

ID: 72182324

One Health, Infectious Diseases - Foodborne - Host Site Description

Oregon Health Authority

Assignment Location: Portland, US-OR
Oregon Health Authority
Acute and Communicable Disease Prevention

Primary Mentor: Rosalie Trevejo, DVM, MPVM, PhD
Enteric Disease Epidemiologist
Oregon Health Authority (Acute and Communicable Disease Prevention)

Secondary Mentor: Emilio DeBess, DVM, MPVM
Public Health Veterinarian
Oregon Health Authority

Work Environment

Hybrid

Assignment Description

This Fellowship position is based in the Acute and Communicable Disease Prevention Program. This program is responsible for surveillance of all reportable communicable diseases (with exception of syphilis, gonorrhea, chlamydia, HIV, tuberculosis, measles, mumps, rubella, and pertussis). We routinely engage with and collaborate with our partners at the State Public Health Laboratory and Local Public Health Agencies on case and outbreak investigations. For multijurisdictional investigations we also collaborate with our partners at federal and other state public health agencies.

The Fellow would be an integral member of ACDP, participating in the activities that staff epidemiologists engage in. This includes participation in rotations for the on-call epidemiologist (approximately two days a month), Urgent Epidemiology Response Team (UERT) for outbreaks (one week approximately every 8 weeks), and Cluster Busters (investigate approximately 5 or 6 enteric disease clusters per year). Epidemiologists in ACDP also conduct surveillance for and investigate health care associated-infections and respond to infectious disease-related public health emergencies. They would participate in our daily end-of-day wrap sessions, perform review and analysis of our surveillance data, and work on data visualization and data quality assurance projects.

In addition, there are opportunities to work on a variety of projects (e.g., processes for using whole genome sequencing in cluster detection; analysis of the effects of culture-independent diagnostic tests on enteric disease surveillance; and incorporation of spatial analysis tools). Orpheus is a centralized statewide database used for all communicable disease surveillance, as well as elevated blood lead reporting, that serves as a robust data source for further exploration. Our surveillance system is fully integrated, which facilitates work across program areas. For instance, we routinely engage with our colleagues in Environmental Health and Immunization Programs. The Fellow would have opportunities to engage with subject matter experts from multiple disciplines to investigate outbreaks of all infectious diseases (respiratory, enteric, vaccine-preventable, etc.), gain knowledge and skills in disease surveillance, and be cross trained in emergency response.

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Describe Statistical and Data Analysis Support, Such as Databases, Software, and Surveillance Systems Available to the Fellow

The AEF Fellow will have access to our suite of in-house, FileMaker Pro-based surveillance databases. These include Orpheus (Oregon Public Health Epidemiology User System), which is our integrated communicable disease reporting database that houses both our communicable disease and environmental health (pesticide poisoning and elevated blood lead data) surveillance data; our outbreak surveillance system, which is linked Orpheus to allow for efficient data capture and follow up during outbreak investigations; and Oregon's Syndromic Surveillance System (ESSENCE), which contains near real-time emergency room surveillance data.

Our communicable disease surveillance system offers a rich source of risk factor, laboratory, and geographic data for reportable conditions in Oregon, with data for approximately the past 20 years. In addition, the Fellow will have access to birth and death record data, All Payer All Claims data, hospital discharge data, and FoodNet surveillance data (we are one of 10 EIP sites conducting active surveillance for 8 enteric pathogens). Many of our staff use R studio and we have a monthly R Users group to share resources and methods with one another.

Other software available for use by our staff includes SAS, SPSS, and ArcGIS Pro. We will provide software and training according to Fellow's needs and preference. The Fellow will also have access to SurveyMonkey and CDC's Secure Access Management Services Platform (includes SEDRIC and RedCap).

Projects

Surveillance Activity Title: Comparison of reported risk factors for enterotoxigenic Escherichia coli cases by international travel status

Surveillance Activity Description:

Clinicians and laboratories are required to report ETEC infections in Oregon; local public health agencies typically conduct a standard case investigation, which includes questions on risk factors and travel history. We are participating in a CDC-convened FoodNet workgroup to analyze data from the three EIP FoodNet sites with available ETEC data (Oregon, Minnesota, and Connecticut), which involves comparison of demographic and clinical characteristics between cases by international travel status and estimation of the degree of underdetection of this pathogen by commonly used laboratory testing methods. This analysis does not include risk factor data, which are locally collected, and not standardized among the FoodNet sites. An analysis of risk factor data for Oregon cases will provide valuable insights into potential sources of domestically versus internationally acquired infections.

