

## **Infectious Diseases, Maternal and Child Health**

### **Tennessee Department of Health, Communicable & Environmental Diseases & Emergency Preparedness, HIV/STD/Viral Hepatitis Section**

Nashville, Tennessee

#### **Assignment Description**

The CSTE fellow will be situated within Tennessee Department of Health's HIV/STD/Viral Hepatitis (VH) Section within the Communicable Environmental Disease Services and Emergency Preparedness (CEDEP) program. HIV and hepatitis C virus (HCV) are reportable diseases in the state of Tennessee and require reporting to TDH within one week of identification. He or she will gain a detailed understanding of HIV and VH surveillance and programmatic activities. The fellow will become familiar with application of HIV and HCV CDC/CSTE case definitions to assign appropriate case status, utilization of HIV and HCV testing algorithms, conducting field investigations, and quality management and assurance.

The fellow will have the opportunity to develop solutions and implement tools to enhance monitoring, reporting, and dissemination of HIV and VH surveillance data. The fellow will also support capacity building for outbreak preparedness and response through piloting and table top exercises guided by the TDH HIV/HCV outbreak response plan. The fellow will also be expected to participate in 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 field investigation report writing. The fellow will also be responsible for designing and managing an analysis of trends in perinatal transmission of HIV and HCV in Tennessee, with a focus on understanding the barriers and outcomes to determining HIV and HCV serostatus in children.

Collaboration with local, regional and state health department staff, as well as agencies outside of TDH such as the CDC, will be necessary. Through these activities, fellows will be closely engaged with our internal and external partners and will have the opportunity to build critical and systems thinking to solve problems and innovate. Placement at TDH will afford the fellow an opportunity to get a true grassroots experience, which will make their future insights into perinatal HIV/HCV surveillance and outbreak planning and response, invaluable. The fellow will be mentored and supported to complete all of the fellowship requirements, and will be encouraged to present their work at local and national meetings and publish findings in peer-reviewed journals.

### **Day-to-Day Activities**

- Attend weekly CEDEP and HIV/STD/Viral Hepatitis surveillance meetings.
- Participate in HIV and/or HCV cluster identification and outbreak investigations.
- Serve as a consultant for local and regional health department staff on questions regarding HIV/HCV outbreak investigations.
- 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.
- Develop and maintain enhanced HIV/HCV surveillance monitoring and reporting tools, including internal and public-facing data dashboards and epidemiologic profiles/reports.
- Analyze data from Tennessee's surveillance systems including the Enhanced HIV/AIDS Reporting System (eHARS), National Electronic Disease Surveillance System (NEDSS) Based System (NBS), and vital records (e.g., birth certificates).
- Develop a best practices guide for tracking HIV and/or HCV perinatally exposed infants and improving testing and linkage to care efforts.
- Collaborate with regional/local health department staff, community partners, and other state health departments to determine HIV/HCV serostatus of children whose disease status is unknown.
- Building a Research Electronic Data Capture (REDCap) database to document information acquired and track patient/provider contact attempts.
- Prepare presentations and deliver presentations at state and national meetings.
- Lead and/or support the writing and development of manuscripts and reports.

## Potential Projects

### **Surveillance Activity      Development of integrated HIV and VH surveillance data monitoring and reporting tools**

New diagnoses of HIV disease and deaths from HIV/AIDS have gradually decreased over the past five years. These decreases can be attributed to the availability of antiretroviral medications through the Ryan White Part B Program, behavioral interventions performed by our HIV Prevention Program, Partner Services (PS) activities conducted through our STD Program, and vast improvements in the timeliness and availability of HIV laboratory data from our Surveillance and Epidemiology Program. However, HIV disparities by gender, race/ethnicity, HIV transmission risk, and geography persist throughout Tennessee and rates of new diagnoses are significantly higher than other regions in the United States. In addition, Tennessee has one of the highest reported case rates of acute HCV infection in the nation and case rates are on the rise. Tennessee, along with three other states in Central Appalachia, demonstrated a 364% increase in reported acute HCV from 2006 to 2012 among individuals aged 30 years and younger. Case rates were twice as high in non-urban compared to urban areas, and approximately 73.0% of individuals reported past or present injection drug use (IDU) behavior. Additionally, Tennessee is observing an uptick in persons who use illicit drugs intranasally, specifically among vulnerable populations.

