COVID-19

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

Albany, NY

**Assignment Description**

The Applied Epidemiology Fellow will be assigned to COVID-19 epidemiologic activities within the Bureau of Communicable Disease Control (BCDC), where Dr. Angie Maxted, Deputy Director of the Emerging Infections and Statewide Surveillance Program and Deputy State Public Health Veterinarian, will be the primary mentor and Amy Robbins, Epidemiologist and OutbreakNet Enhanced Coordinator, will be the secondary mentor. BCDC conducts epidemiologic investigations, routine disease surveillance, and outbreak investigation and control; responds to new or emerging infectious diseases; and provides technical assistance, consultation, training, and education to local health departments (LHDs), hospitals, long-term care facilities, physicians, other health care professionals, and the public. BCDC shares epidemiologic responsibility for infectious diseases with its sister Bureaus of Immunization, Healthcare-Associated Infections, Tuberculosis Control, and Surveillance and Data Systems within the Division of Epidemiology. Staff include board-certified infectious disease and preventive medicine physicians, board-certified veterinarians, and PhD/DrPH- and MPH-trained epidemiologists, nurses, statisticians, and other professionals.

The Fellow’s projects and day-to-day activities will focus on COVID-19 surveillance data analysis, program evaluation, applied research, outbreak investigation, contact tracing, and other special projects as determined by the Fellow’s interests and Departmental needs.

BCDC has broad oversight responsibility for surveillance and control of reportable and emerging communicable diseases including COVID-19. The Fellow will be fully integrated into BCDC’s fast-paced daily activities focused on COVID-19 response. Information-gathering during the pandemic has been intense and has included both traditional and nontraditional sources for investigating COVID-19 cases, laboratory results, hospitalizations, deaths, and associated information. Because of these rich data sources, and because New York has experienced more COVID-19 activity than any other US public health jurisdiction, the Fellow will have an unprecedented opportunity to address emerging epidemiologic and applied research questions. New York’s phased, regional plan for re-opening will be in process as the Fellow’s assignment begins, and the Fellow’s work will be used to provide input for real-time policy decisions. Additionally, ongoing outbreaks in community and healthcare settings, including nursing homes, will allow the Fellow to be involved with investigation, control, and contact tracing efforts.

Although the Fellow’s placement will be in BCDC with experienced CSTE AEF Mentors, the whole-of-Department response to COVID-19 blurs organizational lines and affords the Fellow special opportunity to work alongside experts throughout the Division of Epidemiology and the Department. The Department collaborates with the University at Albany School of Public Health on numerous COVID-19 projects which are resulting in publications. As time and interest allow, the Fellow may have the opportunity to work on applied epidemiology projects related to other communicable diseases, particularly in the areas of enteric diseases, vector-borne diseases, emerging infections, or zoonoses.
The Fellow’s workspace will be located in the Corning Tower, Empire State Plaza, downtown Albany with options to telework while directed by state policy. Albany is part of New York’s Capital District which includes the cities of Schenectady, Troy, and Saratoga Springs intertwined with 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 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**

For COVID-19 response, BCDC is re-structured into teams including four investigation teams that directly assist regional offices and local health departments with the COVID-19 response. Teams assist with case investigation, contact investigations, isolation and quarantine monitoring, notifications to other jurisdictions, assisting with case data collection from Health Information Exchanges, linking to other state agencies (i.e. Office of Persons with Developmental Disabilities, Office of Mental Health), data entry, data cleaning, and other issues/needs as identified. Other teams support disease surveillance, data analysis, and reporting; develop policy and guidance; or provide supervisory epidemiology capacity to the 24/7 statewide call center. The Fellow will be incorporated into one or more of these teams while also working on specific COVID-19 projects. Other activities will include participation in routine meetings, including bi-weekly Incident Management (IMS) meetings, daily huddles with Division of Epidemiology staff, weekly healthcare provider webinars, weekly meetings with local health departments and regional office staff, and department-wide meetings 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 COVID-19 Epidemiologist-of the Day rotation
- Participating in the EOD rotation
- Using the Communicable Disease Electronic Surveillance System (CDESS), CommCare, Electronic Clinical Laboratory Reporting System (ECLRS), hospital discharge data, Health Information Exchange data, and other data sources
- Advising local health departments and regional epidemiologists
- Participating in outbreak investigations
- Participating in efforts to expand COVID-19 molecular and serology testing
- Surveillance data assessment
- Statistical data analysis
- Disease outbreak investigation
- Medical chart review
- Writing scientific papers, fact sheets, brochures, and website content
- Drafting or revising guidance documents
- Preparing scientific and public presentations and posters, including for conferences
- Participating in public health emergency Incident Management
- Attending training classes and exercises for public health emergency preparedness
- Attending training classes on project management and statistical software packages
- Participating in the whole genome sequence enteric disease cluster analyst rotation
- Providing surge capacity for the student interview team
- Working with the public and external stakeholders on antimicrobial resistance prevention and control in NYS

