

## **Infectious Diseases**

### **New York State Department of Health, Division of Epidemiology, Bureau of Communicable Disease Control**

Albany, New York

#### **Assignment Description**

The fellow's assignment will be in the BCDC, which is one of four bureaus comprising the Division of Epidemiology within the Center for Community Health, in the Office of Public Health. The fellow's assignment will include activities within BCDC's various programs and will be tailored to the fellow's interests and the needs of BCDC.

BCDC consists of approximately 45 Albany-based Central Office staff and 11 Regional Office staff. BCDC staff include board-certified infectious disease and preventive medicine physicians, board-certified veterinarians, PhD/DrPH- and MPH-trained epidemiologists, nurses, statisticians, wildlife biologists, and other professionals. BCDC has broad oversight responsibility for surveillance and control of the majority of reportable and emerging public health communicable diseases. BCDC provides oversight for 57 local health departments within NYS, excluding NYC, and produces aggregate data for public health use. BCDC conducts epidemiologic investigations, routine disease surveillance, and outbreak control. BCDC responds to new/emerging infectious diseases. BCDC provides technical assistance, consultation, training, and education to LHDs, hospitals, long term care facilities, physicians, other health care professionals, and the public. BCDC is organized into the Emerging Infections Program & Statewide Surveillance Program, Quality Improvement and Performance Management Program, Vector Borne Disease Program, Investigation and Response Program, and an Administrative Unit.

BCDC works collaboratively with sister infectious disease programs in the Division of Epidemiology, including the Statistical Unit, the Bureau of Tuberculosis Control, the Bureau of Healthcare Associated Infections, and the Bureau of Immunization. BCDC maintains strong relationships with other Centers in the Office of Public Health, including 1) the Center for Environmental Health, with collaborative approaches to enteric diseases and legionellosis, 2) the AIDS Institute, which is responsible for HIV/AIDS and sexually transmitted disease (STD) surveillance, HIV/STD/hepatitis C prevention, LGBTQ health, drug user health, and opioid overdose prevention, and 3) the Wadsworth Center, which is the NYSDOH public health laboratory and a national leader with complementary foci in research, public health testing (including whole genome sequencing), and science education.

BCDC hosts several multi-agency collaborative programs including 1) The Emerging Infections Program, in collaboration with the University of Rochester ([www.cdc.gov/ncezid/dpei/eip/index.html](http://www.cdc.gov/ncezid/dpei/eip/index.html)), 2) The New York Integrated Food Safety Center of Excellence, in collaboration with Cornell University, and 12 northeast state and city public health jurisdictions ([www.cdc.gov/foodsafety/centers/sites/newyork.html](http://www.cdc.gov/foodsafety/centers/sites/newyork.html)), and 3) The Northeast Regional

Center of Excellence in Vectorborne Diseases, in collaboration with Cornell University ([neregionalvectorcenter.com](http://neregionalvectorcenter.com)).

The Applied Epidemiology Fellow will be fully integrated into BCDC's daily activities. Occasional in-state travel is expected. The work environment includes a 7.5-hour work day (37.5 hours/week) and holiday leave. The fellow's workspace will be located within BCDC offices in the Corning Tower in downtown Albany's Empire State Plaza, the home of New York's state government, as well as theatres, the state museum, the state archives, and the state capitol building. Albany is part of New York's Capital District which includes the cities of Schenectady, Troy, and Saratoga Springs intertwined with multiple suburban and rural areas. The area has nationally recognized colleges and universities as well as graduate schools in medicine, law, and pharmacy. The city provides a walkable downtown, excellent transportation, and excellent four-season outdoor recreational opportunities in the nearby Adirondack, Berkshire, Catskill, and Green Mountains. The proximity to New York City, Boston, Vermont, and Montreal enhances the area's cultural and recreational opportunities.

