**Washington State Department of Health**

**Assignment location:**
Tumwater, WA

WA State Department of Health

Office of Innovation & Technology | Informatics Program

**Primary Mentor:** Bryant Thomas Karras, MD, Biomedical Engineering (University of California San Diego), Medicine and Internal Medicine (University of Wisconsin) and Medical Informatics (Yale)

Chief Medical Informatics Officer

WA State Department of Health

**Secondary Mentor:** William Lober, MD, MS

Professor

University of Washington

**Work Environment:** 100% Virtual

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**Assignment Description**

**Agency Description:**
Washington State Department of Health programs and services help prevent illness and injury, promote healthy places to live and work, provide information to help people make good health decisions and ensure our state is prepared for emergencies. To accomplish all of these, we collaborate with many partners every day. We help ensure a safer and healthier Washington by: working to improve health through disease and injury prevention, immunization, and newborn screening, providing health and safety information, education and training so people can make healthy choices, promoting a health and wellness system where we live, learn, work, play and worship, addressing environmental health hazards associated with drinking water, food, air quality and pesticide exposure, and protecting you and your family by licensing healthcare professionals, investigating disease outbreaks and preparing for emergencies.

Our agency has centralized services under the Secretary’s office for many things like: information technology, budget, contracts, grants, human resources and facilities. Most of the programmatic work is performed in our four divisions: Environmental Public Health, Health System Quality Assurance, Prevention and Community Health and Disease Control and Health Statistics.

Our agency mission is equity and optimal health for all. Our mission is “The Department of Health works with others to protect and improve the health of all people in Washington state.” Our values are:
Human-centered: We see others as people who matter like we do and take into account their needs, challenges, contributions, and objectives.

Equity: We are committed to fairness and justice to ensure access to services, programs, opportunities, and information for all.

Collaboration: We seek partnership and collaboration to maximize our collective impact. We cannot achieve our vision alone.

Seven Generations: Inspired by Native American culture, we seek wisdom from those who came before us to ensure our current work protects those who will come after us.

Excellence: We strive to demonstrate best practices, high performance, and compelling value in our work every day.

Our current agency strategic plan focuses our leadership’s intention on the following transformational areas: outward mindset; funding; data, information, and technology innovations; and equity, diversity, and inclusion.

In addition to our primary and secondary mentors we also have on staff Chris Baumgartner, the Interoperability Director and Dr. Ravi Kafle, Senior Informatician. Chris has been with the agency over 10 years and has a lot of experience in standing up new solutions. He also is currently on the Interim Steering Committee for the HL7 Helios FHIR Accelerator for Public Health. Ravi is co-chair of the HL7 Public Health Workgroup and also co-leads the Helios project for aggregate data. Both Chris and Ravi will be helping the fellow with some of the projects outlined below and will be available to provide additional mentorship. In addition, Michelle Campbell the newly appointed DMI coordinator and Director of Center for Data and Systems Modernization will provide mentorship and assistance on project placement and support.

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

The fellow will be provided with R software packages, Rhapsody, Power BI, Tableau, REDCap, MS Office, MS Teams for collaboration and other software/tools as needed. Systems access will be granted based on the projects assigned and may include: our ELR system, Disease Surveillance System, electronic Case reporting systems and FHIR infrastructure tools we plan to implement. Access will also be provided to any appropriate databases for the projects assigned.

**Any additional information about the placement:**

While the fellow can move to WA State if they would like and be able to do some in person work our informatics staff are all working remotely.

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

For the projects we have identified our preferred background and skill would be: HL7 experience, REDCap, R/Python, Microsoft Azure Cloud Analytic Tools, Power BI, Tableau, Rhapsody, experience with various public health data including but not limited to: vital statistics data, electronic lab and case reporting and use of disease surveillance systems.
Projects

Project 1 Title: Developing electronic Case Reporting (eCR) Integration and WA Disease Reporting System enhancement or replacement

*Project objectives and expected deliverables:* This project’s goals is to fully integrate electronic case reports into the primary disease surveillance system at WA DOH (Maven). The deliverables include: working with the eCR team to implement core data elements into Maven; building out processes for onboarding healthcare organizations (including structural and content validation of HL7 messages).

As part of data modernization DOH plans to perform an environmental scan of available disease surveillance solutions. Work here could include surveying states, doing research and helping implement proofs of concept.

