

## **Infectious Diseases**

### **Hawaii Department of Health, Disease Outbreak Control Division (DOCD)**

Honolulu, Hawaii

#### **Assignment Description**

The CSTE Fellow would be assigned to DOCD under the mentorship of Dr. Park and Mr. Johnston; this assignment would allow the fellow to have exposures and experiences within all three branches of DOCD (Disease Investigation Branch, Immunization Branch, and Public Health Preparedness Branch). Involvement in these areas would include participating in investigations of foodborne and vaccine-preventable disease outbreaks, enhancing existing systems including developing and/or improving questionnaires, and analyzing and interpreting data collected. The fellow would also have the opportunity to participate in other areas of interest (e.g., participation in the annual school-located flu vaccination program, assessments of hospital-associated infections, public health emergency preparedness activities) as long as his/her primary project was progressing as agreed upon with his/her mentors. In addition, the Fellow would be expected to gain experience in managing and addressing public inquiries through occasional but regular assignment as the duty officer of the day; this responsibility would lead to sometimes investigating individual cases of infectious disease and potentially being the lead investigator for a disease outbreak response.

#### **Day-to-Day Activities**

The Fellow's primary project would be his/her main focus. In addition, depending on the fellow's initiative, efficiency, and interest, he/she may engage in other activities (e.g., minor involvement in a major project or another smaller project or investigation). The daily schedule would include time for background research and documentation. As part of the Fellow's project, some days may include meetings with other staff and/or with outside stakeholders. Regarding formal meeting requirements, initially the Fellow would meet with the mentors weekly to discuss and review plans, project(s)/activities status, steps for progression, etc.; gradually, as the Fellow gained more confidence and experience and demonstrated steady progress in his/her activities, the number of formal meetings with the mentors would be expected to decrease. Other formal meetings the Fellow would be expected to attend include the weekly meetings of the Field Investigators and quarterly DOCD meetings.

## **Potential Projects**

### **Surveillance      Leptospirosis Surveillance System Activity Activity**

Leptospirosis is considered one of the most widespread zoonoses in the world and is a nationally notifiable disease in the United States. Approximately 50% of the 100–200 cases reported annually in the United States have been reported from Hawaii. However, the true burden of leptospirosis infections in Hawaii is not fully understood and has not been formally examined. The CSTE fellow would use data on leptospirosis gathered from Hawaii’s Electronic Laboratory Reporting (ELR) system and other sources to develop a detailed descriptive epidemiology of leptospirosis infections in Hawaii. The results of this work would be used to help guide and focus our public health efforts in prevention and control of leptospirosis in Hawaii.

### **Surveillance      Leptospirosis Surveillance System Evaluation Evaluation**

While there is no active leptospirosis surveillance system in place in Hawaii, all leptospirosis serological test results are reported from all major clinical laboratories to Hawaii’s Electronic Laboratory Reporting (ELR) system. The CSTE fellow, working with his/her mentors, will evaluate the effectiveness of this system in multiple areas, including assessing the burden of leptospirosis infections, measuring incidence, identifying clusters or outbreaks, and identifying at risk populations. He/she will also evaluate the strengths and weaknesses of the system and identify potential improvements to increase its accuracy and effectiveness.

Alternatively, the CSTE Fellow could choose to evaluate mosquito-borne disease surveillance (i.e., dengue, chikungunya, and Zika) in Hawaii. In Hawaii, we require, by law, for all suspect cases to be reported. Therefore, all clinicians should report as soon as they suspect the diagnosis, and all laboratories must notify us as soon as receive a request to perform testing. However, in reality, we not uncommonly receive late reporting (i.e., when tests are resulted). This is less than desirable in a state which has the mosquitoes capable of transmitting these diseases, statewide. A formal evaluation of our surveillance system has never been done. The data and findings from such an evaluation would be helpful in potentially identifying issues we may need to address to improve our surveillance and better safeguard the public’s health.

## **Major Project    Description of Vaccination Exemptions in Hawaii Schools**

To enroll in schools in Hawaii, students are required to show proof of certain vaccination, based on the Advisory Committee on Immunization Practices (ACIP) recommendations. Under some circumstances, students may be granted exemptions that allow them to bypass this entry requirement. In Hawaii, there are two such exemptions allowed, medical and religious. HDOH collects records of vaccinations and exemptions for each school every school year in the immunization registry. Given the resurgence of vaccine preventable diseases such as measles and pertussis, understanding the vaccination status of these populations is vital in preparing for or responding to a potential outbreak. These data would provide a CSTE fellow with the opportunity to investigate and explore the vaccination status of students in Hawaii's schools and gain experience with study design, data cleaning, analysis, and interpretation, while contributing considerably to Hawaii's efforts to address the issue and impacts of vaccine exemption, including potential future legislation.

The primary focus of the assessment would be to establish the descriptive epidemiology of vaccination exemptions in schools statewide across Hawaii—a formal and comprehensive assessment has not yet been completed or published. The fellow would utilize data from the state's immunization registry to assess the rates of vaccination exemptions across the state and describe the type and frequency of vaccination exemptions, any geographical clustering or patterns identified in the distribution of exemptions, and assess how the rates of vaccination exemptions have changed over time.

A second focus would be to compare the rates of vaccination exemptions to other underlying factors. Using data from HDOH's electronic disease surveillance system and other sources, the fellow would compare rates of vaccination exemptions to rates of cases of various diseases across the state (e.g., measles, pertussis, etc.) as well as other factors that could either potentially affect or be affected by vaccination rates such as SES, population density, etc.

## **Additional        Investigation of Leptospirosis Reporting in Hawaii Project**

As mentioned above, the true burden of leptospirosis in Hawaii is not fully understood. Historically, annual case counts in Hawaii have been as high as 40s–60s. However, case counts have declined in the past decade to the 10s–20s. No specific intervention or concerted public health education effort has occurred which would likely account for this decline. Previously and especially in the past decade, we have suspected there are likely more cases than recognized, either by HDOH or other states' health departments (i.e., visitors returning from Hawaii). However, given the inexplicable decline in our annual case counts, we suspect that Hawaii clinicians may be foregoing testing and empirically treating based solely on patient presentation, or that persons are not seeking care and therefore contributing to underreporting. A CSTE fellow would have an excellent opportunity to investigate this further (e.g., clinician survey or collaborate with healthcare plans to review ICD-9/10 codes) and potentially identify the true burden of the disease in Hawaii.

### **Preparedness Role**

DOCD includes the Public Health Preparedness Branch, which plans preparedness exercises and often recruits participants from elsewhere in the Department as well as outside stakeholders. The CSTE Fellow would be welcome and especially encouraged to participate in these exercises. Times of increased surveillance (e.g., monitoring for the influenza A [H1N1] virus during the 2009 pandemic), responding to statewide disease outbreaks, or preparing the state to respond to the threat of a potential emerging pathogen (e.g., Ebola virus disease response) require assistance from everyone division- and even department-wide. At critical times such as this, the CSTE Fellow would be expected to lend his/her full support to the division.

### **Mentors**

<b>Primary</b>	Sarah Y. Park MD State Epidemiologist; Chief, Disease Outbreak Control Division (DOCD)
<b>Secondary</b>	David Johnston Epidemiologist, Disease Outbreak Control Division (DOCD)