Surveillance Activity Objectives:

The goal of this analysis is to analyze the surveillance data for Oregon ETEC cases to identify differences in reported risk factors between domestically and internationally acquired ETEC infections. The Fellow will export and prepare data for analysis, conduct the analysis, and summarize findings in written form (ideally for publication) and for presentation (e.g., public health conferences, medical association meeting). There is also potential to collaborate with the other FoodNet sites (MN and CT) that investigate ETEC cases to identify risk factor variables that are comparable across sites; this would allow expansion of the analysis to include data from multiple sites.

Surveillance Activity Impact:

Findings from this analysis will inform health education efforts by health care providers and public health professionals for prevention of ETEC infection in domestic and international settings. These results will also be valuable for health care providers when evaluating pretest probability of ETEC infection and utility of testing in patients according to their travel history.

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Lastly, the results will aid in the evaluation of the completeness and quality of the risk factor data currently included in the standard case investigation for this condition and ideally will yield recommendations on how to improve our investigation protocol.

Surveillance System Evaluation Title: Evaluation of Foodborne Outbreak Surveillance System

Surveillance System Evaluation Description:

Foodborne outbreaks are reportable in Oregon and are defined as an incident in which two or more persons from different households experience a similar illness resulting from ingestion of a common food. Local public health agencies in Oregon are required to initiate an investigation and report the outbreak to Oregon Health Authority (OHA) within 24 hours of initial notification. Epidemiologists in ACDP rotate as lead for Urgent Epidemiology Response Team on a weekly basis, during which time they serve as the subject matter expert for local public health agencies that are investigating local outbreaks and as state lead for multijurisdictional outbreaks. An outbreak record is created at the time of report to OHA and standard fields are updated with clinical, risk, laboratory, and other information as the investigation progresses; outbreak records are typically finalized and submitted 30 days after the last onset date. Given the multiple types of data collected, potential need for weeks or months of follow up, and coordination among various stakeholders, an evaluation of this system will be informative in optimizing the user experience with the Outbreaks database and the quality of the data yielded.

Surveillance System Objectives:

The objective of this project is to assess the Data Quality, Acceptability, and Timeliness of the surveillance system. The Fellow will analyze the outbreak data, engage with stakeholders (including communicable disease and environmental health staff at local public health agencies), and perform a literature review.

The deliverable will be for the Fellow to provide an objective assessment of the strengths and limitations of the surveillance system, culminating in the development of actionable recommendations to improve its utility. This analysis will focus on pre-pandemic (2018-2019) and post-pandemic (2023-2025) periods, given the disruption to foodborne outbreak investigation activity during the COVID-19 pandemic. A second deliverable is for the Fellow to submit a summary of their findings for consideration as a presentation or poster for the CSTE conference.

Surveillance System Impact:

This activity will have the Fellow engage with multiple stakeholders involved in foodborne outbreak investigation to streamline and optimize foodborne outbreak surveillance activity going forward, with the goal of ensuring usefulness and quality of the data for targeting disease prevention and public health education efforts.

Major Project Title: Assessment of clinical laboratory testing practices for enteric disease

Major Project Description:

For this analytic project, the Fellow will use Oregon all payer all claims (APAC) data to assess clinical laboratory testing practices for enteric disease (e.g., frequency of testing for enteric pathogens among patients presenting with acute gastrointestinal illness). This project opportunity offers an opportunity for the Fellow to gain experience in analyzing a robust large dataset that uses relational data tables and ICD-10 codes. The Fellow will use diagnostic and procedure data to estimate incidence of gastrointestinal illness among patients that receive laboratory testing; these estimates will be compared with those obtained by passive surveillance data. Testing practices among subpopulations (e.g., age group, region, race, ethnicity) and trends (e.g., changes associated with the COVID-19 pandemic) will also be evaluated. This project offers the potential for the Fellow to collaborate with CDC and other FoodNet site partners to evaluate data from sites in other states.

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Major Project Objectives:

The results of these analyses will provide an estimate of the degree of underreporting of enteric pathogens and identify any gaps in testing. This analysis also ties in with key objectives of the EIP FoodNet program, to determine the burden of foodborne illness and to monitor disease trends. The results of this analysis will culminate in a written report, ideally for publication. The results will also be submitted for presentation at a conference, such as CSTE or West Coast Epi.

Major Project Impact:

These findings will provide valuable insight into the extent of underreporting and underdiagnosis of certain enteric diseases. This information will be valuable in targeted messaging to health care providers on testing approaches for enteric disease and ensuring that all populations have similar access to testing.

