Infectious Diseases, Injury

Kentucky Department for Public Health, Division of Epidemiology and Health Planning

Frankfort, Kentucky

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 but will most likely physically sit within the Infectious Disease Branch.

The CSTE Fellow may choose initiatives in any field within public health but is encouraged to select projects primarily in two main focus areas: infectious disease epidemiology and issues surrounding substance use, including the recent vaping/lung injury situation. The Fellow can expect to have a multifaceted experience in a state health department 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. Several defined infectious and non-infectious disease projects are available. The fellow is encouraged to develop projects in their own particular areas of interest during their assignment in Kentucky. 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. We want to promote maximum flexibility for the fellow in choosing projects, and which projects to engage in more deeply. We believe this flexibility with projects facilitates epidemiology competency development that will be competitive for future employment in applied public health roles. All of the primary activities and projects for the CSTE Fellow would entail hands-on public health activities involving KDPH, public health agencies, hospitals, and other external partners. Activities and projects will include the full spectrum of program planning, organization, administration, and reporting of these activities or projects. The effective CSTE Fellow in this position will carry parts or all of initiatives and projects from the idea stage through the planning process to the implementation phase, have the opportunity for evaluation, and finally, work on reporting of results depending on the timing of the project and the fellow's tenure in Kentucky.

Day-to-Day Activities

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 substance use surveillance, response, and 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 public health responses in the past years, so involvement in department incident command structure will likely be a part of this experience. Opportunities for work in the field in local health departments, on responses and for training exercises, such as a recent survey of first responders and residents affected by a natural gas pipeline explosion, investigation of a cluster of HIV cases among injection drug users, and execution of community health assessment using CASPER methodology, are very likely during the fellow’s time at KDPH.

Potential Projects

Surveillance Activity Infectious Diseases Associated with Injection Drug Use (and Several Other Possibilities)

1) Skin and soft tissue infections and endocarditis are common outcomes of injection drug use. Though Kentucky is a state with an extremely high prevalence of people who inject drugs (PWID), these conditions are not currently reportable conditions. In- and out-patient hospitalization data is available for analysis to describe the overall trends of these outcomes, as well as to look at these trends in relation to changes in laws relating to opioid prescribing over time and risk factors that might lead to more effective prevention measures. Though very important data to examine, KDPH has not had available personnel to delve into this area to date. This could additionally lead to changes in legislation requiring reporting of these conditions. Several other surveillance activities are available, including: 2) analysis of viral hepatitis B and C testing data (all B & C test results are reportable electronically by law in KY); 3) examination of sexually transmitted infection (STI) data to explore rising rates of syphilis and congenital syphilis, looking toward prevention possibilities; and 4) development of a centralized complaint system for foodborne disease reporting. This last example could incorporate complaints received through multiple avenues, such as Poison Control, iwaspoisoned.com, and social media sites.

Surveillance Evaluation Lung-Injury (Not just vaping!) Surveillance Evaluation (and Other Possibilities)

1) The recent increase in vaping-related illnesses and deaths highlighted the lack of surveillance in Kentucky for lung-related health outcomes. Though reporting of cases of pneumoconiosis (Coalminer's Lung), asbestosis, and silicosis, are statutorily required, other lung-injury conditions are not. Kentucky recently implemented surveillance of vaping-related illness and mortality. Analysis of this ad hoc surveillance system after a year in service would be useful in developing overall lung injury surveillance. Data could be contrasted to in- and out-patient hospitalization data available through our Health Data and Analytics program. 2) A second high-profile surveillance system evaluation could be examination of the state’s newly-implemented Immunization Registry to evaluate coverage of actual vaccinations given in Kentucky by the system, effectiveness of vaccination law changes, such as the implementation of the requirement for hepatitis A vaccination to attend school beginning in 2018, and comparison of reported childhood immunization coverage before and after implementation of the KY Immunization Registry. 3) Finally, as Kentucky begins to implement electronic case reporting (eCR) for reportable diseases, the fellow will be starting at an ideal time to look at the effectiveness, validity and reliability of surveillance of reportable diseases via eCR and could troubleshoot gaps and suggest improvements as the system is fully implemented.
Major Project  Legionella Cluster Detection Analysis System

