Host site: Arizona Department of Health Services Office of Environmental Health

Assignment Location: Phoenix, AZ

Primary Mentor: Laura Fox, BS, MPH

Secondary Mentor: Jennifer Botsford, BA, BS, MSPH

Agency Description:

The fellow will be based in the Environmental Public Health Tracking Program which is housed in the Office of Environmental Health within the Bureau of Epidemiology & Disease Control at the Arizona Department of Health Services.

The Arizona Department of Health Services (ADHS) is a state agency with decentralized county, tribe, and community partners that work together in the Agency’s mission to promote and protect the health of Arizona’s children and adults. ADHS’ vision is “Health and Wellness for all Arizonans.” ADHS seeks to strengthen the public health infrastructure and raise the standards for excellence in personal, environmental, and community health through direct care services, science, public policy, and leadership. ADHS has great fiscal responsibility as one of the largest departments in Arizona State Government, with an estimated budget of $500 million. Approximately 1,389 full-time ADHS employees around the state support communities in identifying, monitoring, and preventing adverse health events, providing vital healthcare services, responding to environmental emergencies, and licensing and certifying facilities and providers. ADHS protects public health and the environment through an array of programs and services.

ADHS groups each organizational function or service into a division. Our four divisions are Planning and Operations, Public Health Prevention, Public Health Preparedness, and Licensing. We offer a vast array of public health services. Some of the services provided by ADHS include: public health preparedness programs such as disease surveillance, emergency preparedness, environmental health, public health statistics including tracking of birth and death records through our vital records unit; public health prevention programs through tobacco and chronic disease programs, maternal and child health programs, Headstart, WIC and nutrition services; and health systems development that tracks primary care physician placement; additionally we oversee licensing of health care, long term care, child care, environmental labs, and ambulance services. We also operate a state of the art public health laboratory and the Arizona State Hospital, the sole public psychiatric healthcare facility.

Leaders at ADHS balance the need of each division and align priorities with federal and state initiatives. Our leadership also anticipates new strategic directions and effective public health partnerships across divisions, state agencies, the private sector, and federal partners. We are an accredited public health agency, and are heavily focused on quality improvement initiatives, workforce development, and
performance management as we strive to improve on the ten essential public health services we provide.

**Assignment Description:**

The fellow will be based in the Environmental Public Health Tracking Program which is housed in the Office of Environmental Health within the Bureau of Epidemiology & Disease Control at the Arizona Department of Health Services. The Office of Environmental Health serves as a resource for environmental health surveillance and epidemiology, food safety and environmental services, occupational health, childhood lead poisoning prevention activities, environmental toxicology, private well water safety, biomonitoring, and public health emergency response and planning for extreme weather events.

The fellow will have many opportunities to work on data and informatics projects as leader, team member, and independently with other programs housed in the Office of Environmental Health, including Climate and Health (CDC BRACE), Childhood Lead Poisoning Prevention, Food Safety, and Environmental Health Capacity Programs. The fellow will collaborate on projects with epidemiologists, program managers, health educators, PHAPs, sanitarians, and others on these projects. There will also be opportunities to work with the Arizona Syndromic Surveillance Program and GIS and Informatics Teams.

The Environmental Public Health Tracking Program has multiple groups that need to work together to accomplish grant goals. As such, team meetings will occur frequently so group members can discuss their work and develop and implement projects together. The fellow will be involved in these meetings and will have the opportunity to coordinate and lead efforts with external stakeholders. The fellow will also participate in monthly meetings with EPHT CDC Project Officer, Tracking Content Workgroups, and others that may support the work of the fellow.

The fellow will have a dedicated cubicle, computer, phone, email, standard office supplies, needed software (Microsoft Office, Adobe Professional, SAS, etc), access to network printers, ADHS network, internet, and intranet. The fellow will have the opportunity to work in-person, hybrid, or remotely during their fellowship. The fellow will be supported by an office chief, deputy office chief, program managers, senior epidemiologist, and program staff. The fellow will have the opportunity to network with other CSTE Fellows, CDC EIS Officers, and PHAPs assigned to the agency to encourage networking.

**Preferred Background & Skills:**

The fellow should have some background knowledge and skills in using statistical programming software like SAS or R, familiarity with epidemiology and surveillance methods, and utilizing lab data and/or
syndromic surveillance data. This assignment would be in environmental health, so candidate interest in environmental health topics such as occupational health, climate and health, extreme weather events, or food safety would be beneficial.

