

ID: 46725788

Infectious Diseases, Substance Use/Mental 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: Douglas Thoroughman, PhD, MS
Deputy State Epidemiologist / 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 60 minutes from 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, 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 COVID-19, 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 preparedness 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 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 SPSS, SAS, Excel, and Epi Info and the 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.

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Disease-related information is collected and stored in a number of electronic surveillance systems including the National Electronic Disease Surveillance System (NEDSS), the National Outbreak Reporting System (NORS), and our previous NEDSS-compliant system, the Kentucky Electronic Public Health Record System (KYEPHRS). The fellow may become an active user of these systems and can gain experience using Business Objects software to retrieve data from them. The Kentucky Health Information Exchange (KHIE), which gathers and houses clinical data from healthcare facilities across the state and the fellow will have access to this data for various projects. KHIE is integrated with public health surveillance and immunization registry data collection and electronic case reporting is being implemented for notifiable disease conditions. 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). KDPH epidemiologists and other persons with data analysis responsibilities meet in a monthly Data Users Workgroup, coordinated by the Division of Epidemiology, where updates and ideas are shared between individuals and groups on current data practices, analysis solutions, etc., across the department and with academic representatives. 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: Influenza and Respiratory Disease Surveillance

Surveillance Activity Description:

Since the arrival of COVID-19 and the critical surge in respiratory diseases in late 2022, including RSV, COVID-19, Influenza and Group A Streptococcus (GAS), we have realized the need to revamp our respiratory disease surveillance processes and standardize them across the various pathogens as much as possible, perhaps developing an overall respiratory disease reporting category. COVID-19 is still surveilled using case-based reporting, influenza is only tracked through sentinel sites and influenza deaths, and RSV, GAS and other respiratory infections are not reportable in Kentucky except for outbreaks of these pathogens. A comprehensive examination of our respiratory disease surveillance mechanisms, electronic laboratory and case reporting systems, and a survey of what would be considered useful to our programs would allow us to make informed decisions about how to evolve or develop more effective surveillance that is flexible to adapt to changing disease dynamics.

Surveillance Activity Objectives:

Objectives:

- Characterize the existing surveillance methods in place for respiratory illnesses and the resources that are available.
- Form a workgroup with infectious disease, reportable disease, immunization, and epidemiologic subject matter experts to make recommendations on how to proceed with developing strategies to improve and enhance respiratory disease surveillance to create an effective, flexible, and standardized system for implementation.

Deliverables:

- Meetings with identifiable action items and outcomes documented through minutes, focused workgroups, and outcomes based on findings would be expected.
- Work toward implementation of the recommendations of the workgroup to develop respiratory disease surveillance for Kentucky.

Surveillance Activity Impact:

Provide more comprehensive, real-time data to inform public health action regarding respiratory disease occurrence and detect outbreaks and critical surges earlier.

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Surveillance System Evaluation Title: Perinatal HCV Surveillance Evaluation

Surveillance System Evaluation Description:

Hepatitis C disease, caused by the Hepatitis C virus (HCV), is one of the most prevalent bloodborne pathogens in the United States. From 2008 to 2015 Kentucky experienced the highest incidence rates of Hepatitis C in the nation. HCV can be transmitted from a mother to her newborn child if she tests positive for HCV RNA. There is a roughly 6% perinatal HCV transmission rate from mother to child if the mother is HCV positive and HIV negative, and this rate increases to over 10% when the mother is HCV RNA positive and living with HIV. Women of childbearing age who are pregnant or may become pregnant are a high priority for identifying possible HCV infection because of the risk for perinatal transmission, as well as identifying children aged three years old or less who are HCV RNA positive to monitor so that they can be treated for HCV when they turn three years old. Evaluating and improving this surveillance system is an important goal for public health in Kentucky for women of reproductive age, mothers who are HCV positive, and children who are born to HCV-positive mothers. Despite statutory requirements for testing of all pregnant women in Kentucky, many women are not tested due to lack of prenatal healthcare encounters, educational gaps among healthcare providers, and failure to order testing. Even when a child is born to an HCV-positive woman, the required reporting by healthcare providers often doesn't occur. The current surveillance system picks up HCV positive tests through electronic laboratory reporting, but no system is in place to link birth records to HCV surveillance data to identify children born to women who are HCV positive, nor are women of childbearing age who are known to be HCV positive followed in any systematic fashion in order to target prenatal care or treatment in order to reduce the risk of perinatal transmission. Evaluation of the entire HCV surveillance processes to detect perinatal HCV could inform development of additional surveillance processes in order to reduce the occurrence and impact of perinatal HCV.

