ID: 59837773
Infectious Diseases - HAI, Infectious Diseases - Host Site Description
Massachusetts Department of Public Health

Assignment Location: Jamaica Plain, US-MA
Massachusetts Department of Public Health
Epidemiology/Healthcare-Associated Infections and Antimicrobial Resistance Program

Primary Mentor: Chiara Moore, MPH
Assistant Director of Health Care Strategy and Planning
Massachusetts Department of Public Health

Secondary Mentor: Melissa Cumming, MS
Senior Epidemiologist and HAI/AR Program Manager
Massachusetts Department of Public Health

Work Environment
Hybrid

Assignment Description

The fellow's assignment will be as a healthcare-associated infections and antimicrobial resistance (HAI/AR) epidemiologist in the HAI/AR Program in the Division of Epidemiology. As such, the fellow will participate in all programmatic activities related to surveillance, prevention and control of healthcare-associated infections and antimicrobial resistance. A key feature of this assignment will be conducting advanced analyses of relevant data (NHSN, surveillance, antimicrobial use and resistance, etc.) in order to direct the program's efforts. Additionally, the fellow will necessarily be engaged in activities related to promoting infection prevention and control best practices through educational initiatives as well as becoming fully trained to conduct infection control assessment response (ICAR) visits in healthcare facilities with a public health nurse partner. We would also expect the fellow to be involved in statewide efforts to promote antimicrobial stewardship across the healthcare continuum.

Day to day activities will be like those of other HAI/AR epidemiologists. These activities include but are not limited to: participating in a wide variety of monthly national, stakeholder and regional HAI/AR related calls and webinars (CDC, CSTE, etc.), quarterly statewide HAI/AR Technical Advisory Group meetings, bi-weekly check-ins with HAI/AR Program leads and HAI/AR Program team meetings, bi-weekly division huddles with clinical leadership, monthly division meetings, quarterly Bureau meetings, weekly responsibility for coverage of HAI and AR-related morbidity and investigations, work on specific analytic projects related to HAI/AR Program and OHSCP responsibilities and goals, and participation in both preventive and responsive ICAR visits in healthcare facilities across Massachusetts. The fellow will be provided protected time to study for the Certification Board in Infection Control (CBIC) Certification in Infection Control exam during the fellowship.

The fellow will work with their mentors to create a schedule and timeline for the main projects. The fellow’s weekly schedule will include dedicated time to focus on fellowship projects, attend regularly scheduled meetings within MA DPH and with external partners, and protected professional development time. The fellow will meet weekly with their mentors throughout the fellowship. The fellow will also actively participate in routine ongoing meetings such as our hospital capacity weekly check-ins, weekly health care workforce center meetings, monthly meetings on hospital data modernization, and more.

Externally, the fellow will attend meetings with our regional Health and Medical Coordinating Coalitions (HMCC) and other stakeholders described in the partnerships section as appropriate. The fellow will be invited to attend monthly in-person OHCSP meetings and virtual MA DPH all-staff and Commissioner's Office meetings. Additional virtual and in-person chats foster community development in the hybrid work environment. Based on their interests, the fellow may also attend additional meetings with internal and external partners, as described above in Descriptions of Partnerships and Collaborative Efforts.

This position will have different daily responsibilities based on needs. Days will include data cleaning and analysis in SAS Enterprise, outputting and formatting data for a variety of audiences, conducting literature reviews for best practices in health system delivery, communicating findings to various stakeholders using appropriate modes of communication (data briefs, presentations, dashboards), and peer learning with other early career epidemiologists on the team.

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

The fellow will have access to all of the same surveillance systems, data sources, and statistical software that all members of the HAI/AR Program have access to. These data include but are not limited to NHSN data, antibiotic use data, Massachusetts Virtual Epidemiologic Network (MAVEN) data (our web-based surveillance and investigation platform, including all electronically reported laboratory data relevant to HAI/AR), all-payer claims data, etc.

As far as software, all staff have access to the Office 365 suite of products, as well as SAS, R, Tableau and ArcGIS. Additionally, DPH is in the process of migrating data to Snowflake, so the fellow will gain exposure to Snowflake and SQL programming.

