Assignment Description

The CSTE fellow will be part of the Epidemiology, Evaluation, Data Science & Informatics Division at DPH. This division is comprised of teams focused on four things: 1) epidemiology, program evaluation and surveillance, 2) disease investigation and outbreak response, 3) clinical and community informatics, and 4) emergency preparedness. These teams partner with communities and health systems to mobilize data-driven action for health. The core capabilities of this division include: analysis and evaluation; strategic partnership; translation and dissemination of public health knowledge; health surveillance and disease control; developing and leveraging informatics infrastructure; capacity building and assistance; and project planning and management. As a part of this division, the fellow will have the opportunity to learn about epidemiology across the spectrum, from outbreak response to disease surveillance to statistical analysis and data visualization. The fellow will be able to collaborate with disease investigators, preparedness planners, epidemiologists, evaluators, analysts, data scientists, and informaticians. In addition, because all epidemiology work at DPH is meant to drive broader programming or systems change, the fellow will have the opportunity to work alongside clinicians, direct service providers, administrators, program coordinators, and specialists from across the organization.

Day-to-Day Activities

The CSTE fellow will have ownership of his or her calendar. The fellow will be supported in managing his or her time to meet expected deadlines and to develop expected deliverables. In any given day, the work could include data analysis or medical record review; participating in division meetings to collaborate on division wide initiatives; leading discussions about advancing goals of the projects of the fellowship; training on a quality improvement tool or resource; learning about community programs by participating in meetings held by community organizations; interviewing relevant hospital or city stakeholders about mutually beneficial needs or interests. The fellow will be supported in using traditional office tools including email and electronic calendars to manage their communication and their time. The fellow will have the opportunity to meet with her or his mentors as often as needed, and they will be available to troubleshoot and problem solve in partnership with the fellow. The fellow will be encouraged to take time away from his or her desk to enjoy lunch or snacks and develop relationships with colleagues and peers across the organization, in order to maintain a positive work-life balance. To that end, the fellow will not be expected to take work home, and the fellow’s mentors will support them in balancing their time to ensure that it is possible to meet the expectations of the fellowship within the normal hours of the workday.
**Potential Projects**

**Surveillance Activity**  
**Understanding the Burden of Suicidal Ideation and Attempts Among Denver Residents**

Suicidal thoughts and behaviors are a major public health problem and currently we lack a meaningful way to understand the burden in Denver. There is growing interest in allocating more city resources toward addressing risk factors for suicidal ideation among Denver youth and city employees. To better understand and support prevention of suicide among Denver residents, the fellow will design a surveillance system that can assess the burden of suicidal ideation and attempt across Denver.

The fellow will conduct a literature review and will engage with local and national public health stakeholders to better understand how other local communities are working to understand the burden of suicidal thoughts and behaviors. This information will then be used to design the surveillance system. Data sources that may be used for this surveillance activity include (but are not limited to): electronic health record data from Denver Health (including behavioral health screening data); health survey data focused directly on suicidal thoughts and behaviors or on risks associated with suicidal thoughts and behaviors (e.g. from the Behavioral Risk Factor Surveillance System, Health Kids Colorado Survey, Pregnancy Risk Assessment Monitoring System, etc.); crisis response data for the county; and emergency department and hospital discharge data for the county. The fellow will be supported in collaborating with multiple stakeholders to collect these data and organize them in databases to allow for analysis and visualization of the findings. Based on the fellow’s interests and the needs of those driving suicide prevention work, the fellow can design an epidemiologic study to deepen the understanding of suicidal thoughts and behaviors in Denver.

This surveillance effort will provide much needed data and infrastructure to guide suicide prevention activities conducted by Denver Public Health and the city and county of Denver. The fellow will translate the findings from the surveillance system to be understood and utilized by non-technical audiences and community partners. Additionally, the fellow will partner with those responsible for implementing behavioral health programming at both the hospital and the city to identify meaningful control measures and interventions.

