Infectious Diseases
Harris County Public Health, Disease Control & Clinical Prevention
Houston, Texas

Assignment Description

The Epidemiology Program is within the Disease Control and Medical Epidemiology Section of the Disease Control and Clinical Prevention Division. The Epidemiology Program is responsible for routine disease surveillance, outbreak control and response, and response to public health emergencies. As part of the Epidemiology Program team, the Fellow will participate in other Epidemiology Program activities as his/her availability allows and depending on the level of the response. Since HCPH is a large urban health department, at times the Epidemiology response involves many areas of the department and is organized under the Incident Command Structure (ICS). The Fellow will be able to interact with other programs within the Disease Control and Medical Epidemiology Section such as the Tuberculosis Program.

The Fellow will also have the opportunity to interact with other HCPH divisions and offices according to his/her interests and availability. These are the Environmental Public Health (EPH), Veterinary Public Health (VPH), Mosquito/Vector Control (MC) and Operations & Finance Divisions and the Offices of Policy and Planning, Communications, Education and Engagement, and Public Health Preparedness and Response. The Fellow will also be able to attend the agency wide meeting including but not limited to the Public Health Matters, the One Health Tag Up meetings, and Chronic Disease Tag Up meeting.

Harris County has an international airport which is the 8th busiest airport in the United States and is 3rd for non-stop domestic and international service (http://www.flightstats.com/go/Airport/airportDetails.do?airportCode=iah); the Houston area has many international travelers and the largest medical center in the world. The Epidemiology Program provides epidemiology services including surveillance of notifiable conditions to this population. It is important to describe the population and the area because this will give the Fellow an idea of the breadth of experience he/she will gain by being part of a team which provides epidemiology services to such a large and complex urban population.

In recent years the HCPH Epidemiology Program has been involved in the investigation of a human rabies case, a Japanese Encephalitis case, a large outbreak of hepatitis B associated with long term care facilities, many WNv cases in the largest national outbreak of WNv reported to date, a case of measles, numerous cases of pertussis and many interesting foodborne illness clusters identified by PulseNet. Epidemiologists in our program have experience investigating many types of cases of rare and exotic diseases by the nature of the population we serve.
**Day-to-Day Activities**

The Fellow will apply principles of Epidemiology to disease control activities and respond to public health emergencies within the jurisdiction of HCPH. Of particular importance is the prevention and control of notifiable conditions and communicable disease, including disease related to potential Bioterrorism agents, outbreak situations, and other public health emergencies or natural disasters.

On a daily basis the Fellow will:

1. **Investigate reports of notifiable conditions in Harris County residents as assigned.** This process involves review of medical records, interpretation of laboratory reports, patient interviews, implementation of control measures, and the completion of surveillance forms (with other steps as necessary based on situation or condition).
2. **Provide information related to preparedness and other public health issues via telephone consultation, mail outs and presentations to individuals, schools, child care centers, nursing homes, hospitals, health care providers and other agencies to ensure readiness for responding to Bioterrorism, other outbreaks of infectious disease, and other public health threats and emergencies.**
3. **Participate in investigations and provide intervention for epidemic or unusual community health related episodes or outbreaks, including those related to potential Bioterrorism agents and other related public health issues which develop the public health preparedness capacities of the section.**
4. **Produce special reports and statistical analysis of epidemiological investigations to ensure readiness for responding to Bioterrorism, other outbreaks of infectious diseases, and other public health threats and emergencies.**

**Potential Projects**

**Surveillance Activity**

**Food safety epidemiology**

The Fellow will investigate all foodborne illness complaints that are reported to the Department (either directly or through Environmental Public Health [EPH]). In this capacity the Fellow will be able to experience field investigations of restaurant related complaints, accompanying the EPH Senior Investigator-Foodborne Illness, as appropriate. The Fellow will work alongside another epidemiologist in the event of a large foodborne illness outbreak resulting from the investigation of a single/multiple complaint(s).

**Evaluation of a component of HCPH Notifiable Surveillance System Evaluation**

Conduct a comprehensive evaluation of the Multi-drug resistance organisms (MDRO) Surveillance System utilizing "Updated Guidelines for Evaluating Public Health Surveillance Systems" from the Centers for Disease Control and Prevention (CDC). In the last two years our program has been able to evaluate the arbovirus diseases and the salmonellosis components of our surveillance system utilizing this guidance. This process will allow the Fellow to understand the current state of the specific component of the surveillance system and its components parts. Selected attributes of the
surveillance system included in this evaluation are data quality, flexibility, simplicity and representativeness. Follow up with recommendations and possible implementation as appropriate.