In terms of analytic support, the Division of Epidemiology has an active data analytics working group, to support one another with analytic project work, and access to periodic SAS and R courses through the state's online training platform. Additionally, support and mentorship to those performing analytic work for the program is provided by the HAI/AR Program Analytic Coordinator, with subject matter expertise in analyses involving the data sources listed, and the fellow's primary mentor, the Assistant Director of Healthcare Strategy and Planning, who is a data visualization and analytic SME.

MA DPH offers several SAS training courses (for example, SAS Programming 2: Data Manipulation Techniques, SAS Macro Language 1: Essentials, and Multivariate Statistics for understanding complex data) on an ongoing basis. Besides Microsoft 365 software the fellow will have access to Tableau, PowerBI, and ArcGIS with additional software available based on demonstrated need. MA DPH has several resource groups that the fellow will have access to, including a Community of Practice (CoP) for epidemiologists, a SAS Users group, a Tableau learning cohort, and a GIS Users group. Additionally, there is a Boston area SAS user group that hosts free quarterly meetings.

Projects

Surveillance Activity Title: Develop the Framework and Specifications for an Internal Urgent Care Dashboard

Surveillance Activity Description:
Urgent care centers are not currently centrally licensed in Massachusetts by DPH. Due to recent legislation, DPH will develop and implement a pathway to license urgent care centers. In anticipation of this change, DPH has begun a landscape assessment of urgent care centers in Massachusetts. More information is available here: https://www.mass.gov/info-details/urgent-care-and-retail-clinics-in-massachusetts. The fellow will support the data team in identifying facilities for onboarding to Syndromic Surveillance.

The fellow will then research and develop a proposal of surveillance metrics to describe urgent care utilization and trends. These metrics might be expanded to include areas such as antimicrobial use and stewardship. Once the proposal has been finalized, the fellow will go on to conduct data cleaning and analysis and finally to visualize this data in an internal dashboard.

Surveillance Activity Objectives:
The primary objective is to lay the groundwork for an internal urgent care dashboard to monitor urgent care utilization and trends.

- Develop a project plan and obtain approval from Data Team Leads.
- Develop a list of desired capabilities for an internal urgent care dashboard, based on feedback from Data Team and programmatic leads.
- Create a list of required data elements that will be necessary to populate the dashboard.
- Test a prototype internal dashboard, as funding and dashboard priorities allows.

Surveillance Activity Impact:
This project will enable DPH to understand a critical part of our ambulatory care system. By assessing trends, we will be able to better identify unmet health care needs as well as infectious disease surges across Massachusetts,

Surveillance System Evaluation Title: Understanding Ambulatory Surgical Centers Procedural Volume to Inform State Procedures and Reporting Policy

Surveillance System Evaluation Description:
Currently, acute care hospitals (ACH) in Massachusetts are required to report data to the National Healthcare Safety Network (NHSN) for inpatient surgical site infections (SSIs) associated with six types of inpatient surgical procedures. In recent years, there has been a notable decrease in ACH inpatient surgical procedures, most evident in knee arthroplasty (KPRO) and hip arthroplasty (HPRO) but potentially impacting other procedures such as colon procedures (COLO), abdominal hysterectomies (HYST), and vaginal hysterectomies (VHYS)). Without systematic collection of surgical site infection (SSI) data for outpatient procedures, there is concern for increasing risk to patients, as the frequency of outpatient surgical procedures continues to grow. This project aims to explore the analytic options available for tracking outpatient procedures and SSIs among ambulatory surgical centers to determine appropriate state procedural changes or reporting requirements.

Surveillance System Objectives:
The objectives of this project are primarily to describe SSI procedure volume among ambulatory surgical centers by procedure type using APCD, Medicare, Medicaid, and other available data sets. In addition, a review and evaluation of the NHSN outpatient SSI protocol in collaboration with the HAI Coordinator, HAI/AR Program Analytic Coordinator as well as CDC NHSN team if needed, to determine potential metrics that could be utilized for tracking outpatient SSIs statewide.

- Evaluate the volume of ambulatory surgical center procedures by type using APCD, Medicare, Medicaid, and other available data sets.
- Review and evaluate the NHSN outpatient SSI protocol in collaboration with the HAI Coordinator, HAI/AR Program Analytic Coordinator as well as CDC NHSN team if needed, to determine potential metrics that could be utilized for tracking outpatient SSIs statewide.

