Hawaii Department of Health

Assignment location:
Honolulu, HI
State of Hawaii
Department of Health / Disease Outbreak Control Division

Primary Mentor: Jonathan Johnson, Bachelor of Science, Computer Science
Epidemiology and Laboratory Capacity Information Technology Specialist/
State of Hawaii, Department of Health

Secondary Mentor: Hua (Howard) He, Ph.D in Economics
Research Statistician
State of Hawaii, Department of Health

Work Environment: 100% In-person

Assignment Description

Agency Description:
The mission of the Department of Health is to protect and improve the health and environment for all people in Hawaii. HDOH supports a diverse multicultural workforce that reflects the community, promotes equal opportunity at all levels, and creates an inclusive work environment, free from discrimination. The Disease Outbreak Control Division (DOCD), managed by the State Epidemiologist, is comprised of the Disease Investigation and Immunization Branches. DOCD leads the coordination and management of infectious disease and other outbreak or cluster investigations statewide. DOCD also plays a leading role in data modernization for HDOH. Our Data Science team has expanded in recent years with support from the Center for Disease Control and Prevention Epidemiology and Laboratory Capacity cooperative agreement, and seeks to promote interoperability, standardization of data elements, and a data-driven culture within our organization.

The purpose of interoperability in relation to HDOH is to further create seamless workflows between teams that might appear to be outwardly disparate in function. During our ever-current push towards data modernization, data flow becomes the bridge between all aspects of both health systems and informatic data systems. It is with this understanding that a large component of collaboration is based in creating a more encompassing understanding of role and group interactions. This continues to provide us the means to establish standardization where necessary as a base groundwork, while tackling unique issues inherent to specific arenas that might challenge only specific groups and/or teams within the
DOCD. The purpose of this approach is to fashion the ability to move swiftly in assessment of future crises as they occur, while maintaining long-term support for other critical workflows.

Current events have also shown the necessity to reach out, even more than before, to community organizations to deal in collaborative approaches. This also pushes the DOCD to think in new and more inclusive ways about which how we involve communal systems. This has and will continue to manifest itself centered around cultivating collaborations with universities across the state but also independent entities such as the Hawaii Data Collective. Following lessons learned through the COVID-19 pandemic, we hope to explore other ways of engaging the larger community in conversations about data modernization, such as through townhalls for interested parties outside of the Hawaii State Department of Health.

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

As our statistical program structure is fluid, we do not have a preference toward analytical software services or use. With that in mind, we do have access to the software and training elements inclusive of R and Python and are not adverse to branching out. The fellow will have access to a reporting system that pulls data directly from our back-end data warehouse as related to both Electronic Lab Reporting and Electronic Case Reporting. They will also learn how to run reports in-order to utilize the de-duplicated data inherent to our Maven surveillance system.

As our Informatics Team is considerably interoperable, there is also potential to work with other programs that the larger Data Science program services in which Informatics is situated under.

Any additional information about the placement: *none provided*

Describe the Preferred Background and Skills the Ideal Fellow For This Site Would Have:

The fellow will be expected to have a competent understanding of data science in a broad sense. As there are many new systems in place or being updated, the primary goal will be developing an initial understanding of how these systems interplay as well as extracting data insights from a wealth of information received through multiple channels. This can include the marryng of data sets in addition to providing actionable insights from the data retrieved.

Projects

**Project 1 Title: Electronic Test Order and Results (ETOR) Assessment Tool for Public Health Laboratories**

*Project objectives and expected deliverables:* Final roll-out of the ETORs System and Integration into current Electronic Lab Reporting Standards. The fellow will work from a conceptual level to implementation, both within HDOH and with Horizon (ETORs Vendor). Replacing the current Influenza and Sexually Transmitted Disease (STD) portals. This will require specific coordination of the fellow
between HDOH and Horizon. Communication will involve weekly meetings identifying the needs of the HDOH and conveying these concepts to Horizon, which will then update specifications explicitly. The fellow will be responsible for creating testing documentation, inclusive of feature validation, and distributing the information to the rest of the ETORs Teams.

