ID: 34259611
Chronic Disease - Host Site Description
Cook County Department of Public Health

Assignment Location: Chicago, US-IL
Cook County Department of Public Health
Epidemiology Unit

Primary Mentor: Alfreda Holloway-Beth, PhD, MS
Director of Epidemiology
Cook County Department of Public Health

Secondary Mentor: C. Scott Smith, PhD, AICP
Program Coordinator
Cook County Department of Public Health

Work Environment
Hybrid

Assignment Description

The CSTE Fellow will join the Epidemiology Unit, focusing on areas that align with their skills and interests. While our services cater to suburban Cook County (SCC) residents, our office is in Bridgeview, Illinois. The Epidemiology Unit is responsible for monitoring health issues, disparities, and trends by collecting, analyzing, and disseminating data about the health of suburban Cook. We compile and analyze data from various sources, including population statistics, vital records, hospitalizations, risk factors, and other secondary databases. Our tasks include preparing community profiles for all SCC municipalities, responding to data requests from the community, stakeholders, and researchers, and providing epidemiologic data to CCDPH programmatic units and community partners. Additionally, we maintain and support CCDPH utilization and performance measures, and identify and analyze data sources to support public health programs, policy development, and resource allocation.

CCDPH developed and deployed an innovative online health atlas (Cook County Health Atlas) that makes available analytical and data acquisition tools for multiple stakeholders. The system integrates data and analyses from the department's risk behavior surveys, secondary data sources (e.g., vital statistics, hospital discharge, Survey data, electronic lab reports) and social and structural determinants of health information.

During the pandemic, the Epidemiology Unit has collaborated with IDPH, academic institutions, and research scientists, biostatisticians, and mathematicians on predictive modeling of COVID to assist with resource allocations for the emergency response of this outbreak and collaborated with the Communicable Disease (CD) Unit to conduct case investigation and contact tracing. We also work closely with CD to develop real-time surveillance of opiate, vaping, and tracking of occupational injuries using the ESSENCE system.

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

The fellow will have access to SAS, ArcGIS Pro and ArcGIS Online, RedCap, Qualtrics, Metopio, Biospatial, Tableau, the Illinois-National Electronic Disease Surveillance System (I-NEDSS), Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) through the National Syndromic Surveillance Program (NSSP), R/Shiny, and additional software and supports for specialized projects. As a member of CCDPH's Epidemiology Unit, the fellow would also work with evaluating vital statistics, hospital discharge, medical examiner, emergency medical services (EMS) and other data made available via the Illinois Department of Public Health (IDPH) and other providers.

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Projects

Surveillance Activity Title: Implementation of a Substance Use Disorders Surveillance System

Surveillance Activity Description:
Substance use disorders (SUDs) are closely linked to mental health issues. Many individuals with SUDs also experience co-occurring mental health disorders, which complicates treatment and recovery. Individuals diagnosed with a SUD are 50% more likely to be diagnosed with a co-occurring mental health disorder and vice versa (SAMHSA, 2020). Despite the high prevalence of SUDs, a significant portion of those affected do not receive adequate treatment. Barriers include stigma, lack of resources, and insufficient access to comprehensive care. These concerns highlight the need for more effective prevention, intervention, and treatment strategies to address the evolving landscape of substance use and CCDPH presently have a unified system for surveilling related to SUDs (overall SUDs, Alcohol use disorders, Drug use disorders, illicit drug use disorders, and mental health disorders, Suicide) related hospitalization, deaths and injuries, fatal car crash, Chronic Disease, Hepatitis C and B and cirrhosis. A system like this would use standardized definitions and incorporate recommended data elements to create a continuous and comprehensive record of substance use and mental health disorders within the jurisdiction of the CCDPH. This would help public health professionals and community partners track trends, identify high-risk populations, and evaluate the effectiveness of interventions. It is important to determine the specific geographical area and population groups that will be covered.

Surveillance Activity Objectives:
In coordination with the state health department, the fellow will perform a review of public health epidemiological frameworks and best practices to create a typology of SUDs and mental Health disorders-related events employing when available, associated uniform definitions, data sources and data elements. Data sources will include, but not be limited to, readily available hospital discharge, ESSENCE, medical examiner (ME data) and emergency medical services (EMS) data, Survey data, law enforcement data, and community reports.

