

**ID: 74146548**

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

**Kentucky Department for Public Health**

**Assignment Location:** Frankfort, US-KY  
Kentucky Department for Public Health  
Division of Epidemiology and Health Planning

**Primary Mentor:** Allison Siu, DVM, MPH  
CDC Career Epidemiology Field Officer  
Kentucky Department for Public Health / CDC

**Secondary Mentor:** Kathleen Winter, PhD, MPH  
State Epidemiologist / Director, KDPH Division of Epidemiology and Health Planning  
Kentucky Department for Public Health / University of Kentucky College of Public Health

**Work Environment**

Hybrid

**Assignment Description**

The CSTE Fellow will be working at the Kentucky Department for Public Health (KDPH) located in Frankfort, Kentucky. Frankfort is the capital of Kentucky and is approximately 30 minutes from Lexington and 50 minutes from metro Louisville. The fellow will serve under the Division Director's Office of the Division of Epidemiology and Health Planning. The Division of Epidemiology provides surveillance, reporting, and outbreak response for all infectious diseases, and some other conditions and outcomes, such as opioid overdose, injury, healthcare associated infections, and any outbreak of a health condition, and also houses the Office of Vital Statistics. The CSTE Fellow may choose initiatives in any field within public health and is encouraged to select projects in two main focus areas: infectious disease epidemiology and One Health, but can consider any number of other opportunities within the department. The Fellow can expect to have a multifaceted experience and will have the opportunity to choose from a variety of epidemiologic activities, spanning the gamut of infectious disease outbreaks to harm reduction/syringe exchange program initiatives to surveillance activities to emergency preparedness and response to vital statistics. We have identified a menu of key initiatives from which the fellow can select projects to give the widest exposure to applied public health and epidemiology (see "Potential Fellow Projects" description boxes below) but also strive to match the fellow's areas of interest and career goals. The CSTE Fellow's day-to-day activities will vary with each project but will generally be related to KDPH ongoing work and CSTE Fellow projects related to infectious disease surveillance, reporting, and investigation of outbreaks and response, and disease prevention projects. A typical day could involve meeting with mentors, meeting with KDPH or other state and local staff individually or in groups, responding to urgent public health issues, or interacting with Regional Epidemiologists or other staff at local health departments, hospital infection preventionists, or external partners. Interactions outside of KDPH could be via telephone, email, videoconference, webinars, or in-person meetings. Daily activities will also include analyzing data, participating in field investigations, preparing surveys or reports, and preparing findings for conference presentations or manuscript publication. We have had numerous, high-level, public health responses in the past years, so involvement in department incident command structure will likely be a part of this experience.

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

The fellow will have access to statistical analysis software including SAS, R, Excel, and REDCap data collection software. Several staff members are versed in using each of these analysis software and are available to assist the fellow. Microsoft Access and Microsoft Office programs are available to all staff. Disease-related information is collected and stored in a number of electronic surveillance systems including the National Electronic Disease Surveillance System

**ID: 74146548**

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

**Kentucky Department for Public Health**

(NEDSS), the National Outbreak Reporting System (NORS), and our previous NEDSS-compliant system, the Kentucky Electronic Public Health Record System (KYEPHRS). The Kentucky Health Information Exchange (KHIE) gathers and houses clinical data from healthcare facilities across the state. KHIE is integrated with public health surveillance and immunization registry data collection and electronic case reporting is being implemented for notifiable disease conditions. The fellow may become an active user of these systems and can gain experience using Business Objects software to retrieve data from them. Additionally, surveillance tracking usage and other factors for syringe exchange programs has been implemented using the REDCap system. The Fellow would be enrolled in EPI-X, the CDC Epidemic Information Exchange, and can become a user in the National Healthcare Safety Network (NHSN). Several current staff are well-versed in R as well, so the fellow may have the opportunity to work in that software as well.

**Projects**

**Surveillance Activity Title: Sentinel versus Community Sites for Actionable Wastewater Surveillance**

*Surveillance Activity Description:*

The Kentucky Wastewater Surveillance System (KYWSS; “Cues”) is exploring the concept of regional centers of activity as preferred sentinel sites in an effective wastewater surveillance system (WSS). Our preliminary algorithm scores sites within cooperating readiness and response regions based on traffic counts, numbers of hospitals, higher education, transportation, commerce and tourism/attractions. From these scores, KYWSS has selected the top two (2) sites in each region as Sentinels for enhanced partnership with their Local Health Department (LHD) and participation in a year-long data collection project which will evaluate twice weekly samples for SARS CoV2, Flus A & B, RSV and measles measures as well as sequencing data for each parameter. This time-limited project will run concurrently with our ongoing KYWSS data collection which includes sites that scored much lower via the algorithm and which we will identify as Community sites for comparison.