### **Day-to-Day Activities**

In addition to project work, usual activities will include participation in routine meetings, including a weekly statewide meeting highlighting active investigations, a weekly Investigation Program meeting, and department-wide meetings (SPEED Rounds) on timely public health issues. The fellow will join the "Epidemiologist of the Day" (EOD) rotation, during which the fellow will field inquiries from regional offices, local health departments, or the public on subjects requiring technical assistance, and take the lead on any issues that arise on that day.

Day-to-day activities may include (depending on the fellow's interest and projects chosen):

- Participating in the EOD rotation.
- Working with local health departments, hospitals, the Communicable Disease Electronic Surveillance System (CDESS), Electronic Clinical Laboratory Reporting System (ECLRS) and hospital discharge data.
- Surveillance data assessment.
- Statistical data analysis.
- Disease outbreak investigation.
- Writing scientific papers, fact sheets, brochures, and website content.
- Preparing scientific and public presentations and posters, including for conferences.
- Working with the public and external stakeholders on antimicrobial resistance prevention and control in NYS.
- Attending training classes on public health emergency preparedness.

- Attending training classes on project management and statistical software packages.
- Attending scientific conferences within NYS, the region, and nationally, which could include the annual Northeast Epidemiology Conference, the CSTE Annual Conference, International Conference on Emerging Infectious Diseases, and Infectious Disease Week (ID Week).
- Working with Fellowship Primary Mentor and Secondary Mentor on most work days, with scheduled meetings to review progress at least biweekly.

## **Potential Projects**

### **Surveillance      Viral hepatitis surveillance activity Activity**

The fellow will use viral hepatitis (hepatitis B and C) laboratory and case report registry data to complete the surveillance activity, which can be tailored to the fellow's interests and Bureau needs. The viral hepatitis surveillance program works closely with program staff in the AIDS Institute, New York City Department of Health and Mental Hygiene, and other groups with broad interests in hepatitis prevention, treatment, coinfections, and opioid or substance use disorders. Although viral hepatitis markers, including negative hepatitis C RNA tests, are laboratory-reported, potential exists for laboratory results or case investigations to be inadvertently or inappropriately dismissed and cases to be missed. Potential projects include development of 1) viral hepatitis surveillance summaries including assessment of trends, risk factors, and outcomes to inform prevention and treatment efforts, 2) case ascertainment evaluation reports, or 3) quality assurance reports to provide feedback to LHDs. Ample opportunity exists to become involved in other projects using viral hepatitis data, such as establishment of prevalence estimates, setting metrics for monitoring NYSDOH's efforts to eliminate hepatitis C, and linkage to HIV or tuberculosis case registries to assess coinfection rates.

### **Surveillance      Evaluate current human surveillance activities for tick-borne diseases including Evaluation      anaplasmosis, ehrlichiosis, and Rocky Mountain Spotted Fever**

Current tick-borne disease surveillance activities focus on investigating all positive laboratory reports that meet the relevant CSTE/CDC case definition, including laboratory results that fall within the "equivocal" range. Initial review of tick-borne disease surveillance data suggests that many of these investigations do not ultimately end up meeting case definition and require the expenditure of significant resources on both the Local and State levels. The fellow would be asked to evaluate the current surveillance system for these diseases and assist in determining if modifications to the surveillance system could be made that would relieve investigative burden while maintaining the ability to appropriately classify cases and monitor disease trends.

### **Major Project      Identification of enteric disease clusters using whole genome sequence (WGS) data**

As part of enteric disease surveillance, the Wadsworth Center uses three in-house bioinformatics pipelines for analysis and cluster detection. The pipelines use whole genome sequence (WGS) data to construct single nucleotide polymorphisms (SNP) based phylogenetic trees to identify genomic clusters of interest for Salmonella Enteritidis (SE), Salmonella Typhimurium (ST) and shiga toxin-producing E. coli (STEC). To determine if NYS cases are genetically related to case isolates from other states, Wadsworth uses the National Center for Biotechnology Information (NCBI) Pathogen Detection portal. NCBI creates SNP-based phylogenetic trees for enteric organisms for which WGS data has been submitted. Currently, the NCBI portal holds more than 118,000 genomes for STEC and Salmonella from all states and many other countries; NCBI updates the phylogenetic trees daily. Using criteria developed by NYSDOH, Wadsworth Center staff review this information and report NYS cases

meeting cluster criteria to BCDC to aid in conducting further investigation and developing hypotheses. The fellow will learn how to review NCBI to identify national cases that cluster with NYS cases and to identify environmental isolates which could be used to develop hypotheses for investigation. The fellow will participate in the review of current criteria for reporting and investigation of WGS clusters.