The fellow will then assist in designing a substance use disorders surveillance system prototype that integrates relevant data and definitions in such a way that supports the monitoring of trends in on substance use patterns, treatment admissions, overdose incidents, and related health outcomes and facilitates the assessment of related CCDPH programs and control measures. Implement procedures to ensure data accuracy, completeness, and timeliness.

Surveillance Activity Impact:
The proposed surveillance system aims to centralize data to inform policymakers and share public health information with relevant entities. It will help address substance use and mental disorders by providing definitions, data, and metrics. The system promotes community involvement and resource sharing to raise awareness. Prevention and early intervention strategies and stage-wise interventions are emphasized to educate and support individuals and communities in preventing drug misuse and the development of substance use disorders (SUDs) and improves treatment engagement, retention, and overall outcomes.

Surveillance System Evaluation Title: Evaluation of the Usefulness and Efficiency of biospatial's EMS Dashboard and Data

Surveillance System Evaluation Description:
CCDPH is looking to better leverage its use of emergency medical services (EMS) data which is made available via the biospatial platform. The biospatial platform provides automated analysis of near real-time EMS data, aggregation of trends, and alerting to anomalies based on syndromes that leverage both categorical elements and natural language processing of free-text elements within EMS data. The fellow will evaluate the functionality and robustness of the biospatial platform in helping to achieve department and jurisdictional objectives.

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Surveillance System Objectives:
The fellow will identify and summarize the types of data and dashboards that are available on the biospatial platform. The fellow will then work together with colleagues in CCDPH's Epidemiology Unit to document and examine existing and proposed EMS-related data workflows and their coherence with achieving department objectives. Through this process, the fellow will identify gaps and/or inefficiencies in the department's present use and/or performance of the biospatial platform. (Known limitations include inefficient spatial filtering and querying and cumbersome exporting of EMS data into other platforms.) Lastly, the fellow will develop a report that includes insights and strategies for enhancing and standardizing system and EMS data use within the department and propose modifications to the biospatial platform itself to be shared with the vendor.

Surveillance System Impact:
The insights and strategies communicated in the evaluation will improve the utilization of EMS data in department activities to inform surveillance, epidemiology, prevention effectiveness and other CCDPH public health activities.

Major Project Title: Evaluation of the Usefulness and Effectiveness of Substance Use disorders data visualization

Major Project Description:
The Cook County Department of Public Health (CCDPH) has designed, developed, and deployed an online data visualization tool known as the Cook County Health Atlas. The Atlas provides local geographic breakdowns of consolidated substance use data from various systems, enhancing access and efficiency for prevention and stakeholders across the county and state.

CCDPH want to know how internal partners and external partners and people are using this information. Identify the usefulness and effectiveness of these platforms whether these being used as intended. Based on this evaluation we also want to develop several types of data visualization tools according to partners, stakeholders, and community partners needs and recommendations.

Suburban Cook County continues to grapple with substance use disorders challenges, including high rates of substance use hospitalizations, drug overdose deaths, and other related consequences such as domestic violence, fatal car crashes, and chronic diseases like hepatitis C, hepatitis B, liver cirrhosis, HIV, and unintended pregnancies. Recognizing that substance use issues extend beyond any single drug, we aim to understand the usefulness of data visualization that consolidates prevalence, morbidity, and mortality data on multiple substances of concern for public use. We want to develop an automatic system where once the data is available for CCDPH it will also be available for people who are working on substance use disorders across the county and state.

The Cook County Health Substance Use dashboard can also serve as a tool for monitoring public health issues, identifying health disparities, and evaluating health interventions. The Fellow will evaluate the functionality and robustness of this platform in helping to achieve department and jurisdictional objectives.

CCDPH established an online Cook County health Atlas, in which analytical and data acquisition tools for multiple stakeholders are available. The desired system will integrate data and analyses from the department'srisk behavior surveys, secondary data sources (e.g., vital statistics, hospital discharge, survey data and social and structural determinants of health information.

