

ID: 58883894

Occupational Health, Environmental Health - Host Site Description

Wisconsin Dept. of Health Services

Assignment Location: Madison, US-WI
Wisconsin Dept. of Health Services
Division of Public Health/Bureau of Environmental and Occupational Health

Primary Mentor: Sheryl Bedno, MD, DrPH, MPH
Chief Medical Officer
Wisconsin Dept of Health Services/Bureau of Env. and Occ. Health

Secondary Mentor: Paul Creswell, PhD
Senior Epidemiologist, Occupational Health & Safety Surveillance Program
Wisconsin Dept of Health Services/Bureau of Env. and Occ. Health

Work Environment

Hybrid

Assignment Description

The Fellow will reside in the Epidemiology section of the Bureau of Environmental and Occupational Health (BEOH). BEOH offers a broad range of opportunities for applied epidemiology projects, including public health surveillance, research, health informatics, and case investigations of exposure-disease relationships. The incoming Fellow will gain experience and develop expertise in a broad range of programs and activities during the two-year fellowship period.

Depending on the Fellow's interests, anywhere from 50%-100% of the Fellow's activities will be devoted to occupational health and safety surveillance, which can focus on analyses, investigations, communications or outreach activities. Based on the interests of the Fellow and guidance from the primary and secondary mentors, a work plan will be developed to allow the Fellow to choose from a wide variety of activities that address the fellowship's core competency requirements and broaden the Fellow's perspective and understanding of environmental and occupational health. BEOH maintains expertise in environmental health surveillance, lead poisoning and hazard abatement, asthma, healthy homes, occupational health, Superfund site characterization and revitalization, indoor air quality, climate and health, radiation safety and inspections, and groundwater quality. This expertise includes extensive experience in public health education, stakeholder outreach, public health policy development, and regulatory program administration. BEOH maintains a strong collaboration with faculty and academic staff at UW-Madison; the primary mentor holds an adjunct faculty appointment at UW-Madison and will help facilitate linkages with University staff, programs, and resources as needed for various projects. Both the secondary and tertiary mentors also maintain UW-Madison affiliations in Population Health Sciences.

Additionally, as the opportunities arise, the Fellow will be invited to participate in field experiences such as outbreak investigations, environmental inspections, preparedness exercises, and emergency response activities. The Fellow is strongly encouraged to present and publish results from surveillance or research activities. The mentors work with the Fellow to identify such opportunities, and support for travel to local conferences and workshops is provided as needed.

Describe Statistical and Data Analysis Support, Such as Databases, Software, and Surveillance Systems Available to the Fellow

This project affords significant statistical and data analysis support. All listed mentors have extensive experience with data analysis and statistical methods, as do several other staff members with whom the Fellow would interact two additional Occupational Health epidemiologists and a variety of epidemiologists from other programs within the Bureau or Division. BEOH has a strong cohort of both SAS and R users who can provide data analysis support. BEOH

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epidemiologists have an optional weekly brownbag-style meeting to share work-in-progress and ask questions. BEOH has a strong tradition of publishing peer-reviewed research and can assist the Fellow with manuscript development and preparation if that is of interest. Tableau licenses are also available as needed for data visualization projects, and several staff currently have projects in Tableau and an interest in data visualization best practices. GIS tools are also available for those who are interested. Any software resources that a Fellow needs which are not currently used can be considered.

BEOH makes use of several data sources, including:

- Hospital discharge data
- Vital records
- Ambulance run data
- Workers Compensation claims data
- ESSENCE syndromic surveillance
- Wisconsin Electronic Disease Surveillance System (WEDSS) system for reportable conditions. This system increasingly uses electronic case reporting (eCR) as well as electronic lab reporting (ELR) and manually reported case information.
- Wisconsin Poison Center data
- Cancer registry
- Birth defects registry
- Trauma registry
- Adult and childhood blood lead data
- Behavioral Risk Factor Surveillance System (BRFSS)

Projects

Surveillance Activity Title: eCR-based Surveillance of Occupational Lung Diseases from Biodusts and Bioaerosols

Surveillance Activity Description:

Assist with early implementation of electronic case reporting (eCR) for several conditions falling under this umbrella of occupational lung diseases. Review records for case identification and conduct follow-back activities to further determine occupational and non-occupational sources of exposure and relevant individual risk factors. Analyze resulting data and report findings.

