

ID: 44071143

Environmental Health, Injury - Drug Overdose - Host Site Description

Michigan Department of Health and Human Services

Assignment Location: Lansing, US-MI
Michigan Department of Health and Human Services
Division of Environmental Health

Primary Mentor: Thomas Largo, MPH
Environmental Health Surveillance Section Manager
Michigan Department of Health and Human Services

Secondary Mentor: Anthony Oliveri, PhD, MPH
Environmental Epidemiology and Analytics Section Manager
Michigan Department of Health and Human Services

Work Environment

Hybrid

Assignment Description

The CSTE Fellow would be positioned in the Division of Environmental Health (DEH) and would split their time between the Michigan Climate and Health Adaptation Program (MICHAP) and the Opioids and Emerging Drugs (OED) Unit.

MICHAP supports a climate resilient public health system by investigating climate-driven health risks and collaboratively implementing climate adaptation strategies across levels of government and disciplines. The program creates health education materials, researches climate impacts to health, serves as a subject matter expert, and participates in emergency response and preparedness for climate-driven events. The emergency response work primarily consists of conducting heat and cold-related illness and carbon monoxide poisoning surveillance, coordinating a heat and cold-health warning system, and analyzing syndromic surveillance data for heat, cold, and CO poisonings to create seasonal or event-specific reports.

The OED Unit coordinates and implements overdose and substance use-focused epidemiological studies. Regular activities of the unit include on-going surveillance of novel and emerging drug misuse clusters/outbreaks, providing epidemiological support to public health interventions, producing regular surveillance reports, and responding to data requests from partners. The OED Unit also created and manages an overdose surveillance data system that all local health departments in Michigan have access to, and the OED Unit consequently provides extensive TA and support for Michigan counties.

Day to day activities for this position will include regular meetings with the OED unit and MICHAP, working on the proposed surveillance activity, surveillance system evaluation, and major projects outlined in the following sections. In general, the fellow can expect to spend time designing and conducting analyses of overdose and climate surveillance data, assessing surveillance data quality, spearheading, and writing surveillance reports, attending various meetings with internal and external stakeholders, providing support during emerging drug issues and climate-driven emergency response efforts, and any other relevant work as needed.

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

SAS and/or R software and support will be made available to the fellow and there are user groups and Microsoft Teams Channels set up for both. If desired, ArcGIS and/or QGIS may be made available and the fellow could rely on the support and expertise of the DEH GIS Unit and the State of Michigan's GIS user group.

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The fellow will have access to several surveillance systems related to substance use, including:

- (1) the Michigan Inpatient/Outpatient Database (MIDB/MODB, administrative hospitalization data)
- (2) MiCelerity (a new surveillance system that collects linked data from hospital electronic health messages and Electronic Death Registration System data)
- (3) Michigan resident death files (vital records data from death certificates)
- (4) the Treatment Episode Dataset (TEDS, publicly-funded substance use disorder (SUD) treatment data)
- (5) Michigan Syndromic Surveillance System (MSSS) and the Electronic Surveillance System for Early Notification of Community-Based Epidemics (ESSENCE)
- (6) emergency medical service (EMS) data

For climate-related projects, the fellow will primarily access surveillance data in ESSENCE or the Michigan Syndromic Surveillance System (MSSS), and some work may require using the MIDB/MODB and death certificate data mentioned above as well as emergency medical services (EMS) data.

Projects

Surveillance Activity Title: History of co-occurring substance use disorders in Michigan, with a focus on health equity

Surveillance Activity Description:

This project will be three-fold. The fellow will identify a health equity topic of interest and work with relevant key stakeholders to improve their understanding of the nuances of said topic. They will learn how to appropriately analyze surveillance data with regards to co-occurring drug use, including alcohol and cannabis, and related harms/injuries using available data in Michigan, and then create a final report that can be shared with stakeholders and partners.

Surveillance Activity Objectives:

Objective 1: Conduct a literature review and/or work with programmatic partners to gain an understanding of the history on either a key health equity topic or minoritized population as it relates to substance use disorder.

Deliverable 1: Documentation of findings

Objective 2: Conduct an analysis of alcohol and cannabis use in conjunction with other drugs, examining differences related to identified health equity topic

Deliverable 2: Analysis results

Objective 3: Create a report, with a focus on either a key health equity topic or minoritized population

Deliverable 3: Formal report

Surveillance Activity Impact:

Routine surveillance is not being conducted in Michigan for alcohol nor cannabis use, alone or in conjunction with other drugs. This represents a significant gap at the health department, particularly since the legalization of marijuana in 2018. We will have a CSTE fellow, from summer 2023 to the summer of 2024, examining cannabis specifically and its legalization, and we hope that a new CSTE fellow will expand on those findings by including alcohol, including more historical information for context, and tying it to a key health equity topic as selected by the 2023-2025 CSTE fellow. The fellow would have the opportunity to conduct analyses that influence policy and programmatic planning for an extremely relevant and important health topic.