The CSTE Fellow will be under the direction of Daniel Cooper MPH, KYWSS Wastewater Epidemiologist, Rochelle Holm PhD, University of Louisville, and Liz Loh-Lutz PhD, University of Kentucky in designing and executing applied epidemiological analysis for the purpose of project evaluation, prediction/forecasting, risk assessment and public health decision making. Our intent is to consider the value of a two-tier WSS dependent primarily on Sentinel sites robustly supported by an appropriately selected network of Community sites activated as needed for outbreaks or future pandemics.

*Surveillance Activity Objectives:*

Surveillance Activity Objectives

1. Evaluate the Sentinel site algorithm for generalizability and essential factors
2. Analyze differences in demographics and other characteristics of Sentinel vs Community sites to assess wastewater virus data prediction and forecasting of clinical disease measures
3. Provide data for and participate in risk assessment and risk communication.

Surveillance Activity Deliverables

1. Report to NWSS on the efficacy of Sentinel site selection based on a working site selection algorithm.
2. Created a project evaluation report for KDPH, site partners, and NWSS that documents the efficacy of the year-long project described above, data differences and forecasting utility of a Sentinel-site based plan.
3. Assist in the development of evidence-based public health decision-making trees considering cost and ROI within HD communities (State and Local).

**ID: 74146548**

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

**Kentucky Department for Public Health**

*Surveillance Activity Impact:*

Right-sizing site selection is critical to the effectiveness of wastewater surveillance both from a cost perspective as well as data accuracy and utility in public health decision-making. The Fellow will have a critical role in epidemiological analysis of a project designed to test best practice in site selection for the purpose of respiratory disease risk assessment based on viral activity and sequencing detected in wastewater.

**Surveillance System Evaluation Title: Kentucky Syndromic Surveillance Data Completeness and Quality Evaluation**

*Surveillance System Evaluation Description:*

Kentucky Syndromic Surveillance (KySyS) utilizes a data quality report that analyzes hospital ED data flow, completeness, and quality. This report will be expanded to include clinics and urgent treatment centers from whom we also received data. An R script will be created, and R will be utilized in the creation of this report. By analyzing the quality of the data flowing from clinics and urgent treatment centers we will be better able to identify weak points within the data and apply fixes. We will also be able to monitor for any drops in the data feeds. A data quality report card will also be created for individual clinic and urgent treatment center to share with each facility for their awareness of their data quality. The CSTE fellow will work closely with KySyS to design the report and report card, and to distribute the report and report card to KySyS and the facilities.

*Surveillance System Objectives:*

Project Objectives:

1. Create a data quality report for clinics and urgent treatment centers
2. Develop a data quality report card to be shared with clinics and urgent treatment centers
3. Develop an R script to regularly run the report that can be shared with and run by other R users
4. Develop an R script for the report card that can be shared with and run by other R users

Project Expected Deliverables:

1. Clinic and urgent treatment center data quality report
2. Individual clinic and urgent treatment center data quality report card

*Surveillance System Impact:*

The project will help KySyS better monitor the quality of the current syndromic data it is receiving as well as be prepared to monitor the quality of the data for future facilities that will be onboarded.

**Major Project Title: Understanding Hepatitis Mortality in Kentucky, 2011 - 2024**

*Major Project Description:*

Kentucky continues to experience high rates of hepatitis C with an acute rate of 5.9 cases per 100,000 people, continually ranking in the top 5 highest burden states in the country, and an estimated 80,000 residents infected overall. Additionally, Kentucky has the third highest rate of acute hepatitis B in the country with 1.9 cases per 100,000 people. Non-sterile injection drug use is the main transmission route for both hepatitis B and C in Kentucky. Death certificate review to understand the full outcomes of hepatitis has only been completed at a broad level, more in-depth review is warranted.

