Infectious Diseases, Environmental Health
Tennessee Department of Health, Communicable and Environmental Diseases Services and Emergency Preparedness
Nashville, Tennessee

Assignment Description

The Fellow will be located within the Tennessee Department of Health, Vector-Borne Diseases (VBD) Program and will interact closely with members of the VBD team. Tennessee is fortunate to have received significant funding for VBD activities under the Emerging Infections Program (EIP) and the Epidemiology and Laboratory Capacity (ELC) grants. The Fellow will have substantial input in the projects they pursue. The Fellow's responsibilities would involve work on specific projects and disease outbreak investigations.

Additionally, routine activities would include:

- Participation in weekly surveillance meetings within our Division of Communicable and Environmental Diseases and Emergency Preparedness (CEDEP) staff where current outbreaks and investigations are discussed.
- Participation in weekly VBD team meetings.
- Participate in monthly fellow team meetings with our 5 PHAP fellows within CEDEP, our EIS officer, and current CSTE fellows in CEDEP.
- The CSTE fellow will have the opportunity to present at local and statewide conferences of interest.
- Participation in regional epidemiology meetings which feature presentations from epidemiologists and other public health staff throughout Tennessee. Topics include recent investigations in infectious diseases and environmental health.
- Participation in multi-disciplinary meetings/conferences organized through the Tennessee Mosquito and Vector Control Association in collaboration with the TDH.
- Participation in CSTE's Vector-Borne Diseases Subcommittee webinars, position statement discussions and other subcommittee activities.
- Participation in discussion forums and calls for the National Association of Vector-Borne Disease Control Officials (NAVCO).
- Participation in educational activities e.g., webinars and conference calls from CDC, seminars at Vanderbilt University's Center for Medicine, Health and Society, Institute for Global Health and Center for Health Policy.
Day-to-Day Activities

The following are examples of fellow daily assignments:

- Participate in Vector-borne Diseases Program meetings
- Participate in Surveillance meetings
- Meet with primary and secondary mentors
- Participate in interviewing and vector-borne outbreak investigation
- Serve as consultant for local and regional health department staff on questions regarding vector-borne disease outbreak investigations.
- Work with Vector-borne Program staff to revise the Arboviral Surveillance and Response Plan using CDC's Arboviral Surveillance Plan as a guideline as well as ASTHO's Guidelines for Emergency Management of Vector-Borne Disease Outbreaks.
- 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 Activity

Enhanced Surveillance for La Crosse Encephalitis

Tennessee is one of the states with the highest numbers of cases of La Crosse encephalitis, a serious pediatric illness. Most cases are seen in the Appalachian region of eastern Tennessee, which is an area of poverty. Through previous EIP studies we have conducted, we have found that getting families to take their children for follow-up visits to their doctor is more likely if public health takes an active role in talking with the families and coordinating their visit.

There are also challenges in getting children tested at the appropriate time in their acute infection and challenges in the types of tests available and therefore in coordinating appropriate testing. The Fellow will help coordinate all the steps leading to the case determination by utilizing enhanced and active approaches to the surveillance for La Crosse encephalitis. As part of this study, the Fellow will obtain experience with an IRB approved project and become familiar with study design.
**Surveillance**  
**Tick-borne Diseases Surveillance System**

Tick-borne diseases constitute the majority of vector-borne diseases in Tennessee. Case identification depends on testing requested by physicians and appropriate follow up of positive laboratory reports by public health. Currently our tick-borne diseases surveillance system is de-centralized such that variations in follow-up and interpretation of case definitions may vary among our 13 regions. With the direction of the primary and secondary mentor, the Fellow will evaluate our current de-centralized surveillance system and make recommendations for improvement and the potential costs and benefits to centralizing portions of the system based on a sensitivity analysis comparing centralized and de-centralized approaches. Additional alternative approaches may be compared to our current approach to compare sensitivities of these systems. The fellow will have a Vector Squad to work with comprised of paid student interns from Vanderbilt University and other universities.

**Major Project**  
**Disparities in Risk for Vector-Borne Diseases**

Vector-borne diseases appear to affect the most vulnerable populations in Tennessee. West Nile virus affects the older African-American populations, La Crosse encephalitis virus affects children of impoverished areas of rural Appalachia, and tick-borne diseases affect people living in rural Tennessee who live on or near tick habitat and wildlife.

