ID: 35565023
Infectious Diseases, Infectious Diseases - Foodborne - Host Site Description
Southern Nevada Health District

Assignment Location: Las Vegas, US-NV
Southern Nevada Health District
Division of Disease Surveillance & Control

Primary Mentor: Rosanne Sugay, MD, MPH
Medical Epidemiologist
Southern Nevada Health District

Secondary Mentor: Rebecca Topol, SM
Epidemiology Supervisor
Southern Nevada Health District

Work Environment
Hybrid

Assignment Description

The Fellow will work within the Office of Epidemiology (OOE) in the Division of Disease Surveillance& Control. OOE staff are responsible for all surveillance strategies and work closely with disease investigators, health educators and social workers from other SNHD offices and programs. The epidemiology program was established at the Southern Nevada Health District (SNHD) in August 1998. It conducts surveillance and research of various communicable or non-communicable diseases and conditions that have the most impact on the health and well-being of southern Nevada residentsand visitors, including communicable diseases, foodborne illness outbreaks, chronic illnesses, health risk behaviors, injuries, and biological threats to the public health. The OOE also supports the medical community by giving recommendations for the prevention and control of communicable diseases, educate the public, and provide support to other health district programs and external communitypartners.

The Fellow will have opportunities to interact and collaborate with other divisions, offices, andprograms at the SNHD. For example, the Fellow can work with the EMS/Trauma System to rebuild and enhance Clark County's trauma registry. He/she can also work with the Office of Chronic Disease Prevention and Health Promotion (OCDPHP) to identify, implement, and evaluate evidence-based prevention programs to mitigate the burden due to chronic diseases, injuries, and risky behaviors.

The Fellow will have access to a number of robust databases that are frequently used at OOE, including Nevada BRFSS, birth and death certificates, hospitalization and emergency department visit data, coroner's data, as well as locally maintained databases: reportable disease (includingtuberculosis, HIV/AIDS, and STDs), immunization, and vector (mosquito) surveillance data.

Both the primary and secondary mentors have extensive knowledge and skills to help the Fellow develop his/her competencies. The two mentors combined knowledge covers major social and medical science fields, including medicine, psychology, education, and statistics. In addition, the mentors will also offer trainings to the Fellow in commonly used software, such as SAS, R, andArcGIS.

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

In addition to the two mentors, the support team for the Fellow consists of about 20 senior epidemiologists, epidemiologists, biostatisticians, and informaticians. All team members have advanced degrees (MD, PhD, MPH, MS) in their specialized areas, and will provide support for the Fellow in statistics, informatics, medicine, and scientific writing/editing. The Fellow will have access to a number of robust databases that are frequently used at OIE, including Nevada BRFSS, vital records (birth and death data), hospitalization and emergency department visit data, coroner's data, as well as locally maintained databases: reportable disease (including tuberculosis, HIV/AIDS, and STDs), immunization, and vector (mosquito) surveillance data.

Projects

Surveillance Activity Title: Enhancing Outbreak Investigation Capabilities: Implementation of the Outbreak Investigation Module in EpiTrax

Surveillance Activity Description:
The project focuses on fortifying infectious disease outbreak investigation capabilities at the Southern Nevada Health District (SNHD) by seamlessly implementing the newly integrated Outbreak Investigation Module within the recently deployed EpiTrax system. This initiative involves data migration, standardized case definitions, and real-time data entry, providing a dynamic platform for collaborative investigation, automated case linkage, and enhanced data visualization. By optimizing these features, the project aims to significantly improve the efficiency, accuracy, and real-time responsiveness of infectious disease outbreak investigations, fostering timely decision-making and collaboration among public health professionals and stakeholders involved in outbreak response at SNHD.

Surveillance Activity Objectives:
Project Objectives:
1) Successfully integrate the Outbreak Investigation Module into the EpiTrax system.
2) Conduct comprehensive training sessions for public health staff, epidemiologists, and stakeholders on the functionalities of the new module.

Expected Deliverables:
1) A documented report on the successful integration of the Outbreak Investigation Module into EpiTrax.
2) Training materials and documentation for staff and stakeholders.

