Infectious Diseases

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

Saint Paul, Minnesota

Assignment Description

The CSTE Fellow assigned to the Minnesota Department of Health, Foodborne, Waterborne, Vectorborne, and Zoonotic Disease Section (FWVZ) will work in the Zoonotic Diseases Unit (ZDU) led by State Public Health Veterinarian, Dr. Joni Scheftel, who will be the primary mentor. Dr. Stacy Holzbauer, a CDC Career Epidemiology Field Officer and Deputy State Public Health Veterinarian will serve as secondary mentor. The remaining members of the ZDU include a bioterrorism epidemiologist, an epidemiologist who serves as Rabies Program Coordinator and the MDH project coordinator of the Upper Midwest Agricultural Safety and Health Center, a veterinary epidemiologist who covers endemic fungal diseases and animal contact, a certified veterinary technician with expertise in infection control who provides support for the group, and four MPH graduate students. The ZDU is responsible for zoonotic disease surveillance and outbreak investigation, outreach and response. ZDU handles any issues that arise at the intersection of human health and animal health.

Day-to-Day Activities

Our Fellow will participate in the day-to-day work of the Zoonotic Diseases Unit (ZDU). They will be involved with surveillance of zoonotic diseases, outbreak investigations of zoonotic and foodborne illness, service and outreach to the public, prevention of zoonoses, and zoonotic influenza planning. Animal bite and rabies risk evaluation is also a major responsibility of the ZDU. While the majority of the Fellow’s time would be spent in the zoonotic disease area, there will be opportunities to work in the foodborne area on foodborne illness outbreaks and a variety of projects. The Fellow will be taught a step-by-step approach to cluster/outbreak investigation of zoonotic and foodborne 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. There is potential for expansion of our zoonotic disease surveillance and prevention activities depending on the Fellow’s background and interests. There would also be opportunities for collaboration with the University of Minnesota, the Minnesota Board of Animal Health, and the Minnesota Department of Agriculture. In addition, publication opportunities are frequent at MDH, and they will likewise be made available to our Fellow.
Potential Projects

Surveillance Activity Laboratory-Acquired Infections in Minnesota

Laboratory exposures and infections are important occupational risks in Minnesota clinical laboratories. Currently surveillance is passive. The Fellow will analyze laboratory exposure data for the past 10 years to identify risks, develop interventions, and suggest ways to strengthen surveillance for laboratory exposures in Minnesota.

Surveillance Evaluation High Consequence Zoonotic Diseases

The Fellow will evaluate MDH surveillance systems for sporadic cases of bioterrorism agents such as Bacillus anthracis, Coxiella burnetii, Brucella spp. and Burkholderia spp.

Major Project Pathogen-Specific UMASH Data Analysis

This project would involve a deep-dive into data collected as part of the Upper Midwest Agricultural Safety and Health Center (UMASH) project, looking at the burden of enteric disease in agricultural workers and their families. We have finished a descriptive epidemiology of all the cases and found that the estimated cumulative incidence of zoonotic enteric infections for agricultural workers in Minnesota from 2012 through 2016 was 147 per 10,000 population, 8 times greater than that of the general Minnesota population (18.5 per 10,000 population). The next step is to perform detailed pathogen-specific analyses (including case-case comparison studies) to further understand the problem, including specific populations at risk, food animal production settings, and risk factors for infection with the most important zoonoses of agricultural workers. The Fellow would continue this work by analyzing detailed data from either Campylobacter, Cryptosporidium, Salmonella, or Shiga toxin-producing E. coli cases associated with food animal contact. These data include detailed information about illness history, type of animal exposures, jobs performed on the farm, PPE used, farm management, and knowledge and attitudes of cases.

Additional Project Substance Abuse and Infectious Disease

Drug overdose deaths have increased dramatically in light of the national opioid crisis. The Minnesota Department of Health’s Unexplained Deaths Project (UNEX) works with medical examiners to investigate deaths possibly due to an infectious cause. Initial data analysis has shown an increased in infectious deaths, specifically pneumonia and sepsis, in decedents who have a history of substance abuse. The fellow would have an opportunity to describe the clinical diagnosis and etiologic agents detected and review the trends over time.

