ID: 34589863
Infectious Diseases - Host Site Description
Tennessee Department of Health

Assignment Location: Nashville, US-TN
Tennessee Department of Health
HIV/STI/Viral Hepatitis Section

Primary Mentor: John Dunn, DVM, PhD, EMBA
State Epidemiologist
Tennessee Department of Health

Secondary Mentor: Steffany Cavallo, MPH
Sexually Transmitted Infections Program Director/Epidemiologist 3
TN Department of Health

Work Environment
Hybrid

Assignment Description

The fellow will gain a detailed understanding of HIV, STI, and Viral Hepatitis surveillance and programmatic activities, with a particular focus on syphilis. The fellow will become familiar with application of STI CDC/CSTE case definitions to assign appropriate case status, HIV and viral hepatitis cluster detection, conducting STI and other field investigations, and database and data quality management.

The fellow will have the opportunity to develop solutions and implement tools to enhance monitoring, reporting, and dissemination of STI, HIV and Viral Hepatitis surveillance data. The fellow will participate in outbreak detection and response activities, with a particular focus on assisting the STI program to enhance outbreak detection. 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.

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, this fellow 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. 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.

Fellow's anticipated day to day activities:

- Attend weekly CEDEP surveillance meetings.
- Participate in HIV, STI, and/or Viral Hepatitis cluster detection and outbreak investigations.
- Participate in the STI Outbreak Response Plan Workgroup.
- Serve as a consultant for local and regional health department staff on questions regarding HIV/STI/Viral Hepatitis outbreak and cluster investigations.
- Provide data analysis and report writing support to local and regional health departments.
- Attend all statewide epidemiology trainings including CEDEP conference calls and face-to-face meetings (when they resume).
- Conduct special studies to include aspects of study design, implementation, and analysis.

- Support STI epidemiology staff in development and maintenance of enhanced surveillance monitoring and reporting tools, including data dashboards, data quality reports 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) Base System (NBS), Patient Reporting Investigation Surveillance Manager (PRISM) and vital records (e.g., birth and death certificates).
- Prepare and deliver presentations at state and national meetings.
- Lead and/or support the writing and development of manuscripts and reports.
- Use results of congenital syphilis case control study (to be completed mid-2023 by the current CSTE Fellow Officer) to identify additional intervention opportunities or areas for collaboration in Tennessee to control congenital syphilis rates. Determine if regular monitoring of additional data sources (live birth datasets, hospital discharge datasets) may be useful for tracking progress.
- Assist with monitoring syphilis rapid testing pilots throughout the state, by monitoring test ordering, sites at which tests were used, positivity rates, and summarizing for leadership.

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

The fellow will receive hands-on training on the use and application of multiple databases and surveillance systems, including NBS, PRISM, eHARS, Epi Info, and Research Electronic Data Capture (REDCap). Available statistical analysis software include GIS for Health, Statistical Analysis System (SAS), SQL, R, and Tableau; support and training will be provided via primary and secondary mentors, in addition to formal classroom and online training.

Projects

Surveillance Activity Title: Using laboratory volume data to enhance STI cluster detection in Tennessee

Surveillance Activity Description:
STI case investigation is a labor and time-intensive process. In Tennessee, the sheer volume of STIs such as Chlamydia (>35,000 cases per year) and Gonorrhea (>18,000 cases per year) mean that some jurisdictions are not able to do full investigations, or there are significant time lags to investigation. Historically the STI program has generated threshold reports to identify increases in chlamydia, gonorrhea, or syphilis that are based on completed case investigations. However, these threshold reports are not timely and therefore may limit our ability to adequately detect clusters. This project involves evaluating the usefulness of a laboratory-report based cluster detection system. At TDH most lab reports come in via ELR directly from laboratories throughout Tennessee and are therefore fairly timely. By comparing lab volume from week to week, we may be able to detect clusters early and instruct local DIS in health departments on how to prioritize their work.

Surveillance Activity Objectives:

- Conduct a literature review on STI cluster/or other laboratory report-based aberration detection strategies.
- Meet with TDH HIV and Viral Hepatitis epidemiologists to understand cluster detection activities for these pathogens and where collaboration may be optimal.
- Review incoming lab data for the last 5 years, compare volume of lab reports to proportion that become cases based on the CDC case definition.
- Identify pros and cons of using lab data for cluster detection and whether it is suitable for STI cluster detection.

