

**ID: 58915984**

**Infectious Diseases - Host Site Description**

**Cook County Department of Public Health**

**Assignment Location:** Forest Park, US-IL  
Cook County Department of Public Health  
Communicable Disease Prevention and Control

**Primary Mentor:** Demian Christiansen, D.Sc., M.P.H.  
Unit Director  
Cook County Department of Public Health

**Secondary Mentor:** Kelley Bemis, M.P.H.  
Program Manager, Surveillance and Informatics  
Cook County Department of Public Health

**Work Environment**

Hybrid

**Assignment Description**

The CSTE AEF fellow will be assigned to the Communicable Disease Prevention and Control (CD) Unit and will work across the unit in programs that fit with the fellow's unique talents and interests. Although we cover a large area of more than 700 square miles and nearly 2.3 million residents, including some of the country's wealthiest and poorest communities, our unit is small and close-knit. We are located in Forest Park, IL, adjacent to the City of Chicago and serviced by the "L" and major expressways. The CD Unit is responsible for case investigations, cluster and outbreak detection, and routine surveillance activities covering more than 65 communicable diseases and conditions, as well as emerging infections and conditions that can be monitored through syndromic surveillance. Our unit is dynamic, and we strive for excellence, innovation and transparency with an emphasis on teamwork. The fellow's day-to-day activities will include making progress on the projects outlined below, with flexibility to align with their interests and abilities. Their work may also include investigating communicable diseases reported through the Illinois Disease Surveillance System (IDSS); developing reports and dashboards in IDSS; assisting in the investigation of outbreaks as they arise; working as part of a team on various quality improvement projects in the CD Unit; assisting with syndromic surveillance, data analysis, cluster detection, and the production of weekly and other periodic surveillance reports. The fellow will also conduct ad-hoc research projects to advance public health practice in the CD Unit and may interface with staff at hospitals, provider practices, and long-term care facilities to provide education and outreach.

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

The fellow will have access to every system our staff uses. This includes the Illinois Disease Surveillance System (IDSS), Illinois Comprehensive Automated Immunization Registry Exchange (I-CARE), Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) through the National Syndromic Surveillance Program (NSSP), SAS, R, Python, and ArcGIS, among others.

**Projects**

**Surveillance Activity Title: Seasonal Surveillance - Respiratory Diseases (RSV, Influenza, COVID) and West Nile Virus**

*Surveillance Activity Description:*

The Communicable Disease Unit produces weekly surveillance reports for diseases of seasonal importance - respiratory illnesses year-round but with a focus on the fall and winter months and West Nile Virus in the spring and summer. To

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create these weekly reports, a similar process must be followed for both diseases. Raw surveillance data must be collected from multiple sources (sentinel laboratories and providers, syndromic data, and reportable disease data for respiratory viruses; mosquito abatement districts, climate data, and reportable disease data for West Nile Virus). Data must then be cleaned and analyzed, culminating in setting a weekly activity level and recommendations for the community. Finally, the activity level and supporting data are disseminated via PDF reports and online, interactive web applications.

*Surveillance Activity Objectives:*

In conducting this activity, our goal is for the fellow to become familiar with multiple types of surveillance data, including developing a sense of benefits and drawbacks to different kinds of information. We also want the fellow to get comfortable using multiple sources of information to create a coherent picture of disease activity in the community (i.e., setting an activity level). Finally, the fellow will gain experience in formatting surveillance data for dissemination to a broad audience. Expected deliverables are the weekly reports.

*Surveillance Activity Impact:*

Multiple members of our community use data from these reports to take public health actions. To name just a few examples, infection preventionists use the activity level from our flu reports to inform when to implement visitor restrictions, mosquito abatement districts use them to make decisions about where and when to conduct abatement activities, and media use them to time stories geared towards protective action for the general public.

**Surveillance System Evaluation Title: Tuberculosis Disease and Infection: Updating and Revising Reporting and Surveillance**

*Surveillance System Evaluation Description:*

Tuberculosis Disease and Infection reporting has moved from an older surveillance system operated by the Illinois Department of Public Health (IDPH) called the Illinois-National Electronic Disease Surveillance System (I-NEDSS) to a Salesforce-based environment called the Illinois Disease Surveillance System (IDSS) as of July 2024. The newer system allows for more of a traditional relational database architecture than the previous instance, which was essentially flat. This should make it easier to follow contacts of TB cases and enhance reporting. Part of the evaluation process will be to ensure that cases, especially those in the past 5 years, were ported from I-NEDSS to IDSS properly, to use available reports and develop new reports to ensure that IDSS is complete, accurate and of the highest possible data quality.

In addition, the evaluation of the TB surveillance system will include piloting, and if successful, implementing a REDCap-based solution for obtaining and distributing pertinent TB medical records, on intake, to the appropriate members of the clinical care team. Currently, intake is done by phone and fax with a great deal of manual manipulation of records. We would like to evaluate the automation of some of these intake tasks. If acceptable to both internal and external clients, we would like to implement this as an alternative/complement to phone and fax intake. Once implemented, the fellow will monitor the new REDCap-based system to assess potential improvements in staff time saved as well as data accuracy and completeness.

