**Assignment Description**

The fellow will be assigned to the Bureau of Tuberculosis Control (BTBC) which is housed within the Division of Disease Control of the NYC DOHMH. New York City has one of the highest rates of TB (7.1 per 100,000 in 2015) in the US and the BTBC is the largest TB control program in the US with approximately 200 staff. BTBC is composed of the following offices: Bureau Director, Surveillance and Epidemiology, Clinic Operations, Field Operations, Outreach, Education and Training, Administration, Policy and Planning, and Medical Affairs.

The fellow will be assigned to the BTBC Surveillance and Epidemiology Office and will function as a full member of that office. The Office of Surveillance and Epidemiology is comprised of a surveillance team, data team, field epidemiology team, laboratory reporting team, and outbreak prevention and control team. Surveillance and Epidemiology Office staff perform a number of functions including TB registry maintenance and support, research, TB contact investigations at congregate settings, and TB outbreak and cluster investigations. The fellow will have the opportunity to work closely with each of the units and teams of the Office of Surveillance and Epidemiology. The BTBC is an interdisciplinary setting and the fellow will also work in close collaboration with staff in other offices and units, particularly the Planning and Policy, Education and Training and Outreach, and Medical Affairs units. Working at BTBC will provide the fellow a unique opportunity to participate in many local public health agency functions in a diverse setting where there are high rates of infectious and chronic diseases along with social disparities.

**Day-to-Day Activities**

The fellow will participate in routine surveillance and epidemiology activities such as analyzing epidemiologic and surveillance data, participating in research from the protocol development stage through manuscript preparation, conducting outbreak and cluster investigations, and presenting at internal and external seminars. These activities will provide opportunities for the fellow to gain hands-on program management experience (including creating and revising protocols), work with large datasets, and be involved in many aspects of the largest TB control program in the country.

The fellow will have the opportunity to attend a BTBC orientation, monthly TB-related journal club and methods seminars, the Columbia Mailman School of Public Health TB epidemiology course, epidemiology staff meetings, DOHMH epidemiology grand rounds, relevant team meetings, and Citywide TB rounds. SAS, GIS and other relevant computer software training will be available along with other trainings at the NYC DOHMH in many areas such as scientific writing, presentation skills, and epidemiology.
Potential Projects

Surveillance Activity

Comparative analysis of spoligotype results derived by Luminex vs. whole genome sequencing

BTBC began universal genotyping for all culture-positive TB cases in 2001. Genotyping enables Bureau staff to identify and refute transmission between patients, identify possible laboratory contamination, detect outbreaks, distinguish between relapse and re-infection, explore TB transmission dynamics in NYC, identify high priority groups for public health intervention, and answer important research questions. BTBC uses several different genotyping methods, one of which is spacer oligonucleotide typing (spoligotyping). We receive spoligotype results from the New York State Department of Health Wadsworth Center Laboratory (Wadsworth) and also from the Centers for Disease Control (CDC) via the Michigan Community Health Department Bureau of Laboratory. In March 2016, Wadsworth began using Whole Genome Sequencing (WGS) to generate spoligotype results. Previously, the results were generated through Luminex technology, which is the same technology that CDC uses to generate their spoligotype results. Anecdotally, we have noticed some discrepancies between the spoligotype results generated through WGS and those generated through Luminex. This project would seek to systematically quantify and describe the differences seen between the spoligotype results received from Wadsworth and those received from CDC. The Fellow would be tasked with data cleaning and analysis for this surveillance activity evaluation project.

Surveillance Evaluation

Evaluating the identification and reporting of migrant workers among NYC’s TB population

The Center for Disease Control and Prevention’s cooperative agreement mandates that TB programs collect and report key patient characteristics (demographic, clinical, social) to the CDC annually. One such variable is “migrant worker”, which is defined as follows: “Person who is required to be absent from a permanent place of residence for the purpose of seeking employment, or who may vary their employment for the purpose of remaining employed while maintaining a permanent place of residence”. Accurately identifying migrant work history can have important implications related to TB control efforts, including treatment adherence, contact identification/evaluation and interstate coordination. Through recent cluster and outbreak investigation activities, we’ve noticed that we may not be accurately capturing this information for subsets of patients with non-traditional worksites and transient work histories. This project will seek to evaluate the Bureau’s current methods for identifying migrant work history, its criteria for classifying patients using this variable, and the potential impact of revising the Bureau’s classification mechanisms to more closely reflect the CDC’s definition and more accurately quantify this important sub-population within NYC’s TB patient population.
Major Project  Understanding transmission dynamics between New York City, New Jersey, Connecticut, and surrounding New York counties

