

**ID: 35073434**

**Infectious Diseases, Environmental Health - Host Site Description**

**Utah Department of Health and Human Services**

**Assignment Location:** Salt Lake City, US-UT  
Utah Department of Health and Human Services  
Division of Disease Control and Prevention

**Primary Mentor:** William A. Lanier, DVM, MPH  
Utah State Public Health Veterinarian  
Utah Department of Health

**Secondary Mentor:** Leisha Nolen, MD, PhD  
Utah State Epidemiologist  
Utah Department of Health

**Work Environment**

Hybrid

**Assignment Description**

The fellow will be placed in the Division of Population Health (DPH) directly under the Primary Mentor, Dr. Lanier. The fellow will work very closely with the Disease Response, Evaluation, Analysis, and Monitoring (DREAM) Program within the Office of Communicable diseases. The DREAM Program is responsible for surveillance and investigation of infectious diseases including viral hepatitis, foodborne/enteric diseases, zoonotic diseases, vectorborne diseases, meningitis/invasive diseases, and influenza. In addition, the DREAM program oversees several cooperative agreements/grants including the CDC-Epidemiology and Laboratory Capacity Cooperative Agreement and the CDC-Hepatitis Grant. The fellow will be involved in a variety of infectious disease surveillance and investigation activities working closely with DREAM, UDHHS, the Utah Public Health Laboratory (UPHL), and local health department staff. The fellow will have the opportunity to lead outbreak investigations, as well as participate in preparedness-related activities. The fellow will also be encouraged to participate in conferences and trainings.

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

The fellow will have access to Microsoft Office and Google applications, including Excel and Access, as well as SAS and R statistical software. Most DREAM staff are proficient in SAS and/or R and are available to provide training and technical support, as needed. The fellow will also have access to the UDHHS UT-NEDSS database, EpiTrax, and will receive training on the system.

**Projects**

**Surveillance Activity Title: Evaluate the association between Great Salt Lake water level, dust in the air, and adverse health outcomes.**

*Surveillance Activity Description:*

The Great Salt Lake near Salt Lake City, Utah is shrinking because of a long drought and water use, negatively impacting ecosystems, economy, and public health. Dust and other materials from the exposed dry lakebed can be made airborne by wind. The extent to which these lakebed materials cause adverse respiratory and other health outcomes is unknown. The fellow will collaborate with partners from UDHHS and the US Geological Survey to assess the potential associations between lake level, exposed lakebed, airborne dust, and adverse health outcomes, including emergency department visits for asthma. Results of this analysis will help inform policy and other efforts aimed at preserving the lake.

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*Surveillance Activity Objectives:*

- Develop collaborative relationships with allied partners.
- Identify usable data sources for lake level, exposed lakebed, weather events, dust in the air (or proxies), and adverse health outcomes.
- Analyze the data to assess potential associations.
- Engage with policymakers and other partners to inform efforts to preserve the Great Salt Lake.

*Surveillance Activity Impact:*

This project will strengthen One Health partnerships between public health and environmental health allies and help them collaborate toward common goals. Results of this project are expected to help provide public health reasons to preserve the Great Salt Lake, potentially leading to healthier air. In addition, this project could provide a model for future efforts to assess associations between environmental and public health data.

**Surveillance System Evaluation Title: Compare Mechanisms for Surveillance of Rabies Post-Exposure Prophylaxis Administration: Syndromic Surveillance, Utah State Immunization Information System, and Healthcare Facilities Dataset**

*Surveillance System Evaluation Description:*

Rabies has the highest fatality rate of any zoonotic disease, but is 100% preventable with timely administration of post-exposure prophylaxis treatment (PEP), which consists of a course of human rabies immune globulin (HRIG) and four doses of rabies vaccine given over a two-week period. Although hundreds of Utahns seek rabies PEP each year, the treatment is not a reportable condition in Utah, and there is not currently a systematic, routine system in place for monitoring the quantity of administrations across the state. However, there are three databases that routinely capture rabies PEP-related information:

- 1) Healthcare Facilities Database (HFD) contains encounter records for all licensed hospitals, emergency rooms, and ambulatory surgery centers in Utah. Because HRIG can only be administered at an ER or hospital facility, we consider the HFD database as the “gold standard”, since it captures ER visits for all patients seeking at least the initial course of PEP. However, obtaining these data is onerous and identifying a sufficient, easier-to-access data source for PEP trend tracking would be ideal.
- 2) Utah Statewide Immunization Information System (USIIS) is a secure, confidential immunization information system that helps healthcare providers, schools, child care centers and Utah residents maintain consolidated immunization histories. Reporting of rabies PEP in USIIS is voluntary; it is unclear how representative these data are of all PEP administrations.
- 3) Syndromic surveillance captures chief complaints and ICD-10 codes related to rabies encounters at hospital facilities. Emergency department visit data are available for analysis using the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) system. ESSENCE provides UDHHS with patient-level syndromic data for analysis for patterns in emergency visits. The sensitivity and specificity of this dataset for PEP monitoring are unknown.

The goal of this surveillance project is to evaluate which database (USIIS or ESSENCE) more accurately captures the frequency of rabies PEP data in Utah. Rabies-related data captured in these two databases will be compared to the information collected in the HFD (gold standard comparison group).

*Surveillance System Objectives:*

- Navigate data request and IRB approval processes to obtain necessary information from USIIS, ESSENCE, and HFD databases

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- Engage with the department’s Syndromic Surveillance Team to develop an ESSENCE query that accurately identifies syndromic rabies PEP administration data
- Develop the methodology to compare rabies PEP administrations between the three databases (e.g., case-matching, deduplicating entries, identifying non-reporting entities)
- Write a surveillance report that summarizes the available data in each database and the evaluation findings
- Based on the evaluation findings, provide recommendations to focus and improve future rabies PEP surveillance efforts

*Surveillance System Impact:*

This project will help us monitor PEP administration, which can inform rabies prevention efforts and help justify funding for rabies response. Tracking the burden of rabies PEP administrations is important to better understand rabies disease trends across Utah, assess the economic burden of rabies treatment and prevention, and to inform public health preparedness and response to human and animal rabies exposures.

