Infectious Diseases

Connecticut Department of Public Health, Infectious Disease Section

Hartford, Connecticut

Assignment Description

This Assignment offers hands-on experience and mentoring in the Connecticut Department of Public Health (CT DPH) Infectious Diseases Section. Responsibilities of the Section include implementing disease surveillance and analyzing data, conducting epidemiological studies, investigating outbreaks, responding to emerging infectious diseases, evaluating public health interventions, interacting with providers, developing and providing education for health care providers, assisting local health departments, working with regional public health programs, developing guidelines, evaluating program activities, and assisting in the development of public health policy.

Our goal is to further the Fellow's professional growth and expand access to public health practitioners and leaders. The Connecticut assignment provides a variety of activities that will expand the Fellow’s knowledge and skills in applied epidemiology and public health practice. This experience will help prepare the Fellow for a career with a state or local health department. The Fellow will be considered an integral member of the Infectious Disease Section with project opportunities with the following program areas; epidemiology and emerging infectious diseases (EEIP), healthcare-associated infections (HAI), emerging antimicrobial-resistant (AR) organisms, tuberculosis (TB), and sexually transmitted diseases (STD). The Fellow will have options from a portfolio of projects to demonstrate core competencies in applied epidemiologic methods, communication, public health practice, and program evaluation. The proposed projects emphasize prevention interventions, use of data for decision-making, evaluating programmatic outcomes, and building program capacity. These projects also provide the fellow with opportunities to collaborate with organizations and agencies outside CT DPH and to attend and present at public health meetings.

Day-to-Day Activities

The Fellow will be fully integrated into the daily activities of the EEIP, HAI/AR, TB, and STD Programs in the Infectious Disease Section and will work with multiple groups within DPH to experience the full range of public health activities represented at the agency. The Fellow will engage in routine surveillance activities including database management, data cleaning, and data analysis, cluster and outbreak detection, investigation and response, program evaluation, and policy development. This will include attendance at a variety of project-based team meetings at DPH including EEIP, HAI/AR, and TB/STD staff meetings, bimonthly CTDPH's multidisciplinary Legionnaire's disease investigative team, monthly TB case review meetings, and weekly epidemiology clusters/outbreaks investigation meetings. In addition to internal meetings, the Fellow will be integrated into programmatic interactions with our partners at the state public health laboratory, our academic partner, the Yale School of Public Health, and our community-based advisory groups. The Fellow will have access to the same information and databases other staff members do to conduct their projects and assist with additional activities (e.g. outbreak investigations) as they arise. The Fellow will work to analyze and prepare audience-specific presentations of data to foster partnership and inform the clinical care community and beyond.
Potential Projects

Surveillance Activity    Enhanced Gonorrhea Surveillance

In 2013, Neisseria gonorrhoeae (gonorrhea) was named one of the most urgent antimicrobial resistance threats by CDC. Between 2014-2018, gonorrhea incidence increased nationally 63% to an all-time high of 583,405 cases reported in 2018. Similar increases have been seen in Connecticut with gonorrhea rates increasing 97% in the state over the same time period. With these dramatic increases, it is important to understand the populations being affected to be able to better target prevention interventions. As part of the STD Program’s new five-year cooperative agreement with CDC, the Program is expected to collect more detailed information on a subset of randomly selected gonorrhea patients including demographic data, sex of partner data, symptoms and treatment information. The Fellow would be responsible for assisting the STD Program with establishing these enhanced surveillance activities including identifying the protocol for random selection, following up with health care providers and interviewing patients, if necessary. The Fellow would have the opportunity to analyze enhanced data as well.

Surveillance Evaluation    Evaluation of Inventions Established during Public Health Investigations during Health Care Associated Legionnaire’ disease Investigations

The CTDPH Epidemiology Program would like to develop a survey to evaluate the interventions established during public health investigations to the source of legionella during, at the conclusion, and months to years after the outbreak. In 2018, 201 legionellosis cases were reported of which 42 possible health care associated Legionnaires diseases cases and 2 definite health care associated cases were identified, which lead to seven full public health investigations. All of these investigations were coordinated by the Legionellosis Coordinator and involved the CTDPH Legionnaire’ disease investigation team. During a full public health investigation, an environmental assessment and Legionella environmental sampling are performed. CTDPH Legionnaire’ disease investigation team reviews and evaluates these results to identify deficiencies from the environmental assessment and physiochemical and legionella testing. When deficiencies are identified corrective actions are recommended. Following an outbreak investigation, CTDPH will evaluate interventions that were implemented as a result of an outbreak to determine the effectiveness of corrective actions and remediation. This project would require the Fellow to develop, test, and administer the survey as well as create a database to house the survey data.


