

ID: 45035948

Infectious Diseases - HAI - Host Site Description

Illinois Department of Public Health

Assignment Location: Chicago, US-IL
Illinois Department of Public Health
Division of Patient Safety and Quality

Primary Mentor: Angela Tang, MPH
Healthcare-Associated Infections Epidemiologist
Illinois Department of Public Health

Secondary Mentor: Stacey Hoferka, MPH, MSIS
Special Projects Coordinator / Epidemiologist
Illinois Department of Public Health

Work Environment

Hybrid

Assignment Description

The Fellow will serve as an entry-level epidemiologist in the Division's HAI/AR Prevention Program. They will be fully integrated into the Program's activities in surveillance and data analysis, outbreak prevention and response efforts, development of related guidance and protocols, and training facilities and local health departments as described below.

HAIs, including urgent antibiotic resistant threats such as carbapenemase-producing organisms (CPOs) and *Candida auris*, are significant challenges in Illinois. The HAI/AR Program follows CDC's Interim Guidance for a Public Health Response to Contain Novel or Targeted Multidrug-resistant Organisms (MDROs) and implements activities as outlined in CDC's Epidemiology and Laboratory Capacity agreement that funds the program. As such, the Fellow's day-to-day would include surveillance on CPOs, *C. auris*, and other emerging pathogens reported to the Illinois Extensively Drug-Resistant Organism (XDRO) registry. They would serve as a point-of-contact for facilities and local health departments on how to interpret XDRO surveillance definitions and report to the XDRO registry. The Fellow would also be charged with publishing periodic surveillance reports for situational awareness and to guide policy development. If targeted MDROs or outbreaks are identified, the Fellow would work with the local health department to gather important epidemiologic investigation data, arrange for infection control assessments and colonization testing as needed, and ensure the facility implements appropriate infection control measures. The Fellow would use this experience to help coordinate the MDRO Task Force to set MDRO containment strategy and create or update related guidance documents.

The HAI/AR Program is also responsible for analyzing all HAI data reported by Illinois healthcare facilities to CDC's National Healthcare Safety Network (NHSN) and publishing measures and annual reports to the Illinois Hospital Report Card for Consumers. And, the program will need to analyze baseline and outcome data for a number of antibiotic stewardship initiatives that are underway. As interested, the Fellow will have the opportunity to become familiar with and participate in these or other non-HAI activities described in the "additional learning opportunities" section.

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

A physical and remote desktop will be made available that includes a package of statistical and data software, including SAS for statistical analysis, ArcGIS or Tableau for data visualization, and Microsoft Office 365. The Fellow can also utilize REDCap for data management. Other relevant software will be provided as needed.

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As part of their experience, the Fellow will have the opportunity to learn about and work with several key databases such as:

- XDRO registry (www.xdro.org), a tool for reporting and inter-facility communication of multidrug-resistant
- Illinois-National Electronic Disease Surveillance System (INEDSS), used for reporting of other communicable diseases and national notification to CDC
- NHSN, CDC's surveillance system for HAIs and antimicrobial stewardship
- Syndromic Surveillance (real time Emergency Department visits), and
- Hospital Discharge Data (hospitalization and Emergency Department visit claims).

If needed, other program-specific databases may also be made available to the Fellow for relevant projects, surveillance, and evaluation.

Projects

Surveillance Activity Title: Surveillance of Multidrug-Resistant Organisms in Illinois

Surveillance Activity Description:

In line with CDC's MDRO Containment guidance, the Fellow would routinely review XDRO registry and INEDSS data to identify targeted MDRO cases and output from SaTScan, a software that we have paired with registry data to identify potential clusters based on geographic proximity or patient sharing networks. They would then work with local health departments to further investigate cases and determine next steps. Once investigation and response are complete, the Fellow would review case information for accuracy and completeness before it is sent to CDC as part of national notification.

The Fellow would also run control charts in R to identify facilities that may be under- or overreporting cases as compared to their baseline numbers. As part of data quality review, the Fellow would conduct data entry validation and follow up with providers if data entry errors or underreporting is detected.

In the past, the HAI/AR Program has also created annual surveillance reports as PDFs and presented data in PowerPoint slides for statewide monitoring and situational awareness. However, we would like to create a more interactive data dashboard, using a platform like Tableau, on the IDPH website with more frequent data updates. The Fellow could play a role in designing, creating, and managing such a dashboard.