Additional Project Endemic Mycoses in Minnesota

A CSTE Fellow would have the opportunity to work on developing outreach and health promotion messaging for endemic mycoses in Minnesota. Specifically, this project would entail spatial and temporal mapping of cases of blastomycosis and histoplasmosis to determine which areas of the state to target with messaging, as well as descriptive epidemiology results to target populations that may be at higher risk. The fellow would work fungal disease epidemiologist to develop messaging and methods of delivery.
**Preparedness Role**

Working with the bioterrorism epidemiologist and/or the Office of Emergency Preparedness, the Fellow will participate in bioterrorism and emergency preparedness and response activities, including case investigation of zoonotic diseases associated with bioterrorism, and ongoing swine and avian influenza planning activities. Working with the State Public Health Veterinarian, who serve as a liaison between MDH and Minnesota’s animal health agencies, the Fellow will participate in zoonotic infectious disease planning.

**Additional Activities**

1. Blastomyces dermatitidis and B. gilchristii the causative agents of blastomycosis, are endemic in Northern Minnesota and along the St. Croix River on the state’s eastern border. Approximately 70% of sporadic cases are male with a median age of 44 years. The gender and age distribution of outbreak-associated cases vary depending on the situation. Our fellow could choose to do an age, gender, and telephone prefix matched case-control study to identify gender-specific risk factors for sporadic infections.

2. Rabies is carried by skunks and bats in Minnesota. This project will involve analyzing MDH rabies data from 2003-2019 and writing a descriptive analysis for publication. The Fellow would develop skills in handling, cleaning and analyzing a large dataset, as there are over 35,000 records. This project would represent the first time a summary of animal rabies surveillance in Minnesota was published.

3. Approximately 3-4% of the bats tested at MDH for rabies are positive; these bats generally have had encounters with humans or are behaving strangely. This project would involve a descriptive epidemiology and nested case-control study involving all people who submit bats for rabies testing, regardless of the final test result. The objective is to identify risk factors for submission of bats that test positive for rabies and to identify behaviors that increase the risk of being bitten by a bat. In addition, the Fellow could develop an educational campaign to prevent bat-transmitted rabies.

4. Salmonella in Pocket Pets Project: Although most human Salmonella infections are acquired through consumption of contaminated food, many cases are associated with contact with animals or their environments. Recently, contact with hedgehogs has been associated with outbreaks of salmonellosis in humans. The extent of the problem in the pet industry, or what might be described as the background rate of salmonellosis in retail pocket pets is currently unknown. The objective of this project would be to estimate the baseline prevalence of Salmonella enterica in rodents on display for retail sale in pet stores in the Minneapolis-St. Paul metropolitan area. Background research on the pocket pet supply industry would also be performed and incorporated into the study results.

5. Despite regulations prohibiting them, some Minnesota home daycares have been given variances by their licensors to keep reptile pets in the home. This project would involve educating licensors, and creating educational materials for daycare providers on what pets are allowed and on safe interactions with animals.
6. Every spring in Minnesota, there are salmonellosis cases associated with contact with chicks from mail order hatcheries. This project would include a survey of feed mills and agricultural stores that sell chicks to evaluate their level of awareness regarding the issue and to characterize any educational materials they provide to consumers. In addition, the Fellow could develop an educational campaign designed specifically for these venues.

7. The Fellow would characterize petting zoo outbreaks in Minnesota, including epidemiology of human cases, pathogens, source of the animals, species on display, illness history, and veterinary care.

8. The Veterinary Occupational Health and Infection Control Project (VOHICA) is a unique pilot project designed by ZDU to help veterinary clinics, hospitals, and shelters in Minnesota improve their infection control and occupational health practices. We have enrolled 10 facilities and are currently involved with the baseline, on-site assessments. A fellow could be involved in facility staff training and materials development, and extract, clean and analyze data from the first year of the project.

9. Trichinosis is a parasitic disease caused by eating raw or undercooked pork or wild game infected with Trichinella spiralis. Trichinosis is a rare disease, with an average of 11 cases seen nationally each year. The Fellow would interview chefs in Twin Cities restaurants about the source of their pork products on the menu (including wild boar) and cooking temperature practices to see if they are following the recommendations from the USDA.

10. A dog and cat breeder bill was passed into law in Minnesota in 2014 that requires regulation and inspection of these facilities by the Minnesota Board of Animal Health (BAH). Included in the law is a requirement that adult dogs be tested for Brucella canis prior to sale. Currently, although B. canis infection is reportable in dogs, there are no specific regulations covering handling of B. canis infected kennels in Minnesota. In collaboration with the BAH, the Fellow would conduct a survey of knowledge, attitudes and practices of licensed dog breeders in Minnesota regarding canine brucellosis.

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**Mentors**

**Primary**  
Joni Scheftel DVM, MPH  
State Public Health Veterinarian

**Secondary**  
Stacy Holzbauer DVM, MPH  
Career Epidemiology Field Officer