Infectious Diseases-HAI
Virginia Department of Health, Office of Epidemiology/Division of Surveillance and Investigation
Richmond, Virginia

Assignment Description
The Virginia Department of Health's 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 Surveillance and Investigation (DSI). Responsibilities of the division 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 DSI team of epidemiologists. DSI is very 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 assisted living facilities, so there will be ample opportunity to support these investigations of respiratory or gastrointestinal illness, invasive infections, or bloodborne pathogens. Opportunities also exist to work on zoonotic 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 (HAI) Program and the Division of Surveillance and Investigation (DSI). With support from VDH 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 division 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.
**Potential Projects**

**Surveillance Activity**

**CRE Surveillance and Analysis**

Carbapenem-resistant enterobacteriaceae (CRE) infections are a growing concern among healthcare facilities due to their resistance to many available antibiotics and their potential to disseminate resistance widely. CRE resistance patterns vary regionally, making surveillance efforts necessary to describe local, regional, and state CRE trends. CRE is not a reportable condition in Virginia, thus the true incidence of CRE in the state is unknown. To gauge a better understanding of CRE prevalence in the state, the Fellow would participate in efforts to improve the current CRE surveillance framework. This would include implementing a new CRE case report form, and developing a surveillance database that will be used to track CRE infections in the state. The Fellow could also work with staff revising the CRE guidelines in the state Disease Control Manual to educate local health departments about the most current practices, and ensure that they have adequate tools to work with healthcare facilities during CRE case and outbreak investigations.

**Surveillance Evaluation**

**Tuberculosis Surveillance Evaluation**

One surveillance system evaluation option would be to evaluate the current processes in place for new tuberculosis (TB) cases according to CDC criteria of timeliness, usefulness, representativeness, data quality, etc. The Virginia TB program has become more decentralized in the past year, and there are a significant number of new TB case managers and nurses in the field. There is a need to evaluate the processes used for data collection and analysis, laboratory specimen collection, patient case management protocols, and communication with outside providers. Information learned from the evaluation will be used to improve processes within the system, both at the state and local levels.

**Major Project**

**Antibiotic Resistance Statewide Analysis**

It is estimated that 50% of antibiotic use in hospitals is unnecessary and/or inappropriate. The growing concern of antibiotic-resistant bacteria makes antibiotic stewardship an urgent healthcare priority for VDH, the CDC and the White House. Working with the antibiotic resistance staff on the HAI team, the Fellow would use the National Healthcare Safety Network (NHSN) to generate reports of HAIs caused by antibiotic-resistant pathogens and unusual susceptibility profiles for the purposes of sharing with local and regional health department staff and other stakeholders for situational awareness and follow-up with specific facilities, as appropriate. The Fellow would also be involved in using the Targeted Assessment for Prevention (TAP) strategy to inform facilities and direct them to specific prevention activities. The Fellow could concentrate on running quarterly TAP reports for Clostridium difficile infections (CDI), in order to identify hospitals with a disproportionate burden of CDI so that prevention resources could be targeted to those facilities.
**Additional Project**

**Outbreak investigations**

DSI participates in a wide variety of statewide and national outbreak investigations each year. Through participation in the outbreaks, the Fellow would gain experience in all aspects of outbreak investigations, including formulating hypotheses, designing and administering questionnaires, entering and analyzing data, and generating reports. The placement of the primary mentor, Dr. Lisa McCoy, in the Division of Tuberculosis results in additional outbreak investigation opportunities for the Fellow. For example, our current HAI CSTE Fellow is working with a local health district on data analysis efforts for a large tuberculosis contact investigation.

**Surveillance Activity**

**Virginia Healthcare-Associated Infections Annual Report**

In 2016, the Virginia HAI program created its first statewide HAI Annual Report with 2015 data from 81 acute and critical access hospitals across Virginia. The report was a large undertaking, and is being widely promoted as a way to galvanize new statewide efforts around antimicrobial stewardship and other HAI prevention efforts. In 2017, the HAI program plans to produce a 2016 HAI Annual Report, which will include more data and explanations due to the national models and baselines being updated at the end of calendar year 2016. The Fellow can become involved in authoring the report, starting with conducting quarterly quality assurance of the National Healthcare Safety Network (NHSN) data, writing SAS code to compile and format the data, drafting the annual report in accordance with the CDC/CSTE HAI Data Analysis and Presentation Standardization Toolkit, and producing educational materials to be used in the promotion of the report.

**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 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 current Fellow helped conduct enhanced surveillance surrounding the recent Vice Presidential debate hosted on a Virginia college campus, and there will likely be more surveillance opportunities surrounding mass gatherings 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; developing reference documents for local health department staff, long-term care facilities and hospitals addressing HAI issues such as Clostridium difficile, vancomycin-intermediate/resistant Staphylococcus aureus, and carbapenem-resistant Enterobacteriaceae; analyzing of HAI outbreak data reported to VDH by facilities; writing articles about HAI publications and activities for the VDH HAI Program newsletter for hospital infection preventionists and other stakeholder groups; updating content for the VDH HAI website; and writing HAI sections for the Office of Epidemiology annual surveillance report.

Opportunities will 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**

**Primary**  
Lisa McCoy, MD, MPH  
Director, Division of Tuberculosis; Deputy State Epidemiologist and Deputy Director, Office of Epi

**Secondary**  
Sarah Lineberger, MPH  
Healthcare-Associated Infections (HAI) Epidemiologist