

## **Infectious Diseases-HAI**

### **Pennsylvania Department of Health, Bureau of Epidemiology, Healthcare-Associated Infections/Antibiotic Resistance (HAIAR) section**

Harrisburg, Pennsylvania

#### **Assignment Description**

This position will be in the Pennsylvania Department of Health, Bureau of Epidemiology's Healthcare-associated infection and Antibiotic Resistance (HAIAR) section. This section is responsible for a broad range of disease surveillance and control activities in Pennsylvania including HAI outbreak investigation and response, coordinated response and prevention efforts for emerging MDRO cases, HAI surveillance data analysis, working with partners to facilitate prevention-based collaboratives, providing education and training opportunities for HAIs and antibiotic stewardship, and the development of public health policy related to HAIAR. The section has conducted over 35 HAIAR investigations this year so far and works closely with CDC, including via EpiAids.

The team currently reports directly to the Director of the Bureau of Epidemiology; however, the Fellow will also have the opportunity to work with the Bureau of Epidemiology's Infectious Disease Epidemiology (IDE) Investigation and Surveillance Sections as needed. The HAI team typically handles all HAI-related outbreak and surveillance activities but sometimes requests assistance from the hepatitis viral coordinator, TB program or colleagues in facilities licensure and quality assurance.

The fellow will be mentored by HAI Epidemiologist Cara Bicking Kinsey and CDC Career Epidemiology Field Officer Jeff Miller. Drs. Bicking Kinsey and Miller have extensive experience in HAIAR outbreak response and analysis of epidemiologic data (including NHSN data) in SAS and R. As the program is in its second year of ELC HAIAR funding, the fellow will become part of a growing HAIAR team that includes two other Epidemiologists, a public health nurse, and a public health program administrator. There are also 3 current vacancies (Public Health Physician; Nurse; Antibiotic Stewardship Outreach Coordinator) that are in the process of being filled.

### **Day-to-Day Activities**

The fellow will join the HAIAR Team located in the Health and Welfare Building in downtown Harrisburg, PA a few blocks from the State Capitol and beautiful Susquehanna River. The fellow will fully participate in the day-to-day activities conducted by HAIAR staff, including participate in disease investigations, conference calls with federal, local and regional partners, department and section meetings, and local, regional and national conferences.

The fellow will have a day-to-day role in the analysis and evaluation of HAI data using either SAS EG or R (with support as needed). Pennsylvania has the most extensive database of healthcare-associated infections of any state in the country. This is because Pennsylvania's mandatory HAI reporting law requires all HAIs occurring throughout the hospital to be reported; the same applies to nursing homes. This requirement results in approximately 25,000 hospital-associated HAIs reported annually in over 10 million patient days and 40,000 HAIs in nursing homes reported annually in almost 30 million patient days. There is an abundance of data to be analyzed, including the ability to conduct sub-analyses of HAIs that cannot be assessed in other states where reporting requirements are more limited. There is also the ability to assess pathogens across a range of HAIs. This work can involve exploratory and descriptive analyses as well as the potential for statistical risk modeling if it fits the skill-set and interest of the fellow. Annual reports on HAIs are issued, and the fellow can participate in the preparation of the report. The fellow can also perform studies to assess the use and impact of the data in healthcare and public decision-making.

The fellow can also expect to be involved in a number of outbreak investigations; recent examples include carbapenemase-resistant enterobacteriaceae in a long term care facility, MDR and XDR pseudomonas in a regional burn unit, group A streptococcus in an out-patient surgical center, azole-resistant aspergillus, NTM infections in cardiac surgery patients associated with exposure to heater-cooler devices and first detection of mcr-1 in the United States from an isolate obtained from a PA resident. Additionally, the fellow will have the opportunity to present at monthly Journal Clubs, all-day Department Quarterly Epidemiology meetings attended by 50-100 field and state epidemiology staff, and at national meetings related to HAIs.

## **Potential Projects**

### **Surveillance Activity      Analysis and Report of Clostridium difficile in Pennsylvania**

Since 2007, all Pennsylvania hospitals must report hospital-associated Clostridium difficile Infections (CDI) to the National Healthcare Safety Network database. A potential project will include analyzing this CDI surveillance data to describe regional and temporal trends of community- and hospital-acquired CDI rates. Analyses will account for changes in diagnostic tests. This surveillance project involves a large and rich dataset and will result in a special supplement to the State's Annual HAI Report.

