ID: 76137720
Injury - Drug Overdose, Environmental Health - Host Site Description
Michigan Department of Health and Human Services

Assignment Location: Lansing, US-MI
Michigan Department of Health and Human Services
Division of Epidemiology, Data Analytics, & Evaluation

Primary Mentor: Mary Franks, MPH
Lead and Other Hazards Unit Manager
Michigan Department of Health and Human Services

Secondary Mentor: Haley Kehus, MPH
Opioids & Emerging Drugs Unit Manager
Michigan Department of Health and Human Services

Work Environment
100% Virtual

Assignment Description

The CSTE Fellow would be positioned in the Environmental Health Bureau (EHB) and would split their time between the Environmental Epidemiology and Analytics Section (containing the Opioids and Emerging Drugs (OED) Unit and the Lead and Other Hazards (LOH) Unit) and the Environmental Health Surveillance Section (containing the Health Statistics Surveillance Unit). EHB uses the best available science to reduce, eliminate, or prevent harm from environmental, chemical, and physical hazards. EHB also aims to promote environmental justice and health equity for the people of Michigan by targeting services to those who need them based on the best available data.

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 use clusters/outbreaks, providing epidemiological support to public health interventions, producing regular surveillance reports, and responding to data requests from partners.

The LOH Unit conducts comprehensive epidemiological surveillance and longitudinal assessments of lead in children, water, and homes over time. LOH may also be asked to provide similar assessments for other contaminants as needed.

Day to day activities for this position will include regular meetings with the Units involved in the various activities, designing and conducting analyses of overdose and lead 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 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 CSTE Fellow, along with ArcGIS Pro. The OED and LOH Units have staff that are proficient in both SAS and R, providing the CSTE Fellow with support and guidance. The Division's Geospatial Information Services Unit (GIS Unit) will be available to provide both technical and analytical support and, where needed, data engineering support such as address cleansing and geocoding. EHB also has an R Users Group and SAS Users Group that provides software users a space to connect, troubleshoot, and learn about the software through presentations and structured discussions. 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) and (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), and (4) the Treatment Episode Dataset (TEDS, publicly-funded substance use disorder (SUD) treatment data). For lead-related projects, the fellow will primarily access MiCLPS, a database for blood lead testing results. This project will also involve access to the MICLEAR (a database for tracking case management activities related to elevated blood lead levels and data relating to environmental investigations performed to evaluate potential sources of lead exposure).

Projects

Surveillance Activity Title: Cluster Detection and Investigation in EMS Responses to Probable Opioid Overdoses

Surveillance Activity Description:
This project will be three-fold. The Fellow will familiarize themselves with a surveillance system for emergency medical services (EMS) data and the case definition used for identifying probable opioid overdoses, will build off of ongoing work with OED and GIS Unit staff to develop a process by which clusters or hot-spots are identified within EMS responses, and utilize the identified method to assess the EMS data and report on identified clusters.

Surveillance Activity Objectives:

- Objective 1: Develop a standardized approach to identifying clusters among EMS responses to probable opioid overdoses
    - Deliverable: Documentation of the cluster detection approach and the creation of a routine protocol to be implemented within an ongoing surveillance framework.
- Objective 2: Produce a report on the results of an initial application of the cluster detection approach
    - Deliverable: Formal report characterizing clusters identified within the EMS data, potentially including their trends over time.

Surveillance Activity Impact:
We have historically analyzed and reported EMS responses to probable opioid overdoses by comparing responses across defined geographic boundaries (by county, for example). The development and implementation of a cluster detection approach will allow for clusters to better be identified and communicated to public health partners for follow-up and intervention.

Surveillance System Evaluation Title: Assessment of Michigan Poison and Drug Information Center (MiPDC) Data for Public Health Drug Surveillance

Surveillance System Evaluation Description:
The fellow will use a database of MiPDC data to evaluate the utility of this dataset for public health drug surveillance. The fellow will first familiarize themselves with the dataset and how OED has used these data to fulfill data requests about specific substances like synthetic cannabinoids. Then the fellow will compare specific drug trends in MiPDC data compared to the team's other surveillance sources (emergency department (ED), EMS). This should highlight MiPDC's unique strengths and limitations compared to other datasets. And finally, the fellow will work with OED to develop standard case definitions for commonly requested substances such as opioids, methamphetamine, and cocaine.

Surveillance System Objectives:

- Objective 1: Create standard case definitions for specific drugs in MiPDC
    - Deliverable: Formal report documenting case definition and methodology used.
- Objective 2: Analyze drug trends in MiPDC compared to ED and EMS data.
    - Deliverable 1: Documentation of analysis methodology

- Deliverable 2: Formal report with analysis findings on how MiPDC trends compare with other surveillance datasets. Specifically, the report will describe strengths and limitations of the MiPDC dataset have compared to ED and EMS data. This report should also look at how demographic groups vary across data sources. For example, are persons of certain identifies more or less likely be included in MiPDC data compared to our other datasets?