Potential Projects

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<th>Surveillance Activity</th>
<th>Characterizing cases with multiple test results</th>
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Testing for COVID-19 was limited in all places at the beginning of the response, but in New York testing quickly expanded under the leadership of the Wadsworth Center – New York’s Public Health Laboratory – to provide the highest level of testing access in the nation. Both positive and negative laboratory results are reportable in New York, and some patients have been tested multiple times. Longitudinal test result data provide the opportunity to evaluate such questions as 1) What is the length of time a patient sheds viral RNA? 2) When in the infection do IgM and IgG antibodies become detectable? and 3) Are re-infections possible? The Fellow will review laboratory data alongside case investigation and medical chart information to summarize case testing data, with the above questions in mind, in at least two regions in the state during March – May 2020.

The fellow will characterize the following (but not limited to):
- Epidemiological data including gender, race/ethnicity, hospitalization, living setting, symptoms, occupation, contact with a confirmed case
- Time between onset of symptoms, specimen collection dates, report dates, RNA positivity, antibody positivity, and resolution of symptoms and viral detection
- Type of test, laboratory performing testing, type of specimen
- Underlying health conditions, including immune suppressing conditions, that might lead to prolonged shedding

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<th>Surveillance Activity</th>
<th>Ascertaining outcome for COVID-19 cases and evaluating causes of death</th>
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Because of New York’s high volume of COVID-19 cases, outcome information such as death was often not recorded for individual cases but rather extracted from aggregate, de-identified sources. Thus, individual case report information is often missing this information and does not reflect the severity of the pandemic. Additionally, respiratory failure might not be the direct cause of death in many cases and COVID-19 might be missing from death certificates; indeed, reports of cardiovascular deaths in younger adults and pediatric multisystemic inflammatory syndrome possibly related to COVID-19 are becoming increasingly common. Using patient identifiers from positive laboratory and case reports, the Fellow will match case data with death
To 1) ascertain mortality within 60 days of a COVID-19 diagnosis, and 2) characterize the causes of death for COVID-19 patients who died.

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<th><strong>Surveillance Evaluation</strong></th>
<th><strong>Comparison of hospitalization data from an existing Hospital survey system revised for COVID-19, regional Health Information Exchanges, and case investigation data</strong></th>
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| The Health Electronic Response Data System for Hospitals (HERDS) is used in New York State during the COVID-19 response to collect daily reports from all hospitals statewide on a number of characteristics, including daily counts of new admissions and current COVID-19 hospitalizations, patient discharges and deaths, bed and ICU capacity, and use of ventilators among many other variables. These surveys are completed manually by hospital staff. Additionally, in parallel, hospitals automatically submit electronic health record data to regional Health Information Exchanges (HIEs), which are connected by a statewide system (the Statewide Health Information Network for New York).

The Fellow will retrospectively evaluate the daily HERDS survey data alongside HIE data from 198 hospitals and data collected from the case-based surveillance system. The Fellow will use hospitalization data variables, including date of emergency department visit, date of admission, date of admission to the ICU, and others as needed, to compare daily hospitalization numbers with the HERDS survey data and assess timeliness of reporting. This will be a retrospective analysis for the first couple months of the response (March – May) to identify limitations or changes that need to be addressed prior to a possible second wave, or if appropriate, eliminate the need for facility staff to compile and submit detailed information daily that can be gleaned through already available data systems. |

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<th><strong>Major Project</strong></th>
<th><strong>Risk Factors Associated with Transmission of SARS-CoV-2 in New York State (NYS) Nursing Homes</strong></th>
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<td>Sixty-four percent of NYS Nursing Homes (NH) reported at least one confirmed case of COVID between March 1, 2020-May 12, 2020. NHs submitted daily reports of suspected and confirmed cases, deaths, availability of personal protective equipment (PPE) and other measures over this period of time. In addition, mandatory molecular testing of all healthcare personnel began in mid-May which will provide a cross sectional assessment of infection and may eventually allow the collection of serologic data to determine the prevalence of infection among staff.</td>
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The fellow will conduct an epidemiological assessment to determine what, if any, nursing home characteristics are associated with and can potentially predict likelihood, extent or severity of transmission within nursing homes. As new initiatives to prevent transmission are applied, more data is available to use for this analysis. The Fellow will work directly with the Bureau of Hospital Acquired Infections for this project.