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Surveillance Activity Impact:
Better cluster detection systems will assist Tennessee public health staff with targeting intervention and education activities to reduce burden. In the context of overflowing workloads, the more rapidly we can detect aberrations the more quickly we can adjust our response to be more strategic. If useful, this project could inform development of CEDEP-wide laboratory report-based cluster detection activities.

Surveillance System Evaluation Title: Evaluation of the Tennessee Department of Health Congenital Syphilis Surveillance System

Surveillance System Evaluation Description:
Congenital syphilis (CS) has grown at an alarming rate in Tennessee in the last five years; cases have gone from an average of 4 per year from 2011-2015 to 61 in 2022 and are projected to be even higher in 2023. Babies with CS often have serious health consequences ranging from prematurity to death. Some may not have symptoms at birth, and if the mother is not screened, could go undiagnosed and treated for months or years; further, if the mother is untreated, they could have additional future babies born with CS. Therefore, it is important that every single case of CS be identified so that mom and baby can be appropriately treated. Building off the work completed by the previous CSTE fellow the fellow will evaluate the congenital syphilis surveillance system to answer two primary questions: 1. How good is our current surveillance system at detecting pregnant partners of patients infected with syphilis? 2. How sensitive is our surveillance system to detecting syphilis in pregnancy, as compared to vital statistics data?

Surveillance System Objectives:
- Extract syphilis diagnosis and partner data from PRISM and NBS
- Link STI surveillance and partner data to vital statistics data, then:
    - Identify syphilis patients who are also named in the vital statistics files as parents within their syphilis infectious period.
    - Determine if their partner was previously identified as pregnant.
    - Calculate sensitivity of our surveillance system for detecting pregnant partners
- Compare the 'syphilis diagnosis' field in vital statistics datasets (live birth and fetal death) to the STI surveillance system. Calculate the Predictive Value Positive for the syphilis diagnosis field in the vital statistics data.
- Analyze NBS user Customer Satisfaction survey data to assess impact of the new surveillance system (NBS) on congenital syphilis surveillance attributes such as simplicity, acceptability, and timeliness.

Surveillance System Impact:
Congenital syphilis is 100% preventable if women who are pregnant are screened and then treated at least 30 days prior to delivery. Evaluating our ability to detect this outcome (CS) will help ensure we are appropriately identifying at risk women and are able to prevent CS in the future.

Major Project Title: Using Hospital Discharge Data to supplement STI/HIV Surveillance data

Major Project Description:
Hospital Discharge Data is a very robust data set that can give us important information about our patient population. Traditionally stigmatized behaviors such as drug use are often under-reported during public health interviews. This project would explore the feasibility of using hospital discharge data to generate supplemental information on HIV/STI patients that could be used to better target resources and response to clusters. This project will help us better understand the intersection of drug use, STIs and HIV in Tennessee as well as healthcare utilization in this patient population.

ID: 34589863
Infectious Diseases - Host Site Description
Tennessee Department of Health

Major Project Objectives:

- Conduct a literature review on hospital discharge data and how it has previously been used in combination with surveillance activities.
- Meet with TDH HHDS and STI, HIV, and Viral Hepatitis surveillance directors to clarify project and data needs.
- Identify elements that will allow for linking these datasets.
- Draft project outline and analysis plan.
- Submit data request and IRB approval, if required.
- Analyze the impact of the more complete data; including comparison of cluster detection with supplemental information and without.
- Summarize findings in a written report, including a specific focus on whether this data could be used during field or outbreak investigations.

Major Project Impact:
As getting patients to agree to interviews becomes more challenging in the post-COVID era, exploration of all the data available to us is not only necessary but efficient. Accurately understanding transmission dynamics of STIs and HIVs is of critical importance as both of these epidemics continue to grow in TN.

Additional Project #1 Title: Intersection of Neonatal Abstinence Syndrome and Congenital Syphilis Surveillance
Project #1 Type: Surveillance Activity

Project #1 Description:
This activity is intended to understand what, if any, overlap exists between mothers who have had a congenital syphilis baby and those who have had a baby diagnosed with neonatal abstinence syndrome (NAS).

Project #1 Objectives and Expected Deliverables:

- Meet with the NAS Surveillance team to understand their surveillance system.
- Identify common identifiers and link NAS data with syphilis data
- Assess the number of matches and how many were previously known to the STI program
- Present findings at internal STI, CEDEP and Family Health and Wellness (FHW) meetings

Project #1 Impact:
Understanding the number of individuals who deliver a CS baby that are also diagnosed with NAS will allow more target prevention of CS in certain populations. Also, further understanding the scope of babies with both CS and NAS is essential in accurately describing the current increase in cases.

