

ID: 35065806

Infectious Diseases - Host Site Description

Wisconsin Department of Health Services

Assignment Location: Madison, US-WI
Wisconsin Department of Health Services
Division of Public Health, Bureau of Communicable Diseases

Primary Mentor: Angie Maxted, DVM, PhD
State Public Health Veterinarian
Wisconsin Department of Health Services

Secondary Mentor: Hannah Segaloff, PhD, MPH
Career Epidemiology Field Officer
Wisconsin Department of Health Services, Centers for Disease Control and Prevention

Work Environment

Hybrid

Assignment Description

The CDC/CSTE Applied Epidemiology Fellow will be assigned to the Communicable Diseases Epidemiology Section (CDES) within the Bureau of Communicable Diseases (BCD). BCD is responsible for the prevention and control of communicable diseases in Wisconsin. The Bureau provides surveillance and epidemiological follow-up of more than 80 reportable communicable diseases.

The Fellow's assigned section, CDES, is responsible for maintaining and improving surveillance for all communicable diseases other than AIDS/HIV, sexually transmitted diseases, TB, healthcare-associated infections, and vaccine preventable diseases, which are handled by other sections within BCD. CDES's responsibilities include the epidemiologic investigation and response to: foodborne, waterborne and vectorborne diseases; zoonotic diseases; most communicable disease outbreaks; influenza, COVID-19, and other respiratory diseases; invasive diseases; and emerging and re-emerging diseases among others.

The Fellow will be assigned physical space in CDES near both mentors. The Fellow will have flexibility to work remotely 1-3 days/week as projects allow. Field work opportunities most commonly occur during outbreak situations. When appropriate, every effort will be made to facilitate the Fellow's participation in on-site assessments or environmental sampling which are conducted as part of an investigation. Attendance at off-site meetings and conferences is encouraged.

Daily activities in BCD, particularly early in the Fellowship, will be related to the Fellow's surveillance activities and major projects, and learning the basics of disease surveillance in Wisconsin. With the mentors' guidance, the Fellow will develop an in-depth understanding of communicable disease investigation and follow-up. Although not a primary duty, the Fellow will be expected to conduct some routine and outbreak-related patient interviews using existing interview tools to become familiar with this important component of surveillance. The Fellow will be encouraged to review campylobacteriosis case reports in real-time to identify clusters of illness and work with the mentor and local health department staff to investigate suspected outbreaks. The Fellow will also be involved in the establishment, evaluation, and improvement of two additional disease surveillance systems for severe acute respiratory illness (SARI) and animal rabies (integrating for the first time electronic laboratory results into the Wisconsin Electronic Disease Surveillance System, WEDSS)

With progressive gains in expertise, the Fellow will be encouraged to identify additional projects of interest. The Fellow will be expected to attend and participate in bi-weekly communicable disease meetings with the other program areas in

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the CDES, weekly conference calls with the Wisconsin State Laboratory of Hygiene, and bi-monthly interagency animal health meetings. While both mentors are available at any time and would expect routine contact with the Fellow, weekly meetings will be scheduled to review progress, discuss the work plan, and ensure any needs are being addressed.

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

We are committed to helping the Fellow develop analytical expertise. CDES staff routinely use SAS applications for epidemiologic purposes, but R and Tableau are also used. While not used routinely, SPSS and STATA are available to the Fellow upon request. The Fellow will have opportunities for training and to grow their abilities in these systems. Epidemiologists, statisticians, and other analysts within CDES and throughout the Division of Public Health are willing and able to provide technical support. The Fellow will have the opportunity to access and use multiple databases. Work conducted within BCD will intensively use the Wisconsin Electronic Disease Surveillance System (WEDSS) which is the State's web-based disease reporting and management system and is the system to which cases of reportable diseases and animal bites are reported, laboratory data are submitted, and case interview data are entered. The Fellow will also become familiar and comfortable using both EpiInfo and Access databases. Depending on specific project needs other potential data sources that may be accessed include vital statistics, hospitalizations, emergency department visits, EMS data, immunization registry, BRFSS, poison control center calls, cancer registry, birth defects registry, and air and water quality datasets. In addition, the Fellow will be encouraged to use ArcGIS to visualize and map health data, and training courses are available in-house.

Projects

Surveillance Activity Title: Surveillance of Campylobacter Infections

Surveillance Activity Description:

The burden of illness associated with Campylobacter infections among Wisconsin residents is significant. During 2015—2021, Wisconsin reported an average of 1560 cases of campylobacteriosis annually, and reported nine Campylobacter outbreaks. Case data are submitted from laboratories and clinicians throughout the state. Patients diagnosed with campylobacteriosis are interviewed by local public health staff regarding their exposures and clinical specimens are forwarded to the Wisconsin State Laboratory of Hygiene for confirmation and subtyping. This data is reported to the Wisconsin Electronic Disease Surveillance System (WEDSS).

