ID: 75319124
Infectious Disease - AMD, Infectious Diseases - Host Site Description
Alabama Department of Public Health

Assignment Location: Montgomery, US-AL
Alabama Department of Public Health
Infectious Diseases & Outbreaks

Primary Mentor: Rachel Tulibagenyi, MPH
Epidemiologist Senior
Alabama Department of Public Health

Secondary Mentor: Amanda Ingram, MPH
IDO Division Director
Alabama Department of Public Health

Work Environment
100% In-person

Assignment Description

The fellow will be placed within the Infectious Diseases and Outbreaks (ID&O) Division, a multidisciplinary team responsible for protecting public health by surveilling more than 40 different pathogens. This division works daily with a diverse network of internal and external partners to monitor disease trends and implement control measures statewide. While the fellow's primary focus will be on enteric disease work, they will have the opportunity to collaborate across various sections, including Healthcare-Associated Infections (HAI), vector-borne diseases, and respiratory illnesses. Anticipated day-to-day activities will be dynamic, as the division's epidemiologists regularly lead instate outbreak investigations. The fellow will work in an office setting that emphasizes face-to-face collaboration and frequent communication with stakeholders to respond to emerging health threats. In this environment, the fellow will be constantly encouraged to learn and grow, with the division providing structured pathways for professional development and technical advancement throughout the assignment.

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

The fellow will have access to a comprehensive array of surveillance and analytical tools for epidemiologic work. Primary disease tracking is conducted via NEDSS, supplemented by syndromic surveillance for real-time trend monitoring and a wastewater surveillance system for community-level pathogen detection. REDCap is utilized for managing outbreak investigations and data collection.

For analysis and reporting, the fellow will be provided a dedicated SAS license to aggregate and analyze data, R and R Studio along with Python will be made available as well. The Microsoft Office Suite, including Excel, will be available for data storage, manipulation, and the production of formal reports and presentations.

Projects

Surveillance Activity Title: AMD Integration in Enteric Disease Surveillance

Surveillance Activity Description:
This surveillance activity focuses on leveraging advanced molecular detection (AMD) methods to enhance the monitoring and investigation of enteric pathogens within Alabama's public health system. The core activities include routinely monitoring ALNBS (Alabama NEDDS Base System) reports for enteric pathogens and developing a district-level

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AMD dashboard. This dashboard will visualize the geographic spread of specific serotypes, providing epidemiologists with near real-time data to rapidly identify and analyze potential clusters and inform control measures.

Surveillance Activity Objectives:
The objectives of this project are to modernize enteric disease surveillance in Alabama by integrating advanced molecular detection (AMD) data with traditional epidemiological reporting. Specifically, the project aims to: improve situational awareness, visualize genomic data, optimize laboratory infrastructure, and advance data integration.

Deliverables:

- Weekly Cluster Report: Develop an interactive AMD data dashboard for public health surveillance, that is to be shared weekly.
- Visualize Genomic Data: Develop a district-level AMD dashboard to map the geographic spread of specific genomic serotypes, enabling the rapid identification of localized clusters and outbreaks.

Surveillance Activity Impact:
This project is expected to significantly enhance Alabama's public health response by providing high-resolution, near real-time insights into the transmission of foodborne and waterborne illnesses. By integrating Advanced Molecular Detection (AMD) with ALNBS notifiable disease data, the state can move from reactive cluster identification to proactive genomic surveillance, enabling health officials to detect and resolve smaller, more localized outbreaks that might otherwise go unnoticed. The development of a district-level AMD dashboard will empower local epidemiologists to visualize geographic trends in specific genomic lineages, facilitating faster source attribution and more targeted public health interventions. These advancements will lead to a more robust surveillance system that reduces the overall burden of enteric disease through earlier containment and improved evidence-based policy decisions.

Surveillance System Evaluation Title: Evaluation of Alabama School Absenteeism Data

Surveillance System Evaluation Description:
The goal of this project is to evaluate the value added by the Alabama School Absenteeism dashboard by performing a descriptive analysis that consist of the following three steps: (i) brief description of the school absenteeism dashboard; (ii) analysis of the system's attributes and performance (sensitivity, specificity, timeliness, usefulness, representativeness, simplicity, flexibility, stability, and communication) compared to other surveillance systems like disease reports in the surveillance system and emergency department visit records in syndromic surveillance; and (iii) identification of end-users and stakeholders if a value added is identified.

Surveillance System Objectives:
Major Competencies: Design or implement a new, or revise an existing surveillance system; evaluate a surveillance system and know the limitations of surveillance data; collect health data from appropriate sources; recommend control measures, prevention programs, or other public health interventions based on epidemiologic findings; write a surveillance report; present data graphically and know how to use graphic software; present at a national or regional meeting

- Assess previous school year's school absenteeism data presented in the dashboard and available for export.
- Identify potential clusters associated with spikes in absenteeism at the school and/or residential ZIP code level.
- Compare spikes to syndromic surveillance data, disease reports, and outbreak notifications.
- Assess which data sources were more timely.
- Submit abstract to the CSTE Annual Conference.
- Create a report summarizing findings and recommendations.
- Implement identified methods for surveillance improvements.