Surveillance Activity Impact:
This project is expected to significantly improve outbreak investigation capabilities, leading to faster response, precise data, efficient resource allocation, and enhanced collaboration for effective public health outcomes.

Surveillance System Evaluation Title: Evaluating the Enhanced Surveillance System for Large-Scale Events in Clark County, Nevada

Surveillance System Evaluation Description:
Las Vegas, Nevada, renowned for hosting large-scale events like the Formula 1 (F1) car race in November 2023 and Superbowl LVIII in February 2024, necessitates robust public health surveillance strategies. Recognizing this imperative, the Southern Nevada Health District (SNHD) initiated an electronic daily enhanced surveillance report. This system aimed to furnish response coordinators with timely information during major events, enabling early identification of potential public health issues requiring SNHD intervention.

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Leveraging the Electronic Surveillance System for the Early Notification of Community-Based Epidemics (ESSENCE), queries were formulated to capture syndromes (gastrointestinal illness and influenza-like illness (ILI)) and diagnoses (COVID-19, influenza, and injuries). Additional data included the number of complaints from the foodborne illness complaint system, poison control calls, and emergency medical system calls. Preliminary death records in ZIP codes around the F1 event were scrutinized for drug overdose, crowd-associated injuries, homicide, and suicide. Shewhart C charts, incorporating 1, 2, and 3 sigma control limits, were generated for each syndrome, diagnosis, number of foodborne complaints, EMS calls, and deaths, using a one-month pre-event period to establish a baseline. A concise 1-page report, distributed pre-event and post-event (11/13-11/20/23), featured alert levels (low, medium, high) based on data analysis, guiding public health action. Traditional passive surveillance for reportable diseases such as COVID-19, influenza, and enteric pathogens continued, allowing for a comparative analysis of case report trends with syndromic surveillance findings at the conclusion of the event.

This project seeks to evaluate the effectiveness of the enhanced surveillance system during large-scale events, ensuring its capacity to provide actionable insights for public health interventions and contribute to overall event safety and well-being.

Surveillance System Objectives:
Project Objectives:
1) Assess the Effectiveness: Evaluate the effectiveness of the enhanced surveillance system in detecting and monitoring potential public health events during large-scale events, with a focus on syndromic and diagnostic indicators.
2) Early Identification: Determine the system's ability to facilitate early identification of health-related trends, including syndromes (gastrointestinal illness, ILI) and specific diagnoses (COVID-19, influenza, injuries), contributing to timely public health interventions.
3) Integration and Correlation: Examine the integration and correlation of various data sources, including complaints, poison control calls, emergency medical system calls, and preliminary death records, to provide a comprehensive understanding of health-related patterns during events.
4) Alert System Validation: Validate the effectiveness of the alert system by comparing the generated alert levels (low, medium, high) with actual public health actions taken during the large-scale events.

Expected Deliverables:
1) Evaluation Report: A detailed report assessing the overall effectiveness of the enhanced surveillance system, including insights into its strengths, limitations, and areas for improvement.
2) Recommendations for Enhancement: A set of recommendations for enhancing the surveillance system based on the evaluation findings, with a focus on improving early detection, data integration, and overall system performance.

Surveillance System Impact:
The expected public health impact of this project is a more resilient and responsive public health system, capable of early detection, rapid response, and optimized interventions during large-scale events, ultimately contributing to enhanced community safety and well-being.

Major Project Title: Tuberculosis Death Review: A Comprehensive Analysis in Clark County, Nevada

Major Project Description:
This project aims to conduct a thorough and comprehensive analysis of tuberculosis-related deaths to improve understanding and identify opportunities for enhanced prevention and intervention strategies. This project involves a detailed review of each TB-associated fatality, examining the clinical, epidemiological, and social factors contributing to adverse outcomes. Through collaboration with healthcare providers, public health professionals, and relevant stakeholders, the project seeks to identify patterns, gaps, and modifiable risk factors associated with TB deaths.

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The insights gained from this review will inform targeted interventions, contribute to the refinement of TB control strategies, and ultimately aim to reduce the impact of TB-related mortality in the community. This project aligns with the broader goal of strengthening tuberculosis surveillance and control efforts to safeguard public health in Clark County.

