## Assignment Description

Tennessee Department of Health’s, the Communicable and Environmental Diseases and Emergency Preparedness Division (CEDEP) works to track the spread of diseases by collecting health information to prevent and contain outbreaks, analyze population health trends, track immunization rates, respond to infectious disease outbreaks, and educate and promote healthy choices for the people of Tennessee. The division is made up of thirteen programs: Emergency Preparedness, Environmental Epidemiology, Environmental Health, Foodborne Diseases, Healthcare Associated Infections, HIV & STD, Immunizations Program, Surveillance Systems and Informatics, Tuberculosis, Vector-borne Diseases, Viral Hepatitis, Waterborne Diseases, Zoonotic Diseases, and Business and Grants Management. More information about CEDEP programs is available on our website: [https://www.tn.gov/health/cedep.html](https://www.tn.gov/health/cedep.html).

Before the first case of the novel coronavirus (COVID-19) was detected in Tennessee, CEDEP worked vigorously to prepare for and respond to this world-wide public health crisis. Under the direction of the TDH COVID Response Team, over 40 response teams have been established to oversee activities directly related to monitoring COVID-19. These activities include but are not limited to: Testing Strategy, Database Development and Maintenance, Data Visualization, Healthcare Preparedness and Response, Clusters, Mortality Verification, Enhanced Mortality Surveillance, Clinician Hotline, Data Entry, Contact Monitoring, Action Plans and Situation Reports. Our fellow will be integrated within CEDEP to assist the Operations Branch with multiple projects focused on COVID-19 surveillance activities, data visualization, cluster detection and response and contact monitoring. A detailed description of these projects is below.

## Day-to-Day Activities

- Work with the Contact Monitoring team to support volunteer callers and answer questions regarding quarantine and isolation from COVID-19 cases and contacts
- Assist the Cluster Monitoring team in identifying clusters of cases, arrange testing if needed, communicate results and document all activities in the Cluster Monitoring database and the NEDSS Based System (NBS)
- Attend and lead sections of the daily COVID-19 check-in for public health meetings;
- Actively participate in daily COVID-19 Operations meetings;
- Meet regularly with Data Visualization and Data Quality teams to coordinate activities between the two groups;
- Review ESSENCE to track patient chief complaints and discharge diagnoses from 95 emergency departments across the State;
- Attend all statewide epidemiology trainings including monthly CEDEP conference calls and face-to-face meetings;
- Contribute to developing the Tennessee Weekly Situation Summary
- 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

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<tr>
<th>Surveillance Activity</th>
<th>Cluster Monitoring Support</th>
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The Tennessee Department of Health (TDH) has a team dedicated to the identification and management of COVID-19 clusters. A COVID-19 cluster is defined as two or more confirmed cases of COVID-19 linked by the same location of exposure (e.g., prison, long-term care facility) or event (e.g., work party, vacation, etc.) excluding household exposures. Once a cluster is identified, Central Office TDH staff work closely with local and regional health department colleagues and facility staff to swiftly isolate confirmed cases, test close contacts and symptomatic employees/residents and report number of confirmed and probable cases, hospitalizations and deaths.

Our fellow will work with the COVID-19 Cluster Team to provide daily reports to internal partners (the Tennessee Emergency Management Agency, the Unified Command Group, etc.) outlining the facility name, county and city where the facility is located, and the number of associated confirmed cases and deaths. This information will also be published on the TDH COVID-19 website each week. Using data from the TDH COVID-19 Cluster Questionnaire, our fellow will lead efforts in using data visualization software to develop reports describing affected facilities and the populations they serve. These reports will better inform TDH leadership and facility partners of new and on-going transmission and help determine if additional infection control training and support is needed. If additional training and support is identified at a facility, our fellow will work alongside Healthcare Acquired Infections staff in implementing TDH’s COVID-19 Guidance for Investigations in Healthcare Settings: [https://www.tn.gov/content/dam/tn/health/documents/cedep/novel-coronavirus/TDH-Healthcare-Investigation-Steps.pdf](https://www.tn.gov/content/dam/tn/health/documents/cedep/novel-coronavirus/TDH-Healthcare-Investigation-Steps.pdf).