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Surveillance System Impact:
The Alabama Department of Public Health (ADPH) used school absenteeism map and reports from the Alabama State Department of Education (ALSDE) for potential outbreak alerts from 2006-2018. ADPH access discontinued when the ALSDE upgraded to a new system. After several years and solution meetings, ADPH began receiving data feeds to develop visuals internally.

The theory is that school absenteeism may precede indicators of community-level respiratory diseases. However, with 100% hospital involvement reporting emergency department visits, there is uncertainty of the value added by school absenteeism. Reviewing the school absenteeism data and system, and comparing to other surveillance tools will potentially demonstrate the value added by school absenteeism resulting in guidance documents for surveillance staff to reincorporate this method of community surveillance into their daily routines.

Major Project Title: Developing a One Health Framework for Genomic Epidemiology of Enteric Pathogens

Major Project Description:
This project establishes a comprehensive One Health Genomic Integration Framework for Enteric Pathogens in Alabama, modernizing public health surveillance by integrating human, animal, and environmental genomic data to identify and disrupt the transmission pathways of recurring enteric disease clusters. The fellow will lead AMD Integration in Enteric Disease Surveillance by mapping genomic lineages across the state's Public Health Districts to trace the movement of pathogens between humans, animals, and the environment. The key activity includes conducting high-level phylogeographic analyses to perform geographic inference of genomic data. Furthermore, the fellow will chair the AMD Workgroup, facilitating cross-sector data sharing between human health epidemiologists and environmental health specialists to translate complex bioinformatics into actionable public health interventions.

Major Project Objectives:
Developing a One Health Genomic Integration Framework for Enteric Pathogens project aims to integrate human clinical genomic data with animal and environmental sequencing to identify zoonotic and environmental sources of recurring enteric disease outbreaks in Alabama. The project also intends to develop a One Health Genomic Dashboard for visualizing cross-sector transmission data and a Strategic Recommendations Report for standardizing AMD integration into Alabama's 2028 One Health response plans.

Deliverables:

- A One Health Genomic Dashboard that overlays human cluster data with state-specific environmental and animal sequencing hits.
- A Strategic Recommendations Report for integrating AMD into Alabama's broader One Health response plans for 2028.

Major Project Impact:
The expected public health impact of this project is the establishment of a robust One Health genomic infrastructure that identifies and can help mitigate recurring zoonotic and environmental reservoirs of enteric disease. Ultimately, these efforts will strengthen Alabama's broader preparedness and response plans, leading to a measurable reduction in the burden of foodborne and waterborne illnesses across the state.

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Additional Project #1 Title: Identifying Regional Surveillance Gaps
Project #1 Type: Surveillance Activity

Project #1 Description:
This project seeks to identify and quantify "surveillance deserts" within the state by conducting a geospatial and statistical gap analysis between reported clinical cases and corresponding laboratory specimens. While epidemiological reporting provides a baseline for disease prevalence, the utility of molecular surveillance depends entirely on the consistent submission of isolates or clinical specimens to the public health laboratory. By cross-referencing case data from the state's surveillance system with SEDRIC and NCBI pathogen sequences, the fellow will map jurisdictions where high disease burdens do not align with proportional specimen submission. This investigation will highlight geographic and lab-specific disparities that may be masking active clusters or hindering outbreak detection.

Project #1 Objectives and Expected Deliverables:
The primary objective of this project is to develop a standardized metric for measuring "submission compliance" across various health districts and healthcare facilities. Key outcomes include the creation of a comprehensive surveillance dashboard that visualizes reporting-to-submission ratios and the publication of an internal "Surveillance Desert Report" identifying high-priority areas for intervention. By the end of the fellowship term, the fellow will have established a data-driven framework to monitor the timeliness and completeness of isolate transfers, ensuring that the lab's molecular data is a statistically representative sample of the state's true epidemiological landscape.

Project #1 Impact:
This project will significantly enhance the state's ability to detect and respond to foodborne and infectious disease outbreaks in real-time. By identifying and addressing surveillance deserts, the department can transition from passive monitoring to targeted outreach, providing specific guidance to under-reporting facilities and regions. Ultimately, improving the representativeness of submitted specimens ensures that molecular subtyping and genomic sequencing (WGS) are utilized to their full potential. This leads to the earlier identification of clusters, more precise source attribution, and a more equitable public health response that protects all citizens, regardless of their proximity to major clinical laboratories.

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

The fellow will work with the Center for Emergency Preparedness and Office of Informatics and Data Analytics to develop internal-facing data vizualizations that incorporate syndromic surveillance into situational awareness products to inform emergency response. Potential activities include; monitoring for increased ED visits and outbreaks during mass gatherings; developing a Power BI dashboard visualizing event-related visits. The fellow will also be engaged in the ADPH response to public health emergencies as needed. Time: 10%

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

The fellow will dedicate approximately 25% of their time to the active investigation and management of enteric disease clusters and outbreaks. They will serve as the primary epidemiologist responsible for ongoing cluster investigations within the state. The fellow will be an integrated member of Alabama's state outbreak response team, participating in all phases of investigation: case finding, data collection, hypothesis generation, and control measure implementation. Following a structured training period on state processes and protocols, the fellow will transition into a leadership role, taking the lead on managing specific, moderate-complexity outbreaks under the direct supervision of the primary mentor.