ID: 76011129
Environmental Health - Host Site Description
Arizona Department of Health Services

Assignment Location: Phoenix, US-AZ
Arizona Department of Health Services
Director's Office/ Bureau of Resiliency and the Environment

Primary Mentor: Jennifer Botsford, MSPH, BA, BS
Bureau Chief
Arizona Department of Health Services

Secondary Mentor: Niki Lajevardi-Khosh, MPH, BS
Environmental Epidemiology Program Manager
Arizona Department of Health Services

Work Environment
Hybrid

Assignment Description

The fellow will be placed within the Environmental Health Capacities and Resilience Office, reporting to the Bureau Chief for Resiliency and the Environment, under the broader guidance of the Chief Heat Officer and the Agency Director. This office is responsible for addressing climate-related public health challenges, with a strong focus on heat mitigation. The fellow's primary responsibilities will center on enhancing heat-related surveillance and intervention strategies. This includes developing a syndromic dashboard for weather-related health data, modernizing heat and cold illness surveillance reports, and creating interactive Power BI dashboards for annual reports. They will also collaborate with Arizona State University (ASU) to translate research into actionable interventions, such as expanding the cooling center optimization tool and conducting an epidemiological study on the impact of cooling centers on hospitalizations and mortality. Additional duties include assisting with the Heat Alert API, developing strategic plans for climate-related public health issues, participating in a heat evaluation with ASU, and validating heat tier systems.

Day-to-day activities will involve attending internal and external meetings, reviewing surveillance data to inform program decisions, developing and reviewing evaluation plans, tracking project metrics, and participating in leadership and professional development trainings.

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 suite of statistical and data analysis resources to support their work within the Environmental Health Capacities and Resilience Office.

Database/Surveillance Systems:

- Syndromic Surveillance Systems: Access to real-time data for monitoring health events related to weather factors.
- Hospital Discharge Data: Detailed records of hospital admissions, providing insights into heat-related illnesses and other health outcomes.
- Death Data: Vital statistics data for analyzing mortality trends and identifying populations at risk.
- MEDSIS (Medical Electronic Disease Surveillance Intelligence System): A state-wide system for disease surveillance and outbreak management.

- AzPIERS (Arizona Patient Incident and Encounter Reporting System): A system for reporting and tracking patient incidents and encounters in healthcare settings.
- Snowflake: A cloud-based data warehousing platform for efficient data storage, analysis, and querying.

Training and Collaboration:

- Snowflake Trainings: Opportunities to gain proficiency in using the Snowflake platform for data analysis.
- Collaboration with Senior Staff: Direct access to epidemiologists and other experienced data analysts for guidance and mentorship.
- Bi-Weekly Meetings with Data Team: Regular meetings to discuss data analysis strategies, share insights, and troubleshoot challenges.
- Collaboration with University Partners: Opportunities to work with researchers and data analysts at Arizona State University on joint projects, gaining exposure to advanced analytical techniques and research methodologies.

Projects

Surveillance Activity Title: Modernize Heat and Annual Surveillance Reports

Surveillance Activity Description:
This project involves a comprehensive review and redesign of existing heat and annual surveillance reporting systems. Current reports, which may be static and limited in accessibility, will be transformed into dynamic, interactive, and user-friendly platforms. The focus is on leveraging modern data visualization and analysis tools to enhance the timeliness, accuracy, and accessibility of heat-related illness and overall health surveillance data. This will include integrating data from multiple sources (syndromic, hospital discharge, mortality) and streamlining the reporting process.

Surveillance Activity Objectives:
Objective 1: Modernize Heat-Related Illness Surveillance Reports:

- Deliverable: Development of interactive, real-time dashboards (e.g., Power BI) for heat-related illness surveillance, allowing for dynamic data exploration and trend analysis.
- Deliverable: Creation of standardized, automated reporting templates for timely dissemination of heat-related illness data.

Objective 2: Enhance Annual Surveillance Reports:

- Deliverable: Transition from static annual reports to interactive Power BI dashboards, enabling users to explore data trends and patterns.
- Deliverable: Implementation of data visualization best practices to improve the clarity and accessibility of annual surveillance data.
- Deliverable: Improvement of the data collection and data management of the data used in the annual reports.

Objective 3: Improve Data Integration and Accessibility:

- Deliverable: Integration of data from various sources (syndromic, hospital discharge, mortality) into a centralized reporting system.
- Deliverable: Development of user-friendly interfaces for accessing and interpreting surveillance data.