Surveillance System Impact:
MiPDC is a newer dataset for the OED unit and its unique utility is yet to be determined. There is great potential for this dataset as it is very timely and contains very specific drug information. A formal evaluation of this dataset will help OED decide how to best use it for its strengths while understanding its limitations.

Major Project Title: Evaluation of Cluster Detection Approaches for Use in Monitoring Trends in Blood Lead Testing

Major Project Description:
The Fellow will research and evaluate a variety of cluster/hot-spot detection approaches for use with blood lead testing data. The Fellow will develop recommendations concerning which approaches would work best within the context of LOH's ongoing work and develop a proposed framework for how to operationalize the approaches.

Major Project Objectives:
- Objective 1: Identify potential cluster detection approaches
  - Deliverable 1: Conduct a literature review of the usage of cluster or hot-spot detection methods for blood lead testing data
  - Deliverable 2: Identify a set of potentially appropriate solutions for cluster/hot-spot detection for blood lead data within LOH
- Objective 2: Assess approaches for use in evaluating trends in blood lead testing data
  - Deliverable 1: Create documentation of results of analyses utilizing each of the approaches identified above, including a comparison and characterization of ways in which their results diverge
  - Deliverable 2: Create recommendations regarding strengths and drawbacks of each approach for monitoring trends in blood lead testing data
  - Deliverable 3: Create framework for use of cluster detection approach(es) within monitoring of the implementation of universal blood lead testing in Michigan

Major Project Impact:
With the promulgation of rules requiring universal blood lead testing among children in Michigan, LOH has an ongoing obligation to conduct surveillance to monitor both the progress towards reaching full testing coverage as well as the potential trends in elevated blood lead levels that may become apparent with the increase in testing. This, combined with the general increase in volume of data coming to the Unit and a mission to further evaluate blood lead data towards the identification of health inequities, means the development and utilization of cluster detection methods will be incredibly helpful towards Unit goals and impacts.

Additional Project #1 Title: Incorporating Mapping and Spatiotemporal Methods into the Cancer Incidence Investigation Protocol
Project #1 Type: Major Project

Project #1 Description:
The purpose of the Health Statistics Surveillance Unit, which is within the EHB Environmental Health Surveillance Section, is to investigate, characterize, and report on disease burden in areas that may have experienced an environmental exposure. One responsibility of this unit is to respond to public concerns about potential cancer clusters.

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The EHB Cancer Incidence Investigation Program within the unit is looking to incorporate mapping and spatiotemporal cluster detection methods into its current analysis protocol. The CSTE Fellow would be responsible for reviewing available cluster detection software, such as R and SaTScan, and apply cluster detection software to a previous or new community cancer investigation. It is anticipated that this project will require 8 hours per week for 12 weeks.

Project #1 Objectives and Expected Deliverables:

- Objective 1: Identify and describe different mapping/spatiotemporal software types
    - Deliverable 1: List of software types with written descriptions of advantages and disadvantages
- Objective 2: Pilot the presumed optimal software type using cancer data from the Michigan Cancer Incidence Investigation Program
    - Deliverable 1: Written description of the software, and a How-To Guide for its use
- Objective 3: Apply mapping and spatiotemporal cluster methods to a previous or new community cancer concern
    - Deliverable 1: Publish an epidemiological report summarizing the use of mapping and spatiotemporal methods
    - Deliverable 2: Update the EHB Cancer Incidence Investigation process to incorporate mapping/spatiotemporal analyses.

Project #1 Impact:
The Cancer Investigation Program currently does not use mapping or spatiotemporal methods during cancer cluster investigations. Mapping and analyzing the data over space and time can help reveal whether changes in incidence or mortality statistics are observed and may suggest risk factors that warrant further consideration. The results of the GIS and spatiotemporal analysis can be used internally for decision making, can inform public health actions, and can be used to communicate with the public.

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

The Fellow will have the opportunity to assist with a variety of response efforts conducted by the Environmental Health Bureau (EHB). EHB is regularly involved in responses to other emergency events, recent examples of which include a Blastomycosis outbreak at a paper mill, an investigation into reports of neurological symptoms in students attending a local high school and recalls surrounding lead in applesauce/powdered-spices and Diamond Shruumz-brand products in which epidemiological support was needed, and the Fellow could assist. The time allocation for these activities would be approximately 1-2 hours per month as part of routine preparedness processes, with the potential to be higher if events requiring a more mobilized emergency response developed.

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. The HSS Unit likewise regularly fields requests to investigate clusters in cancer incidence. The fellow will be integrated into each of these activities and the time allocation would be approximately 10-15 hours per month.