Waterborne Diseases, Infectious Diseases

Minnesota Department of Health, Infectious Disease Epidemiology, Prevention and Control Division
St. Paul, Minnesota

Assignment Description

The CSTE Fellow would be located within the Waterborne Diseases Unit, which is supervised by Trisha Robinson, who will act as Secondary Mentor. The unit is located within the Foodborne, Waterborne, Vectorborne, and Zoonotic Diseases Section, supervised by Dr. Kirk Smith, the Primary Mentor. This is a very busy, active section that is constantly involved with cluster and outbreak investigations and active surveillance for numerous infectious diseases. The section meets on Mondays to discuss our current cases or investigations, so we keep well informed of section activities outside our own. In addition, we frequently collaborate with environmental health specialists throughout Minnesota and CDC, EPA, and other states.

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, harmful algal blooms), 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

Surveillance Activity Harmful Algal Blooms

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. Activities could include follow-up and investigation of suspected animal and human harmful algal bloom cases, the creation and coordination of an inter-agency REDCap database, historical review of dog deaths or illness reports, and inter-agency working group coordination.

Surveillance Evaluation Evaluation of Cryptosporidium Surveillance System

Approximately 300 cryptosporidiosis cases are reported annually in Minnesota. Cryptosporidium is both a reportable and submittable pathogen in Minnesota, where we complete molecular subtyping on all Cryptosporidium specimens and interview all cases. An evaluation of the Cryptosporidium surveillance system would include both the laboratory and epidemiology components.

Major Project Online Reportable Disease Surveillance

In response to limited resources available for Giardia surveillance, we propose to have the Fellow create, implement and evaluate an online surveillance system for giardiasis. Activities could include evaluation of data quality, timeliness, completion rates, and other parameters in online vs. traditional phone interviews.

Additional GIS Analysis of Waterborne Disease Pathogens Project

The Fellow would perform GIS analyses to assess the effect of census-tract level poverty on waterborne disease pathogens. Analyses would include species-specific comparisons.
Additional Project

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).

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 IDEPC is faced with public health emergencies or emergent diseases that require large-scale, rapid, multi-faceted public health responses. Recent examples include Ebola, 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 IDEPC 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.

Additional Activities

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. There is potential for expansion of our waterborne disease surveillance and prevention activities depending on the Fellow’s background and interests.

Mentors

Primary
Kirk Smith, DVM, MS, PhD
Manager, Foodborne, Waterborne, Vectorborne, and Zoonotic Diseases Section

Secondary
Trisha Robinson, MPH
Supervisor, Waterborne Diseases Unit