Surveillance Activity Impact:

- Modernized surveillance systems will deliver timely and accurate heat-related illness data, enabling rapid public health interventions. Interactive dashboards will empower data-driven decisions for professionals and policymakers, while user-friendly visualizations will increase public awareness and engagement. Enhanced

understanding of heat illness patterns will strengthen mitigation strategies and optimize resource allocation. Ultimately, this project aims to reduce heat-related morbidity and mortality, and improve long-term public health planning related to climate change.

Surveillance System Evaluation Title: Heat Tier Validation and Evaluation

Surveillance System Evaluation Description:
This project involves an evaluation of the existing heat tier system, which assigns risk levels based on temperature and other environmental factors. The evaluation will assess the system's accuracy in predicting heat-related health risks, its effectiveness in triggering appropriate public health responses, and its overall utility in protecting vulnerable populations. Data sources will include syndromic surveillance, hospital discharge records, mortality data, and environmental monitoring data. Statistical analysis will be used to determine the correlation between heat tier levels and health outcomes, and to identify potential areas for improvement.

Surveillance System Objectives:
Objective 1: Validate the Accuracy of Heat Tiers:

- Deliverable: A comprehensive report detailing the statistical analysis of heat tier accuracy, including sensitivity, specificity, and predictive values.
- Deliverable: Development of updated heat tier thresholds, if needed, based on the evaluation findings.

Objective 2: Evaluate the Effectiveness of Heat Tier-Triggered Interventions:

- Deliverable: An analysis of the impact of heat tier activation on public health interventions, such as cooling center activation and public messaging.
- Deliverable: Recommendations for improving the effectiveness of heat tier-triggered interventions.

Objective 3: Assess the Utility of the Heat Tier System for Vulnerable Populations:

- Deliverable: An assessment of the system's ability to identify and protect vulnerable populations, such as the elderly, children, and those with chronic health conditions.
- Deliverable: Recommendations for tailoring the heat tier system to better address the needs of vulnerable populations.

Objective 4: Develop an evaluation plan to be used on the states heat mitigation efforts.

- Deliverable: A comprehensive evaluation plan that can be used to assess the effectiveness of the state's heat mitigation efforts.

Surveillance System Impact:

- Improved Heat Risk Communication: Validated heat tiers will provide more accurate and reliable information to the public, enabling individuals to take appropriate precautions.
- Enhanced Targeted Interventions: Evaluation findings will inform the development of more effective interventions, specifically tailored to heat tier levels and vulnerable populations.
- Optimized Resource Allocation: Accurate heat tier information will enable public health agencies to allocate resources more efficiently, focusing on areas with the highest risk.
- Reduced Heat-Related Morbidity and Mortality: By improving the accuracy and effectiveness of heat tier systems, this project will contribute to a reduction in heat-related illnesses and deaths.
- Increased Community Resilience: By providing better information and interventions, the community will be more resilient to heat events.

ID: 76011129
Environmental Health - Host Site Description
Arizona Department of Health Services

Major Project Title: State Heat Evaluation

Major Project Description:
This project aims to evaluate the overall effectiveness of the state's heat mitigation strategies and programs in partnerhsip with ASU and public health consultant. It will involve analyzing various data sources, including heat-related illness surveillance, cooling center utilization, public messaging reach, and community-level intervention data. The evaluation will assess the state's progress in reducing heat-related morbidity and mortality, identifying successful strategies, and highlighting areas for improvement. This evaluation will utilize the evaluation plan created in the Heat Tier Validation and Evaluation project.

Major Project Objectives:
Project Objectives and Deliverables:

Objective 1: Assess the Effectiveness of Current Heat Mitigation Strategies:
- Deliverable: A comprehensive report evaluating the impact of existing heat mitigation programs on reducing heat-related health outcomes.
- Deliverable: Identification of best practices and successful interventions for heat mitigation.

Objective 2: Evaluate the Reach and Impact of Public Messaging Campaigns:
- Deliverable: An analysis of the effectiveness of public messaging in raising awareness about heat risks and promoting protective behaviors.
- Deliverable: Recommendations for improving the reach and impact of future public messaging campaigns.

Objective 3: Analyze the Utilization and Effectiveness of Cooling Centers:
- Deliverable: An evaluation of cooling center utilization rates and their impact on reducing heat-related hospitalizations and deaths.
- Deliverable: Recommendations for optimizing cooling center placement, accessibility, and services.

Objective 4: Identify Gaps and Areas for Improvement in Heat Mitigation Efforts:
- Deliverable: A report outlining gaps in current heat mitigation strategies and recommendations for addressing them.
- Deliverable: Development of a strategic plan for improving state-wide heat mitigation efforts.