Outcome measures may include, but are not limited to:

- Number and percent of residents with suspected and confirmed infection.
- Number and percent of staff with molecular and/or serologic tests reported to be positive.
- Death rates
- Comparison of death rates between 2020 and previous years.

Risk factors may include but are not limited to:
- Analysis of potential risk factors including date of first detected case, if first detected case was in a resident or staff, characteristics of the facility including size, type (skilled, mixed SNF/HRF), location in the state, part of a larger corporation vs. independent facilities.
- Staff characteristics, including but not limited to, staffing ratio (if available as currently proposed by CMS), percent of staff immunized for influenza, etc.
- Resident characteristics, including case age, race, ethnicity, and services provided (dialysis, ventilatory support, locked memory care, etc.).
- Effect of prevention measure implemented including no visitor policies, swabbing all staff and residents, biweekly testing of staff, and testing of residents prior to returning to the facilities.
- Changes in policies and practices over time, including access to testing.

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<th>Additional Projects</th>
<th>Streamline process to create and disseminate COVID-19 laboratory and syndromic surveillance data by county, NYSDOH region, and Economic Development region</th>
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<td>Graphical and table reports were created by BCDC staff to summarize longitudinal trends of testing, positive laboratory results, and emergency department syndromic surveillance data statewide and by NYSDOH regions, Economic Development regions defined for phased re-opening, and local health department (county). The Fellow will streamline the process of developing these reports and enhance the reports after discussing data needs with others within BCDC, the Division of Epidemiology, and regional office epidemiology staff. The Fellow will create a mechanism for routinely sharing these reports on an appropriate time frequency. Such data will be used for early detection of increased COVID-19 activity and may be used to inform the state’s phased re-opening.</td>
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**Preparedness Role**

The COVID-19 response in NYSDOH has used the ICS structure and included collaboration between all program areas of NYSDOH and Emergency Preparedness. The Fellow will be incorporated into the state’s response and participate in Incident Management System (IMS) calls as they occur.

The Fellow will work closely with BCDC and Division of Epidemiology staff that routinely worked with emergency preparedness prior to the COVID-19 response. Dr. Maxted, in her role of supervising influenza surveillance, works closely with the NYSDOH Office of Health Emergency Preparedness on infectious disease preparedness planning and response. The fellow will be trained on the Countermeasure Data Management System (CDMS) that is used in point-of-distribution (PODs) for vaccinations, including hepatitis A and other outbreak responses, both to enter attendees to PODs and to develop the health screening tools used during the PODs. Some counties are using POD-style clinics for testing, and in the two-year term the fellow may be involved in future vaccination efforts. 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. 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, hepatitis A outbreaks, and the 2018-2019 measles outbreak.

**Additional Activities**

The COVID-19 response needs change rapidly and multiple activities may be possible within the two-year fellowship. As time and interests allow, the fellow will have opportunities to work on other communicable disease outbreak investigation and surveillance in conjunction with BCDC staff, other NYSDOH staff, academic partners, and other state agencies.

Other potential projects include:

- The use of the surveillance system to capture test results on cases initially testing negative than positive
- Review death certificate data to identify potential probable cases of COVID-19 that were not tested
- Identify modifications to CDESS and/or CommCare to capture additional data elements
- Clean and analyze COVID-19 data
- Lead enhanced cyclosporiasis surveillance during May-August
- Analyze the effect of culture independent diagnostic tests (CIDTs) on shiga toxin-producing *Escherichia coli* (STEC)
- Develop waterborne disease surveillance reports and calculate performance measures
- Perform a match of death certificate data to cases of listeriosis
- Develop training materials for health care providers on best practices for hepatitis B testing
- Update surveillance guidance and algorithms for testing and case-classification
- Evaluate the impact of changes to the national surveillance case definition on disease incidence rates and ability to detect trends over time for select vector-borne disease
- Review and update algorithms used for SatScan cluster analysis for legionellosis and other conditions
- Assist subject matter experts to analyze and review electronic laboratory reporting data for a variety of communicable diseases; develop business rules for mapping lab data to the surveillance system (CDESS); and assess data quality following implementation

The fellow’s projects will include opportunities to fulfill all the CSTE Fellow assignment deliverables.

**Mentors**

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<th>Primary</th>
<th>Angie Maxted BS, MS, DVM, PhD</th>
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<td>Deputy Director, Emerging Infections &amp; Statewide Surveillance Program; Deputy State Public Health Vet</td>
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<tr>
<th>Secondary</th>
<th>Amy Robbins BA, MPH</th>
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