

ID: 60350075

Substance Use/Mental Health, Injury - Host Site Description

Illinois Department of Public Health

Assignment Location: Springfield, US-IL
Illinois Department of Public Health
Office of Health Promotion/ Division of Emerging Health Issues

Primary Mentor: Leslie Wise, Ph.D.
Opioid Epidemiologist
Illinois Department of Public Health

Secondary Mentor: Megan Koch, MPH, MPA, BS
Violence and Injury Epidemiologist
Illinois Department of Public Health

Work Environment

Hybrid

Assignment Description

The Fellow will be placed within the Division of Emerging Health Issues in the Office of Health Promotion. The Division is responsible for surveillance of substance use, overdoses, violence, and injury.

Day-to-day activities of the Fellow will include group meetings, individual work, and sharing work products within IDPH and with external agency partners, health stakeholders, and others.

Duties and responsibilities will include:

1. documenting data methods wherein existence, and developing methods where none exist (such as the use of syndromic surveillance),
2. assisting with data methods, protocols, and analysis,
3. reporting key findings from the major project and communicating these to a variety of stakeholders,
4. writing analytical reports and publishing the findings in a peer-reviewed journal,
5. consulting with the community, state, and federal partners on additional surveillance needs,
6. communicating analyses data, through written reports, briefs, oral presentations to diverse professional and lay audiences.

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

The fellow will have access to SAS for statistical analyses, Tableau for creating visualizations, and ArcGIS Pro for mapping projects. These are in addition to the basic programs such as Microsoft Office. The fellow will have access to ESSENCE, the National Syndromic Surveillance Program, for near-real time emergency department surveillance projects.

Additionally, the fellow can request data from databases such as our Hospital Discharge database, Emergency Medical Services database, Behavioral Risk Factor Surveillance System, Vital Statistics, Pregnancy Risk Assessment Monitoring System, and others. For projects involving substance use, the fellow can also request data from Statewide Unintentional Drug Overdose Reporting System and the Illinois Prescription Monitoring Program. For projects involving violent deaths, the fellow can also request data from the Illinois Violent Death Reporting System.

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Projects

Surveillance Activity Title: Self-Harm Dashboard Development

Surveillance Activity Description:

The surveillance activity focuses on the development of a Self-Harm Dashboard, contingent upon successful validation results. The project aims to expand the existing firearm-related emergency department (ED) visit dashboard to include syndromic data on self-harm-related ED visits as well as fatal self-harm and suicide data from the National Violent Death Reporting System (NVDRS). Incorporating these elements would enable integrated visualization of both fatal and non-fatal incidents, supporting a more comprehensive approach to behavioral health surveillance.

Surveillance Activity Objectives:

Objectives:

1. **Expand Surveillance Capabilities:** Integrate self-harm-related emergency department (ED) visit data and fatal self-harm/suicide data into the existing firearm-related dashboard.
2. **Enhance Data Visualization:** Develop an interface that provides combined visualization of fatal and non-fatal self-harm incidents for comprehensive behavioral health monitoring.
3. **Improve Public Health Insights:** Enable stakeholders to identify trends, patterns, and risk factors associated with self-harm and suicide for informed decision-making.

Deliverables:

1. **Integrated Dashboard Prototype:** Visualization combining fatal and non-fatal self-harm data with filters for time, geography, demographics, and method
2. **Technical Documentation:** User guide for dashboard navigation and interpretation.
3. **Stakeholder Review Report:** Summary of validation results and dashboard functionality with recommendations for future enhancements.
4. **Final Operational Publicly-Available Dashboard:** Fully deployed system accessible to public users

Surveillance Activity Impact:

The development of a Self-Harm Dashboard represents a significant advancement in behavioral health surveillance. By integrating both fatal and non-fatal self-harm data, this project will provide a more comprehensive view of self-harm trends, enabling public health professionals to identify emerging patterns and high-risk populations. This enhanced visibility supports timely interventions, resource allocation, and policy development aimed at reducing self-harm and suicide rates. Additionally, the dashboard will strengthen data-driven decision-making for prevention programs, improve coordination among healthcare providers and public health agencies, and ultimately contribute to reducing morbidity and mortality associated with self-harm behaviors. In the long term, this tool can help address gaps in mental health surveillance and promote a proactive approach to behavioral health crises.

