Assignment Description

The Virginia Department of Health, Office of Epidemiology is responsible for a broad range of disease surveillance and control activities in Virginia. The Fellow would work mainly within the Office’s Division of Clinical Epidemiology (DCE) and Division of Surveillance and Investigation (DSI). Responsibilities of both divisions include investigating or providing consultation on communicable disease outbreaks, developing and implementing disease database and surveillance systems, developing guidelines for communicable disease management, and supporting statewide epidemiologic infrastructure and capacity by maintaining grants, regulations, and policies and by providing training. The Fellow will become a member of the DCE and DSI team of epidemiologists. DCE and DSI are focused on applied public health epidemiology, and some of the assignment will involve doing or supporting field epidemiology work through interacting with district health department epidemiologists. Some of the projects will be focused on surveillance, others will involve conducting investigations, and some projects will illustrate the complementary nature of surveillance and investigation activities. Nearly half of the outbreaks reported in the state occur in healthcare facilities including hospitals, long-term care facilities, and increasingly in outpatient settings, so there will be ample opportunity to support these investigations. Opportunities also exist to work on foodborne or vaccine preventable illnesses, and to participate in emergency preparedness exercises and activities.

Day-to-Day Activities

The Fellow’s day-to-day activities will involve active participation as a team member within the Healthcare-Associated Infections and Antimicrobial Resistance (HAI/AR) Program in the Division of Clinical Epidemiology (DCE). With support from VDH DCE and Division of Surveillance and Investigation (DSI) staff, the Fellow will work on projects related to detecting, monitoring, and responding to communicable diseases of public health importance in Virginia. This may include collecting and analyzing epidemiologic data and reporting findings, working to improve surveillance systems or the use of existing systems, creating information for the public and healthcare providers and guidance for health departments, and giving presentations on public health topics. Outbreak investigations involve collecting information and designing and implementing an analytic approach to identify the source of the outbreak and developing recommendations to prevent further spread of disease. The Fellow will participate in weekly staff meetings, where current outbreaks, investigations, and special projects are discussed, as well as monthly statewide epidemiology conference calls and semi-annual communicable disease training events. The Fellow will also have the chance to collaborate with epidemiology staff in other Divisions, such as the Division of Immunization (DOI). Potential DOI projects include assisting local health department staff with case, cluster, and outbreak investigations and enhanced statewide surveillance efforts for select vaccine-preventable diseases.
Potential Projects

**Surveillance Activity**  Validation of HAI Data Reported by Hospitals into the National Healthcare Safety Network

In 2015, the Virginia Department of Health (VDH) healthcare-associated infections (HAI) reporting regulations were updated to align with those of the Centers for Medicare and Medicaid Services (CMS) Hospital Inpatient Quality Reporting Program. Hospitals are required to share data on HAIs from particular units or procedures, as well as healthcare personnel influenza vaccination rates, with VDH through the National Healthcare Safety Network (NHSN). The HAI/AR Program sends quarterly data cleaning reports to each hospital to quality assure NHSN data ahead of CMS submission deadlines. The Fellow would use the CDC 2019 External Validation Guidance and Toolkit to assess the validity of laboratory-identified data (methicillin-resistant Staphylococcus aureus bacteremia and Clostridioides difficile) being submitted by Virginia hospitals to NHSN. This would improve the surveillance process, resulting in higher quality data for epidemiologic analysis and prevention activities. This would allow the Fellow to visit hospitals and interact with infection preventionists in-person. The project would also give the Fellow the opportunity to contribute to grant metrics for federal grant progress reports.

**Surveillance Evaluation**  Evaluation of the Virginia Surveillance System for Carbapenemase-Producing Organisms

One surveillance system evaluation option would be to evaluate the current surveillance and investigation processes for carbapenemase-producing organisms (CPOs), including surveillance for carbapenemase-producing carbapenem-resistant Enterobacteriaceae and Pseudomonas aeruginosa. CPOs are a significant concern within the healthcare system due to their resistance to many available antibiotics and their potential to disseminate resistance widely. Infections or colonization due to CPOs are required to be reported to local health departments in Virginia as of November 14, 2018. Testing for CPOs began at the state public health laboratory in March 2018 (with voluntary reporting for 8 months prior to being required). Many stakeholders are involved with CPO reporting, testing, and response, including: VDH district epidemiologists, VDH regional epidemiologists, the HAI/AR Program, healthcare facilities, patients, and state, regional and CDC public health laboratories. The Fellow would use the CDC Guidelines for Evaluating Public Health Surveillance Systems to determine the timeliness, usefulness, representativeness, flexibility and stability of the system, as well as assess data quality across several surveillance systems used for CPO response across Virginia. Information learned from the evaluation will be used to improve processes within the system, both at the state and local levels.

