Occupational Health, Injury

Washington Department of Labor and Industries (L&I), Safety and Health Assessment and Research for Prevention (SHARP)
Tumwater, Washington

Assignment Description

The prospective fellow will be placed within the Safety and Health Assessment and Research for Prevention (SHARP) program at the Washington Department of Labor and Industries (WA L&I). SHARP is an internationally recognized research program who partners with business and labor to develop practical solutions to identify and eliminate workplace hazards and reduce human and economic costs of on-the-job illnesses and injuries.

SHARP typically employs approximately 20 scientists who offer expertise in economics, epidemiology, ergonomics, industrial hygiene, occupational medicine, occupational health psychology,safety, and data management. SHARP's researchers are recognized as leaders in their fields, with their high-quality research frequently cited in the scientific literature. SHARP participates locally, nationally, and internationally by delivering seminars, presenting research activities and results, providing independent scientific review of issues, and publishing information.

L&I/SHARP is recognized by the federal government as the lead state agency to address occupational illnesses and injuries in Washington State. SHARP has been successful in securing about $725,000 per year in federal research funds, and is currently funded for core occupational health surveillance and capacity building from CDC's National Institute of Occupational Safety and Health's

(NIOSH) surveillance fund-awarded in five-year cycles. SHARP also receives additional NIOSH funding for the Washington Fatality Assessment and Control Evaluation (FACE) program; the Adult Blood Lead Epidemiology Surveillance (ABLES) system; occupational respiratory disease surveillance; the Trucking Injury Reduction Emphasis through Surveillance (TIRES) program; and a project aimed at identifying risk of musculoskeletal disorders in home health care.

SHARP research focuses on the primary prevention workplace injuries and illnesses. Aside from the federally-funded projects mentioned above, some areas of focus in SHARP include: workplace violence and bullying; effectiveness of consultation and enforcement activities on workers' compensation claims; research and surveillance of work-related musculoskeletal disorders; health and safety of firefighters; injury prevention in the logging industry; and utility of administrative workers' compensation claims data in predicting future workers' compensation claims. SHARP also recognizes the disparities that exist making some workers much more vulnerable to poor outcomes than others. SHARP has recently began to initiate work describing these disparities by race and ethnicity of the worker, as well as investigating injuries among temporary workers.

Day-to-Day Activities

The fellow will be incorporated into the SHARP program, whose day-to-day activities will be indistinguishable from the other entry-level epidemiologists. The fellow will attend weekly staff meetings, participate in SHARP's journal clubs, and other regular work-group meetings in SHARP such as the Communications, Occupational Health Disparities, and the SHARP Epidemiologists work groups. The fellow will also have the opportunity to attend agency-wide meetings and trainings, as well as monthly epidemiology seminars at the Department of Health.

During their placement in SHARP, the fellow will have several projects that will be their primary responsibility and occupy much of their daily activities. The fellow's projects, as described in detail below, will both contribute to SHARP's occupational safety and health mission and allow the fellow to complete all of the CSTE fellowship methods and communication requirements. The fellow will fully integrate into SHARP-- becoming competent in the use of workers' compensation data and unemployment insurance data for occupational health research and surveillance; using surveys, such as the Behavioral Risk Factor Surveillance System, to describe work-related injuries and illnesses; applying their epidemiological skills to develop surveys and design studies to answer specific public health questions; aiding in primary collection of data in the field; employing appropriate methods to analyze data and interpret results; following all Washington State Institutional Review Board (IRB) policies and guidelines for human subjects research; and finally, communicating findings widely. The fellow will serve as a valuable epidemiological resource to our team, applying their knowledge and gaining experience in a research-to-practice environment.

The fellow will have the opportunity to interact with a variety of different groups collaborating with SHARP, as described earlier. The fellow will be encouraged to attend meetings that bring together occupational health and safety stakeholders, to interact with other occupational health epidemiologists and other professionals nationally, and develop relationships with other public health practitioners at the Washington Department of Health.

