixels: Converting data recorded on paper to an electronic data capturing and reporting system

Surveillance System Evaluation Description:

Current system captures data on presence or absence and quantification of pathogens in wastewater and manually examines data for trends. The evaluation will assess the automation of the system.

Surveillance System Objectives:

Objectives: automate data on presence or absence and quantify pathogens and examine for trends; identify system errors to automate data,

Deliverables: recommendations to automate the wastewater surveillance system, a user-friendly dashboard that informs public and public health professionals about emerging diseases in the community.

Surveillance System Impact:

Increase awareness and confidence among the public and public health professionals that the information in the dashboard is accurate, transparent, timely, and useful.

Major Project Title: Clinical significance of pathogens in wastewater

Major Project Description:

Collect appropriate samples and optimize assay that analyzes for pathogens in wastewater and determine the clinical significance of pathogens in wastewater.

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Major Project Objectives:

- Collect appropriate and process wastewater samples,
- Analyze samples by D-PCR to identify pathogens,
- Interpret data and write and present report,
- Evaluate the wastewater surveillance system,
- Report information to public, health professionals, and utilities,
- Create dashboards to display real time wastewater data, and
- Identify actionable items for public health.
- The deliverables include a wastewater surveillance system dashboard, surveillance reports, and abstracts, presentations, and journal article.

Major Project Impact:

Contribute to the knowledge of the public health significance of pathogens viruses in wastewater. Answer the question: what is the clinical significance of detecting pathogens in wastewater?

Additional Project #1 Title: Development of Standard Operating Procedures (SOPs) for response to positive wastewater testing in nursing homes

Project #1 Type: Surveillance Activity

Project #1 Description:

HDOH has begun piloting wastewater testing for nursing home facilities in Hawaii. However, without having standardized procedures in place, when positive results are identified in the wastewater specimens, what actions are to be taken next can be unclear, which can delay an effective response. The fellow will develop and refine standard operating procedures (SOPs) for when positive results are identified in wastewater specimens from participating facilities for a variety of pathogens, including COVID-19, influenza, RSV, norovirus, Carbapenemase-Producing Organisms (CPOs), and *C. auris*. As part of this project, the fellow will also coordinate with our CSTE Healthcare Associated Infections (HAI) Applied Epidemiology Fellow (AEF) to design and implement a validation study comparing wastewater results to a point prevalence survey at selected target facilities, which will help inform the development of SOPs.

Project #1 Objectives and Expected Deliverables:

Objectives: Establish standardized procedures for responding to positive wastewater results from participating nursing homes.

Deliverables: 1.) SOPs for responses to positive results of selected specimens. 2.) A summary report of validation study

Project #1 Impact:

Having standardized SOPs for when positive results are identified in wastewater testing will improve the timeliness and effectiveness of the associated public health response.

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

Provide technical and operational support for appropriately scaling wastewater surveillance capabilities in Hawaii to detect and respond to public health threats.

Where appropriate, support wastewater surveillance data integration and analysis into public health emergency information management.

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Develop or update wastewater surveillance decision-making thresholds and key messages for public health action, thereby supporting a timely and cohesive emergency public health response. Fellow can have a one-month rotation in the preparedness and response section and stand by for any events that occur in their fellowship.

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

As part of their epidemiology experience, the fellow will be involved with investigating disease clusters and outbreaks. They will start with investigating cases and expand to identifying the source and transmission of diseases in clusters and outbreaks. Fellow will be on standby to participate in cluster and outbreak investigations.

Please Describe the Fellow’s Anticipated Role in the COVID-19 Response – Include Activities and Time Allocation

While the COVID-19 response in Hawaii is scaling down, there are opportunities for the fellow to participate with case investigations of clusters, contact tracing, and participating in studies such as understanding why COVID clusters are still occurring in long term care facilities. Fellow can have a one-month rotation in the group that conducts COVID-19 response. The fellow will be involved with investigating cases and clusters and analyzing data for trends, transmission patterns, and identify associations.

Please Describe Opportunities for Fellows to Work in Health Equity as well as Incorporating Diversity, Equity, and Inclusion into their Work

1. Seek input from community leaders, advocates, and residents to understand concerns, priorities, and cultural considerations related to wastewater surveillance.
2. Ensure that sampling locations are selected with consideration for diversity in socioeconomic status, geography, and demographics to capture a representative range of communities.
3. Develop communication strategies that are culturally sensitive and inclusive. Translate materials into multiple languages and use accessible formats to reach a diverse audience.
4. Provide training and capacity-building opportunities for individuals from underrepresented groups in the field of wastewater surveillance.
5. Share results with the communities involved in the study and provide opportunities for feedback and discussion.