New York City has been using genotyping as part of routine TB control since 2001. In 2004, CDC started the National Genotyping Service, which offers TB control programs TB strain information that they can use to understand transmission dynamics. Many people live outside NYC, but work in NYC and vice versa. There have previously been genotype clusters of TB that have crossed jurisdictions; however, we have not systematically compared our data with that of neighboring jurisdictions to quantify the extent of this transmission. The fellow would collaborate with our TB control colleagues from Suffolk, Nassau, Rockland and Westchester counties in New York, New Jersey, and Connecticut to collect patient demographic and genotyping data to analyze any unidentified cross jurisdiction transmission that may be occurring to inform NYC transmission dynamics.

Additional Project  TB Needs Assessment in the Mexican Community in NYC

While TB rates have declined steadily in NYC since the early 1990s (from 51.1 per 100,000 persons in 1992 to 7.1 per 100,000 in 2015), the proportion of TB cases among foreign-born persons increased dramatically during the same time period, from 18% in 1992 to 82% in 2015. The NYC TB rate among the foreign-born is more than seven times higher than the native-born rate (14.4 versus 2.0 per 100,000 in 2012). Further analysis of DOHMH surveillance data shows that foreign-born groups in NYC have varied TB incidence, patient characteristics and TB risk. Mexicans are currently the fifth largest foreign-born population in NYC, have a higher TB rate in NYC than the rate reported in Mexico, and have a high proportion of molecular genotyping clustering, which may indicate recent transmission.

A TB-related health needs assessment was implemented in the Mexican community using several methods, including analysis of existing DOHMH TB patient data; and semi-structured interviews with Mexican TB patients, community representatives and non-DOHMH healthcare providers serving Latino patients. Interviews were translated and transcribed but have not been analyzed. Through this project, the fellow will take a leadership role on a multidisciplinary team of outreach and epidemiology staff to analyze this data using qualitative methods and make recommendations to inform BTBC's efforts to increase individual knowledge related to TB and TB risk, reduce barriers to TB-related and other health care services, increase TB screening among high-risk individuals, and ensure medical evaluation and treatment as applicable for infected individuals.

Additional Project  Project based on the fellow's interests

Once the fellow has completed the surveillance evaluations and major project, we welcome additional ideas based on the fellow's interests.
**Preparedness Role**

The fellow will be part of NYC DOHMH's emergency response structure and be assigned to the Epidemiology/Surveillance sub-section of the NYC DOHMH Incident Command System. This section is responsible for 1) investigating the incident to characterize event by person, place, and time; 2) collecting data and developing databases; 3) implementing enhanced, active or passive syndromic surveillance to monitor impact and recommend preventive measures. The fellow will receive emergency response training and may have the opportunity to participate in emergency response exercises such as point of distribution (POD) exercises. In the past few years the health department has been activated for a number of major city-wide emergencies including Hurricane Sandy, Ebola virus and most recently Zika virus.

**Additional Activities**

**Genotype cluster/outbreak investigations**

The fellow will participate in and lead genotype cluster investigations. This involves collecting, reviewing and analyzing patient records, re-interviewing patients to identify sites of exposure and epidemiologic links between cases, and generating transmission assessments and related recommendations for public health intervention.

**Field-based contact investigations in congregate settings**

The fellow also will serve as lead investigator for an expanded contact investigation (ECI) at a congregate setting (school, worksite, hospital, etc.) that has had a TB exposure. This typically involves working with the site to conduct an education session on TB and its transmission, arranging testing of persons exposed to TB, ensuring all that are exposed are evaluated, reviewing and analyzing the evaluation results to make a transmission assessment, and writing a report of the investigation.

**Mentors**

**Primary**

Shama Ahuja, PhD, MPH  
Director of TB Surveillance and Epidemiology

**Secondary**

Jeanne Sullivan Meissner, MPH  
Team Lead, Outbreak Detection and Response