ID: 85885917
Infectious Diseases - HAI, Infectious Diseases - Host Site Description
Alabama Department of Public Health

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

Primary Mentor: Melanie Roderick, MPH
HAI/AR Epidemiologist Supervisor
Alabama Department of Public Health

Secondary Mentor: Amanda Ingram, MPH
Director of the Infectious Diseases and Outbreak Division
Alabama Department of Public Health

Work Environment
Hybrid

Assignment Description

The Bureau of Communicable Disease is comprised of four Divisions: Immunizations, Infectious Diseases & Outbreaks (ID&O), Sexually Transmitted Diseases (STD), and Tuberculosis (TB). The fellow would be assigned to ID&O, which is responsible for conducting passive surveillance for 91 disease and conditions, syndromic surveillance for 10 syndromes, and outbreak investigations for a wide range of infectious, non-infectious, and environmental conditions of public health concern. The fellow will be provided a well-rounded experience and be given the opportunity to conduct and lead these types of investigations at the local, state, and federal levels. ID&O would like the fellow's assignment to be focused on healthcare-acquired infections (HAI). Since Alabama's HAI Program is small, this will provide the fellow with the opportunity to contribute to the development of the program from the ground up. They will work with colleagues to identify ways to harmonize ID&O's current condition-specific activities with the aim to improve overall efficiency.

As for the day-to-day, no day is ever the same in ID&O. However, it can be guaranteed that the fellow would be working at their PC conducting surveillance activities; conducting or leading outbreak investigations; analyzing data; preparing reports, presentations, fact sheets, or meeting agendas; developing just-in-time trainings; and collaborating with stakeholders. Additionally, there will be opportunities to write and submit abstracts to national conferences.

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

The Fellow will be given access to (at a minimum) the following surveillance system applications:

- Alabama NEDSS Base System
- BioSense
- National Outbreak Reporting System
- REDCap

The Fellow will be provided the following analysis tools:

- SAS Server/Studio
- R/R Studio (if needed)
- Epi Info
- ArcGIS Pro
- Tableau Desktop
- SaTScan

Within ID&O, there are at least 10 other staff members who can provide help with data analyses or subject matter expertise.

Projects

Surveillance Activity Title: Detecting Legionella Clusters with SaTscan

Surveillance Activity Description:
Between 2000 and 2026, there has been a steady increase in the rise of community-acquired Legionnaires' disease (LD), with current estimates ranging from 10,000 to 25,000 annual cases in the United States. ADPH's current Legionellosis investigation form does not capture community-acquired exposures for LD cases. ADPH wants to address this gap with the use of SaTScan, a statistical tool that uses cluster detection to provide an automated early warning system that allows epidemiologists to pinpoint specific high-risk areas even before traditional surveillance reveals a shared location. The fellow would use SaTScan to help identify LD cases in the community that would warrant further investigation.

Surveillance Activity Objectives:
Project Objectives:

- Bridge Surveillance Gaps: Enhance the ADPH Reportable Disease Surveillance System by incorporating spatiotemporal analysis to capture community-acquired exposures.
- Establish Early Warning Capabilities through SaTScan to automate the detection of unusual disease clusters in space and time before they are linked through traditional interviews.
- Inform Field Investigations: Provide actionable data to epidemiologists to prioritize cases for further investigation and potential exposure identification.

Expected Deliverables:

- Develop a SaTScan Surveillance Protocol: A standardized operating procedure (SOP) for the use of SaTScan to detect community-acquired LD cases
- Geospatial Risk Maps: Use cluster data to develop maps visualizing LD clusters to be used for internal ADPH reporting.
- Evaluation Report: A summary of identified community-acquired clusters and an assessment of how many cases would have remained "sporadic" without SaTScan detection.

Surveillance Activity Impact:
The use of SaTScan for early cluster detection will allow for the reduction in morbidity and mortality associated with LD. SaTScan will also facilitate targeted public health interventions that may be known to have social risk factors, such as low-income or poverty. Uncovering hidden hotspots in these areas may reveal a disproportionate health burden and would ensure that marginalized populations receive the same level of intervention and public health response.

Surveillance System Evaluation Title: Evaluation of MDRO Surveillance Activities

Surveillance System Evaluation Description:
The current multidrug-resistant organism (MDRO) surveillance system is a multi-part process that involves receiving laboratory results, or alerts, from various sources and manually entering them into an Excel tracking sheet. To improve this process, the ADPH fellow will evaluate at least three core attributes of the surveillance system based on CDC evaluation guidelines. Specifically, the fellow will assess notification volume and type, including case reports, electronic lab reports (ELR), and out of state alerts; how the system tracks the notifications; and the system's sensitivity in detecting clusters or outbreaks. The ultimate goal is to determine if the system can transition to an automated dashboard or alert-based platform to enhance efficiency and response times.