Finally, the fellow will assume responsibility for the processes pertaining to intake, scheduling, notification and submission of new arrivals to the USA/Cook County with TB B1/B2 conditions using the Centers for Disease Control's Electronic Disease Notification System.

*Surveillance System Objectives:*

The fellow will take a leading role in assessing TB data in IDSS and recommending and implementing solutions when required to improve data quality for both cases, contacts and new arrivals. The fellow will identify areas for process improvement while maintaining the systems for intake, contact investigation, scheduling and the like for cases, contacts

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and new arrivals. Regular monitoring of each system and regular reporting of new cases, contacts and their TB infection status and evaluation of the systems for new arrivals will be expected to be ongoing.

*Surveillance System Impact:*

Several of our current procedures related to TB surveillance and case/contact management rely on tedious, manual steps. We have seen with other areas in our program that applying creative solutions to automate tasks results in fewer errors and frees up staff time to dedicate to solving more complex and interesting problems. We expect applying the same kind of innovations to our TB processes will result in better systems, better data, better communication, and more efficient workflows.

**Major Project Title: Implementing and Monitoring IDSS 2.0 in Suburban Cook County**

*Major Project Description:*

As mentioned above, the state of Illinois is in the process of moving from I-NEDSS to IDSS. The first set of conditions to be migrated were sexually transmitted infections, including syphilis for the first time in an electronic surveillance system, along with tuberculosis disease and infection. Much work has been done at CCDPH to identify and report bugs in the new system to make sure that IDSS functions properly and contains the highest quality data, critical for investigation. This includes rebuilding and revamping myriad reports that were previously in the Business Objects environment to the Salesforce-based environment with IDSS.

In the coming year, all remaining reportable diseases and conditions will be migrated from I-NEDSS to IDSS. As was the case with STIs and TB, there will be a need to ensure that reports and investigations of enterics, vector-borne diseases, vaccine-preventable diseases, etc. are of the highest quality and can be captured and reported out with completeness and accuracy. Again, there will be a need to rebuild, revise, and finalize previously established Business Objects reports in the new environment. In addition, the new environment is expected to have increased ability for building dashboards to support situational awareness, outbreak detection, and investigation quality metrics.

*Major Project Objectives:*

There are several goals we hope to achieve: (1) document, report, and have IDPH correct bugs; (2) redevelop and implement system reports to enhance investigative workflows; and (3) accurately develop and/or redevelop reports and dashboards to monitor investigation cycles and counts of reportable diseases and conditions as part of the fundamental surveillance we conduct for Cook County.

*Major Project Impact:*

The work done in the major project will help to ensure complete and accurate surveillance data are available as quickly as possible. Timely and accurate surveillance data is critical to detect and mitigate potential outbreaks of communicable diseases as quickly as possible. These data also provide vital information on disease trends, helping to inform the overall health status of the community we serve as well as how resources and education should be targeted.

**Additional Project #1 Title: Daily Reportable Disease Monitoring, Data Entry, Deduplication, and Case Investigation**

**Project #1 Type: Surveillance Activity**

*Project #1 Description:*

As part of IDSS 1.0 (migration of STIs and TB), there is a need to merge reportable and potentially reportable electronic laboratory reports to individual cases and/or mark them as reviewed and "not a case." A small but not insignificant number of STI cases are reported to CCDPH in line lists from 2-3 sites because they are unable to report electronically. These reports must be hand-entered. Also, processing TB cases, contacts, and new arrivals involves data entry and

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moving between different systems to obtain required information for accurate and timely surveillance. We expect the fellow would also be involved in similar activities once IDSS 2.0 comes online.

In addition, the fellow will also spend time conducting case investigations for a variety of reportable diseases. At CCDPH, early career epidemiologists often rotate through our communicable disease programs (STI, TB, Infection Prevention, Vaccine Preventable Diseases, and General Communicable Disease) to gain exposure to and experience with a variety of reportable diseases, as well as get to know everyone in the unit. The fellow would follow a similar rotation to our other staff members. Experience with these case investigations will also prepare the fellow to join outbreak response teams when they are needed.

*Project #1 Objectives and Expected Deliverables:*

The fellow will work with epidemiologists in the unit to perform routine inspection of electronic lab results, data entry, and general housekeeping activities to ensure prompt and accurate surveillance data in IDSS. These activities serve as some of the most foundational activities in any successful surveillance system and will help the fellow gain expertise in critical fields required for investigation as well as the pros and cons of various data collection methods. Through case investigations, they will also gain background knowledge in many disease areas and cultivate interviewing and relationship-building skills. Together with the other projects outlined in the billet, the fellow will become an expert in all aspects of surveillance.

*Project #1 Impact:*

Through these routine but critical activities, the fellow will master the fundamental building blocks of any surveillance system and will contribute to its success. Excellent, thorough, timely and accurate surveillance is the cornerstone of preventing and controlling the spread of communicable diseases.

