ID: 60154896
Chronic Disease, Infectious Diseases - COVID-19 - Host Site Description
Michigan Department of Health and Human Services

Assignment Location: Lansing, US-MI
Michigan Department of Health and Human Services
Lifecourse Epidemiology and Genomics Division

Primary Mentor: Beth Anderson, MPH
Chronic Disease Epidemiology Section Manager
Michigan Department of Health and Human Services

Secondary Mentor: Olivia Barth, MPH
Chronic Disease Informatics Epidemiologist
Michigan Department of Health and Human Services

Work Environment
100% Virtual

Assignment Description

This fellow will be sitting in the Chronic Disease Epidemiology Section which consists of seven epidemiologists, 2 informaticists, a statistician and an EMS consultant. This fellow will be working on Chronicle, Chronic Disease Registry Linking Electronic Health Records. Michigan is one of the first states to develop a chronic disease registry. This is a near real-time statewide disease surveillance system designed to capture electronic health records (EHR) data.

Chronicle leverages Michigan's health information exchange (HIE) infrastructure and HL7 electronic health messages in the form of Admission, Discharge, and Transfer (ADT) messages to collect data on health care encounters related to hypertension and stroke events. ADT messages are triggered by health care events and contain information regarding demographic and diagnostics, including ICD-10-CM codes, of the patient. For health care facilities within Michigan where a particular diagnosis code is recorded, ADT messages related to these encounters are exchanged with the statewide HIE organization, Michigan Health Information Network (MiHIN). If an ADT message includes an ICD-10-CM code of interest, MiHIN routes a copy of the message to CHRONICLE. The information within the ADT messages is then parsed and used to populate the patient and event information within CHRONICLE.

This fellow will meet several times a week with the Chronicle Epidemiologist and Informaticists to review activities and progress related to the registry. This position will not only expand epidemiology experience and knowledge but also be immersed in learning about data modernization with IT infrastructure.

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

This epidemiological work with this project will primarily be with SAS and Excel programs. We have staff with extensive experience with this software and can provide technical support for the fellow. This fellow will also have the unique opportunity to grow their knowledge around ICD-10 codes, HL7 electronic messaging, and ADT and CCD messages.
The fellow will primarily work with the Chronicle data; however, they will also have access to hospitalization, mortality, EMS, Medicaid and other data systems that will be used for validation purposes and linkage for long term understanding of a chronic event. They will also be linking Chronicle data to COVID data collected from case reporting and state-wide immunization records.

Activities that the fellow will be a part of will also include opportunities to learn mapping with ArcGIS and building interactive dashboards with Microsoft PowerBI.

ID: 60154896
Chronic Disease, Infectious Diseases - COVID-19 - Host Site Description
Michigan Department of Health and Human Services

Projects

Surveillance Activity Title: Monitoring trends and quality of the Chronicle data

Surveillance Activity Description:
CHRONICLE has been collecting ADT message data on diagnosed hypertension and stroke events since September 2022. Over the next few years, continued systematic data quality analyses of CHRONICLE to ensure the validity and reliability is planned. Other anticipated next steps in 2024 will include system expansion to additional clinical settings, incorporation of other chronic conditions, and linkage to supplementary data sources, such as Medicaid data, death record data, and EMS data. The incoming data needs regular monitoring to ensure data quality, identify trends/spikes in cases and distribution of surveillance reports.

Surveillance Activity Objectives:
The fellow will perform monthly data analyses of the cases being collected in Chronicle. The objective is to ensure acceptable data quality by looking for irregularities, ie. missing facility IDs, spikes in a particular ICD-10 code, ect. These irregularities will be reported to the larger Chronicle team to determine next steps in addressing the issue, by either working with the facility, the statewide health information exchange, or other entity. The fellow will develop a monthly report to track number of cases and notes on the issues found that month. The fellow will also develop a web-based interactive dashboard that will be available to the general public on the MDHHS webpage and updated on a regular basis.

Surveillance Activity Impact:
Michigan's CHRONICLE, the Chronic Disease Registry Linking Electronic Health Record Data, is a near real-time, statewide, disease surveillance system designed to capture electronic health record (EHR) data and explore stroke events and hypertension burden throughout Michigan. There is strong evidence for using EHR data in chronic disease surveillance to provide rapid insight on health care utilization, outcomes, and public health interventions. By collecting this information, we aim to improve longitudinal chronic disease surveillance capacity and utilize evidence-based practices to reduce health disparities. This project in particular will provide valuable support for CHRONICLE as it expands statewide and to additional chronic conditions. We anticipate that the fellow will help further the development of validated case definitions and measures that will be utilized by our disease prevention and management programs and partners in the community.

Surveillance System Evaluation Title: Evaluation of the Chronicle Surveillance System

Surveillance System Evaluation Description:
Using the CDC MMWR framework 'Updated Guidelines for Evaluating Public Health Surveillance Systems' the fellow will evaluate the effectiveness and value of Chronicle, as well as opportunities for further improvement. The fellow will work with the Chronicle team and partners to describe the system's attributes (ie. Simplicity, flexibility, timeliness, and representativeness) and then state conclusions and make recommendations for the system.

Surveillance System Objectives:
A brief report will be the deliverable for this project that can be shared internally to help direct the future activities of Chronicle. Fellow may be asked to present findings from the evaluation to internal staff.

Surveillance System Impact:
Chronicle is a new system using new technology. It is critical to know at the beginning if the system needs to be adapted or revised based on these findings. The system needs to be useful and accurate for internal and external audiences.

