Infectious Diseases

Public Health - Seattle & King County, Prevention Division/Communicable Disease Epidemiology & Immunization Section
Seattle, Washington

Assignment Description

The Fellow will work as a member of PHSKC’s Communicable Disease Epidemiology and Immunization Section (CD-Imms). The Fellow will collaborate on projects with various teams within the CD-Imms program, including the Analytics & Informatics team, Viral Hepatitis team, Vaccine Preventable Diseases team, Enterics and Foodborne Illness team, Zoonotic and Emerging Infections team, Healthcare Associated Infections team, and the Immunizations team.

Day-to-Day Activities

The section will aim to provide the fellow with a broad range of experiences and growth opportunities, tailored to their interests and skill sets. The fellow will gain knowledge and skills in applied epidemiology and informatics.

In the first couple of months, the fellow can expect to participate in onboarding, training on data systems, and meeting with key staff to understand section workflows and routine operations. The section is committed to incorporating equity and social justice (ESJ) principles in all aspects of its work, consistent with the County’s ESJ Strategic Plan. The fellow will be encouraged to participate in ESJ training opportunities and then incorporate these principles into practice.

The fellow will be immersed in the daily disease control and prevention activities of the section, including case and outbreak investigations. The Fellow will routinely participate in the section's daily morning report, a review of open investigations. After gaining experience in case and outbreak investigations, the fellow will be encouraged to identify in-depth projects of interest.

Day-to-day, the fellow will work with mentors and colleagues to:

- Develop analysis plans; conduct epidemiological and statistical analyses; respond to ad-hoc and outbreak-related data requests; assist in the conduct of data quality assurance; design and create data visualizations and dashboards
- Generate disease surveillance summaries and reports
- Expand our public health informatics capacity by design or improving infrastructures, tools, and methodologies for collecting communicable disease and immunizations data

The fellow will have the opportunity to interact with a variety of divisions within the health department, potentially including the HIV and STD programs, TB program, Emergency Medical Services, Medical Examiner’s Office, Emergency Preparedness, and the Assessment, Policy Development and Evaluation Unit.
**Potential Projects**

**Surveillance Activity**  **Analyze Communicable Disease Data for Health Disparities**

Identifying sociodemographic and economic factors associated with the incidence of disease may help identify opportunities for prevention. Using communicable disease data collected by the section, combined with data from the U.S. Census Bureau, the fellow will conduct an ecological analysis to identify sociodemographic and economic factors associated with the incidence of enteric infections and chronic viral hepatitis B and C in King County. The fellow will also explore using medical and social vulnerability scores to identify geographic areas and other subsets of the population that would benefit from focused public health interventions and prevention activities.

**Surveillance Evaluation**  **Analyze Clinical and Regional Human Papillomavirus (HPV) Immunization Rates**

The fellow will analyze data from the Washington State Immunization Information System to describe HPV vaccine series initiation and completion by clinic type. The fellow will create dashboards in Tableau to visualize the data and will summarize trends for staff to help guide decision-making about allocation of resources to promote HPV vaccine uptake. In addition, the fellow will evaluate a centralized HPV vaccine reminder/recall system. The fellow will also design a data collection instrument and help collect data from a school-based health center HPV vaccine promotion project and will conduct a qualitative analysis and develop recommendations for improving the program.

**Major Project**  **Enhance Detection of Foodborne Illness Outbreaks**

The fellow will explore strategies for enhancing the detection of foodborne illness outbreaks by using existing data from restaurant inspection histories, foodborne illness complaints, and risk factor information gathered from patient interviews to analyze predictors of foodborne disease. The fellow will also conduct literature reviews and key informant interviews with health departments across the country to identify best practices for collecting foodborne illness data from the public using web-based surveys. The fellow will then create and pilot a web-based survey using REDCap to collect foodborne illness complaint information.