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

At the end of the fellowship, we hope the fellow will be able to have the knowledge, skills, and abilities outlined in the CSTE Core Competencies of an Applied Epidemiology Fellow (https://www.cste.org/page/CoreCompetencies) and be able to perform at a minimum the competencies associated with a Tier 1 Epidemiologist (https://cdn.ymaws.com/www.cste.org/resource/resmgr/Workforce/AECTier1.pdf). Some of these competencies include, identify surveillance data needs, support evaluation of surveillance systems, use statistical software to analyze and characterize epidemiologic data, maintain databases, and prepare written and oral reports and presentations that communicate necessary information to agency staff or other audiences. These skills will lay the foundation for future public health work.

Potential Projects include:

Host sites have listed up to 5 projects

Project 1: Heat-Related Illness Dashboard for CSTE DSTT Project

Problem statement: The Arizona Department of Health Services (ADHS) Environmental Public Health Tracking (EPHT) and Climate and Health Programs (C&H) have conducted heat-related illness (HRI) surveillance for several years to characterize HRI burden in the state by person, place, and time. These programs have partnered with the ADHS Syndromic Surveillance Program over a number of years for collaborative projects such as building dashboards in NSSP ESSENCE to share with under-resourced local health departments (internal facing dashboards) and using syndromic surveillance data to conduct near-real time surveillance to enhance public health messaging, such as through heat alerts and social media posts. In the past couple years, public health partners and media have requested information from ADHS on current HRI ED visits, hospitalizations, and deaths. A challenge that our programs face is that traditional data sources such as hospital discharge data and vital records data experience months to year lag in reporting. We propose developing a public facing dashboard for HRI using syndromic surveillance data. Proposed methods: An internal-facing HRI dashboard will be built as an initial step to gain consensus from local health departments and stakeholders, to gather feedback and evaluate its usefulness in monitoring HRI in Arizona. Similar public facing dashboards have been published using syndromic surveillance data, including CDC’s Heat and Health Tracker, which displays HRI ED visit data by HHS region, and Maine’s Heat Illness Data Dashboard, that displays count and percent of ED visits by county. We would use these dashboards as models for this project. The second part of the project would be to publish the public dashboard, using feedback from the internal dashboard review and inputs from
data stewards. Note: This project was identified for the CSTE DSTT group project in our December 2021 application. The fellow would become a member of the team. Expected outcomes: This project will address the Data Modernization Initiatives priority of accelerating data for action by identifying and using timely HRI data at a locally-relevant scale to monitor trends in Arizona during summertime months. Expected outcomes of this project include (1) trained epidemiology staff and team in data science and expanded skill set in data visualization and programming skills. (2) an internal and public dashboard for state/local health department staff to utilize to monitor, analyze, and act on HRI trends, (3) increased collaboration, communication, and partnership between internal/external partners.

The primary outcome of this project will be a public facing dashboard that displays heat-related illness ED visit data from syndromic surveillance data in near-real time. Data will be displayed in a map by county, over time as daily percentage or counts, and by demographic factors (age, sex, race/ethnicity, etc.). Data displayed in this fashion will be accessible to state and local health partners for timely response to heat illness in summertime months. Key messaging will also describe prevention measures and other resources such as information on the nearest cooling center. The anticipated public health impact of this project will be near-real time information on HRI, situational awareness for public and public health partners, fulfill media requests for information, and target public health interventions and prevention messaging. At the completion of this project, improvements will be made with regard to timeliness of HRI information, increased transparency, improved interagency relationships, and ability to use this data and information to apply for grants/funding for climate sensitive populations.

Project 2: Update Targeted Lead Screening Tool - “Does my child need a blood lead test?”

The Arizona Childhood Lead Poisoning Prevention Program worked with the Environmental Public Health Tracking program to develop an interactive lead poisoning risk map to display census tracts (neighborhoods) where populations are at increased risk for lead poisoning in 2018. The application titled “Does my child need a blood lead test?” was published in 2018 utilizing 2011-2015 blood lead surveillance data reported for children under the age of 6 years to the Arizona Department of Health Services. Risk factors associated with lead poisoning were identified using ACS data. Predictive probability of risk was calculated for each census tract. Housed within this tool (https://azdhs.gov/gis/childhood-lead/), a user can search for their census tract using an address or zip code and identify their child’s risk and recommendations to mitigate exposure. This tool has not been updated since it’s initial release. We propose that this risk tool be updated to version 2.0 with the most current blood lead surveillance data available. This project will bring together epidemiologists from both programs as well as members of the GIS team to build a new tool and work through nuances in the data that were not present before. The expected deliverables would be (1) Identify at-risk geographic neighborhoods and populations for childhood lead poisoning based on recent data (2) develop a new risk tool for parents, medical community, and the public can use to evaluate childhood risk to blood lead poisoning and (3) create a repeatable process for future years of data to update risk tool by documenting the process and other complementary documentation like SAS programs.

