Host site: Solano County Department of Health and Social Services
Public Health

Assignment Location: Fairfield, CA

Primary Mentor: Bela Matyas MD, MPH

Secondary Mentor: Meileen Acosta, MPH

Agency Description:

The mission of the Solano Department of Health and Social Services (DHHS) is to optimize the health of the community through individual and population-based services which promote health and safety through prevention and treatment of disease and injury. DHHS is nationally recognized for its programs and known across the state as a leader in partnering with both community and public service leaders. Through countywide planning and coordination, the DHSS’s role in health care includes providing clinical services and health care assistance, alcohol, drug and mental health services, dental services, social programs, and protecting the community from public health threats. The DHSS programs primarily focus on the medically underserved, uninsured, and vulnerable individuals by developing effective partnerships with health care providers, public health agencies, and community organizations within Solano County.

Public Health (PH) performs surveillance for communicable diseases, chronic diseases and injuries, risk factors for health conditions. It responds to emerging disease threats and outbreaks and provides services to vulnerable populations and focuses on prevention of disease, disability and harmful health outcomes. Key functional areas in Public Health include communicable disease control, surveillance and epidemiology, health promotion and community wellness, public health laboratory, maternal, child and adolescent health, nutrition services, and vital statistics. Solano Public Health hosts the Population and Public Health Hub (Solano Hub), a public health data health information exchange where data relating to COVID-19, immunizations, electronic laboratory reports, and health encounters (including syndrome surveillance) are received from the county’s five hospitals and the Family Health Services Clinics. Solano Public Health Laboratory provides testing services to Solano County and three other counties, testing more than 30,000 patient and environmental specimens each year.

Notable recent accomplishments include, among many others:

2020, established the Napa/Solano Area Agency on Aging whose mission is to advocate for and enhance the quality of life, health, independence, and dignity of older adults in Napa and Solano counties. This program combines community level activities (such as increased outreach to seniors and implementation of fall prevention classes and social activities at senior centers) with home-based, direct services targeting medically fragile older adults.
In 2020, established CalFresh Healthy Living partnerships with Fairfield-Suisun Unified School District to provide kid-friendly cookbooks and distribute vegetable plants for urban cultivation to families and youth.

In 2020, in the Solano Kids Thrive initiative offered the first of many two-part virtual trainings entitled Trauma Informed Systems 101 (TIS 101): Transforming Stress and Trauma; Resilient Organizations to more than 100 participants throughout Solano County. The TIS 101 focuses on understanding how stress and trauma impact individuals, communities, organizations, and systems.

Prior to school closures in 2020, the Oral Health Education program visited 12 schools, and 116 students in transitional kindergarten and kindergarten classes. Through a grant from First 5 Solano, these students received free fluoride varnish applications, dental screenings, and oral health education.

The 2020 Solano County Community Health Needs Assessment provides an assessment of population health among Solano County residents, highlighting key priority health needs to inform local public health programs, policies and partnerships.

Assignment Description:

Solano county is located on the northeast corner of the San Francisco Bay and is the most diverse of the Bay area counties. Solano County is the smallest Bay Area county (454K population) and most diverse county in the state of California. It is situated midway between San Francisco and Sacramento (the state’s capital) and is the poorest county in the Bay Area, with 12% of residents living below the poverty level. The Solano county environment is extremely varied, including urban, suburban and rural communities, with close proximity to San Francisco and Napa and Sonoma counties. Despite being a relatively small county population wise for California, Solano county is more than four times the size of the average county population in the US. (~100K).

