

Occupational Health/Environmental Health

Assignment Description

The Fellow will be working primarily in occupational and environmental disease/injury surveillance and epidemiology, with access to 25 years of surveillance data on occupational/environmental diseases and injuries and the numerous health data resources of Michigan Department of Community Health (MDCH) including Vital Records, the cancer registry, BRFSS, in-patient hospitalizations, communicable disease reports, the state's syndromic surveillance system based on emergency department chief complaints data, Medicaid claims, and a variety of chronic disease data sets.

Existing occupational and environmental surveillance data provide an opportunity to conduct a surveillance system evaluation and then to design one or more analytical projects. Occupational health surveillance in Michigan has always been linked to worksite interventions through on-site worksite inspections conducted by the Michigan Occupational Safety and Health Administration (MIOSHA) or other regulatory agencies and training of workers, employers, and health care professionals. The Fellow will have numerous opportunities to access workplaces with the MIOSHA inspectors. Intervention results data are available for program effectiveness evaluation. In addition, there will be opportunities to explore new and emerging public health data systems and technologies for their utility in occupational/environmental illness and injury prevention.

Day-to-Day Activities

Activities will be dictated by the Fellow's goals and interests, but will typically focus on desk work at the office, field work, 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, data collection, analysis and interpretation of results, and in their dissemination. In addition, the Fellow will participate in site visits to companies identified by the surveillance data that have potential occupational exposure or injury hazards, accompanying other MSU staff and an inspector from the Michigan OSHA program. Past trainees at MSU and MDCH have found this field work to be particularly interesting and rewarding.

The Fellow will have opportunities to participate in other BoE activities as time and interest permits, including communicable and environmental disease outbreak investigations and field response. The Fellow will also have opportunities to participate in public health emergency preparedness planning, drills and exercises. He/she will be encouraged to develop professionally through seminars, professional meetings and trainings.

Potential Projects

MDCH and MSU have a large amount of data, well structured regulations and excellent support staff that will allow the Fellow to have a great deal of flexibility about what they do. Administrative support is provided so the Fellow will not have to spend time on clerical type activity such as data entry. The specific projects listed below are examples of things that can be done. The actual projects will be based

on the Fellow's specific interests. In addition there are epidemiology seminars and various conferences that the Fellow will be encouraged attend at MDCH and MSU. Additional opportunities for training and conferences are at the University of Michigan and Wayne State University, because of the close collaborations between all three state universities and MDCH in applied public health epidemiology projects:

- 1) Michigan's case-based occupational and environmental disease and injury surveillance systems based on mandatory reporting requirements include: laboratory reporting of mercury, arsenic, and cadmium in human blood and urine; laboratory reporting of carboxyhemoglobin in blood; health care provider and facility reports of acute pesticide illness and injury, carbon monoxide (CO) poisoning, work-related amputations, occupational lung disease including work-related asthma, asbestosis and silicosis, work-related burns, work-related traumatic fatalities, and other occupational diseases. Extensive demographic, medical and exposure data on the thousands of reported cases are available. All of these case-based systems have an intervention component, which will allow the Fellow to conduct field investigations. Annual reports, special projects, and research studies are carried out using these data, many of which have data going back 10 or more years, and have information from each individual case reports. In addition to analytical opportunities based on these many data sets, the Fellow will accompany staff on worksite visits to evaluate hazards and collaborate on the development of educational interventions based on surveillance findings.

The following are potential Fellow projects related to these case-based public health surveillance systems:

- A. Perform a surveillance system evaluation for one of the existing systems, using the CDC surveillance system evaluation guidelines.
- B. Conduct descriptive analysis of the subset of occupational pesticide poisoning related to exposure to disinfectants and develop an educational intervention project based on the analytical results.
- C. Analyze existing data on respiratory symptoms of co-workers of cases with work-related asthma. OEM-MSU has interviewed approximately 10,000 co-workers at over 550 facilities where individuals have developed work-related asthma. The Fellow would first participate in co-worker interviewing, going on-site with MIOSHA inspectors and other OEM-MSU staff to learn how the surveillance system works, and then develop an analytical plan.
- D. Conduct a follow-up study of hospitalized work-related carbon monoxide cases to identify root causes of exposure. The data collected from the study would be analyzed to develop interventions and/or policy recommendations.
- E. Develop a new case-based surveillance system of interest to the Fellow for a condition not included in current surveillance but for which case-based reports can easily be

obtained because of mandatory disease/injury reporting requirements already in place (e.g., work-related traumatic brain injury). The Fellow would develop the surveillance protocol, obtain Institutional Review Board review, and implement the surveillance protocol. This would provide experience in all aspects of surveillance system development and implementation.