Major Project Impact:
- Evidence-Based Policy Development: Evaluation findings will inform the development of evidence-based policies and programs for heat mitigation.
- Optimized Program Implementation: Evaluation results will guide the optimization of existing heat mitigation programs, ensuring efficient resource allocation and effective interventions.
- Improved Community Protection: By identifying and addressing gaps in heat mitigation efforts, this project will enhance the state's ability to protect vulnerable populations from heat-related health risks.
- Enhanced Public Health Preparedness: The evaluation will contribute to improved public health preparedness for heat events, reducing the impact of future heat waves.
- Increased Program Accountability: This project will increase the accountability of heat mitigation programs by providing data-driven evidence of their effectiveness.
- Long term improved health outcomes: The evaluation will allow for the state to improve heat mitigation efforts, leading to long term improved health outcomes.

ID: 76011129
Environmental Health - Host Site Description
Arizona Department of Health Services

Additional Project #1 Title: Weather and Health Syndromic Dashboard
Project #1 Type: Surveillance Activity

Project #1 Description:
This project involves the development and implementation of a dynamic, interactive dashboard that integrates syndromic surveillance data with real-time weather information. The dashboard will provide public health officials with a comprehensive view of health outcomes influenced by weather patterns from heat, cold, wildfire, poor air quality, and monsoons. It will utilize advanced data visualization and analysis tools to identify trends, patterns, and potential public health threats, enabling timely and targeted interventions.

Project #1 Objectives and Expected Deliverables:
Objective 1: Develop a Real-Time Syndromic Surveillance Dashboard:

- Deliverable: Creation of an interactive dashboard that displays syndromic data (e.g., emergency department visits for heat-related illness, respiratory issues) alongside real-time weather data (temperature, humidity, air quality).
- Deliverable: Implementation of automated alerts for exceeding pre-defined health thresholds.

Objective 2: Integrate Diverse Data Sources:

- Deliverable: Integration of syndromic surveillance data from MEDSIS, hospital discharge, and other relevant sources with weather data from reliable meteorological services.

Objective 3: Enhance Data Visualization and Analysis:

- Deliverable: Implementation of interactive maps, charts, and graphs to visualize weather-related health trends.
- Deliverable: Development of analytical tools to identify high-risk populations and geographic areas.
- Deliverable: Creation of a report that details how to use and interpret the dashboard.

Objective 4: Ensure User Accessibility and Usability:

- Deliverable: Development of a user-friendly interface accessible to public health professionals, policymakers, and potentially the public.
- Deliverable: Implementation of training materials and user support.

Project #1 Impact:

- Improved Timeliness of Public Health Interventions: Real-time data will enable rapid responses to emerging weather-related health threats, minimizing morbidity and mortality.
- Enhanced Targeted Interventions: The dashboard will allow for the identification of high-risk populations and geographic areas, enabling targeted interventions and resource allocation.
- Increased Public Awareness: Public-facing components of the dashboard (if implemented) will increase public awareness of weather-related health risks and promote preventive behaviors.
- Strengthened Public Health Preparedness: The dashboard will improve public health preparedness for extreme weather events, reducing the impact of heat waves and other climate-related hazards.
- Data-Driven Policy Development: The data provided by the dashboard will support the development of evidence-based policies and programs for climate adaptation and mitigation.

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

The Fellow will play a vital role in enhancing the agency's preparedness and response capabilities, particularly concerning heat-related emergencies. This will involve a combination of data analysis, reporting, and planning activities, contributing to a more robust and proactive approach to public health preparedness. These activities would consume about 15% of the fellow's time.

ID: 76011129
Environmental Health - Host Site Description
Arizona Department of Health Services

Anticipated Role and Activities:

Heat Alert Automation and Analysis :

- The Fellow will assist in the automation and refinement of the Heat Alert system, ensuring timely and accurate dissemination of warnings.
- This includes analyzing heat alert data to assess the effectiveness of the system and identify areas for improvement.
- They will utilize data to understand the relationship between heat alerts and health outcomes.

Epidemiological Updates at State Heat Briefings:

- The Fellow will prepare and deliver epidemiological updates at state heat briefings, providing critical insights into current heat-related health trends and potential risks.
- This will involve synthesizing complex data into clear and concise presentations for diverse audiences, including public health officials, policymakers, and community leaders.

Assistance with Emergency Preparedness Plan Development :

- The Fellow will contribute to the development and refinement of emergency preparedness plans, focusing on heat-related emergencies.
- This will involve conducting research, analyzing data, and collaborating with other agencies and stakeholders to ensure comprehensive and effective plans.

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 actively involved in cluster and outbreak investigations, gaining hands-on experience in the critical aspects of public health response, as needed. This role will provide a valuable opportunity to apply epidemiological principles and contribute to real-world disease control efforts. Fellow will spend approximately 5- 10% of their time on this as needed.