

## **Environmental Health, Occupational Health**

### **Nebraska Department of Health and Human Services, Division of Public Health, Epidemiology and Informatics Unit**

Lincoln, Nebraska

#### **Assignment Description**

The NDHHS Epidemiology and Informatics Unit provides an ideal training opportunity to an Environmental Health Fellow (EHF). The Epidemiology and Informatics Unit is housed in the Division of Public Health's Health Licensure and Health Data Section and is administered by Ming Qu, PhD. The Unit is responsible for providing statistical information and epidemiology services that support public health actions and policies to improve the health and safety of Nebraskans. The Unit implements a wide range of health registries and public health surveillance systems, including the CDC-funded Nebraska Electronic Disease Surveillance System (NEDSS) for reportable and infectious diseases, birth and death registries, immigration registry, prescription drug monitoring system, and syndromic surveillance system.

Within the Unit, the Office of Epidemiology conducts various environmental public health activities. Office staff epidemiologists routinely conduct surveillance and investigation of environmentally-related infectious disease cases, including waterborne disease outbreaks, West Nile virus surveillance, and zoonotic diseases. The Office receives funding support from CDC for Childhood Lead Poisoning Prevention and leads childhood lead poisoning surveillance and epidemiology activities. The Nebraska Occupational Safety and Health Surveillance Program (NOSH), which is housed also in the Office of Epidemiology, is funded to conduct occupational health surveillance through a CDC National Institute of Occupational Safety and Health (NIOSH). In addition to surveillance of occupational injuries, NOSH coordinates adult blood lead surveillance and is also one of 13 NIOSH SENSOR-Pesticide Surveillance states which coordinates pesticide illness surveillance.

The Fellow's assignment will involve working alongside Epidemiology and Informatics Unit staff to coordinate environmental health epidemiology activities among the Office's surveillance programs. These activities include designing and developing environmental public health surveillance programming and will touch on several cross-cutting areas including occupational health and infectious diseases.

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

The Fellow will be involved with several day-to-day activities, including: 1) Develop an understanding of and familiarity with environmental health surveillance concepts and datasets; 2) Refine data processing and data management skills; 3) Learn and understand how to assess and evaluate surveillance systems; 4) Analyze and interpret data; 5) Prepare epidemiology reports; 6) Designing and planning environmental health surveillance programming; and 7) Developing protocols, guidance documents, work plans for environmental health surveillance. The training goals for the Fellow will be defined by Centers for Disease Control and Prevention (CDC)/Council of State and Territorial Epidemiologists (CSTE) Applied Epidemiology Competencies (AECs). At the completion of the fellowship, the Fellow will function as a well-qualified Tier 2, mid-level epidemiologist and will be highly employable in a wide range of public health settings.

## **Potential Projects**

### **Surveillance Activity      Surveillance and Investigation of Environmental Poisonings, Illnesses, and Exposures**

Each year, hundreds of Nebraskans experience poisoning and illnesses due to exposures environmental contaminants. Nebraska reportable disease regulations require healthcare provider and laboratory reporting of lead poisoning, carbon monoxide poisoning, and poisonings or illnesses due to pesticides, heavy metals, and other industrial chemicals. This project will expose the Fellow to various poisoning data sources including laboratory reports, hospitalizations and emergency department visits, deaths, syndromic surveillance, and poison center reports. The Fellow will review incoming surveillance data and will be involved in the epidemiological investigation for priority poisonings for childhood and adult lead poisonings, occupational and non-occupational pesticide illnesses, carbon monoxide poisonings, and other chemical poisonings. The Fellow will also assist the DHHS team in the investigation of infectious diseases attributed to environmental factors as needed, such as water-borne disease outbreaks. The Fellow will be responsible interviewing patients, contacting healthcare providers, working with local health departments and other agencies in response to case reports. The Fellow will also analyze poisoning data and develop surveillance reports to describe the burden and trends of environmental illnesses and poisoning in Nebraska.

### **Surveillance Evaluation      Evaluation of Nebraska's Lead Poisoning Surveillance System**

Nebraska's surveillance system for lead poisoning involves the collection of blood lead level laboratory results. All blood lead tests performed in Nebraska are required to be reported to Nebraska DHHS. The Environmental Health Fellow will have the opportunity to conduct a surveillance system evaluation of Nebraska's lead poisoning surveillance system using CDC's Updated Guidelines for Evaluating Public Health Surveillance Systems. The Fellow will 1) engage with stakeholders to participate in the evaluation, 2) describe the surveillance system, 3) design the evaluation, and 4) gather credible evidence of the surveillance system including the data quality, simplicity, representativeness, and timeliness. The Fellow will write a report summarizing the findings of the evaluation. Additionally, the Fellow will work with lead poisoning prevention staff to develop and calculate performance measures as it relates to CDC lead poisoning prevention program grant requirements.