Surveillance System Evaluation Title: Syndromic Surveillance Validation for Self-Harm and Suicide

Surveillance System Evaluation Description:

The surveillance system evaluation project will focus on validation of syndromic surveillance definitions for suicidal ideation, suicidal intent, self-harm behaviors and non-fatal suicide-related emergency department visits. The project will include line-level validation with comparison against a gold standard dataset to assess the accuracy of syndromic surveillance definitions using Illinois-specific data. The assessment will include an analysis of how accurately syndromic data captures true cases and reflects trends over time. These steps ensure the reliability and integrity of the data before it is incorporated into public-facing tools or reports.

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Surveillance System Objectives:

Objectives:

1. **Ensure Data Accuracy:** Validate four syndromic surveillance definitions before they are used for external reporting or dashboards.
2. **Assess Reliability:** Determine how well syndromic data captures true cases and reflects trends over time.
3. **Establish Benchmarking:** Compare syndromic definitions against a gold standard dataset to confirm validity.
4. **Improve Public Health Reporting:** Strengthen confidence in syndromic surveillance data for suicide-related behaviors and ED visits.
5. **Support Future Integration:** Provide validated definitions for inclusion in dashboards and other surveillance tools.

Deliverables:

1. **Validated Syndromic Definitions:** Evaluate the accuracy of four syndromic surveillance definitions (suicidal ideation, suicidal intent, self-harm behaviors and non-fatal suicide-related emergency department visits)
2. **Methodology Documentation:** Detailed documentation of the validation process including recommendations for ongoing monitoring
3. **Validation Report:** Validation results with comparison against the gold standard dataset and accuracy metrics. Create recommendations that can be implemented in Illinois to ensure full surveillance of suicide and self-harm.
4. **Stakeholder Summary:** Key findings and implications for surveillance
5. **Final Approved Definitions:** Approved for use in external reporting and dashboards

Surveillance System Impact:

Validating syndromic surveillance definitions for suicide-related behaviors is critical to ensuring accurate and reliable data for public health decision-making. By confirming that these definitions correctly identify true cases and reflect meaningful trends over time, this activity will enhance the quality of behavioral health surveillance systems. Validated definitions strengthen confidence in dashboards and external reporting, supporting evidence-based policy development and prevention strategies. Ultimately, this work contributes to reducing morbidity and mortality associated with suicide and self-harm by improving the foundation for early warning systems and informed public health action.

Major Project Title: Understanding the Role of Substance Use in Nonfatal Suicide Attempts: Findings from Illinois Hospital Discharge Data, 2018-present

Major Project Description:

This project aims to investigate the co-occurrence of substance use and suicide-intent self-harm among Illinois residents using hospital discharge data. Nonfatal suicide attempts represent a critical public health challenge, and growing evidence indicates that substance use may significantly increase suicide risk. Despite this, population-level insights into how substance involvement varies over time, across demographic groups, and by substance type remain limited. To address these gaps, the project will analyze temporal trends, identify demographic and geographic disparities, and examine substance-specific patterns associated with suicide-intent self-harm. Findings will provide a deeper understanding of the intersection between substance use and suicidal behavior, informing targeted prevention strategies and resource allocation to reduce morbidity and mortality in Illinois.

Major Project Objectives:

Objectives:

1. **Analyze Co-Occurrence:** Examine the relationship between substance use and suicide-intent self-harm among Illinois residents using hospital discharge data.
2. **Identify Temporal Trends:** Assess how substance involvement in suicide-intent self-harm has changed over time.

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3. Evaluate Demographic and Geographic Disparities: Determine variations in co-occurrence across age, sex, race/ethnicity, and geographic regions.
4. Characterize Substance-Specific Patterns: Identify which substances (e.g., alcohol, opioids, stimulants) are most commonly associated with suicide-intent self-harm.
5. Inform Prevention Strategies: Generate actionable insights to guide targeted interventions and resource allocation for suicide and substance use prevention.

