ID: 45379108
Infectious Diseases - Foodborne, Wastewater Surveillance - Host Site Description
Arizona Department of Health Services

Assignment Location: Phoenix, US-AZ
Arizona Department of Health Services
Preparedness/Office of Infectious Disease Control

Primary Mentor: Joli Weiss, BA; MS; PhD
Chief; Office of Infectious Disease Control
Arizona Department of Health Services

Secondary Mentor: Reshma Neupane, BS; MPH
Food/Waterborne Disease Program Manager
Arizona Department of Health Services

Work Environment
Hybrid

Assignment Description

The Applied Epidemiology fellow (AEF) will be located in the Division of Preparedness; Bureau of Infectious Disease Services (BIDS); Office of Infectious Disease Control (OIDC), under the Food/Waterborne Diseases Program. This Program is responsible for surveillance of food and waterborne diseases such as Salmonella, E. coli, Campylobacter, Botulism, Cryptosporidium, etc. as well as conducting outbreak response activities for these enteric diseases. The Program also conducts wastewater surveillance activities for SARS-CoV-2 and other pathogens of interest (such as Mpox, Influenza, and RSV). The OIDC has about 20 infectious disease epidemiologists covering enteric diseases, mycoses, vaccine preventable diseases, vector-borne and zoonotic diseases, preparedness, and TB. This is a fast-paced environment with seasoned managers, ready to respond to all hazards. The OIDC is often the lead Office staffing the Ops Section of our Health Emergency Operations Center (HEOC). While the HEOC is active, the AEF will be in the Ops Section to address priority tasks that vary from planning of vulnerable population testing, mitigation planning, outbreak control, contact tracing, analyzing test and tracing data, messaging and providing epidemiologic support for local and tribal health departments. Orientation will include Agency orientation classes, training on Incident Command Structure, HIPAA and data security, communicable disease surveillance protocols, MEDSIS (NEDSS), WebEOC, rules and statutes, case investigation/contact tracing, Arizona Management System and meetings with all staff members. Primary supervisor will conduct weekly meetings to provide guidance, assist with barriers or troubleshooting, to ensure completion of the fellow's projects and learning objectives. The fellow will also be paired with an existing staff member to provide mentorship, integrate the fellow into the Office and make introductions to fellow employees.

The fellow will primarily assist with wastewater surveillance and foodborne outbreak response activities but the fellow's day-to-day activities will also include active participation as a team member within the Food and Waterborne Disease Program and OIDC. The fellow will benefit from support from Office and Program mentors and staff while working on projects and investigations related to the safety and public health concerns in Arizona. These activities will include, but are not limited to:

- Conducting wastewater surveillance for SARS-CoV-2 and additional disease targets
- Collecting data from stakeholders; Coordinating with the Arizona State Public Health Laboratory, utilities and municipalities to ensure wastewater samples are collected and submitted for testing
- Submitting data to CDC DCIPHER/NWSS
- Updating dashboards
- Maintaining data within the database

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- Participating in monthly Arizona wastewater community of practice calls with stakeholders as well as community of practice and monthly calls with CDC
- Conducting surveillance and monitoring enteric disease reports to identify outbreaks and risk factors for infection
- Assisting with enteric disease outbreak investigations, by participating in study design, data collection, data analysis, and intervention recommendations
- Responding to inquiries from the local health jurisdictions, public, academic partners and health care providers in Arizona
- Developing and implementing response and prevention activities aimed at reducing transmission of pathogens in the population overall
- Communicating and coordinating with various partners (Arizona State Public Health Laboratory, local health departments, tribes, utility companies, municipalities, other states, CDC, IHS, FDA and USDA)
- Utilizing the incident command structure during public health emergencies, including widespread infectious disease outbreaks.

Primary responsibilities of the fellow will depend on chosen projects and current wastewater disease surveillance and outbreak response needs within the state. The fellow will participate in weekly Food/Waterborne disease team huddles, OIDC staff meetings, monthly state laboratory and epidemiology meetings, routine calls with local health department partners, monthly Wastewater Community of Practice meetings with state and national partners, and quarterly Foodborne Disease/Food Safety Task Force meetings with statewide partners. The fellow will have an opportunity to help plan and participate in the annual Arizona Department of Health Services Infectious Disease Training & Exercise. In addition, the fellow will assist the wastewater team in planning Arizona's in-person wastewater conference.