Major Project Objectives:
Project Objectives:
1) Conduct a detailed review of tuberculosis-related deaths in Clark County, examining clinical histories, treatment adherence, and associated risk factors.
2) Identify patterns and commonalities among TB fatalities to inform targeted interventions.

Expected Deliverables:
1) A detailed report summarizing the findings of the comprehensive TB death review, including clinical, epidemiological, and social determinants analyses.

Major Project Impact:
This project encompasses a holistic approach to tuberculosis prevention and control, aiming to improve clinical outcomes, reduce health disparities, and strengthen the community's resilience against tuberculosis-related mortality. It will contribute to an improved understanding of TB mortality patterns, enhanced clinical management and treatment outcomes, addressing social determinants of TB mortality, and informed public health policies and practices.

Additional Project #1 Title: Leveraging Social Media for Early Detection of Foodborne Illness Outbreaks
Project #1 Type: Surveillance Activity

Project #1 Description:
This innovative project focuses on exploring the utility of social media as a tool for early detection of potential foodborne illness outbreaks in Clark County, Nevada. The fellow will collaborate with the Southern Nevada Health District (SNHD) to design and implement a pilot study that involves the systematic monitoring and analysis of social media platforms for mentions of foodborne illness symptoms and related experiences. By leveraging natural language processing and sentiment analysis techniques, the project aims to identify signals indicative of possible outbreaks, allowing for early investigation and response. The fellow will work closely with data scientists, epidemiologists, and public health experts to develop a methodology for social media surveillance, establish criteria for distinguishing credible reports, and assess the feasibility of integrating social media data into the existing surveillance framework.

Project #1 Objectives and Expected Deliverables:
Project Objectives:
1) Assess the feasibility of integrating social media data into the existing infectious disease surveillance framework, considering data privacy, ethical considerations, and technical compatibility.
2) Develop a methodology for systematically monitoring and analyzing social media platforms to detect signals related to foodborne illness.
3) Conduct a pilot study to implement the social media surveillance methodology, evaluate its effectiveness in detecting potential foodborne illness outbreaks, and refine the approach based on pilot findings.

Expected Deliverables:
1) Documentation detailing the methodology developed for monitoring and analyzing social media for foodborne illness signals.

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Project #1 Impact:
The expected public health impacts of this project include early detection, rapid response, enhanced situational awareness, community engagement, and improved decision-making, ultimately contributing to a more resilient and proactive public health system in the context of foodborne illness outbreaks.

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

Routine activities at the OOE will enable the Fellow to develop skills in disease investigation and response and offer the opportunity to participate in and later to lead outbreak investigations. Outbreak and other major investigations or events are performed under the structure of the Incident Command System (ICS), which will give the Fellow first-hand experience in the operation of emergency preparedness activities. The Fellow will also have the opportunity to be trained and become a member of the Rapid Response Team, to receive other Public Health Preparedness (PHP) training, and to participate on mass casualty exercises and other events related to PHP. We expect the Fellow to spend 4-6 weeks during the two-year training on preparedness and response efforts.

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

The Fellow will play a pivotal role in assisting with cluster and outbreak investigations, engaging in various activities and dedicating time to this critical aspect of public health. Responsibilities will include developing data collection instruments, utilizing diverse methods such as patient and healthcare provider interviews, medical record abstraction, surveys, and environmental assessments (if applicable). The Fellow will then analyze the collected data and contribute to the preparation of comprehensive investigation reports, participating in after-action reviews and collaborating with multiple partners involved in the investigative process. The Fellow's involvement in outbreak investigations will be substantial, with opportunities to lead and/or assist in cases such as the approximately 4-7 foodborne illness outbreaks occurring annually in southern Nevada. Additionally, the Fellow will contribute to lead poisoning investigations, conducting interviews with cases to gather primary data and identify potential sources of exposure. We are dedicated to providing the Fellow with leadership opportunities in investigations, supporting their participation in emergency response deployments arranged by CSTE. Anticipated time allocation for the Fellow's engagement in cluster and outbreak investigations is expected to be 4 weeks over the two-year training period, ensuring a robust and impactful experience in this crucial public health domain.