In the United States, national surveillance for antimicrobial resistance among foodborne bacteria was established in 1996 with the formation of the National Antimicrobial Resistance Monitoring System (NARMS). This system was created by the CDC in collaboration with the US Food and Drug Administration Center for Veterinary Medicine (FDA-CVM) to prospectively monitor changes in susceptibility to antimicrobial agents of human and veterinary importance over time. The Connecticut Department of Public Health (CT DPH) has participated in NARMS since 1996 starting with Salmonella and E coli; in 1997 Campylobacter isolates were added, and in 1999 Shigella isolates were added, and in 2009 Vibrio isolates were added. According to national NARMS data, antibiotic resistance among
Campylobacter, Shigella and Non-Typhoidal Salmonella isolates have been classified as serious public health treats.

This evaluation would involve analyzing: pathogen specific resistance trends to each antimicrobial and or drug class; changes in prevalence to antimicrobial drug class using 5-year intervals (or other intervals based on changes in antimicrobials tested over the study period); and characterizing statistically significant increases or decreases in antimicrobial resistance patterns. The Fellow would also be able to link the NARMS data with Connecticut surveillance data for Salmonella, E coli, Campylobacter, Shigella and Vibrio, allowing for an expanded analysis to determine if antimicrobial resistance might be associated with healthcare, food consumption, domestic or international travel, or animal exposures prior to illness onset.

**Major Project**  Evaluation of Proactive Screening For Candida Auris Colonization Among Patients With Carbapenemase-Producing Organisms

Connecticut conducts active surveillance for Carbapenem Resistant Organisms (CROs). CRO surveillance provides actionable data for infection control. Funding through the Epidemiology and Laboratory Capacity Cooperative Agreement and implementation of the Antimicrobial Resistance Laboratory Network (AR Lab Network) allows for genetic characterization of all carbapenem resistant Enterobacteriaceae and Acinetobacter in the state. Using these laboratory data, the HAI program, in conjunction with our clinical partners, can target active surveillance and control activities.

The emergence of Candida auris and in particular the geographic concentration of cases in adjacent jurisdictions, has led Connecticut to develop strategies for the early identification and isolation of infected or colonized cases. To this end, Connecticut works closely with the AR Lab Network Regional Laboratory at Wadsworth to proactively screen carbapenemase producers for C. auris who have healthcare exposures in geographic areas or facilities where C. auris has been detected.

The Fellow will have the opportunity to participate in the process of using surveillance data from laboratories to guide targeted control strategies to prevent the spread of antimicrobial resistance. The Fellow will learn the process of detailed medical record review and the integration of screening into response activities. This evaluation will encompass a review of processes and protocols to identify areas of improved efficiency to yield maximum benefit and reduce barriers to the flow of information between the public health laboratory, the HAI program staff, and the clinical care community. A specific focus of this evaluation will be to assess the incorporation of C. auris screening into the response to carbapenemase producers and to identify potential improvements to the execution of this work.

**Surveillance Activity**  Tuberculosis Surveillance

In 2018, 9,025 cases of tuberculosis (TB) were reported in the United States. While this was the lowest number of cases ever reported, cases have plateaued over the last few years with decreases year to year becoming smaller. A similar trend has been seen among Connecticut cases with case counts ranging between 51-63 between 2016-2018. While cases have leveled off, case management of TB patients is getting more challenging as state and local health department staff navigates multiple issues to ensure TB patients complete their treatment including medical, social and financial challenges. This analysis would focus on describing the TB cases in Connecticut during this leveling off period with an aim of trying to understand if there has been a significant increase in the complexity of cases. In addition to
analyzing surveillance data, the Fellow would be responsible for creating a model that includes other factors that could contribute to successful outcomes for TB patients (e.g. completion of treatment) including other medical comorbidities, financial issues and social factors e.g. homelessness or joblessness.

**Preparedness Role**

Possible activities might include working with bioterrorism/emerging pathogen response protocols and planning for continuity of program operations in an emergency. Fellows may participate in a table top exercise, hot-wash/after action meetings or other field exercises regularly planned through the agency's Office of Emergency Preparedness.

**Additional Activities**

If the Fellow is interested, the Fellow would be invited to attend CSTE HAI and Legionnaire’ disease work-group call

If the Fellow is inclined, HAI/AR Program staff will support and encourage pursuit of the Certified in Infection Control (CIC) credential. Recently opened to public health professionals, this designation can prove beneficial when interacting with clinical partners if the Fellow is interested in remaining in the area of healthcare-associated infections.

**PLEASE NOTE**

Connecticut also has a third host site mentor - Meghan Maloney, MPH

**Mentors**

**Primary**

Lynn Sosa MD  
Deputy State Epidemiologist

**Secondary**

Paul Gacek MPH  
Legionellosis Coordinator & Waterborne Disease Coordinator