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

ADHS has an IT department that would be available to assist the fellow with computer and database issues. In addition to MS Office, GIS software, and Google Suites, the fellow would have access to SAS for statistical analysis. Epidemiologists within the Bureau routinely use the statewide electronic disease surveillance system (MEDSIS), the state immunization registry (ASIIS), vital records datasets (birth and death data), hospital discharge database (HDD), and the National Health Safety Network (NHSN). In addition, the fellow can request access to several other databases, including population-based survey results, such as BRFSS and HIV/STD data. The fellow would also have the opportunity to use and be trained on PowerBI and the ADHS Visual Analytics Program provides various resources and guidance that fellow can utilize.

The fellow would also have access to and be trained on the common enteric and wastewater surveillance systems in use by the Food/Waterborne Disease Program such as the National Wastewater Surveillance System (NWSS) and the System for Enteric Disease Response, Investigation, and Coordination (SEDRIC).

There are several epidemiologists in the Bureau who are proficient in statistical analyses using SAS. Informal SAS training is provided periodically to epidemiology staff in the Bureau. The agency also has a Bioinformatics Division that provides training and resources on a variety of topics including surveillance systems, whole genome sequencing, data analysis, etc.

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Projects

Surveillance Activity Title: Wastewater surveillance of SARS-CoV-2 and additional pathogens

Surveillance Activity Description:
The fellow will assist in surveillance of SARS-CoV-2 and additional pathogens as added for wastewater surveillance and monitor disease trends across the state. This will be accomplished by working with data received directly from partners participating in wastewater surveillance, which will be stored in the ADHS SQL database and CDC's National Wastewater Surveillance System. The fellow will also support the wastewater team to provide guidance and subject matter expertise, as needed, to county health departments on wastewater epidemiology and public health.

Surveillance Activity Objectives:
Improve surveillance for SARS-CoV-2 and additional pathogens tested in wastewater; Increase understanding of wastewater data for SARS-CoV-2 and additional pathogens; Create a summary report for wastewater surveillance in AZ.

Surveillance Activity Impact:
Provide early warnings to health departments and leadership for situational awareness and public health mitigation measures; Help educate the community and leadership about wastewater based epidemiology.

Surveillance System Evaluation Title: Evaluation of established visualizations and data analysis methods

Surveillance System Evaluation Description:
The Office of Infectious Disease Control at ADHS is diligently working towards developing their wastewater surveillance program. The wastewater team is currently working to create an external dashboard and has just released a new internal dashboard. The external dashboard will be shared on the ADHS wastewater surveillance page. In addition, the wastewater team has explored various data analysis methods to determine the threshold levels for public health action, including utilizing other public health metrics that can be compared with wastewater data. With the establishment of new visualizations, utilization of various analysis methods, and availability of different public health metrics; there is a need to evaluate the information being shared through visualizations, data analysis methods used, and metrics that can be compared with the wastewater data. The fellow will perform an evaluation of the dashboards, three methods of trend analysis developed by the wastewater team, and other public health data to identify any gaps, to improve and enhance information sharing with our partners, and to determine the best analysis method for creating threshold levels along with other metrics that can be compared with the wastewater data.

Surveillance System Objectives:
Identify any gaps, improve and enhance information sharing with our partners, determine the best analysis methods for the wastewater dashboards and create threshold levels for public health response. Identify other public health data that can be compared with the wastewater data; Perform an evaluation of the wastewater dashboards, data analysis methods, and other public health data that can be compared with the wastewater data.

Surveillance System Impact:
Guide efforts for prevention and control of SARS-CoV-2 and additional pathogens circulating within the community; Develop a robust wastewater monitoring program at the state to provide early warnings to public health partners.

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Major Project Title: Developing an internal dashboard for efficient tracking of food and waterborne disease outbreaks

Major Project Description:
One of the key responsibilities for the ADHS food and waterborne team is to respond to outbreaks promptly and efficiently, ensuring public health is protected. At this time, Arizona's outbreak data is stored within the state's surveillance system (MEDSIS). The fellow will collaborate closely with the outbreak epidemiologist to develop a centralized dashboard for enteric outbreaks. This dashboard will not only provide streamlined access to essential data points but will also enable comprehensive trend analysis, such as identifying historical trends, making comparisons across time periods, understanding emerging trends and risk factors. Using this internal dashboard, the team will be better equipped in monitoring outbreaks real-time and in making data-driven decisions that enhance response efforts.

Major Project Objectives:
Develop a centralized (internal) dashboard for food and waterborne disease outbreaks; Facilitate trend analysis, including historical comparisons, patterns/risk factors identification; Enhance outbreak detection and response.