The Fellow will work with the enteric disease epidemiologists to learn all aspects of enteric disease surveillance. This will include conducting routine surveillance activities aimed at identifying clusters for further investigation or individual cases requiring additional follow-up or interventions by local public health. These surveillance activities provide essential experience for understanding the roles of local and state agencies. The Fellow will also have the opportunity to work with staff at the Department of Agriculture, Trade, and Consumer Protection (DATCP) to gain an understanding of the regulatory and environmental health components of food safety and outbreak investigations.

Surveillance Activity Objectives:

1. The Fellow will complete a 10-year surveillance summary and analysis of campylobacteriosis data to describe burden and demographic, temporal, or exposure trends.
2. Based on the results from the surveillance summary and analysis the Fellow will provide recommendations to update DHS investigation recommendations, control measures, and WEDSS case form.
3. The Fellow will create a presentation to share the results of the summary and data analysis with professional audiences.

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4. The Fellow will create a presentation on the prevention and control of campylobacteriosis in Wisconsin for the general public based on the results of the surveillance summary and data analysis.
5. The Fellow will create an infographic for the prevention and control of campylobacteriosis in WI using the results from the surveillance summary and data analysis.

Surveillance Activity Impact:

Results of the surveillance summary and data analysis will be used by DHS to update investigation recommendations for local health departments. It will also allow the department to improve our communication about campylobacteriosis risk factors and prevention measures to the public.

Surveillance System Evaluation Title: Evaluation of Animal Bite and Rabies Surveillance Data

Surveillance System Evaluation Description:

Within WEDSS exists a module for animal disease reporting, including reports of animal bites requiring follow-up to determine the rabies status of the offending animal or administration of rabies post-exposure prophylaxis, and reports of confirmed animal rabies cases. Although animal bites are not a reportable condition in Wisconsin, local public health jurisdiction follow-up of any potentially exposed person is expected. Use of the WEDSS Animal Bite/Rabies interface is encouraged by DHS but is not required, resulting in unequal use by jurisdiction and no standardized data that would help public health officials assess rabies prevention practices. Several improvements to animal rabies surveillance will be in place by mid-2023, including 1) automatic electronic laboratory reporting of all animal rabies testing results to WEDSS, 2) revision of the disease-specific form to better capture animal exposure data, and 3) updated rabies requisition form to capture these data at the time of submission, as requested by CSTE/CDC.

Surveillance System Objectives:

The Fellow will

1. Describe and characterize current use of the WEDSS Animal Bite/Rabies interface, assess gaps or variations in its use across local jurisdictions, and identify where the system best performs its intended function (management of animal bite reports).
2. Document improvements in data quality (e.g., completeness, timeliness) as captured by WEDSS and transmitted to CDC following the planned system improvements.
3. Identify additional data sources outside of WEDSS containing animal bite information to better describe the burden of animal bites and rabies post-exposure prophylaxis (RPEP) administration in Wisconsin; these could include vital records, the Wisconsin Immunization Registry, and hospital discharge, EMS, and emergency department data.

Upon completion, the Fellow will

1. Provide recommendations for system improvement.
2. If interested, be involved with creating a statewide Rabies Control/Animal Bite Management manual containing guidance for local jurisdictions about best practices and use of WEDSS.

Surveillance System Impact:

Results of the evaluation will be used by DHS in the writing of a statewide Rabies and Animal Bite Management manual, which is intended to guide optimal use of the WEDSS Animal Rabies test reports and the Animal Bite Module/Rabies interface to meet the public health goals of human rabies prevention and elimination of unnecessary RPEP.

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Major Project Title: Severe Acute Respiratory Infection Surveillance

Major Project Description:

Since the beginning of the COVID-19 pandemic, circulation of seasonal respiratory viruses has been augmented. The introduction of a new seasonal respiratory virus in SARS-CoV-2, in addition to altered pattern of disease circulation and intense strain on the hospital system has highlighted the importance of a robust and multifaceted respiratory virus surveillance system. In order to enhance respiratory virus surveillance in Wisconsin, Wisconsin DHS is commencing severe acute respiratory infection surveillance among pediatric patients in the 2023-24 winter respiratory virus season.

The Fellow will aid Dr. Segaloff and the Respiratory Virus Surveillance coordinator in the launch and monitoring of this system through coordination with laboratory colleagues and infection preventionists at children's hospitals across Wisconsin. They will also have the opportunity to monitor initial data retrieved from this system and contribute to improvements throughout the season. The Fellow will be encouraged to participate in CSTE, CDC, and other workgroup calls to learn more about respiratory virus surveillance across the country.

