Infectious Diseases—Food Safety

Assignment Description

The CSTE fellow will be fully integrated into the Tennessee Department 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.

CEDEP staff members and Fellows have been involved in numerous outbreak investigations and surveillance system projects. Our previous CSTE fellow evaluated TDH's food complaint system. She discovered many areas in need of improvement and worked with local and state staff to implement the changes needed to create a more effective system. This Fellow also published a MMWR article titled *Thrombotic Thrombocytopenic Purpura (TTP)-Like Illness Associated with Intravenous Opana ER Abuse* where she served as the lead investigator (http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6201a1.htm). She was also a key investigator in the multi-state fungal meningitis outbreak associated with tainted steroid injections lead by Tennessee. Other projects taken on by CEDEP staff include investigating an *E.coli* O157:H7 outbreak associated with raw milk consumption, an analysis of epidemiologic responses to pulse-field gel electrophoresis (PFGE) clusters, variability among sates in investigating foodborne disease outbreaks, among many others.

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, the Fellow will participate in the review development of various on-line outbreak response trainings for epidemiologists, nurses, disease investigators, laboratorians and environmental health specialists. The fellow will contribute to the COE work by reviewing content for the food production website being managed by the University of Colorado. The fellow will review and develop all content for one food commodity.

The Fellow will be mentored and supported to complete all of the Fellowship requirements. Additionally, they will be encouraged to present their work at local and national meetings and publish findings in peer-reviewed journals.

Day-to-Day Activities

The Fellow will be integrated into all facets of TDH's foodborne program. Day to day activities include:

- Attend weekly CEDEP meetings, including FoodNet / FoodCORE staff meetings, EHS Net and GEH meetings as time allows;
- Participate fully in interviewing, cluster evaluation, and acute foodborne outbreak investigations;
- Interview Salmonella and STEC cases using standardized surveillance interview tool;
- Serve as a consultant for local and regional health department staff on questions regarding foodborne disease outbreak investigations;
- Work with FoodNet staff to revise Foodborne Outbreak Response Manual using the Council to Improve Foodborne Outbreak Response (CIFOR) guidelines as a template.
- 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

Data Analysis:

- Approximately 100 enteric outbreaks are reported to the TDH every year. Roughly 60% of those outbreaks are due to norovirus. The majority of norovirus outbreaks occur in long-term care facilities in Tennessee. The Fellow will analyze norovirus outbreaks in Tennessee by setting and CaliciNet sequence type to describe circulating genogroups of Norovirus, differential morbidity and spatial differences in the occurrence of outbreaks. These data will be provided to TDH health regions on a quarterly basis to inform where infection control educational efforts are needed most. Data will be shared with the Department of Health Licensure to show the burden of norovirus in facilities regulated by this department.

- Tennessee reports approximately 1,000 cases of *Salmonellosis* each year. The majority of cases, especially those who reside in the western section of the state, are thought to be caused by environmental exposures. At this time, TDH has not conducted an analytic study to support this hypothesis. The Fellow will analyze spatial and temporal clustering for common Salmonella serotypes (e.g., S. Javiana, S. Newport, S. Typhimurium) and PFGE patterns to develop hypotheses for future analytical studies. Once a hypothesis is generated, the Fellow will develop the study questionnaire, database, and analysis plan. He or she will train other TDH staff to assist in interviewing and data entry activities. The fellow will also collaborate in an ongoing project assessing environmental reservoirs and environmental exposures with the University of Memphis. A final report will be developed including recommendation for changes to current surveillance interview tools.

- 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 the field and state 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 CIFOR working group has recently revised performance indicators published in 2009. The indicators were developed for public health agencies to evaluate the performance of their foodborne programs. The revised indicators will now include recommended targets from the Performance Indicators and other sources that will help agencies demonstrate their public health performance and effectiveness for the overall outcome of better population health. In Tennessee we have calculated the CIFOR metrics on a state level; however this calculation needs to occur for our 13 individual health regions. Working with FoodNet epidemiologists, the Fellow will develop an analysis plan to analyze the CIFOR metrics across Tennessee's 13 health regions. Reports will be provided to regional health department staff on a bi-annual basis. The reports will show the individual health regions compared to the other 12 health regions and the state. The CSTE fellow will also conduct the CIFOR assessment in neighboring states willing to share these data.

- Evaluation of long-term outcomes following Hemolytic-Uremic Syndrome using FoodNet data, 2000-2012. The fellow will capitalize on an ongoing data sharing agreement with Blue Cross Blue Sheild of Tennessee to review cases of HUS among the insurance carriers members. Diagnosis, treatment, and procedure codes will be reviewed for cases verified in Tennessee's FoodNet data. The fellow will describe differences in long-term outcomes and estimate costs for case-patients with and without HUS following *E. coli* O157 infection.

Surveillance System:

- Over 100 cases of Shiga Toxin-producing E.coli are reported in Tennessee each year. Evaluation of national risk factor surveillance for STEC will be conducted in collaboration with CDC and CSTE. We will assess commonly ascertained exposures and promote the implementation of the recently adopted position statement to standardize STEC exposure ascertainment. The position statement was written and passed by our current CSTE fellow.

- The BioSense program is a public health surveillance system that increases the ability of health official at local, state and national levels to efficiently, rapidly and collaboratively monitor and response to harmful health effects of exposure to disease or hazardous conditions. BioSense provides public health officials a common electronic health information system with standardized tools and procedures for rapidly collecting, sharing and evaluating information. Collaborating with TDH Public Health Emergency Preparedness staff the Fellow will conduct an evaluation of BioSense as a tool for acute gastroenteritis (AGE) outbreak detection. The Fellow will gain a full understanding of BioSense and will frequently interact with health department and hospital-based users.

Preparedness Role

The Fellow will participate in all ICS training and certification activities and participate in emergency response activities. These include assessment of BioSense surveillance as it relates to AGE and outbreak detection and participation in Community Assessment for Public Health Emergency Response (CASPER) activities. Opportunities will exist for the Fellow to participate in emergency response training, exercises, and events. The CSTE fellow will become familiar with the State Health Operations Center, Incident Command System, and response plans.

Assignment Location:	Tennessee Department of Health Nashville, TN
Primary Mentor:	John Dunn, DVM, PhD Deputy State Epidemiologist
Secondary Mentor:	Katie Garman, MPH Epidemiologist