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Surveillance System Evaluation Title: Evaluation of Michigan’s syndromic surveillance system for conducting surveillance of heat- and cold-related illness associated with extreme heat and cold weather events.

Surveillance System Evaluation Description:

Michigan’s syndromic surveillance system (MSSS) and the Electronic Surveillance System for Early Notification of Community-Based Epidemics (ESSENCE) will be utilized to identify residents receiving treatment for cold- and heat-related illness during cold and hot weather events. Because of the reliance on the syndromic surveillance data in ESSENCE and MSSS, it will be essential to understand the salient attributes of this system.

These attributes are as follows:

- (1) timeliness - the amount of time from patient treatment to when that information is made available to MDHHS
- (2) flexibility - the level of effort required to revise case definitions or make other types of modifications necessary to enhance surveillance
- (3) simplicity- an indication of the structure and ease of operation of the system
- (4) acceptability- the willingness of those responsible for data collection and reporting to participate in the system
- (5) data quality - primarily a measure of the degree of missing or out-of-range data, but it can also examine the frequency that there are problems in data submission from a facility (e.g., a ‘dropped feed’); it may also involve the comparison of data values contained in the surveillance system to ‘true’ values
- (6) representativeness - the degree to which data provided by the surveillance system represents the population of interest
- (7) sensitivity - the degree to which true cases are actually captured by the surveillance system
- (8) predictive value positive - the proportion of cases identified by the MSSS that are in fact cold- or heat-related illness cases. Depending on the results of the analysis, the findings could be used to improve and further refine the heat and cold related illness queries in ESSENCE/MSSS for Michigan specific data.

Surveillance System Objectives:

Objective 1: Work with mentor to identify strategies for conducting the evaluation.

Deliverable 1: Written plan.

Objective 2: Develop timeline for conducting the evaluation.

Deliverable 2: Written timeline.

Objective 3: Conduct evaluation and disseminate results. Potentially add suggestions for improving or further refining the queries for heat and cold illness for Michigan specific data.

Deliverable 3a: Written report.

Deliverable 3b: Verbal presentation.

Surveillance System Impact:

This project will provide essential information to MDHHS regarding the value and limitations of using syndromic surveillance to measure the potential health impact of extreme cold and heat events. Additionally, depending on the results of the analysis, the findings could be used to improve and further refine the heat and cold related illness queries in ESSENCE/MSSS for Michigan specific data.

Major Project Title: Burden and risk factors for cold-related and heat-related illness and death

Major Project Description:

MICHAP would like to better understand the burden, risk factors, and circumstances of exposure for illness and death directly attributed to each cold and heat in Michigan. Using methods by Lane et al. 2018, and exploring other

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approaches, the goal is to examine hospital discharge, death certificate, medical examiner, and syndromic surveillance data from the cold and hot weather seasons over a period of 5 or 10 years. If we know the average annual burden of cold and heat-related illness and death, and the factors that place individuals at higher risk, this can inform the extreme heat and extreme cold public health prevention and intervention strategies in the state.

Lane et al. 2018:

<https://pubmed.ncbi.nlm.nih.gov/29601479/#:~:text=The%20majority%20of%20deaths%20and,heat%20are%20most%20at%20risk>

Major Project Objectives:

Objective 1: Review the literature for best practices on analyzing burden and risks of heat-related illness and death, cold-related illness and death

Deliverable 1: Literature review

Objective 2: Apply a methodology to burden and risk analysis for heat and cold-related illness and death

Deliverable 2a: Documentation of analysis methodology

Deliverable 2b: Formal report explaining analysis methods and results

Objective 3: Determine potential public health preventions and interventions

Deliverable 3: Presentation of findings (for all three objectives) and prevention/intervention recommendations

Major Project Impact:

This project will give the fellow an opportunity to add to a growing body of research on local heat and cold-related health impacts. A data-driven approach will help MICHAP determine the best methods for outreach, engagement, and education to prevent and reduce the cold and heat-related illnesses and deaths in the state. This research will inform other projects MICHAP hopes to pursue, including analyzing health-based heat thresholds for the state and projecting future heat and cold-related illnesses and deaths (based on climate projections).

Additional Project #1 Title: Connection between extreme weather, housing instability, and Substance Use Disorder (SUD)

Project #1 Type: Major Project

Project #1 Description:

The paper "Burden and Risk Factors for Cold-Related Illness and Death in New York City" found that "unsheltered homeless individuals, people who use substances and become incapacitated outdoors, and older adults with medical and psychiatric conditions without home heat are most at risk" (Lane et al. 2018). To date, there has not been any analysis conducted to examine the connection between housing and SUD nor extreme weather and SUD. This project would include several analyses and has a lot of room for input and direction by the CSTE fellow.