This project will provide many public health benefits: (1) Support the work of the Childhood Lead Poisoning Prevention Program grant, (2) Update a tool utilized by parents and the medical community to
evaluate childhood risk for blood lead poisoning, (3) Increase inter-program collaboration between several ADHS programs, (4) provide an opportunity for the fellow to lead a project based on public health lab data.

Project 3: Biomonitoring Study Data Tableau Dashboard

The Arizona Department of Health Services Office of Environmental Health received funds through CDC Grant “State-based Public Health Laboratory Biomonitoring Program” and participated in the Four Corner States Biomonitoring Consortium, a collaboration between Arizona, Colorado, Utah, and New Mexico, from 2015-2019 to collect urine specimens and water samples to test for heavy metals, phthalates, and pesticides from private well owners. The primary objective of the consortium was to generate science-based information that would lead to relevant public health policy to address several Healthy People 2020 Environmental Health objectives to improve to ensure safe drinking water, reduce pesticide exposure, and reduce exposure to metals including arsenic, cadmium and mercury. Study participants completed a questionnaire regarding several different exposure categories such as water sources in the home and diet. Participants were notified of their individual results once testing was complete. Over time, data has been stored in several locations as staff turnover during the study period occurred and new sampling results became available. To examine these data, staff worked to create a de-identified database of all sample and survey results during the study period in Summer 2020. Data was initially summarized in aggregate in Summer 2020 as well as initial analysis comparing survey results and sampling results. ADHS OEH partnered with University of Arizona colleagues to summarize the survey and sampling results. The initial sampling data in aggregate has been made publicly available but we would like to make the survey data available as well. Other states who have participated in this project have successfully created dashboards making their data available and bringing awareness to heavy metal exposures of private well owners. This project will include (1) create a final database of all survey and sample results, (2) complete analysis of survey data and sample data, (3) prepare data for visualization in a Tableau dashboard for display on the OEH Biomonitoring Study and Tracking websites, and (4) work with internal partners from the Tableau and Informatics team to develop a Tableau dashboard for this data.

This project will bring transparency to the Biomonitoring Study conducted in Arizona by publishing data in aggregate on our public facing websites and serve as a resource for private well owners to understand their exposure risk, ultimately reduce or eliminate exposure to environmental chemicals by helping at-risk populations assess risks and intervention programs.

Project 4: Census Tract Data in EPHT Data Explorer

Stakeholders in the EPHT Technical Advisory Group (TAG) meetings have identified more locally-relevant data at census tract level as beneficial to their work. During the Fall 2019-2021 data submissions, the EPHT Program piloted submitting census tract level data to the Centers for Disease Control and Prevention (CDC) for heart disease hospitalizations and asthma emergency department visits from 2010-2020. This data was validated and reviewed by CDC, EPHT Staff, and ADHS data stewards and found to be sufficient to proceed with publishing to our state EPHT Data Explorer. This project will explore how
and when to build consensus in the agency, including data stewards, data scientists, and leadership, to explore how to publish census tract level data in the Environmental Public Health Tracking (EPHT) Data Explorer. Health outcome data will be prioritized based on input from the EPHT Technical Advisory Group (TAG) and ADHS partners. Once published, initial datasets will be evaluated for use amongst partners and identify improvements and updates on how data is presented within the EPHT Data Explorer. This project aligns with EPHT grant deliverables and expands the Tracking Network in Arizona. Expected deliverables include datasets displayed at census tract level or smaller sub-county scale (like CDC’s 5k and 20k geographies), associated metadata files, and established routine processes for publishing census-tract level data at ADHS.

The public health impact of this project will be locally-relevant data made publicly available and displayed on the EPHT Data Explorer, as requested by partners and members of the EPHT Technical Advisory Group.

**Additional information about the placement:**

No additional information provided.