

ID: 86849959

Injury, Injury - Drug Overdose - Host Site Description

Nebraska Department of Health and Human Services

Assignment Location: Lincoln, US-NE
Nebraska Department of Health and Human Services
Department of Health and Human Services

Primary Mentor: Rishad Ahmed, MBA, PhD
Epidemiologist 3
Division of Public Health

Secondary Mentor: Christopher Austin, MA
Epidemiologist 2
Division of Public Health

Work Environment

Hybrid

Assignment Description

The Fellow will be placed within the Injury Surveillance Epidemiology Unit at the Nebraska Department of Health and Human Services, working closely with the Drug Overdose Prevention team. This unit is responsible for statewide surveillance of drug overdoses, suicide, and other injury outcomes. The unit analyzes multiple data sources and provides timely, high-quality data to guide prevention efforts, resource allocation, and policy decisions across Nebraska.

The Fellow's primary assignment will focus on developing and supporting a Spatiotemporal Cluster Detection system for Drug Overdose Surveillance under the mentors' supervision. This project involves building and improving an interactive R Shiny dashboard that connects to Nebraska's ESSENCE syndromic surveillance system. The tool retrieves emergency department data and applies spatial scan statistics using SaTScan to detect statistically unusual increases in overdose visits across Nebraska's 93 counties. The system supports monitoring of multiple overdose categories, including opioid, fentanyl, stimulant, methamphetamine, cocaine, and benzodiazepine-related overdoses.

Day-to-day activities will include retrieving and cleaning syndromic surveillance data, running spatial cluster detection analyses, refining R and Shiny code, validating statistical outputs, and preparing visualizations for internal and external partners. The Fellow will help interpret results and assist in communicating findings to prevention staff, local health departments, and other stakeholders. They will participate in CDC calls, team meetings, and overdose response discussions to understand how surveillance findings guide public health action.

This project has a strong health equity focus. The cluster detection tool will help identify geographic areas experiencing sudden increases in overdose burden, including rural counties and underserved communities. The Fellow will examine patterns by county, region, and available demographic indicators to identify populations at disproportionate risk.

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

The fellow will have access to statewide surveillance datasets, including syndromic surveillance (ESSENCE), hospital discharge data, EMS data, death certificate data, SUDORS, ODMAP, and PDMP data. The fellow will use R, SQL, SAS, Excel, Power BI, ArcGIS, and SaTScan for spatial cluster detection. They will also work with secure CDC platforms used for OD2A reporting and data submission. The fellow will receive direct supervision, analytic guidance, and code review from experienced epidemiologists.

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Projects

Surveillance Activity Title: Nonfatal and Fatal Drug Overdose Surveillance

Surveillance Activity Description:

The fellow will conduct routine surveillance of nonfatal and fatal drug overdoses using syndromic surveillance (ESSENCE), hospital discharge, EMS, death certificate, and SUDORS data. Activities will include monitoring trends over time, identifying geographic and demographic disparities, and supporting timely dissemination of findings to prevention partners.

Surveillance Activity Objectives:

1. Conduct monthly and quarterly analyses of overdose trends
2. Produce summary tables, figures, and visualizations
3. Contribute to at least two surveillance reports or data products

Surveillance Activity Impact:

Timely and accurate overdose surveillance will help state and local partners identify high burden areas and populations at increased risk, allowing prevention resources to be directed where they are most needed.

Surveillance System Evaluation Title: Evaluation of Nonfatal Overdose Surveillance Systems

Surveillance System Evaluation Description:

The fellow will evaluate key overdose surveillance systems, including syndromic surveillance, EMS, and hospital discharge data. The evaluation will assess data quality, completeness, timeliness, representativeness, and usefulness for detecting overdose spikes and informing response.

Surveillance System Objectives:

1. Develop a structured surveillance system evaluation plan
2. Assess strengths, limitations, and gaps in current systems
3. Prepare a written evaluation summary with recommendations
4. Present findings to internal program staff

Surveillance System Impact:

Improving surveillance system performance will enhance early detection of overdose clusters and strengthen the state's ability to respond quickly to emerging threats.