*Expected public health impact from this project:* Case reports have the ability to not only provide much better demographic and medical information for case investigation and surveillance (health equity) but to fill in missing gaps where electronic lab reporting does not identify a case for public health investigation. This project should greatly enhance WA DOH’s ability to support our LHJ and Tribal partners in preventing and controlling disease outbreaks and in better surveillance via the additional data available. It also provides more timely data from our clinics and hospitals vs. faxing case reports.

Our current disease surveillance system ran into many challenges during the pandemic as we dealt with extreme volumes of data that had never been anticipated. DOH is interested in surveying potential solutions that may scale better during responses.

Project 2 Title: Washington Tracking Program (WTN.DOH.WA.gov) Tableau dashboard including but not limited to Wastewater-Based SARS-Cov-2 Surveillance and Analytics

*Project objectives and expected deliverables:* One is to modernize the workflow for updating the community report Tableau dashboard published on the Washington Tracking Network. Dashboards currently are built using data extracts in Excel. The community report dashboard includes health outcomes, behaviors and access and preventive care from eight different data sources.

Secondly, to support the DOH Office of Resiliency and Health Security (ORHS) by automating the updating of measures from the U.S. Health & Human Services emPOWER dataset monthly on the Washington Tracking Network.

Additionally, the project supports the new Washington State DOH Wastewater-Based Epidemiology (WAWBE) program, monitoring for SARS-CoV-2 and other public health concerns through wastewater. The project’s goal is to integrate wastewater disease monitoring results, electronic case reports, and other pertinent COVID-19 disease data into an online dashboard for participating counties, tribes, and local health jurisdictions. The role of the fellow will be to help enhance the dashboard that used by DOH and local health jurisdictions participating in the program. Although initial efforts focus on COVID-19,
the program is expected to expand to other public health concerns including enteric viruses and multiple drug resistant organisms (MDROs).

*Expected public health impact from this project:* Community Report tool allows users to see a variety of health measures for a given geography. Data included are birth risk factors, cancer incidence, fertility, hospitalizations, mortality, pregnancy and abortion, sexually transmitted diseases, and health behaviors. The user can select which county(s) you would like data for, and which data you would like to see. Data can be viewed as a map or as trends over time and are available for download. The expected benefit of this project is to streamline the updating of these data so that they are available more quickly, and staff can focus on creating dashboards at additional geographies, including census tracts and accountable communities of health.

Many individuals live independently and rely on electricity-dependent durable medical and assistive equipment and devices, and/or essential health care services. These data are used by ORHS to help communities to better anticipate, plan for and address the potential needs of electricity-dependent at-risk individuals who may rapidly need assistance in the event of an incident, emergency or disaster.

Wastewater disease monitoring (WDM) supplements clinical testing for understanding disease spread in a community. Since WDM relies on wastewater (and everybody “poops”) it can be particularly helpful for communities where access to testing is limited, or in communities reluctant to engage in government-sponsored programs for testing. This project should greatly enhance WA DOH’s ability to support our LHJ and Tribal partners in monitoring disease prevalence in underserved communities, communicating public health messages to local health officers and the community, and preventing or controlling disease outbreaks.

**Project 3 Title: Making EHR Data More Available for Research and Public Health (MEDMorRPH), Expanding Chronic Disease Surveillance through Public-Private Partnership aggregate data from EHR (MENDS 2.0)**

*Project objectives and expected deliverables:* The goal of this project is to develop a shared platform for data owners and public health users to optimize data access for chronic disease surveillance while allowing data owners to retain control of their information. This solution builds on our existing MENDS program experience. DOH’s desire is a cooperative, jointly governed, private-public shared resource for health data analytics and public health chronic disease surveillance built using existing electronic health record (EHR) exchange standards (including USCDI and MEDMORPH for transport). Public and private sector partners would benefit through viewing both panel populations (each data owner) and the overall population-level surveillance (created content from state).

*Expected public health impact from this project:* Chronic diseases remain our greatest cause of premature morbidity and mortality. Related public health surveillance is needed to develop and evaluate appropriate prevention strategies, yet chronic disease surveillance has challenges. Current surveillance surveys are limited in scope, based on self-report, not timely, and suffering from declining response rates. A shared analytic platform with our clinical partners hosted at our state HIE has the potential to assist not only public health but many of our partners in more strategically being able to address chronic disease.
Project 4 Title: HL7 FHIR projects: SMART Health Cards for QR-coded vaccines + test results for proof in International travel, advanced directives registry, bulk FHIR-enabling Vital Statistics Death Reporting, and FHIR Situational Awareness for Novel Epidemic Response (SAN)

Project objectives and expected deliverables: COVID testing has largely shifted to OTC kits making surveillance and other public health activities challenging. As testing is continued to be required for entry to certain events, facilities or travel it becomes important to have a way to validate test results. WA currently has a SMART Health Card for Vaccines (WA-Verify) and would like to explore adding test results from the NIH operated Make My Test Count initiative. Their portal allows the public to enter their test results and provides the data to PHAs via APHL AIMS.

