

ID: 44301892

Infectious Diseases-HAI – Host Site Description  
Minnesota Department of Health

**Assignment Location:** Saint Paul, US-MN  
Minnesota Department of Health  
HAI-AR Section

**Primary Mentor:** Susan Klammer, MPH  
Supervisor, HAI-AR Programs and Partnerships Unit  
Minnesota Department of Health

**Secondary Mentor:** Ruth Lynfield, MD  
State Epidemiologist and Medical Director  
Minnesota Department of Health

### **Work Environment**

Hybrid

### **Assignment Description**

The Fellow will be mentored by the Director of One Health Antibiotic Stewardship (MDH Executive Office), the State Epidemiologist (MDH Executive Office), and the Programs & Partnerships Unit Supervisor (HAI-AR Section in the Division of Infectious Disease Epidemiology and Prevention) and will work with other staff in the HAI-AR Section and collaborate with colleagues in the Public Health Laboratory. The Fellow will be active in HAI-AR Section activities, including surveillance, outbreak investigation, and special projects. They will also play a role in both the HAI Advisory Group and the Minnesota One Health Antibiotic Stewardship Collaborative, working with non-MDH partners such as Stratis Health (the state's Quality Improvement Organization), Minnesota Hospital Association, Association of Professionals in Infection Control and Epidemiology-Minnesota Chapter, Minnesota Department of Agriculture, Minnesota Pollution Control Agency, and others.

In addition to providing a solid foundation in HAI epidemiology, response, and prevention, this position presents an exciting opportunity for a CSTE AEF Fellow to work in a professional, academically minded health department that is currently redefining the boundaries of how we can approach one of the most important public health problems of our time—antibiotic resistance. MDH is invested in expanding antibiotic resistance research and surveillance activities, supporting antibiotic stewardship initiatives across the continuum of healthcare, and tackling the problem of resistance and antibiotic use across disciplines by using a unique One Health approach. In addition to garnering federal interest and fiscal support, MDH has become the rallying point for antibiotic use initiatives within Minnesota. There has been unprecedented attention to antibiotic resistance and use issues from clinical entities, federal agencies, the White House, and the United Nations. Minnesota has emerged as a leader in this area and is positioned to address data issues, provide support to healthcare facilities, and improve the public's understanding of their important role in antibiotic stewardship issues.

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

The Fellow will attend internal and external meetings, including those for infectious disease epidemiology and lab staff (e.g., Morning Report), the antibiotic stewardship workgroup, the HAI-AR Section and the State HAI Advisory Committee; meet with mentors to discuss projects, progress, and opportunities; develop and execute epidemiologic projects; develop public health communications; provide technical assistance to healthcare facilities; write scientific reports; increase and maintain subject matter expertise by reading peer-reviewed literature and other relevant documents and by participating in online training; and present work products, including scientific posters and presentations at local, state, and national scientific conferences.

## **Describe Statistical and Data Analysis Support, Such as Databases, Software, and Surveillance Systems Available to the Fellow**

Available software includes SAS, Epi Info, Microsoft suite including Excel and Access, REDCap, and End Note. Surveillance systems and databases available include: MDH HAI outbreak database (REDCap), MDH containment database (REDCap), CDC MuGSI Case Management System (CDC SAMS), CDC MuGSI Incident Case Detection System (web-based), CDC Candidemia Database (REDCap), National Healthcare Safety Network (NHSN) dataset, the MDH Public Health Laboratory database (Laboratory Information Management System [LIMS]), Minnesota Electronic Disease Surveillance System (MEDSS) database, and Oracle BI Discoverer. Other databases and software as needed (e.g., SQL, Tableau, ArcGIS software, Minnesota Registration and Certification database, etc.).

## **Projects**

### **Surveillance Activity Title: Hospital HAI and Antimicrobial Use Prevalence Survey.**

#### *Surveillance Activity Description:*

Hospital healthcare-associated infection (HAI) and antimicrobial use point prevalence survey. Since 2011, CDC has conducted periodic surveys to measure HAIs and antibiotic use in hospitals as part of the Emerging Infections Program (EIP). Minnesota Department of Health is one of ten EIP sites conducting special surveillance projects and has participated in both hospital and nursing home national HAI and antimicrobial use surveys. The CSTE AEF Fellow will have an opportunity to assist with data collection, validation, and analysis and will join project-related calls with CDC and other EIP sites. Data from Minnesota hospitals from previous surveys (2011 and 2015) have not been summarized outside of the national data set. The Fellow could analyze these and 2023 data to share with participating hospitals and other partners.