**Major Project**  Surveillance, Investigation, and Infection Prevention to Prevent Antimicrobial Resistance in a Healthcare Setting

The HAI/AR Program works routinely with a wide range of healthcare facilities to prevent the spread of antimicrobial resistance, and each setting has unique challenges and educational needs. The Fellow will be asked to focus on a healthcare setting of their choice; options include dialysis centers, long-term acute care hospitals, nursing homes, and inpatient rehabilitation facilities. The Fellow will partner with different members of the HAI/AR team to conduct surveillance, onsite infection prevention assessments, case or outbreak investigations, statewide education, and ultimately prevent infections.
Surveillance: Non-hospital settings started reporting healthcare-associated infection data to VDH in 2019 via the National Healthcare Safety Network. The Fellow will analyze data and develop reports that can be sent back to facilities to inform public health action.

Onsite assessment: The Fellow will accompany HAI/AR infection prevention experts to conduct onsite infection prevention and control assessments. Visits are being conducted proactively in facilities statewide to identify infection control gaps and provide both immediate and comprehensive feedback.

Case investigation: The Fellow will conduct case investigations of carbapenemase-producing or other emerging multidrug-resistant organisms (MDROs) by following the steps of the CDC Guidance for a Public Health Response to Contain Novel or Targeted MDROs.

Statewide education: The Fellow will have the opportunity to develop educational materials for their setting of choice based on needs identified through their project. A conference or training will be identified for the Fellow to present their work to healthcare facilities, as well as to local health departments. This entire body of work will strengthen collaborative relationships with healthcare facilities across Virginia and provide the Fellow with in-depth epidemiologic and infection prevention experience.

Additional Project Analyzing National Healthcare Safety Network Antimicrobial Use Data

Core elements for antibiotic stewardship in hospitals were developed to improve antibiotic use, reduce adverse events, prevent emergence of resistance, and lead to better outcomes for patients. One of the core elements describes tracking and monitoring antibiotic use. The CDC National Healthcare Safety Network Antimicrobial Use (NHSN AU) Module provides a mechanism for facilities to report and analyze antimicrobial use using the preferred antimicrobial use metric of antimicrobial days per 1,000 days present. Fifty-five hospitals (acute care, long-term acute care, and critical access hospitals) in Virginia include NHSN AU reporting in their monthly reporting plans and are sharing data with VDH. The Fellow can analyze the available data and develop statewide antibiotic use reports and facility-specific reports. The analyses will aide statewide stewardship interventions and provide additional data for each facility to target stewardship efforts.

Additional Project Estimating the Average Cost and Public Health Time Commitment for Managing Tuberculosis Cases

Tuberculosis (TB) remains a public health challenge in the United States. The costs of treating and managing TB disease have been estimated nationally; however, these estimates have not been performed for Virginia specifically. The Fellow can perform a literature review of the available data on costs associated with the treatment and management of TB cases. They can then develop a survey or tool to collect data from local TB programs as well as use available operational data from the Virginia Department of Health to estimate costs and public health time commitment for several different types of TB cases (e.g., pan-susceptible pulmonary cases, pulmonary TB cases vs. extra pulmonary, presumptive cases that are worked up and then ruled out, etc.). The Fellow can estimate cost to both the state (public health work hours, TB drugs, coverage of copays, hotel bills, food, etc.) as well as the individual (lost wages, lost job, quality of life, etc.). Results from this project will be used to guide leadership in resource justifications.
Preparedness Role

The Office of Epidemiology plays a prominent role in emergency preparedness and response activities. Staff work closely with the VDH Office of Emergency Preparedness and the Virginia Hospital & Healthcare Association to conduct a wide range of activities, which the Fellow will have an opportunity to participate in, including serving as part of the 24-hour on-call rotation for the Office of Epidemiology, emergency preparedness exercises and drills, and responding to public health emergencies. The Fellow will complete National Incident Management/Incident Command System trainings, including the opportunity to complete the NIMS/ICS 300 training in-person. Recent past Fellows have helped conduct enhanced surveillance related to a Vice Presidential debate hosted on a Virginia college campus and following a major hurricane that affected Virginia. There will likely be more surveillance opportunities surrounding mass gatherings or natural disasters in the future. The Fellow may also choose to join a local chapter of the Medical Reserve Corps, which will provide for additional exposure to emergency preparedness trainings and exercises.

Additional Activities

Other activities that the Fellow may participate in include: shadowing a hospital-based Infection Preventionist; analyzing HAI outbreak data reported to VDH by healthcare facilities; studying for the Certification in Infection Control exam (if interested); writing articles about HAI publications and activities for the HAI/AR Program newsletter sent to hospital infection preventionists and other stakeholder groups; and updating content for the HAI/AR website and VDH social media accounts. Opportunities also exist for the Fellow to work on projects with other divisions within the Office of Epidemiology, as well as with epidemiologists in the field. Such opportunities will provide the Fellow with extensive practical experience and skills, a good understanding of the roles and responsibilities of state and local health departments, and access to significant projects related to the interests and career goals of the Fellow. Overall, it is expected that the Fellow will acquire a range of practical public health skills and experiences useful in a wide variety of career paths. These activities may also lead to presentations, conference abstracts, and/or peer-reviewed publications. We expect that the Fellow will have the time and autonomy to develop projects of interest, while participation in the Office of Epidemiology’s many activities will provide opportunities to acquire a broad range of skills and experiences.

Mentors

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