Major Project Title: Development of a Health Equity Focused Spatiotemporal Cluster Detection Module for Drug Overdose Surveillance

Major Project Description:

The Injury Surveillance Epidemiology Unit is developing a statewide Spatiotemporal Cluster Detection system for drug overdose surveillance using syndromic surveillance data from Nebraska's ESSENCE platform. Senior epidemiologists are building the core R Shiny dashboard infrastructure and statistical framework.

The Fellow will lead development of a specific analytic module within this system focused on identifying and visualizing overdose clusters in relation to geographic and demographic disparities. This module will retrieve emergency department overdose data through secure API connections, apply spatial scan statistics using SaTScan, and generate outputs that highlight statistically significant increases in overdose visits across Nebraska's 93 counties.

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The Fellow's module will incorporate overdose subcategories (opioid, fentanyl, stimulant, methamphetamine, cocaine, benzodiazepine) and integrate county-level population and vulnerability indicators to support health equity analysis. The Fellow will refine analytic parameters, validate outputs, and design visualizations that clearly communicate cluster findings to prevention partners.

This project will operate in close coordination with experienced DHHS epidemiologists while allowing the Fellow to independently develop, test, and implement a defined component of the surveillance system.

Major Project Objectives:

1. Develop and implement a functional cluster detection module within the existing R Shiny dashboard.
2. Configure and validate SaTScan parameters for prospective and retrospective overdose cluster detection.
3. Integrate at least one demographic or county-level vulnerability indicator to support equity-focused analysis.
4. Produce documentation describing analytic methods and workflow.
5. Develop a written report or formal presentation summarizing findings and system functionality.

Major Project Impact:

This project will strengthen Nebraska's ability to detect emerging overdose clusters in near real time and support rapid response. By integrating geographic and demographic indicators, the module will help identify rural, underserved, or disproportionately affected communities. The improved detection and visualization of overdose clusters will support targeted prevention efforts, more equitable allocation of resources, and faster public health action to reduce overdose morbidity and mortality.

Additional Project #1 Title: Development of a Standardized Overdose Spike Review Protocol (ODAlerts)

Project #1 Type: Major Project

Project #1 Description:

The Fellow will develop and pilot a simple, standardized protocol for reviewing suspected overdose spikes identified through syndromic surveillance or cluster detection tools.

Nebraska already uses multiple overdose surveillance systems, but response steps may vary depending on the situation. The Fellow will create a structured workflow that outlines what actions to take when a potential overdose anomaly is detected. This will be based on the CSTE Overdose Anomaly Toolkit's Plan—Act—Evaluate framework.

The project will focus on creating clear guidance and templates rather than building new statistical systems.

Project #1 Objectives and Expected Deliverables:

1. Define clear criteria for what qualifies as a suspected overdose spike (for example, statistical alert or sudden increase in ED visits).
2. Develop a simple review checklist for epidemiologists to follow when a spike is detected.
3. Create a one-page rapid summary template for communicating findings to leadership or local health departments.
4. Pilot the protocol using historical data or during a real-time signal (if one occurs).
5. Produce a short written summary describing lessons learned and recommended improvements.

Project #1 Impact:

1. Review overdose surveillance data when an alert is triggered
2. Conduct basic descriptive analysis (time, place, overdose category)
3. Prepare summary tables or simple charts
4. Draft a short spike summary report

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5. Participate in internal discussions about whether response actions are needed

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

This project will improve consistency and timeliness in how overdose spikes are reviewed and communicated. By standardizing the review process, the health department can respond more quickly and clearly when unusual increases occur. This supports better coordination with local health departments and prevention partners and improves preparedness for future overdose events.

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

The Fellow will dedicate approximately 10-15% of their time to cluster and outbreak investigation activities related to suspected overdose spikes. When a statistical alert or unusual increase is identified through syndromic surveillance, EMS data, or ODAAlerts tools, the Fellow will assist senior epidemiologists in reviewing and validating the signal.

Activities will include conducting basic descriptive epidemiology (time, place, and person), generating trend charts and county-level summaries, reviewing overdose subcategories (opioid, fentanyl, stimulant, etc.), and preparing concise summary reports for internal leadership and local health departments. The Fellow may also assist with follow-up analyses and participate in response discussions with prevention staff.

The Fellow will work under supervision but will gradually take increasing responsibility for conducting initial analyses and preparing investigation summaries.