Major Project Impact:
This project aims to enhance outbreak detection and response, ultimately improving the health and wellness of Arizonans; Trend analysis will allow for identification of long-term patterns, which can help inform strategies for preventing future outbreaks.

Additional Project #1 Title: Build Salmonella National Hypothesis Generating Questionnaire (NHGQ) into REDCap
Project #1 Type: Surveillance Activity

Project #1 Description:
To enhance data collection and analysis, the food and waterborne team at ADHS has begun using REDCap as a data collection tool. To support this initiative, the food and waterborne team needs the fellow's assistance in building the existing Salmonella National Hypothesis Generating Questionnaire into REDCap. This project will make data collection more efficient and save valuable time during future outbreak investigations.

Project #1 Objectives and Expected Deliverables:
Migrate the existing Salmonella National Hypothesis Generating Questionnaire (NHGQ) into REDCap for improved data collection and analysis.

Project #1 Impact:
To make data collection more efficient and save valuable time during future outbreak investigations.

Additional Project #2 Title: Outbreak Investigation and Response
Project #2 Type: Surveillance Activity

Project #2 Description:
The food and waterborne team at ADHS closely monitor and investigate food and waterborne-related outbreaks and clusters. As needed, the fellow will participate in these outbreak and cluster investigations. The fellow will initially serve in a support capacity, but after gaining experience may lead an investigation later in their Fellowship. This will allow for hands-on experience; activities may include designing questionnaires, performing interviews, analyzing data, developing outreach materials and presentations.

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Project #2 Objectives and Expected Deliverables:
Analyzing exposure data of cases linked to the outbreak; performing interviews, designing questionnaires, and developing outbreak materials and presentations as needed; Review whole genome sequencing data; Entering outbreak information into the statewide outbreak management system (MEDSIS OBM) as well as into the national outbreak response system (SEDRIC); Informing the local health departments of the relevant outbreaks and available epidemiology data; Participate in local/state/national outbreak conference calls.

Project #2 Impact:
Ensure local and state health departments respond to outbreaks in a timely manner and make informed public health decisions, when/where necessary. Ensure necessary mitigation measures are put into place to prevent further cases/outbreaks.

Additional Project #3 Title: Development of wastewater CANVAS training courses and materials
Project #3 Type: Major Project

Project #3 Description:
One of the goals of the ADHS wastewater surveillance program is to educate and provide resources. The wastewater team will collaborate with partners across the state to develop training modules on wastewater surveillance, which will be in a Canvas course format. The fellow will work closely with the wastewater surveillance epidemiologist and program project specialist to develop training courses for wastewater. Through this opportunity, the fellow will gain experience in creating training materials as well as incorporating their feedback and thoughts in development of these materials, when/where needed.

Project #3 Objectives and Expected Deliverables:
Create CANVAS training courses and materials for wastewater surveillance; Provide feedback and suggestions for development of these training courses and materials. Evaluate training courses (via course survey from end users or other mechanisms) and revise training as needed.

Project #3 Impact:
Educate on wastewater based epidemiology; Ensure state and local health departments have tools and resources to understand wastewater data and how it can be used to make informed public health decisions.

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

The fellow will have multiple opportunities to participate in preparedness activities. The fellow may be included into the state's incident command structure during public health emergencies, including widespread infectious disease outbreaks or during disaster drills such as the annual exercise in response to a release of radiation at the Palo Verde Nuclear Power Generating Station. During emergency responses, OIDC staff are typically an integral part of the Operations Section. The fellow will have an opportunity to participate in emergency preparedness tabletop exercises, developing emergency response and outbreak response plans, creating educational resources and materials for biological, chemical and/or radiological emergencies, and responding to public health emergencies. The fellow will also have the opportunity to conduct after hours drills with the local health departments that include a high impact infectious disease scenario. The fellow will likely spend about 20% of their time on preparedness activities.

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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 incorporated into the Food and Waterborne Disease Program where they will have the opportunity to work on disease surveillance and outbreak response. There are currently 2 epidemiologists that work on outbreaks on a rotating basis as outbreaks are reported. The fellow will be trained on outbreak response actions and will be worked into the rotation. The fellow will assist with entering outbreak information into the statewide outbreak management system (MEDSIS OBM) as well as into the national outbreak response system (SEDRIC), provide updates/communication to the local jurisdictions, review whole genome sequencing data, review interview data for commonalities, provide outbreak stats and create epi-curves, and participate on county/state/national outbreak calls. The fellow will likely spend about 30% of their time assisting with outbreak response.