

Environmental Health

Description:

He/she will be based in the Epidemiology and Surveillance Section of DEH. DEH currently has seven staff with advanced degrees and training in epidemiology; three have doctorates. Drs. Wahl and Cameron will provide overall direction and guidance to the Fellow. Because of the collaborative structure of the BoE, the Fellow can readily get access and assistance in using data systems managed by other sections such as Chronic Disease Epidemiology and Communicable Diseases. Please visit our website at www.michigan.gov/epi. Due to the crosscutting impact of environmental health issues in multiple areas, we are building collaborations with programs outside of the BoE. The Fellow will have the opportunity to work with specialists in the DEQ and access some of their specialized data sets, which are described in subsequent sections.

Day-to-Day Activities:

The Fellow will have the opportunity to participate in a wide variety of applied epidemiologic activities in collaboration with knowledgeable and experienced scientists. Activities will be dictated by the Fellow's goals and interests, but will typically focus on deskwork at the office, with some fieldwork, meetings, and consultations. On a daily basis, the Fellow will learn to use data sets of varying size and complexity, link data files, edit data and maintain quality control, and manage projects. He/she will participate in the design of studies, in data collection, in the analysis and interpretation of results, and in their dissemination. Academic collaborations exist with experts in environmental epidemiology from MSU and UM SPH that afford the opportunity to engage in high quality scientific research. The Bureau also works closely with the DEQ Air Quality Division on projects related to air pollutant exposure and asthma (see Part D, "Potential Projects"). The Fellow is welcome to participate in other Bureau activities as time and interest permits, including communicable disease or environmental field investigations. He/she will be encouraged to develop professionally through seminars, professional meetings and trainings.

Potential Projects:

This position provides the CSTE Fellow the opportunity to pursue a wide range of topics under the broad area of Environmental Epidemiology. Program areas, which are all available to the Fellow, are described below:

1. A project team, including members from DEH, UM SPH, the MSU Department of Epidemiology, and DEQ, are currently conducting spatial and temporal analyses to determine the effects of exposure to specific air pollutants and proximity to traffic and industry on occurrences of asthma urgent care utilization in the pediatric Medicaid population in Detroit. This project team also assessed the relationships between exposure to specific air pollutants and occurrences of adverse birth outcomes in Detroit. The team completed an analysis of low birth weight; analysis of pre-term births and births with intrauterine growth retardation (IGR) continues. The Fellow could join our project team and examine the effects of exposure to a specific air pollutant on a health outcome, such as asthma exacerbation or births with IGR.

2. The DEH maintains surveillance systems, based on mandatory reporting requirements from laboratories for mercury, arsenic, and cadmium blood and urine levels; and, in collaboration with Michigan State University (MSU), has surveillance systems based on mandatory reports from health care providers and facilities for acute pesticides illness and injury, carbon monoxide poisoning, work-related amputations, and occupational diseases. MSU also maintains the adult blood lead registry, which includes adults with both occupational and non-occupational elevated blood lead levels. Annual reports, special projects, and research studies are carried out using these data. Reporting of all chemical poisonings is mandatory, but MDCH currently only collects reports on selected types of poisoning (e.g. carbon monoxide, pesticides). However, at any time MDCH has the authority to request other types of poisonings. The CSTE fellow could identify another type of poisoning of interest, develop the surveillance protocol, obtain IRB review, and implement the surveillance system. This would provide experience in all aspects of surveillance system development.
3. Our Healthy Homes asthma and injury hazards intervention demonstration project involves in-home indoor air quality (IAQ) assessments, questionnaires, and asthma trigger interventions at baseline and three, six, and 12 months in 240 homes. The project is in the first year of a three-year grant, and project staff members are currently collecting questionnaire data from participating households from the baseline and three and six-month home visits. At the end of the current calendar year (CY 2009), 12-month home visits will begin to be completed, and staff will begin to analyze these first-year questionnaire data. At the end of CY 2010, staff will analyze questionnaire data from the first two years of the project. In addition, a pilot project is being conducted in which dust samples are collected and tested at the baseline and 12 month home visits in 50 of the 240 participating households. These data will also be analyzed following CY 2009. The Fellow could assist in the analysis of the completed questionnaire and dust sampling data (following CY 2009) and/or assist in the collection, preparation, and analysis of data from the next three years.
4. Surveillance data sets that exist because of on-going reporting requirements, many of which have data going back 10 or more years, have information from each case report about the individual reported, including contact information, and would lend themselves to a variety of special projects. For example, a follow-up study of hospitalized carbon monoxide cases could be conducted to identify root causes of exposure, and then the data could be analyzed to develop interventions and/or policy recommendations. Another project would be to develop and implement a survey of non-occupational pesticides case reports to collect additional data to inform the development of interventions. (Currently we only collect follow-up telephone interviews with individuals who have had occupational pesticide poisoning.). A third potential project could be the development and implementation of a study to determine the reasons why physicians order heavy metals screening tests in their patients (most of which appear to be unnecessary, based on our surveillance data), and to use the results to develop recommendations for health care providers.
5. As part of our new program examining the public health effects of climate change, the Fellow could explore the relationship of temperature and other weather parameters on a variety of communicable diseases. a. There is a suggestion in the literature that warmer nighttime

temperatures increase the incidence of mosquito-borne disease. The Fellow could examine the utility of the ArboNet surveillance system to detect temporal associations of weather measurements with arbovirus in humans, animals, and mosquitoes. b. Increasing frequency of severe rainstorms and warmer temperatures may raise the risk of water contamination. The BoE has been exploring ways to develop a system to track illness related to waterborne exposures with Dr. Joan Rose of MSU. The Fellow could work with her Waterborne Diseases Fellowship Program to develop surveillance for waterborne disease, perhaps through modifying the current communicable disease reporting system, the Michigan Disease Surveillance System (MDSS).

6. DEH currently generates the CSTE State Injury, Occupational Health, and selected Environmental Health (EH) and Environmental Public Health Tracking Indicators. In addition, Michigan is an active member of the State Environmental Health Indicators Collaborative (SEHIC), with DEH contributing significantly to the development of SEHIC asthma indicators. Furthermore, DEH is actively participating in the development of cardiovascular and climate change EH Indicators. The Fellow could complete selected climate change EH indicators in collaboration with SEHIC.
7. Opportunities are available for the Fellow to participate in communicable disease or environmental field investigations, as time and interest permits.

Emergency Preparedness Role:

The Fellow is encouraged to participate in trainings and exercises through DEH's Chemical Terrorism and Emergency Preparedness Section, which provides support to the MDCH Office of Public Health Preparedness for chemical and radiological events.

Assignment Location:	Lansing, Michigan
Primary Mentor:	Robert Wahl, DVM, MS Environmental Epidemiologist Michigan Department of Community Health
Secondary Mentor:	Lorraine Cameron, PhD, MPH Environmental Epidemiologist Michigan Department of Community Health