Surveillance Activity Objectives:

- 1) To allow case capture of relevant occupational lung diseases via eCR.
- 2) To identify high risk industries, occupations, and work settings for various lung diseases related to biodusts and bioaerosols.
- 3) To identify other relevant risk factors or groups emerging from the data (e.g., non-occupational exposures; demographic or geographic groups, etc).
- 4) To share findings with internal and external audiences via manuscript, surveillance brief, dashboard or other similar product.

Surveillance Activity Impact:

This project will help Wisconsin's public health community assess the burden of such diseases; identify communities at risk; and craft prevention strategies and communications.

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Surveillance System Evaluation Title: Evaluation of Alternative Follow-Back Tools to Supplement Occupational Disease Surveillance

Surveillance System Evaluation Description:

Electronic case reporting and electronic lab reporting have vastly increased the State's access to potential case reports. However, since neither lab results nor health records tend to include relevant exposure information needed to classify cases as occupational, follow-back with the patient or provider is almost always needed. The traditional approach of phone-based interviews is limited by staff capacity and suffers from known deficits, including substantial response biases (by e.g., age, language, work schedules and hours) and a general trend towards reduced response rates. In response, during Spring 2024 BEOH will begin to pilot both paper and electronic questionnaires as alternative means of gathering industry, occupation, and exposure data. The Fellow will compile overall and question-specific response rates for both the paper and electronic questionnaires and assess any patterns based on case demographics, questionnaire timing (e.g., time from first diagnosis to outreach), and other relevant factors. Results will help quantify the benefits of alternative approaches and point towards opportunities to further increase data quality and quantity for future iterations.

Surveillance System Objectives:

The project will help answer the following questions:

- 1) How successful is the alternative follow-back approach at capturing key data fields?
- 2) For whom and under what conditions is it most effective?
- 3) How could the system be further improved?

Surveillance System Impact:

The evaluation project will help BEOH best leverage limited resources to fill key gaps in occupational surveillance data. Results of the evaluation project can inform the work of other Wisconsin surveillance programs that may also benefit from integration of self-reporting tools. Such projects are important at a time when traditional tools such as phone-based interviews or surveys are seeing diminishing returns.

Major Project Title: Analysis of novel work-related BRFS questions

Major Project Description:

Assessing the prevalence and burden of key occupational illnesses and injuries is notoriously difficult in the U.S. Both administrative and medical datasets are known to significantly under-report or misclassify such cases. Given these limitations, in recent years Wisconsin has included several such questions in the BRFS. These include questions on long COVID (which can both affect someone's ability to work and result from workplace transmission of SARS-Cov2); a set of questions on work-related injuries or illnesses; and standard questions on the respondents' industry and occupation. The work-related injury questions are being piloted by Wisconsin and have been adapted and shortened from an earlier multi-state BRFS module. These represent novel, as-yet unexplored data sources. The CSTE Fellow would be the first to analyze and report out on the results. Given the breadth of the BRFS, the Fellow could choose to disaggregate or control for any number of other variables of interest. In addition to providing prevalence estimates for long COVID or work-related injuries, the results would directly inform Wisconsin's decisions around future use of such questions.

Major Project Objectives:

- 1) Using BRFS to provide workforce prevalence estimates for long COVID and/or work-related injuries.
- 2) Identifying elevated risk groups (e.g., by industry or occupation groups, demographics, or other health status questions).
- 3) Reporting results as a manuscript, surveillance brief or formal presentation.
- 4) Conducting some validity and reliability checks on the work-related injuries module (if used).

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- 5) Engaging BEOH program staff in discussions of data strengths and weaknesses as revealed through analysis.

Major Project Impact:

Work is a social determinant of health, and work-related illnesses and injuries contribute to many of the leading sources of morbidity and mortality in the U.S. At the same time, the contribution of work to morbidity and mortality remains under-appreciated within public health--largely due to large and persistent gaps in our ability to capture work-relatedness in key data sources. If found to be sufficiently valid and reliable, the piloted BRFSS work injury or illness questions could provide a new and valuable data source for capturing the prevalence and burden of work-related injuries and illnesses. This is particularly important since current data sources rely heavily on employers, healthcare providers, or insurers and are known to grossly under-represent the most at-risk worker. Better self-reported estimates from workers themselves could shed light on the health burdens faced by vulnerable workers and inform policy and prevention efforts. This potential to inform policy and outreach exists whether the Fellow opts to analyze the workplace injury questions, the long COVID questions, or both.