This project will describe how the extract, transform, and load (ETL) process will need to change in order to implement a FHIR-based transfer of data for vital stats. For this project, the fellow will 1) Identify what data elements are extracted from the Washington Health and Life Events System (WHALES) database 2) Describe how these data elements are transformed for the current transfer process 3) Identify any additional data transformations that may be required to comply with the new FHIR IGs 4) assist in developing test records to be used in the development/testing of a FHIR transfer. This is a requirement for WA DOH under the ELC DMI Tier 3 Grant from CDC.

Currently vital information from hospitals regarding their ability to respond to pandemics (bed availability, PPE, active cases, etc.) has to be manually entered by staff into a system maintained by the state. In WA State this system is called WA-Health (https://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/WAHealth) and is built on the Microsoft Dynamics Platform. To enable better interoperability, WA DOH would like to be able to automate this using the new FHIR IG for this called SANER (https://build.fhir.org/ig/HL7/fhir-saner/).

Expected public health impact from this project: Extending our SMART Health Card application to other DOH data sources will assist PHAs in reducing risk of infection and assist us in proving out how to further leverage the SMART platform to seamlessly deliver data to the public for their individual needs in compliance with ONC’s interoperability rules.

FHIR-enabling our reporting to the NVSS will ensure crucial information for national surveillance is delivered in a more timely, efficient manner with better data quality by leveraging the newest version of HL7 & FHIR. This work will also allow WA DOH to assess beginning to accept this data from hospitals via FHIR and the HIE. This would be a huge benefit in collecting the data for WA DOH and reduce the burden on clinical partners who currently enter the information twice (once in their EMR and once into the WA DOH system).

Expected outputs will be: layout of existing WA Health system components i.e. data input, process and output; mention the components and processes being added in Phase 1; write up of a comparative analysis of Phase 1 processes with Phase 2 plan under the following headings: Strengths, weaknesses, opportunities and threats; improving data automation for this vital information with at least 1 healthcare organization; and helping WA DOH demo our work at HIMSS - https://www.himss.org/global-conference.
Project 5 Title: Bluetooth Smartphone based digital Exposure Notifications (WaNotify) technical enhancements and evaluation

Project objectives and expected deliverables: WA Notify is the exposure notification solution in Washington State that works through smartphones to alert users they may have been exposed to COVID-19, without sharing any personal information. WA Notify was launched on November 30, 2020 and was activated more than 1 million times in the first week. Activations continue to grow and there have been more than 3.7 million activations since launch, representing nearly 62% of smartphones in the state. In partnership with the University of Washington, the DOH evaluates WA Notify’s impact using aggregated, anonymous data utilizing a modeling approach to estimate COVID-19 cases averted and lives saved by use of the tool. Evaluation of this innovative and complex technology requires new analytical tools and methods, including the Exposure Notification Private Analytics (ENPA) measurement system. The ENPA system that the National Institutes of Health supports, in collaboration with the MITRE Corporation and the Internet Security Research Group, provides additional data from a subset of users who opt-in to share usage analytics anonymously and securely with their PHA. Data obtained from the ENPA system is integral in evaluating the epidemiologic impact of this novel technology. ENPA data also provide real time insight into the utilization and reach of the tool, enabling DOH to make adjustments as needed to adapt to the changing state of the pandemic. Washington state is just one of twenty states that either currently utilize ENPA or are in the onboarding process, demonstrating the widespread use of ENPA data for EN system monitoring and evaluation.

The fellow will participate in expansions and enhancements to the system and learn how to evaluate and report to other jurisdictions assisting in the widespread adoption of this innovative Non-Pharmaceutical Intervention that also give us real time situational awareness of disease spread and secondary attack rate.

Expected public health impact from this project: WA Notify and exposure notification tools provide a layer of protection to prevent the spread of COVID-19. With the shift from widespread case investigation and contact tracing, WA Notify alerts users of COVID-19 exposures they may not otherwise be aware of so they may take protective measures to avoid infecting others. It also empowers individuals who are making conscious efforts to support the health of their community and reinforces public health behaviors that are critical to outbreak prevention. Exposure notification technology has proven that it can help prevent community transmission and save lives.