ID: 72436075
Infectious Diseases - Foodborne, Infectious Diseases - Host Site Description
Fort Bend County

Assignment Location: Missouri City, US-TX
Fort Bend County
Epidemiology

Primary Mentor: Nicolette Janoski, MPH
Epidemiology Division Manager/ Chief Epidemiologist
Fort Bend County

Secondary Mentor: Debbie Figueroa-Colon, JD, MPH, BS
Epidemiology Supervisor
Fort Bend County

Work Environment
Hybrid

Assignment Description

Under the Epidemiology Manager, Epidemiologist II and Data Analysist and/or as part of various workgroups and teams, the fellow will performs the following essential functions:

- Gather and analyze local, regional, and national data on foodborne illnesses (e.g., Salmonella, E. coli) and vector-borne diseases (e.g., West Nile Virus, Dengue).
- Use advanced statistical and computational tools to identify patterns, trends, and potential outbreaks.
- Develop predictive models to anticipate disease outbreaks based on environmental factors (e.g., rainfall, temperature), population trends, and historical data.
- Collaborate with experts in public health informatics to refine model accuracy and usability.
- Conduct public awareness campaigns on disease prevention, emphasizing food safety practices and mosquito control measures.
- Collaborate with universities, such as the University of Houston, to integrate innovative research methodologies.
- Partner with the Texas Department of State Health Services and CDC to align forecasting efforts with broader public health goals.
- Assist in outbreak investigations, providing timely data and insights to guide containment strategies.
- Support emergency preparedness and response efforts during disease outbreaks.

The fellow's contributions will help reduce the burden of foodborne and mosquito-related diseases by enabling early detection and prevention. Their efforts will enhance public health readiness, protect vulnerable populations, and strengthen the overall health infrastructure of Fort Bend County.

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

Epidemiologists at Fort Bend County use data from National Electronic Disease Surveillance System (NEDSS): Tracks notifiable diseases and integrates data from healthcare providers and laboratories. Foodborne Disease Active Surveillance Network (FoodNet), Weather and Climate Data (NOAA): Used for mosquito-borne disease forecasting, Local Vector Surveillance Data, Electronic Laboratory Reporting (ELR), Statistical and Data Analytics Software such as R, STATA, and Excel, ArcGIS, and ESSENCE (Electronic Surveillance System for the Early Notification of Community-based Epidemics).

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Projects

Surveillance Activity Title: Foodborne Illness Surveillance Enhancement

Surveillance Activity Description:
The surveillance project will focus on designing and implementing a foodborne surveillance system. The system will enhance the detection, monitoring, and response to foodborne outbreaks. It will leverage electronic disease reporting, syndromic surveillance, and laboratory data. The system will also include tools for community reporting and real-time data visualization to assist in public health decision-making.

Surveillance Activity Objectives:
- Improve detection capabilities to detect foodborne illness cases and outbreaks.
- Test web-based case investigation.
- Review historical data for Fort Bend County. Integrate data from laboratories, healthcare providers, syndromic surveillance systems, community reports into a database.
- Automate detection in foodborne disease patterns using statistical models.
- Provide actionable insights to guide public health interventions and outbreak investigations.
- Train providers and laboratories on the importance of reporting, testing and forwarding specimens on for whole genome sequencing.

Surveillance Activity Impact:
Early outbreak detection and reductions in foodborne illness cases.

Surveillance System Evaluation Title: Foodborne Illness Surveillance Tool

Surveillance System Evaluation Description:
The system will be evaluated on performance metrics such as time to detect and respond to foodborne outbreaks, number of outbreaks identified, and usability of the product. We will also evaluate the completeness, timeliness, and accuracy of data collected.

Surveillance System Objectives:
Improve detection capabilities, enhance data integration, facilitate rapid response, educate stakeholders.

Surveillance System Impact:
Increased surveillance efficiency, reduction in disease burden, building staff capacity for county growth and outbreak response within the county, strengthen partnership among community partners, DSHS regional offices and healthcare providers.

Major Project Title: Predictive Model for Mosquito-Borne Disease outcomes

Major Project Description:
Fort Bend County has recently added a vector control unit within Environmental Health. This fellow will develop a predictive model to forecast mosquito-borne disease outcomes, such as West Nile Virus and Dengue, for Fort Bend County. The model will integrate environmental, climatic, and epidemiological data to identify high- risk areas and time periods, enabling targeted interventions and resource allocations to prevent outbreaks.

Major Project Objectives:
- Analyze historical vector surveillance, weather data and case information.

- Incorporate environmental factors.
- Create a tool to forecast outbreak risk location and times.
- Test and validate the model using real time data to ensure accuracy.
- Create a user-friendly tool for staff to use for predictions and to implement control measures.

Major Project Impact:

- Collect data on historical datasets for mosquito- borne disease cases, vector populations, and climate factors.
- A working model that forecast disease risk.
- An interactive tool visualizing hotspots maps for the public.
- Technical report on methodology, model performance, and recommendations for use.
- Training tools for other local health departments staff on using the tool.
- Training guidance document for other health departments who want to develop the same tool in their jurisdiction.

Additional Project #1 Title: One Health Approach in Epidemiology
Project #1 Type: Surveillance System Evaluation

Project #1 Description:
To investigate interconnections between animal, environmental, and human health in emerging infections. The approach will encompass investigating shared microbiomes between livestock and humans in agricultural settings. Inform prevention strategies for cross-species disease transmission.

Project #1 Objectives and Expected Deliverables:
The One Health Approach will be used to identify the interconnectedness of human, animal, and environmental health in the FBC community by fostering collaboration across various sectors.
Objectives and deliverables will include:

- Identify, monitor, and mitigate zoonotic disease transmission.
- Strengthen early warning systems for zoonotic spillover.
- Promote vaccination campaigns for animals and humans.
- Implement biosecurity measures in agriculture and wildlife management.
- Establish a strong communication plan.
- Develop integrated systems for data collection and sharing among human, animal, and environmental health sectors.

Project #1 Impact:
Encourage cross-sectoral communication to identify trends and threats to prevent outbreaks in FBC.

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

The fellow will assist in risk assessment and forecasting for both mosquitoes borne disease, foodborne illness, shelter surveillance for hurricanes. The vector borne model could identify area for high risk for vector borne disease due to increased standing water post-hurricane. It could also anticipate timing for geographic spread of vector borne disease such as West Nile and Dengue. Monitor foodborne disease trends and predict vulnerabilities in food safety during power outages, flooding, or disruptions in food supply chains. Monitor disease outbreak within disaster shelters. Help develop risk communication tools on preventing foodborne illness and mosquito borne diseases, including proper food handling and mosquito control strategies.

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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)

Fellow's Role in Cluster and Outbreak Investigations:
The Fellow will play an integral role in identifying, investigating, and managing clusters and outbreaks of infectious diseases within Fort Bend County. Their responsibilities will encompass various aspects of epidemiological practice, allowing them to develop key competencies in outbreak response.
The Fellow will work closely with:

- Epidemiologists and data analysts within the department.
- Local healthcare providers and laboratory personnel.
- Community stakeholders and emergency preparedness teams.

This role will provide the Fellow with hands-on experience in public health surveillance, outbreak management, and applied epidemiology, ensuring their readiness to respond effectively to public health emergencies.