Deliverables:

1. Data Acquisition and Preparation: Hospital discharge dataset cleaned and standardized for analysis with defined inclusion/exclusion criteria for suicide-intent self-harm and substance involvement.
2. Analytical Report: Temporal trend analysis of substance involvement in suicide-intent self-harm with demographic and geographic disparity findings and substance-specific pattern characterization. The report will include charts and graphs highlighting any changing trends over time, substance-specific breakdowns and maps depicting important geographic disparities.
3. Technical Documentation: Comprehensive methodology for data extraction, coding, and analysis.
4. Stakeholder Summary and Recommendations: Key findings translated into actionable insights with recommendations for prevention programs and policy development.

Major Project Impact:

By understanding the intersection of substance use and suicidal-intent self-harm, IDPH can identify high risk situations, missed opportunities for intervention, and recommend screening protocols. These findings will enable public health agencies and healthcare providers to identify high-risk populations and regions, prioritize resources, and design targeted prevention strategies that address both substance use and suicide risk. In the long term, the project will help guide policy development and improve behavioral health outcomes statewide.

Additional Project #1 Title: Investigating Co-morbidities Among Patients who Die by Suicide in Illinois

Project #1 Type: Major Project

Project #1 Description:

This project will explore the relationship between comorbidities and substance use a year before fatal suicide among decedents. Using the Master Person Index (MPI), the analysis will examine emergency department visits or hospitalizations in the year prior to death, focusing on reasons for visits such as substance use, mental health conditions, and other physical comorbidities. The project will also identify mechanisms of suicide (e.g., firearms versus other methods), demographic differences in variations in method, and potential missed opportunities for intervention.

Project #1 Objectives and Expected Deliverables:

Objectives:

1. Analyze Pre-Death Healthcare Utilization: Examine emergency department visits and hospitalizations in the year prior to death using the Master Person Index (MPI), focusing on reasons related to substance use, mental health, and other comorbidities.
2. Characterize Substance Involvement: Identify substances present among suicide decedents and assess the prevalence of polysubstance use, including alcohol.
3. Identify Suicide Mechanisms and Patterns: Determine methods of suicide (e.g., firearms vs. other means) and explore demographic differences in method.
4. Detect Missed Intervention Opportunities: Highlight points of contact with healthcare systems that could have served as opportunities for prevention.

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5. Inform Prevention Strategies: Provide actionable insights to guide interventions targeting substance use and suicide risk.

Deliverables:

1. Data Preparation: Clean and standardize datasets for analysis.
2. Analytical Report: Substance involvement and polysubstance prevalence among suicide decedents and the patterns of healthcare utilization prior to death.
3. Stakeholder Summary: Key findings, implications for prevention, and recommendations for intervention strategies and policy development.

Project #1 Impact:

This project will provide critical insights into the role of polysubstance use prior to suicide deaths, as well as patterns of healthcare utilization prior to these events. By identifying substances involved and examining emergency department visits and hospitalizations in the year before death, the analysis will uncover missed opportunities for intervention and prevention. Understanding demographic differences, suicide mechanisms, and substance-specific patterns will enable public health agencies to design targeted strategies that address both substance use and suicide risk. These findings can inform clinical screening protocols, improve coordination between behavioral health and substance use services, and guide resource allocation to high-risk populations. The long-term goal for this work is to strengthen prevention efforts, reduce suicide mortality, and improve behavioral health outcomes across Illinois.

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

The fellow will assist IDPH in creating a protocol to guide a multi-agency response to a large-scale overdose cluster. This protocol will include input from IDPH’s Office of Preparedness and Response, local health departments, Illinois Emergency Management Agency, and external healthcare systems (5% time allocation).

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

The fellow will be included in data team meetings and agency responses to abnormal overdose clusters. The activities include review of data, meeting with team members to discuss further actions, drafting and sending communications to external partners. When a cluster requires additional investigation, the fellow will be included in the opportunities for outreach and interviewing. (5% time allocation).