

## **Injury**

### **Multnomah County Health Department, Public Health Division**

Portland, Oregon

#### **Assignment Description**

The Fellow will be assigned to the Multnomah County Health Department's (MCHD) Community Epidemiology Services (CES) unit. As a member of the CES, the fellow will have the opportunity to work across the primary programmatic areas of the Public Health Division (PHD), which include Maternal, Child, and Family Health (MCFH); HIV/STD and Adolescent Sexual Health Equity; Communicable Disease Services; and Environmental Health Services. The CES unit is comprised of Epidemiologist and Research and Evaluation Analysts (REA) that work across the portfolio of programs within the PHD; across the Divisional units of the MCHD; as well with our external stakeholders involved in the population health within Multnomah County and between our Tri-County partners, such as our Community Care Organizations (CCO). The assignment allows the CSTE Fellow the opportunity to pursue diverse opportunities over the course of the fellowship. The Fellowship is grounded in injury epidemiology; yet, from this perspective the Fellow will have the opportunity to strengthen his/her methodological capabilities in developing surveillance indices, assessing surveillance systems, and incorporating a rigorous equity lens into the quantitative data. The fellow may elect to utilize these highly transferable skills by choosing to engage in or developing special projects within the injury space or within different epidemiologic subspecialties.

The goal is to train the CSTE Fellow as an integrated member of the CES team of epidemiologists, larger community of public health practitioners, and the myriad of professions who work on the frontlines of public health. The fellowship will focus on the ability to collect, analyze, and interpret public health data in ways that directly impact health status and prevent undue health burdens, meaningfully inform state and local legislative activities, and more fully understand the inseparable role of epidemiology in the cycles of public health practices. The PHD has access to a broad range of data sources, ranging from communicable disease surveillance and vital statistics to electronic health records and medical examiner data. The CES unit collaborates with partners to assess information from programs as diverse as refugee health, ambulance transports, and needle exchanges. Moreover, the Fellow may avail him or herself of the option to develop and implement independent analyses or study designs. In addition to a reasonably balanced training experience, it is the specific intent to have the Fellow with his Primary and Secondary mentor to develop at least two manuscripts suitable for publication.

Multnomah County serves the Portland, Oregon metropolitan area. Our rapidly-growing county is nearing 800,000 people and we work closely with neighboring metro-area counties, providing services for a population of nearly 1.8 million people. Our Department has many nationally recognized public health programs as well as the largest Federally Qualified Health Care (FQHC) system run by any county in the US. Our Public Health Division itself includes diverse maternal-child health,

environmental health, communicable disease prevention programs, along with a developing community wellness and prevention program. CES directly supports these programs and others by providing epidemiology, informatics, and quality improvement services. In recent years we have supported new initiatives, such as the CDC STRYVE youth violence prevention project. We collaborate closely with other outside agencies (e.g., Fire/EMS, Alcohol and Drug, law enforcement, etc.), and a new consortium that works to coordinate health care among the county's major healthcare provider organizations, including the Health Department's primary care system.

Broadly, the fellowship placement emphasizes population health and public health's role to assess health status and, in that context, identify undue burdens to optimal health and well-being, elucidate evidence-driven interventions, and evaluate the ongoing impacts of said intervention strategies. Specifically, the fellowship places an emphasis on effectively utilizing epidemiologic evidence to guide the understanding and prevention of harms related to firearms, rigorously examining the determinants of gun-related harms and their antecedent causal mechanisms, and strategically engaging the policy discourse to mitigate the adverse consequences of firearm related events. Specific benefits to the Fellow include development in the following competency areas: advanced applied epidemiologic research methods and techniques; strong biostatistical skills; evaluation and research design; quantitative survey methodology; communication skills; scientific writing; expert knowledge of public administration principles, best practices, and procedures appropriate to departmental scientific and technical research/evaluation practices; principles and practices of effective leadership; knowledge of scientific and technical management principles and practices for project management, strategic planning, and other functions; and knowledge of federal, state, and local laws, and regulations related to public health practice. The Fellow in this assignment may lead public health surveillance assessments, investigations, applied public health research, and support the planning and implementation of public health services and response. We encourage and support the sharing of learning and information through professional networks such as state and national conferences and peer-reviewed journals.

### **Day-to-Day Activities**

MCHD will involve the Fellow in day-to-day activities and research projects that provide a "hands on" applied epidemiology experience. Functional responsibilities include:

- Performing epidemiologic studies and developing public health surveillance systems.
- Providing consultation to county managers and staff on scientific, analytic, and technical aspects of epidemiologic investigations and public health surveillance.
- Working with program managers and community partners to develop health interventions, policies, or programs based on epidemiologic findings.
- Working with partners across the Health Department to define meaningful health and well-being outcomes, and measurable outcomes for Oregon's statewide Public Health Modernization work.
- Writing material for internal reports, public information, and peer-reviewed journals.
- Participating in internal and external meetings as needed to involve project stakeholders and to learn how public health systems operate.