- F. Work with BRFSS data. MSU/MDCH has published data on work-related asthma, dermatitis and hearing loss using the BRFSS data. Michigan BRFSS now has two years of occupation and industry data from BRFSS participants, providing a new and rich source of data for analysis for the associations between disease/injury, behavioral risk factors, and work.

2) Several opportunities exist for development of new occupational health surveillance systems.

- A. **MIEMSIS:** Almost all of Michigan's Emergency Medical Services agencies are now entering all of their ambulance-run data into an electronic data system (MIEMSIS or Michigan Emergency Medical Services Information System) that is a standardized data system under implementation by EMS in almost all states. Several data elements are related to work, and thus the data should be able to provide information about work-related acute events requiring medical care but that do not result in hospitalization. (Michigan has data on discharges from all acute hospitalizations but does not have a comprehensive data system for Emergency Department visits.) The MIEMSIS program in MDCH has requested the services of an epidemiologist to begin looking at the MIEMSIS data, and thus this is an ideal opportunity to pioneer development of an administrative data system for public health use, looking at occupational and other uses of the data.
- B. **Syndromic surveillance:** Although MDCH does not have a complete Emergency Department data set, MDCH has established a syndromic surveillance system, based on real-time data feeds from approximately half the EDs in Michigan, using chief complaints data to identify aberrations in ED visit frequency primarily related to syndromes likely to indicate infectious disease outbreaks. This system has the capability of being programmed to customize the detection of other problems identified in chief complaints, and thus, for example, a heat-related illness chief complaints detection algorithm is now activated during heat waves. As MDCH considers expanding uses of syndromic surveillance beyond communicable disease outbreaks, there are opportunities to develop new detection algorithms, including those for occupational injuries, for example.
- C. **Occupational infectious disease:** The case-based surveillance system for infectious diseases is a sophisticated electronic data system called MDSS (Michigan Disease Surveillance System). It includes some data on potential work-relatedness, but has not yet been explored for developing electronic linkages with the occupational disease

surveillance systems at OEM-MSU. DEH and the communicable disease program at MDCH collaborate on preparedness and outbreaks, so moving forward with collaboration on occupational infectious disease surveillance is opportune.

Preparedness Role

The Fellow will participate in trainings and exercises, through the DEH's Environmental Health Preparedness Section and MDCH Office of Public Health Preparedness, for chemical, natural disaster, infectious and radiological emergency events. If a real emergency event takes place in environmental or communicable disease, the Fellow will be assigned an epidemiology function within the Incident Command Structure. (Note: one of the previous Fellows spent three weeks in the Command Center following a large oil spill in Michigan tracking acute health effects from the spill, and was a co-author on the resulting surveillance report.) All of MDCH's CSTE Fellows and other CDC assignees participated in Michigan's first CASPER (Community Assessment for Public Health Emergency Response) the week of September 10, 2012, which involved door-to-door surveys using the CDC CASPER methodology. If a CASPER is conducted in 2014 or 2015, the Fellow will have another opportunity to be directly involved with a Preparedness activity. Finally, MDCH is beginning the process of developing "Responder Safety and Health" plan to protect public health staff deployed during a public health emergency. The Fellow will be expected to contribute to the design of this plan, which will need to include a health surveillance module.

Assignment Location: Michigan Department of Community Health
Lansing, Michigan

Primary Mentor: Kenneth Rosenman, MD
Professor

Secondary Mentor: Martha Stanbury, MSPH
State Administrative Manager