

ID: 45411606

Chronic Disease, Maternal and Child Health - Host Site Description

Chicago Department of Public Health

Assignment Location: Chicago, US-IL
Chicago Department of Public Health
Chronic Disease Prevention and Health Promotion

Primary Mentor: Emma Boylan, MS, PhD
Epidemiologist, Chronic Disease Prevention and Health Promotion
Chicago Department of Public Health

Secondary Mentor: Hannah Matzke, MS, PhD
Epidemiologist IV
Chicago Department of Public Health

Work Environment

Hybrid

Assignment Description

CDPH is currently engaged in a pilot project to obtain electronic health record (EHR) data from CAPriCORN, a network of Chicago-area health systems, for use in population health surveillance. This project is part of our implementation of CDC's Data Modernization Initiative and will address critical data needs in chronic disease, maternal and child health, community health, and other programs across the department. The AEF will help implement, institutionalize, and sustain this work by leading evaluation and validation analyses, providing training and technical assistance, and standardizing our procedures. By the end of the fellowship, the AEF will be a subject matter expert in EHR-based surveillance and CDPH's internal expert on helping programs implement this approach. The AEF will be jointly supervised by Dr. Boylan and Dr. Matzke, the two senior epidemiologists on this initiative.

The AEF will be based within the Office of Chronic Disease with extensive contact with the Office of Epidemiology. Our Offices collaborate closely on chronic disease data modernization and other projects, both report directly to the Commissioner, and are co-located in the same area of CDPH headquarters at 111 W. Washington. The Offices of Chronic Disease and Epidemiology have collaborated on this application and project proposals and will work collaboratively to develop the Fellow's projects and provide support and mentorship.

In order to conduct their work, the Fellow will meet regularly with the mentorship team (primary/secondary mentors plus current and former AEF fellows), program leadership (Director of Epidemiology Nik Prachand and Chronic Disease Medical Director Dr. Ajanta Patel), the CAPriCORN project team, and epidemiologists across the department to develop and progress the projects. The mentorship team will ensure that the AEF develops relationships with CDPH epidemiologists and other staff; informaticists and researchers from the CAPriCORN network; and any other internal or external partners necessary to their success. Our current AEF meets twice a month individually with each mentor and once a month with the full mentor team to discuss her overall progress, goals, and needs and to ensure that she is meeting the requirements for graduation. Mentor meetings are flexible to respond to the needs of the Fellow.

Data requests sent to CAPriCORN are implemented by informaticists at the contributing sites. With other project staff, the Fellow will meet regularly with the CAPriCORN Informatics Working Group to coordinate the technical implementation of CDPH data requests. Their projects will also involve providing technical assistance to CDPH programs that are new to working with CAPriCORN. Depending on the needs and epidemiology capacity of the program, the AEF may provide training, consultation, or the full development and validation of an EHR data query. CDPH is a collaborative atmosphere where work across teams is the norm, particularly for epidemiologists.

ID: 45411606

Chronic Disease, Maternal and Child Health - Host Site Description

Chicago Department of Public Health

The proposed projects align with CDPH's goals to maintain and improve our infrastructure for public health surveillance. Therefore, the Fellow will be asked to present their plans and work product to CDPH leadership and to provide substantive input to ongoing department-wide data infrastructure projects that support chronic disease surveillance. The mentor team will provide support and guidance to the Fellow in translating the results of their work for a variety of audiences.

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

The Fellow will have access to the same analytic and productivity software as other CDPH epidemiologists including SAS, R, ArcGIS Pro, REDCap, Power BI, Tableau Server, and Office 365.

The fellow will be the primary analyst for new data contributed from the CAPriCORN network. They will also have the same access to surveillance data and other data sources relevant to chronic disease prevention and control that other epidemiologists have including raw Healthy Chicago Survey data; Illinois vital records, cancer registry, and hospital discharge data; CDPH GIS datasets; EMS data; internal program evaluation data; and both public and internal-facing versions of data posted to the Chicago Data Portal. The Fellow will have back-end access to the Chicago Health Atlas and the data posted there. The fellow will be added to data use agreements, contracts, or other authorized user lists as necessary to access restricted program-specific data that they may need to complete their work.