Additional Project #1 Title: Initial Analysis of Work-Related Injuries in the Wisconsin Trauma Registry

Project #1 Type: Surveillance Activity

Project #1 Description:

The purpose of this project is to conduct some basic descriptive analyses of at least five years of work-related injuries as recorded in the Wisconsin trauma registry. Our program currently has access to Trauma Registry data, but have not yet had an opportunity to explore this data source. The registry is one of the few data sources that includes required questions on whether or not an injury was work-related. Thus, it is a potentially important data source for our Occupational Health and Safety Surveillance Program. While the primary objectives of this project are related to accessing and using Trauma Registry data per se, there is a somewhat evaluative component in the third objective (i.e., the potential for results to help evaluate the completeness of other data sources).

Project #1 Objectives and Expected Deliverables:

- Objective 1: Enhance the program's surveillance capacity by developing and sharing code for analysis of work-related injuries in the WI trauma registry.
- Objective 2: Produce descriptive statistics of work-related injuries in the WI Trauma Registry to identify the most frequent injury types and populations at risk (by industry, occupation, geographic region, age, sex, race/ethnicity).
- Objective 3: Compare the resulting Trauma Registry statistics to the incidence and distribution of similar injuries in worker's compensation (WC) data to identify any populations or types of injury that are significantly under-reported in workers' compensation. Note that the Fellow will not need to analyze WC data, but can use existing data products and collaboration with in-house staff to help complete the comparison.

Deliverables: Deliverables for this project could variously include a conference paper or poster, surveillance brief, manuscript, or simply in-house presentation to the Occupational Health team. The determining factor will be the Fellow's time and availability.

Project #1 Impact:

Given the explicit reporting requirements of work-relatedness in the Trauma Registry, this project has the potential to uncover previously under-appreciated patterns of traumatic, work-related injuries in Wisconsin. More vulnerable groups of workers are generally less likely than more advantaged workers to file a workers compensation claim when injured at work (see e.g. [Azaroff et al's](#) classic study). This means that the former group's injuries are less likely to be captured by public health surveillance, and that such workers are less likely to receive the medical coverage and income-replacement payments that come from workers compensation. By contrast, because reporting of work-relatedness in the Trauma Registry is not exclusively tied to whether or not the worker files a claim, Trauma Registry data may reveal higher rates

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and different patterns of injury among young people, workers of color and more precarious workers than currently reflected in our workers compensation data. Such findings could in turn help our program to adjust our surveillance, communications and outreach efforts to better reflect those populations and serve those workers. The result would be a more equitable approach to Wisconsin's occupational health work.

Conversely, if the results of the Trauma Registry analysis roughly mirror the workers compensation data across demographics, that could indicate that selective under-claiming by vulnerable workers is less of a problem than anticipated in Wisconsin. Such findings would support our current use of workers compensation data as a primary tool of injury surveillance. They would also point towards relative successes in the Wisconsin workers compensation system—something that we could share with partners directly involved in that system.

This brief explanation does not exhaust the possible results or the drivers behind such results. However, it points to the importance of exploring this data source as part of our occupational health surveillance. Whatever the results of an initial analysis, the project is sure to inform our work and spark additional lines of inquiry and public health intervention.

References:

- Azaroff LS, Davis LK, Naparstek R, Hashimoto D, Laing JR, Wegman DH. Barriers to use of workers' compensation for patient care at Massachusetts community health centers. *Health Serv Res.* 2013 Aug;48(4):1375-92. doi: 10.1111/1475-6773.12045. Epub 2013 Feb 28. PMID: 23445431; PMCID: PMC3725530.
- Mobinizadeh M, Berenjian F, Mohamadi E, Habibi F, Olyaeemanesh A, Zendedel K, Sharif-Alhoseini M. Trauma Registry Data as a Policy-Making Tool: A Systematic Review on the Research Dimensions. *Bull Emerg Trauma.* 2022 Apr;10(2):49-58. doi: 10.30476/BEAT.2021.91755.1286. PMID: 35434165; PMCID: PMC9008338.
- Sears JM, Bowman SM. State Trauma Registries as a Resource for Occupational Injury Surveillance and Research: Lessons From Washington State, 1998-2009. *Public Health Rep.* 2016 Nov;131(6):791-799. doi: 10.1177/0033354916669358. Epub 2016 Oct 19. PMID: 28123225; PMCID: PMC5230832.

