Infectious Diseases-Foodborne, Infectious Diseases

New York City Department of Health and Mental Hygiene, Bureau of Communicable Disease/Division of Disease Control

Queens, New York

Assignment Description

The CSTE fellow will be fully integrated into the Bureau of Communicable Disease at the NYC DOHMH and assigned to the Enteric, Waterborne, and Health Education Unit. He/she will have his/her own analytic, surveillance and educational projects to work on daily. The fellow's main assignment will be with foodborne disease surveillance and outbreak investigations. He or she will gain a detailed understanding of foodborne disease surveillance and outbreak investigations. The unit investigates an average of 150 clusters and outbreaks each year, and the fellow will participate in all aspects of foodborne investigations, with the goal of being able to manage them independently. The fellow will have the opportunity to participate in all aspects of the FoodCORE-funded activities, which include attending monthly conference calls and annual Vision meetings, participating in CDC site visits, and assisting with FoodCORE specific surveillance initiatives and projects.

Day-to-Day Activities

The fellow will be fully integrated into all facets of BCD's foodborne program. Day to day activities include the following:

-Attend weekly outbreak meetings in BCD to discuss current acute issues for all diseases that BCD tracks.

-Attend biweekly foodborne cluster and outbreak meetings with colleagues from Environmental Health and the Public Health Laboratory to discuss all active investigations.

-Attend quarterly in-person meetings with Environmental health and the Public Health Laboratory staff to discuss shared projects.

-Investigate hepatitis A cases and arrange post-exposure prophylaxis for close contacts.

-Work with FoodCORE-funded MPH students to help oversee cluster and outbreak investigations.

-Assist with quarterly training of MPH students from Columbia University who provide surge capacity to conduct data collection in large outbreak settings.

-Investigate clusters and outbreaks of foodborne disease which will include interviewing patients, developing databases for data entry, data analysis, and preparing final reports. Visits to restaurants or stores to review food preparation practices and collecting invoices with Environmental Health staff will also be part of some investigations.

-Run outbreak detection program to identify possible outbreaks reported in social media data. Review possible complaints and respond to complainants to obtain additional information to conduct further investigation, as needed.

-Conduct special studies, to include aspects of study design, implementation, data collection, and analysis.

-Prepare presentations and publications for meetings and conferences.

Potential Projects

Surveillance Activity **Investigating foodborne disease outbreaks**

The CSTE fellow will be fully integrated into the Bureau of Communicable Disease, foodborne illness program. S/he will gain a detailed understanding of foodborne disease surveillance and outbreak investigation within the Agency. Outbreaks in New York City are identified from a variety of sources, including reports from patients or providers and analysis of disease reports. In addition, pulsed-field gel electrophoresis (PFGE) clusters are reported by NYC's PulseNet laboratory. The DOHMH receives reports of approximately 30 foodborne outbreaks and over 100 PFGE identified clusters each year. The fellow will take primary responsibility for investigating some of these outbreaks and clusters. The fellow will have the opportunity to oversee and become involved in every aspect of a foodborne outbreak, which will include developing a questionnaire, conducting outbreak interviews, building Microsoft Access databases for data entry, analyzing outbreak data, and writing the final report. For multi-jurisdictional outbreaks, the fellow will participate in multistate calls, and calls with CDC, FDA, USDA and other relevant agencies. S/he will have the opportunity to go on restaurant inspections, conduct hazard analysis critical control points (HACCP) reviews, and to take the NYC food safety training that is offered to restaurant operators.

Surveillance Evaluation **Evaluating the identification of complaints and outbreaks identified at NYCDOHMH and comparing characteristics of those identified through social media versus telephone/online complaint systems**

There are approximately 24,000 restaurants in NYC and DOHMH receives approximately 5,000 foodborne illness complaints each year, with about 30 resulting in a foodborne outbreak associated with a restaurant. Not all jurisdictions have electronic systems for managing foodborne illness complaints. Since 2003, NYC has a system for receiving and managing foodborne illness complaints through the non-emergent telephone and on-line complaint system called 311. Many restaurant-associated outbreaks are reported from patrons who become ill after eating out and then call 311. While social media has been reported as a mechanism to identify outbreaks, little validation has been done in studies looking at internet data. To explore the potential use of social media to identify unreported outbreaks, DOHMH worked with Columbia University and Yelp to identify reviews indicating foodborne illness, and only 3% of Yelp review complaints were also reported directly to DOHMH. The application has been enhanced and in 2016, DOHMH has also started reviewing Twitter data. To date, 10 outbreaks have been identified through Yelp data and 2 investigations have been initiated due to data identifying complaints in Twitter. The fellow would have the opportunity to evaluate the complaint system at NYC DOHMH and compare characteristics of those identified through traditional methods (i.e. 311 complaint system) and social media.