**Major Project  Large outbreak investigation**

Actively participates in a large-scale outbreak investigation. The Fellow will conduct the following activities:

1. Design an interview questionnaire or other data collection tool.
2. Collect data from patient interviews, medical records and laboratory reports.
3. Create a database for an outbreak.
4. Use statistical software to analyze and characterize epidemiologic data.
5. Interpret findings from epidemiologic studies, including recognition of the limitations of the data and potential source of bias and/or confounding
6. Recommend control measures, prevention programs, or other public health interventions based on epidemiologic findings

**Major Project  Health disparities project**

Learn to analyze morbidity data for health disparities using poverty level census tract socioeconomic data; this analysis technique will be utilized in the generation of an in-depth disease-specific report on enteric diseases (including shigellosis, campylobacteriosis and STEC cases).

**Surveillance  Descriptive Epidemiology Report of Zika Disease**

Activity

Write a descriptive epidemiologic report of Zika disease cases in Harris County excluding Houston to include clinical presentation, symptomatology, for better understanding of the disease, illness onset patterns in our patient population.

**Preparedness Role**

Harris County is no stranger to emergencies and HCPH has long experience responding to these situations. The Epidemiology Program plays an integral part in the HCPH response to public health emergencies and natural disasters in Harris County. In September 2005, as part of the Incident Command Structure (ICS) set up to respond to large numbers of evacuees arriving in Harris County following Hurricane Katrina, HCPH lead the Medical Branch Operation at the Astrodome/Reliant Complex. The Epidemiology Program had primary responsibility to implement a comprehensive epidemiological response in all shelter areas. HCPH applied a health assessment in the clinic triage areas for all evacuees seeking care in shelter clinics. Further investigation was conducted for all evacuees suspected of having infectious diseases cared for on-site or sent for hospital care. Routine preexisting surveillance systems were maintained and allowed for follow up of hospitalized evacuees. Additionally, epidemiologists rounded in all shelter areas every 12 hours to identify any infection control related issues that might arise. An example of this was the identification of large ice chests with drinks placed at various places in the shelters with access to all evacuees. Immediately risk of
fecal-oral transmission of infectious pathogens was identified and the practice was corrected. Volunteers were placed at all ice chests to distribute drinks as needed. In collaboration with the University Of Texas School Of Public Health a daily cot-to-cot tally was implemented to assess the general health status of evacuees in the shelter areas. This effort was instrumental in quick identification of a Norovirus outbreak in the main shelter area at the Astrodome. HCPH was also able to track immunizations given in the shelters, laboratory tests ordered, medical complaints, and pharmaceutical usage. In addition to these disease control efforts, environmental shelter assessments were conducted and appropriate health education messages for evacuees and response personnel were provided.

Epidemiology Program staff stayed at â€œshelters of last resortâ€ (for residents with significant medical conditions who were unable to evacuate) during Hurricane Ike and participated in the post-hurricane response. Epidemiology-related activities implemented as part of the post-hurricane response included shelter assessments, disease surveillance in shelters, and other active surveillance activities. The HCPH Epidemiology Program responded to the 2014-15 Ebola Outbreak by conducting passenger monitoring to more than 100 passengers arriving from West African countries including a couple of passengers categorized under â€œsome riskâ€ which required direct active monitoring. The CDC/CSTE Applied Epidemiology Fellow assigned to our agency at the time took an active role during that response. More recently in 2016 our program is actively responding to the ongoing Zika virus disease emergency. To date we have investigated more than 400 reports of suspected Zika virus disease in residents of Harris County.

The Epidemiology Program staff also participates in emergency response drills for suspected biological terrorist attacks and prophylaxis distribution (point of dispensing (POD) exercises).

**Additional Activities**

Participate in special projects such as the Community Assessment for Public Health Emergency Response (CASPER). The Fellow will attend agency wide, and other meetings including a bimonthly meeting of epidemiologist in our region.

**Mentors**

**Primary**
Diana Martinez, MPH, PhD
Epidemiology Program Manager

**Secondary**
Sherry Jin, MD, MPH
Infectious Disease Surveillance Supervisor