Surveillance Activity Objectives:

The Fellow's work on this activity will result in identification of cases/clusters that need investigation through XDRO data review, preparation of case information for national notification to CDC, follow-up with facilities/labs that have reporting errors to improve data quality, and creation of and updates to the XDRO data dashboard.

Surveillance Activity Impact:

This surveillance will support containment of MDROs, resulting in fewer colonized cases and infections in the state.

Surveillance System Evaluation Title: Evaluation of the XDRO registry

Surveillance System Evaluation Description:

Since November 2013, Illinois has mandated healthcare facilities, labs, and providers to report cases of carbapenem-resistant Enterobacteriales (CRE) to IDPH's XDRO Registry. The registry serves as both a surveillance system and an inter-facility communication tool in which facilities can receive alerts or search the system for a patient's history of XDROs. Over time, *Candida auris* and other XDROs have been added as needed. While an evaluation was conducted early on in

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the registry's existence, the landscape has changed in recent years with COVID-19 affecting reporting, new carbapenemase-producing organisms (CPOs) emerging, and the epidemiology of cases potentially changing. Additionally, the CSTE/CDC definition for CPOs has been updated starting in 2023 and Illinois will correspondingly seek to expand the CPOs that are reportable to the XDRO registry.

Surveillance System Objectives:

The Fellow will collaborate with Division staff to: (1) conduct an evaluation of the registry's attributes per the CDC's surveillance system evaluation criteria and (2) make recommendations to improve the accuracy and completeness of reporting, enhance the inter-facility communication feature, and increase the overall usefulness of the registry. The evaluation will also assist the HAI/AR team in identifying and making any needed changes to enable mandatory reporting of the additional CPOs. The Fellow will create a final report and/or present findings to the Division and relevant partners.

Surveillance System Impact:

Evaluation of and subsequent improvements to the registry will support rapid response and communication of MDROs, resulting in containment of antibiotic resistance and a decrease in colonized cases and infections.

Major Project Title: Prevention and Containment of MDROs

Major Project Description:

Illinois is battling with a number of urgent antibiotic resistant HAI threats, notably *C. auris* and CPOs, as the number of patients colonized or infected with these pathogens continues to rise. IDPH has been working with affected local health departments, facilities, and laboratories to support investigation, response, prevention, and communication activities for the various multijurisdictional cases and clusters. The Fellow will play a key role in these efforts. In addition to the surveillance and investigation activities described previously, the Fellow will help lead colonization screening or wider point prevalence surveys (PPS) in response to HAI clusters or outbreaks. Typically, a PPS would entail coordinating with local health departments and the Antibiotic Resistance Lab Network to ensure testing capacity; preparing laboratory line lists; training the facility to collect, package, and ship the specimens; communicating test results with facilities; utilizing REDCap as a database to track and share results; and determining next steps for containment. The Fellow will collaborate with the HAI/AR team's infection preventionists by assisting with remote or onsite infection control assessments, making infection control recommendations, and ensuring implementation of recommended measures. Based on their surveillance, investigation, and response experience, the Fellow will work with the HAI/AR team to develop communications (e.g., health alerts), protocols, and educational materials targeting healthcare providers, local health departments, the general public, or other stakeholder groups. The Fellow can also help coordinate the MDRO Task Force, which identifies issues and creates solutions regarding containment in the state.

We have also uncovered critical gaps in infection prevention capacity, particularly in long-term acute care hospitals and long-term care facilities. IDPH is beginning to implement a CDC-supported approach to MDRO prevention (as opposed to resource-intensive response measures), especially in areas outside of metro Chicago, where prevention may have a greater effect. The infection preventionist team is conducting proactive infection control assessments at facilities, while the epi team will pursue proactive PPS's, admission screening, and training. The Fellow may assist with or play a significant role in these efforts.

Through the efforts described above, the Fellow will have the opportunity to collaborate with senior IDPH staff along with a wide array of external partners. They will be able to lead aspects of and contribute significantly to a public health priority, and will gain experience in a diversity of areas ranging from hands-on fieldwork to data to communications and policy-making.

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Major Project Objectives:

The Fellow will help implement (1) CDC's MDRO containment strategy in response to targeted cases or clusters and (2) CDC's MDRO prevention guidance. Deliverables will include PPS's conducted, infection control assessments and related reports, and training sessions or educational materials developed.