Surveillance System Objectives:

Objectives:

- Identify gaps in the current perinatal HCV surveillance processes
- Compare benefits of active versus passive surveillance
- Determine viability and accuracy of matching lab data and birth certificate data

Deliverables:

- Recommendations to improve the process of surveillance for children born to women who are HCV positive
- Present on accuracy of matching lab data and birth certificate data
- Potentially assist in developing new processes or a revamped surveillance system to identify and maintain a database of children born to HCV-positive women

Surveillance System Impact:

- Improved surveillance for perinatal HCV cases
- Improved ability to pinpoint/identify areas with reporting insufficiencies
- Improved reporting mechanisms and training of clinicians when insufficiencies are identified
- Create a system that can allow children exposed to HCV through their HCV-positive mothers to be targeted appropriately for early intervention to reduce the impact of HCV in childhood.

Major Project Title: Bacterial and Fungal Infections among people who inject drugs (PWID)

Major Project Description:

Illicit injection drug use leads to a number of bacterial and fungal infection sequelae among PWIDs. Localized infections (e.g., skin and soft tissue), and systemic infections (e.g., endocarditis) are growing concerns for drug user health, nationwide. In Kentucky, where an estimated 2.6% of individuals have injected drugs in the past year, there has been limited surveillance of these outcomes.

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Kentucky has not had the capacity to collect, analyze or interpret data related to these outcomes, despite the high rate of injection drug use in the state. The fellow will initiate an examination of non-viral infectious diseases related to injection drug use. The fellow could leverage hospitalization data to assess the burden of these infections and their cumulative impact on patients with other substance use-related illnesses. Because of the high number of syringe service programs (SSPs) in Kentucky, this surveillance could guide far-reaching interventions, beyond safe injection practices, to include wound monitoring and wound care.

Major Project Objectives:

Objectives:

- Evaluate the presence of bacterial and fungal Infections among PWID through analysis of in- and outpatient hospitalization data and/or the Kentucky Health Information Exchange (KHIE) data.
- Characterize the demographic and risk factor data for bacterial and fungal Infections among PWID identified through healthcare data.
- Conduct epidemiologic analyses appropriate to the data collected in order to illuminate particular high-risk populations, regions, localities, or behaviors (outside of injection drug use itself).

Deliverables:

- Produce a report detailing the findings of the infectious disease impacts of injection drug use on Kentucky's population beyond the known effects of viral hepatitis transmission.
- Database data analysis model development to allow standardization and ongoing continuation of this characterization for future data.

Major Project Impact:

This would allow Kentucky to assess the impact of infectious disease sequelae to injection drug use and to potentially target interventions in the PWID population. Kentucky hosts a robust harm reduction/syringe exchange program (HRSEP) through over 80 local health department HRSEP operations where education and testing of PWID can be targeted as well as varying interventions such as wound monitoring and care, as mentioned above.

Additional Project #1 Title: Chronic Hepatitis C Surveillance Improvements

Project #1 Type: Major Project

Project #1 Description:

All hepatitis Virus (HCV) testing is required to be reported in Kentucky, including both positive and negative test results. This was designed to allow tracking of individuals at risk for HCV or test positive for HCV and allows characterization of acute vs. chronic hepatitis C infection when a negative test is followed by a positive test (acute) or two positive RNA tests are separated by at least 6 months (chronic). Maintaining a complete and reliable registry of all chronic HCV individuals allows quick differentiation of acute vs. chronic cases when new positive electronic lab results are received at KDPH as well as targeting of intervention and treatment for those most likely to transmit HCV to others. This project would assess the current surveillance system, which relies only on electronic lab reports, in order to develop improvements and recommendations for enhancements that could yield more complete and accurate data on individuals with chronic HCV.