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Surveillance System Impact:
The potential for SSIs to occur following outpatient surgical procedures has been a growing concern of the HAI/AR Program and Departmental Leadership. Understanding the frequency and types of outpatient procedures being performed and standardizing SSI surveillance could significantly benefit patient safety and care. Patients seek and receive elective surgeries for a variety of reasons, and it is important for the Department to monitor and evaluate risk in the ambulatory surgical center setting, and in turn, share these data with facilities and patients for transparency and improved patient safety and quality.

Major Project Title: Characterizing Med-Spa Utilization and Service Scope to Guide IPC Education and Mitigate Infection Risks

Major Project Description:
The HAI/AR Program, the Bureau of Health Care Safety and Quality (BHCSQ), and the Office of Health Care Strategy and Planning (OHCSP) have jointly investigated reports of medical (med)-spa related infections, adverse reactions, and infection prevention and control (IPC) breaches. Using available resources and data, the fellow will ascertain med-spa volume and service options to inform the development of polices, provide guidance for med-spa owners and practitioners, and create educational messages for owners and clientele to mitigate potential infection and IPC-related issues.

The med-spa landscape is largely unregulated, even as the number and popularity of med-spas continue to rise. In the Greater Boston area alone, there are an estimated 500 med-spas currently in operation. In Massachusetts, sub-regulatory guidance issued in 2013 clarified that a med-spa offering medical services is subject to clinic licensure if it is not wholly owned and controlled by one or more of its practitioners. If a med-spa is wholly owned and controlled by one or more medical practitioners, it is not required to obtain clinic licensure but may not use the words clinic, institute, or dispensary in its name.

The Department has conducted several investigations involving serious health and safety concerns including unlicensed practitioners providing medical services, med-spas using counterfeit products and operating under unsafe conditions. Given the rapid growth of the industry, the 2013 regulations should be updated and expanded to ensure that med-spa owners clearly understand the requirements for compliance. This includes providing guidance in plain language and, where possible, in the owner's primary language to promote safe service delivery. At the same time, local, national, and global reports of infections associated with med-spas and procedures obtained through medical tourism are increasing. As a result, it is increasingly important to provide clear guidance to ensure that licensed providers purchase and administer FDA-approved products safely and that all services are delivered in accordance with appropriate infection prevention and control practices.

Major Project Objectives:
The fellow will conduct an analysis and inventory of med-spas in Massachusetts to quantify the number of spas operating with and without a license. In collaboration with the BHCSQ and OHCSP, the fellow will develop updated regulations and guidance for practitioners, as well as education materials for consumers.

- Compile existing data on med-spa volume (number of facilities, geographic distribution, client volume) and catalog common services offered. Identify those with higher infection risk.
- Review investigations previously conducted by DPH and identify trends, gaps, and areas of elevated IPC concern.
- Review existing regulations and identify gaps; draft evidence-informed policy to address gaps and identified risks.
- Develop clear, practical guidance tailored to med-spa owners and practitioners.
- Develop practitioner-focused IPC best practice checklists.

- Draft client-facing educational messages to raise awareness about safe practices and what to expect (in plain language and accessible formats).

Major Project Impact:
Clear regulations and explicit guidance are essential to ensure that med-spa practitioners follow established safety standards and properly administer FDA-approved products. When licensed providers use approved products correctly and adhere to appropriate infection prevention and control practices, the risk of complications, infections, and unsafe treatments is significantly reduced. This protects individuals from preventable harm and helps avoid unnecessary strain on the broader healthcare system.

Additional Project #1 Title: Evaluating the Accuracy of Syndromic Surveillance in Massachusetts- Compare and evaluate key metrics between two data sets: Syndromic Surveillance and Case Mix Hospital Discharge Data
Project #1 Type: Surveillance System Evaluation

Project #1 Description:
Massachusetts collects near real-time data from emergency departments and some urgent care centers as part of CDC's National Syndromic Surveillance Program (NSSP). There is an active national Community of Practice that develops and shares syndrome definitions. In Massachusetts, we have reliably validated COVID-19 and ILI syndromes (you can find more here: https://www.mass.gov/info-details/massachusetts-syndromic-surveillance-data-nowcast-and-moving-epidemic-methods). We have many emerging use cases for this dataset and have been developing syndromes accordingly. This project would seek to validate some of these new identified syndromes against our hospital discharge dataset as the gold standard. Specific syndromes will be defined based on the fellow's interest and most pressing public health priorities during the fellow's time with DPH.