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 elicited or treated and may warrant changes in our efforts to reach patients and their partners. Additionally, in 2023, 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. 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 chlamydia, gonorrhea, and syphilis cases that could be reinfections.
- Breakdown reinfection rates by age, sex, and geography.
- Assess possible treatment failure among persons diagnosed with gonorrhea.
- Assess possible non-compliance/treatment failure among persons who received doxycycline vs. penicillin.
- Present reinfection rates on statewide STI manager call.

Project #2 Impact:
Understanding reinfection rates will help regional health departments target outreach. Additional efforts to contact and educate, or alternative treatments may be needed for individuals with apparent reinfections or treatment failure.

Additional Project #3 Title: Public facing congenital syphilis dashboard
Project #3 Type: Surveillance Activity

Project #3 Description:
Description: There has been a rapid increase in congenital syphilis across the country and in Tennessee. Between 2021 and 2022 cases nearly doubled in Tennessee (from 36 to 61). With the current attention congenital syphilis is receiving nationally it is essential that interested parties have access to the data in a digestible manner. This dashboard will be built with tableau using NBS and PRISM data.

Project #3 Objectives and Expected Deliverables:

- Take Tableau trainings offered by TDH.
- Work with epidemiologist in the STI program to understand the backend of NBS and PRISM and potential concerns around congenital syphilis data.
- Meet with STI team to understand what questioned are frequently asked about congenital syphilis to best construct the dashboard. Complete a review of available dashboards on congenital syphilis and describe the strengths and weakness of them.
- Understand TDH branding standards and data suppression rules.
- Construct the dashboard and upload it to the public server.

Project #3 Impact:
The ability to share data with the public and other external stakeholders is an essential part of public health. By creating an interactive dashboard, the fellow will demonstrate an understanding of congenital syphilis surveillance data, data visualization skills, and the importance of sharing data with the public.

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

HIV/STI/Viral Hepatitis outbreak preparedness and response will be a core component of the fellow's role within our section. The fellow will participate in STI Outbreak Response Plan Work Groups and will assist with drafting incorporating STI elements into the existing HIV/HCV Outbreak Response Plan. They will also work closely with all regional surveillance staff to provide technical assistance for investigation of and response to potential 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/STI/Viral Hepatitis). Time allocation: 5-10 hours/month.

ID: 34589863
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Tennessee Department of Health

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

The fellow will be expected to participate in any HIV//STI/Viral Hepatitis cluster or outbreak response that occurs during their tenure. If no outbreaks are reported by year 2 of their fellowship, the fellow will be expected to assist with an outbreak within other CEDEP program areas including foodborne diseases or healthcare associated infections. Expected time allocation: 10 hours/week for 4-12 weeks for a HIV/VH/STI outbreak or ~20 hours/week for 3 weeks for an acute CEDEP outbreak response.

Please Describe the Fellow's Anticipated Role in the COVID-19 Response – Include Activities and Time Allocation

Major COVID activities are currently staffed by a dedicated COVID workforce therefore the fellow is unlikely to be pulled into COVID activities at the expense of other fellowship activities. Depending on interest, the fellow may assist with the Tennessee COVID-19 in pregnancy project which is co-led by the Viral Hepatitis program director as it utilizes the Surveillance for Emerging Threats to Mothers and Babies Network (SET-NET) infrastructure developed for perinatal hepatitis C surveillance. Their potential role on this project could include listening in on monthly internal calls and assisting the Special Projects Epidemiologists with data cleaning, data analysis, quality assurance, and data visualization as needed. Expected time allocation: 5-10 hours per month.

Please Describe Opportunities for Fellows to Work in Health Equity as well as Incorporating Diversity, Equity, and Inclusion into their Work

The HIV/STI/Viral Hepatitis Section has a workgroup called CAReS (Cultural Awareness and Reducing Stigma) which was kicked off in late 2019. Its purpose is to address the public health impact of bias and discrimination on various populations, including people of color, LGBTQ+, and persons who use drugs. The fellow will be expected to participate in program-wide CAReS activities and will have the opportunity to become an active member in the CAReS workgroup. Diversity, equity, and inclusion is important both to how our section works internally, and how we do our public health work. We expect all employees, fellows, and interns to understand the impact of their work on groups that have been marginalized.