ID: 45663876
Infectious Diseases - COVID-19, Infectious Diseases - Host Site Description
Minnesota Department of Health

Assignment Location: St. Paul, US-MN
Minnesota Department of Health
Infectious Disease Epidemiology, Prevention and Control

Primary Mentor: Scott Seys, PhD, MPH
Epidemiologist Senior
Minnesota Department of Health

Secondary Mentor: Beth Gyllstrom, PhD, MPH
Epidemiologist Principal
Minnesota Department of Health

Work Environment

Assignment Description

The fellow will be mentored by Dr. Scott Seys, the EIDER Variant Epidemiologist, Dr. Beth Gyllstrom, the EIDER Epidemiologist Principal and Ms. Ashley Fell, the Mortality Epidemiologist (all within the IDEPC EIDER Section) and will also work with epidemiologists within the EIDER Section and collaborate with colleagues in the Public Health Laboratory.

The fellow will be active in EIDER Section activities, including surveillance, outbreak investigation, and special projects. This person will also play a role in working with external partners on wastewater surveillance and leading work related to emerging variants of concern.

In addition to providing a solid foundation in emerging infectious disease epidemiology, response, and prevention, this position presents an exciting opportunity for a fellow to work in a professional, academically minded health department that is currently refining how we proceed with endemic surveillance activities for COVID-19. In addition, Minnesota Department of Health (MDH) is in the process of geocoding all of our case data, which will result in many opportunities for more in-depth analysis and characterizations of our case population with regard to social and community factors, with an emphasis on identifying vulnerable and underserved populations.

The fellow's anticipated day-to-day activities will include: attending internal and external meetings, including those for infectious disease epidemiology and lab staff (e.g., Morning Report), the EIDER Epi and Data Unit meetings; meeting with mentors to discuss projects, progress, and opportunities; develop and execute epidemiologic projects; developing public health communications; writing scientific reports; increasing and maintaining subject matter expertise by reading peer-reviewed literature and other relevant documents and by participating in online training; presenting work products, including scientific posters and presentations at local, state, and national scientific conferences; and preparing manuscripts for publication.

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

Available software includes: SAS, R, Tableau, Epi Info, REDCap, Microsoft suite including Excel and Access, and End Note. Surveillance systems and databases available include: MDH Public Health Laboratory database (Laboratory Information Management System [LIMS]), Minnesota Electronic Disease Surveillance System (MEDSS) database, and Oracle BI Discoverer. Other databases and software as needed (e.g., ArcGIS software, Minnesota Registration and Certification database, etc.).

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Projects

Surveillance Activity Title: Characterization of SARS-CoV-2 in Minnesota using Wastewater Surveillance Methods

Surveillance Activity Description:
Throughout the COVID-19 pandemic response, numerous organizations have begun conducting wastewater testing to characterize SARS-CoV-2 in Minnesota communities. The University of Minnesota has focused on breadth, sampling wastewater systems statewide, while the Metropolitan Council has focused on depth, sampling systems in the Minneapolis-Saint Paul metropolitan area and utilizing mutation assays to quantify variant trends. Both approaches have been beneficial to surveillance activities in the state. Although recent trends are distributed by email on a weekly basis, there has been limited incorporation into Minnesota Department of Health surveillance systems. With the development of a wastewater sampling program at the Public Health Laboratory, there is a need to evaluate wastewater surveillance in the state and consider how to better integrate data into COVID-19 case surveillance. Depending on the interests of the fellow, advanced analysis or an additional project may be possible.

Surveillance Activity Objectives:
- Work with the MDH public health laboratory as it works to develop and expand wastewater sampling in-house and consider how to best incorporate this new data source into ongoing COVID-19 surveillance.
- Compare and evaluate the findings of MDH wastewater surveillance with the work of external partners at the University of Minnesota and the Metropolitan Council.
- Develop recommendations on the inclusion of wastewater surveillance into ongoing surveillance activities, including recommendations for advanced analysis and/or connections between this data and other surveillance systems.