**Additional Project      Evaluation of electronic receipt of antimicrobial sensitivity results**

The NYSDOH is in the process of implementing procedures to receive and process antimicrobial sensitivity results for reportable conditions through its Electronic Clinical Laboratory Reporting System (ECLRS) and Communicable Disease Electronic Surveillance System (CDESS). The fellow would have the opportunity to be part of the team implementing this unique system addressing antimicrobial susceptibility surveillance. The fellow would assist in an evaluation of the modifications to the surveillance processes and analysis of the new data collected.

**Additional Project      Develop surveillance reports or performance metrics for waterborne pathogens**

Illnesses associated with waterborne pathogens (*Cryptosporidium*, *Cyclospora*, and *Giardia*), increase during the summer months. Although evaluation of case report data quality and disease trends occur regularly for foodborne pathogens, similar evaluations need to be developed for waterborne pathogens. The fellow may help develop surveillance reports and performance metrics for cases of waterborne pathogens. Activities could include conducting interviews, data collection, data entry, and data analysis. The CSTE fellow will develop SAS programs and templates for surveillance reports and performance metrics on cases of the waterborne pathogens. Additionally, the CSTE fellow may map cases using GIS software and collaborate with the Center for Environmental Health to identify populations where prevention messages can be targeted.

**Preparedness Role**

Several BCDC staff, including Dr. Maxted and nurses, MDs, and epidemiologists, work closely with the NYSDOH Office of Health Emergency Preparedness on infectious disease preparedness and response. These staff and others have connections with the SPH Center for Public Health Preparedness and the new, first in the nation, University at Albany College of Emergency Preparedness, Homeland Security, and Cybersecurity. Through these affiliations, the fellow will have the opportunity for training and assisting with preparedness projects. The Fellow will have the opportunity to complete FEMA study courses on the Incident Command System and participate in drills and exercises that occur periodically throughout the state. Additionally, the Fellow can participate in outbreak response activities with the Division of Epidemiology and the Office of Health Emergency Preparedness, or evaluate prior response activities. Recent activities have included joint tabletop exercises with

multiple agencies for statewide avian influenza preparedness planning and response activities (e.g., standing up call centers, issuing testing and clinical guidance) for Zika virus and hepatitis A outbreaks.

### **Additional Activities**

The fellow will have opportunities to work on communicable disease outbreaks and emerging diseases in conjunction with BCDC staff, other NYSDOH staff, and partners, such as Cornell University and other state agencies. Other potential projects include:

- Analyze and publish epidemiologic, clinical and outcome information for one or more zoonoses (e.g., brucellosis, psittacosis).
- Review, update, or develop zoonoses educational materials.
- Review, modify, or create disease-specific pages in the communicable disease surveillance system for low-incidence zoonotic diseases.
- Implement Epi Info Web Survey.
- Implement and evaluate a new foodborne complaint system that is under development.
- Analyze disease clusters detected by pulsed-field gel electrophoresis (PFGE) and whole genome sequencing (WGS).
- Link human and vector surveillance data

The fellow's projects will include opportunities to fulfill all of the CSTE fellow assignment deliverables.

### **Mentors**

<b>Primary</b>	Angie Maxted BS, MS, DVM, PhD  Deputy Director, Emerging Infections/Statewide Surveillance Program; Deputy State Public Health Vet
<b>Secondary</b>	Amy Robbins BA, MPH  Senior Epidemiologist; OutbreakNet Enhanced Coordinator