Major Project **Case-case analysis of Campylobacter infections**

Campylobacter is the leading case of bacterial diarrheal disease in the US. NYC Receives approximately 1,600 campylobacteriosis cases reported each year, which has increased over the past five years from approximately 1,200. Interestingly, reported Salmonella infections have declined during this same time period. There are many shared risk factors for salmonellosis and campylobacteriosis, such as undercooked chicken, international travel, and young age, and these infections can generally cause similar symptoms such as diarrhea, abdominal cramps, and fever. The NYC DOHMH routinely interviews all salmonellosis case-patients with an extensive hypothesis-generating questionnaire and interviews a sample of campylobacteriosis case-patients as well. In order to better understand these diverging trends and identify potential risk factors of illness associated with campylobacteriosis, the fellow would perform a case-case analysis comparing campylobacteriosis cases to salmonellosis cases.

Surveillance Evaluation **Evaluating the impact of CIDT on Shiga-toxin producing E. coli surveillance data**

Shiga toxin-producing E. coli (STEC) are bacteria that can cause gastrointestinal illness. Symptoms include diarrhea, abdominal cramps, and complications such as hemolytic uremic syndrome can develop. The most common STEC is E. coli O157; however there are over 100 other types of non-O157 STEC. The CSTE case definition requires that the STEC be confirmed be culture to be considered a confirmed case. With the increased use of culture-independent diagnostic tests (CIDT), which are PCR tests that identify DNA in specimens, the number of STECs identified has increased, particularly those that are non-O157. In NYC, there are approximately 100 confirmed cases annually, however there were 281 reports received. Many of those reported were identified using CIDT. The fellow would evaluate the impact that the increased use of CIDT has had on STEC surveillance data and compare factors of cases that are confirmed with culture to those that could not be confirmed by culture.

Additional Project **Comparing restaurant inspection scores for those with and without report outbreaks**

There are approximately 24,000 restaurants in NYC and DOHMH receives approximately 5,000 foodborne illness complaints each year, with about 30 resulting in a foodborne outbreak associated with a restaurant. NYC restaurant inspectors perform approximately 52,000 inspections per year. There is little research that has been conducted to understand the relationship of poor restaurant inspection scores to the likelihood of identifying a foodborne illness complaint or an outbreak associated with that restaurant. A comparison between restaurant inspections scores and restaurants that have received foodborne illness complaints would allow researchers to determine if there is in fact an association between poor inspection scores and restaurant complaints. The fellow would work closely with colleagues in Environmental Health on large restaurant inspection data as well as complaint and outbreak data.

Preparedness Role

The NYC DOHMH has responded to a number of citywide and national emergencies in the last few years, including the initial outbreak of West Nile virus in 1999, the response to the terrorist attacks and anthrax investigation in 2001, the Citywide blackout in August, 2003, the H1N1 outbreak in 2009, Ebola response in 2014, and outbreaks of legionellosis. All employees are assigned to an Emergency Preparedness Committee for purposes of planning for and responding to emergencies. The fellow will be assigned to the Surveillance and Epidemiology Team and expected to participate in the DOHMH response in the event of an emergency and in all drills and meetings required by the unit. The fellow may also have the opportunity to participate in drills that occur during his/her time here. Prior fellows have had the opportunity to participate in two point-of-distribution (POD) clinics to disseminate hepatitis A vaccine to patrons of restaurants.

Additional Activities

Various seminars and trainings are held within BCD and elsewhere in the agency, including a monthly Epi Grand Rounds, regular brown bag sessions, and trainings. Fellows are encouraged to attend any of the presentations and trainings that are of interest. The fellow will also be encouraged to participate in other acute disease investigations that come up in the Bureau or in other parts of the agency such as the measles outbreak that was investigated in NYC.

Mentors

Primary	Bruce Gutelius MD MPH
	Medical Director, Enterics, Waterborne and Health Education Unit
Secondary	Vasudha Reddy MPH
	Directer of Enteric Diseases