**Major Project    Design and Develop of a State-based Environmental Public Health Surveillance System**

The environment where we live, work, and play can affect our health. Nebraska DHHS has robust environmental public health data sources, yet there is a need to use these data to assess the impact of the environment on Nebraskan's health. Data available include hospitalizations and emergency department visits from hospital discharge data, syndromic surveillance data, death certificates, Behavioral Risk Factor Surveillance System data, water quality data, and air quality data. This project will involve designing and developing an environmental public health surveillance system. This project will have the Fellow working on broad activities including inventorying and obtaining environmental databases to assess data quality, working with multiple internal and external public health program staff learn more about environmental hazards and exposures, and developing surveillance work plans and protocols. The Fellow will use these data to calculate, analyze, and interpret environmental public health indicators and data measures as specified by CSTE and CDC's Environmental Public Health Tracking Program. The main outputs will include development of an inventory and metadata of environmental health data sources, development of a report summarizing the epidemiology of environmental public health indicators/data measures, and development of program planning documents. The Fellow will translate the information gained to develop prevention strategies, recommendations, and educational outreach messaging.

**Additional        Assessing the Burden and Trends of Asthma in Nebraska Project**

The disease of asthma is linked with environmental factors, and the prevalence of asthma in Nebraska is high. Nebraska DHHS has robust data sources to assess the epidemiology of asthma in Nebraska. The Environment Health Fellow will identify, access, and assess the quality of surveillance data to lead a project describing the burden, trends, and epidemiology of Asthma in Nebraska. The Fellow will analyze and interpret data for asthma-related deaths, hospitalizations, emergency department visits, and self-reported prevalence from the BRFSS. This project will also expose the Fellow to syndromic surveillance data, in which real-time emergency department data can be assessed and compared to air quality data to detect geographic and temporal trends and predictors of negative respiratory health outcomes. The Fellow will develop an asthma surveillance report that summarizes the descriptive epidemiology of burden and trends. The Fellow will be the agency's main asthma point of contact and will worked with community-based organizations to identify recommendations and prevention strategies to reduce the impact of asthma in Nebraska.

## **Additional      Using Mapping as a Tool for Environmental and Occupational Health in Nebraska Project**

Using maps to present health data through geographic information systems (GIS) is a powerful tool for public health practice. Maps can be more effective at communicating data for non-public health professionals. Additionally, they can be used to identify regional and local-level variations of health outcomes and risk factors, which help focus public health intervention efforts. Despite their potential, there is a need in Nebraska to take full advantage of using mapping to communicate environmental and occupational health data. The Environmental Health Fellow mapping project will involve using the GIS software ArcMap to generate maps that present environmental illnesses and occupational injury and illness data at the sub-Nebraska geographic level (i.e. county, region, zipcode). Several data sources and surveillance systems exist for this type of analysis. Environmental data for lead, asthma, pesticides, heat-related illnesses will be analyzed and mapped. Occupational injury and illness data sources include workers' compensation claims data, which will be analyzed and linked with employer data to develop geographic-based rates.

### **Preparedness Role**

The Environmental Health Fellow will be expected to respond to acute and emergent problems related to Environmental and Occupational Health Epidemiology, including emergency response activities related to naturally occurring and intentional events which have actual or potential impact on citizens, workers' and responders' morbidity/mortality. Nebraska's Bioterrorism Preparedness Program offers training and exercises to ensure Nebraska's preparedness in the event of an incident or attack involving biological, chemical, radiological or other agents of bioterrorism. The Fellow will access this training and participate in such exercises.

### **Additional Activities**

Education and outreach to stakeholders, working with environmental health and occupational health program staff to gain understanding state-level public health prevention and enforcement activities, assisting in the epidemiology response to outbreaks and public health emergencies, attending training and workshops to develop skills, networking with environmental and occupational health stakeholders at the local, state, and national-level.

### **Mentors**

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| <b>Primary</b>   | Ming Qu PhD<br>Epidemiology and Informatics Unit Administrator                    |
| <b>Secondary</b> | Bryan Buss<br>Deputy State Epidemiologist & CDC Career Epidemiology Field Officer |