*Major Project Objectives:*

Project Objectives:

1. Understand hepatitis B and C related mortality in Kentucky from 2011 to 2024.
2. Complete relevant subgroup analysis to understand trends in divergent geographic areas and deaths by age, sex or other characteristics.
3. Quantify mortality per year.

**ID: 74146548**

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

**Kentucky Department for Public Health**

**Project Expected Deliverables:**

1. Literature Review of hepatitis related mortality in the United States and Kentucky.
2. Comprehensive report including descriptive statistics and relevant outcomes.

*Major Project Impact:*

Understand hepatitis B and C related mortality in Kentucky from 2011 to 2024. This information will help establish trends for hepatitis related deaths and inform stakeholders of the full burden of hepatitis in the state.

**Additional Project #1 Title: Enhancing Surveillance of Zoonotic Pathogens in Animal Laboratory Reports**

**Project #1 Type: Major Project**

*Project #1 Description:*

The Kentucky Zoonosis program receives daily animal laboratory reports from IDEXX. Currently, these reports are reviewed and archived without clinical context or systematic follow-up. This project aims to improve the utilization of animal laboratory reports received from IDEXX for public health surveillance, particularly in identifying potential zoonotic disease risks. A CSTE fellow will develop a structured approach to analyze a year's worth of data, identifying trends and potential concerns such as *Campylobacter* or *Salmonella* in companion animals.

*Project #1 Objectives and Expected Deliverables:*

**Project Objectives:**

1. Establish a Systematic Review Process - Develop and implement a structured approach for reviewing, categorizing, and analyzing animal laboratory reports from IDEXX, focusing on zoonotic pathogens of public health concern.
2. Enhance Zoonotic Disease Surveillance - Identify and investigate potential linkages between reportable zoonotic diseases in animals and corresponding human cases by collaborating with public health officials and existing surveillance systems.
3. Develop Data-Driven Insights - Conduct a one-year retrospective analysis of animal laboratory reports to identify trends, emerging threats, and opportunities for improving communication between veterinary and public health sectors.

**Project Expected Deliverables:**

1. Standardized Review and Follow-Up Protocol - A documented workflow for reviewing, categorizing, and responding to concerning laboratory findings, including coordination with reportable disease surveillance teams.
2. Annual Surveillance Report - A comprehensive summary of animal laboratory findings over a one-year period, highlighting key trends, potential human health implications, and recommendations for future surveillance efforts.
3. Stakeholder Communication Plan - A framework for improving communication between veterinary diagnostic labs, local health departments, and public health officials to ensure timely awareness and response to potential zoonotic threats.

*Project #1 Impact:*

The fellow will establish protocols for daily review and follow-up, coordinating with public health officials to determine if cases warrant further investigation. Additionally, they will explore potential human-animal case linkages by communicating with reportable disease surveillance systems. The project will enhance zoonotic disease monitoring capacity, contribute to One Health efforts, and provide actionable insights for public health interventions.

**ID: 74146548**

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

**Kentucky Department for Public Health**

**Additional Project #2 Title: Kentucky Disaster Syndromic Surveillance**

**Project #2 Type: Major Project**

*Project #2 Description:*

Each year Kentucky faces a new disaster, whether natural or manmade. This project will include identifying all possible disasters that Kentucky has experienced and could possibly experience again. We will then create queries and dashboards to monitor for those disasters and possible outcomes related to those outcomes. Vulnerable populations will be identified and plans implemented to support them. New ways of analyzing the data and identifying vulnerable populations will also be developed.

*Project #2 Objectives and Expected Deliverables:*

Project Objectives:

1. Identify past, present, and possible future natural and manmade Kentucky disasters
2. Create queries and dashboards to monitor
3. Identify vulnerable populations and determine best practices for monitoring their health outcomes
4. Devise plans to support vulnerable populations
5. Develop new ways of analyzing data to identify underlying trends

Project Expected Deliverables:

1. New queries and dashboards created
2. Best practices for identifying vulnerable populations

*Project #2 Impact:*

The project will help KySyS better prepare for future disasters so plans can be in place before disaster strikes, making surveillance and response a smoother process.

**Additional Project #3 Title: Establishing an Antibiotic Use Surveillance System for Federally Qualified Health Centers**

**Project #3 Type: Major Project**

*Project #3 Description:*

This project aims to develop a surveillance system to monitor antibiotic use within Federally Qualified Health Centers (FQHCs), which serve a high proportion of Medicaid and Medicare patients. By collecting and analyzing antibiotic prescribing data, this initiative will provide valuable insights into prescribing patterns, potential disparities in access to appropriate treatments, and antimicrobial stewardship opportunities.

