Infectious Diseases- HAI, Environmental Health

Houston Health Department, Office of Surveillance and Public Health Preparedness
Houston, Texas

Assignment Description

The Applied Epidemiology Fellow will be placed within the Office of Surveillance and Public Health Preparedness (OSPHP), under the direct mentorship of the Director of the division, Raouf Arafat, MD, MPH. The Fellow will work closely with the Bureau of Epidemiology, with two programmatic areas: Informatics & Data Management and Infectious Disease Surveillance. The secondary mentor, Biru Yang, PhD, MS, MPH, is the manager for the Informatics & Data Management unit.

The Informatics & Data Management program is focused on meeting the informatics needs of the division and the department, while the Infectious Disease Surveillance program is focused on conducting surveillance of communicable diseases. The Fellow’s surveillance project, Developing a City-wide Antibiogram, is a project within the Infectious Disease Surveillance program, while the surveillance system evaluation project, Evaluating Meaningful Use and Interoperability Projects, is focused in the public health informatics group, with significant input from surveillance and other areas.

Day-to-Day Activities

The OSPHP allows for reasonably flexible scheduling to accommodate the Fellow’s preferences and needs. The Fellow’s day-to-day activities will include a mixture of:

- individual, activity-focused work (described in Project Description)
- learning opportunities (such as trainings, one-on-one learning, and mentoring)
- meetings (with leadership, mentors, external partners, and project staff)
- team-building activities (such as lunches and retreats).

The Fellow will also be encouraged to participate in career-development opportunities, such as local, regional, and national conferences, additional trainings, and other networking opportunities.
Potential Projects

**Surveillance Activity**

**Developing a City-wide Antibiogram**

Working under the guidance of the OSPHP Antimicrobial Stewardship Coordinator and our Healthcare-Associated Infections Epidemiologist, the Fellow will work on this ongoing project to develop a city-wide antibiogram for Houston. An antibiogram is a summary analysis of antimicrobial susceptibilities, usually performed for a single healthcare facility. For a city-wide antibiogram, the Fellow will work with several healthcare systems, hospitals, and clinics to develop a city-wide summary analysis of antimicrobial susceptibilities from these healthcare partners.

This is a unique project that, to the best of the OSPHP’s knowledge, has not been conducted in a large municipal jurisdiction before. With the increasing threat of healthcare-associated infections and multi-drug resistant organisms, this project is both timely and relevant to the future of public health epidemiology.

**Surveillance Evaluation**

**Evaluating Houston’s Communicable Disease Surveillance System**

Working with the Bureau of Epidemiology leadership, the Fellow will evaluate the existing communicable disease surveillance system to ensure that communicable disease surveillance is efficient and effective. Houston’s surveillance system utilizes Maven as the platform for their surveillance information management system. This system incorporates all reportable conditions in Texas (except HIV, STDs, and TB) into a single database. Furthermore, communicable disease information is received from a variety of sources – providers, laboratories, schools, and others – and this information triggers routine to complex public health responses. Ensuring the success of the complete system is vital to protecting the health of city residents.

The Fellow would work with stakeholders to describe the surveillance system, design an evaluation plan, gather evidence of the effectiveness and efficiency of the system, and develop conclusions and recommendations based upon the evaluation results. Furthermore, the Fellow would be involved in the process of implementing the recommendations made and ensuring the continued improvement of surveillance in the City of Houston.
Major Project  Hospital Acquired Infection Assessments, Mitigation, and Research

The OSPHP investigates cases of HAIs and MDROs on a regular basis. Additionally, the OSPHP has engaged Houston-area hospitals, laboratories, and other medical facilities to assess and mitigate HAI risks. The Applied Epidemiology Fellow would work with the OSPHP’s HAI Coordinator and others to assess hospitals, as part of the ongoing project, recommend mitigation steps, and conduct research on hospital settings and HAIs.

Apart from the ongoing hospital assessments, the OSPHP currently partners with the University of Houston School of Pharmacy to conduct research on HAIs, which would be expanded according to the Fellow’s interests. Additionally, the OSPHP chairs the Houston Antimicrobial Stewardship Council, which works with Houston-area hospitals to conduct research on HAIs and promote safe and effective antimicrobial use and practices. The work of this Council aims to further the White House’s “National Action Plan for Combating Antibiotic-resistant Bacteria”. The Fellow’s participation with this Council and their efforts would contribute to preventing adverse health outcomes associated with HAIs and MDROs.

Additional Project  Analyzing Environmentally Linked Health Outcomes

The OSPHP has ongoing collaborations and projects with Rice University, Texas Children’s Hospital, Air Alliance Houston, and others to conduct epidemiological research on air pollution and adverse health outcomes. Currently, the OSPHP is focused on assessing the impact of air quality on acute, emergency health outcomes, such as stroke, heart attack, COPD exacerbation, and asthma exacerbation. Additionally, the OSPHP has recently expanded these efforts to include chronic conditions in Houston-area children with Texas Children’s Hospital and their affiliated primary care clinics. The Fellow will be involved in these ongoing research projects, including learning and applying methods, publishing findings, and presenting research to peers, the community, and policy-makers.

Preparedness Role

The Applied Epidemiology Fellow will work closely with Bureau of Public Health Preparedness (PHP), which is also housed within the Office of Surveillance and Public Health Preparedness.


Additionally, the Fellow will attend: bi-monthly PHP meetings, monthly regional epidemiology-bioterrorism meetings, and other local conferences and meetings. In addition to these trainings, the Fellow will have the opportunity to participate in cross-sector exercises and trainings, including drills, tabletop exercises, and others.
**Additional Activities**

**Gaining Experience for Leading the Future of Public Health**

This activity will be based upon observing, interacting with, and participating in the leadership of the OSPHP and department. The skills needed to become a leader for public health require participation in the leadership process, so the Fellow will be given every opportunity possible to participate in this process with the OSPHP. Minimally, this includes bi-monthly leadership meetings.

**Working with Disadvantaged Communities**

Working with Disadvantaged Communities at the HHD holds several community outreach events annually, including community needs assessments, dental exams and sealants for underprivileged elementary students, and eye exams and prescription glasses for underprivileged children of all ages. The Fellow will be involved in one to two of these community outreach events annually.

**Mentors**

**Primary**
Raouf Arafat, MD, MPH  
Director, Office of Surveillance and Public Health Preparedness

**Secondary**
Biru Yang, PhD, MS, MPH  
Informatics Manager, Bureau of Epidemiology