Assignment Description

The Fellow would be part of the Science and Research Unit (SRU), which is responsible for improving and enhancing the scientific activities within the Department. This includes writing papers and abstracts and helping with complex and ad-hoc analyses for other areas within the Department.

SRU exists within the Office of Science, Surveillance, and Technology (OSST). OSST is responsible for all epidemiological surveillance activities and driving technological innovation through tools such as VDOT and building our mobile fleet of public health vehicles.

HCPH has been a Public Health Accreditation Board-accredited health department since 2018. It was recognized in 2016 by National Association of County and City Health Officials (NACCHO) as Local Health Department (LHD) of the Year for its cornerstone values of Innovation, Engagement, and Equity. HCPH has also adopted One Health and Health Equity approaches in public health practice.

The Fellow will have the opportunity to interact with other divisions and offices across the agency according to his/her interests and availability. These include: Tuberculosis Elimination, Refugee Health Screening, and HIV Prevention Programs in the Disease Control and Clinical Prevention Division; Environmental Public Health Division (EPH); Veterinary Public Health Division; Mosquito and Vector Control Division (MVCD); Nutrition and Chronic Disease Prevention Division; Office of Policy and Planning; Office of Communications, Education and Engagement; and the Office of Public Health Preparedness and Response (OPHPR). As a part of One Health efforts, an innovative Data Warehouse is also housed within OSST, which provides the Fellow a favorable environment to explore and utilize various data from departments across HCPH, such as data from MVCD, EPH, and OPHPR.

In addition, the Fellow will have opportunities to participate in various agency wide meetings, trainings and education. Furthermore, the Fellow may engage in conferences and outreach activities organized by HCPH such as the One Health conference, Food Safety Summit, and Mobile Heath Village events in the community.

Day-to-Day Activities

The fellow would be involved in enhancing HCPH’s overdose surveillance system. Currently, we have access to full toxicology and mortality reports (with data well beyond what is on the death record); ED visit data through ESSENCE; inpatient/outpatient data through the State; and we are exploring using data from EMS, Jail Health, and criminal justice records.

The Fellow would be involved in daily review of the surveillance records, regular analysis of trends, and help link new data feeds with existing data feeds.

Lastly, the Fellow would be expected to help HCPH complete all relevant surveillance objectives within our OD2A grant application.
Potential Projects

Surveillance Activity  Analyze Existing Data

Syndromic surveillance is utilized to detect early signs of outbreak or unusual patterns existing within the community. This is useful for early detection of biological terrorism, outbreaks, or unusual clusters existing within an area in real-time as syndromic surveillance monitors trends. This early detection and notification can be useful in noticing unusual trends before final diagnoses have been made which, allows for a more rapid response and a reduction in morbidity and mortality. Harris County Public Health utilizes the syndromic surveillance system housed by the Houston Health Department known as ESSENCE to monitor trends throughout the community.

The fellow will analyze existing data on opioids (ESSENCE, mortality, IPOP data, etc) on a daily basis to look for temporal or geographical trends. Additionally, the Fellow will learn to apply syndromic surveillance in relation to infectious disease surveillance.

Surveillance Evaluation  Evaluate ESSENCE

Fellow will evaluate ESSENCE (syndromic surveillance system) on opioids to determine queries usefulness for public health prevention efforts.

Major Project  Natural Language Processing (NLP) Algorithm

Currently, HCPH receives an annual datafile from the medical examiner’s office on substance overdose mortality events. This dataset contains detailed information on the decedent, including demographics, toxicology report, and the investigation report. The toxicology report and investigation report are free-text fields, which allows the data to be explored using natural language processing (NLP) tools.

NLP is a way in which computers are better able to understand and interpret human language with the goal of having computers and humans work more proficiently together. The Fellow will work with primary mentor to develop a Natural Language Algorithm that can analyze the free-text fields of the medical examiner’s report for each overdose mortality event. These fields provide critically important information to understand the context of an overdose (e.g., chronic abuse vs acute abuse of opioids). However, resources are insufficient to read over each report. Therefore, HCPH plans to develop an NLP tool that can 'scan' the free-text to classify each report as being chronic or acute abuse.

Preparedness Role

The Fellow will first engage in preparedness by completing FEMA’s Incident Command System (ICS) trainings. This sets a baseline knowledge of the way in which people are organized and activated during an emergency situation. The Fellow will participate in HCPH’s Community Assessment for Public Health Emergency Responses (CASPER), to either help assess the community’s preparedness in relation to an emergency, or in response to an emergency that may arise. The fellow will also participate in regular
Preparedness exercises and table tops, as well as be active in any response activity within our community.

Additionally, the Fellow will have the option to shadow the Office of Public Health Preparedness and Response (OPHPR) on a project to gain a better understanding of planning, preparing and responding to an event in the community.

Additional Activities

Participate in internal and area groups, committees, etc. to support the Fellow's professional development and networking opportunities.

During the time at HCPH, the Fellow will learn how to use R, a free data analyses platform that will be integral and useful in developing their data analytic skills. The Fellow will also be encouraged to join the R Group for Biosurveillance through CSTE, as well as other internal and external workgroups in areas of interest for the Fellow.

The fellow will be encouraged to participate in the creation, submission and presentation of abstracts to conferences of their choice, where they choose to utilize their professional development funding.

The Fellow will have the opportunity to partake in Infectious Disease case investigations, to understand some of the day to day work of other epidemiologists at Harris County Public Health.

The Fellow will also be encouraged to explore projects in their own areas of interests.

Mentors

Primary       Eric Bakota MS  
              Science and Research Unit Manager

Secondary    Dana Beckham DVM, MBA, MPM  
              Director of the Office of Science, Surveillance, and Technology