ID: 74143991
Infectious Diseases, Injury - Host Site Description
Public Health Madison & Dane County

Assignment Location: Madison, US-WI
Public Health Madison & Dane County
Epidemiology & Data Science

Primary Mentor: Katarina Grande, MPH
Public Health Supervisor, Epidemiology & Data Science
Public Health Madison & Dane County

Secondary Mentor: Nicole Morales, MPH
Public Health Epidemiologist
Public Health Madison & Dane County

Work Environment
Hybrid

Assignment Description

The Fellow would be placed within the Epidemiology & Data Science team, with regular touchpoints including the program team attached to the project the Fellow is supporting. The Epidemiology & Data Science team is the data powerhouse of Public Health Madison & Dane County and contains epidemiologists focused on: environmental health, reproductive justice, communicable disease, injury and violence prevention, community health, and emergency preparedness. The epidemiologists support projects related to their area of expertise (i.e. our reproductive justice epidemiologist supports our sexual & reproductive health clinic data, nurse home visiting programs, fetal and infant mortality review, and maternal and child health program). The AEF would get to work across different program areas.

The model of co-locating all the epidemiologists (alongside a data analyst and data communications coordinator) onto one team emerged out of COVID, when it became apparent that a disseminated network of data expertise was contributing to information silos. Joining data staff together allowed for teaming on projects, rapid sharing of analytic approaches, a standardization in data presentation and communication, and a shared vision of translating data to action.

Day to day activities for the AEF will depend on the specific project. For example, activities related to the electronic health records project would include: meeting with program representatives and program epidemiologists to understand needs and map out electronic health record data collection and interface customization requests, (to the extent allowable by vendor), meeting with community health center who also shares an EHR instance with UW Health to understand how they customized the system to fit their needs, writing R code to format data to input into the EHR, writing protocols to guide program teams on how to input data and run reports out of the EHR, and other duties related to the EHR project as assigned.

Broadly, the AEF would split their time between engaging with data and programmatic colleagues; analyzing data; writing analytic code; developing data visualizations; and improving data surveillance systems. The AEF would attend bi-monthly Epidemiology & Data Science team meetings, monthly Data Visualization Community of Practice meetings, and monthly Health Equity Cafes.

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

The AEF will have SAS and R available for data analysis. For data visualization, the AEF will have access to PowerBI and Excel.

Database access would be project-dependent, but may include our electronic disease surveillance system, ESSENCE (our syndromic surveillance system), and (once it is established) our electronic health records system.

Projects

Surveillance Activity Title: Enterpathogenic E. Coli (EPEC) case interview assessment

Surveillance Activity Description:
In the past two years, enteropathogenic E. coli has emerged as the most common reportable enteric disease in Dane County, likely due to increased case-finding with the addition of multiplex gastrointestinal assays. Resources to conduct a full case investigation are limited and are not required by the state health department. The AEF's role would be to interview a sample of cases with EPEC. Then, the AEF would analyze the data to determine common routes of exposure or other patterns. Findings would be incorporated into health communication messaging, as well as reported to local healthcare providers via PHMDC's Communicable Disease newsletter and dashboard.

Surveillance Activity Objectives:
Objective: Analyze enteropathogenic E. coli case interview data in order to ascertain exposure patterns that can be communicated via health education messaging
Deliverable 1: Interviews conducted for a sample of EPEC case interview data
Deliverable 2: R code written to summarize EPEC interview data into descriptive statistics
Deliverable 3: Themes from interview analysis summarized into communications plan

Surveillance Activity Impact:
Having a deeper understanding of the local landscape of enteropathogenic E. coli, specifically what the common exposure routes are, will allow for more precise health messaging related to avoiding infection. Internally, this assessment will guide our Communicable Disease team follow-up protocols by helping to determine whether a need exists to conduct follow-up interviews more regularly.

Surveillance System Evaluation Title: Syndromic surveillance system evaluation of intentional and unintentional overdoses

Surveillance System Evaluation Description:
Currently, the surveillance system for understanding unintentional overdoses in our county is comprised of data from a syndromic surveillance system, emergency medical services, hospital discharge records, police, vital records, and syringe exchange programmatic data. The most real-time data comes from emergency department visit codes and descriptions that flow into the ESSENCE syndromic surveillance system. Sorting out which overdoses are likely unintentional versus those that are intentional is a challenge to automate. This project will work to review overdose-related emergency department data, and categorize incidents relative to the intent, substances involved, and demographics. The analysis will also serve to inform community planning efforts around suicide prevention.

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Surveillance System Objectives:
Objective: evaluate syndromic surveillance system overdose incidents to identify patterns and generate queries/code/processes to categorize unintentional versus intentional overdoses.
Deliverable 1: Report containing summary of findings and recommendations for ongoing surveillance approach to differentiate intentional versus unintentional overdoses
Deliverable 2: Protocol, including relevant R code, to process ESSENCE syndromic surveillance data to provide insights on intentional overdose emergency department visits
Deliverable 3: Presentation to Substance Use Prevention and Harm Reduction team
Surveillance System Impact:
Suicide and unintentional injuries are a leading cause of death in our county. One of the Dane County Suicide Prevention and Harm Reduction Coalition's strategies for reducing deaths due to suicide, opiate, and alcohol abuse is to "use data to inform and evaluate efforts." The syndromic surveillance data could fill a data gap for this coalition.