Through this surveillance activity, the fellow will have the opportunity to learn and practice most of the epidemiologic methods competencies, as well as a number of the communication competencies required for the fellowship.

**Surveillance Evaluation**  
**Examining Electronic Health Records as a System to Identify Youth at Risk for Suicide**

Denver Public Health is affiliated with Denver Health and Hospital Authority (DHHA), the leading safety-net institution serving the Denver community, which includes a trauma-one hospital, several community clinics and school-based health centers. The DHHA health network serves one third of Denver’s youth. As suicide among youth is one of the greatest public health concerns in the Denver community, it is essential that our health system is able to identify youth who are experiencing suicidal ideations, who inflict self-harm, or attempt suicide. Accurate and timely identification will help to quantify the number of youth at risk, and inform programs to ensure that youth are provided necessary support and
resources. The CSTE fellow will conduct a comprehensive surveillance evaluation of the DHHA electronic health record (EHR) system as a resource to identify youth at-risk for suicide. The surveillance evaluation will include parameters based on the Centers for Disease Control and Prevention (CDC) attributes of a surveillance system: simplicity, flexibility, acceptability, sensitivity, predictive value positive, representativeness, and timeliness. This evaluation project will include identifying ways in which suicidal ideations, self-harm, and suicide attempts are documented in the EHR. The system will be evaluated to determine it’s usefulness for public health surveillance and program (health system) monitoring. The assessment will include key informant interviews with providers, medical coders, and public health personnel to understand various aspects of the EHR system in the context of their needs. Findings from the comprehensive surveillance evaluation will be shared with DHHA and DPH key stakeholders through presentations and as a written summary, which will include clear actionable recommendations on how to optimize surveillance of youth at-risk for suicide at DHHA.

**Major Project**

**Understanding the Utilization of Emergency Services to Address Behavioral Health Concerns in the Denver Community**

Mental health issues and substance use are associated with an increased risk for suicide and death. The initial interface with the health care system for persons with behavioral health concerns may be in the emergency department setting. It is critical to understand the extent to which emergency services are being utilized for mental health and substance use issues as the primary complaint, in order to plan for adequate resources and inform community programs to try to reach populations in need of care. The Denver Health and Hospital Authority (DHHA) Center for Addiction Medicine (CAM), established in 2018, has implemented a service called Treatment on Demand to provide 24/7 availability for behavioral health consultation across the hospital network.

This project will utilize the DHHA Virtual Data Warehouse and Electronic Health Record System to better understand healthcare utilization patterns related to behavioral health issues in the emergency department (ED). This evaluation will include records of visits to the DHHA emergency department between January-December 2019 and examine the prevalence of primary and associated visits related to behavioral health concerns. Using these data, the top mental health and substance use diagnoses among persons presenting to the ED will be identified, sociodemographic (including whether the individual is experiencing homelessness or is justice-involved) and clinical factors (severity at presentation, co-morbidities) will be characterized, and primary payor will be determined (e.g., Medicaid). This analysis will also describe healthcare utilization among the identified 2019 cohort over time (both retrospective and prospective), including non-emergency ambulatory and emergency visits. Finally this evaluation will describe the clinical care cascade among persons who present to the ED for behavioral health concerns.

The fellow will lead this analysis and the dissemination of the results to key stakeholders at DHHA (hospital senior leadership, hospitalists and clinicians) and at the city (Office of Behavioral Health Services leadership).


**Additional Project  Case Definition Validation for Suicide Attempt in Hospital Discharge Data**

Denver residents, the fellow will test the case definition for suicide attempt and intentional self-harm developed by the National Center for Health Statistics in 2018 (National Health Statistics Reports: Number 108) using Denver Health electronic health record data. Using the ICD-10-CM codes included in this case definition, the fellow will identify possible cases and then, after conducting medical record review, will narrow down to ‘true’ cases. This process will allow for the fellow to test for sensitivity, specificity, and positive predictive value of the case definition.

