Infectious Diseases, Infectious Diseases-Foodborne

Colorado Department of Public Health and Environment, Disease Control and Environmental Epidemiology

Denver, Colorado

Assignment Description

The Communicable Disease Branch (CDB) is within DCEED and includes foodborne/enteric illness (including Hepatitis A), vaccine preventable disease, healthcare-associated infections, tuberculosis, emerging infections, zoonotic and vectorborne diseases, and respiratory diseases (including influenza). The Communicable Disease Branch provides guidance and technical assistance to local health departments, hospitals, and health care providers.

The Fellow will be assigned directly to the Zoonoses program area within the CDB. This location will facilitate training on the epidemiology and investigation of over 20 zoonotic and vector-borne pathogens. The CSTE Fellow’s secondary assignment will be with the FEED group who are responsible for enteric infections and routinely investigate clusters and outbreaks. The combined work within these two program areas will provide ample opportunity for a CSTE Fellow to develop core skills and meet the required competencies of the program including elements of epidemiologic methods, communication, and public health practice, policy, and legal issues.

Day-to-Day Activities

Day-to-day activities of the Fellow will vary greatly based on the disease control issues occurring in Colorado at the time. The Fellow will participate in responses to specific disease cases and outbreaks in the FEED and Zoonotic programs. Responses include case interviews, discussion with local public health agencies, participation in CDC and other national calls, calling health care providers, conducting reviews of medical records and potentially site investigations and environmental assessments. As the Fellow is a trainee, he or she will be pulled into unique investigations within the entire communicable disease branch including vaccine preventable diseases and healthcare associated events. The Fellow will participate in weekly staff meetings which will keep him/her involved in current activities and policies within the department. The Fellow, with training, will be allowed to take "epi call" with other epidemiologists on a rotating schedule. This allows for exposures to a broad range of topics that epidemiologists are asked to get involved with.

Potential Projects

Surveillance Activity  Animal Disease Testing

The branch currently uses an in-house developed database for animal-based testing (West Nile virus, rabies virus, plague, and tularemia); local public health agencies statewide access this database for animal related test results. The database, developed in 2002, has received only minor upgrades since that time. While still functional, the system is no longer keeping up with current technologies. Animal bites to humans are reported in another state-developed database (Colorado Electronic Disease
Reporting System--CEDRS, a home-grown surveillance system) that does not communicate with the animal testing data. A few counties are beginning to pilot moving reporting into a REDCap database.

The CSTE Fellow can immediately start the assignment by conducting surveillance evaluations of the three current systems. With guidance from mentors, the Fellow will work with stakeholders (local public health agencies and animal control officials) to propose to develop a more standard process across the state.

Surveillance Evaluation Outbreak Database Needs Assessment

In January 2019, CDPHE began using an in-house developed REDCap Outbreak database for outbreaks across all pathogen groups investigated by CDB (enteric, vaccine preventable, flu, etc.). This new system does contain enough data to conduct a surveillance system evaluation of the database. There will be an opportunity for the fellow to conduct a needs assessment of the utility and function of the database with stakeholders and offer constructive improvement suggestions. Since this is a new database, CDB staff plan to make changes to the database using the results of this surveillance evaluation. In addition, this database will have direct uploads to the CDC’s National Outbreak Reporting System (NORS); the fellow will have the opportunity to evaluate this informatics process and learn about NORS.

Major Project Solving the Unsolvable: Multi-year Outbreak of Salmonella Norwich in Eastern Colorado

Since 2015, Colorado has had an increase in cases of Salmonella Norwich in northeastern and southeastern Colorado each summer and fall. Cases from these two regions and across multiple years are highly related by whole genome sequencing. We suspect a seasonal environmental exposure (migratory animals, agricultural water source, change in animal shedding by season), but have not been able to identify the source of this multi-year outbreak.

The Fellow will attempt to solve this as-of-yet unsolved outbreak by:

- Conducting a literature review on Salmonella Norwich and environmental/animal exposures to Salmonella.
- Speaking with experts at other state health departments and federal agencies.
- Working with local public health partners in Northeast and Southeast Colorado.
- Developing environmental exposure questions; interview all cases of Salmonella Norwich with these questions.
- Developing an environmental sampling plan in conjunction with environmental health and laboratory staff; conduct environmental sampling in the field.
- Conducting epidemiologic analysis of all data.
- Conducting mapping/GIS analysis of all data.
- Summarizing efforts in an outbreak report and presentations.
Additional Project 25 Years of Hantavirus: A Summary of State-Wide Data and Development of Best Practices for Public Health Investigations

Description: The fellow will compile hantavirus data and develop model practices guidance tools by:

- Analyzing data from 1993-2018 (which includes 115 case reports).
- Assisting local public health agencies investigate new case reports which may include medical record review, patient interviews and onsite environmental investigations.
- Evaluating commercial laboratory reports and determining positive predictive value of those reports.
- Evaluating current investigation guidance and providing recommendations for improvement.
- Writing an abstract and presenting information at meetings and conferences (within Colorado and nationally).

Additional Project Participate in Enteric Disease Surveillance, Outbreak Detection, and Outbreak Investigation

The fellow will participate in enteric disease surveillance, outbreak detection, and outbreak investigation activities by:

- Conducting enteric disease interviews for sporadic and outbreak-related cases
- Using laboratory and epidemiologic data to identify outbreaks
- Investigating clusters of enteric disease cases
- Investigating outbreaks of enteric disease, including on-site investigations, designing and implementing epidemiologic studies, analyzing outbreak data, making disease control recommendations, writing outbreak reports, presenting on outbreaks at meetings and conferences (in Colorado and nationally).

Preparedness Role

In the fall of 2020, public health agencies and health care providers throughout Colorado will be participating in a statewide full-scale exercise. The purpose of the exercise is to test receipt and distribution of Strategic National Stockpile resources, as well as test pandemic response plans. There will be epidemiological components of the exercise, including testing contact monitoring, deployment of a Colorado-based epidemiology rapid response team, and aggregate case reporting by hospitals. While planning will have already concluded when the fellow starts, there will be opportunity to participate in the exercise execution.

The fellow will be encouraged to take emergency preparedness trainings offered (in person and online) by the Office of Emergency Preparedness and Response at CDPHE.
**Additional Activities**

In addition to the described projects and surveillance activities, the CSTE Fellow will have the opportunity to develop their own projects based on their interests. The Fellow may also attend Epidemiology Grand Rounds lectures at the Colorado School of Public Health, Infectious Disease Grand Rounds at the University of Colorado, as well as go on site visits with environmental health staff. Placement within the Communicable Disease Branch with supervision concurrent from the FEED and Zoonoses programs will help facilitate networking with multiple other agencies as well as conduct interagency investigations. Other agencies that the Fellow will be introduced to include local public health agencies, CDC, other state public health agencies, the Colorado Department of Agriculture, the United States Department of Agriculture, Food and Drug Administration, and Colorado Parks and Wildlife.

**Mentors**

**Primary**
- Jennifer House DVM, MPH, BS
  - State Public Health Veterinarian

**Secondary**
- Rachel Jervis MPH, BS
  - Enteric Disease Unit Manager