#### *Surveillance Activity Objectives:*

This EIP Hospital Survey is conducted to gather data on all types of HAIs across all acute care inpatients in hospitals, including those not routinely tracked by the National Healthcare Safety Network (e.g., infections not associated with a medical device or procedure). The survey also collects data on antimicrobial use. The results of the hospital surveys help to improve methods to collect data on HAIs, create policies and procedures to reduce HAIs, and support appropriate use of antimicrobial drugs.

Expected deliverables from this project include a summary of hospital prevalence data from MN hospitals, to be shared with participating hospital partners and the public. The Fellow could also develop an infographic or other resource to communicate findings clearly. The Fellow will have the opportunity to summarize findings at an MDH EIP meeting and other state-level meetings.

#### *Surveillance Activity Impact:*

Tracking HAIs is a critical step to identify areas for improvement and, ultimately, prevention.

### **Surveillance System Evaluation Title: Carbapenem-resistant organism (CRO) Surveillance.**

#### *Surveillance System Evaluation Description:*

CROs are bacteria that are resistant not only to the important carbapenem class of antibiotics but also often to other drug classes that might be indicated for infection treatment. CROs pose a substantial public health threat, particularly to hospitalized patients and residents of long-term care. The threat is even greater when these pathogens carry carbapenemase genes on transmissible genetic elements. Such genes are easily shared among bacteria, allowing resistance spread to spread quickly in healthcare facilities when containment measures are not in place.

Carbapenem-resistant Enterobacterales (CRE) and carbapenem-resistant *Acinetobacter baumannii* (CRAB) have been reportable statewide to MDH since January 2016 and March 2020, respectively. MDH also conducts sentinel reporting for CRE and CRAB as part of the CDC Emerging Infections Program. Carbapenem-resistant *Pseudomonas aeruginosa* is not reportable statewide, but laboratories are asked to report carbapenemase-producing CRPA and to submit CRPA isolates if support for carbapenemase testing is needed. The CSTE AEF Fellow will learn about the importance of CROs to patient safety and the spread of antimicrobial resistance. They will review and evaluate the laboratory-based surveillance systems in place at MDH as well as efforts for proactive surveillance (e.g., hospital admission screening) using the essential characteristics of surveillance systems.

*Surveillance System Objectives:*

This project is intended to provide actionable information to the HAI-AR Section regarding an important surveillance program. The Fellow will conduct a surveillance evaluation, based on established criteria. The Fellow will be encouraged to summarize findings in an abstract to be submitted for oral presentation at CSTE Conference 2024. The Fellow will summarize findings for the HAI-AR Section, Public Health Laboratory, and other MDH programs.

*Surveillance System Impact:*

Assessment of the comprehensiveness and sustainability of surveillance systems is an important component of public health practice. This work sometimes facilitates refinement of case definitions and/or catchment, improvement of workflow, and estimation of the quality and generalizability of data collected. CROs are one of our most important public health threats, and surveillance for these organisms is of critical importance.

**Major Project Title: Use of Medicare Public Use Files to Establish a Feedback Program for High-Volume Antibiotic Prescribers.**

*Major Project Description:*

Centers for Medicaid and Medicare Services Medicare Part D data are available through public-use files after a two-year lag (e.g., 2020 data become available after December 2022). The data set contains prescriber-level aggregate counts of outpatient antibiotic prescriptions and provider characteristics, including names, National Provider Identifier, specialty (including prescriber type), and zip code. MDH used these data to estimate that the top 10% of prescribers by volume (“high-volume prescribers”) prescribed 35% and 34% of all prescribing volume in 2018 and 2019, respectively. Publications by other researchers and CDC have associated high prescribing volume with inappropriate prescribing practices.

This project involves use of Medicare public use files to describe prescribing in Minnesota and establish an approach to using these data to provide feedback to high-volume prescribers.