Expected public health impact from this project: Currently the State Lab Division (SLD) transference of laboratory test data that is received from outside organizations (providers, etc.) goes through a complex data transport process. This is characterized by multiple translations of said data as well as transports among often redundant routes to maintain data integrity. The dissolution of this former process in favor of utilizing the ETORs platform, is the ability to streamline not only the way SLD receives and sends data but removing unique specifics to data conversion allowing a wider range of data received. This will be most obviously seen in widening the scope of ingested data such as the inclusion of clinical information not specific to laboratory testing across all interconnected data platforms. In a general sense, the way surveillance systems used to capture data relied on two different methodologies. Prior, surveillance systems would ingest data through data routes and rely on physical or mechanical conversations to import clinical data. ETORs allows for the combination of these two steps through a simplified and direct process. This also means in the future data expansions are more readily achieved cutting down on onboarding time and providing access to growth.

Project 2 Title: Epidemiological Data Approach to Hawaii Electronic Disease Surveillance System (HI-EDSS) Whole-Genome-Sequencing(WGS) Data Automation

Project objectives and expected deliverables: Build a denormalized database in HI- combine which includes administrative, demographic, and clinical variables. Extract whole-genome-sequencing antibody(ab) test data from the State Laboratory Division’s dashboard site. Merge the above by either person identifier or encounter identifier. Using SAS to clean the merged data and generate whole-genome-sequencing statistics.

Expected public health impact from this project: Hawai’i is a major travel destination. Many of the visitors arrive from overseas increasing the possibility that variants present overseas may be introduced into Hawai’i. Whole-genome sequencing (WGS) has become an essential tool for public health surveillance and molecular epidemiology of infectious diseases. Data automation of Hawaii Electronic Disease Surveillance System (HI-EDSS) and Whole-Genome-Sequencing(WGS) Data will enable Hawaii to detect mutations quickly to prevent the spread of new strain types and track the transmission routes of the virus globally.

Project 3 Title: eCR (Electronic Case Reports) Data Transport and Analytics Improvement Program

Project objectives and expected deliverables: Enhance data governance activities as it relates to Electronic Case Reporting (eCR). Support pressing public health challenges utilizing evidence based research on eCR data. Assist with coordination of efforts for implementation of eCRs from Electronic
Health Records (EHRs). Ensure production validation of eCR auditing and evaluation processes during and after onboarding. Provide more accurate methodologies on how we approach implementation for various diseases within the jurisdiction to support surveillance and public health action. Confirm onboarding messages are accurate with expected testing results.

Expected public health impact from this project: Electronic Case Reports (eCRs) and Electronic Initial Case Reports (eICRs) are foundational to providing an automated pipeline in which electronic health records (EHRs) from participating provider partners may flow via data transport into the State of Hawaii’s Department of Health program and disease groups, specifically centered around the Disease Outbreak Control Division.

This project will allow not only for the ingestion of data on a large scale, complete with actionable validation procedures and data optimization, but also the ability to perform statistical analysis on incoming data. This will allow more accurate information on perspective disease impact as well as monitoring trends, especially those centered around hospitalization.

Project 4 Title: Advancing health equity through FHIR

Project objectives and expected deliverables: The APHIF would work with the electronic case reporting (eCR) team to explore implementation of FHIR detailed race/ethnicity codes for standardized collection of disaggregated race/ethnicity from electronic health records.

Expected public health impact from this project: The COVID-19 pandemic has underscored pre-existing disparities in access to care and health literacy among various racial and ethnic groups in Hawaii. The pandemic has highlighted the critical need to collect accurate and timely information on race/ethnicity, disaggregated to a level that defines meaningful and discreet cultural experiences within the state. HDOH published an MMWR in February of 2021 that illustrated how aggregate reporting of "Native Hawaiian and Pacific Islander" categories based on established national reporting requirements obscured important differential disease trends occurring among specific pacific islander populations. HDOH is committed to setting a statewide standard for collection of disaggregated race/ethnicity, and recognizes the crucial role of implementing standardized and interoperable processes to capture high quality race/ethnicity data at the time of medical encounter. Collection of high quality data is the first step in providing evidence of inequities and understanding how to better address them.