The APHIF fellow will be primarily hosted by the Solano County Public Health Department in Fairfield, California under the direct mentorship of Public health officer Dr. Bela Matyas and senior epidemiologist Meileen Acosta. Stanford University (Palo Alto) will serve as the cohost institution, due to the longstanding collaboration of Solano county with Dr. Lorene Nelson at Stanford University Center for Population Health Sciences (PHS) and the fact that much of the data are hosted by the highly secure PHS Data Center. The activities of the fellow will be extremely varied, interesting, and challenging. The fellow will have the opportunity to contribute to of three distinct projects described below, therefore, the day-to-day activities will depend on which of the three projects is the focus. Activities will include: (1) developing and applying novel methods to integrate electronic health data for active public health surveillance
(2) developing a data strategy plan aimed at enhancing our current data ecosystem infrastructure for improved data collection, integration, visualization, and support of improved decision making for public health applications

(3) integrating social determinants of health data with healthcare data

(4) integrating data from heterogenous sources into a data ecosystem that contains information on social and environmental determinants of health data that can be joined with sources of health data to identify vulnerable populations at sub county levels

(5) develop tools for data cleaning, data ingestion, and generating automated reports on underserved populations, community health, and health disparities

(6) participating in cross-sector partnerships to improve public health. By the end of the 2-year fellowship, the fellow will have developed advanced competencies in public health informatics, data science, and epidemiology. They will have used their skills to solve cutting-edge public health problems using the novel data ecosystems and will have the pleasure of applying their skills to addressing adverse effects of climate change, opiate use disorder and multiple chronic conditions of aging, among others.

Preferred Background & Skills:

The three projects described in this application will require knowledge of epidemiology, statistics, information systems, public health informatics, data science, and public health. We welcome applications from candidates who have previous work experience in public health-related fields in state and local health department, but that is not an absolute requirement. We seek a candidate who has a doctorate (PhD, MD) or a masters level degree (MPH, MS) from an accredited academic institution in one of the following: public health informatics, clinical informatics, information sciences, data and computer science, information technology, statistics, epidemiology, medicine, public health, or a related discipline. GIS skills are strongly encouraged by not an absolute requirement since we have GIS training resources at Stanford University. For master's level candidates, we seek individuals who have one year of documented experience in one of the following: public health informatics, health informatics or related field, information systems, data science, computer science, or information technology.

What can the fellow expect to gain from 2 years at this host site?

The fellow with benefit significantly from knowledge gained from the public health officer, informatics lead and senior epidemiologist within the Solano county public health department. Because the fellow will be co-hosted by Stanford University at the Center for Population Health Sciences, s/he will have access to the courses, training opportunities and conferences at Stanford University in informatics, epidemiology and data science.
Potential Projects include:

Host sites have listed up to 5 projects

Project 1: Modernizing the IT Infrastructure for Translating Public Health Data into Evidence-Based Recommendations

Solano County Public Health has built a population-based data ecosystem in Solano county that will be transportable in concept and analytics to other California counties and, if successful, to counties and states around the U.S. This is possible because almost all healthcare providers now utilize electronic health records (EHRs), which offer tremendous potential to aggregate, analyze, and integrate individual- and community-level data across settings and over time. Solano county is currently the only California local health jurisdiction that invested the resources necessary to host a cloud-based data analytics platform that receives individual-level data for county residents from all major hospital and health care provider systems (e.g., Kaiser, Sutter, etc.) and laboratory service organizations (i.e., Quest, LabCorps, etc.) in the region. The four types of data are (1) electronic laboratory data, (2) immunization data, (3) syndromic surveillance data, and (4) data on all reportable conditions. This data infrastructure has been set up so that electronic health data are received continuously and can be used for real-time querying for longitudinal studies to provide insights for actionable public health initiatives. The entire data set can be granularly queried by county epidemiological staff and is also hosted by the Stanford Center for Population Health Data Center, a long-term partner of Solano Public Health. We are in need of a dedicated informatician who can work with Solano county public health staff and epidemiologists and biostatisticians at Stanford University to extend this platform to realize its full promise. The environment at Stanford University will enable access to cutting edge informatics tools and educational opportunities to expand the competencies of the public health informatician who works on this public health-academic center collaboration.

If Solano county is selected as an APHIF host site, the APHIF fellow will work with a highly innovative public health data ecosystem to implement use cases that will serve as exemplars for how other counties in California and the U.S. can use electronic health data for real-time actionable public health priorities.

