

**ID: 59163254**

**Infectious Diseases, Maternal and Child Health - Host Site Description**

**Tennessee Department of Health**

**Assignment Location:** Nashville, US-TN  
Tennessee Department of Health  
Communicable and Environmental Diseases and Emergency Preparedness

**Primary Mentor:** Rand Carpenter, DVM; BA  
HIV/STI/Viral Hepatitis Section Director  
Tennessee Department of Health

**Secondary Mentor:** Heather Wingate, MPH; BS  
Viral Hepatitis Surveillance Director  
Tennessee Department of Health

**Work Environment**

Hybrid

**Assignment Description**

The fellow will be housed within CEDEP's HIV/STI/Viral Hepatitis Section, which oversees surveillance and outbreak detection, early detection, and rapid response for each of the named conditions. The section also strives to improve access to prevention, testing, and treatment within Tennessee.

In addition to the three mentors, the fellow will be given the opportunity to collaborate with our five other epidemiologists each day. The fellow will participate in routine surveillance activities to gain an understanding of programmatic goals, processing laboratory data, matching datasets, creating investigations, and transmitting data to CDC.

The fellow will become completely immersed in our section, affording frequent collaboration with our programmatic nurse navigators, local and regional health department staff, and partnering agency members. Each epidemiologist is encouraged to submit at least one abstract to a national conference and to participate in relevant manuscript development; the fellow will be supported by our program to participate in these opportunities as well.

The fellow's anticipated daily activities include:

- Attend regular programmatic meetings
- Attend weekly CEDEP surveillance meetings
- Attend monthly HIV/STI/VH epidemiologist huddles
- Attend statewide epidemiology trainings
- Conduct surveillance and quality assurance assessments related to STI and HCV in pregnancy and perinatal exposures
- Provide statistical and analytical support for ongoing and upcoming surveillance and prevention projects across HIV, STI, and Viral Hepatitis Programs
- Perform quality assurance and quality improvement of STI/HCV data within the National Electronic Disease Surveillance System (NEDSS) Base System (NBS)
- Participate in cluster or outbreak investigations and monitoring within the HIV/STI/Viral Hepatitis section
- Collaborate with programmatic staff to develop abstracts, presentations, and/or manuscripts to share at state and national meetings or submit to peer-reviewed journals
- Assist with REDCap survey designs, analyze collected survey data, and summarize findings

**ID: 59163254**

**Infectious Diseases, Maternal and Child Health - Host Site Description**

**Tennessee Department of Health**

**Describe Statistical and Data Analysis Support, Such as Databases, Software, and Surveillance Systems Available to the Fellow**

The fellow will be provided with access to the following systems and software: SAS, SQL Server, Python, R Studio, ArcGIS, Tableau, PowerBI, REDCap, the standard Microsoft Suite, and National Electronic Disease Surveillance System (NEDSS) Base System (NBS). They will receive technical training from program mentors as well as classroom and online training.

**Projects**

**Surveillance Activity Title: Enhanced Surveillance for pregnancy among persons living with HIV, hepatitis C, and untreated syphilis**

*Surveillance Activity Description:*

This activity will involve building surveillance capacity to identify infections in pregnant and reproductive-age populations. The fellow will need to utilize the TN National Electronic Disease Surveillance System Base System (NBS) to extract information on this population (investigation and laboratory report data). They will identify other data sources to link to for ascertaining current pregnancy status (e.g., EMRs, TennCare [TN's Medicaid program]). Daily activities will include data extraction, data cleaning, data analysis, and the development of a surveillance dashboard.

*Surveillance Activity Objectives:*

- Build surveillance capacity to identify persons living with hepatitis C, HIV, or untreated syphilis who are reproductive-aged or currently pregnant
- Identify cases of co-infection
- Create a Standard Operating Procedure (SOP) outlining base practices for pregnancy ascertainment
- Develop code to capture and analyze pregnancy status among HIV, STI, and viral hepatitis cases

*Surveillance Activity Impact:*

The activity would improve the identification of HIV, STI, and hepatitis C in pregnant and reproductive-age populations. This data will be used to develop surveillance reports and expand our navigation efforts. Additionally, this syndemic approach would allow for the identification of co-occurring infections among TN's pregnant population.