Project #1 Objectives and Expected Deliverables:
The fellow will conduct an analysis comparing syndromes identified in NSSP and hospital discharge data for ED visits. For the selected syndromes, the fellow will test the validity (positive predictive value, negative predictive value, sensitivity, and specificity) for the syndromes to capture the final diagnosis in the ED discharge tables.

- Identify priority syndromes for evaluation in collaboration with the data team
- Conduct a literature review for how to categorize selected conditions using hospital discharge data
- The fellow will submit an evaluation plan.
- Create applicable 2x2 tables and generate validity findings using SAS
- Conduct the evaluation and prepare a report of findings.
- The report will include recommendations for improving the validity of the Syndromic Surveillance data.
- Develop a recommendation for confidence intervals to apply to syndromes to improve public facing reporting

Project #1 Impact:
This project will increase the validity and reliability of near real-time syndrome reporting. With high priority public health syndromes well defined and understood, public health resources can more dynamically be activated to respond to emerging threats or trends as needed. This project will support the state in developing timely and accurate reporting of ED capacity, operations, and common conditions to facilitate improved health care planning.

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

The Division of Epidemiology and the HAI/AR Program enjoy a collaborative working relationship with our partners in the MDPH Office of Preparedness and Emergency Management (OPEM). When MDPH was selected as one of three pilot sites for the NHSN Connectivity Initiative to assess hospital bed capacity, our HAI/AR Program NHSN subject matter experts provided much needed assistance to our OPEM colleagues. We would welcome the opportunity for a CSTE Fellow to engage in this important initiative.

A major project for this fellow will be to develop the framework and specifications for an internal urgent care dashboard for the Commonwealth. While the initial intent for this dashboard is not primarily preparedness, this is a potential feature that could feasibly be explored in the future. Additionally, there are multiple other preparedness activities ongoing at the Department including: development of an inter-state transfer protocol for patients diagnosed with a high-consequence infectious disease (e.g. Ebola virus disease) requiring care at the Region 1 Regional Emergency Special Pathogens Treatment Center which exists in Massachusetts; refinement of existing plans for response to outbreaks of Eastern equine encephalitis (EEE), a mosquito-borne disease which impacts Massachusetts disproportionately; and updates to the statewide Infectious Disease Emergency Response plan which includes appendices for specific pathogens. Depending on the progress of each of these efforts and the specific interests of the fellow, these are several of the opportunities for involvement in preparedness efforts that they could engage in.

In terms of response efforts, large outbreaks often require an all-hands on deck approach for at least some period of time. Previous Applied Epidemiology Fellows have been included in large, multi-state food-borne disease outbreaks and EEE response activities. Emerging issues that could also provide experience include response to migrant populations and significant increases in active tuberculosis and congenital syphilis cases. We anticipate that emergency preparedness work will be 5% or less but that involvement in response activities may add to the proportion of time the fellow spends in cluster and outbreak investigation by 5-10%.

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

We anticipate that from day one, the fellow would begin shadowing other epidemiologists during HAI/AR cluster and outbreak investigations, such as invasive Group A Streptococcus outbreaks in long term care facilities and carbapenemase-producing organism clusters in acute care and other healthcare facilities. Extensive shadowing, participation and training would occur over the course of the fellowship, and we would expect that by the end of the two-year period, the fellow would have a full comprehension of internal standard operating procedures for responding to such situations and would be able to lead such investigations with support from HAI/AR Program leads.

Activities will include, communicating with clinicians and infection preventionists in a variety of healthcare settings, communicating with laboratory partners, interpreting laboratory results, documenting all activities related to the investigation in our surveillance and investigation platform (MAVEN), managing calls and meetings with facilities and HAI/AR Program staff, conducting on-site visits when indicated, making appropriate recommendations related to colonization screening and infection prevention and control where appropriate and facilitating colonization screening with laboratory partners and impacted healthcare facilities. Time allocation for these activities is estimated to be 25-30% but will naturally vary over time.