Infectious Diseases - HAI, Infectious Diseases
North Carolina Department of Health and Human Services, Division of Public Health, Epidemiology Section, Communicable Disease Branch
Raleigh, North Carolina

Assignment Description
NC DPH’s Epidemiology Section includes three branches: Communicable Disease, Occupational and Environmental Epidemiology, and Public Health Preparedness and Response. (Please see the attached organizational chart for the location of the Communicable Disease Branch within the Section.) Because communicable diseases can have so much impact on the population, the surveillance and control of such diseases is an important part of protecting the public’s health. The Communicable Disease Branch primarily deals with infectious diseases that are reportable by law to the state health department, and other communicable diseases of public health significance, such as influenza, norovirus infection and certain healthcare-associated infections. The North Carolina Communicable Disease Branch works closely with local health departments and strives to protect and improve the health of people in North Carolina through disease detection, tracking, investigation, control, education, prevention and care activities to reduce morbidity and mortality resulting from communicable diseases that are a significant threat to the public. The Communicable Disease Branch houses approximately 190 staff members, with a subset (30) sitting in the Medical Consultation Unit which is where the CDC/CSTE Applied Epidemiology Fellow will be located.

The Epidemiology Section of the NC Division of Public Health (DPH) is committed to providing an exceptional, well-rounded experience for a CSTE/CDC Applied Epidemiology Fellow. The Epidemiology Section Communicable Disease Branch has a strong history of hosting CDC Epidemic Intelligence Service Officers, UNC-Chapel Hill public health students, and student interns. This assignment will allow a Fellow to develop applied epidemiology competencies under the guidance of experienced mentors by engaging in both narrowly-focused and cross-cutting projects in Healthcare-Associated Infections, with opportunities to easily gain experience in communicable disease and public health preparedness, as well as environmental and injury epidemiology as desired.

Mentors will work with the Fellow to choose projects that fit with the Fellow’s interests, fulfill the competency areas, and provide solid broad-based experience in applied epidemiology. These projects will involve the Fellow with staff across the Section, DPH, and from other states and CDC. Projects provide opportunities to present at national/state conferences and submit manuscripts to peer-reviewed journals. The Fellow will present work to state advisory boards and will be mentored in handling data/technical assistance requests (e.g., from public, legislators, and media). Placement within this specific venue (HAI) will allow the Fellow opportunities to review and propose public health policy, and observe how epidemiologic and other surveillance data can help drive these policies.

All mentors have 10+ years of experience in applied epidemiology and are committed to ensuring an exceptional experience for an Applied Epidemiology Fellow.
Day-to-Day Activities

Day-to-day activities will primarily depend on the nature of the project and experience of the Fellow. As this Fellow will be housed in the Healthcare-associated Infections Prevention Program, the majority of the initial time will be spent acclimating to healthcare associated infections data and reports. Initially, daily activities will be strongly linked to one or more of the mentors. As the Fellow develops capacity, more independent oriented activities will predominate. As new projects are initiated, the mentors will work with the Fellow to get oriented and will check in to ensure progress toward reaching competencies is made. In addition to healthcare-associated infections projects, as part of the Communicable Disease Branch, the Fellow will participate in outbreak investigations and other projects as they arise. Fellows will also participate in serving as the epidemiologist on call, responding to inquiries from local health departments and the general public. Communicating with past and current EIS Fellows might illuminate anticipated daily activities within the Communicable Disease Branch over the course of two years.

Potential Projects

Surveillance Activity
NC hospital data from National Healthcare Safety Network (NHSN)
This surveillance project would be used to: evaluate NC hospital data from NHSN to identify trends and use data to guide action; use data to drive or support public health policy; review and perform analysis of HAI co-morbidities; use GIS applications and other data to map demographic data to assess disparities in HAI rate and outcomes. Data are available from 2012-present, and include data from acute care hospitals, long-term acute care hospitals, inpatient rehabilitation facilities and specialty hospitals.