Major Project Title: Building a data dashboard for county-wide youth health data

Major Project Description:
The Dane County Youth Assessment is the most comprehensive data source on school-aged youth health in our county. Every three years, youth in grades 7-12 in 17 school districts complete a behavioral risk survey. Similar to the format of the national Youth Risk Behavioral Survey, the DCYA captures data across a variety of topics such as mental health, physical health, sexual behaviors, bullying, drug use, and school experience. Because the DCYA is developed, implemented, and analyzed at the local level, there are opportunities to regularly update the survey to collect information on emerging issues. However, there is less capacity for analyzing and visualizing the data. The data are summarized in PDF reports that are challenging for stakeholders to interpret. There is a great need to make the DCYA data more accessible so that it can better inform action--the desired format is a data dashboard.

Major Project Objectives:
Objective: Build a data dashboard to visualize Dane County Youth Assessment data, including trends over time stratified by group
Deliverable 1: Assessment of the consistency of analytic approaches across time (i.e. have sampling strategies remained the same over time? Has question wording changed, impacting comparability over time? Has weighting changed over time? Is weighting necessary? etc.)
Deliverable 2: Summary of findings from Fellow-hosted community conversations to inform dashboard build (i.e. what components of a dashboard would be most important to stakeholders such as teachers, students, parents, community organizations that work with youth, etc.)
Deliverable 3: Annotated R code that cleans and transforms DCYA data to be ready for upload into a dashboard
Deliverable 4: Build of PowerBI dashboard to visualize DCYA data
Deliverable 5: Protocol written to update dashboard upon new releases of DCYA data

Major Project Impact:
By increasing the accessibility of youth health data, community organizations focused on students will be better able to respond to emerging needs. Individual school districts will have a better pulse on the issues impacting their students. Stakeholders seeking funding to support youth will be able to power their grant applications with the most up-to-date data. Less epidemiologist capacity will go toward analyzing the DCYA data, as stakeholders will be empowered to visualize the data themselves via the dashboard. In summary, the impacts of releasing this data from the clutches of PDF-report-doom are expected to be significant.

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Additional Project #1 Title: Investigating Hispanic/Latine birth outcomes by maternal nativity/ethnicity sub-group
Project #1 Type: Surveillance Activity

Project #1 Description:
Hispanic and Latino babies experience higher mortality compared to Dane County babies overall. When these data are stratified by mother's/birthing person's place of birth (maternal nativity), babies born to US-born mothers and birthing people experience higher mortality. However, in the most recent three years across which we have data, the trends are starting to converge-that is, the rates of infant mortality among Hispanic/Latino babies born to US-born and foreign-born mothers/birthing people are more similar than in the past.

The reasons for this are explored in case reviews conducted by the Dane County Fetal and Infant Mortality Review (FIMR) team, as well as in discussions with community partners. Additional quantitative and qualitative data would support the ability of both FIMR and community partners to further frame these data and bring increased urgency to strategies aimed at reducing infant mortality in both populations.

Project #1 Objectives and Expected Deliverables:
Objective: Conduct an in-depth analysis to investigate trends in infant mortality and preterm birth among Hispanic/Latino babies by maternal nativity.
Deliverable 1: Literature review of recent trends (and factors driving the trends) in infant mortality and preterm birth by maternal nativity
Deliverable 2: Data summary of perinatal periods of risk, country/region of maternal birth stratification, and other available variables such as timing of prenatal care initiation
Deliverable 3: Presentation of key findings to the Fetal and Infant Mortality Review Team

Project #1 Impact:
The reasons underlying the changing patterns of infant mortality and preterm birth in Hispanic/Latino populations are layered and, increasingly, politically complex. By having a deeper understanding of the trends, prevention efforts can be more focused. Additionally, community partners working in this space have requested a deeper data analysis on this topic. This project is in alignment with our team values to be responsive to community data needs.

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

The fellow will have the opportunity to participate in emergency preparedness tabletop exercises, and, if an event requiring a response emerges, they will participate in an ICS structure likely in the Operations unit. Additionally, the Fellow will gain experience using our syndromic surveillance system and can monitor the system during periods of extreme cold for spikes in ED visits among the unhoused population. This can help inform the policies of shelters during extreme cold events.

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

The fellow will (more than likely!) have the opportunity to participate in a foodborne outbreak response. Activities related to this activity may include: establishing a case definition, conducting case interviews, generating an epidemic curve, calculating odds ratios, analyzing interview data, and developing communications materials (such as press releases). Depending on the size of the outbreak, the time allocation could look like a 1-2 week period of full-time effort.