The CSTE fellow will work closely with the Kentucky Department of Public Health (KDPH) to design and pilot a data collection framework, assess feasibility, and compare antibiotic use trends between FQHCs and traditional outpatient practices with a lower percentage of Medicaid/Medicare beneficiaries.

*Project #3 Objectives and Expected Deliverables:*

Project Objectives:

1. Develop an Antibiotic Use Surveillance Framework - Establish a data collection system to monitor antibiotic prescribing patterns in Federally Qualified Health Centers (FQHCs), ensuring consistency and accuracy in reporting.
2. Assess Antibiotic Prescribing Practices - Compare antibiotic use in FQHCs to traditional outpatient practices to identify potential differences related to Medicaid/Medicare patient populations.
3. Support Antimicrobial Stewardship Efforts - Provide data-driven insights to inform targeted interventions, improve prescribing practices, and enhance antimicrobial resistance prevention strategies.

**ID: 74146548**

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

**Kentucky Department for Public Health**

**Project Expected Deliverables:**

1. Pilot Antibiotic Use Surveillance System - A structured data collection and reporting framework implemented in select FQHCs to assess feasibility and accuracy of antibiotic prescribing data.
2. Comparative Analysis Report - A comprehensive analysis comparing antibiotic prescribing trends between FQHCs and traditional outpatient settings, highlighting disparities and potential areas for intervention.
3. Policy and Stewardship Recommendations - A set of actionable recommendations for public health officials and healthcare providers to improve antibiotic stewardship and address health equity concerns in outpatient settings.

*Project #3 Impact:*

This project will help identify health equity concerns related to antibiotic prescribing, inform policy recommendations, and support antimicrobial resistance prevention efforts in vulnerable populations.

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

Incoming fellows can engage in emergency preparedness and response projects and activities throughout the tenure of their fellowship and are encouraged to participate in emergency public health response activities and activations. In recent history, Kentucky has experienced several large-scale natural disasters (historic flooding, tornadoes, and winter storms) and outbreak investigations requiring public health response, including the largest hepatitis A outbreak in the nation, the lung injury and vaping response, COVID-19, and investigation into illnesses caused by consumption of psychedelic mushroom candy products. Previous fellows have been integrated into all aspects of emergency public health response ranging from pre-event planning, to training, to fulfilling Emergency Operations Center roles, to field data collection during actual responses (e.g. 2014 Ebola Response, 2010 H1N1 pandemic, 2009 KY Ice Storm), planned mass gatherings (e.g. 2010 World Equestrian Games and annual NASCAR Sprint Cup events), and training exercises (e.g., joint KY/Tennessee preparedness CASPER surveys, US Public Health Service Training Missions). The CSTE fellow may also participate with local health department preparedness operations for annually-scheduled large-scale events (e.g., the Kentucky Derby in Louisville). The Fellow’s role in emergency preparedness can be as large or as small as the fellow desires: time allocation would likely be at least 10% but could be upwards of 50% if another pandemic or large-scale public health emergency occurs.

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

The AEF can assist Infectious Disease Branch staff in the detection and investigation of outbreaks of any sort. The AEF will learn how to perform various activities during the outbreak investigation, including how to: assign outbreak numbers; participate in and potentially lead outbreak investigation; develop and modify case definitions; create line lists and epidemic curves; and perform descriptive and analytic statistics to determine risk factors in given outbreaks. The AEF will learn how to coordinate the investigation of outbreaks: create and implement ad hoc investigation forms and guidance documents for local health departments, help coordinate testing of specimens (if collected); manage all investigation forms (line list, epi curve, reporting forms); ensure all documentation of the outbreak is submitted to the Reportable Diseases Section once the outbreak is deemed over; ensure that the outbreak is accurately entered into the National Outbreak Reporting System (NORS), if applicable; and track the course of the outbreak investigation to ensure that control measures are implemented and effective. Finally, the AEF could work with Infectious Disease Branch staff to develop an outbreak management database in REDCap, which would have long-lasting impact in state public health operations. Time allocation would be variable based on the fellow's interests and the emergent issues at hand, and again can be as large or small as the fellow desires.