References describing this approach include:

- Gouin KA, Fleming-Dutra KE, Tsay S, Bizune D, Hicks LA, Kabbani S. Identifying Higher-Volume Antibiotic Outpatient Prescribers Using Publicly Available Medicare Part D Data - United States, 2019. *MMWR Morb Mortal Wkly Rep* 2022;71:202-205. DOI: <http://dx.doi.org/10.15585/mmwr.mm7106a3>
- Schwartz et al. Effect of Antibiotic-Prescribing Feedback to High-Volume Primary Care Physicians on Number of Antibiotic Prescriptions. *JAMA Intern Med.* 2021;181(9):1165-1173.

*Major Project Objectives:*

The CSTE AEF Fellow will develop sustainable SAS code to facilitate annual analysis of Medicare Part D outpatient antibiotic prescribing public use files. The Fellow will summarize prescribing rates by high-volume prescribers and stratify prescribing rates and volume across prescriber types, MN geography, and other patient or provider attributes. Analysis will include multiyear assessment to determine the percent of high-volume prescribers that remain in the top 10% year over year.

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If feasible given MDH capacity and resources, the Fellow will develop a Tableau dashboard that will allow MDH, other state agencies, healthcare partners, and the public to review aggregated de-identified antibiotic prescribing data.

With these data in-hand, the Fellow will contribute to methodology development for notification of high-volume prescribers (e.g., notify top 10% each year or notify prescribers remaining in the top 10% over a defined number of years), assist in drafting the communication and resources that will be sent to high prescribers, and be included in the process for getting project approval and signatories from the Health Commissioner and MDH Executive Office. Although, given the two-year lag in Part D data, the Fellow might not see any impact from provider notification, the Fellow will work with other MDH staff to outline a plan to assess the impact of provider notification when the Part D data are summarized in future years.

*Major Project Impact:*

Individual prescriber feedback has been shown to improve prescribing behaviors. This project utilizes publicly available data to develop a feedback plan that can be used year after year to connect directly with high-volume prescribers.

**Additional Project #1 Title: Dental antibiotic stewardship and prescribing practices**

**Project #1 Type: Major Project**

*Project #1 Description:*

Dentists prescribe 10% of outpatient antibiotics. In addition, of community-associated *Clostridioides difficile* patients who reported recent antibiotic use, 15% reported taking antibiotics for a dental procedure. During winter 2015, MDH conducted a survey of Minnesota dentists to obtain baseline information about antibiotic prescribing for treatment and prophylaxis, antibiotic selection, educational resources used to guide prescribing, barriers to professional guideline use, and patient communication about antibiotic risks. Since that time, we have made more materials available for dentists online and have had dentistry-relevant sessions at Minnesota's annual stewardship conference. This work needs to be reviewed and updated based on additional professional guidelines and published studies.

*Project #1 Objectives and Expected Deliverables:*

Early in the fellowship period, the CSTE AEF Fellow would conduct a survey of dentists that mirrors that conducted in 2015 and includes additional questions on knowledge, attitudes, and practices of antibiotic stewardship. These data will be used to measure progress in prescribing practices and the understanding of antibiotic stewardship. The Fellow could also conduct a new survey of Minnesota dental hygienists to learn about knowledge, attitudes, and practices regarding antibiotic stewardship activities, available personnel, information technology capabilities, use of data to inform antibiotic prescribing, and barriers and facilitators to optimize antibiotic prescribing.

The results of these surveys will allow the CSTE AEF Fellow to lead development of dental materials, plan a stewardship webinar or other education opportunity for dental professionals, and other outreach endeavors identified by the Fellow.

*Project #1 Impact:*

Dentists prescribe a large proportion of outpatient antibiotics. Assessment of practices and awareness in MN can help target education and improved prescribing behaviors. Some studies have shown national disparities in prescribing for dental conditions across different patient populations. Improved prescribing benefits all patients. When knowledge of appropriate practices is coupled with awareness of how prescribing might be influenced by non-clinical factors, we can also make progress to mitigation of prescribing inequities.