**Surveillance System Evaluation Title: Evaluation of Pregnancy Status Reporting via electronic laboratory report for HIV, STI, and Viral Hepatitis**

*Surveillance System Evaluation Description:*

Pregnancy status is required to accompany all positive reportable disease laboratory reports, yet it is rarely reported. The fellow will work with the Surveillance Systems and Informatics Program to evaluate HL7 messages for reporting of pregnancy status, particularly among HIV, STI, and Viral Hepatitis conditions. They will also utilize other fields within the laboratory report and investigation to confirm pregnancy status (e.g., reason for testing, ordering provider type). The fellow will develop a process for early detection of pregnancy status, assist with strategic outreach to laboratory reporters, and ultimately improve surveillance of pregnant persons impacted by the syndemic.

*Surveillance System Objectives:*

Objective One: Assess positive predictive value, sensitivity, and representativeness of laboratory-reported pregnancy status.

Deliverables:

- Calculate positive predictive value (PPV) and sensitivity by condition

**ID: 59163254**

**Infectious Diseases, Maternal and Child Health - Host Site Description**

**Tennessee Department of Health**

- Calculate PPV and sensitivity by laboratory and/or ordering provider to assess representativeness of this incoming surveillance data and help prioritize outreach efforts.
- Create dashboard for ongoing monitoring and final report outlining achievements and next steps for surveillance improvements.

Objective Two: Establish best practice for identifying possibly pregnant people living with HIV, STIs, or viral hepatitis and other conditions with incoming HL7 data.

Deliverables:

- Standard Operating Procedure for identifying possibly pregnant persons with acute STI conditions or living with HIV or HCV
- Code adaptable across the HIV/STI/VH Section. Ideally, the code would identify new possible pregnancies among all existing HIV/STI/VH patients
- Dashboard to visualize possibly pregnant cases or a notification system for high-priority possibly pregnant patients

*Surveillance System Impact:*

Identifying these populations will enable us to expand our navigation and linkage-to-care efforts. Developing a disease-agnostic pregnancy flag will help with early intervention among populations who may have significant barriers to care.

**Major Project Title: Analysis of TN SPARK (Secure Platform for Analytics, Research and Knowledge) data for generating an integrated “Syndemic” risk profile**

*Major Project Description:*

Over the last five years, the TDH Office of Informatics and Analytics has worked to implement the first-ever TDH data lake, “SPARK”. This system integrates data from various systems across TDH, allowing users to access all a person’s data in a single place. The potential application within the TDH HIV/STI/Viral Hepatitis Section is currently under evaluation. The fellow will explore the use of SPARK as a basis for developing an integrated cluster-detection and response in STI/HIV/Viral Hepatitis.

*Major Project Objectives:*

- Compare SPARK patient profiles to those in NBS for a selection of patients
- Aggregate transmission risk information across HIV, STI, and Viral Hepatitis investigations
- Work with program staff to develop an algorithm or rubric for addressing discrepant values across systems. For example, if a patient is reported as using injecting drugs in one system but not another.
- Incorporate syndemic risk factors into existing cluster-detection processes.
- Update current workflows to incorporate SPARK across the section (e.g., identifying postpartum persons)

*Major Project Impact:*

Aggregating information collected from the same patient across conditions can reduce duplication, undermatching, workload, and ensure we have a full picture of the patient and population needs.

**Additional Project #1 Title: Evaluation of Unreported HBV/HCV Cases in Pregnant and Postpartum Persons Utilizing Death Certificates and Hospital Discharge Data System (HDDS) files**

**Project #1 Type: Surveillance Activity**

*Project #1 Description:*

Unreported cases of HBV/HCV have a significant impact on viral hepatitis surveillance and the ability to appropriately link clients to care and harm reduction services. Multiple sources have been identified that track the incidence of HBV/HCV but do not necessarily involve formal case reporting. Two of these sources are death certificates and HDDS

**ID: 59163254**

**Infectious Diseases, Maternal and Child Health - Host Site Description**

**Tennessee Department of Health**

data. In death certificates, causes of death are listed by ICD-10 codes to include whether HBV/HCV was a contributing factor. Likewise, HDDS tracks in-patient and out-patient hospitalization, including whether HBV/HCV was among the ICD-10 codes classified for diagnosis.

