

Infectious Disease- HAI

Assignment Description:

The CSTE Fellow would be assigned to support the Disease Investigation Branch, primarily in the area of respiratory disease surveillance to evaluate such, enhance existing systems including developing and/or improving questionnaires, and analyze and interpret data collected. Support to this area, however, entails an overlap with other areas within the Disease Outbreak Control Division, and the fellow would have the opportunity to participate in other areas of interest (e.g. investigations of angiostrongyliasis, participation in the annual school flu vaccination program, assessments of antimicrobial resistance) 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 occasionally being assigned to be the duty officer of the day; this responsibility would lead to sometimes investigating individual cases of infectious disease and potentially even being the lead investigator for a disease outbreak.

Anticipated 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 twice per week 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, monthly DIB meetings, and quarterly DOCD meetings.

Potential projects:

Primary project – Antimicrobial Susceptibility Test Result Data Analysis:

The State of Hawai'i Antimicrobial Resistance Project (SHARP) Data System is the repository for the majority of antimicrobial susceptibility test (AST) data collected from major clinical laboratories in Hawai'i. Statewide data are available from 2005. Since comprehensive organism data are received from all participating data providers, the SHARP Data System is a rich resource for antimicrobial resistance data analysis and reporting. Given the current concerns regarding antimicrobial resistance (e.g., gram negative or enterobacteriaceae, methicillin resistant *Staphylococcus aureus*, and drug resistant *Streptococcus pneumoniae*), we have ample data and resources for the CSTE Fellow to develop a focused project with his/her mentors to assess and describe the epidemiology of such in Hawai'i.

Examples of potential topics from which the CSTE Fellow may choose in coordination with his/her mentors to analyze AST result data over time include:

1. Care homes and long term care facilities: methicillin resistant *S. aureus* (MRSA), methicillin susceptible *S. aureus* (MSSA), vancomycin intermediate *S. aureus* (VISA), vancomycin resistant *S. aureus* (VRSA), vancomycin resistant *Enterococcus* (VRE), *S. pneumoniae*

2. Dialysis patients: MRSA, MSSA, VISA, VRSA, VRE
3. Specimen source (blood, urine, CSF): MRSA, MSSA, VISA, VRSA, VRE
4. Range of numeric result values: MRSA, VRSA, VRE, *S. pneumoniae*
5. Specific antimicrobial resistance profiles for foodborne illness:
 - a. *Salmonella enterica* serotype Typhimurium
 - b. *S. Heidelberg*
 - c. *S. Enteritidis*
 - d. *S. Weltevreden*
 - e. *S. Muenchen*
 - f. *S. Newport*
6. *Clostridium difficile* frequencies: *C. difficile* infection may occur post or even during antibiotic use; it may also be transmissible, person-to-person (suspected). This is an emerging hospital pathogen and understanding and determining the frequency alone is of interest.
7. *Neisseria meningitidis*: quinolone-resistance, specifically ciprofloxacin-resistance, is of current interest.
8. AST results with respect to bacterial infections secondary to viral influenza

For this and the following activities, it would be helpful for the Fellow to have a background that includes bacteriology and even more advantageous if he/she is also knowledgeable regarding antimicrobial resistance. This endeavor is anticipated to familiarize the CSTE Fellow with antimicrobial resistance trends in Hawaii and potentially compare them with regional and/or national trends, create report products that may become established and annualized, and lead to the development of journal abstracts and papers that would contribute substantially to the epidemiology of antimicrobial resistance.

Examples of other potential projects (as time permits):

Air traveler screening:

Hawai'i is a major travel destination and hub. The risk that a communicable disease could spread easily from an endemic area to Hawai'i is high, which was most clearly demonstrated during the H1N1 pandemic. Since 2005, the Disease Outbreak Control Division (DOCD) Disease Investigation Branch (DIB) has maintained a passive surveillance program to attempt to detect influenza-like illness (ILI) among international air travelers and determine what flu strains may be entering the state. This ongoing passive surveillance takes advantage of the requirement for international air crews to notify the airport of any ill passengers. Any passengers who fulfill ILI criteria are assessed by the local Centers for Disease Control & Prevention (CDC) Quarantine Station staff and swabbed for a respiratory specimen for influenza testing. The CSTE Fellow may participate and assist in aspects of the ongoing passive surveillance program and/or the planned enhanced portion involving a health questionnaire administered to selected arriving domestic and international air passengers at the Honolulu International Airport.

Angiostrongyliasis Surveillance:

Eosinophilic meningitis and angiostrongyliasis have been reportable in the State of Hawai'i since January, 2005 in response to reports of several cases with eosinophilic meningitis and complicated neurological outcomes, all likely the result of angiostrongyliasis. *Angiostrongylus cantonensis*, a parasitic nematode, has been documented in various snail and slug species in Hawai'i since at least the

1960's, but the frequency of human infection has not been well characterized, especially given the lack of a definitive diagnostic test. Since 2005, when DIB began investigating all laboratory reported cases with CSF specimens yielding eosinophils, 25 probable and confirmed angiostrongyliasis cases have been identified. Collected data and preliminary epidemiological assessments suggest that there may be an increased risk for *Angiostrongylus* infection, especially on the island of Hawai'i. DOCD/DIB is collaborating with colleagues at CDC, the University of Hawai'i, and the US Department of Agriculture-Pacific Basin Agricultural Research Center to better define the epidemiology of angiostrongyliasis in Hawai'i with the objective of better understanding risk factors and therefore implement more specific public health interventions. The CSTE Fellow would have the opportunity to become involved in the case investigations as well as in developing a focused public health assessment to better determine why the disease seems to be more prevalent on the Big Island when infected mollusks can be found statewide.

Role of the Fellow in Emergency Preparedness

DOCD includes the Public Health Emergency Preparedness Branch, which plans preparedness exercises and often recruits participants from elsewhere in the Department. The CSTE Fellow would be welcome and encouraged to participate in these exercises. Times of increased surveillance, such as in monitoring for the 2009 influenza A (H1N1) virus, require assistance from everyone division-wide. At critical times such as this, the CSTE Fellow would be expected to lend his/her full support to the division.

Location: Honolulu, Hawaii

Primary Mentor: Sarah Park, MD, FAAP

State Epidemiologist and Chief of Disease Outbreak Control Division

Hawaii State Dept of Health

Secondary Mentor: Myra Ching-Lee, MPH

Epidemiologic Specialist V and Supervisor of Disease Surveillance and Informatics Section

Hawaii State Dept of Health