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<th>Surveillance Evaluation</th>
<th>Comparison of Syndromic Surveillance Data and COVID-19 Reports</th>
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According to the Centers for Disease Control and Prevention (CDC)’s syndromic surveillance provides public health officials with a timely system for detecting, understanding, and monitoring health events. By tracking symptoms of patients in emergency departments, before a diagnosis is confirmed, public health can detect unusual levels of illness to determine whether a response is warranted. More than 80 hospitals in Tennessee protect health by contributing data to CDC’s National Syndromic Surveillance Program. These systems are primarily used to detect illness, injury and other health care
needs after major disasters, such as a hurricane. They are also used to detect for early signs of an outbreak associated with crowding and compromised sanitation at mass gatherings like large festivals (Bonnaroo) and conventions.

Recently TN used syndromic surveillance to identify potential cases of mumps. A patient was seen in a TN hospital and discharged with diagnosis code related to mumps. Only two days later, syndromic surveillance detected and flagged this visit. Public health immediately interviewed the suspected case and conducted confirmatory laboratory testing. Due to public health’s quick intervention, the patient was confirmed to be a true case of mumps, close contacts were assessed and other states were notified of potential exposures. No additional cases in TN were identified.

Using the CDC’s “Guidelines for Evaluating Public Health Surveillance Systems,” our fellow will describe the simplicity, flexibility, data quality, acceptability, sensitivity, predictive positive value, representativeness, timeliness and stability of one large metropolitan health department’s syndromic surveillance system. Our fellow will provide recommendations on how to further modify and improve the system to prepare for the upcoming respiratory season (COVID, influenza, etc.) this Fall. Methods to improve detection of clusters of respiratory diseases in high-risk populations such as Long-term Care Facilities or other congregate settings will be examined. S/he will also conduct a retrospective analysis to determine if this system detected the first signs of COVID-19 in early 2020.

**OTHER IDEAS:**
- Compare THA admission discharge and transfer (ADT) data to our data
- Point-of-care testing (testing clinicians can do in their own office) Evaluate and perform active surveillance in small counties that do point-of-care testing

### Major Project Differences between hospitalized vs. non-hospitalized COVID-19 cases

Currently, there is little known about the demographic, clinical and socioeconomic differences among hospitalized vs. non-hospitalized COVID-19 cases in Tennessee. According to CDC COVID-Net data (March 1-30, 2020), hospitalization rates increased with age (2.5 for age 18-49 vs. 17.2 for those 85 and older). Approximately 90% of hospitalized cases reported having one or more underlying health condition such as obesity, hypertension and diabetes mellitus.

Our fellow will examine demographic (age, sex, race, etc.), location (zip codes, census tract) and clinical history (comorbidities such as obesity, hypertension, diabetes mellitus, etc.) of confirmed and probable COVID-19 cases requiring hospitalization and those who were not. The analysis will inform the TN Unified-Command Group (UCG) if factors such as race, age, sex, comorbidities and socioeconomic status are associated with hospitalization. Findings from this analysis will provide the COVID-19 UCG with information needed to develop interventions, educational campaigns or other activities focused on mitigating the spread of COVID-19 among these high-risk groups.

According to the American Health Rankings, Tennessee continues to rank high for comorbidities such as obesity, hypertension and diabetes, 38th, 45th and 46th respectively. Poverty and lack of health insurance are also prevalent in Tennessee. According to the 2019 Census Tennessee QuickFacts, 12% of Tennesseans under the age of 65 are uninsured and 15% live in poverty. This project is critical in better understanding how COVID-19 infections affect Tennesseans with underlying medical conditions and limited access to medical care.
**Other ideas**

- *Data analysis and dashboard creation*
- *Shape re-opening metrics*
- *Interested in epi curves in cluster community cases (prisons, long-term health care settings vs community)*
- *Analysis of out-of-state cases – survey neighboring states to understand their different reporting metrics and what that means for follow-up on non-resident cases.*

**Additional Projects**

**Contact Monitoring Team Lead:**

Tennessee’s CSTE fellow will serve as a Contact Monitoring Team Lead. As a team lead, they will be responsible for overseeing the daily monitoring effort of Contact Monitoring Interview Teams assigned to a specific health region. Team leads field questions from contact monitors and answer questions from cases and contacts regarding their isolation/quarantine period, symptoms or other pressing issues. Team leads also help identify contacts and cases who continue to go to work during their isolation/quarantine. They are responsible for calling these individuals to stress the importance of not going out in public or providing contacts who are essential workers with CDC guidance on how to keep others safe while at work. Team leads also issue isolation letters, letters of authenticity and release from isolation to cases/contact who request such documentation. Team Leads typically work one to two 8 hour shifts per week and meet weekly with other Team Leads and the Contact Monitoring Directors to discuss successes and challenges.

