Host site: Oregon Health Authority Acute and Communicable Disease Prevention

Assignment Location: Portland, Oregon

Primary Mentor: June Bancroft, MPH

Secondary Mentor: Shannon Allain, Bachelor of Science

Agency Description:

Oregon Public Health is a division under the Oregon Health Authority. There are three centers in the Public Health Division - Center for Health Protection, Center for Prevention and Health Promotion, and the Center for Public Health Practice. The Acute and Communicable Disease Prevention (ACDP) program resides in the Center for Public Health Practice along with the Oregon State Public Health Laboratory, HIV, STD and TB programs, Center for Health Statistics, Emergency Preparedness and Response, and the Immunization Program. The ACDP staff have grown during the pandemic and now over 60 staff work in ACDP on four teams: Informatics, Preparedness Epi and Surveillance, Health Care Acquired Infections, and water and foodborne Disease.

The ACDP Informatics Team, ‘METIS’ (Merging Epidemiology, Technology, and Information Systems), designs data systems and ensures that data exchange initiatives are sound, secure, interoperable with other public health information systems, responsive to user needs and are nimble enough to adapt to emerging public health threats. This team serves as the translators and bridge builders between epidemiologists, research analysts, local public health professionals, information technologists, health information system vendors and the broader healthcare community. The METIS Team ensures that appropriate technologies are available to facilitate data-driven decision making and has implemented data modernization activities to continue to strengthen workforce, data reporting, data management, and analytics. The mission of the Oregon Health Authority is lifelong health for all Oregonian’s and health equity by 2030.

The ACDP section works to identify how to promote equal opportunity to achieve the highest attainable level of health for all populations. In 2016, we convened an ACDP health equity working group which continues to meet monthly. This group advances health for people in Oregon by identifying and implementing projects and priorities related to health equity in infectious disease and preparedness. The principles used in ACDP’s approach align with the approach of targeted universalism as we reduce disparities for priority populations, we will improve overall well-being for our community. Opening with racial equity as a goal will promote equity for all people in Oregon.

It is expected that the following values and principle for ACDP are woven with in the goals, strategies, and tactics; 1.) Establish a clear section-wide awareness of health equity, and identify and address disparities through education, policies, and other actions. 2.) Leverage pre-existing architecture and
infrastructure. 3.) Be flexible to meet changes in the political, demographic, technologic, and environmental landscape. 4.) Leverage and engage with community partnerships 5.) Be proactive with prevention and build capacity to respond, rather than react.

Assignment Description:

The fellow will sit in the Acute and Communicable Disease Prevention (ACDP) Program and be a member of the ACDP Informatics team, ‘METIS’ (Merging Epidemiology, Technology, and Information Systems). METIS was informally established in 2015 and formally became a team with additional staff in 2020. This cohesive team is a mission focused yet agile group whose members are collaborative and flexible in prioritizing and completing systematic evaluations of informatics and data modernization activities. The METIS team also has a close working relationship with the Oregon State Public Health Lab.

The fellow will have ample opportunities to take part in data modernization activities, learn the inner workings of our robust surveillance data systems, create data visualizations, and perform quality assurance. We have a variety of specific projects the fellow can choose from; incorporation of spatial analysis tools, completion of HL7 Message Mapping Guides used for implementation of National Notifiable Diseases Surveillance System case notifications, build out visualizations from our newly created disease reporting SQL DataMart, be a part of the data quality improvement project to improve message format and population of data from ELR and eCR messages, participate in a METIS workgroup to create a roadmap for the development and implementation of FHIR, and collaborate with the METIS team to develop an “Informatics 101” course for all ACDP staff and the local public health staff who use our information systems. The fellow will be welcome to join the ACDP Health Equity Work Group. The fellow will participate in daily wrap sessions, system monitoring, regular METIS meetings, Data Modernization Initiative calls, CSTE workgroups and training calls, Association of Public Health Laboratories webinars and meetings, ACDP and OHA program training sessions, and the Data Science Training Team meetings.

Preferred Background & Skills:

The ideal fellow will have a background in informatics and database management as well as experience with electronic data exchange systems, data security, and messaging design and configuration. It will be important to have solid knowledge of health information technology data standards, Health Level Seven (HL7) including Fast healthcare Interoperability Resources (FHIR), Systematized Nomenclature for Human and Veterinary Medicine (SNOMED), Logical Observation Identifiers Names and Codes (LOINC), International Classification of Diseases (ICD), and other standardized and proprietary codes. The fellow should have experience working with some database, analytic and visualization tools such as; R, FileMaker, SQL, SAS, STATA or SPSS, Tableau or Power Bi, Windows Desktop and Server; Sybase mapping
and messaging applications; Orion Rhapsody Integration Engine; and file transfer protocol (FTP and sFTP). Oregon has been selected to participate in CSTE’s Data Science Team Training program. The project plan is to focus on designing and optimizing SQL views and tables to provide meaningful data for public health action using our Enterprise tools, a secured ArcGIS portal and internal/external tableau servers. A fellow with Spatial-temporal analysis experience will integrate nicely into this project.