The Atlas serves as an interactive platform for exploring and sharing various health-related documents, data, and measures concerning the suburban residents of Cook County. It transforms complex health data into understandable, visually engaging formats such as maps, tables, and charts, making it easier for users to analyze, interpret, and download

data. The Cook County Health Atlas can also serve as a tool for monitoring public health issues, identifying health disparities, and evaluating health interventions. The atlas plays a significant role in raising awareness about health issues, preventive measures, and healthy behaviors by presenting data in an accessible and engaging manner. The platform also facilitates collaboration among healthcare professionals, policymakers, researchers, and community-based organizations by providing a central repository of health data that can be easily shared and discussed. The Fellow will evaluate the functionality and robustness of this platform in helping to achieve department and jurisdictional objectives.

Major Project Objectives:
The fellow will assist in the development of a suburban cook county Substance Use disorders Dashboard and updating Cook County Health web page and Atlas Data project by applying data analysis knowledge, using different statistical software, and maintaining communication with website vendor and partner agencies for timely and accurate buildout and update. The fellow will also help identify and, if necessary, process and upload and enhance visualizations of various types of datasets and associated measures/indicators into the atlas, including demographic data, mortality, morbidity, and natality data, prevalence and survey data on chronic diseases like SUDs, Mental health disorder, and Maternal and child health data, and other public health-related data.

Major Project Impact:
The public health department utilizes data visualizations internally for disease reporting, monitoring, and evaluation activities. By aggregating data from multiple sources, CCDPH offers the public easy access to county-level data. These dashboards can display health and health equity data across specific geographic boundaries, presenting and disseminating new metrics that impact population health to guide research and advocacy efforts.

Additional Project #1 Title: Development and Enhancement of Suburban Cook County Substance use and Mental Health Disorders Epidemiology Surveillance and Rporting Capacity Expansion Project
Project #1 Type: Major Project

Project #1 Description:
A project that supports in strengthening our epidemiology capacity to track and respond to Substance use and Mental health disorders, with a focus on building better surveillance systems, developing data visualization for data capturing and analysis, and the sharing of best practices among other stakeholders and states to prevent and reduce the impact of Substance use and Mental health disorders and providing training to public health personals.

Project #1 Objectives and Expected Deliverables:
The fellow will assist CCDPHs epidemiology unit in data analysis for identify the indices of frequency (e.g., the total number of cases and/or deaths; incidence rates, prevalence, and/or mortality rates), indices of severity (e.g., bed-disability days, case-fatality ratio, and hospitalization rates and/or disability rates); disparities or inequities associated with the health-related event; costs associated with the health-related event; preventability ;potential clinical course in the absence of an intervention.

The fellow will also help identify, process, and make reports and enhance visualizations of several types of datasets and associated measures/indicators related SUDs/Mental health disorders, including demographic data, mortality and hospitalization data, prevalence and survey data, and other public health-related data.

Project #1 Impact:
The data, metrics and visualizations made available will help inform agency policy, operations, programs and strategies as well as centralize and share critical public health information with health care partners and the broader community Both local health departments and the communities they serve need neighborhood-level measures of population health to assist in planning public health prevention programs, allocating resources, formulating health policy and engaging in

health care decision making and delivery. This project would help the department, by developing a strategy for producing and communicating neighborhood-level estimates using readily available datasets.

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

The Epidemiology Unit is leading the data analysis, assessments, and program evaluations for several Opioid-related grants include the CDC Overdose Data to Action LOCAL and American Rescue Plan Act. The fellow will have opportunities to work with colleagues on non-communicable case investigations, spatial analysis, and program evaluation in order to identify community preparedness and efficacy of related response efforts.

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

Similar to other local health departments, CCDPH is increasingly using spatial analysis and maps of neighborhood-level health information to document and address geographic disparities in the burden of chronic disease morbidity, mortality, risk factors, and treatments. To this end, the Epidemiology Unit is employing Bayesian statistical techniques to estimate local level (e.g., municipal, census tract) prevalence rates. The fellow will be trained in associated ArcGIS and R techniques to expand upon this work by assisting with the identification and mapping of spatially significant hot/cold localized prevalence clusters throughout CCDPH's jurisdiction. This ongoing effort will likely consume 1 or 2 hours of the fellow's time every couple weeks.