Infectious Diseases
Arizona Department of Health Services, Public Health Services
Phoenix, Arizona

Assignment Description

The Fellow will be situated in the the Office of Infectious Disease Services (OIDS) within the Bureau of Epidemiology and Disease Control (EDC) in the Arizona Department of Health Services (ADHS). The Office of Infectious Disease Services (OIDS) is responsible for monitoring and controlling a variety of diseases, including influenza; foodborne/waterborne diseases; invasive organisms; vaccine-preventable diseases; and vectorborne and zoonotic diseases. OIDS also implements and maintains systems for reporting, managing, and analyzing communicable disease data. To accomplish this, OIDS staff work closely with other public health and healthcare professionals at local health departments, healthcare facilities, federal agencies, and other agencies.

OIDS staff also collaborate with colleagues in other ADHS offices and bureaus including: Environmental Health; Immunization Program Office; State Health Laboratory Services; and Public Health Emergency Preparedness, all within the Division of Public Health Services, and the Office of Border Health. The Fellow will work under the supervision of the Surveillance Epidemiologist and the State Epidemiologist. According to the specific project the Fellow will be able to also work with other epidemiologists and managers and with local and tribal health partners.

Day-to-Day Activities

Anticipated day-to-day activities for the Fellow will include:

- Monitoring disease reports to identify outbreaks and risk factors for infection;
- Assisting with outbreak and exposure investigations, by participating in study design, data collection, data analysis, and intervention recommendations;
- Producing surveillance reports based on state-wide electronic disease surveillance system (MEDSIS) data;
- Developing and implementing response and prevention activities aimed at reducing transmission of pathogens in the population overall;
- Responding to inquiries from the public and health care providers in Arizona;
- Communicating and coordinating with various partners (Arizona State Public Health Laboratory, local health departments, tribes, other states, CDC, IHS, FDA and USDA);
- Participating in a CDC Epi-AID as opportunities arise;
- Utilizing the incident command structure during public health emergencies including widespread infectious disease outbreaks.

Primary responsibilities of the Fellow will depend on chosen projects and current public health needs within the state. The Fellow will participate in weekly OIDS staff meetings, monthly state laboratory & epidemiology meetings, and routine calls with local health department partners. The Fellow will
have an opportunity to help plan and participate in the annual Arizona Department of Health Services Infectious Disease Training & Exercise. Additionally, the Fellow will also have the ability to cross-train in vaccine-preventable diseases (e.g., measles, rubella, pertussis and hepatitis B); HIV/AIDS; emergency preparedness; vector-borne diseases (e.g., rabies, hantavirus, plague and West Nile virus infections); sexually-transmitted diseases; as well as other emerging infectious diseases. Orientation will include a tour of our state laboratory, HIPAA training, meeting with key individuals and managers, training on MEDSIS, and inclusion in routine disease surveillance activities.

**Potential Projects**

**Surveillance Activity**

**Disease surveillance of animal rabies and selected vector-borne and zoonotic diseases in Arizona**

The Fellow will assist in surveillance of animal rabies and selected zoonotic diseases among humans to monitor disease trends and characterize disease epidemiology in Arizona through the years. This will be accomplished by working with animal rabies data and human data from the Medical Electronic Disease Surveillance Intelligence System (MEDSIS) and resulting in a report about the trends and the epidemiological profiles of the selected morbidities in Arizona in the past years. The Fellow will also support county health departments with case investigations and work with the vector-borne and zoonotic disease group to provide infectious disease subject matter expertise and guidance, as needed.