**Additional Project #2 Title: Development of Guidelines for Syndromic Surveillance Use**

**Project #2 Type: Surveillance Activity**

*Project #2 Description:*

CCDPH uses syndromic surveillance data (both emergency department data and inpatient data) for monitoring several conditions of public health importance. From 2005 to 2019, CCDPH operated a local syndromic surveillance system. In 2019, this system was sunset and CCDPH began using the National Syndromic Surveillance Program's Biosense Platform (NSSP). Historical data from CCDPH's local system was transferred to NSSP; however, required and optional variables differed between the two systems. In addition, some local hospitals have had long data flow interruptions or other data quality issues that have the potential to affect comparisons over time. To better understand potential surveillance artifacts and bias in CCDPH's syndromic surveillance history, and under the guidance of the Enhanced Surveillance Program Manager, the fellow will perform a series of data analyses examining trends in visit counts as well as assessing availability of priority fields over time. Analyses will be performed at the hospital, public health district, and jurisdiction level.

*Project #2 Objectives and Expected Deliverables:*

Through this project, the AEF fellow would gain experience working with syndromic surveillance data, including understanding its strengths and limitations. The fellow would also strengthen their data analysis skills and gain experience summarizing, visualizing, and reporting results. Expected deliverables would include a report that contains overall guidelines for the use of syndromic surveillance going forward (e.g. "If using the discharge diagnosis field, do not use data earlier than 2016").

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*Project #2 Impact:*

CCDPH is a heavy user of syndromic surveillance data and relies on it for situational awareness and decision-making for multiple conditions. The development of data use guidelines will allow us to quickly stand up surveillance for new conditions/syndromes, as well as document potential sources of bias to improve trend interpretation.

**Additional Project #3 Title: Evaluation of Electronic Interviews for Syphilis**

**Project #3 Type: Surveillance System Evaluation**

*Project #3 Description:*

Patients newly diagnosed for syphilis must be interviewed by public health staff to gather information on clinical symptoms, treatment, risk factors, and partner information. Currently, these interviews are conducted by epidemiologists over the phone but non-response rates are high. CCDPH would like to explore whether patients may be more comfortable providing sensitive information if secure, HIPAA-compliant survey software, such as REDCap, is used to gather information. The CSTE Fellow would be responsible for the data analysis of a pilot project comparing interview response rates and data completeness/accuracy between individuals randomized to phone interviews and individuals randomized to computerized, survey interviews.

*Project #3 Objectives and Expected Deliverables:*

The objective of this project would be to analyze response rates and data completeness/accuracy between phone interviews and computerized, survey interviews. The results of the analysis would determine whether survey software is a helpful supplement to traditional phone interviews for syphilis cases.

*Project #3 Impact:*

Computer-based survey interviews may be more comfortable for patients from younger age brackets, especially when discussing sensitive topic areas. Offering this option may result in more comprehensive data collection and free up staff time for epidemiologists to focus on patients who need more intensive follow up or who prefer phone interviews. As funding for public health becomes more precarious, staying nimble and adapting to use new tools will help us maintain high quality investigations.

**Additional Project #4 Title: Long Term Follow Up and Outcome Monitoring for Pregnant People with Syphilis**

**Project #4 Type: Surveillance Activity**

*Project #4 Description:*

Congenital syphilis (CS) can have devastating effects on infants born to mothers with syphilis, and has been increasing nationwide and in suburban Cook County. CCDPH is committed to reducing the number of CS cases and is prioritizing several interventions in this area. One such intervention is increasing monitoring for people who are diagnosed with syphilis while pregnant. The fellow would assist the STI program in checking in on these patients until delivery to ensure adequate treatment is administered, additional testing is performed where necessary, and to collect information on the pregnancy outcome.

*Project #4 Objectives and Expected Deliverables:*

Closer follow-up of pregnant people with syphilis will provide more opportunities for CCDPH to assist providers in intervening to prevent congenital syphilis. It will also provide better data on pregnancy outcomes for pregnant syphilis patients. We expect this work would be ongoing throughout the fellow's time at CCDPH.

*Project #4 Impact:*

The fellow's activities will help support the reduction of congenital syphilis in Cook County.

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

The AEF fellow will complete the ICS-100 and ICS-200 NIMS courses upon starting their fellowship and are encouraged to take additional NIMS courses that suit their interest level (e.g. ICS-300 & 400, IS-700 & 800). The fellow will also participate in any tabletop exercises conducted by our Emergency Preparedness and Response Unit and gain exposure to this unit's roles and responsibilities through COVID-19 response activities. We estimate these activities will account for a few hours per month of the fellow's time.

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

As a large public health department, our unit is typically involved in at least one, or more, large or unusual outbreak response (e.g. measles, novel pathogen) each year. Our past AEFs have taken various roles in these responses, including interviewing cases and contacts, contact symptom monitoring, monitoring data quality, and creating situational awareness reports and updates. AEFs can also be involved in smaller cluster investigations and support program areas with general case investigation activities, as time and interest allow. We estimate these activities to account for between 10-20% of the fellow's time, with flexibility to suit the fellow's interest level.