Potential approaches for analysis include (but are not limited to):

1) The fellow would analyze the relationship between heat and cold-related illness and death and known risk factors such as substance use disorder and/or being unhoused/homeless. Syndromic surveillance data presents an imperfect but potential application for analyzing rates of SUD and homelessness in cold and heat-related emergency department visits.

2) The fellow could conduct a literature review on overdose morbidity and mortality related to severe weather events.

Lane et al. 2018:

<https://pubmed.ncbi.nlm.nih.gov/29601479/#:~:text=The%20majority%20of%20deaths%20and,heat%20are%20most%20at%20risk>

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Project #1 Objectives and Expected Deliverables:

Objective 1: Determine ways of analyzing the relationship between SUD and homelessness, and extreme weather and SUD. For each area of interest, identify variables of interest and study design. This could include times and areas that experienced extreme temperatures over the past several years as well as overdose outcomes such as number of fatal overdoses. It could also include variables related to cold and heat-related emergency department visits and/or deaths that indicate if the individual was also under the influence of a substance and/or experiencing homelessness.

Deliverable 1: Identified variables and study design

Objective 2: Conduct analysis and write report

Deliverable 2a: Analysis output

Deliverable 2b: Formal report

Project #1 Impact:

This project will give the fellow the opportunity to analyze the way unstable housing, extreme weather, and SUD may interact which will improve public health understanding of the topic. This project will have the potential to influence key policy and programmatic interventions. Currently, Michigan is determining ways in which opioid settlement money will be spent, an analysis like this would provide much needed information around housing-related program gaps.

Additional Project #2 Title: Create a report on access to (including barriers) SUD recovery resources

Project #2 Type: Major Project

Project #2 Description:

The information on SUD recovery pathways is scattered, and websites will often have information on a single type of recovery, such as buprenorphine prescribing. There is a need to better understand what resource gaps exist across the state for both formal and informal recovery, who is accessing (or not accessing) different types of recovery, and what protective factors may lead to a more successful recovery journey.

Project #2 Objectives and Expected Deliverables:

Objective 1: Preliminary research, the fellow may work with the Lived Experience Advisory Group (LEAG), staff running Overdose Fatality Reviews (OFRs) and/or work with program and policy staff to complete this objective.

Deliverable 1a: Research and meeting notes

Geographic analysis on statewide SUD recovery availability. Fellow may work with the GIS Unit to do any desired mapping work.

Deliverable 1b: Gathered and cleaned data

Deliverable 1c: Analysis and output

Objective 2: Analysis on access to recovery (by demographic group). Fellow may work with key stakeholder groups, such as an SUD Race Equity Workgroup or representatives from Michigan's Tribal Communities.

Deliverable 2a: Analysis output

Objective 2b: Formal report that pulls together the first two objectives and include policy recommendations. Fellow may include information from the LEAG, OFRs and/or work with program and policy staff to complete this objective.

Deliverable 2c: Formal report

Project #2 Impact:

This work will inform policy and program planning and decision making around access to recovery resources. There is a special need at the moment for work like this, given the opioid settlement dollars being distributed across Michigan. The information OED distributes are and will be key resources for decision makers in the SUD space. This report will be included in that list of key resources available to partners.

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

Division of Environmental Health (DEH) is regularly involved in responses to other emergency events in which epidemiological support is needed and the fellow could assist. Recent examples include flooding, vapor intrusion, other hazardous substance releases, etc. The time allocation for these activities could be 2-4 hours per month, with the potential to be higher if new events requiring DEH response developed.

Additionally, the fellow can assist MICHAP's heat and cold preparedness plans and heat and cold health early-warning communication alerts. The fellow would assist the ongoing syndromic surveillance of cold and heat-related illness and carbon monoxide poisonings (which occur after power outages from extreme weather events). Through this surveillance, data from an increase in cases would be incorporated into messages sent through the Michigan Health Alert Network and potentially into press releases issued by MDHHS or the State of Michigan.

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

The OED Unit performs regular checks for overdose clusters which, if detected, in turn lead to deeper investigations via the associated surveillance systems and the distribution of an alert to relevant stakeholders.

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

None.

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

Reducing health disparities and incorporating diversity, equity, and inclusion into on-going work is a priority within the Division of Environmental Health. Publications by the DEH regularly address health disparities, particularly racial and ethnic disparities. The DEH also periodically collaborates with the MDHHS Office of Equity and Minority Health on projects and jointly funds a health disparities epidemiologist with this office. The fellow will be expected to apply a health equity lens to their projects/analyses, and will have opportunities to collaborate with other staff, such as the health disparities epidemiologist, working to promote health equity. The fellow will also have the freedom to pursue projects or analyses related to health equity that relate to their work in the division.