Surveillance Activity Impact:
Wastewater surveillance has been identified as a potential early warning system for COVID-19 activity, however there are strengths and limitations to the approach. Being able to better understand and clarify how to best use wastewater data as part of a comprehensive surveillance program is key to being able to respond quickly to any emerging concerns. This information is critical for decision-makers and policymakers in Minnesota who can allocate resources for mitigation and intervention strategies.

Surveillance System Evaluation Title: Evaluation of Minnesota COVID-19 Surveillance Systems

Surveillance System Evaluation Description:
Minnesota has used many data collection and storage tools to create a COVID-19 surveillance system. Much of this work was done in real time, without the time or ability to carefully plan and create a comprehensive surveillance system. To date, we use MEDSS, REDCap, COVID-NET, SET-NET, hospital teletracking data, syndromic surveillance, and mortality data to track, characterize and monitor COVID-19 activity in Minnesota. We have not had the opportunity evaluate these systems in terms of their ability to provide timely and relevant data for decision-making, both individually and collectively. The fellow would assist with a comprehensive evaluation of our COVID-19 surveillance system.

Surveillance System Objectives:
- Evaluate strengths/limitations of the current individual data systems and sources
- Evaluate data reporting mechanisms and timeliness of data availability
- Provide recommendations for how to "right-size" our COVID-19 surveillance system

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Surveillance System Impact:
The COVID-19 active pandemic response required intensive state and local resources in Minnesota, both in terms of staffing and data systems. Because of the rapid onset and implementation of the response, it was not possible to carefully plan and implement a comprehensive surveillance system. As the pandemic course has changed, the time is right to evaluate our current systems and make recommendations for a sustainable system that can continue, acknowledging likely decreases in resources (both staffing and financial). It is critical to identify those components of a COVID-19 surveillance system that result in data to support policymakers and citizens in decision-making around interventions and mitigation strategies.

Major Project Title: Analysis of COVID-19 in Minnesota using GIS and mapping techniques

Major Project Description:
Minnesota Department of Health (MDH) is currently in the process of geocoding all COVID-19 case data which will create numerous opportunities for the fellow to conduct more in-depth analysis of cases using GIS and mapping techniques, as well as community-level measures of socioeconomic status (e.g., social vulnerability index) by census tract. Geocoded case data could also provide a deeper understanding of trends in vaccine breakthrough cases, reinfections, hospitalization, death, and transmission of variants of concern, depending on the interests of the fellow. This project will focus on analyzing our 1.7 million COVID cases through the perspective of geospatial and community-level variables, in conjunction with standard variables of interest from our case database.

Major Project Objectives:
- Apply and make recommendations to incorporate community-level social indicators into our databases to allow for better assessment of health disparities and identification of vulnerable populations.
- Work collaboratively with the MDH Center for Health Equity and our COVID Community Coordinators (CCCs) to maximize the use of data for public health recommendations and interventions. The CCCs are community-based organizations that were created during the COVID-19 active response to connect Minnesota's diverse communities to COVID-19 testing, vaccination and other resources and to provide access and support for comprehensive health recovery post-pandemic.
- Develop community engagement opportunities to translate and discuss findings from the medical literature that are focused on vulnerable and underserved populations. Using bidirectional exchange of information, together develop recommendations for communities on the prevention, treatment, and control of COVID-19.

Major Project Impact:
These data will help MDH continue to advance health equity by identifying additional vulnerable and underserved populations most impacted by COVID-19 and help inform the COVID-19 response by better targeting interventions and resources.

Additional Project #1 Title: Long COVID Follow-up Study
Project #1 Type: Major Project

Project #1 Description:
MDH staff are currently working with our Health Promotion and Chronic Disease (HPCD) division to design and implement a two-arm study related to long COVID in Minnesota. We are currently working to design two studies to characterize long COVID among Minnesotans and believe there will be opportunities to build upon lessons learned and further expand that work into the future. Ideally, we will develop an ongoing surveillance system for long COVID in Minnesota.