**COVID-19 Data Liaison**

Our fellow will serve as a liaison between the COVID-19 Data Quality Team and Data Visualization Team. This will allow the Data Quality Team to run data quality reports on the variables used by the Data Visualization Team. The line of communication provided by the CSTE fellow will ensure both teams continue to use similar data sources. Our fellow will also assist each team in refining data quality reports, creating new visualization tools and working with other COVID Operations section to address data quality issues discovered.

**Enhanced COVID-19 Pregnancy Surveillance Module**

Our fellow will assist with the Enhanced COVID-19 Pregnancy Surveillance Module implementation and analysis. The data will help describe risk for severe illness or adverse outcomes among pregnant individuals with laboratory evidence of COVID-19 infection up to delivery and effects to their newborns. Routine activities conducted by our fellow to achieve project goals will be medical record requests, medical chart abstractions and data analysis. Results obtained from this project will help inform public health guidance and risk communication messages expecting/new moms and their healthcare providers.
### Preparedness Role

The mission of TDH’s Emergency Preparedness Program (EPP) is to prepare for, respond to and recover from health emergencies affecting the State of Tennessee. The EPP is responsible for developing plans for the Tennessee Department of Health to protect the health of residents and visitors from the effects of man-made and naturally occurring events. Our fellow will participate in all Incident Command System (ICS) training and certification activities and participate in emergency response activities. They will become familiar with all EPP services and activities including all-hazard planning, interstate cooperation, the Strategic National Stockpile, healthcare preparedness, Medical Reserves Corps and the programs to test emergency response strategies. They will also receive first-hand experience with various information technology services such as the:

- Tennessee Countermeasure Response Network, which allows emergency managers to manage healthcare resources;
- Tennessee Health Alert Network, a secure web-based system used to alert personnel and partners of a public health emergency;
- Healthcare Resource Tracking System, a secure website used to direct ill or injured patients to the appropriate healthcare facility during an emergency;
- Tennessee Volunteer Mobilizer, a system used to register medical and non-medical staff to assist during an emergency.

Our fellow will be incorporated into the Operations Branch of TDH's ICS for COVID response and any other activations of the State Health Operations Center (SHOC). S/he will focus on activities related to just-in-time creation of data collection instruments, analysis and data visualization.

### Additional Activities

**After Action Review**

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 TN public health staff. He/she will work with local, regional and state staff to develop and pilot this plan. Recommendations from frontline and state staff will be evaluated and implemented. A final plan will be presented and will be implemented at the conclusion of foodborne outbreaks led by TN staff. Our fellow will lead After Action Reviews activities during their tenure with TDH and summarize findings.

**Evaluation of WGS implementation in TN and other WGS activities**

Whole-genome sequencing (WGS) has replaced pulsed-field gel electrophoresis (PFGE) as the gold standard for enteric disease cluster identification. WGS provides the ability to identify distinct sub-clusters not distinguishable by PFGE. TDH's State Public Health Laboratory (SPHL) implemented WGS.
for Listeria in 2015 and currently sequences all *Salmonella*, *Campylobacter*, STEC and *Shigella flexneri* isolates. Our fellow will evaluate sequence and analysis timeliness compared to PFGE and will provide recommendations to our SPHL partners on sequencing procedures and communicating results with epidemiologists and CDC. Our fellow will also work collaboratively with the SPHL’s informatics team to develop methods to integrate WGS data into NBS. The impact of culture independent diagnostic testing on WGS in TN will also be assessed by reviewing the volume of specimens vs. isolates received by the SHPL. Our fellow will also be involved with WGS sequence analysis activities and will work with TDH epidemiologists to identify and investigate enteric disease clusters.

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| **Primary** | Mary-Margaret Fill, MD  
Medical Epidemiologist |
| **Secondary** | Kelly Squires, MPH  
Epidemiologist |