Additionally, the fellow will have several opportunities for professional development. SHARP creates a very supportive environment encouraging employees to learn and grow- also, part of the agency's strategic plan. The SHARP program has developed their own format for internal professional development, known as SHARP'en Up talks, which have recently included trainings on qualitative research methods and using R for analysis and display of data. L&I also offers a variety of professional development trainings to its employees, such as SQL courses, an intro into the legislative process, and a series of selected TED Talks, which will also be available to the fellow. The fellow will also be encouraged to seek out other trainings of interest in the area. For example, many of SHARP's epidemiologists have attended Edward Tufte's course on data visualization in Seattle.

Potential Projects

Surveillance Activity **Development of a system to enhance monitoring of workplace violence in Washington**

The SHARP program currently employs two researchers that specialize in occupational health psychology, with expertise in the area of safety climate, and bullying and violence among health care workers. The fellow would contribute to this area by developing an enhanced system to broadly monitor workplace violence in the state. The fellow would research and gather relevant data on this topic from sources such as workers' compensation data and mortality data, to describe the epidemiology of injuries resulting from workplace violence. The fellow would use these data to describe recent trends, populations most at risk, circumstances when available, and risk factors. The fellow would also be responsible in developing a reporting format that clearly outlines the most useful information for the agency and other stakeholders.

This project will involve collaboration with the SHARP experts on workplace violence, and allow the fellow to work on a topic of high visibility to WA leaders, while applying key epidemiological methods in surveillance.

Surveillance Evaluation **Evaluation of the Syndromic Surveillance system for occupational injury and illness surveillance**

Syndromic surveillance systems have become staples in many health departments across the country for early detection of potential outbreaks. The system has expanded beyond infectious disease surveillance and been applied to monitor different outcomes such as injury and violence, sexual assault, poisonings, and adverse health effects during weather-related disasters. The fellow would evaluate the WA syndromic surveillance system's ability to tracking certain occupational injuries and illnesses in near-real time treated in the Emergency Department. This work will require the fellow to develop a system to identify work-relatedness and injury type using free-text fields and/or ICD-10-CM codes, estimate expected Emergency Department visits due to work-related injury, and make surveillance recommendations based upon these findings.

Major Project **Investigating effect of climate change on occupational safety and health**

Little work on climate change has focused on the potential impacts to workers. Like other states, Washington has not been immune to recent change in climate, for example, increasingly high temperatures and frequent forest fires during the summer quarter. Workers who spend more time outside are more vulnerable to the effects of the climate, such as temperature or air quality.

SHARP recently collaborated with researchers at the University of Washington and described an increased risk for traumatic injury among agricultural workers that coincided with hot outdoor temperatures. We hypothesize that Work-related Musculoskeletal Disorders (WMSDs) may also be related to outdoor temperatures among certain populations of workers. The fellow would compare workers' compensation claims due to WMSDs over time with outdoor weather data to evaluate this relationship. Alternatively, the fellow may also work with the occupational respiratory disease team in SHARP to investigate work-related injury or respiratory disease claims and air quality to determine if there is any relation to working near forest fires and injury or illness. This work may involve collaboration with epidemiologists at the Department of Health, as well as occupational health

professionals at the CDC/National Institutes of Occupational Safety and Health (NIOSH) at the Spokane, WA office who have expertise in the area of climate change.

With this major project, the fellow would become familiar with recent climate change literature and its potential effects on workers to further develop hypotheses and design and epidemiological study. This project would also involve collecting and analyzing claim data from the WA workers' compensation data system, as well as weather and air quality data. The fellow would evaluate clustering of cases by geography and/or time using appropriate statistical techniques and controls. Finally, the fellow would interpret and communicate the results in the appropriate formats, which may include peer-review publication.