Currently, the HIV and VH programs have a need for focused efforts to develop HIV and HCV epidemiologic profiles, and data visualization and reporting tools that can be used to better monitor and track the HIV and HCV epidemics in Tennessee. Current HIV and HCV case reporting tools are not sufficient to effectively monitor these epidemics, particularly given our vulnerability to an outbreak in several regions throughout the state. The fellow would have the opportunity to develop these products, collaborating across the HIV and Viral Hepatitis programs, to include data dashboards for internal and external use. Processes need to be modernized for usability by central office and in the field, to rapidly detect and investigate possible HIV clusters, and inform prevention and care resources in emergent regions and priority populations. The fellow would be actively involved in translating HIV and VH surveillance data into public-facing products, which is critical for stakeholders relying on these data to guide local prevention and care programs.

### **Surveillance Evaluation      Evaluation of the Tennessee Department of Health Enhanced HIV/AIDS Reporting System (eHARS) and the NEDSS Based System (NBS) to Conduct Perinatal HIV and HCV Surveillance**

Tennessee's Enhanced HIV/AIDS Reporting System (eHARS) is a browser-based application provided by the Centers for Disease Control and Prevention (CDC). TDH's HIV Surveillance Program uses eHARS to collect and monitor information on individuals who are newly diagnosed or living with HIV in Tennessee. Information entered and stored in eHARS includes HIV test results, viral load, and CD4 count and percentage. This data system is critical for investigation of potential HIV cases,

management of data on current persons living with HIV, analyzing information to monitor and direct resources for addressing the HIV epidemic in Tennessee, and reporting data to CDC.

At TDH, VH data are extracted from the NEDSS Based System (NBS) in real-time by accessing the DataMart via a secure Open Database Connectivity (ODBC) connection through Statistical Analysis Systems (SAS). All surveillance activities are tracked within NBS including laboratory reports and individual patient investigations. Laboratory reports indicative of acute HBV and/or HCV infection are reviewed and field investigated by the regional staff corresponding to the address of the patient.

The fellow would fill a critical role in evaluating the effectiveness of eHARS and NBS to conduct perinatal surveillance and develop recommendations for improvement of data collection and analysis. The fellow will utilize the CDC Guidelines for Evaluating Public Health Surveillance Systems for the evaluation of these surveillance systems, with a particular focus on the following attributes:

- **Simplicity** – are the perinatal HIV/HCV case definitions easily applied? Does data flow through the surveillance systems efficiently?
- **Data Quality** – is the information contained in the surveillance systems sufficient to appropriately classify perinatal exposures as a ‘case’ or ‘not a case’?
- **Sensitivity** – identify the proportion of HIV and/or HCV positive pregnant women in each of the surveillance systems compared to the birth registry (counterpart system); we expect that all would appear in both systems and 100% sensitivity would occur for each.
- **Representativeness** – The data contained in the surveillance systems should reflect the true incidence of perinatal HIV and/or HCV in Tennessee. To ensure representativeness, the data contained in the surveillance systems should be frequently evaluated and updated.

Additionally, with respect to each attribute, the fellow will outline any problems identified as well as a recommendation for improvement.

**Trends in Perinatal Transmission of HIV and Hepatitis C Virus (HCV) in Tennessee:**  
**Major Project    Understanding the Barriers and Outcomes for the Determination of HIV and HCV Serostatus in Children**

TDH proposes focusing heightened surveillance efforts on emerging at-risk populations, namely women of reproductive potential and pediatric exposures to HIV and/or HCV. Recognizing the need for a nuanced understanding of these vulnerable populations, the fellow will be responsible for identifying trends in perinatal HIV and or HCV in Tennessee as well as barriers encountered when attempting to determine serostatus of these children. Barriers to acquiring this information include, but are not limited to: complicated testing algorithms for determining HIV status, children being placed into the foster care system, and collaborating with the eight states bordering Tennessee.