Please Describe the Fellow's Anticipated Role in Preparedness and Response Efforts – Include Activities and Time Allocation (Required Competency of Fellowship)

Several BEOH programs pursue work related to climate adaptation. The Fellow's activities related to climate adaptation, especially preparation for extreme heat and precipitation events, closely align with the initiatives of DPH's Office for Preparedness and Emergency Healthcare. The Fellow has an opportunity to participate in statewide emergency preparedness exercises that cover a range of potential incidents, including radiological contamination, power outages, and bioterrorism. The Fellow may also have the opportunity to participate in an Incident Command System during real-world responses to statewide emergencies.

Please Describe the Fellow's Anticipated Role in Cluster and Outbreak Investigations – Include Activities and Time Allocation (Required Competency of Fellowship)

BEOH programs engage in cluster and outbreak investigations related to a variety of exposures and conditions, including: lead; other heavy metals; CO; silica; asbestos; harmful algal blooms; cancer clusters; and other emerging environmental or occupational exposures. The Occupational Health program also assists the Bureau of Communicable Disease in certain work-related infectious disease outbreak investigations. During 2023, the Occupational Health program conducted on-site investigations in response to worker or employer requests to unidentified contaminants. In both cases, a multi-disciplinary team engaged in interviews, site investigations and testing to identify the contaminant

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and make recommendations. The Hazard Assessment section regularly sends staff to respond to local public health requests for toxicological assistance for any number of environmental health scenarios.

The Fellow would be provided the option to participate in such site visits, to conduct interviews, and to help compile results and communicate findings. This would comprise 5%-10% of the total fellowship, with some intense periods of investigation followed by stretches without any cluster or outbreak investigation work.

Alternatively, a Fellow with an interest in improving cluster or outbreak detection could help improve detection and early alerts for given conditions via syndromic surveillance, poison control center, WI Electronic Disease Surveillance System (WEDSS) or other data systems. Such a detection project could comprise up to 20% of a Fellow's total time with BEOH.

Please Describe the Fellow's Anticipated Role in the COVID-19 Response – Include Activities and Time Allocation

While BEOH is not actively engaged in COVID-19 response at this time, the Fellow will be introduced to tools that the Occupational Health program used earlier in the pandemic to track worksite COVID-19 outbreaks as well as communication tools for engaging workers, employers, and local public health. BEOH works closely with infectious disease colleagues within the Bureau of Communicable Disease and there are opportunities for a Fellow to engage with other response efforts. For instance, in recent years the Occupational Health program assisted with Mpox response efforts; with a Blastomycosis outbreak; and with Highly Pathogenic Avian Influenza (HPAI) outreach and communications. BEOH continues to partner with stakeholders to promote COVID-19 and other vaccination efforts to high-risk populations such as immigrant farm workers. Approximately 5% of the Fellow's time could be devoted to such infectious disease response efforts through case investigation interviews, data review, or preparation of communications materials. A Fellow with substantial interest in infectious disease response efforts could expand this part of the work to suit their interests.

Please Describe Opportunities for Fellows to Work in Health Equity as well as Incorporating Diversity, Equity, and Inclusion into their Work

Health inequities are alarmingly apparent in environmental and occupational health. Almost any project a Fellow engages in will have the opportunity to quantify and contextualize health disparities as they relate to unequal environmental or occupational exposures. BEOH also has a Health Equity Strategist on staff to directly engage programs in deeper DEI work. The State Health Officer holds regular Friday office hours focused on health equity to help programs better incorporate DEI into their work. The Occupational Health program additionally provides opportunities to hear directly from health-impacted workers through contracted English and Spanish language listening sessions (carried out by the University of Wisconsin-Madison). There is ample room for a Fellow to innovate or advocate for additional approaches to bringing DEI concerns forward in their projects or related activities.