Major Project Objectives:

1. Work with health department subject matter experts and external collaborators to ensure surveillance data is flowing properly at the beginning of the respiratory virus season.
2. Monitor weekly data and address any gaps in the surveillance with laboratory or health system colleagues to improve the system.
3. Work with health department colleagues to develop outreach and communication based on the data received, including integrating results into the standing weekly respiratory virus surveillance report.
4. At the end of the season, interpret and describe seasonal data for an external communication to describe viral activity during the respiratory virus season.

Major Project Impact:

The Fellow's work will improve respiratory virus surveillance in Wisconsin, giving stakeholders and the public a more nuanced picture of seasonal viral activity, encouraging appropriate action to reduce the burden of disease and enhance hospital preparedness.

Additional Project #1 Title: Syphilis Screening Among Pregnant Women

Project #1 Type: Major Project

Project #1 Description:

Syphilis in pregnancy, if not detected and treated, can lead to serious complications in the fetus. Approximately 40% of babies born to women with untreated syphilis are stillborn or die soon after birth, those that are born with congenital syphilis often have significant health problems. Congenital syphilis cases and syphilis cases among pregnant women have been increasing in the USA since 2015; Wisconsin has seen a spike in congenital syphilis cases since 2019, especially in the City of Milwaukee.

An initial analysis by the City of Milwaukee Health Department and Wisconsin Department of Health Services has concluded that there has been a large rise in primary and secondary syphilis cases in the previous two years in the City of Milwaukee, likely contributing to corresponding rises in cases among pregnant women and congenital syphilis cases.

The Fellow will use Medicaid claims and diagnosis data to identify all pregnant women on Medicaid from 2015-2021 and determine whether they had any syphilis screening, diagnoses, or treatment during their pregnancy. They will then examine predictors of missed screening, such as region of the state, race, age, and other demographic factors.

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Project #1 Objectives and Expected Deliverables:

1. Identify factors associated with missed syphilis screening among pregnant women.
2. Collaborate with the harm reduction section to incorporate data into presentations to health care providers and other stakeholders to inform syphilis screening guidelines.
3. Work with the harm reduction section to map areas of the state with lower syphilis screening rates to correlate with prenatal care deserts.

Project #1 Impact:

In the setting of rising congenital syphilis cases nationally and in Wisconsin, this project will provide important information to the Harm Reduction Section about missed syphilis screening and its potential contribution to congenital syphilis. In addition, identification of characteristics of pregnant women more likely to have missed screening could help identify contributing causes to disparities in congenital syphilis and potential solutions to reducing these disparities.

Additional Project #2 Title: Surveillance and Response to Emerging Vector-borne Diseases

Project #2 Type: Surveillance Activity

Project #2 Description:

Vector-borne diseases, especially tick-borne diseases, are a significant disease burden in Wisconsin. In addition to Wisconsin being designated by the CDC as a high incident state for Lyme disease, rates of anaplasmosis reported in Wisconsin are routinely among the highest in the country. Furthermore, several emerging and geographically discrete tick-borne infections can be acquired in Wisconsin, including infections from *Borrelia miyamotoi*, *Borrelia Mayonii*, and *Ehrlichia muris euclairensis*, the last of which was first identified in a Wisconsin resident in 2009. While more rare than tick-borne infections, the emergence of mosquito-borne infections (especially Jamestown Canyon Virus and Eastern Equine Encephalitis virus) are also of concern in Wisconsin. Finally, surveillance for tick species not routinely expected to be found in Wisconsin such as *Amblyomma americanum* and *Haemaphysalis longicornis* is becoming more important.

The CSTE Fellow would be encouraged to work with the DHS Vector-borne Diseases (VBD) Program to identify at least one project during their fellowship that would allow them to gain experience and expertise in Vector-borne disease surveillance or response. Projects would be tailored to both the interest of the Fellow and emerging needs of the program but could include projects focused on data analysis, field work/tick surveillance, program evaluation, or communicating public health information. Wisconsin has a robust VBD Program within the DHS Bureau of Communicable Diseases that includes epidemiology capacity, a state public health entomologist, and support from public health educators. In addition, DHS works closely with the University of Wisconsin (which has been designated by the CDC as the Midwest Center of Excellence for Vector-borne Diseases), the Wisconsin Department of Natural Resources, Wisconsin local and tribal health departments, and private healthcare partners. The VBD Program conducts routine surveillance of reportable vector-borne diseases (tick-borne and mosquito-borne) in people, conducts active tick and mosquito surveillance via tick drags and other field work, provides annual training to local and tribal health agencies, runs an annual awareness campaign using social media called "Fight the Bite", and manages a passive tick surveillance program offering an online tick identification service.

