Infectious Diseases

Cook County Department of Public Health, Communicable Disease Prevention and Control

Forest Park, Illinois

Assignment Description

The CSTE Fellow will be assigned to the Communicable Disease Prevention and Control (CD) Unit and will work across the unit in programs that fit with the Fellow’s unique talents and interests. Although we cover a large area of more than 700 square miles and nearly 2.4 million residents, including some of the country’s wealthiest and poorest communities, our unit is small and close-knit. We are located in Forest Park, IL, adjacent to the City of Chicago and serviced by the "L" and major expressways. The CD Unit is responsible for case investigations, cluster and outbreak detection, and routine surveillance activities covering more than 65 communicable diseases and conditions, as well as emerging infections and conditions that can be monitored through syndromic surveillance. Our unit is dynamic, and we strive for excellence, innovation and transparency with an emphasis on teamwork.

Day-to-Day Activities

The Fellow’s day-to-day activities will include investigating communicable diseases reported through the Illinois-National Electronic Disease Surveillance System (I-NEDSS), developing reports on that system’s back-end, assisting in the investigation of outbreaks as they arise, working as part of a team on various quality improvement projects in the CD Unit, assisting the program manager responsible for syndromic surveillance and informatics in data analysis and cluster detection, and the production of weekly and other periodic surveillance reports. The Fellow may also conduct ad-hoc research projects to advance public health practice in the CD Unit and interface with staff at hospitals, provider practices, and long-term care facilities to provide education and outreach.

Potential Projects

Surveillance Activity  Daily Reportable Disease Cluster Detection Using SatScan

Epidemiologists need to be able to connect dots, which is a major reason that so many infectious diseases are reportable in the first place. Connecting the dots can lead to cluster identification and outbreak detection--and if done early enough--can prevent them from growing larger. However, even teams of epidemiologists tasked with these functions can benefit from technological innovations such as spatio-temporal cluster detection using statistical software to help connect the dots that might be missed through traditional surveillance strategies.

In October 2019, CCDPH began running a daily, automated cluster detection program using R and SatScan to look for potential outbreaks of reportable diseases including Salmonella, Campylobacter, Pertussis, Legionella, and several others. The program triggers an automatic alert to epidemiologists for further investigation when a statistically significant cluster is detected. The Fellow will be responsible for receiving these alerts and investigating these potential clusters to determine if an outbreak is actually occurring. The Fellow will also be responsible for collecting data on how the program is performing (such as calculating sensitivity and specificity) and tweaking it to improve hits generated.
Surveillance Evaluation  STI Surveillance and Field Operations

The United States is in the midst of a large increase in syphilis, after years of steady declines, and suburban Cook County is no exception. Between 2014 and 2015, primary and secondary syphilis cases increased 112% and an additional 29% from 2015-2016. Rates have remained 3 times above baseline.

We have begun to address our syphilis surveillance in two phases. The first phase was to put in place mechanisms to track records of syphilis investigation field records, for managers to have situational awareness and to track cases electronically. The second phase of this surveillance project has begun but is still in its infancy. The first set of goals are to establish programmatic baselines for timeliness and quality and then to begin working with STI staff to encourage program improvements and enhancements. The second set of goals would be to monitor progress to help reverse the upward trajectory in syphilis incidence observed in recent years in suburban Cook County. The CSTE Fellow would be a vital part of this surveillance and quality improvement effort. The fellow would perform data entry, design queries and reports using MS Access and SQL, and help coordinate quality improvement efforts and suggest changes to the way these surveillance data are collected with help from the Director, STI/HIV Program manager and line staff.

Major Project  Reducing Active Tuberculosis Disease by Treating Latent Tuberculosis Infection

In 1989, the CDC set a goal to eliminate TB in the United States by 2010. However, as 2020 approaches, progress towards this goal has stalled and the declines in TB incidence have plateaued. Recent models suggest that achieving the goal of TB elimination in the U.S. won’t be possible unless we begin to address seriously the number of people with latent tuberculosis infection (LTBI). Analysis of our own active TB data, as well as available US Census and ACS data, support this finding. In Illinois, for several years, LTBI cases were optionally reportable; however, over the past 12 months, large volumes of LTBI cases have been reported as a result of improvements in electronic laboratory reporting. With this in mind, the Fellow will review (and possibly repeat) our previous analysis and will work with internal and external partners on a program geared around improving patient and provider education on LTBI overall, improvements in screening for LTBI, and LTBI treatment for those who are positive. The project will emphasize treatment in an LTBI patient’s medical home. This project will lay the groundwork for reductions in the numbers of active cases over time, particularly in high-risk groups.

Surveillance Activity  Vector-borne Disease Surveillance

The Fellow will conduct surveillance and case investigations for the following vector-borne diseases: malaria, Zika, dengue, West Nile virus, etc. Part of this project will include production of weekly surveillance reports for WNV using a semi-automated system that incorporates mosquito, bird and human case data. An additional element to this project would be researching the effects of climate change on the distribution and human effects of these vectors in the intermediate- to long-term.

Additional Project  Analysis of Marijuana Legalization Using Syndromic Surveillance

In January 2020 marijuana (for recreational use) will become legal in Illinois. Following the models of other states, the Fellow will use data from the National Syndromic Surveillance Program (i.e., emergency department data) to analyze the effects of this legislation on numerous outcomes/adverse events, including accidents and addiction-seeking services. The Fellow will be responsible for creating and validating this new syndrome category and monitoring trends over time.
**Preparedness Role**

The CSTE fellow would take part in Emergency preparedness exercises and would be encouraged to take appropriate NIMS courses for an equivalent FTE in the same position in the CD Unit (typically an upper-level epidemiologist). In addition, the CD Unit has begun coordinating table-top exercises with staff from the Emergency Preparedness and Response Unit, and the Fellow would be a player and later in his or her tenure, a planner/facilitator.

**Additional Activities**

Depending on the interests and skills of the CSTE Fellow, we can tailor projects, ranging from leading outbreak investigations, attending local meetings (Chicago Technical Advisory Group meetings, Cook-DuPage TAG meetings) as well as bi-monthly regional meetings with the Northern Illinois Public Health Consortium, presenting his or her work at those meetings as appropriate, and writing and publishing his or her work whenever the opportunity arises.

**Mentors**

**Primary**
Demian Christiansen DSc, MPH
Director, Communicable Disease Prevention and Control

**Secondary**
Kelley Bemis MPH
Program Manager, Enhanced Surveillance and Informatics