ID: 74406454
Infectious Diseases - HAI, Infectious Diseases - Host Site Description
Oregon Health Authority

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

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

Secondary Mentor: Alexia Zhang, MPH
Program Leadership and Epidemiology Manager, 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, the fellow 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

The 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: Hepatitis C Patients and Follow-up care

Surveillance Activity Description:
Hepatitis C cases are reportable in Oregon from both labs and clinicians. Current treatment recommendations include an 8-12-week course of therapy given patient comorbidities. Following treatment, the patient should be tested again. The fellow will review available sources of data on cases following Hepatitis C infections to describe longitudinal trends for follow-up care rates among Hepatitis C cases. During this analysis, the fellow will also identify any factors that may be inhibiting access to follow-up care. Potential data sources include Oregon's ORPHEUS disease surveillance system, claims data, hospital discharge data (when such infections require hospitalization), Northwest Area Indian Health Board, and collecting data directly from centers.

Surveillance Activity Objectives:
The objective of this activity is to determine the number and proportion of Hepatitis C cases that received follow-up care following initial case investigations completed by local public health authorities. 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 for patients that are not being connected to follow-up care. Eighteen counties in Oregon are currently connecting Hepatitis C cases to follow-up care; OHA's goal is to make this approach universal among all counties in Oregon. Data from this analysis will be assessed to identify areas of potential intervention and needed resources from OHA moving forward, and to guide improvements in surveillance of Hepatitis C cases through updates to Oregon's ORPHEUS disease surveillance system.

Surveillance System Evaluation Title: Oregon's Antimicrobial Resistance Information Exchange (ARIE)

Surveillance System Evaluation Description:
Our interfacility transfer communication (IFTC) administrative rule (OAR 333-019-0052) requires that appropriate infection prevention-related precaution requirement documentation accompanies any transferred patient. In 2023, Oregon's HAI Program deployed Oregon's ARIE, utilizing the Collective Platform supported through PointClickCare, to automate electronic multidrug-resistant organism (MDRO) interfacility transfer alerts in notifying healthcare partners of patients previously colonized or infected with specific MDROs admitted to their facilities. The fellow will evaluate Oregon's AIRE based on CDC's guidelines for evaluating public health surveillance systems and CDC's interim guidance on AIREs.

Surveillance System Objectives:
The objective of the project is to assess the functionality and accuracy of the system, and to identify opportunities for improvement. The expected deliverable is the development of a continuous quality improvement plan.

Surveillance System Impact:
This activity will enhance Oregon's ability to share information of MDRO cases among healthcare facilities, help facilities comply with the state's IFTC administrative rule, and ultimately limit healthcare transmission of targeted MDROs.

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Major Project Title: Admission Screening Assessment of Oregon Healthcare Facilities

Major Project Description:
Eleven of 61 hospitals in Oregon conduct routine admission screening of patients for high consequence antimicrobial resistant pathogens like Candida auris and Carbapenemase-producing organisms, with varying screening criteria. For this project, the fellow will collect available admission screening data to analyze screening metrics across facilities. Analytic outcomes will include percentages of patients screened by facility, percent positivity of target organisms by facility, and the turnaround time for screening results for facilities. The fellow will also design and execute a survey for hospitals to assess factors that may assist or inhibit screening implementation. For hospitals that already screen patients on admission, the survey will assess staffing needs, aspects that work well, screening barriers, precautions in the absence of screening results for admitted patients, where samples are sent ("in house" vs outsourced testing), and any planned changes to current methodologies. For hospitals that do not screen patients on admission, the survey will assess perceived barriers to screening implementation.

Major Project Objectives:
Expected deliverables include sharing analysis results with responding facilities and OHA partners. Summaries of quantitative/qualitative data (survey responses) for admission screening successes and barriers with stakeholders through presentations and published reports, including a peer-reviewed publication.

Major Project Impact:
The goal of this analysis and survey is to understand what pathogens are being screened by different facilities, to what level is admission screening standardized across different facilities, and how OHA can best encourage more facilities to implement routine admission screening programs.