ID: 60154896
Chronic Disease, Infectious Diseases - COVID-19 - Host Site Description
Michigan Department of Health and Human Services

Major Project Title: Chronic Disease and COVID Linkage

Major Project Description:
A new study showed that as of January 2023, 53.9% of Michigan adults had ever had COVID and 26.6% of these adults had experienced long COVID. Research is still being done on the long-term effects of COVID. It is known that those with severe COVID can experience multiorgan effects or autoimmune conditions. As a result of these effects, people may be more likely to develop new health conditions such as diabetes, heart conditions, blood clots or neurological conditions. It is also known that people with certain chronic conditions (including hypertension, diabetes, and obesity) are more likely to have a severe COVID experience. There have been associations observed between COVID-19 infection and stroke risk and cardiovascular disease, along with other severe chronic disease outcomes. Long COVID impacts multiple organ systems within the body and it's link to chronic conditions and long term outcomes warrants further review.
As additional evidence emerges about the association between long COVID and the exacerbation of chronic diseases, we need a surveillance tool with the capacity to investigate the population level burden of long COVID in Michigan. This project will require the Chronicle data system to link with our COVID case reporting and immunization systems through an identifier. Once this linkage is complete many unique analyses can occur.

Major Project Objectives:
This project is comprised of four complementary activities that support long COVID, COVID case reporting, COVID vaccination and chronic disease surveillance using a novel EHR-based data system.
1. Linkage of Chronicle to the Michigan Disease Surveillance System (MDSS) that houses COVID case reporting and Michigan Care Improvement Registry, the statewide immunization system.
2. Compare self-reported chronic conditions from MDSS with EHR-based chronic conditions in Chronicle to better understand and improve case reporting in a pandemic.
3. Examine COVID immunization status among those with chronic conditions in Chronicle.
4. Compare COVID status among Michigan residents with a chronic condition.

Major Project Impact:
Linking COVID-19 data to the existing Chronicle architecture and expanding linkage to novel data sources offers a unique opportunity for intersectional chronic and communicable disease surveillance. This project will demonstrate how EHR data can drive targeted interventions and improve health history data collection to address emerging public health concerns.

Additional Project #1 Title: Chronicle Interactive Dashboard
Project #1 Type: Surveillance Activity

Project #1 Description:
This project will include two components, with the fellow developing a public-facing interactive dashboard with aggregated data that will be shared on the MDHHS webpage, as well as evaluating and identifying opportunities for improving the dashboard functionality within Chronicle, the Chronic Disease Registry Linking Electronic Health Record Data. Each dashboard will cater to different audiences and therefore require unique considerations for their level of detail, ease of use, and features. These dashboards are an important step in disseminating the information gathered from EHR-based data on a number of chronic conditions with the public and our partner organizations.

The existing within-system dashboard featured in Chronicle has not yet been formally evaluated and there are likely a number of improvements that can be made. The fellow will gather feedback from Chronicle users, MDHHS staff, and Chronicle's Steering Committee through surveys or focus groups to inform their evaluation of the within-system dashboard. The fellow will determine the evaluation framework or approach they would like to use as one has not yet been identified. They will also generate suggestions to enhance the dashboard, which may include identifying a better

software to integrate within Chronicle, identifying usability gaps, or suggesting key indicators or visualizations for inclusion.

Chronicle is a new tool and MDHHS is currently evaluating the quality of the data collected in Chronicle and conducting data validation analyses before disseminating the information on a broader scale. Once these analyses have been completed and the data meets an acceptable standard, a public-facing dashboard will be developed and shared via an MDHHS webpage. The fellow will be responsible for creating an interactive dashboard using Power BI, or comparable software, that visualizes the aggregated data collected from Chronicle. The fellow will create a dashboard consistent with audience needs and data available. They will also create any user instructions necessary and document the methodology used to generate the data and measures displayed in the dashboard.

Project #1 Objectives and Expected Deliverables:
In-System Dashboard:
- Outline evaluation approach and design.
- Conduct interviews, focus groups, or surveys to gather feedback on Chronicle's -system dashboard.
- Create a Chronicle System Dashboard Evaluation Report.
- Public-Facing Dashboard.
- Outline the goals, audience, layout, and content desired for each disease state (including asthma, cardiovascular disease, chronic kidney disease, diabetes, high cholesterol, hypertension, sickle cell disease, and stroke).
- Analyze Chronicle data and identify key measures for inclusion in the dashboard.
- Create public-facing Chronicle Data Dashboard and review with Chronicle team.
- Create methods documentation and instructions for using the dashboard (if necessary).

Project #1 Impact:
As Chronicle is a novel tool for analyzing chronic conditions in near real-time, it is critical that we demonstrate its utility for public health and disseminate the data to our partners and organizations that want to use it for actionable change. The aim for Chronicle is to provide data that can inform program strategy, intervention tailoring, and emergency response to improve chronic disease prevention and outcomes. Both of the dashboards that the fellow will be evaluating and developing will help us to reach these goals.

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 with data analysis and mapping. They will be part of a team with various environmental health partners. They will be part of conversations about the environmental concern. The fellow will help with writing of the final report which they would be lead in writing the data section that describes the problem that is being investigated. If a survey of residents is needed, the fellow will assist with the development of the survey and participate in the interviews and data entry. They will follow the concern from start to finish with a final report and a presentation to communities if needed.

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

There are times when chronic diseases have clusters and need to be investigated. Often that is with asthma or cancer. When a cluster is identified the fellow will assist with geocoding and mapping the cluster, analyze data from pre/post cluster date and assist with a questionnaire for the impacted population. The fellow will have the opportunity to work alongside toxicologists and other environmental health staff to see if there is an environmental component related to the identified area and disease. They will learn GIS and geocoding also as part of this project.