**Assignment Description**

The Fellow will be located in the Community Epidemiology Program of the Marin County Department of Health and Human Services located in the San Francisco Bay Area. We are a generalist epidemiology program with both communicable and noncommunicable disease epidemiologists who function within a dynamic local public health jurisdiction. We recognize that well conducted and timely research into emerging local public health issues has value far beyond our region. Our site offers the fellow an opportunity to experience depth in applied epidemiology while working on a breadth of programs and topic areas. These range from real-time event response such as outbreaks and disaster response, to long term departmental initiatives including vaccination promotion, overdose prevention and chronic disease prevention. The CSTE Fellow will participate as an integral member of the epidemiology team, sitting in an office suite shared with the Communicable Disease prevention team. The fellow will have regular open access to both mentors, who are located in the same facility. The team works with other public health professionals whose role is to collect, analyze, and interpret public health data to assist with disease control and prevention programs and advise on local public health policies. To perform analyses the fellow will have access to local, state and federal databases, surveillance systems, questionnaires, reports, and subject matter experts. Specific projects will be determined by the fellowship curricular requirements, the fellow's individual interests, and departmental priorities. Upon starting the assignment, staff in the epidemiology program will orient the Fellow to our team and available data sources, the County Health and Human Services Department, and the relationship between county, state and federal public health infrastructure. The Fellow will also be oriented to the community we serve.

**Day-to-Day Activities**

The Fellow will primarily focus on the projects necessary to fulfill the required competencies, guided by the fellow's interests and specific leaning objectives. The fellow would be invited to join the daily communicable disease team "huddle" for updates on disease incidence, contact investigations, and outbreak control. The fellow would be routinely analyzing and interpreting epidemiologic data with the guidance of the mentors and fellow epidemiologists. In addition to contributing to team based initiatives, such as outbreak investigations, fellows are encouraged to carry their own longer term projects in areas of interest. For example, designing or evaluating a surveillance system. Fellows summarize analyses in written and visual formats as reports, posters, presentations, and manuscripts. Opportunities will also be available to carry out data requests from within the health department, other branches of government, community organizations, and members of the public. During disease outbreaks, the Fellow will be engaged in investigations to determine the scope and nature of the event to mitigate spread and inform containment and treatment measures. Integrated in the daily operations of the epidemiology team, the Fellow will also have the option to attend meetings of the communicable
disease team, a regional health inequities initiative data committee, a local prescription drug misuse and abuse initiative, and other forums as they arise. Our health department is in close proximity to many other Bay Area local health departments, as well as the California Department of Public Health’s communicable disease and environmental/occupational health offices, allowing the Fellow to attend other meetings and grand rounds that may be of interest. The Fellow will have regular meetings with mentors and will have support on his/her activities from other epidemiologists and program-specific staff, as needed.

Potential Projects

Surveillance Activity  Develop a Surveillance System and Conduct Regular Surveillance

Potential projects to meet this competency include:

- Design and implement an automated system to receive and categorize cause of death data, including toxicology reports routinely received from the Office of the Sheriff-Coroner.
- Using data available through criminal justice, 911, Emergency Department and school-based data, design a set of indicators to measure the potential impact of the legalization of cannabis in California in 2018.
- Using school-based vaccination data, develop a surveillance system for monitoring Medical Exemption rates from required childhood vaccinations, which have been increasing since the passage of law eliminating exemptions based on Personal Beliefs. These are not systematically tracked and cluster in certain school populations, threatening herd immunity.
- Using hospital, Emergency Department and Emergency Medical Services Data, develop a surveillance system for more timely local detection of emerging pathogens, such as Zika and enterovirus related flaccid paralysis. Novel pathogens are not included in the conventional list of reportable diseases, leading to under reporting early in the course of any potential outbreak.
- Using geospatial data available through Emergency Medical Services (911), develop a surveillance system for describing injury risk and hot spots. New data systems in ambulances enables new surveillance tools for bicycle and pedestrian safety, falls among the elderly and other preventable harms.