**Surveillance Evaluation**

**Evaluating the sensitivity of Arizona’s communicable disease surveillance for capturing hospitalization**

The Fellow will assess the sensitivity of Arizona’s Medical Electronic Disease Surveillance Intelligence System (MEDSIS) for capturing hospitalized cases of morbidities frequently causing severe illness, such as meningococcal disease, Shiga toxin-producing E. coli, and hantavirus pulmonary syndrome. The state’s hospital discharge data (HDD) captures all hospital visits, including both inpatient and emergency department visits, at non-federal acute care hospitals in the state. HDD will be searched for cases of the selected morbidities; these will be compared to MEDSIS data to ensure that a) the cases were captured by the surveillance system, and b) that inpatients were identified as having been hospitalized. Medical records may be reviewed for non-reported cases to confirm whether they should have been reported. The evaluation will help identify any areas of under-reporting that need to be addressed, and allow for better future estimation of hospitalization rates from MEDSIS data.
Major Project  The role of neighborhood level socioeconomic characteristics and racial/ethnic health inequalities in enteric infections in Arizona

Socioeconomic and racial/ethnic status play an important role in the incidence of a variety of diseases, including enteric infectious diseases. However, surveillance data often contain incomplete socioeconomic and racial/ethnic information, limiting public health access to this type of analysis. To address this gap, several methods have evolved in the last decade including the use of neighborhood-level characteristics obtained by geocoding the data and extrapolating the indicators of interest from the census or other publicly available datasets.

In Arizona, enteric diseases are among the most commonly reported infectious diseases (third most common after influenza and valley fever), but little is known about their distribution across socioeconomic and racial/ethnic strata of the population. The CSTE Fellow will analyze selected enteric diseases, including salmonellosis, campylobacteriosis and shigellosis, using data from Arizona’s Medical Electronic Disease Surveillance Intelligence System (MEDSIS) and the American Community Survey (ACS). The analysis will help the Fellow develop skills in data analysis in SAS 9.3, as well as data manipulation and mapping using ArcMap. Preliminary results suggest the presence of interesting socioeconomic and racial/ethnic disparities, which encourages further analysis of potentially publishable findings.

Additional Project  Examination of the association of valley fever incidence and climate patterns

Valley fever (coccidioidomycosis) is one of the most commonly reported infectious diseases in Arizona and the number of reported cases has been increasing during summer 2015. This infection is caused by a fungus that is found in the soil of the southwestern United States, and is transmitted via inhalation of contaminated dust. Environmental factors greatly influence the fungal life cycle and studies have shown that climate accounts for much of the variability in valley fever incidence in past years.

The Fellow will used coccidioidomycosis data from Arizona’s Medical Electronic Disease Surveillance Intelligence System (MEDSIS) and climate data to identify whether any environmental factors are associated with the increase in the number of reported cases seen during summer 2015 in Arizona (Maricopa and Pima Counties). In addition, the Fellow may help establish a system for routine integration of these climate data into valley fever surveillance. Analysis of climate data and disease incidence could also be extended to other infectious diseases (for example tularemia and plague).
Additional Project
Developing an epidemiological profile of viral hepatitis in Arizona

The Fellow will work with the Viral Hepatitis Coordinator to analyze multiple sources of hepatitis data, including the Arizona’s Medical Electronic Disease Surveillance Intelligence System (MEDSIS), hospital discharge database, cancer registry, death certificate database and substance abuse data from the Department’s Division of Behavioral Health Services to better understand the impact of these diseases in Arizona. Viral hepatitis, and in particular hepatitis C, has been receiving more attention nationally with the recent availability of better treatment options; the epidemiological profiles and reports developed from this project will help fill a gap in our knowledge of the burden of these diseases in the state.

Preparedness Role
The Fellow will be incorporated into the state’s all hazard incident command structure during public health emergencies, including widespread infectious disease outbreaks. There will be opportunities to participate in semi-annual exercises for radiological release at the Palo Verde Nuclear Generating Station. During emergency responses, EDC staff is typically an integral part of the Operations Section. The Fellow may also have the opportunity to assist with development of the public health response task force as part of the state’s emergency response plan.

Additional Activities
The Fellow will have the opportunity to take part into field and outbreak investigation activities that will arise during his/her stay with us. Some examples of past activities include: investigation of a dengue outbreak in Yuma County, investigation of a West Nile virus and St. Louis encephalitis virus outbreak in Maricopa County and Rocky-Mountain spotted fever campaigns in the American Indian reservations.

Mentors
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