### **Surveillance Evaluation      Fungal HAIs reported to NHSN --- How Complete is Microbiology Culture Data?**

Fungal infections are an important but poorly described cause of HAIs. The CSTE fellow would analyze NHSN data to describe the burden of fungal HAIs. Some invasive fungal infections are difficult to culture and only diagnosed after biopsy and histopathologic examination. Using a convenience sample of hospitals, the CSTE fellow will evaluate existing systems for detecting fungal HAIs and conduct a capture-recapture analysis to compare cases detected from microbiology versus histopathology reports. Depending on the interests of the fellow, the project could easily be tailored to explore informatics or natural language processing issues in HAI surveillance. This work, completed in a supportive environment, would be a novel contribution to the HAI literature.

### **Major Project      Hospital and LTCF Collaboratives: To participate or not?**

The goal of this project is to determine how best to encourage and support participation in prevention collaboratives. In a prevention collaborative, healthcare facilities (e.g., hospitals, LTCFs) volunteer to share challenges, resources, best-practices and enthusiasm as they implement an intervention to reduce a particular HAI (e.g., catheter-associated urinary tract infections). Although highly effective, usually less than half of invited healthcare facilities participate. The fellow will catalog previous collaboratives, facilitate discussions among stakeholders, and examine how facilities who participate differ from those who do not. Domains will include facility characteristics, HAI rates, and hospital culture. This important qualitative and quantitative work will provide valuable evidence-based practices for the Department to use for future recruitment and intervention design. The fellow will have the opportunity to work with, and learn about, multiple stakeholders including the Hospital and Health System Association of Pennsylvania, Pennsylvania Patient Safety Authority and regional CMS-designated Quality Improvement Organization/Network.

**Additional Project      Outbreak Investigations**

In Pennsylvania, the CSTE HAI fellow is guaranteed to receive training that will serve as a strong foundation for outbreak investigations in any field. The fellow will have the opportunity to participate in and lead outbreak investigations in varied settings. Past investigations have involved immunocompromised and immunocompetent patients, infected healthcare providers, drugs, devices, procedures, bacteria, viruses, fungi and multiple modes of transmission. The fellow will learn principles of infection control and secondary and tertiary prevention. We encourage presentation or publication of work from outbreak investigations; previous general ID CSTE fellows hosted in Pennsylvania have published work from HAI investigations (e.g., mcr-1).

**Additional Project      Promoting Appropriate Antibiotic Prescribing through Physician Commitment Posters**

Patients with viral upper respiratory infections are often prescribed antibiotics against published treatment guidelines. One relatively simple and proven intervention to reduce inappropriate prescribing is to have providers hang a poster with a letter of commitment addressed to the patients in the office. A potential project would be to recruit physicians to implement this strategy and train those who don't know about the guidelines. If interested, this project could be expanded to involve data collection, analysis and a publication.

**Preparedness Role**

The fellow will work with emergency preparedness epidemiologists (secondary mentor Jeff Miller and others) on a wide range of topics related to Emergency Preparedness and emerging infections, from bioterrorism to influenza. As learned from Ebola, MERS-CoV and other emerging diseases, fundamental infection control principles are critical in preventing transmission, ensuring healthcare worker safe and safeguarding our healthcare systems. The fellow will also provide support in any public health emergencies (i.e. novel influenza) that occur during the fellowship period.

**Additional Activities**

The fellow will be involved with other activities in the Bureau that are deemed to be valuable for competency development or educational experience including collaborations with IDE and Community Epi. The Bureau's Get Smart program is highly active in community outreach and may provide a breadth of public health experience. Other potential activities include participation in Northeast Epidemiology Conference and local and regional trainings as well as Bureau Quarterly Epidemiology meetings.

**Mentors**

**Primary**

Cara Bicking Kinsey PhD, MPH, RNC

Epidemiologist

**Secondary**

Jeffrey Miller MD MPH

CDC Career Epidemiology Field Officer