Project #1 Objectives and Expected Deliverables:

Objective:

- Evaluate and develop recommendations for current chronic HCV disease registry system

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Deliverables:

- Report on improvement and usage recommendations for a chronic HCV disease registry
- Potential for work to develop further enhancements or processes to register chronic HCV individuals based on the findings of this project

Project #1 Impact:

- Improved surveillance for chronic HCV and availability of data for analysis of people with chronic hepatitis C infection in Kentucky
- Improved identification of chronic HCV cases in order to locate and treat

Additional Project #2 Title: Characterization and Evaluation of Congenital Syphilis Increases in Kentucky

Project #2 Type: Major Project

Project #2 Description:

From 2018 to 2021 Kentucky experienced a 150% increase in congenital syphilis cases; going back to 2008 to 2021, we have experienced a 2400% increase. 2022 data is still preliminary, but indicates that Kentucky will likely exceed the number of cases reported in 2021. Increases in overall syphilis cases have been seen across the US and KY is no exception. From 2008 to 2021, KY experienced a 610% increase in reported syphilis cases and from 2018 to 2021, KY had a 76% increase. Some of the contributing factors to increases in congenital syphilis cases are lack of prenatal care or receiving care late in pregnancy and increases in drug use among individuals diagnosed with syphilis. Congenital syphilis can result in numerous negative health outcomes, and infants that are untreated can progress to many additional and more severe clinical manifestations.

Project #2 Objectives and Expected Deliverables:

Objectives:

- Gather and examine all available data for cases of congenital syphilis
- Characterize this data over the past 10-15 years, focusing on illuminating factors that are most likely to be contributing to the changing epidemiology of congenital syphilis in Kentucky.

Deliverables:

- Report and/or presentations on the findings of the evaluation, including characterization of the demographics, risk factors and other associated findings that might be contributing to the current increases.

Project #2 Impact:

- Increase rapid identification of infants at risk for congenital syphilis in order to target effective interventions.
- Identifying risk factors for congenital syphilis will help inform programs to reduce the incidence of congenital syphilis.

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 preparedness projects and activities throughout the tenure of their fellowship and are encouraged to participate in emergency public health response activities. In recent history, Kentucky has experienced several large-scale natural disasters and outbreak investigations requiring public health response, including the largest hepatitis A outbreak in the nation, the lung injury and vaping response, and finally COVID19, most recently.

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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 fellow can assist Infectious Disease Branch staff in the detection and investigation of outbreaks of any sort. The fellow 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 fellow 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 fellow 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.

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

Up until mid-2022, COVID-19 has been an "All hands on deck" experience for the Division of Epidemiology, with virtually every epi staff member involved heavily in the response. We expect that the COVID-19 response will continue to require a workforce commitment well into late 2023 or 2024, so the fellow will likely have the option to assist the Kentucky Department for Public Health with the COVID-19 response in a number of roles, including things like data management, analysis, surveillance of breakthrough infections, coordination of vaccination efforts, etc. The fellow will learn the basics of COVID-19 disease investigation and contact tracing; how to use the National Electronic Disease Surveillance System and other COVID-19-specific surveillance systems; and will work with the data team to develop and distribute COVID-19 data for leadership and public use. The fellow may be asked to characterize certain aspects of the pandemic in Kentucky involving analysis and interpretation of the following data points: case counts and incidence, mortality counts and incidence, demographic data of cases and deaths, positivity rate, geospatial and temporal distribution of cases and deaths, identified clusters, indicators for utilization of the hospital infrastructure, and vaccine effectiveness. To work on these types of projects, the fellow will learn and hone skills using the National Electronic Disease Surveillance System (NEDSS), Business Objects, SAS, REDCap, Excel, and ARCGIS. Time allocation will depend on the ongoing public health relevancy of COVID-19 and the needs of the department but a minimum of 10% commitment should be expected.

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

The Kentucky Department for Public Health has a dedicated Office of Health Equity in the Commissioner's Office which is very active and involved at KDPH in all programs. Each Division had developed health equity initiatives to address disparities among the populations and public health arenas that we deal with. The fellow will have access to the Office of Health Equity, the health equity initiatives and efforts within the Division of Epidemiology, and will be encouraged to adopt a health equity lens in their own chosen projects and fellowship experience.