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**Additional Project #2 Title: One Health Antibiotic Stewardship Collaborative**

**Project #2 Type:**

*Project #2 Description:*

In July 2016, MDH, Minnesota Department of Agriculture, Minnesota Pollution Control Agency, and Board of Animal Health endorsed and committed to the Minnesota One Health Antibiotic Stewardship Five-Year Strategic Plan. The plan was developed through collaboration of these state agencies, as well as stakeholders from academia, many healthcare facilities, animal agriculture producer groups, health industry, and other groups. The goal is to approach the problem of antibiotic resistance and responsible antibiotic use by using a One Health approach, engaging human, animal, and environmental health. The CSTE AEF Fellow would participate in the Collaborative as the group works toward objectives outlined in the 2023—2027 Minnesota One Health Antibiotic Stewardship Strategic Plan. They could be involved in the One Health Collaborative by cooperating on technical working group activities to meet strategic plan goals, managing Collaborative logistics and communications, facilitating meetings, conducting monitoring and evaluation of the state plan, and becoming a resource for partners and public on the One Health concept and the gains that can be made from engaging across disciplines. In addition to contributing to subject matter expertise in the field of antibiotic stewardship, this activity will provide the CSTE AEF Fellow experience beyond the science, including communication and collaboration with interdisciplinary scientific partners, leading professional work groups, and coordination of large scientific meetings. The Strategic Plan is available at: <http://www.health.state.mn.us/onehealthabx/>.

*Project #2 Objectives and Expected Deliverables:*

The CSTE AEF Fellow will be given the opportunity to serve as chair of the One Health Engagement work group of the Collaborative. This involves developing agendas for quarterly calls, moderating these calls, and working with Collaborative leadership to connect the activities happening in other work groups.

The Fellow will also have the opportunity to lead multistate One Health antibiotic stewardship calls, which are attended by stewardship leaders from other states, as well as representatives from CDC, FDA, and other organizations.

*Project #2 Impact:*

Issues like antibiotic stewardship require a collaborative effort across multiple disciplines. By using One Health-oriented communication, Minnesota's public and professionals grow awareness needed to think innovatively and responsibly about approaches to optimizing antibiotic use within each health field. More and more states are moving to a model of One Health stewardship. Participating in Minnesota's efforts will position the Fellow to lead and participate in similar initiatives after the fellowship.

**Please Describe the Fellow's Anticipated Role in Preparedness and Response Efforts – Include Activities and Time Allocation (Required Competency of Fellowship)**

There will be multiple opportunities for the fellow to participate in MDH's emergency preparedness and response (EPR) activities. MDH EPR routinely conducts exercises with regional healthcare coalitions, and the fellow will participate in planning meetings to support the development of at least one tabletop exercise with healthcare partners. The fellow will also join MDH EPR team members in planning for and observing exercises as part of the high consequence infectious disease and Ebola workgroup.

**Please Describe the Fellow’s Anticipated Role in Cluster and Outbreak Investigations – Include Activities and Time Allocation (Required Competency of Fellowship)**

The CSTE fellow will serve as part of the HAI outbreak investigation team alongside an HAI team outbreak lead, infection control and response (ICAR) representative, and other team members such as an MDH public health laboratory representative as appropriate to each response. Examples of past HAI outbreak responses in which CSTE fellows have been involved include MDRO containment, device/equipment breaches, product recalls, infection control breaches, and foodborne illness outbreaks taking place within health care facilities. The outbreak investigation team will collaboratively assess the nature of the outbreak or breach, gather additional data and information to guide the response, maintain lines of communication with affected individuals, health care facilities and MDH leadership, and contribute to documentation of each step in the response until the investigation is closed.

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

MDH has established a COVID-19 Section and multiple types of SARS-CoV-2 data have been and continue to be collected. If the CSTE AEF Fellow expresses interest in a COVID-19 project and/or if an agency-wide response is again needed, the Fellow could be engaged in COVID-19 activities.

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

In 2023, MDH will release an inaugural Minnesota AS and AU Annual Report, containing summaries of all Minnesota antibiotic use data available to MDH. The report will include a focus on health equity, describing both where we are able to use data to explore potential inequities in diagnoses and antibiotic prescribing (e.g., All Payer Claims Data) and where data are insufficient to understand individual prescribing and how those behaviors might differ across areas and populations of Minnesota (e.g., hospital administration data). MDH HAI-AR Section is currently establishing relationships with those elsewhere in the agency focused on health equity to ensure that our work reflects the wider mission and vision of MDH in this area. As part of the Programs and Partnerships Unit, the Fellow will be directly engaged in this progress.

MDH’s Infectious Disease Epidemiology, Prevention, and Control Division convenes a Health Equity work group with subgroups focused on community, data, and policy. The fellow will have the opportunity to participate as an active member of the work group and a subgroup depending on their interests and current work group projects.