*Project #1 Objectives and Expected Deliverables:*

- Identify unreported cases of HBV/HCV using ICD-10 codes in death certificates
- Create enhanced algorithms with HDDS data using ICD-10 codes to identify unreported cases of HBV/HCV
- Collaborate with the data entry team and Surveillance Systems and Informatics Program to request unreported laboratory backlogs and medical records
- Create a Standard Operating Procedure outlining newly developed processes and best practices
- Develop code and REDCap Project to analyze and collect data

*Project #1 Impact:*

Incorporating data from death certificates and ESSENCE will improve identification of HBV/HCV cases that may otherwise go unreported. Proper identification will increase the accuracy and completeness of surveillance data and aid in the timely linkage to care and supportive services for birthing parents and/or their exposed infants.

**Additional Project #2 Title: Analysis of STI reinfection rates and treatment failure in Tennessee**

**Project #2 Type: Surveillance Activity**

*Project #2 Description:*

Timely treatment of persons diagnosed with STIs and their partners is essential to slowing the STI epidemic. Reinfection rates among Tennesseans have not been evaluated in recent years. Reinfection indicates a partner or partners may not have been treated and may warrant changes in our efforts to reach patients and their partners. Additionally, in 2023 and 2025, shortages of penicillin G benzathine, the frontline treatment for syphilis, led to rationing of this medication and use of doxycycline for all non-pregnant patients for >12 months combined. Non-compliance with a doxycycline regimen (14 or 28 days of oral medication) is likely, but difficult to measure once a patient leaves with their prescription. The fellow will compare patients who received the doxycycline regimen to those who received the traditional penicillin regimen.

*Project #2 Objectives and Expected Deliverables:*

- Determine the proportion of gonorrhea and syphilis cases that could be reinfections. Elements to consider include: 1) whether a partner was identified and successfully treated, 2) results from subsequent lab reports, 3) additional treatments administered.
- Breakdown STI reinfection rates by age, sex, and geography
- Syphilis only: doxycycline vs. penicillin and pre- and post-Bicillin shortage.
- Present reinfection rates on statewide STI manager call
- Determine if there is a way to proactively identify patients with possible treatment failure and flag them in TDH REDCap data quality reports.

*Project #2 Impact:*

Understanding reinfection rates will help regional health departments target outreach. Additional efforts to contact and educate patients or to consider alternative treatments may be needed for individuals with apparent reinfections or treatment failure. Understanding the impacts of the Bicillin shortage may help the STI Program refine its Bicillin management strategy during future shortages.

**ID: 59163254**

**Infectious Diseases, Maternal and Child Health - Host Site Description**

**Tennessee Department of Health**

**Please Describe the Fellow's Anticipated Role in Preparedness and Response Efforts – Include Activities and Time Allocation (Required Competency of Fellowship)**

As part of the HIV/STI/Viral Hepatitis Section, the fellow will become familiar with an integrated outbreak response plan, complete Incident Command System (ICS) training, and learn about the State Health Operations Center (SHOC). Familiarity with these plans and infrastructures will enable the fellow to participate in any outbreak response efforts within the HIV/STI/Viral Hepatitis Section, as well as serve in surge capacity in the event of an outbreak requiring CEDEP response.

High rates of hepatitis C can be indicative of drug use transmission networks and often precede HIV and outbreaks. Regular HIV/STI/Viral Hepatitis Network meetings are hosted to view current trends and ensure rapid response to clusters/outbreaks. The fellow will be expected to actively participate in these meetings.

Anticipated Time Allocation: 5-15 hours per month

**Please Describe the Fellow's Anticipated Role in Cluster and Outbreak Investigations – Include Activities and Time Allocation (Required Competency of Fellowship)**

The fellow will participate in any cluster or outbreak investigations with the HIV/STI/Viral Hepatitis Section during their fellowship. In accordance with our HIV/Viral Hepatitis Outbreak Response plan, the fellow will participate in regular calls, fieldwork, and training on HIV and viral hepatitis transmission, prevention, and rapid HIV and HCV testing. In the event that no HIV, STI, or viral hepatitis clusters/outbreaks occur during their tenure, the fellow will be asked to assist another CEDEP Program with its outbreak response efforts.

Anticipated Time Allocation: approximately 10-15 hours per week for 4-12 weeks HIV/STI/Viral Hepatitis outbreak; approximately 20 hours per week for 4 weeks assisting another CEDEP Program with acute outbreak response