

**ID: 35806919**

**Infectious Diseases, Infectious Diseases - HAI - Host Site Description**

**Oregon Health Authority**

**Assignment Location:** Portland, US-OR  
Oregon Health Authority  
Public Health Division

**Primary Mentor:** Paul Cieslak, MD  
Medical Director, Communicable Diseases and Immunizations  
Oregon Health Authority

**Secondary Mentor:** Dat Tran, MD, MS  
Medical Director, Healthcare-Associated Infections Program  
Oregon Health Authority

**Work Environment**

Hybrid

**Assignment Description**

The fellow would serve as an epidemiologist within ACDP, which has responsibility in Oregon for writing administrative rules specifying reportable diseases; guiding Oregon local public health officials in their investigation and control efforts; investigating outbreaks that cross county jurisdictional lines; collaborating with neighboring states and federal agencies on interstate communicable disease outbreaks and issues; managing data systems for reportable diseases, outbreaks, healthcare-acquired infections, and emergency department surveillance; analyzing and summarizing communicable disease data for publication; and providing epidemiologic assistance in public health emergencies of any kind.

As a member of our ACDP Epidemiology Team, would take day call 1—2 days per month, primarily fielding queries from Oregon’s 32 local public health authorities, and occasionally from physicians, nurses, and veterinarians. In this way, the fellow would learn to deal with a variety of communicable diseases, learning Oregon methods as well as developing an approach to public-health decision making when data are few. The fellow would join the technical team that services Oregon’s statewide integrated disease database “ORPHEUS,” learning informatics skills; and serve on our “Urgent Epi Response Team,” investigating outbreaks one week a month. They would participate in ACDP’s 4 P.M. daily “wrap-up” session, which we use both to ensure some standardization of approach and as didactic sessions for newer members of the section. The fellow will also be cross-trained in emergency response. When not working in these capacities, the fellow would work on longer-term projects as described elsewhere in the application; and analyzing other data regarding reportable diseases.

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

Fellow will have access to our suite of home-grown, FileMaker Pro-based surveillance databases (Orpheus, Outbreaks, et al.); ESSENCE emergency department surveillance data; and Oregon data within the National Health Safety Network (NHSN). Most epidemiologists here use SAS; a few use Epi Info, STATA or R; the Fellow could use any of these. The Fellow will learn to get "under the hood" of our FileMaker relational databases.

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## **Projects**

### **Surveillance Activity Title: Surgical site infections in ambulatory surgery centers**

#### *Surveillance Activity Description:*

Selected surgical site infections (SSIs) -- e.g., those following knee and hip prosthesis implantation -- are reportable from hospitals in Oregon via the National Healthcare Safety Network (NHSN). However, some of these are increasingly performed in the ambulatory setting. The fellow will review available sources of data on infection following these procedures to inform the decision as to whether to make SSIs following ambulatory surgery reportable. Potential data sources include claims data; review of hospital discharge data (when such infections require hospitalization); and collecting data directly from centers.

#### *Surveillance Activity Objectives:*

The objective of this activity is to determine the number and proportion of SSIs following knee and hip prosthesis implantation that are not captured by NHSN. Expected deliverables include presentations to our Healthcare-Associated Infections Advisory Committee and to NHSN; and a peer-reviewed publication.

#### *Surveillance Activity Impact:*

This activity will help us better understand current gaps in surveillance of selected SSIs in Oregon via NHSN, and guide improvements in surveillance of these SSIs.

### **Surveillance System Evaluation Title: Enteric Disease Cluster Detection**

#### *Surveillance System Evaluation Description:*

Until July 2019, molecular subtyping for detection of clusters of enteric bacterial infection was performed by pulsed-field gel electrophoresis (PFGE). In July 2019, whole-genome sequencing (WGS) supplanted PFGE. This shift requires a re-thinking of criteria for clusters meriting investigation—which was waylaid by the COVID-19 pandemic. New investigative criteria will ideally be based on empirical data. The fellow will review our clusters and outbreaks to identify parameters of successful investigation (e.g., a minimum threshold for number of cases, maximum allowed SNP or allele differences between isolates in a presumed cluster, a specific time interval).

#### *Surveillance System Objectives:*

The objective of the project is to develop criteria for practical detection and triage of enteric bacterial infection clusters based on WGS typing results. The expected deliverable is an internal investigative guidance document.

