Infectious Diseases-Foodborne, Infectious Diseases

Tennessee Department of Health, Communicable and Environmental Disease Services and Emergency Preparedness

Nashville, Tennessee

Assignment Description

The CSTE Fellow will be fully integrated into the TennesseeDepartment of Health's Communicable Environmental Disease Services and Emergency Preparedness (CEDEP) program. He or she will gain a detailed understanding of Tennessee's Foodborne Diseases Active Surveillance Network, or FoodNet, and Foodborne Diseases Centers for Outbreak Response Enhancement, or FoodCORE, surveillance and programmatic activities. FoodNet conducts surveillance for nine foodborne disease pathogens and FoodCORE centers work collaboratively with CDC to develop new and better methods to detect, investigate, respond to and control multistate outbreaks of foodborne diseases. Tennessee has been a member of FoodNet since 2000 and a member of FoodCORE since 2012.

The Fellow will be expected to participate, and have the opportunity to lead, all aspects of an outbreak investigation including questionnaire design, interview training and case/control interviews, data collection and management, data analysis, after-action reviews and report writing. Collaboration with local, regional and state health department staff, as well as agencies outside of TDH such as the Tennessee Department of Agriculture, CDC, FDA, USDA-FSIS and others will be necessary. We encourage a leadership role in outbreaks depending on the level of comfort and collaborative experience demonstrated by the fellow.

CEDEP staff members and fellows have been involved in numerous outbreak investigations and surveillance system projects. Our current fellow, Jane Yackely, evaluated TDH's Shiga toxin-producing E.coli (STEC) surveillance system to better understand the system's strengths and weaknesses during a time of changing laboratory testing practices. Ms. Yackley has worked on numerous foodborne outbreak investigations with frontline public health staff. She has also collaborated with state and local environmental health staff to create a statewide web-based foodborne illness complaint system. We anticipate that the new fellow will similarly and successfully work within the context of CEDEP. The Fellow will be fully supported to complete projects and take on responsibilities that will influence statewide activities. Our previous fellow completed all requirements in approximately one year.

The Fellow will have the opportunity to collaborate with regional Integrated Food Safety Centers of Excellence (CoE) in developing and delivering food safety training and educational materials to states and jurisdictions in need. The Centers are partnerships between designated state health departments and academic institutions that serve as resources for local, state and federal public health professional to response to foodborne illness outbreaks. In collaboration with the University of Tennessee, our Fellow will participate in the review development of various on-line outbreak response trainings for epidemiologists, nurses, disease investigators, laboratorians and environmental health specialists.

Day-to-Day Activities

- Attend weekly CEDEP meetings, including FoodNet /FoodCORE/CoE staff meetings, EHS Net and GEH meetings as time allows.
- Participate fully in interviewing, cluster evaluation, and acutefoodborne outbreak investigations.
- Interview Salmonella and STEC cases using standardizedsurveillance interview tool.
- Serve as a consultant for local and regional health department staff on questions regarding foodborne disease outbreak investigations.
- Review Whole Genome Sequencing data and procedures.
- Work with FoodNet staff to identify surveillance reporting issues and provide training to frontline public health staff and area hospitals/laboratories to address issues.
- Provide data analysis and report writing support to local and regional health departments.
- Attend all statewide epidemiology trainings including monthly CEDEP conference calls and face-to-face meetings.
- Conduct special studies to include aspects of study design, implementation, and analysis.
- Prepare presentations and publications, and deliver them at state and national meetings.

Potential Projects

Surveillance A review of the National Evironmental Assessment Reporting System (NORS) Activity

NEARS is a national effort to systematically collect, analyze, interpret, and disseminate environmental data from foodborne illness outbreak investigations. According to CDC, the system provides food safety program officials with information to:

- Take food safety actions and assess effectiveness.
- Support program evaluation.
- Develop or modify program policies or regulations based on sound epidemiologic data.
- Train environmental health specialists about environmental causes related to foodborne illness outbreaks, and
- Help prevent foodborne illness outbreaks associated with restaurants and other food venues (such as banquet facilities, schools, and other institutions).

Data collected in NEARS helps CDC and other public health professionals determine and understand the primary causes of outbreaks. CDC states that users will submit data about foodborne illness outbreaks, which will improve response to and prevention of future outbreaks. Analysis of the data will help to determine how and why outbreaks occur. CDC will use data from NEARS to recommend actions for food safety programs and will share findings with food safety programs, food industries, and academia.

The recommendations and sharing of findings should increase effectiveness of food safety programs, increase food safety, and decrease foodborne illness. By participating in NEARS, CDC states that state and local jurisdictions can help identify the environmental causes of foodborne illness outbreaks and reduce future outbreaks. Using the updated guidelines for evaluating public health surveillance systems, our Fellow will conduct an assessment of NEARS in Tennessee. The fellow will include the attributes of surveillance systems, and engage with stakeholders currently using the system. Additionally, the fellow will assess the systems ability to increase the effectiveness of food safety programs and integrate with other systems like NORS.

