

Infectious Diseases- HAI

Assignment Description:

According to CDC (www.cdc.gov/HAI) data, Healthcare-associated infections (HAI) are a significant cause of death and are a critical challenge to public health in the United States. HAI are infections that patients acquire when receiving healthcare treatment. At any given time, about 1 in 20 patients have an infection while receiving healthcare treatment in U.S. hospitals. HAI in hospitals alone result in up to \$33 billion in excess medical costs every year. Despite these staggering statistics, these infections are preventable and comprehensive programs are needed to make progress toward the goal of eliminating HAI.

The Nebraska Office of Epidemiology provides an ideal training opportunity to a HAI Epidemiology Fellow. The Office's Health Surveillance Section is supported by the same funding source as the HAI Prevention and Control Program therefore will collaborate in the study of HAI epidemiology and in implementing prevention and control strategies in healthcare facilities. The Fellow would also be involved with the Nebraska's HAI Advisory Council. This team will include the State Epidemiologist (Primary Supervisor), Lead HAI Epidemiologist, the CDC-assigned Career Epidemiology Field Officer (CEFO) (Secondary Supervisor), along with key stakeholders in Nebraska that have devoted much of their professional career to infectious disease prevention that include representatives from:

- Nebraska Hospital Association
- Nebraska Infection Control Network
- Nebraska Chapter - Association for Professionals in Infection Control and Epidemiology
- CIMRO of Nebraska
- Board-certified infectious disease physician(s)
- Society for Healthcare Epidemiology of America
- Consumer representative
- Nebraska Nurses Association

Duties will include:

- Advise on collection, analysis, and dissemination of HAI data, often requiring consideration or adoption of national standards or NHSN.
- Determine additional reporting measures as appropriate.
- Recommend standard definitions, measures, criteria, or methods.
- Evaluate the quality and accuracy of facility data or establish a process for this evaluation.
- Prepare reports or determine methods for sharing reports with the public.
- Review draft regulations, legislation, and other items of importance to HAI prevention (e.g., CMS IPPS rule, Council of State and Territorial Epidemiologists HAI reporting standards).

The HAI Fellow will work as part of this team and will have access to multiple databases to study a variety of HAI-related issues. The team members are located in close proximity to each other in various parts of our integrated Health and Human Services agency and community. The training and skill development of the HAI Fellow will be the primary responsibility of the State Epidemiologist. All team members will be at the disposal of the HAI Fellow to provide expertise in selected aspects of epidemiology and programmatic activities. The fellow will be authorized to access and analyze data sets/surveillance systems in all of these areas.

Day-to-Day Activities:

1) Develop an understanding of and familiarity with HAI datasets; 2) Refine data processing and data analysis skills; 3) Understand how to assess surveillance systems; 4) Acquire, analyze, and interpret data;

and 5) Prepare epidemiology reports; and (6) Understand the State's HAI surveillance and prevention infrastructure and how epidemiological data can enhance prevention practice. The training goals for the Fellow will be defined by Centers for Disease Control and Prevention (CDC)/Council of State and Territorial Epidemiologists (CSTE) Applied Epidemiology Competencies (AECs). At the completion of the fellowship, the Fellow will function as a well-qualified Tier 2, mid-level epidemiologist and will be highly employable in a wide range of public health settings.

Potential Projects:

In addition to understanding ongoing projects and surveillance systems, the HAI Fellow will focus on three priority areas: 1) Perform HAI Validation Study; 2) Community Onset of Infection; 3) Assess CDI in Nebraska

HAI Validation Study:

The HAI Fellow will have the opportunity to expand the utilization of existing surveillance systems beyond current levels and will have the opportunity to identify and develop novel systems to capture information which is currently lacking. The Office of Epidemiology in Nebraska has been a national leader in developing automated systems to acquire and message electronic health information provided by the state's health care facilities (e.g. Electronic Laboratory Reporting and Emergency Department Syndromic Surveillance). Specifically, this project would involve the following:

- Develop and implement protocols for NHSN data validation
- Determine the accuracy of reporting
- Determine if cases meet NHSN criteria for infection
- Determine if all of NHSN aspects reporting protocols are met
- Determine if there is under-or over-reporting
- Determine if cases are complete

Capturing Community Onset Infections:

A critical component of an effective prevention program is use of standardized process and outcome data as a means to inform those responsible for implementing the program and evaluate its impact. Unfortunately, many of the current HAI surveillance strategies are labor intensive and subject to limitations as a result of poor inter-rater reliability in applying standard definitions and variable implementation of case-finding strategies.

In addition, current case-finding strategies are largely focused on identifying infections that are manifested during an inpatient stay or as a result of specific surgical procedures. Such strategies may not capture an important and potentially large proportion of HAIs that, although the direct result of care delivered during an inpatient stay or in the ambulatory care setting, have their onset in the community.

Strategies that make use of existing electronic data sources for creating process and outcome measures may have a number of important potential advantages, including decreasing the burden of data collection, reducing error introduced by poor inter-rater reliability, and providing the ability to track adverse events longitudinally over the spectrum of a particular patient's healthcare delivery.

Surgical care has been shifting to the outpatient setting in recent decades and post-operative inpatient stays are becoming shorter. These trends raise challenges in detecting SSIs, as no standardized methods for post-discharge and outpatient SSI surveillance exist, and common approaches to case finding may be inadequate. There is data suggesting that SSI rates reported to the NHSN may be underestimated. More

standardized methods for SSI case finding are needed, including those that are exportable beyond acute care to ambulatory care centers.

CDI in the community:

Better assessments of incidence/burden of CDI in Nebraska, including setting of onset and in relation to healthcare exposures are needed. Any of the following measures could be included in the assessment:

- Methodology for measuring transmission and burden of CDI in non-acute care settings (e.g., long term care facilities)
- Better understanding of the epidemiology of antimicrobial use in inpatient settings
- Role of asymptomatic carriers in healthcare transmission
- Role of *C. difficile* in neonatal/infant diarrhea
- Better understanding of the incubation period before CDI develops after *C. difficile* acquisition
- Relative importance of different sources of *C. difficile* transmission in the healthcare setting (e.g., environment versus healthcare workers) and in relation to CDI burden
- Better understanding of CDI in the community

Program or surveillance system evaluation component:

- Evaluate the adequacy of surveillance methods to detect infections
- Enhance the reliability and consistency in applying the surveillance definitions
- Written final validation report to each participating site evaluated
- Run and publish data quality report from NHSN web site.
- Provide in-person opportunities to discuss data inconsistencies identified, discrepancies and to discuss if records need to be modified by the hospitals.

Preparedness Role:

The HAI Fellow will be expected to respond to acute and emergent problems related to HAI and infectious disease, including emergency response activities related to naturally occurring and intentional events which have actual or potential impact on HAI/infectious disease and associated morbidity/mortality. Nebraska's Bioterrorism Preparedness Program offers training and exercises to ensure Nebraska's preparedness in the event of an incident or attack involving biological, chemical, radiological or other agents of bioterrorism.

Assignment Location: Lincoln, NE

Primary Mentor: Tom Safraneck, MD
State Epidemiologist
Nebraska Department of Health & Human Services

Secondary Mentor: Brian Buss, DVM, MPH, DACVPM
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