#### *Surveillance System Impact:*

This activity will standardize and optimize investigations of clusters of enteric bacterial infection going forward.

### **Major Project Title: Wastewater-based Surveillance of Antibiotic Resistant Pathogens**

#### *Major Project Description:*

In 2020, OHA contracted with Oregon State University (OSU) to conduct weekly wastewater surveillance for SARS-CoV-2. Currently, wastewater in more than 40 Oregon communities, including two tribal communities, is tested by PCR up to twice weekly for SARS-CoV-2 RNA. Wastewater-based epidemiology (WBE) complements ongoing clinical surveillance for statewide monitoring of COVID-19 trends and variant detection. OHA has participated in National Wastewater Surveillance System (NWSS) calls since their launch in late 2020, and the creation of a publicly available NWSS-adapted wastewater dashboard has improved data sharing and provides relevant community-level information to our local public health authorities. The successful collaboration of OHA with OSU and partners in public works has also facilitated the

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expansion of wastewater surveillance in Oregon to pathogens beyond SARS-CoV-2. Two additional pilots are currently underway to evaluate community-level WBE of influenza and cryptosporidiosis (the latter important, given Portland's unfiltered surface-water source of drinking water!). We are looking to secure funding for another pilot to validate a method for wastewater surveillance of antibiotic-resistant (AR) pathogens in higher-acuity care facilities in Oregon.

For this latest pilot project, OHA will partner with at least two (and up to six) higher-acuity care facilities to incorporate microsewered wastewater surveillance for AR pathogens in facility effluent as part of targeted sentinel-surveillance efforts. For the post-acute care setting, we will prioritize our one long-term acute-care hospital (LTACH) and one ventilator-capable SNF for recruitment in this pilot, followed by our SNFs that provide lower-acuity ventilator care. The pathogens tested during this pilot would be *Candida auris*, carbapenemase-producing carbapenem-resistant Enterobacterales (CP-CRE) (KPC, NDM, OXA-48, VIM, and IMP), and extended spectrum  $\beta$ -lactamase (ESBL)-producing organisms (CTX-M-15). We will work with CDC to ensure collection of the appropriate epidemiologic data from participating facilities for correlation with wastewater sampling data.

*Major Project Objectives:*

The objectives of this pilot would be to test the hypothesis that wastewater AR pathogen levels correlate with AR point prevalence survey data, and to explore whether WBE could be used as an early-warning system for increased circulation or outbreaks of AR pathogens at the facility level. Expected deliverables include a peer-reviewed presentation and publication, as well as an internal report with recommendations for future wastewater-based surveillance of AR pathogens in Oregon.

*Major Project Impact:*

The advantages of WBE for infectious disease surveillance are well described in the literature and include utilization of pooled community samples that can be analyzed in near real-time, capture of mild and sub-clinical infections that would be missed by diagnosis-based surveillance, and data collection that is independent of healthcare-seeking behavior and testing access. However, less is known about the feasibility of wastewater-based methods for surveillance of AR pathogens, particularly when their prevalence is low, which is the case for CP-CRE and *C. auris* in Oregon. This project will provide insights into the utility and limitations of WBE in supplementing diagnosis-based surveillance of AR pathogens that will help inform its implementation at OHA and by public health authorities in other jurisdictions.

**Additional Project #1 Title: Infectious Disease Complications of Injection Drug Use**

**Project #1 Type: Major Project**

*Project #1 Description:*

Although we discern reportable infectious diseases associated with injection drug use (IDU), we have yet to assess the massive and growing burden of non-reportable infections (e.g., endocarditis, vertebral osteomyelitis, epidural abscess) associated with IDU. The fellow will assess available data (e.g., hospital discharge data), collect data as necessary, enumerate the cases, and examine their association with other potential risk factors (e.g. age, sex, race, ethnicity, residence in a rural community, homelessness, lack of access to hygiene including clean needles).

*Project #1 Objectives and Expected Deliverables:*

The objectives of this project are to ascertain the burden of non-reportable infections associated with IDU, and to identify other associated risk factors. Expected deliverables include a peer-reviewed presentation and publication, as well as a presentation to the Healthcare-Associated Infections Advisory Committee (HAIAC).

*Project #1 Impact:*

To address the public health crisis of opioid and other IDU and associated infectious diseases, many experts have pushed for a new paradigm focusing on all aspects of prevention and control, while improving disease surveillance and ensuring

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access to integrated treatment. This project will provide a baseline understanding of the burden of non-reportable IDU-associated infectious diseases and guide decisions about their surveillance in the future.