Major Project Statistical modeling to predict future workers' compensation claims

WA maintains one of the most complete and comprehensive workers' compensation systems in the country, with the ability to link to other state agency databases providing wide-ranging information on workers in the state. Often, prevention work in occupational safety and health is reactionary, and relies on other workers being injured or hazards being identified during an inspection. However, inspection resources are very limited, and not all hazardous workplaces are visited. SHARP recently completed an analysis using administrative workers' compensation and unemployment insurance data to identify characteristics of construction firms that could be used to prospectively identify firms at risk for future workers' compensation claims. Several characteristics were identified that put certain construction firms at significantly high risk for future injuries/future claims. This information is currently being used by the agency for targeted intervention in construction. We want to know if this method can be applied to other high-hazard industries to increase our impact and prevention more injuries.

The fellow would be involved in deciding which high-hazard industry to evaluate next (e.g., agriculture, manufacturing, trucking), and work with the SHARP project lead on an analytic plan. This project involves linking two large administrative datasets, and going through the process of statistical modeling to identify indicators that significantly predict future injuries/future claims. The fellow would be able to then take their results and develop a plan for the agency to implement what they've found for prevention. This project gives the fellow first-hand experience in applied research that will have a direct impact on agency operations, with the goal of preventing future work-related injuries in that specific industry. The fellow would also write up the results of this major project in the most appropriate format/s, potentially including a peer-reviewed publication.

Surveillance Activity Evaluate risk of suicide by occupation

Suicide is the 8th leading cause of death in Washington (WA) State, and WA consistently has a higher suicide rate than what is observed nationally. Disparities by age, sex, race, and ethnicity are often described in suicide surveillance, however, occupation is another important socioeconomic factor that should also be considered.

The WA Department of Health (DOH) developed the Occupational Mortality Database, in which all death certificates between 1950 and 2010 were been coded and classified into occupational categories. Using auto-coding software, the fellow would work to update the occupational coding for the most recently mortality data, gaining experience with the Standard Occupation Classification (SOC) system. The fellow would use these numerator data, and would identify the most appropriate denominator data (e.g., Census) to calculate rates over time. The fellow would be expected to

communicate the results of this work via publication in technical report or peer-reviewed journal format, and/or present findings at the appropriate professional conferences.

Preparedness Role

We will partner with the Department of Health to give the fellow experience in emergency preparedness at that agency, including attending staff trainings on emergency planning in preparedness in which the response and roles of the health department staff during different scenarios are presented in detail.

Additional Activities

Field data collection

The SHARP program has expertise in field data collection, our industrial hygienists and ergonomists regularly assess hazards in the workplace. If interested, the fellow would have the opportunity to assist SHARP researchers collect primary data of exposures in the field. The fellow would gain a deeper understanding of the assets of data collected in the field, and the limitations of these types of data. The fellow would also gain valuable experience in planning and executing field studies.

Respond to data requests

The fellow will also be involved in helping with occasional data requests that may come in from agency leadership, outside researchers, or from researchers within SHARP. The fellow will work with the requestor to develop specific questions that may be accurately answered by available data, analyze the data with appropriate statistical methods, and help interpret the results.

Provide epidemiology support to SHARP

SHARP thrives as a multidisciplinary team, with expertise in many different areas in occupational health. The SHARP epidemiologists all maintain their own projects, but also provide support on projects headed by other researchers in other areas such as ergonomics, industrial hygiene, and economics. SHARP epidemiologists often work with other researchers on survey and study design, development of surveillance systems, program evaluation, and analytic methods. The fellow will also have the opportunity to interact on our multidisciplinary project teams and apply their epidemiological knowledge.

Participate in creation of communication products

SHARP regularly publishes a wide variety of products for different audiences, including research findings, statistical briefs, hazard alerts, and fatality investigations. The fellow will produce the appropriate products to communicate findings from their own projects. The fellow may also provide technical assistance such as overall design or idea, data analysis and visualization, and interpretation of findings for other researchers in SHARP.

Mentors

Primary	Jennifer Marcum MS, DrPH Epidemiologist
Secondary	David Bonauto MPH, MD Research Director