Project 2: Using EHR Data To Improve Quality of Preventive Care in Solano Public Health Federally Qualified Healthcare Clinics

We seek to develop a new data system consisting of an extract of electronic health record (EHR) data from the 3 federally qualified health Solano Family Health Service (FHS) clinics overseen by the Solano County Health Commissioner (Dr. Matyas). This system cares for approximately 45,000 patients and the EHR data system currently is NextGen but will soon be replaced by Epic. Our goal is to create an analytic 'sandbox' of critical EHR data elements from all 3 FHS clinics so that we may carry out research and
implementation projects in this safety net population. Although we will set this up as a general resource that is flexible available to address a number of objectives, our initial projects will focus on three aspects: (1) collecting and integrating information on social determinants of health with EHR data; (2) evaluating and improving screening rates for infectious causes of cancer (HPV, hepatitis); and (3) evaluating and improving prediabetes screening and preventive interventions.

For public health departments that provide medical care services to the underserved population, this project will serve as an exemplar for how EHR data collected during the course of clinical care may be used to monitor and improve health outcomes in the most vulnerable county residents.

Project 3: California Public Health Data Ecosystem Collaborative

The APHIF fellow will work with a highly innovative public health data ecosystem to implement use cases that will serve as exemplars for how other counties in California and the U.S. can use electronic health data for real-time actionable public health priorities. The fellow will participate as a member of the Stanford team that is carrying out the California Public Health Data Ecosystem Collaborative, contributing his or her informatics and data science expertise to the project. The objective of PHDE is to provide local public health departments in California with a collaborative infrastructure and data ecosystem that enables them to address priority health concerns that affect the most vulnerable members of their communities. With an initial focus on COVID-19, the PHDE platform currently joins those data with more than 35 data sources containing data on social and environmental determinants of health at refined geographic levels (census blocks, zip codes, neighborhoods) including sociodemographic characteristics, environmental factors (weather, air pollution, smoke from wild fires, built environment factors, crowding indices), data on geographic mobility of county residents (SafeGraph), food insecurity, job loss, transportation, and other rich contextual factors that when joined with health outcome data give public health departments and county policy makers the evidence-based insight necessary to reach the most vulnerable in their communities. We are at a pivotal point where we need an influx of effort that will enable us to establish a permanent public health learning collaborative and further develop the CA-PHDE to expand to other health outcomes such as chronic disease risk factor prevention, opiate use disorder, interpersonal violence, and other conditions of major public health importance. This will enable the identification of the residents of Solano county who are suffering the greatest health inequities and enable the targeting of scarce public health resources to benefit the groups most in need. The APHIF fellow will help advise about additional data sources for information on social and environmental determinants of health as well as additional sources of health data on the underlying county populations. They will help lead the application of the PHDE data to specific public health use cases. As an example, the first three public health use cases are: (1) enriching the data on metrics of climate change and collecting data on adverse health effects of climate-related disasters, (2) addressing the opiate use disorder epidemic, and (3) investigating the impact of multiple chronic diseases among elderly and devising strategies to enhance the ability of elderly to age in place in our community. We look forward to continuing our work with Dr. Nelson’s team and expanding the use of the enhanced data ecosystem for addressing many other public health challenges and being able to target the most vulnerable in our county with our public health resources.
The work that Solano County Public Health and Stanford University are doing together will serve as an exemplar of a public health-academic partnership that can be modeled and scaled to other health departments across the United States. This type of collaboration between public health departments, community clinics, health systems, and academic researchers to develop infrastructure and processes for scalable data integration and aggregation will allow us to address research questions of major public health importance. The combination of a rich data ecosystem and a public health community of practice will enable data-to-action projects implemented in one area to be adopted and implemented by other local public health jurisdictions. Together we will conduct research that is timely and useful--quickly translated into information that can be used to address upstream causes for prevention and improved individual and population health gains. For example, having advanced data access and data analytic capabilities will be particularly important when a natural disaster occurs, to be able to direct patients across the region to urgent care services and enable access to medications needed to manage chronic conditions. Combined with the threat of climate change, there is a growing need for a health data ecosystem so that we can manage disasters with less loss of life and greater resilience.

**Additional information about the placement:**

The APHIF fellow will be working with data hosted at two sites: Solano County Public Health and Stanford Center for Population Health Sciences, as described elsewhere in this application.