Cases of Legionellosis are increasing each year and CDC is encouraging states to conduct more complete investigations and to recommend control measures. It would extremely useful to conduct a thorough retrospective data analysis of Kentucky cases. In particular, it would be helpful to have cases mapped, especially in urban areas and in relation to the location of cooling towers. We would like to move toward detection of geospatial and temporal clusters (perhaps using SaTScan); the AEF could assist with or lead in design, building, and automation of this type of analysis (as much as possible) in order to put in place an ongoing analysis system long-term. CDC is also prioritizing facilities to develop and adopt comprehensive water management plans (WMPs), so it might be possible to work with KDPH’s Environmental Health and Healthcare Associated Infections programs to determine healthcare and long-term care facilities with WMPs in place, which do not, and the need/gaps in promoting widespread adoption of WMPs. Additionally, development of a standard Legionella response plan for cases and outbreaks is needed to establish a framework for response that is effective and inclusive of both the environmental health and healthcare associated illness aspects of Legionella response.

Additional Project  HIV Program Linkage to Care

Kentucky identified the second largest outbreak of HIV among people who inject drugs (PWID) nationally in the fall of 2017. This outbreak spanned northern Kentucky and the Hamilton County/Cincinnati metropolitan area. Louisville sits a mere 35 miles from Austin Indiana, where the largest-ever outbreak of HIV in PWID occurred in 2015. Finally, Huntington, WV sits directly across the KY/WV border and is currently experiencing the 3rd largest HIV/PWID outbreak nationally.

Kentucky’s HIV Program has been funded by CDC for the Data to Care (D2C) initiative to assist with linkage of HIV patients to appropriate clinical care with the goal of ongoing viral suppression. This is a critical strategy in reducing the transmission of HIV in PWID and other risk groups and saves the health and lives of HIV-infected individuals. Examination of the data collected in this system to determine if we are collecting appropriate data on linkage to care as well as looking further at barriers keeping people from care is an important initiative that has the attention of the CDC and HIV experts nationally.

Additional Project  Cluster/Outbreak Detection System for Pathogens Not Normally Cultured

The Reportable Disease Section needs assistance in developing a method of cluster detection for reportable diseases for which strain typing is not typically performed. Examples of these conditions include some of the waterborne/enteric diseases (Campylobacter, Legionella, Cryptosporidium) and vector-borne diseases. The Fellow could develop an analytic method to detect geospatial/temporal clusters using software such as SaTScan or other similar software and develop a reporting template to alert the KDPH disease subject matter experts about clusters detected. The Fellow could also work to enhance the current case management/surveillance system to improve collection, management, and analysis of relevant exposures. This work could include reviewing/updating surveillance forms, creating/updating NEDSS (National Electronic Disease Surveillance System), Epi Info or REDCap databases to manage case information, creating standardized NEDSS/Business Objects reports to query data in NEDSS, and developing SAS code to conduct regularly occurring, standardized data analyses of exposures.
**Preparedness Role**

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, vaping/lung injury currently, and the largest hepatitis A outbreak in the nation over the past two years. 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 in 2010). 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.

**Additional Activities**

Kentucky experiences pretty-much ongoing outbreak response activities with different pathogens. The AEF is welcome to participate in any outbreak investigation as desired. This may entail field work - recent examples include assisting in "tick drags" and rodent capture for tularemia testing, house-to-house surveys for health effects related to a natural gas pipeline explosion, surveying residents and collecting toenail clippings to assess arsenic exposure in a previous wood-treatment factory location, and conducting healthcare-associated illness hospital assessments and environmental specimen collection. We encourage involvement in projects with any division within KDPH, including Women's Health, Maternal and Child Health, Environmental Health, Chronic Disease, State Lab, even Admin and Finance if that is of interest to the AEF. We also have a Health Equity Program and work with a Communications program continuously. Though not a noted focus of this application, neonatal abstinence syndrome (NAS) is an area of concern in Kentucky, with its high rate of overall drug use and increasing rates of illicit drug use in women of child-bearing age.

**Mentors**

**Primary**
Doug Thoroughman PhD, MS  
State Epidemiologist (acting)/CDC Career Epidemiology Field Officer

**Secondary**
Tisha Johnson MD, MPH, FACPM  
Infectious Disease Branch Manager (Interim)/HIV/AIDS Medical Director