Infectious Diseases

California Department of Public Health, Division of Communicable Disease - Tuberculosis Control Branch
Richmond, CA

Assignment Description

The California Department of Public Health (CDPH) Tuberculosis Control Branch (TBCB) collaborates with large urban jurisdictions as well as with rural and small health jurisdictions on diverse statewide activities to prevent and control tuberculosis. These activities include surveillance, research, program evaluation, program management and outbreak investigation. There are approximately 45 TBCB staff, including epidemiologists, clinical specialists, program liaisons, communicable disease investigators, and other professional and support staff. California contributes the most TB cases of any state—2,169 cases were reported in 2013—approximately 23% of the nation’s TB cases reported in 2013.

The Fellow will be an active member of the Division of Communicable Disease Control and the surveillance and epidemiology team in the TBCB. The SE team is specifically responsible for supporting surveillance, epidemiology, and the Multidrug Resistant TB (MDR-TB) Consultation Service. The SE team members work closely with other TB Branch and Department staff.

Day-to-Day Activities

The primary daily activity of the CSTE Fellow will be to participate in ongoing epidemiology activities of the TBCB. The Fellow will meet regularly with members of the SES team to plan and carry out epidemiologic analyses. The Fellow will also interact frequently with local health department personnel, including making visits to local health departments and directly participating in TB field investigations. One of the secondary activities for the Fellow will be to provide epidemiologic support to the TB Branch MDR-TB Consultation Service.

Outbreak field investigation: The CSTE Fellow will have an opportunity to participate in outbreak field investigations. Within the past several years, California has experienced TB outbreaks in a variety of populations and settings including: newly arrived immigrant populations, marginally housed persons, correctional populations, schools, immunocompromised persons, and extensive, complex contact investigations. The TBCB investigates many TB outbreaks each year including TB outbreaks among adults of foreign-born origin, homeless populations, schools and within institutions.

The CSTE Fellow has the opportunity to be trained in TB outbreak response. She/he can be part of a team that plans the outbreak response, providing epidemiologic and analytic support to local health departments, interacting with other involved health jurisdictions, and coordinating the outbreak response. In addition, the fellow will be responsible for MDR TB analytics, tasks and analysis of genotyping data, as well as the core surveillance epidemiology activities.

Note: Other important activities are described in detail in the next section under Potential Projects.
Potential Projects

Surveillance Evaluation of TB patient outcomes using an electronic system to provide daily directly observed therapy.

Over the last several years, local TB programs have been implementing innovative techniques to provide daily directly observed therapy (DOT) to TB patients such as video DOT. Though considered to be cost-effective, a formal evaluation of this technology has not been conducted. This evaluation will look at the feasibility, acceptability and overall costs of an electronic directly observed therapy (DOT) application and/or e-reminder system using the CDC surveillance evaluation guidelines.

Surveillance Activity Trends in TB patient complexity

Though TB incidence is decreasing, TB cases appear to be more complex to manage with multiple co-morbidities such as diabetes, substance use and immunosuppression. The goal of this project will be to examine trends in TB patient complexity over time in California, including trends in drug-resistant TB to better understand the challenges with TB treatment and management.

Major Project Genotyping

As of 2004, CDC implemented a universal TB genotyping project for all culture positive TB specimens. The genotyping allows programs to identify transmission between individuals and distinguish between infection acquired in the past compared to recently or newly acquired infection. There are several projects involving genotyping data including: looking at factors associated with transmission and a randomized intervention trial to stop transmission, a determination of which types of strains are associated with multi-drug resistant TB and which strains are most likely to propagate in California.

Major Project Multi-drug resistant TB (MDR TB) investigation

California reports the most MDR TB patients in the US. The goal of this project would be to determine if MDR TB treatment outcomes differ from non-MDR TB cases. Additionally, sub-analysis will look at MDR TB treatment practices including the use of a new MDR TB medication approved in 2013.

Major Project Smoking Cessation

Smoking is a risk factor for TB disease and is associated with poor anti-TB treatment outcomes. TB clinics offer a unique opportunity to provide smoking cessation counseling to an underserved population. The goal of this project would be to implement a smoking cessation program in the San Francisco TB clinic in collaboration with the San Francisco Department of Health Smoking Cessation program to: 1) determine the prevalence of smoking among TB clinic patients and 2) assess the feasibility of linking smoking cessation with TB prevention.
**Preparedness Role**

The Fellow will work actively in collaboration with the Branch epidemiologist responsible for the TB control portion of the State Emergency Preparedness Plan. Activities may include helping to determine how to incorporate lessons learned from TB outbreak investigations into bioterrorism and emerging pathogen response protocols, and how to plan for continuity of government operations (keeping state and local TB programs running in an emergency). Local health departments regularly use TB outbreak investigations as an opportunity to test local emergency response systems. The CSTE Fellow will have opportunities to assist with these tests.

**Additional Activities**

1. Investigate the use of whole genome sequencing and genotyping in detection and tracking of outbreaks; Investigate the added value of whole genome sequencing across diverse TB cluster investigations.
2. Examine the uptake of new surveillance variables associated with *Mycobacterium bovis*.
3. Analysis and modeling of diverse policy strategies to advance TB elimination.
4. Since 2010, the TBCB has implemented several changes to its TB surveillance system, including use of web-based reporting and a revised TB reporting form. The Fellow will have opportunities to evaluate aspects of these major surveillance system changes.
5. Participation in a wide variety of evaluations that are routinely carried out by the TBCB or within the Division of Communicable Disease Control. These include indicators of local TB control performance, national systems to evaluate new immigrants for TB, laboratory reporting practices, and cost-effectiveness analyses.
6. The Fellow will have the opportunity to gain experience with Microsoft Access and Excel, SAS, and Internet-based data sharing systems.

**Mentors**

- **Primary**
  - Jennifer Flood, MD, MPH
  - Branch Chief - TB Controller

- **Secondary**
  - Neha Shah, MD, MPH
  - CDC Medical Officer