Additional Project #1 Title: PointClickCare data analysis
Project #1 Type: Major Project

Project #1 Description:
PointClickCare (PCC) is a health technology company that provides software to over 21,000 long-term care providers including skilled nursing facilities (SNFs) and assisted living facilities (ALFs) across the U.S.; including 86% of Oregon's long-term care facilities. Data will be purchased from PCC to initiate a scoping review of antibiotic use among long-term care facilities in Oregon. Initially, data will be used to calculate antibiotic days of therapy (DOT) per 1,000 resident days from 2018 to 2023. Comparison of results to other facilities across Oregon (and the United States) will help OHA establish criteria to identify and approach facilities for antibiotic stewardship interventions. Subsequent analyses will consider percentages of residents receiving antibiotics, common antibiotic classes that are prescribed, and diagnoses that are most prone to receiving antibiotic treatment. The current PointClickCare data includes both antibiotic orders and administration, and increased usage of ICD-10 codes. Lack of provider level data will not allow for provider level feedback, but our primary goal will be to identify facility-level patterns to guide facility-level stewardship.

We will also use this data set to compare with Oregon's All Payer All Claims (APAC) data to explore the feasibility of utilizing APAC data to capture LTC antibiotic use going forward. Specifically, we will explore whether place of service codes or LTC pharmacy NPI variables are useful for statewide or facility-level analysis of antibiotic use.

Project #1 Objectives and Expected Deliverables:
The fellow will collaborate with other HAI staff to lead analyses related to this project. The fellow will complete a report of this analysis to be posted on the OHA website. Presentations of results will include several groups, including Oregon's Antimicrobial Stewardship Network (ORASN), OHA's Healthcare Associated Infections Advisory Committee, and ACDP staff for data science training purposes.

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Project #1 Impact:
Following this project, OHA will use analysis results to design antibiotic stewardship activities in long-term care facilities. Understanding differences in prescribing practices by facility type, region, and diagnoses is key to knowing where increased antibiotic stewardship efforts are needed. This project will also serve as a first step to understanding how existing data sources in Oregon can be supplemented with PCC data.

Additional Project #2 Title: Antibiotic Prescribing for Acute Respiratory Tract Infections in Oregon
Project #2 Type: Surveillance Activity

Project #2 Description:
With the COVID-19 pandemic, telehealth 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 for acute respiratory tract infections (ARTIs) from 2022 to 2024, comparing antibiotic prescribing practices between telehealth and non-telehealth visits, and looking at trends over time using all-payer-all-claims (APAC) data. Previous APAC analyses identified providers in Oregon that were potentially overprescribing antibiotics for ARTIs. Those providers are being contacted for intervention. The fellow will complete a follow-up analysis (with current data) to both update OHA's estimates for ARTI prescribing, and to assess if provider outreach worked as an antibiotic stewardship intervention.

Project #2 Objectives and Expected Deliverables:
The objective of this project is to describe rates of antibiotic prescribing for ARTIs and to assess the observed 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 OHA to identify and understand trends in antibiotic prescribing practices, and guide future antimicrobial stewardship work in this emerging healthcare delivery mechanism.

Additional Project #3 Title: Wastewater-based surveillance of antibiotic-resistant (AR) pathogens
Project #3 Type: Surveillance Activity

Project #3 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. The successful collaboration of OHA with OSU and partners in public works has also facilitated the 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 have secured funding for another pilot to validate a method for wastewater surveillance of antibiotic-resistant (AR) pathogens in higher-acuity care facilities in Oregon. The target pathogens for this pilot are Candida auris, carbapenemase-producing carbapenem-resistant Enterobacterales (CP-CRE) (KPC, NDM, OXA-48, VIM, and IMP), and extended spectrum β-lactamase (ESBL)-producing organisms (CTX-M-15). CDC has approved the proposed collection methods for epidemiologic data from participating facilities for correlation with wastewater sampling data. Baseline (Year 1) wastewater data collection is currently underway. The fellow will assist with data analysis and management - testing the association between antibiotic resistant pathogen signals in wastewater and the presence of a known case.

Project #3 Objectives and Expected Deliverables:
The objectives of this pilot are 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.

Project #3 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.

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 Surge & Epidemiology Team (PSET), 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 to 10%.

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 fellow will also be a part of ACDPs "Cluster Buster" team. This is a rotating team of epidemiologists who are are assigned WGS clusters for investigation as they are identified by the Oregon State Public Health Lab. As part of their work on the HAI team, the fellow will also take part in investigations and responses for high consequence multidrug-resistant pathogens like Candida auris and carbapenemase-producing organisms. The time allocation for these activities is estimated at 10-15%.