Projects

Surveillance Activity Title: Development of electronic health record case definitions for community health surveillance

Surveillance Activity Description:

While more public health authorities are incorporating EHR data into their population health surveillance programs, standardized case definitions do not yet exist for EHR-derived rates of many chronic conditions. Validation data sets requested during CAPriCORN/CDPH Wave 1 are being delivered throughout 2025. Individual Wave 1 queries were highly customized to each condition of interest and may not yet reflect all lessons learned from the collaboration between CDPH and CAPriCORN. The AEF will enhance the capacity and sustainability of EHR surveillance activities at CDPH by developing reporting standards for EHR-derived measures and creating supporting materials for measures that meet those standards. The Chicago Health Atlas is a publicly available database of health and contextual data co-managed by CDPH and University of Illinois - Chicago School of Public Health. The AEF will help determine when and how EHR-derived population health measures can be shared through CDPH's premier data dissemination platform.

Surveillance Activity Objectives:

- 1) Conduct a literature review and develop recommendations for aggregated EHR data to be considered representative of the health of Chicagoans
- 2) Review the design of CAPriCORN/CDPH Wave 1 workplans and data outputs and identify opportunities for standardization
- 3) Develop workflow, statistical programs, and documentation for public health indicators that meet validation criteria
- 4) Advise Office of Epidemiology on the creation of EHR-derived health indicators for the Chicago Health Atlas

Surveillance Activity Impact:

Development of standardized, repeatable case definitions is essential to moving EHR surveillance from a pilot research project to a usable data pipeline. The fellow's work on this project will ensure that EHR surveillance at CDPH meets the highest data quality standards and is shared with the public as soon as reasonably practicable.

Surveillance System Evaluation Title: Continuous improvement of geographic data obtained from electronic health records

Surveillance System Evaluation Description:

The City of Chicago often uses a unit of geography called the Community Area (CA). The 77 CAs are linked to Census tracts, generally contain multiple neighborhoods, and their boundaries rarely change over time, making them useful for planning and statistics. At CDPH, public health data is presented at the CA level whenever possible and comparison between CAs is a standard step in many analyses. During Wave 1, CDPH provided technical assistance to the CAPriCORN network to enable sites to report data at the CA level. However, both readiness to use 2020 Census geography and pilot data quality varied by site. In this project, the AEF will help navigate a critical barrier to EHR-based surveillance in Chicago, enhancing the epidemiology capacity of all collaborating organizations.

Surveillance System Objectives:

- 1) Analyze the completeness and accuracy of geographic data returned from CAPriCORN/CDPH Wave 1
- 2) Create recommendations and provide technical assistance to CAPriCORN Informatics Workgroup to improve the completeness and accuracy of community area-level EHR data
- 3) Develop a standard approach for CDPH epidemiologists to use geographic inclusion criteria in EHR data queries
- 4) Develop procedures, including statistical programs, documentation, and data standards for linking CAPriCORN data to additional geographic information such as Census data, air monitoring data, or the locations of city assets

Surveillance System Impact:

Comparison of health outcomes between CAs is essential for CDPH to promote health equity and target services to the areas of greatest need. The results of this cross-cutting project will be used by every CDPH program that participates in the EHR surveillance program. Because this project will also enhance CAPriCORN's ability to implement CAs and improve the quality of their geographic data, this project will also benefit health services researchers throughout Chicago.

Major Project Title: CAPriCORN/CDPH Wave 2: Pilot to Pipeline

Major Project Description:

Use of electronic health record (EHR) data for population health surveillance is an emerging area of work for applied epidemiologists, especially in maternal and child health and chronic disease. EHR data has the potential to fill critical gaps to inform public health interventions, for example, by linking the health outcomes of mothers and babies; learning what share of people with chronic diseases are receiving recommended screenings and care; or collecting data on conditions that may prevent people from answering public health surveys. This information can be used to better inform public health departments' choice of interventions and use of limited resources.

For the past two years, CDPH has worked to establish a new data pipeline from CAPriCORN, a federated network of EHR data covering Chicago's major health systems. The graduating AEF (Class 21) collaborated with CAPriCORN network members and CDPH epidemiologists to develop multiple queries that will allow us to describe the prevalence of additional chronic conditions, screening adherence, disease control, and maternal and child health outcomes. Data are being delivered throughout 2025.