**Additional Project #2 Title: Antibiotic Prescribing During Telehealth Visits in Oregon**

**Project #2 Type: Surveillance Activity**

*Project #2 Description:*

With the COVID-19 pandemic, telehealth has emerged as an increasing mechanism for healthcare services, but our understanding of antibiotic prescribing practices during telehealth visits in Oregon is very limited. For this project, the fellow will analyze antibiotic prescribing in telehealth from 2019 to 2022, comparing antibiotic prescribing practices between telehealth and non-telehealth visits, and looking at trends over time using all-payer-all-claims (APAC) data. To assess appropriateness of antibiotic prescribing, the fellow will review published guidance (such as the Antibiotic Use in Outpatient Settings report by the Pew Charitable Trust found here:

[www.pewtrusts.org/~media/assets/2016/05/antibioticuseinoutpatientsettings.pdf](http://www.pewtrusts.org/~media/assets/2016/05/antibioticuseinoutpatientsettings.pdf)) and will consult with CDC as needed to compare observed versus appropriate prescribing rates.

*Project #2 Objectives and Expected Deliverables:*

The objective of this project is to assess the observed and appropriate antibiotic prescribing rates during telehealth visits relative to non-telehealth visits. Expected deliverables include sharing of aggregate data on antibiotic prescribing in telehealth versus non-telehealth delivery mechanisms with stakeholders through presentations and published reports, including a peer-reviewed publication.

*Project #2 Impact:*

Telehealth use is expected to grow after the COVID-19 pandemic; this project will allow us to identify and understand trends in antibiotic prescribing practices, and guide future antimicrobial stewardship work in this emerging healthcare delivery mechanism.

**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 Coronavirus Response and Recovery Unit (CRRU), gathering and summarizing data to be used for decision making in emergency response. The fellow will also 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 ranges from 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 Epi Response Team,” investigating clusters and outbreaks one week a month. Additionally, the fellow will have the opportunity to participate in interesting cluster and outbreak investigations that arise outside of their “Urgent Epi Response Team” on-call periods. The time allocation for these activities is estimated at 10-15%.

**Please Describe the Fellow’s Anticipated Role in the COVID-19 Response – Include Activities and Time Allocation**

The fellow will have the opportunity to work with the Healthcare-Associated Infections Program’s Infection Preventionists in providing infection control consultation for COVID-19 outbreaks in healthcare settings, including long-term care facilities. The fellow will participate in 3-5 infection control consults and attend weekly HAI WRAP meetings, during which infection control questions and challenges arising from consults are discussed. The time allocated to these

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activities is estimated to be 5%, which may increase to 15% if they choose to participate in specific COVID-19 special projects funded by CDC.

**Please Describe Opportunities for Fellows to Work in Health Equity as well as Incorporating Diversity, Equity, and Inclusion into their Work**

In 2016, ACDP convened a health equity working group (HEWG) to identify and implement projects and priorities related to health equity in infectious diseases and preparedness. In 2019, we completed a Health Equity Assessment ([www.oregon.gov/oha/PH/DISEASES/CONDITIONS/COMMUNICABLEDISEASE/Documents/Health-Equity/ACDP-HE-Assessment-2019.pdf](http://www.oregon.gov/oha/PH/DISEASES/CONDITIONS/COMMUNICABLEDISEASE/Documents/Health-Equity/ACDP-HE-Assessment-2019.pdf)), which has been used to identify priority areas for the ACDP's 5-year strategic plan. Examples of work by the HEWG include awarding mini-grants to local public health authorities to support implementation of communicable disease projects that address community health disparities among groups that have experienced major obstacles associated with socio-economic disadvantages and historical and contemporary injustices, and analysis of reportable communicable disease data to identify those that have a disproportionate impact on certain racial and ethnic groups. The Fellow will have the opportunity to join the HEWG, which meets monthly to review health equity priorities and progress on specific equity-related projects. Additionally, the fellow will have the opportunity to examine equity-related variables that identify disparities in antibiotic prescribing if they choose to complete the evaluation of antibiotic prescribing during telehealth visits given that the APAC data elements include geographic variables such as an urban or rural flag, race, ethnicity, primary language spoken, and insurance payer.