

## **Infectious Diseases**

### **Michigan Department of Health and Human Services, Bureau of Epidemiology and Population Health**

Lansing, Michigan

#### **Assignment Description**

The Michigan Infectious Disease Fellow would have a truly unique opportunity to act as a member of Michigan's infectious disease epidemiology team, with special emphasis on zoonotic, vectorborne and emerging infectious disease opportunities. The Fellow will work closely with mentors Dr. Kimberly Signs and Dr. Mary Grace Stobierski in the Emerging and Zoonotic Infectious Diseases (EZID) Section of the Bureau of Epidemiology and Population Health, as well as other members of the Section. The mentors will oversee the training, research and field activities of the Fellow, ensure that the Fellow is familiar with the processes and responsibilities of the Section, and encourage the overall professional development of the Fellow.

Our Fellows are welcomed as entry-level epidemiologists into our agency and are afforded identical rights and privileges as newly hired full-time staff epidemiologists. This Fellow will be organizationally housed within the Emerging and Zoonotic Infectious Diseases (EZID) Section, Bureau Epidemiology and Population Health. An office space, again identical to those of regular staff epidemiologists, will be made available to this person. It will be located next to other Section and Bureau staff. The Fellow will be involved in all aspects of the work of the section including reportable disease surveillance, outbreak response, educational outreach, interagency collaborations, and response planning. Outbreak investigations may require working in multi-disciplinary teams. The EZID Section works closely with local public health staff, as well as state partners at the Departments of Agriculture and Rural Development and Natural Resources, and Federal partners including the CDC, and USDA's Veterinary Services and Wildlife Services Divisions.

Recent investigations or surveillance projects that Fellows within the Section have been involved with include: cluster of tularemia infections in falconers, Shiga-toxin producing E. coli infections associated with a local petting farm, multi-state salmonella outbreak associated with contact with live poultry, transfusion-associated Babesiosis, outbreak of human H3N2 variant influenza associated with contact with swine at agricultural fairs, Mycobacterium tuberculosis infection in research macaques, ongoing emergence of Lyme disease in Michigan, and the first case of plague in Michigan in a recent traveler to an endemic area of Colorado.

While this host site application includes a major project description, once the Fellow is acquainted with the activities of the EZID Section, they may choose to develop an alternate project based on their interests as well as the current activities and needs of the EZID Section. In addition to a major project, MDHHS will support the candidate's completion of the required activities related to this CSTE Fellowship, including a surveillance system evaluation. The CSTE Fellow will have the opportunity to support acute outbreak investigations requiring immediate public health response, under the guidance of the lead Epidemiologist. This may include working first-hand with the CDC, federal, state,

and local regulatory partners on local and multi-state investigations. They will learn how to communicate effectively about health risk and utilize those skills to develop and disseminate messages for a variety of audiences.

The EZID Section also provides some unique opportunities for Fellows to meet their core requirements. Fellows will be trained to develop and edit content for Michigan's Emerging Diseases website. They will participate in organizing and developing content for EZID's One Health webinars provided to public health partners in the State. They will also attend and have the opportunity to present at the annual statewide Communicable Disease Conference. The target audience includes all Local Health Departments, as well as infection control practitioners and clinical laboratory directors from healthcare systems and nursing homes. Our previous Fellows have had the opportunity to present their work at this and other statewide meetings. Fellows are encouraged to seek out educational and training opportunities, as funding and resources allow. Fellows traditionally participate in fieldwork for Lyme disease surveillance including tick dragging and mammal trapping. The Fellow will also get an introduction to mosquito surveillance for West Nile virus and the vectors of Zika virus through our ongoing community mosquito surveillance project with select local health departments. The current Zika outbreak also provides opportunities for Fellows to engage and contribute to ongoing issues of public health concern.

### **Day-to-Day Activities**

On a daily basis, the CSTE Fellow will:

- 1) Assist in surveillance and outbreak investigations for zoonotic and vectorborne diseases in Michigan.
- 2) Participate in regularly scheduled meetings within the EZID Section, Bureau and Department.
- 3) Participate in existing state-level working groups and discussions on topics of zoonotic disease, including the Michigan Arbovirus Working Group, the Michigan Rabies Working Group, and the monthly Michigan One Health conference call.
- 4) Attend local, state, and national level meetings on topics including public health, epidemiology and infectious disease.
- 5) Assist with field investigations MDHHS may undertake to better understand the epidemiology of zoonotic and vectorborne diseases in Michigan.
- 6) Develop the knowledge and skills necessary to field the calls and questions from the public and other stakeholders on zoonotic and vectorborne disease topics.

## **Potential Projects**

### **Surveillance      Blastomycosis in Michigan Activity**

Michigan is endemic for *Blastomyces dermatitidis*. Human cases occur sporadically within the state and previous data has shown exposure risk to be higher in the northern half of the state. Dogs are good sentinels for the pathogen in the environment, but the disease is not a reportable condition to the Michigan Department of Agriculture and Rural Development. This project would develop an epidemiologic profile of blastomycosis in Michigan. The Fellow will review and update the state's case definition for blastomycosis, investigate sources of data for veterinary cases of blastomycosis, use available sources to update the statewide risk map for blastomycosis in Michigan, and develop a webpage with information and resources for human and animal healthcare providers about the disease in Michigan.