Surveillance Evaluation  Evaluation of Non-fatal Opioid and Other Drug Overdose Surveillance

Potential projects to meet this competency include:

- Evaluate a newly developed overdose surveillance system based on Emergency Medical Services responses for fatal and non-fatal overdoses, correlating with Emergency Department, hospital, and coroner datasets.
- Evaluate local influenza surveillance system using weekly Emergency Departments and urgent care facility reports of influenza-like illness, as well as commercial and public health laboratory reports of confirmed influenza cases.
Major Project

Projects that will build competency in designing an epidemiologic study to address a health problem; analyzing, interpreting, and presenting graphic and numerical data to lay and scientific audiences:

- Design and perform an analysis correlating vaccination rates with pertussis incidence within local communities. Marin County has among the highest rates of pertussis in California. Vaccination rates have been historically low and vary widely between school communities.
- Design and perform a retrospective analysis of active tuberculosis patients to identify patterns of healthcare touches prior to diagnosis. In order to inform strategies to enhance detection and treatment of TB in its latent state.
- Participate on the design and execution of public health analytics of the new Health Information Exchange (HIE), adopted by Marin County in 2018, integrating electronic medical records from several Marin healthcare systems into a single platform which can be analyzed for population health.
- Conduct an analysis and description of STD and vaccine-preventable disease incidence and at-risk populations to better target interventions and measure effectiveness.
- Analyze breast cancer risk factor prevalence and breast cancer incidence using data from the Marin Women’s Study, a large multiyear study of breast cancer in Marin County funded by CDC and Avon. The fellow would have access to the data set of 14,000 lives being followed prospectively for breast cancer incidence.
- Design and conduct a life expectancy analysis stratified by geographic region, race/ethnicity, and sex to guide efforts to narrow gaps in health outcomes.

Additional Project

Projects that will build competency in outbreak investigation and reporting:

Marin County typically experiences 20-30 reportable disease outbreaks annually. These include outbreaks in schools, congregate living facilities, shelters, prisons (including San Quentin, a 4000 inmate facility) and the community at large. The fellow would be invited into any outbreak response and is expected to participate in at least one outbreak investigation and present the results in written and/or oral form.

- Assist with local foodborne outbreaks, for which epidemiologists currently serve as incident commanders, which will allow for meaningful participation is all aspects of the outbreak from detection, description, mitigation, and public messaging.
- Participate in non-foodborne outbreak investigations such as pertussis or norovirus by maintaining a line list, creating an epidemic curve, and summarizing demographic data to inform public health action.
- Assist the communicable disease team in investigating TB outbreaks, which are often regional and engage state and other counties. The fellow would engage in describing both epidemiologic and genotype-based links between cases.
Additional Project

Additional projects that may be used to fulfill core competencies:

- Develop and implement an automated system to merge non-fatal opioid overdoses encountered by Emergency Medical Services into the Whole Person Care WPC data collection and care management system to flag candidates for program enrollment.
- Assist with a qualitative research study evaluating facilitators of and barriers to utilizing medications for opioid use disorder treatment in the criminal justice system by providing support coding qualitative data and identifying main themes from focus group and key informant interviews (opportunity for co-authorship on a manuscript).
- Assist the Health & Human Services Department in fulfilling competencies in preparation for applying for Public Health Accreditation.
- Draft a manuscript for publication of results from an evaluation of the Non-Motorized Transport Pilot Project in Marin County, which involved the installation of bike/walk paths for non-motorized forms of transportation and commuting.

Preparedness Role

The Fellow will participate in tabletop and functional exercises Preparedness program conducts at the Emergency Operations Center, in which the role of the epidemiologist is drilled in a variety of scenarios. Recent local wildfires and mass displacements into shelters have increased the need for shelter-based outbreak detection and response. In a real disaster the fellow will be invited to actively participate in response, as appropriate. The Fellow will have the opportunity to participate in the development of enhanced surveillance related to large scale emergencies, including outbreak detection systems and CASPER. The Fellow will take ICS online training.

Support the Marin County Public Health Preparedness Program in developing and conducting community events for emergency response to disasters (i.e. influenza mass vaccination/point of dispensing exercises).

Additional Activities

For any projects outlined, the fellow will have the opportunity to engage directly with relevant partners, for example laboratory visits to experience microbiology testing, clinic or hospital visits to gain insight into healthcare system reporting behavior, and joining state health officer meetings or topic specific work-group meetings, including communicable disease and opioid crisis response.
**Mentors**

**Primary**  Matthew Willis MD, MPH
Public Health Officer

**Secondary**  Rochelle Ereman MS, MPH
Epidemiology Program Manager