**Major Project**  **Enhance Disease Detection Using Syndromic Surveillance Data**

The CD-Imms Section has a local home-grown syndromic surveillance system to monitor trends in emergency department visits and school absenteeism data. The system is used by PHSKC to assist with case-finding for notifiable conditions, support outbreak investigations, and for situational awareness of events and illnesses of public health importance, including seasonal and pandemic influenza surveillance. In addition, the Washington State Department of Health submits data to the National Syndromic Surveillance Program (NSSP) for monitoring trends in emergency department and outpatient visits. The fellow will be trained on how to monitor data in these systems and respond to data requests, which may span across communicable disease surveillance, violence and injury surveillance, drug overdose surveillance, and surveillance of health impacts associated with climate change. In addition, the fellow will improve on the current system of visualizing and reporting on the data by creating interactive dashboards using Tableau. Public health staff will use these visualizations to enhance outbreak detection and situational awareness. Further enhancements could include applying temporal and spatial surveillance methods to help guide disease investigation. In order to help support a
transition from King County’s local home-grown system to the State’s syndromic surveillance system, the fellow will also conduct an evaluation aimed at identifying differences in data quality, timeliness, and completeness.

**Major Project: Analysis of Co-Morbidities and Long-Term Health Outcomes Among Persons Infected with Hepatitis C**

Seattle & King County collects clinical and laboratory data that enable epidemiologists and investigators to follow patients infected with hepatitis C as they move through the continuum of care from diagnosis to evaluation, treatment and cure. In order to derive prevalence estimates of hepatitis C in King County, the fellow will match hepatitis C records from our local surveillance database against death records from vital statistics. In addition, the fellow will match hepatitis C records against HIV and STD surveillance databases. The fellow will use the composite data set to create data dashboards describing the burden of co-infections as they relate to various risk factors (e.g., opioid use and unstable housing), and to describe the impact of these risk factors and co-morbidities on long-term health outcomes (e.g., HCV treatment success and mortality). The fellow will work across teams to develop manuscripts for submission to peer-reviewed journals describing key findings.

**Preparedness Role**

CD-Imms is responsible for monitoring and responding to communicable disease events as well as biological emergencies and non-communicable disease related acute conditions that require investigation and coordination of healthcare system responses (e.g., carbon monoxide poisoning, illness after natural disaster, biological terrorism). During the past year alone, the section has activated Incident Command several times in response to infectious disease outbreaks, including measles and hepatitis A. The CD-Imms section works closely with Public Health’s Preparedness Section to respond to and manage these events. The fellow will participate in Incident Command System (ICS) and National Incident Management System (NIMS) trainings. The fellow will also have the opportunity to plan for how to coordinate shelter surveillance in the event of an emergency, including developing web-based data collection instruments in REDCap, and creating accompanying dashboards in Tableau to support disaster surveillance and response.

**Additional Activities**

The fellow will be trained on conducting communicable disease case and outbreak investigations, including enteric and foodborne illnesses, vaccine-preventable diseases, zoonotic and emerging infections, and healthcare associated infections. The fellow will routinely participate in the section's daily morning report, a review of open investigations. The fellow will also have the opportunity to work with a public health nurse and disease research intervention specialist to support hepatitis C case management, including linking patients infected with chronic hepatitis C to care.

The projects listed in this billet represent a small sample of the types of opportunities that are available. The nature and volume of the section’s work has been, and will continue to be, impacted by increases in population size and diversity of our population, the homelessness crisis, the opioid epidemic, and the potential for impacts of climate change and globalization on health, disease transmission and disease emergence. Therefore, the CD-Imms section operates in a dynamic environment where the day-to-day surveillance needs, and priorities shift in order to address emerging public health needs. The CD-Imms
The section is committed to providing the fellow with a meaningful, practice-based training opportunity, in which the fellow will have a thorough understanding of the roles and responsibilities of a large urban local health department. Depending on the fellow’s interests and career goals, we can adjust the assignment to emphasize investigations or data analysis/informatics or provide a combination of training in these areas. The fellow will have the option of collaborating with other sections in the health department, and section leads will identify additional mentors as needed to ensure that the fellow is well-supported and emerges from the program with a broad, competitive skill set. The section is looking forward to welcoming a CSTE fellow to our program.

**Mentors**

**Primary**
- Atar Baer PhD, MPH
  - Program Manager

**Secondary**
- Meaghan Fagalde MPH
  - Epidemiologist