### **Surveillance      Animal Bite Reporting Evaluation**

In Michigan, animal bites are reportable to the local health department but are not required to be reported at the state level. As a result, there is little statewide data available about animal bites beyond the number and types of animals that are tested for rabies annually by the MDHHS Bureau of Laboratories. Several years ago, the EZID Section developed an "Animal Bite Report Form" that was added as an option in the Michigan Disease Surveillance System (MDSS), the electronic mechanism for reportable disease tracking. This form was created at the request of local health departments that wanted to use MDSS to track their animal bite reports. The MDSS animal bite data has not been analyzed at the State level. The Fellow will evaluate the use of MDSS for animal bite reporting by Michigan local health departments.

### **Major Project      Rabies Post-exposure Treatment Reporting**

The EZID Section would like to make rabies PEP a reportable condition in Michigan, so that we can better assess the use of PEP in the state and identify areas for additional education and training. This is an ongoing project that other Fellows have contributed to over the past few years. The next step is to finalize a case report form and pilot and assess its use with targeted local health departments and the health care facilities in their jurisdiction. The results of this project will provide the evidence to support (or not) officially making rabies PEP reportable state-wide.

**Additional Project      Canine Brucellosis Surveillance**

In the past few years, canine brucellosis, caused by *Brucella canis*, has been detected in a number of large breeding kennels in Michigan. This is a zoonotic disease that primarily affects dogs, but can infect people. Human cases are difficult to detect because the disease may be mild and there is currently no serologic test that can identify when a person has been exposed. Despite a number of kennel outbreaks there have been no documented human cases of *Brucella canis* in Michigan, but the risk exists. With kennel outbreaks increasing in frequency in the state, there is a need to address this issue through a number of different stake-holder groups including public health, veterinarians, animal control, pet stores and breeders. The Fellow would organize the effort to develop a comprehensive approach to canine brucellosis surveillance, outbreak response, and control under a One Health approach.

**Additional Project      Enhanced surveillance for Zika virus vectors**

In Michigan, mosquito surveillance for arboviruses is historically sparse. As Zika virus continues to emerge in the Americas, it highlights the importance of strong surveillance and early warning of potential outbreaks. Michigan has not yet identified Zika vector species in the state, however MDHHS plans to expand surveillance in order to anticipate or prevent areas of possible transmission. To this end, the Emerging and Zoonotic Infectious Disease Section is currently developing an enhanced surveillance network to identify arbovirus vectors in Michigan. This project will enlist up to 25 local health jurisdictions to trap, identify, and potentially test mosquitoes throughout high-risk areas of the state. The fellow will assist Section staff in providing epidemiologic, entomologic, and logistical support to local health departments. This may include training and educating health department staff on arbovirus ecology, mosquito collection procedures including trap use, data collection, and analysis. The fellow may also work in the MDHHS home county to conduct mosquito surveillance for Zika vectors or endemic arboviruses. Data collected through this project will be shared with CDC partners, and published to the Michigan Emerging Diseases website.

**Preparedness Role**

Michigan has an established Bureau of EMS, Trauma, and Preparedness (BETP) which has drawn staff from both the epidemiology and laboratory programs of the health department and thus maintains close ties with both of these programs. The Fellow would have many opportunities to participate in trainings, tabletop exercises, discussions and projects with this Bureau. Among these would be:

**Incident Command Training:**

The availability and completion of Incident Command System training for better integration with the National Incident Management System structure employed throughout Michigan's public health community in response to emergent public health issues. This structure is mandated for incident response at the federal, state and local level.

**Bioterrorism Education:**

The Fellow would also be encouraged to take advantage of the many Bioterrorism-Preparedness education opportunities and exercises offered through a variety of sources, including the MI-TRAIN portal (<https://mi.train.org>), a learning resource for professionals who protect the public's health.

**Additional Activities**

The CSTE Fellow can choose among several focused areas to tailor experiences leading to advanced skills in applied epidemiology as well as policy and program development. The Fellow, together with both mentors will be able to choose a project suited to the background of the Fellow and current needs of the Bureau. Past projects have included developing and distributing education materials about Lyme disease targeted to healthcare providers and assessing their effectiveness, a KAP survey of veterinarians in Michigan regarding Leptospirosis, collaboration with Michigan State University researchers conducting field research on the ecology of Lyme disease in Michigan, and development of the Michigan Beg Bug Manual, to name a few. MDHHS has been collaborating with partners at Michigan State University on an ongoing Lyme Disease project. This project has provided previous Fellows with valuable field experience, an opportunity to contribute to a meaningful epidemiologic investigation, as well as a means to meet some of their Fellowship objectives.

**Mentors**

<b>Primary</b>	Kimberly Signs, DVM Zoonotic and Vectorborne Disease Epidemiologist
<b>Secondary</b>	Mary Grace Stobierski, DVM, MPH Manager, Emerging and Zoonotic Infectious Diseases Section