

Infectious Diseases-HAI

Assignment Description:

The fellow will be able to work on a number of HAI related projects (See below) as well as be part of other disease investigations working in the Division of Infectious Disease Epidemiology.

Day-to-Day Activities:

The fellow will fully participate in the day-to-day activities conducted by IDE staff, including participating in disease investigations; conference calls with federal, local and regional partners; attend departmental meetings as well as local, regional and national conferences. The fellow will have a day-to-day role in the analysis and evaluation of HAI data. 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 particular types of HAIs that cannot be assessed in other states where reporting requirements are more limited. There is also the ability to assess particular pathogens across a range of HAIs. This work can involve exploratory and descriptive analyses as well as the potential for statistical risk modeling. 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 carbapenimase-resistant enterobacteriaceae in a long term care facility, group A streptococcus in an outpatient surgical center, hepatitis C transmission associated with a health care worker, and the national fungal meningitis outbreak. Additionally, the fellow will have the opportunity to present at monthly Journal Clubs, all-day Department Quarterly Epidemiology meetings attended by 50-100 by field and state epidemiology staff, and at national meetings related to HAIs.

Potential Projects:

Examples of potential projects that demonstrate opportunities for data analysis, outbreak field investigations, and opportunities to work on interdisciplinary teams are listed below.

Pennsylvania Health Care Associated Infections, evaluation of the implementation of a reporting system for healthcare associated infections. A number of changes to reporting through the CDC National Healthcare Safety Network (NHSN) will be implemented in 2013, including changes to the case definitions for central-line associated bloodstream infections, surgical site infections, and ventilator-associated events. Some of these changes are anticipated to result in increases in the number of recognized HAIs and some in decreases. Pennsylvania requires house-wide reporting of all of these types of infections. The fellow can conduct an analysis of the way these definitional changes result in the shift of recognized HAIs from one category to another (e.g. shifts from skin & soft tissue infections to surgical site infections), and for declines or increases that are attributed purely to the modifications. The fellow will also work to examine the quality of the data reported by Pennsylvania into the NHSN as required by state legislation under the new definitions. This will include evaluating reported data and determine annual benchmark criteria for various types of institutions based on reporting. The fellow will also assist on developing reporting systems and benchmarking criteria for the nursing home setting.

Long Term Care Facility Reporting. Pennsylvania is one of the few states that requires reporting of HAIs from nursing homes. This requirement has been in place since 2009, and reports are received through a state-based system known as PA-PSRS (Patient Safety Reporting System) using modified versions of McGeer case definitions. In 2012, CDC added a module to the National Healthcare Safety Network (NHSN) related to long term care facilities, and it is anticipated that facilities in Pennsylvania will begin using this system in 2013. The fellow can compare the patterns and types of reports received through PA-PSRS to those submitted to NHSN, and evaluate the sensitivity and specificity of definitions used in these systems (the definitions will vary). Some of the tasks will include:

- Designing and implementing validation study of nursing home reporting
- Comparison of reports received in PA-PSRS to those received in NHSN from Pennsylvania long term care facilities

HAI Mortality Project

- Merge Pennsylvania death records with SSI data reported in NHSN and proceed by chart review and data collection to assure that they are HAI related deaths within 90 days after the six benchmark surgeries.
- Manage the mortality data base.
- Calculate state-wide HAI mortality rate and case (infection) fatality rate
- Perform univariate data analysis and explore multivariate analysis for determination of risk factors using appropriate and feasible epidemiologic methodology.
- Communicate with CDC and academic institutes for input and report the results in the team.
- Assist in generation of report and manuscripts.
- Assist in policy recommendation for intervention on the improvement of HAI reduction in Pennsylvania.

Other potential projects include:

- Assist in examination of quality and content of reports of non-ventilator associated pneumonia and lower respiratory tract infections reported in NHSN, in order to determine whether these represent HAIs, risk factors for illness, and potential for preventability.
- Evaluate the use and rate of annual influenza vaccination levels in selected out-patient settings, such as doctor's offices, dental practices, free-standing dialysis centers, and ambulatory surgical centers. These settings have been much less studied than the hospital and nursing home setting, are likely to have lower rates of healthcare worker vaccination, and represent major opportunities for prevention
- Participate in antibiotic stewardship prevention collaborative taking place in southeastern Pennsylvania.
- Conduct a follow-up to a project on evaluation of electronic hospital surveillance systems for healthcare associated infections and its impact on data collection. The initial evaluation was conducted and published by a previous CSTE fellow
- Examination of HAI patterns and reporting quality in small (<100 bed) community hospitals in Pennsylvania.
- Analyze reports of HAIs in special settings, including psychiatric facilities, long-term acute care hospitals, and rehabilitation hospitals and wards. All of these locations are required to report in Pennsylvania, but the types and quality of their reports have not been thoroughly examined.
- Examine the patterns and trends of carbapenimase-resistant enterobacteriaceae (with a focus on *Klebsiella pneumoniae*) in Pennsylvania hospitals.

Preparedness Role

The fellow will work with the Planning & Preparedness section on wide range of topics related to Emergency Preparedness from Bioterrorism to Influenza. This fellow will also support on any public emergencies (i.e. pandemic H1N1 outbreak) that occur during the fellowship period. The fellow will also attend meetings and conferences that are attended by fellow bureaus and departments such as Office of Public Health Preparedness, Bureau of Laboratories Pennsylvania Emergency Management Agency (PEMA), and the Pennsylvania Department of Agriculture.

Assignment Location: Harrisburg, PA

Primary Mentor: Jeff Miller, MD, MPH
CDC Career Epidemiology Field Officer
Pennsylvania Department of Health

Secondary Mentor: Zeenat Rahman, MBBS, MPH
Epidemiologist
Pennsylvania Department of Health