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Our fellow could be involved in this work, which involves meeting with community groups, designing and implementing surveys, evaluating engagement and retention approaches, and designing ongoing surveillance systems. A component of this work also involves whole genome sequencing (WGS) and it's potential role in characterizing the development of long COVID (e.g., monitoring variants and how they might result in long-term sequelae). In addition, we can provide training on epidemiological applications of WGS for COVID. While especially useful in our characterization of COVID, these approaches can be expanded and applied to other pathogens.

Project #1 Objectives and Expected Deliverables:

- Evaluate the strongest study design for monitoring long COVID symptoms and characterize strengths/limitations through the perspective of feasibility as well as data integrity.
- Provide recommendations on incorporating various study designs into ongoing surveillance activities.
- Determine if and how these approaches could be expanded and applied to other pathogens.

Project #1 Impact:
Long COVID, although still not well-defined and understood, is emerging as a potentially important long-term public health issue. It is critical to begin to understand the symptoms and duration of long COVID, how those might affect activities of daily living, and factors associated with increasing the risk of long COVID. In addition, findings will be used to help better educate citizens on potential prevention strategies, as well as helping identify needed resources and support. Longer term, incorporating long COVID surveillance is critical to provide the data and information needed to help policymakers allocate resources and further support to help mitigate the effects.

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

It is anticipated that there will be opportunities to participate in emergency responses to public health threats. The EIDER section has worked closely with the MDH Center for Emergency Preparedness and Response throughout the COVID-19 pandemic and continue to collaborate closely on COVID-19 and other responses, including Ebola travel monitoring, a measles outbreak, and an early wave of multiple respiratory viruses this past November-December which further stressed the healthcare system. All mentors provide leadership to the MDH response for COVID-19 and have done so since the beginning of the pandemic (winter 2020). There are also opportunities to participate in general preparedness activities, such as bioterrorism. There is opportunity to work with bioterrorism preparedness staff and participate in the development of table-top exercises.

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

A key component of the GIS-focused analysis will be on identifying and characterizing potential clusters. In particular, we are very interested in examining how the pandemic affected areas of higher social vulnerability and/or are comprised of high priority population groups. This includes Black, Indigenous and people of color (BIPOC), as well as medically-underserved communities, and differences among rural and urban populations in Minnesota. Finally, the connection between variant analysis and geocoding will allow us to further explore and characterize emerging variants by geographic location. In addition to the work on COVID-19, we will offer the opportunity to lead a foodborne or other outbreak investigation. We anticipate 5-10% of the fellow's time will be focused on cluster and outbreak investigations.

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Please Describe the Fellow's Anticipated Role in the COVID-19 Response – Include Activities and Time Allocation

The projects outlined directly support the ongoing COVID-19 response in Minnesota. While the fellow may have the opportunity to assist with other outbreaks, the primary focus of the work is focused on COVID-19. We'd anticipate at least 80% of the fellow's time will be spent on COVID-19 activities, including response work.

Please Describe Opportunities for Fellows to Work in Health Equity as well as Incorporating Diversity, Equity, and Inclusion into their Work

MDH has an agency-wide focus on promoting health equity and ensuring that health equity is incorporated into every aspect of our work. Health equity is not simply something to check off as we work, but rather, there is an expectation that health equity and diversity is considered throughout project inception, planning and implementation. Specific to this position, the fellow will have opportunities to consider how we can use our data to better explain and describe how COVID has affected different populations in Minnesota, in particular, our BIPOC and socially vulnerable populations. For example, Minnesota has already created a social vulnerability index (quartiles) based on geocoded socioeconomic census data. We present COVID case rates and hospitalization rates using these quartiles and can demonstrate differences across the groups. The focus project identified for a prospective CSTE fellow involves expanding our use of GIS and mapping techniques to visually depict how COVID has disproportionately affected certain populations. This type of information is critical for the purposes of translating our data into useful information for policymakers and stakeholders who can then suggest policy recommendations and change.