The Fellow will work with her/his primary mentor and secondary mentor as well as faculty at Vanderbilt University to study elements (economic, cultural and environmental) that are unique to vulnerable populations in Tennessee and that put them at risk of acquiring pathogens transmitted by vectors. Recommendations tailored to their unique situations will be made as a result of this study. In order to conduct this project, the Fellow will work with statistical packages such as SAS, R, and SPSS as well as ArcGIS.

**Surveillance**  
**Arboviral Surveillance Activity**

The Fellow will conduct routine case investigation for mosquito-borne disease. The Fellow will be responsible for conducting follow-up investigations (by contacting regional health officers, healthcare providers, laboratory facilities, and patients as needed), tracking laboratory reports, and entering and analyzing data according to TDH/CEDEP standards. This will expose the fellow to multiple reporting systems currently used.

The fellow will have the opportunity to become familiar with the conditions and case definitions, and pursue a condition of interest for a more tailored surveillance activity project. Projects could include describing the geographic distribution of cases in Tennessee, and analyzing spatial and temporal patterns of disease transmission.
Additional Field Experience/Emerging Pathogens Investigations

Project
The Fellow will participate in large outbreak investigations that include data collection and data analysis. Past examples of outbreaks include: Babesiosis, Heartland virus, Chagas disease, Ehrlichiosis and Spotted fever rickettsiosis cluster response, and chikungunya virus. Our recent PHPS fellow was able to significantly contribute to our state’s preparedness, surveillance and response to chikungunya (CHIK) virus before, during, and after the outbreak of 2014. Briefly, in anticipation of travelers returning from areas with ongoing outbreaks and the potential for local transmission in Tennessee, this fellow developed and delivered a tabletop exercise on CHIK to statewide partners in March 2014. She took feedback from this exercise to inform the development of a statewide surveillance and response plan, which was distributed in May. We began investigating potential cases the first week of June and activated our State Health Operations Center and established an Incident Command Structure (ICS). She was positioned into various levels of the ICS, including advising us on mission coordination, leading the epidemiology branch of the operations section, conducting surveillance and case investigation, and developing guidance during the outbreak.

Our field investigations typically have involved collection of entomological samples as well as sample collection from wild and domestic animals and people. After sample testing at our VBD Laboratory, the Fellow will be involved in data analysis. Our VBD program currently has been awarded an EIP grant to conduct Pathogen Discovery. Samples acquired during emerging pathogen field investigations will also support our pathogen discovery study. As with all previous field investigations, it is expected that these projects will result in the presentation and publication of results.

Preparedness Role
The Fellow will participate in TDH preparedness and response efforts as needed (based on emerging infectious diseases and outbreaks). For example, past fellows/associates assigned to TDH have played a critical role in preparing for and responding to ebola, chikungunya, fungal meningitis, and a coal-ash spill. Specific responsibilities will be determined based on the assigned role in preparedness and response efforts and the Fellow’s interest and abilities. As an example, our recent PHPS fellow contributed to the State Health Operations Center (SHOC) during the CHIK outbreak as describe above, as well as during the Ebola outbreak where she supported education and guidance to clinicians and the public. The Fellow will also have opportunities to participate in Community Assessment for Public Health Emergency Response (CASPER) activities and other preparedness exercises.
**Additional Activities**

The Fellow will participate in a diversity of training opportunities including training in statistics, GIS, information technology, reporting systems, etc. The Fellow will have opportunities to help organize or participate in multiple state meetings and statewide webinars. CEDEP has recently offered training for EpiInfo form creation and dashboard analysis, ArcMap and GIS. TDH epidemiologists participated in the Tennessee state employee SAS day, and are involved with ongoing professional development opportunities provided directly by SAS. The Fellow will travel within the state to meet with health partners and communities being served. There will also be opportunities for out of state travel to present at national or regional meetings.

**Mentors**

**Primary**
Abelardo Moncayo, Ph.D.
Director, Vector-Borne Diseases Program

**Secondary**
John Dunn, D.V.M., Ph.D.
Deputy State Epidemiologist