

Infectious Diseases

Assignment Description:

Washington State has a population of 6.8 million living in diverse communities ranging from its largest city of Seattle to rural agricultural regions. The Office of Communicable Disease Epidemiology in the Washington State Department of Health supports surveillance and response activities for the reportable communicable conditions (<http://www.doh.wa.gov/Portals/1/Documents/5100/210-001-Poster-HCP.pdf>), excluding sexually transmitted diseases, HIV and tuberculosis which are handled by offices in Olympia, the state's capital. Additional activities in the Office of Communicable Disease Epidemiology relate to public health emergency preparedness and response and to refugee health.

On a daily basis the Office of Communicable Disease Epidemiology handles consultations with the state's 35 local health jurisdictions regarding case investigations or outbreaks in three general areas:

- 1) Foodborne diseases such as Shiga toxin-producing *E. coli* infections, salmonellosis, and campylobacteriosis represent the largest numbers of cases and outbreaks reported annually. The Office of Communicable Disease Epidemiology maintains close contact with the Centers for Disease Control and Prevention in identifying and investigating multi-state outbreaks. Fellow activities may include daily monitoring of the laboratory database, consultation with local health jurisdictions, conducting interviews, and analyzing exposure data.
- 2) Vaccine-preventable diseases (VPDs) including pertussis, measles, mumps, and meningococcal disease constitute ongoing challenges for disease prevention. The Office of Communicable Disease Epidemiology is closely associated with the Immunization Program, which tracks vaccination distribution in Washington. Fellow activities may involve VPD case management, consultation with local health jurisdictions during investigation of suspected or confirmed cases or outbreaks, facilitation of diagnostic testing at PHL, and classification in the reportable disease database, as well as undertaking projects related to immunization issues including working with state immunization registry (CHILDPProfile) data.
- 3) Zoonotic diseases such as West Nile virus, Lyme disease, and hantavirus, along with emerging fungal infections due to *Cryptococcus gattii* and *Coccidioides*, have been of lower volume but of high interest. Fellow activities may include descriptive analysis of cases, consultation with local health jurisdictions, and monitoring animal testing for rabies at the Washington State Public Health Laboratories.

Other diseases reported to the Office of Communicable Disease Epidemiology include influenza, acute viral hepatitis, botulism, human prion disease, legionellosis, and healthcare-associated infections.

The Office of Communicable Disease Epidemiology is co-located with the Washington State Public Health Laboratories just north of Seattle. Laboratory staff include two PhD molecular biologists and frequent post-doctoral microbiology laboratory fellows. Routine laboratory techniques include pulsed-field gel electrophoresis, PCR, pyrosequencing, and serotyping for a variety of agents. Collaboration with the Public Health Laboratories is possible depending on the interests of the fellow.

Examples of surveillance and evaluation projects completed by recent fellows include:

- Evaluation of laboratory-confirmed influenza death reporting through the Public Health Issues Management System (PHIMS), Washington, 2009 (poster presentation at CSTE Conference)

- Evaluation of the utility of the PHIMS electronic database for pertussis and salmonellosis surveillance in Washington State (poster presentation at CSTE Conference)
- Evaluation of Washington State's Immunization Information System for utility in estimating immunization coverage levels (poster presentation at CSTE Conference)

Examples of data analysis projects completed by recent fellows include:

- Trends in rotavirus vaccine coverage and maternal risk factors associated with partial and no vaccine coverage in Washington State during 2007–2010 (poster presentation at CSTE Conference, manuscript in preparation)
- Shiga toxin-producing *Escherichia coli*: Incidence Trends and laboratory testing practices in Washington State, 2005–2010 (multiple conference presentations and publication in *Journal of Emerging Infectious Diseases*)
- Risk factors for intensive care unit admission or death due to 2009 pandemic influenza A (H1N1) virus infection, Washington State, 2009 (publication in *Public Health Reports*)

Day-to-Day Activities:

Day-to-day activities for the CSTE Fellow include attending daily office meetings to discuss current case and outbreak investigations, reviewing reported notifiable condition cases and participation in emergency response preparedness and exercises. The fellow will spend time each day on long-term project, with the support of various subject matter experts and is encouraged to utilize access to SAS, Stata, R, LinkPlus, EpiInfo and a variety of statewide databases. While unpredictable, at least one good-sized multi-jurisdictional outbreak typically occurs during each year of the fellowship.

CSTE Fellows have attended and are encouraged to present talks at training meetings for local health jurisdictions, the regional West Coast Epi Conference, and the state's Joint Conference on Health. Attendance is also encouraged at any local lectures and training; many are offered at the University of Washington.

Potential Projects:

Surveillance system evaluations could be done within the section or in another part of the Department of Health. Communicable disease surveillance data are available in an electronic database that includes core data for 30 years and detailed case investigation information since 2005. The fellow will also have access to several other statewide databases at the Department of Health including the hospital discharge database, death records, birth certificates, and the state immunization registry.

Potential surveillance system evaluation projects include:

- Evaluation of the statewide hepatitis surveillance system.
- Evaluation of a newly implemented Electronic Death Registry for its use in detecting deaths due to notifiable conditions.
- Evaluation of pertussis surveillance during the 2012 outbreak. Completeness of reporting could be assessed using data from large clinical laboratories.
- Evaluation of legionellosis surveillance. Completeness of reporting could be assessed using data from our hospital discharge database.

Other potential projects include:

- Participating in a local, statewide, or multi-state foodborne or respiratory disease outbreak investigation.

- Developing and implementing a laboratory survey to assess changing practices in commercial laboratories over time and how these changes affect trends in incidence of communicable diseases.
- Comparing the demographic and clinical characteristics of legionellosis cases diagnosed by PCR testing vs. urine antigen or culture to determine if PCR-positive cases appear to be true cases.
- Estimating the effectiveness of influenza vaccine for preventing lab-confirmed influenza hospitalizations using electronic hospitalization data.
- Determining the incidence of TB disease among refugees within 1, 5 and 10 years of arrival and risk factors for development of TB disease.

Preparedness Role:

The CSTE Fellow would be expected to take a role in emergency response training, exercises, and actual events based on the State Emergency Preparedness plan. Specific responsibilities will be assigned within the Office's incident command structure.

Assignment Location: Shoreline, WA

Primary Mentor: Kathy Lofy, MD
State Vaccine Preventable Disease Epidemiologist
Washington State Department of Health

Secondary Mentor: Chas DeBolt, RN, MPH
State Vaccine Preventable Disease Epidemiologist
Washington State Department of Health