

Environmental Health- Waterborne

Assignment Description:

The CSTE Fellow assigned to the Minnesota Department of Health (MDH) to work on waterborne diseases will work in the Foodborne, Vectorborne and Zoonotic Disease Unit (FVZDU). FVZDU is supervised by Dr. Kirk Smith, who will act as Primary Mentor. FVZDU comprises six foodborne disease epidemiologists, two vector-borne disease epidemiologists, two zoonotic disease epidemiologists, one bioterrorism epidemiologist, one Career Epidemiologist Field Officer, three health program representatives, and a cadre of MPH student workers. FVZDU includes Senior Epidemiologist Trisha Robinson, MPH, who will act as Secondary Mentor. This is a very busy, active unit that is constantly involved with cluster and outbreak investigations and active surveillance for numerous infectious diseases. The unit meets on Mondays to discuss our current cases or investigations, so we keep well informed of Unit activities outside our own. In addition, we frequently collaborate with environmental health specialists throughout Minnesota and CDC, EPA, and other states who participate in the Environmental Health Specialists Network's Water Program.

Day-to-Day Activities:

The Fellow will be involved with human case surveillance of waterborne disease pathogens (e.g., *Cryptosporidium*, *Giardia*, *Campylobacter*, Shiga toxin-producing *E. coli*), field surveillance for selected waterborne diseases, investigations of novel, rare, or especially concerning waterborne diseases (e.g., primary amebic meningoencephalitis due to *Naegleria fowleri*), service and outreach to the public, and waterborne disease prevention. While the majority of the Fellow's time would be spent in the waterborne disease area, opportunities may also be available to work with the foodborne disease group on foodborne illness outbreaks, with the zoonotic disease group to provide guidance on animal bites and rabies prophylaxis, and a variety of other activities. The Fellow will participate in the day-to-day work of the waterborne disease group, and his or her activities will vary depending on whether they are conducting routine surveillance activities, outbreak investigations, disease prevention activities, or outreach to other public health professionals or to the public. In addition, publication opportunities are frequent at MDH, and they would likewise be made available to our Fellow.

There is potential for expansion of our waterborne disease surveillance and prevention activities depending on the Fellow's background and interests. In addition, the Fellow will be taught a step-by-step approach to cluster/outbreak investigation of waterborne diseases, including questionnaire development, interviewing skills, hypothesis development, database creation, data analysis, working with outside agencies, keeping involved parties informed, interaction with the public and media, and finally, writing outbreak investigation reports.

Potential Projects:

There are several major waterborne disease projects that our CSTE Fellow might choose to undertake:

1. **Naegleria fowleri Field Surveillance and Prevention Project.** In 2010, the first confirmed case of *Naegleria fowleri* was diagnosed in a child after swimming in a Minnesota lake, representing the northern most case by over 500 miles; a second case was confirmed in 2012. Our Fellow would work to conduct field surveillance for the amoeba in lakes throughout Minnesota. Additionally, our Fellow would develop a multi-media educational campaign to raise awareness about *N. fowleri* among visitors to lakes, rivers, and other natural bodies of water. Materials could include brochures, posters, and educational PowerPoint presentations or videos.

2. Harmful Algal Bloom (HAB) Surveillance. Algal blooms, often caused by the addition of nutrients to a water body, are sometimes made up of cyanobacteria, commonly called blue-green algae. Some cyanobacteria can produce toxins, called cyanotoxins. In Minnesota, there is no formal cyanotoxin monitoring program. Our Fellow would work with the Minnesota Pollution Control Agency and colleagues at MDH in both the Zoonotic Diseases Group and the Site Assessment and Consultation Unit to conduct surveillance for human and animal cases of harmful algal bloom toxicosis.
3. Beach Monitoring Surveillance Coordination. There is currently no single entity in Minnesota that tracks the closure of beaches, and testing of beaches is up to the discretion of the local authorities. Our Fellow would work with MDH and local environmental health officials to develop a resource to track beach monitoring programs statewide. This information will be used not only to inform the public, but also as a tool to compare to exposures reported by routine enteric disease surveillance cases (e.g., Giardia, Campylobacter, Cryptosporidium, Shiga toxin-producing E. coli).
4. Enhanced Public Health Communication. We have a very limited website regarding waterborne disease that needs critical review and updating. In addition, we lack fact sheets and other health promotion materials for several important waterborne diseases in Minnesota. The Fellow would work closely with the waterborne disease epidemiologist to develop print materials and signage on the prevention of waterborne diseases. Ideally, the Fellow will become comfortable enough in waterborne diseases to give talks to the public, medical providers, and local public health.
5. Enhanced Giardia Surveillance to Detect Waterborne Outbreaks. This would include data analysis and potentially an opportunity for the Fellow's surveillance system evaluation. Associated activities include: performing clinical follow-up with clinicians and laboratories; interviewing patients or their family members; coordinating submission of clinical specimens when needed; maintaining data records; and providing updates to other ADIC staff.
6. Other Projects. Depending on time, resources and interests, other waterborne diseases activities could include: responding to data requests from outside groups and agencies; answering questions from the public by phone or e-mail regarding waterborne diseases; and exploratory/hypothesis-generating data analysis on existing surveillance databases.

Preparedness Role

Prior CSTE Fellows have participated in the response to BioWatch positive results and an evaluation of bioterrorism surveillance. The new Fellow would receive ICS training and participate in other emergency events that happen.

Nearly every year, MDH-ADIC is faced with public health emergencies or emergent diseases that require large-scale, rapid, multi-faceted public health responses. Recent examples include H1N1 influenza, an outbreak of novel progressive inflammatory neuropathy among swine workers, an investigation of exposure to Haemophilus influenzae type B among infants in a large area of Minnesota, and an outbreak of fungal meningitis associated with epidural steroid injections. When such events occur, nearly all staff members in ADIC are involved with the response. The CSTE Fellow would be called on to participate in such a response, in a way that best suits his or her skills and experiences.

Assignment Location: St. Paul, MN

Primary Mentor:

Kirk Smith, DVM, MS, PhD
Supervisor, Foodborne, Vectorborne, and Zoonotic Diseases Unit
Minnesota Department of Health

Secondary Mentor:

Trisha Robinson, MPH
Epidemiologist Senior
Minnesota Department of Health