**Major Project Title: Assessment of Utah’s enteric disease outbreaks associated with unpasteurized dairy products, 2009-2022**

*Major Project Description:*

For the past decade, Utah has reported more enteric disease outbreaks associated with unpasteurized dairy products (including raw milk) than any other state. The fellow will analyze the National Outbreak Reporting System/Foodborne Disease Outbreak Surveillance System (NORS) dataset to epidemiologically describe these outbreaks during 2009-2022. The fellow will also research Utah’s laws, regulations, and supply and demand related to unpasteurized dairy products to gain a better understanding of the policy and cultural context in which the outbreaks occurred.

*Major Project Objectives:*

- Obtain NORS and internal Utah data on enteric disease outbreaks associated with unpasteurized dairy products
- Obtain information on Utah’s laws, regulations, and supply and demand related to unpasteurized dairy products
- Describe Utah’s enteric disease outbreaks associated with unpasteurized dairy products, 2009-2022
- Put the outbreaks in policy and cultural context
- Make recommendations for the prevention, detection, and reporting of enteric disease associated with unpasteurized dairy products

*Major Project Impact:*

This project will increase our understanding of enteric disease associated with unpasteurized dairy products in Utah and will inform prevention, detection, and reporting activities.

**Additional Project #1 Title: Assess Illnesses related to Harmful Algal Blooms Utilizing Data Collected through the Utah Poison Control Center**

**Project #1 Type: Surveillance System Evaluation**

*Project #1 Description:*

Harmful algal blooms (HABs) have recently emerged in Utah as a public health concern. Illnesses in humans and animals associated with HABs are challenging to detect using traditional surveillance methods for a number of reasons, including a lack of availability of testing for cyanotoxin exposure. In partnership with UDHHS, the Utah Poison Control Center (UPCC) collects information from callers who report human or animal illnesses suspected to be related to HABs and enters the information directly into CDC’s One Health Harmful Algal Bloom Surveillance System (OHHABS). Using CDC’s Guidelines for Evaluating Public Health Surveillance Systems, the fellow will evaluate Utah’s OHHABS surveillance, including examining whether sufficient data are being collected to determine whether cases meet CDC’s case

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definitions, as well as assessing quality and completeness of the data. This project will include close collaboration with the DREAM waterborne epidemiologist, the Environmental Epidemiology program toxicologist, the UPCC, and the Utah Department of Natural Resources to identify ways to improve HAB-associated illness data reporting and dissemination of related information to partners.

*Project #1 Objectives and Expected Deliverables:*

The goal of the project is to improve surveillance of illnesses in humans and animals associated with HABs in order to better understand the most common presentations of symptoms, severity of HAB-associated illnesses, and risk factors for developing illness. Deliverables include:

- A surveillance evaluation report
- A summary of available data
- Recommendations to improve the surveillance system

*Project #1 Impact:*

Improving surveillance of HAB-related illnesses will allow environmental and public health programs to identify appropriate mitigation strategies to prevent illness in humans and animals as well as targeting prevention strategies to those at highest risk.

**Additional Project #2 Title: Expand Utah's statewide foodborne illness complaint system to allow collection of data related to suspected waterborne illness cases**

**Project #2 Type: Surveillance Activity**

*Project #2 Description:*

UDHHS maintains a public-facing web-based system called iGotsick to collect data from the public related to suspected foodborne illnesses. The system has been very successful but, by design, is only able to collect information on illnesses related to food exposures. Illnesses related to other types of exposures, such as recreational water, can not effectively be reported through the system. The fellow will help expand the existing system to collect information regarding illnesses related to potential water exposures.

*Project #2 Objectives and Expected Deliverables:*

The primary objective of the project is to facilitate the detection and mitigation of waterborne illness outbreaks by bringing waterborne diseases under the same umbrella as foodborne diseases, creating consistency in how foodborne and waterborne diseases are recognized, monitored, reported, investigated, and prevented.

Project deliverables include:

- Identify appropriate variables to add to the system
- Work with staff from the DREAM and Informatics programs to incorporate the new variables into the web-based iGotsick system
- Evaluate the effectiveness of the system

*Project #2 Impact:*

It is expected that this project will increase reporting and detection of waterborne illnesses. By identifying and investigating these illnesses, we can identify risk factors and appropriate prevention measures to prevent additional illnesses.

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**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 closely with the DREAM program Preparedness Epidemiologist and will attend monthly Preparedness program meetings and participate in preparedness trainings and exercises, as available. The fellow will also have the opportunity to participate in Incident Command meetings for any responses that may occur during the fellowship.

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

The fellow will participate in and lead outbreak and disease investigations, as available, working closely with the State Epidemiologist, State Public Health Veterinarian, and DREAM program staff. The fellow will also participate in collaborative meetings such as weekly meetings with local health department staff to discuss disease investigations, bi-weekly laboratory-epidemiology meetings, as well as other trainings and conferences.

**Please Describe the Fellow's Anticipated Role in the COVID-19 Response – Include Activities and Time Allocation**

None

**Please Describe Opportunities for Fellows to Work in Health Equity as well as Incorporating Diversity, Equity, and Inclusion into their Work**

UDHHS is committed to promoting health equity and diversity in all aspects of our work. The fellow will have the opportunity to participate in meetings with staff from the UDHHS Office of Health Equity, and participate in health equity-related trainings.