

Occupational Health

Assignment Description:

The Fellow will be working primarily in occupational disease/injury surveillance and epidemiology, with access to 25 years of surveillance data on occupational diseases/injuries and the numerous health data resources of 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 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 (OSHA) and other regulatory agencies and extensive education and training of workers, employers, and health care professionals. 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 illness and injury prevention. Potential projects are discussed below.

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 as potentially having 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 disease and environmental outbreak and field investigations. 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 as well as good support so the Fellow will not have to spend time on clerical type activities 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.

Michigan's case-based occupational disease and injury surveillance systems based on mandatory reporting requirements include: laboratory reporting of mercury, arsenic, and cadmium in human blood and urine samples; laboratory reporting of cholinesterase and 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. The system has extensive demographic, medical and exposure data on the thousands of cases reported by providers and laboratories to these surveillance systems. 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 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:

- Perform a surveillance system evaluation for one of the existing systems, using the CDC surveillance system evaluation guidelines.
- 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.
- 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 Michigan OSHA inspector and other OEM-MSU staff, to learn how the surveillance system works, and then develop an analytical plan.
- 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.
- Develop a case-based surveillance system of interest to the Fellow 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.
- Develop and implement a study to determine the reasons why physicians order heavy metals screening tests for their patients, most of which appear to be unnecessary based on current surveillance data; these results would be used to develop recommendations for health care providers.
- Work with BRFSS data. MSU/MDCH has published data on work-related asthma, dermatitis and hearing loss using the BRFSS data. In 2013, for the first time the Michigan BRFSS will be collecting data on occupation and industry, which will be available for analysis in 2014.

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

- 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.

- 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. However, this system has the capability of being programmed to detect 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.
- 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, and radiological 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. MDCH is planning on performing at least one CASPER in 2013, which will give the Fellow another opportunity to be directly involved with a Preparedness activity.

Assignment Location: Lansing, MI

Primary Mentor: Kenneth Rosenman, MD
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