Despite enormous resources employed to construct NEARS, uptake has been poor. Our Fellow will provide recommendations to enhance surveillance activity and integrate with NORS.

Surveillance Evaluation **Statewide Foodborne Illness Complaint System**

Our Fellow will conduct a surveillance system evaluation on TDH's statewide foodborne illness complaint system. This web-based complaint system was launched in June, 2017. The primary purpose of a foodborne illness complaint system is to identify and investigate suspected foodborne outbreaks. In addition to outbreak detection, a complaint system can identify safety or regulatory issues at food establishments.

Using the "Updated Guidelines for Evaluation of Public Health Surveillance Systems," our Fellow will describe the simplicity, flexibility, data quality, acceptability, sensitivity, predictive value positive, representativeness, timeliness and stability of the system. This comprehensive evaluation will be able to inform stakeholders (epidemiologists, environmental health specialists, and other frontline public health staff) of needed system and training improvements.

Major Project **An Analysis of Tennessee's Non-O157 STEC Case-Control Study Data**

Shiga toxin–producing Escherichia coli (STEC) are an important cause of diarrhea and the major cause of postdiarrheal hemolytic uremic syndrome. Non-O157 STEC infections are being recognized with greater frequency because of changing laboratory practices. To gain a better understanding of exposures associated with non-O157 STEC, the CDC FoodNet program launched a 36 month matched case-control study in all 10 FoodNet sites. Our Fellow will analyze TN's data to identify behavioral, environmental, dietary and medical risk factors for sporadic non-O157 STEC infections. The Fellow will describe the serotypes from case patients and characterize the spectrum and severity of illness associated with different serogroups.

Additional Project **Evaluation of TN's Integrated Food Safety Center of Excellence Web-based Courses**

The Integrated Food Safety Centers of Excellence identify and evaluate best practices for foodborne disease surveillance and outbreak investigation then share this knowledge with others. CDC named Tennessee state health department and the University of Tennessee as a Center of Excellence under the authority of the Food Safety Modernization Act (FSMA) on August 31, 2012.FSMA is the most sweeping reform of our food safety laws in more than 70 years. Signed into law on January 4, 2011, FSMA focuses on preventing food contamination and relies on CDC’s expertise in surveillance to accomplish this goal.

With CDC's support, this Center aims to:

- Provide technical help and training in epidemiological, laboratory, and environmental investigations.

- Decrease the burden of foodborne illness using improved techniques in detection, investigation, control, and reporting.
- Use information gathered during outbreak investigations to prevent future illnesses and outbreaks.
- Develop and share best practices.

One of our Center's main projects is the development of a web-based Outbreak Investigation and Response training series. The goal for this series of online courses is to train public health professionals and other involved personnel to rapidly identify, investigate and implement control measures for a foodborne disease outbreak to ultimately reduce the incidence of foodborne illness. Our Fellow will evaluate the published courses by describing participants roles in an outbreak investigation, pre/post test results and participant comments. The Fellow will be able to provide recommendations for future course improvements and strategies on how to best publicize the course to the target audience.

Additional Project **Evaluation of WGS Implementation in Tennessee**

Whole-genome sequencing (WGS) is replacing pulsed-field gel electrophoresis (PFGE) as the gold standard for cluster identification. WGS provides the ability to identify distinct subclusters not distinguishable by PFGE. The Tennessee Department of Health's State Public Health Laboratory implemented WGS for Listeria in 2015 and currently sequences most Salmonella isolates. Our Fellow will evaluate sequence timeliness and will provide recommendations to our SPHL partners on sequencing procedures and communicating results with epidemiologists and CDC. The impact of culture-independent diagnostic testing on WGS in TN will also be assessed.

Preparedness Role

The Fellow will participate in all ICS training and certification activities and participate in emergency response activities. These include participation in Community Assessment for Public Health Emergency Response (CASPER) and Zika virus and avian influenza preparedness activities. Opportunities will exist for the Fellow to participate in emergency response training, exercises, and events. The Fellow will become familiar with the State and Regional Health Operations Center, Incident Command System, and response plans.

Additional Activities

After Action Review:

The Council to Improve Foodborne Outbreak Response (CIFOR) recommends post outbreak meetings among members of the outbreak team to assess lessons learned and to compare notes on ultimate findings. This type of after-action review is extremely important for multiagency investigations but is also important for single agency investigations. The CSTE fellow will develop an after action process for reviewing outbreaks led by Tennessee public health staff. He/she will work with local, regional and state staff to develop and pilot this plan. Recommendations from frontline and state staff will be evaluated and implemented. A final plan will be presented and will be utilized for all foodborne disease outbreaks led by Tennessee staff.

The fellow will participate in all statewide meetings including the Emerging Infections Program Scientific Day.

Mentors

Primary	John Dunn PhD, DVM Deputy State Epidemiologist
Secondary	Katie Garman MPH Epidemiologist 3