What can the fellow expect to gain from 2 years at this host site?

A fellow will develop cross program knowledge of communicable disease surveillance data and code sets. They will gain skills in data visualization using GIS and Tableau, as well as tools to design public health data dashboards to drive policy decisions. With the agency goal of health equity for all Oregonians, the fellow will learn about additional data sources and sets that can be used with communicable disease data to display and analyze population health metrics associated with social determinants of health. They will be able to design SQL views to display data of interest to communicable disease surveillance and learn how to troubleshoot data workflows. The fellow will have significant interaction with CDC program areas and increased practical knowledge of SnoMED and LOINC coding as well as the ins and outs of HL7 reporting.

Potential Projects include:

Host sites have listed up to 5 projects

Project 1: Visualization of Communicable Disease Data for Public Health Action

This project will focus on data analysis and visualization, specific to our disease surveillance and laboratory systems. ACDP and OSPHL are leading the charge building an informatics workforce, and plan to host informatics fellows and interns to quickly respond to requests for information, integrate systems, share (when appropriate) complete and accurate data, and ultimately make the data we collect more accessible to health departments and the community. We plan to focus on designing and optimizing SQL views and tables to provide meaningful data for public health action using our Enterprise tools, a secured ArcGIS portal and internal/external tableau servers. This work will build upon our current systems using these products, incorporating more spatial analysis, hot spot detection, and alerting features. Additionally, data will provide the CD metrics to measure progress towards health equity for Oregonians by 2030. The team will develop methods to report on new Race, Ethnicity, Language and Disability (REALD) and Sexual Orientation and Gender Identity (SOGI) data that are required to be collected as part of a community initiative turned into senate bill. Objectives: Determine data to be used for public health action - Identify fields and create SQL views of Orpheus/Opera data for use in intervention/prevention activities Learn how to engage stakeholders in a development project - Participate/facilitate a user-based workgroup to design reports and views of the data. Increase proficiency in ArcGIS for cluster detection – Understand pros and cons of ESRI ArcGIS spatial cluster
detection tools, compare use of different tools to epidemiologically identified clusters and outbreaks. Determine parameters (time and space) for cluster detection for Salmonella, Shigella and Shiga-toxin producing E. coli. Deliverables: A performant database for viewing communicable disease data - Develop, test, optimize performance of SQL views Reporting/Analysis of REALD and SOGI data on communicable disease – Tableau

Our data are rich, we summarize and report on risks and exposure data via data exports and external analyses. We want to analyze co-morbid conditions and develop multi-pronged interventions based on data we have—conditions affecting those unstably housed, persons who inject drugs, those who are not vaccinated, or we are unable to reach. Data on REALD, SOGI and housing status data can give granular data for identifying population risk, but with GIS we can use external data to explore additional relationships. Dashboards will be available to share these data with stakeholders. Oregon is an emerging infections program site and visualization of active bacterial core surveillance (ABCs) data are used to understand the burden of these severe infections and to inform vaccine and other public health policies. For enteric pathogens, like Salmonella or E. coli, lab results can be delayed; by receiving information on ordered tests, investigators would be aware of cases in the pipeline.

Project 2: National Notification Diseases Surveillance System (NNDSS) Modernization

Objective: Continue implementation of HL7 Message Mapping Guides for NNDSS case reporting; The fellow will participate on team that is prioritizing implementation order of MMG work, collaborate with lead Epidemiologist for specific disease to create test cases, collaborate with Informatics staff to update scripts to produce properly formatted and populated messages, and engage with CDC to follow the step-by-step implementation plan for onboarding and production approval. Using MMG for reporting will be efficient and replace a more time intensive reporting process. Deliverable: MMG approved for production submission. In further detail, this work involves conducting a gap analysis of Orpheus data to the CDC standardized fields, gaining knowledge and experience with CDC systems for notifiable infections, including the message validation processing and provisioning system (MVPS). This CDC sponsored system receives, processes, and provisions data for national notifiable diseases. The Message Evaluation and Testing Service (METS) allows jurisdictions to validate HL7 messages against required vocabulary and programmatic standards. The CDC Secure Access Management Service (SAMS) manages user access to MVPS. Then building out the message using the CDC standard code sets. Once the messages are built, they need testing and validation in the production environment.