Through this research effort, the fellow will have the opportunity to apply for IRB approval using the processes developed for the Colorado Multiple Institutional Review Board (COMIRB), of which, Denver Health is a participating institution. Once approved, the fellow will use the STROBE checklist to develop a manuscript for publication in a peer-reviewed journal describing the findings from this case definition validation effort.

**Additional Project  Calculating Summary Measures of Population Health to Better Understand Morbidity Associated with the Suicide Cascade in Denver**

Building on the effort of designing a surveillance system to assess suicidal thoughts and behaviors among Denver residents described above, the fellow will design and conduct an epidemiologic study to better understand key summary measures of population health related to death by suicide or related to suicidal thoughts or behaviors. The fellow will work to determine the most meaningful measures to develop for Denver and will conduct the associated analysis.

The summary measures that the fellow can focus on include: Years of Life Lost (YLL), Disability-Adjusted Life Years (DALY) and Years Lived with Disability (YLD) due to death by suicide or suicidal thoughts or behaviors. The YLL, DALY and the YLD are all common epidemiologic summary measures that the fellow will employ to deepen Denver’s knowledge and understanding of the burden and impact of death by suicide and suicidal ideation in Denver’s communities.

**Preparedness Role**

Staff on the DPH Epidemiology team supports the Denver Department of Public Health in Environment (DDPHE) for Public Health Emergency Preparedness and Response for the city and county of Denver. DPH holds a central role in coordinating with and guiding Denver Health Hospital Authority and other city health care agencies in the event of a public health emergency. The CSTE fellow will be trained on Incident Command Structure (ICS), which is the foundation for emergency preparedness when an emergency is declared in Denver. The CSTE fellow will contribute to the development of response plans, standard operating procedures, and dissemination and training to public health staff that include different aspects of public health related emergencies, including activation of the Director’s Operation Center (DOC) at DDPHE. The fellow will also have an opportunity to participate in table-top and scenario-based city-wide exercises for emergency preparedness in the event of a large scale communicable disease outbreak (e.g., influenza, Ebola), a natural disaster or bioterrorism event.
**Additional Activities**

The fellow will have multiple opportunities to participate in additional activities both related directly to the work that he or she is leading, broadly related to building and strengthening epidemiological skills, or related more generally to the practice of public health in a local setting.

There are staff both at the hospital and at the city public health agency working on preventing suicide and strengthening systems and policies that minimize risk for individuals and protect communities broadly. The fellow will be invited to support those on the behavioral health team at DPH in devising meaningful interventions to address suicide in the health care and community settings, and will also be able to partner with the city’s Suicide Prevention Administrator and Health Equity Data Analyst to support the approaches that Denver takes to address suicide across the city. The fellow will have the opportunity to communicate about findings from the surveillance system that he or she designs and support using those data to mobilize specific interventions to address suicide in Denver. The fellow can also support strategic thinking about how to shape and evolve suicide prevention programming at both the hospital and the city.

The division that the fellow will be a part of (Epidemiology, Evaluation, Data Science & Informatics) regularly receives requests to conduct ad hoc analyses of data outside of the team’s regular work load. The fellow will have the opportunity to lead or support those analysis efforts as they arise and collaborate on a cross-divisional team to meet those ad-hoc requests. Examples of recent requests include: analyzing heat vulnerability among Denver’s most vulnerable populations; understanding the burden of excessive alcohol consumption and its impacts on families and communities in Denver; and supporting the Denver Health Trauma team in understanding leading causes of trauma injury treated in the Denver Health Emergency Department.

All staff across Denver Public Health are encouraged to participate in cross-departmental efforts that advance the department’s mission to “Improve Health with our Community”. To this end, all staff are welcomed to contribute to department level committees focused on strategic planning, health equity, community engagement, workforce development, quality improvement, work-life balance, and more. The fellow will be able to participate in learning and skill-building opportunities provided by these committees and will be encouraged to apply to be a committee member if interested.

**Mentors**

**Primary**
Laura Podewils PhD, MPH
Epidemiologist Supervisor

**Secondary**
Abigail Steiner MS MPH
Epidemiologist