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Surveillance System Objectives:
Objectives: To evaluate the current MDRO tracking surveillance system in Excel vs Alabama's disease surveillance system investigation forms and assess the efficiency of existing tracking methods to determine if they meet the timeliness and stability standards required for effective public health response.

Deliverables: Developing a new cluster detection tool and a dashboard using Power BI

Surveillance System Impact:
An improved surveillance system would enable early detection of clusters and outbreaks, allowing for rapid intervention to help contain, and ultimately prevent, the spread of MDROs. Additionally, replacing manual tracking with streamlined digital dashboards, will allow ADPH to better monitor resistance trends and evaluate the effectiveness of infection prevention strategies. Ultimately, a more robust surveillance infrastructure protects the community by safeguarding the power of existing antibiotics and reducing the overall morbidity and mortality associated with HAIs.

Major Project Title: NHSN Antimicrobial Use and Resistance (AUR) Module Data Analysis

Major Project Description:
Antimicrobial resistance rates continue to increase in hospitals across the United States. One of the five CDC core actions to combat the spread of antimicrobial resistance is improving the use of antimicrobials. The NHSN AUR Module provides a mechanism for facilities to report and to analyze AU and/or AR data to inform benchmarking, reduce antimicrobial resistant infections through antimicrobial stewardship, and interrupt transmission of resistant pathogens at individual facilities or facility networks. The ADPH HAI program wants to analyze AUR data to improve antibiotic use in healthcare facilities.

Major Project Objectives:
Antibiotic Use Objectives:

- The primary objective is to facilitate antimicrobial use benchmarking.
- A secondary objective is to evaluate antimicrobial use trends over time at the facility and state level.

Antibiotic Resistance Objectives:

- Facilitate antimicrobial resistance data evaluation using a standardized approach to:
  1. Provide local practitioners with an improved awareness of a variety of antimicrobial resistance problems to aid in clinical decision making and prioritize transmission prevention efforts.
  2. Provide facility-specific measures in context of a regional and national perspective (specifically, benchmarking) that can inform decisions to accelerate transmission prevention efforts and reverse propagation of emerging or established resistant pathogens.
- Allow for a regional assessment of antimicrobial resistant organisms of public health importance

Expected Deliverables: The fellow will analyze AUR data to provide timely and reliable feedback of NHSN data to clinicians regarding their prescribing practices and based on the data, they will develop reports that can be shared with the facilities on their antimicrobial usage.

Major Project Impact:
This project would allow ADPH to transform raw clinical data into actionable intelligence to combat the growing crisis of antimicrobial resistance in Alabama.

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Additional Project #1 Title: Assessing MDROs in Veterinary Clinics and Companion Animals
Project #1 Type: Other

Project #1 Description:
Antimicrobial resistance (AMR) is a critical One Health challenge that impacts both human and animal health. The current rise of MDROs in pets has become a significant and growing concern, with veterinary hospital environments, including medical equipment, being indicated as a source of transmission. Additionally, recent studies have shown that companion animals can transmit MDROs to humans, which is why ADPH would like to begin the process of strengthening infection control practices within veterinary facilities. To do this, the fellow will distribute a survey to evaluate current infection control practices in veterinary clinics across the state. The fellow will then will then analyze the survey responses to identify gaps between existing protocols and established clinical standards. Using the findings from this gap analysis, the fellow will then create specialized educational resources for veterinary staff, adapting CDC Project Firstline training materials to meet the unique needs of the animal care environment.

Project #1 Objectives and Expected Deliverables:
Objective: The primary objective of this project is to evaluate and enhance the infection prevention and control (IPC) standards within veterinary facilities across the state with the aim of mitigating MDRO transmission within clinics and from companion animals to humans.

Deliverables:
1. Send out the veterinary clinic survey
2. Gap analysis
3. Targeted training based on CDC Project Firstline trainings to fit the specific needs of the veterinary environment.

Project #1 Impact:
This project addresses the One Health connection between animal care and human wellness. By improving IPC practices in veterinary clinics, the project reduces the risk of MDRO transmission from pets to their owners or veterinary staff.

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 conduct analyses that will inform healthcare infrastructure situational awareness and preparedness. Potential activities include: an analysis bed utilization during the pandemic; an analysis comparing respiratory illness ED visits that were admitted to the hospital to the weekly reported hospitalizations for respiratory illnesses. 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 use SaTScan to detect Legionnaires' Disease (LD) clusters in community settings to develop an early warning system for outbreaks. Potential activities include: developing a SaTScan surveillance protocol to detect community-acquired LD cases; using cluster data to develop geospatial risk maps; and producing an evaluation report, summarizing identified community-acquired LD clusters and an assessment of how many cases would remain "sporadic" without SaTScan detection. Time 25%