In the context of this assignment, the fellow will conduct active surveillance to augment the routine passive surveillance activities currently in place by the HIV/STD/ H program. This project will integrate HIV and HCV perinatal surveillance and track outcomes among exposed children. The fellow will employ a Care and Prevention in the United States (CAPUS) model to 1) determine the HIV and HCV

status of infants known to be exposed to either HIV or HCV but not appropriately classified as positive or negative for disease and 2) cultivate community engagement and partnership building with organizations, providers, and health department staff in the public health regions.

Specific activities will include examining the HCV variable in provisional weekly birth certificate data to determine if previously unidentified HCV positive pregnant women have not been appropriately tested and/or reported to the health department. In addition, the fellow will define a cohort of HIV and HCV exposed infants and matching children to eHARS and NBS to determine if they were tested for disease and classified appropriately. Collaborating with regional/local health department staff, community partners, and other state health departments to determine serostatus of children whose disease status is unknown, will be a critical function of this project. The fellow will also have the opportunity to build a REDCap database to document information acquired and track patient/provider contact attempts, and work within eHARS and NBS to append acquired information to patient records. Project deliverables will also include a best practices guide for tracking HIV and/or HCV perinatally exposed infants, improving testing and linkage to care efforts, and deconstructing siloes.

**Additional Project      Implementation and Evaluation of the TDH HIV/HCV Outbreak Response Plan in Western Tennessee**

While Tennessee experienced a 36% reduction in newly diagnosed HIV infection cases rates from 2008 to 2013, the 2015 HIV outbreak related to IV drug use in Scott County, Indiana raised significant concern regarding the potential for a similar outbreak in Tennessee. The CDC conducted an analysis to identify U.S. counties where people who inject drugs (PWID) appear especially vulnerable to the rapid spread of HIV infection, if introduced, as well as to new or continued increases in HCV. Forty-one of the 220 counties identified in this analysis as being most vulnerable to such an outbreak are located in Tennessee (predominantly Eastern Tennessee). Vulnerability to the intersection of these epidemics is driven by extremely high rates of opioid use and abuse. Patterns of opioid prescribing and downstream consequences of opioid abuse are problematic throughout the United States, and even more marked in Tennessee. For example, while the total number of opioid pain relievers in the United States has dramatically increased in the U.S. over the past 25 years, Tennessee continues to demonstrate some of the highest opioid prescribing rates in the country (consistently ranking in the top five). Opioids, both prescription and illicit, are the main drivers of drug overdose deaths in Tennessee. From 2014 – 2015, Tennessee experienced a significant increase (13.8%) in the rate of overdose deaths.

As the HIV and VH programs continue to build statewide capacity for outbreak preparedness and response, the Fellow will have an opportunity to play an active role in expanding upon the HIV/HCV Outbreak Response (OR) Plan developed in 2016. While OR tools have been piloted in the context of a cluster investigation in Eastern Tennessee and classroom setting in Central Tennessee, they need to be introduced in the Western part of the state. Given the high rates of HIV in Memphis, and the identification of HIV/HCV outbreak vulnerability in West Tennessee region, a classroom exercise

needs to be conducted. The purpose of this exercise will be to identify which stakeholders should be incorporated into the information flow of the OR plan and assess user-friendliness of the questionnaire for the DIS. The fellow will take the lead on planning and conducting this exercise and as a result, will gain experience in outbreak detection, planning, and response.

### **Preparedness Role**

As described in 'Potential Fellow Projects' HIV/HCV outbreak preparedness and response will be a core component of the fellow's role within our section, with a particular focus on the Western Region of Tennessee. The fellow will also work closely with all regional surveillance staff to provide technical assistance (TA) for investigation of and response to potential transmission clusters, as needed. In addition, the fellow will become familiar with the State Health Operations Center and receive training in Incident Command System (ICS) for public health outbreak investigations. The fellow will also serve as surge capacity during any CEDEP-related outbreaks and emergency response activities (not just HIV/HCV). This may include participation in Community Assessment for Public Health Emergency Response (CASPER) activities and opportunities will exist for the fellow to participate in emergency response training, exercises, and events during the course of the two-year fellowship.

### **Mentors**

<b>Primary</b>	Meredith Brantley PhD MPH Director of HIV/STD Surveillance & Epidemiology/Epidemiologist 3
<b>Secondary</b>	Lindsey Sizemore MPH Director of Viral Hepatitis/Epidemiologist 3