## **Potential Projects**

### **Surveillance Activity      Utilizing the Index of Concentration at the Extremes (ICE) in Public Health to Monitor Structural Determinants of Health**

Epidemiology is the cornerstone of public health practice and it functions as a critical diagnostic tool to assess health status, identify determinants of health, and evaluate the impact of public health interventions. Inequitable health status among racial/ethnic and lower income populations continues to be pervasive and persistent in the United States. In 2007, in the Black non-Hispanic population, the largest health disparities were attributed to six indicators of sexually transmitted diseases, inclusive of human immunodeficiency virus infection. Four additional indicators contributing to health disparities among the Black non-Hispanic populations were nonfatal firearm-related injuries, tuberculosis, homicides, and drug induced deaths. In 2015, among ages 18-34, the Black non-Hispanic population had higher deaths than whites for eight of the ten leading causes of death. Surveillance data has begun to elucidate the antecedent role of concentrated disadvantage in influencing differential health status; yet, the monitoring of concentrated disadvantage is not systematic and ongoing. The surveillance project involves developing a foundation for a public health monitoring system to utilize metrics to identify concentrations of deprivation and privilege at the census tract level. Specifically, the Fellow will utilize U.S. Census data to construct an Index of Concentration at the Extremes (ICE) measure for racialized and economic segregation in Multnomah County. To construct the index measure, the Fellow must be able to demonstrate proficiency in a statistical software package, such as R, SAS, or Stata. The Fellow will calculate values of the index for each census tract and map these values over time using software such as ArcGIS or Tableau. The systematic and ongoing monitoring of ICE will complement current and established monitoring systems within the purview of the Multnomah County Health Department and will prove to be a valuable tool for engaging the assurance and public policy functions of public health practice.

### **Surveillance Evaluation      Assessing Prevalence and Underreporting of Firearm-Related Death**

Recent applications of the capture-recapture method of estimating population size have shown an underreporting of firearm-related injuries and law-enforcement-related deaths on the local and national level. In regards to firearm-related deaths, the capture-recapture method may be deployed to estimate the total number of such events by comparing the counts noted on independent, yet incomplete, registries of fatal firearm-related injuries. To estimate the total number of firearm-related deaths at the state (Oregon) and local (Multnomah County) levels, the Fellow will apply the capture-recapture method to lists of firearm-related deaths documented by the Gun Violence Archive and Oregon Health Authority Vital Statistics data. The Fellow will document the extent to which current surveillance systems capture the universe of firearm-related fatalities and present findings to local and state health officials.

### **Major Project    Examining Structural Inequalities in Firearm-Related Injury and Fatality**

Building upon the findings of the surveillance activity and surveillance system evaluation, the Fellow will examine the geospatial relationships between the Index of Concentration at the Extremes, the likelihood of firearm-related injury and death, and correlates of misclassification of firearm-related fatalities in Vital Statistics reports. The Fellow will first utilize statistical and mapping software to examine the dispersion of firearm-related injuries and fatalities across the county and how this distribution correlates with the constructed index to quantify structural barriers to socioeconomic and health opportunity. Along with elucidating the geographic component of this relationship, this project will turn focus toward the individual and community-level factors associated with surveillance system misclassification. Specifically, the Fellow will conduct analyses to highlight the factors associated with a firearm-related death misclassification in the Vital Statistics data, i.e. classified as a firearm-related fatality in the Gun Violence Archive data and missing in the Vital Statistics report. Such factors may include, but are not limited to, race/ethnicity, sex, and neighborhood-level demographics of the decedent. The Fellow's findings will prove critical in ensuring the quality of data and improving our injury surveillance programs. The Fellow may present his or her findings to local and state health officials, along with peers and public health practitioners at conference proceedings.

### **Other Project    Assessing Urban Fatality Rates among Adolescents and Young Adults (Firearms and Opioids)**

The final injury project involves assessing the rates of firearm, opioid overdose, and non-opioid poisoning fatalities within the urban landscape of Portland, OR. In 2014, there were 33,594 deaths due to firearm injuries, nationwide. Among the firearm-related fatalities, an estimated 63.7% and 32.8% consisted of suicides and homicides, respectively. While homicides by firearm account for 20.9 deaths per 100,000 for African Americans from 1999 through 2015, such homicides only account for 2.6 and 5.7 deaths per 100,000 for whites and the total population, respectively. This leads to a disparity in potential years of life lost (PYLL). Although non-gun related homicide was the greatest contributor to PYLL for both racial groups, firearm-related homicide was the number one contributor to PYLL for African Americans. Since 2014, the mortality rate among adolescents and young adults, ages 15-39, has acutely increased. In order of magnitude, firearms, opioid overdoses, and non-opioid poisonings contribute to this increase in mortality. The firearm death rate was nearly two times higher than unintentional opioid and other drug overdoses.

In this project, the fellow will calculate fatality rates for firearm-related deaths, opioid overdoses, and non-opioid poisonings in the Portland metropolitan area. The geographical scope will be limited to Portland, OR and the Fellow will calculate fatality rates within neighborhood boundaries within the city. In addition to determining neighborhood fatality rates, the CSTE Fellow will develop a small report specific to neighborhoods experiencing increases in fatality rates. Among the communities where fatality rates have increased, the Fellow will apply measures of effect and determine potential

years of life loss. From a methodological perspective, the Fellow may have the opportunity to learn the application of joinpoint regression methods.

In developing the report, The CSTE Fellow will take a leadership role as a member of the Gun Violence as a Public Health Issue Collaborative with the Oregon Health and Science University-Portland State University School of Public Health, of which, Community Epidemiology Services is a partner-member. The CSTE Fellow will also be a part of the agency collaborative with the Mayor's Office on Violence Prevention. In the aforementioned forums, the Fellow will participate on a monthly basis and develop the work products of this project to present to the collaborative and contribute to the strategic direction of the partnerships.

**Preparedness Role**

Multnomah County offers a series of training and exercises for disaster resilience through the Multnomah County Office of Emergency Management (MCEM). The curriculum delivered through MCEM includes trainings for local and regional, natural and man-made disasters. The Fellow will have the opportunity to engage in county-level emergency planning practices delegated to the Health Department, such as disease outbreak response and medical services deployment in emergency management situations.

**Mentors**

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| <b>Primary</b>   | Frank Franklin BS, MPH, PhD, JD<br>Principal Epidemiologist, Director Community Epidemiology Services |
| <b>Secondary</b> | Jason Thompson BA, MA, PhD<br>Senior Research and Evaluation Analyst                                  |