The AEF (Class 23) will lead efforts to institutionalize this partnership. They will use lessons learned from their own projects and the collaboration so far to develop trainings for epidemiologists and program staff who are new to EHR-based surveillance. They will develop documentation and templates to facilitate query development for new EHR data requests. Similar to their work with geographic data in the CAPriCORN network, the AEF will lead CDPH's response to technical questions that affect multiple data requests or the collaboration as a whole.

ID: 45411606

Chronic Disease, Maternal and Child Health - Host Site Description

Chicago Department of Public Health

Finally, the AEF will provide technical assistance as needed to programs that require routine EHR data but do not have the epidemiological capacity to develop and analyze their own data.

Major Project Objectives:

- 1) Develop technical documentation and training materials to help CDPH epidemiologists get started working with CAPriCORN data
- 2) Provide ongoing technical assistance to CDPH programs developing, analyzing, and validating their first CAPriCORN queries
- 3) Coordinate CDPH responses to scientific and informatics questions or concerns that affect multiple queries

Major Project Impact:

This project will ensure that collaborative work done so far to develop EHR-based public health surveillance will result in the permanent, sustainable enhancement of CDPH epidemiology capacity.

Additional Project #1 Title: Evaluation of the completeness and quality of social determinant of health codes in CAPriCORN network EHRs

Project #1 Type: Surveillance System Evaluation

Project #1 Description:

ICD-10-CM Z-codes are used to record contextual and social determinant of health (SDOH) information in patient medical records. This information is of interest to public health agencies, and may be especially helpful in the community management of chronic conditions or promoting the health of mothers, infants, and children. Z-codes may also represent a source of information that is otherwise difficult to obtain: in 2019, the most common Z-code among Medicare fee-for-service beneficiaries was Z59.0: Homelessness. However, these codes are believed to provide an undercount of the relevant conditions due to ascertainment bias and the stigmatization of many of the situations recorded. The AEF will develop an analysis to describe the availability and prevalence of Z-codes in the CAPriCORN patient population, identify any patterns, and compare the prevalence of relevant conditions to other data sources such as the Healthy Chicago Survey. Based on the results, the AEF will develop recommendations for CDPH epidemiologists on the proper use and interpretation of Z-codes.

Project #1 Objectives and Expected Deliverables:

- 1) Develop a query and analysis protocol to collect encounter-level Z-codes in the CAPriCORN patient population
- 2) Assess the completeness and quality of Z-codes in the CAPriCORN patient population including any differences by site, health status, or sociodemographics
- 3) Develop recommendations for CDPH epidemiologists on the appropriate collection, analysis, interpretation, and use of Z-codes in the CAPriCORN population

Project #1 Impact:

The results of this project will address an important potential use case for EHR surveillance across CDPH programs. Findings could result in a critical new source of SDOH data for Chicago. Regardless of findings, guidance developed by the AEF will improve the quality of EHR data analyses conducted by CDPH epidemiologists.

ID: 45411606

Chronic Disease, Maternal and Child Health - Host Site Description

Chicago Department of Public Health

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

As this application is being developed, our team is soliciting EHR data requests from additional programs including vaccine-preventable diseases and hospital preparedness. As part of their major project, the AEF will continue outreach to programs engaged in preparedness and response, and will assist these programs to develop, implement, and analyze at least one EHR query relevant to their needs.

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

Based on department need and the fellow's availability, the AEF will deploy to a cluster or outbreak investigation for up to one month as a member of the epidemiology team. In addition to supporting the investigation as assigned, the AEF will help the team assess their need for contextual or longitudinal data available from EHRs. For example, investigators may be interested in translating a case definition for the EHR network to compare their performance; or they may request additional information such as detailed local geography, information about health behaviors such as commercial tobacco product use, chronic comorbidities, or socioeconomic context such as insurance payor or Z-codes. The AEF will develop an EHR query that meets the longer-term or contextual needs of the investigative team and will lead the analysis of the resulting data. EHR project work may extend beyond the period of deployment.