Major Project Impact:

This project will result in timely and effective response to outbreaks, containment, and prevention of antibiotic resistance, with the ultimate desired impact of a decrease in colonized cases and infections.

Additional Project #1 Title: Integration of Substance Abuse with Mental Health

Project #1 Type: Surveillance Activity

Project #1 Description:

Using morbidity and mortality data sets (syndromic, hospital discharge, vital records) and on-going data linkage activities, the fellow will be able to perform descriptive analysis of the mental health issues in IL, validate definitions for multiple mental-health specific conditions, and perform novel analysis at the individual-level on association of these health conditions and effective prevention strategies. IDPH is developing and utilizing a technology platform, the IDPH Opioid Hub, to serve as a central repository for aggregating multiple de-identified datasets over time and provide the framework for producing integrated data reports.

Project #1 Objectives and Expected Deliverables:

- Describe trends in mental health conditions in a report for the agency.
- Develop visuals of the data for presentation in Tableau dashboard.
- Work with the Office of Health Promotion and the multidisciplinary group of key data stewards on the Illinois Suicide Prevention Alliance to identify a community-oriented set of surveillance metrics that will be publicly reported on the Illinois Public Health Community Map at <http://www.healthcarereportcard.illinois.gov/map>, or a platform similar to the IDPH Opioid Data Dashboard, <https://idph.illinois.gov/OpioidDataDashboard/>.
- Engage Local health departments to view local data and identify local public health concerns.
- Perform individual-level analysis of linked data sets to identify risk factors for mental health conditions and substance abuse.

Project #1 Impact:

- Inform internal and external stakeholders on the current trends in mental health issues in IL
- Engage partners to implement prevention efforts, resources and interventions
- Characterize the problem in the context of substance abuse co-morbidities

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

The Fellow will become familiar with the real-time surveillance of hospital visits in syndromic surveillance. This tool can be used with many other disease and injury presentations, as well as provide context to overall healthcare utilization trend. Hospital ED visit surges can be caused by mass gatherings, sudden unexpected emergencies, or media reports on emerging health events that triggers worried-well visits. Any of these events can lead to longer wait times, bypass of ambulance services, or increasing risks for severe outcomes. The fellow can support IDPH's Office of Preparedness and Response during these events by monitoring hospital data for surges.

Specific tasks would include:

- Attending preparedness meetings for major events

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- Train Emergency Preparedness staff on how to view and interpret hospital visit data
- Create and share dashboards for Emergency Preparedness teams with event-specific temporal and spatial analysis
- Responding to emerging public health issues, such as gun violence
- Coordinating data analysis with the Emergency Medical Services data housed under Emergency preparedness for interpretation of overdose clusters

Estimated time is 5-10% FTE, but would depend on project selected and what might events arise.

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

As described under the Surveillance Activity and Major Project sections, the Fellow will have a substantial role in cluster and outbreak investigations (estimated 30% FTE). The Fellow will be responsible for assisting local health departments with gathering epidemiological information on cases/clusters, analyzing data, summarizing findings, and identifying next steps for containment. They will coordinate colonization testing with the facilities and regional lab and participate in infection control assessments with IDPH’s infection preventionists. They will then use findings to create communications, trainings, and reports as needed.

The Fellow could additionally lead investigation and response to other HAIs, such as Group A Streptococcus, Legionella, and Elizabethkingia outbreaks or infection control breaches in healthcare facilities. The Fellow would have an opportunity to work with another team (Communicable Disease Control Section) that typically leads these efforts while diversifying their knowledge and skills to other diseases.

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

We do not anticipate a COVID-19 role at this time. Our Division's epidemiologists have been integral players on the Data Team and Long-Term Care Team during the response, but have largely returned to regular duties. We have many HAI/AR initiatives that were delayed due to the pandemic and need to refocus our attention on them and the additional activities proposed under SHARP and Nursing Home and Long-Term Care Strike Team funding from CDC. However, if the fellow has an interest in working on the response, we can seek activities to fulfill that goal.

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

IDPH places health equity as a top priority. IDPH has been partnering with local health departments, facilities, and organizations representing or serving disproportionately affected populations or underserved areas. All of our CDC-funded HAI/AR activities and IDPH's sub-grantees are now required to incorporate health equity; one example is with our MDRO prevention activities, in which we are prioritizing areas with fewer resources. The Fellow can assist the team by analyzing available data to ensure that we appropriately identify and assist those communities.