Message mapping guides help modernize case surveillance and improve accuracy of reporting as well as reduce reporting burden. NNDSS manages the case reports and in turn provides data on national notifiable disease to CDC programs responsible for national surveillance, prevention, and control of infectious and noninfectious conditions. NNDSS receives, processes, and provides data on national notifiable diseases to programs across CDC to do the following: identify outbreaks; track disease at the state, regional, and national levels; identify geographic areas of concern and provide decision makers with data; identifying groups most at risk; fund disease control activities; and help state and local public health departments better control disease.
Project 3: Informatics 101 Curriculum: Bridging Understanding

In the “Skilled Workforce” section of the 2021 Acute and Communication Disease Prevention (ACDP) Informatics Assessment, it was determined that workforce development was needed to improve the program’s level of understand of informatics principles, concepts, and methods. Understanding the concepts of informatics is critical to being able to communicate to partners and to scope projects and expectations appropriately. The team used the Public Health Informatics Institute’s guide, “Building an Informatics-Savvy Health Department: A Self-Assessment Tool”, to guide the assessment. A goal was set to create training materials for new and existing data system users to have the skills to effectively use information systems and tools, and the knowledge of how to identify and document needed system improvements Objectives: Seek guidance from the Oregon Health and Science University’s Informatics Department regarding a robust curriculum. Impart the value of the informatics process/principles Include information regarding role of a public health informatician to bridge IT, public health, epidemiology, health analytics, and policy Raise user skill level of data systems by increasing understanding of data sources, data processing workflow and system capabilities. Promote best practice use of the data and data systems. Deliverable: Training guide and course materials

Public health partners and program staff will more fully understand the importance of informatics work and be better able to articulate their needs regarding the data systems they are using and for the data sets to be utilized. This will assure that work in the data systems is being done most efficiently, effectively, and accurately.

Project 4: Modernize reporting of negative and preliminary ELRs

Objective: Create an analytical plan with lab and epi support to define evaluation metrics for communicating negative results to epidemiology (e.g., more timely, complete assessment of case status or outbreak response and control). Where relevant, align metrics with epidemiological case investigation guides and current laboratory methods for testing (e.g., order of tests). Use R, Python, or comparable machine learning tool to evaluate utility. Assess predictive value of negative results in epi case investigations. Pilot DevOps environments for scripting. Deliverable: Analytical plan, scripts, and overall summary of findings Objective: Create a workflow document diagraming how negative and preliminary ELR's are processed upon creation of record to linkage with case, including documenting manual steps. Identify how logic may change with moving to new environment. Deliverable: Workflow document Objective: Identify recommended changes to current surveillance logic based upon assessment of value of data and current workflow. Deliverable: Written plan with summary of recommendations Objective: Identify vocabulary (e.g., LOINC or SNOMED) gaps for reportable results. Deliverable: Complete vocabulary map

This project will align epi reporting needs with modernized laboratory reporting capabilities. The OSPHL is moving reporting logic from within the LIMS (Harvest) to the OPHD Rhapsody integration engine. With this move, the lab expects to have more flexibility in how individual tests and results are selected for reporting to state epidemiology and can potentially reduce complexity in the various systems now involved in filtering (e.g., rules within Harvest, rules within Harvest "Mapper" scripts external to LIMS,
and FileMaker systems in use by state epidemiology). This project will help the laboratory streamline how test results are reported from the Oregon State Public Health Laboratory to Acute and Communicable Disease Prevention (state epidemiology). Negative test results are communicated in the context of outbreaks, certain vaccine preventable diseases (e.g., Measles, Mumps) and for the purposes of identifying acute versus chronic disease conditions (e.g., TB). The process to identify and pull negative results from the laboratory information management system is complex and relies upon brittle infrastructure, and the lab has historically not had tools or staffing to design more streamlined reporting.

**Additional information about the placement:**

The project descriptions provided are a sample of those available to the fellow - we would like to assure that the projects they chose are of interest to them and are a good match to their skill set. The fellow will have many opportunities to partner with various programs across the agency and academic schools. We would like to enhance our partnership with the Informatics program at OHSU and the fellow will be instrumental in that effort. We are also applying for an additional CSTE AEF fellow to work on visualization of our outbreak data using Tableau. There are currently three AEF fellows working on various projects in ACDP, who work collaboratively with epidemiologists, METIS team members and academic partners.