Additional Project #1 Title: Evaluation of rabies risk from animal bites in Oregon residents

Project #1 Type: Surveillance Activity

Project #1 Description:

Animal bites and rabies are reportable conditions in Oregon. For this project the Fellow will analyze our surveillance data to describe the epidemiology of animal bites (e.g., species involved, case demographics, seasonality, circumstances of bite, outcomes) and rabies testing data (species tested and frequency of positive results). The Fellow will use our state immunization database (ALERT data) to identify rabies vaccination status of persons bitten by animals and use these data to estimate the frequency of and factors associated with rabies post-exposure prophylaxis. This project will entail collaboration with subject matter experts in ACDP and Immunization Programs.

Project #1 Objectives and Expected Deliverables:

Animal bites and rabies are among the most common concerns of callers to our on-call epidemiologist line. The objective of this analysis is to provide a data summary to our local public health and healthcare partners to aid in risk assessment for animal bites.

The Fellow will prepare a written summary for publication as a CD Summary article (distributed by ACDP to public health partners and health care providers). The Fellow will also present these results to local and state public health partners, such as at one of our monthly training series provided for local and state public health epidemiologists and communicable disease investigators.

Project #1 Impact:

Our local public health partners and health care providers frequently deal with animal bite scenarios. Having a current and comprehensive summary of the surveillance data will be helpful to our partners in assessing rabies risk among patients with animal bites. This information will also be helpful for informing health education and prevention efforts regarding animal bites in Oregon.

Additional Project #2 Title: Characteristics of antimicrobial use and resistance patterns for Campylobacter infections in Oregon

Project #2 Type: Major Project

Project #2 Description:

This project will consist of two components. The initial focus for the Fellow will be to conduct a descriptive analysis of surveillance data for Campylobacter cases reported in Oregon from 2015-2025, including demographics, illness severity indicators, antimicrobial treatment, and reported risk factors. As an Emerging Infections Program FoodNet site, we collect detailed surveillance data for these cases, submit isolates to the National Antimicrobial Resistance Monitoring Program (NARMS), and perform whole genome sequencing (WGS) of submitted isolates.

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Case demographics will be compared with census data to identify populations disproportionately impacted (e.g., age groups, race/ethnicity, region). Frequency of reported risk factors will be compared with baseline exposures in the general population as estimated by the 2018-2019 FoodNet Population Survey. The second focus of this project will be for the Fellow to analyze antimicrobial resistance data to evaluate trends and geographical clustering in resistance patterns and association between resistance and clinical outcomes.

Project #2 Objectives and Expected Deliverables:

The Fellow will write a summary (brief report), ideally for publication, and present the findings to local and state public health partners, veterinarians, and other health professionals (e.g., Oregon Epidemiologists' Meeting, Continuing Education offerings for veterinarians and clinicians).

Project #2 Impact:

These results will help with informing public health messaging and prevention activities regarding *Campylobacter* infections and judicious antimicrobial use for health care providers, veterinary professionals, and the public.

Please Describe the Fellow's Anticipated Role in Preparedness and Response Efforts – Include Activities and Time Allocation (Required Competency of Fellowship)

The Fellow will be trained in the Incident Command System and will collaborate with the Preparedness, Surveillance, and Epidemiology Team (PSET) on emergency response efforts. Previous Fellows and trainees have participated in responses to a large measles outbreak and adverse health effects associated consumption of nationally distributed products containing psychoactive mushroom extracts. PSET also plays a role in HPAI response activities (testing and surveillance), including partnership with agricultural partners (e.g., Oregon Department of Agriculture), that the Fellow could participate in. The Fellow would also have opportunity to provide input on the evaluation and development of surveillance plans for health events associated with natural hazards, e.g., wildfires and winter storms.

The time allocation for these activities is approximately 5%.

Please Describe the Fellow's Anticipated Role in Cluster and Outbreak Investigations – Include Activities and Time Allocation (Required Competency of Fellowship)

The Fellow will serve on our "Urgent Epidemiology Response Team", taking a one-week rotation approximately every eight weeks. For outbreaks that occur during their rotation, the epidemiologist serves as the primary subject matter expert for local health agencies and as the lead investigator for multijurisdictional outbreaks. The Fellow will also join the "Cluster Busters" rotation, in which epidemiologists rotate on taking lead for investigation of enteric disease clusters (approximately one cluster every two months) as they are identified by whole genome sequencing at the State Public Health Laboratory. Additionally, the Fellow will have the opportunity to join other epidemiologists in cluster and outbreak investigations that require a larger response outside of their "Urgent Epidemiology Response Team" and "Cluster Buster" assignments.

The time allocation for these activities is estimated at 10-15%.