Project #2 Objectives and Expected Deliverables:

Possible Fellow projects and opportunities:

1. Evaluation of the VBD Program's enhanced surveillance program for the detection of rare/emerging arboviruses such as Jamestown Canyon and Powassan viruses.
2. Develop and perform a surveillance project to assess occupational risk factors for tick-borne disease infection.
3. Conduct an analysis of tick-borne disease infections associated with the *Ixodes scapularis* tick (i.e., Lyme disease, anaplasmosis, babesiosis) to determine the frequency of co-infections and describe the epidemiologic characteristics of cases with co-infections.

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4. Conduct a surveillance program evaluation of emerging tick-borne disease pathogens (e.g., *Borrelia miyamotoi*, *Borrelia Mayonii* or *Ehrlichia muris eauclairensis*).
5. Conduct a field project with the state public health entomologist to characterize endemic tick populations or identify emerging tick species and/or pathogens.
6. Review existing outreach materials with a health equity lens and propose updates to improve vector-borne disease inequities.
7. Participate in response to an emerging vector-borne disease pathogen or a new cluster of human vector-borne disease cases (should one occur).
8. Coordinate the development of a multi-agency Asian longhorned tick state surveillance and response plan.

Project #2 Impact:

The Fellow's work will strengthen the understanding of vector-borne diseases, emerging threats, and effective response to these threats by the public, local public health agencies, state agencies, and other partners.

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

The state's emergency preparedness program is located in the Office of Preparedness and Emergency Health Care. This office works closely with staff in BCD and funds staff in many areas of public health including Drs. Maxted and Segaloff. CDES regularly collaborates with and participates in preparedness activities. The Fellow will have the opportunity to meet with these staff to learn more about the program and will be encouraged to complete ICS trainings and other trainings as they are available. The SPHV is one of the BCD staff responsible for select agent response planning and will be able to identify opportunities for the Fellow to participate in plan revision, simulations, and table-top exercises. Further, Dr. Segaloff works closely with staff in the Office of Preparedness and Emergency Health Care and helps identify potential projects of interest to the Fellow. If actual events occur requiring activation of emergency preparedness plans, the Fellow would likely be an active participant in a response. Depending on the Fellow's interest in preparedness and response efforts and responses during the Fellow's time at DHS, time allocation may range from a few hours of trainings and exercises to several weeks of full-time preparedness response efforts.

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

The Fellow's placement within the Communicable Diseases Epidemiology Section (CDES) assures they will have ample opportunity to gain experience conducting effective outbreak investigations from experienced epidemiologists. One important responsibility of the section is to respond to acute health events. It is important that all Fellows placed in CDES have the opportunity to learn these important skills. In particular, the enterics program investigates dozens of outbreaks (large and small) each year and the waterborne disease program routinely investigates multiple outbreaks of legionellosis. In recent years the section has also investigated outbreaks of leptospirosis, toxoplasmosis, blastomycosis, histoplasmosis, adenovirus, and hospital acquired infections among others. The Fellow's campylobacter surveillance responsibilities will connect them with the enterics program where they will learn to identify and investigate disease clusters and outbreaks, and the Fellow will also participate in any zoonotic disease outbreaks. They will have the opportunity to participate in all aspects of an investigation from generating a hypothesis and developing a questionnaire and database, to interviewing cases, conducting data analysis, and writing the outbreak report. Depending on what occurs during the placement, and the particular interest of the Fellow, opportunities for participating in disease investigations outside of enteric and zoonotic program areas may be available. These could include, healthcare acquired infections, respiratory diseases, or others. The Fellow should anticipate participating in, and leading, multiple cluster or outbreak investigations during their fellowship. Outside of the listed or additional projects, much of the Fellow's time will likely be allocated to cluster and outbreak investigation.

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

A large proportion of the Department's COVID-19 surveillance activities are housed within CDES. The Fellow will have the opportunity to participate in the COVID-19 response by providing technical assistance to Local and Tribal Health Departments on isolation, quarantine, and outbreak management. The Fellow may also have the opportunity to participate in other projects aimed at improving COVID-19 surveillance efforts or data quality. Depending on the Fellow's interest in COVID-19 responses activities, time allocation may range from a few hours to several weeks assisting COVID-19 response efforts.

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

Health equity is a major priority of DHS and DPH. The Fellow will have the opportunity to take part in health equity initiatives at the Division or Department level. The Office of Health Equity is a centralized hub that aligns and amplifies the diversity, equity, and inclusion efforts occurring across all DHS divisions and offices, and has staff that can help ensure the Fellow approaches projects through a health equity lens.