Evaluation
Evaluation of surveillance for Salmonella and impact of culture independent diagnostic testing
Given that Salmonella is so common (>2,000 reported cases in NC/year), and the use of CIDTs is becoming more prevalent, it is proposed to perform a standard evaluation and look at the impact CIDT use may be having. This has been discussed, most recently in March (http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6409a4.htm). This evaluation may be used to guide recommendations and public policy.

Major Project
Hepatitis C virus in NC
The burden of chronic hepatitis C is unknown in North Carolina, and it will become a reportable disease in 2016. While not currently reportable, the Fellow would have access to laboratory results submitted to the state by a large commercial laboratory on a voluntary basis, with an estimated database size of approximately 100,000 results. We propose to: describe the epidemiologic burden of chronic hepatitis C in North Carolina; assist in the design and implementation of enhanced and targeted hepatitis C (HCV) testing campaigns; and measure the impact of “linkage to care” services for persons identified with chronic HCV. In addition, we would also like to calculate the impact of injection drug use programs (e.g., needle exchange, methadone) on acute hepatitis C incidence rates.
Surveillance Evaluation

Evaluation of surveillance for spotted fever group rickettsia (e.g., RMSF)

NC historically has reported more cases of these rickettsiae than almost any other state. A review of national data from 2001-2005 revealed what was called unusually low rates of severity for cases reported in NC. This may be attributable to many factors: RMSF is so common in this area relative to the rest of the country, local clinicians and healthcare providers are more aware of it as a potential source of illness in patients, and therefore may be better at detecting, diagnosing, and appropriately treating RMSF. It may also be possible that other less pathogenic or clinically milder strains of rickettsiae may be circulating in this region. (Am. J. Trop. Med. Hyg., 80(1), 2009, pp. 72â€“77) As this is our most common vector borne disease, we propose to conduct a review of the surveillance system and available data.

Major Project Antimicrobial Resistance

Antimicrobial resistance is a substantial threat to public health, and a growing problem in healthcare, particularly in long-term care facilities. We propose the assessment of resistance and patterns of resistance in NC, working with partners to decrease resistance in targeted long-term care facilities, and researching avenues to access antibiotic use data.

Preparedness Role

The fellow will participate in outbreak investigations, which are common in North Carolina and a prominent responsibility of the staff within the Communicable Disease Branch. When outbreaks are of a nature that may represent a large scale threat to the population of North Carolina, Communicable Disease Branch staff, working jointly with and closely with staff from the Public Health Preparedness and Response Branch, may operate from the Public Health Coordination Center, as was done during our response to SARS, 2009 pandemic influenza, Ebola preparedness and other significant events. The Public Health Preparedness and Response Branch is within the Epidemiology Section and co-located with the Communicable Disease Branch. If the Public Health Coordination Center is opened, requests will be made throughout DPH for volunteers to assist in response efforts.

Section epidemiologists and fellows, including EIS and CSTE fellows, have worked in the Public Health Coordination Center during hurricanes, floods, H1N1, food-borne outbreaks and other public health response events. Roles, tasks and length of detail will be negotiated with the Fellow. An EIS Fellow served as the Epidemiology and Surveillance Lead for the 2012 Democratic National Convention held in Charlotte. Our current CSTE fellow served as an integral component of our NC Ebola response, assisting to create the database used to monitor returning travelers.

An outbreak response curriculum has been developed by the secondary mentor; the Fellow will receive this training and will be actively engaged in outbreak response and field investigations as appropriate. In addition, the Fellow will be trained in the FEMA Incident Command System.
**Additional Activities**

Fellows within the Communicable Disease Branch will participate in serving as the epidemiologist on call, responding to inquiries from and providing guidance to local health departments and the general public. Additional projects may include: ongoing HAI data validation, establishing a state Standardized Infection Ratio (SIR) based on NC HAI data, collaborating with partners on healthcare worker drug diversion activities, evaluating LabID events and impact of CIDTs on Clostridium difficile, and addressing Healthy NC 2020 objectives. Several other options are also possible and can be arranged as appropriate.

**Mentors**

**Primary**
Jean-Marie Maillard, MD, MSc  
Medical Director, Communicable Disease Branch

**Secondary**
Jennifer MacFarquhar, MPH, BSN  
Career Epidemiology Field Officer (CEFO)