Infectious Diseases, Substance Use/Mental Health

Maricopa County Department of Public Health, Division of Disease Control, Office of Epidemiology

Phoenix, Arizona

Assignment Description

Maricopa County, Arizona, is home to approximately 4 million residents (61% of Arizona's population), making it one of the largest local public health jurisdictions in the country. For comparison, the county's population is larger than the population in 24 U.S. states. Due to its size and geographical location, the county faces unique public health challenges. The Maricopa County Department of Public Health (MCDPH) exists to address these issues and to protect and promote the health and well-being of its residents and visitors.

In May 2016, MCDPH received public health accreditation. To become accredited, health departments must demonstrate that they meet the Public Health Accreditation Board’s (PHAB) standards, which reflect the ten essential services of public health. By going through this process, MCDPH identified areas for improvement, restructured segments of the organization, and updated its systems to provide the highest quality public health services for the county. MCDPH is one of the largest local health departments in the country to receive the honor. The Fellow will find MCDPH’s culture of high performance and quality a great environment for working with credible, nationally-recognized experts in the field.

The Fellow will be assigned to the MCDPH Division of Disease Control, Office of Epidemiology. The office is responsible for managing data requests, publishing weekly and annual morbidity and mortality reports, complex data analyses (e.g., return on investment studies or geo-spatial analyses), establishing syndromic surveillance protocols, conducting community health assessments, preparing grant proposals, and writing/contributing to the publication of scholarly manuscripts. The office is also responsible for monitoring emerging and zoonotic diseases, interviewing patients with notifiable diseases, conducting outbreak investigations, and providing MCDPH and community partners with solutions for disease control and prevention. The Fellow will work closely with members from across the office, so he/she improves skills in patient interviews, outbreak investigations, surveillance, study design, data management, statistical analysis, interpreting results, and disseminating findings.

The Fellow will focus on learning the goals and operations of the health department, completing Fellowship projects, expanding his/her applied epidemiology skill-set, and attending internal and external meetings. The Fellow will meet with the primary mentor on a weekly basis to discuss progress on training goals and project assignments. The mentors and other staff will support the Fellow as he/she manages data, monitors data quality, performs analyses, interprets findings, and prepares reports. At the end of the first year, the Fellow will meet with the mentors to report on the progress of major projects. If sufficient progress has been made, the Fellow may propose a special project that is geared toward his/her interests.

The mentors are dedicated to expanding the skill-set of the Fellow so he/she is prepared for launching a career in applied public health. In addition to expanding public health-specific skills, the mentors will work with the Fellow to polish his/her cover letter, personal statement, and resume/CV, as well as develop skills in preparing grant proposals, protocols, reports, manuscripts, and presentations.
**Day-to-Day Activities**

Local health departments must adapt to shifting public health priorities. Thus, the Fellow should expect variety in their work activities from day-to-day.

At the onset of the Fellowship, the mentor and Fellow will establish timelines for completing the surveillance evaluation and major projects. This will include a discussion regarding goals for producing deliverables (e.g., presentations and reports) and what the Fellow hopes to learn from the project. Each day, the Fellow will be responsible for managing these projects in order to meet deadlines. The beginning of the Fellowship will focus on training to orient the Fellow with data sources, statistical packages, and team operations as a whole. As the Fellow becomes familiar with MCDPH procedures and protocols, the Fellow will manage their time and projects more independently. Mentors will monitor the work and make adjustments as necessary.

During special events, such as outbreaks, large-scale scheduled events, or public health emergencies, the Office of Epidemiology will shift its priorities, and the Fellow will be asked to participate in departmental activities. These activities may include patient interviews, outbreak investigation analyses, or disease control and prevention initiatives.

The Office of Epidemiology is dedicated to professional development for all staff. The Office holds regular meetings to communicate recent projects and seminars to provide scientific updates in the field. Employees have created their own in-house classes to discuss best practices for using analytical methods / software and how to apply these to their current work (e.g., statistics, SAS, R, and GIS). The Fellow will be encouraged to attend meetings, seminars, and continuing education opportunities to expand his/her own skill-set and successfully complete assignments and projects.

**Potential Projects**

**Surveillance Activity Situational Awareness Using Traditional and Syndromic Surveillance**

Surveillance is an essential public health activity. MCDPH relies on traditional surveillance (e.g., notifiable disease reports, hospital discharge diagnoses, and community surveys) as well as syndromic surveillance (e.g., school absentee records, 911 and poison control center call logs, and real-time patient visit data) to maintain situational awareness in the county. Over the course of the Fellowship, the Fellow will rotate through the office and work with nurses, disease investigators, data analysts, and epidemiologists to gain experience in conducting patient interviews, managing outbreak investigations, analyzing data, writing reports, and sharing findings at local, state, and national meetings. In the process, the Fellow will become intimately familiar with the means through which MCDPH systematically acquires data related to infectious diseases, environmental exposures, injuries, chronic diseases, death, and their risk factors; designs epidemiological studies; selects appropriate statistical methods to carry out real-world analyses; writes SAS programs to carry out tasks; develops reports; and uses data to make public health decisions.
**Surveillance Evaluation**

Evaluate Maricopa County’s One Health Disease Reporting System to Determine its Utility in Monitoring Antimicrobial Stewardship Activities and Practices

The CDC estimates that around 2 million people acquire an antibiotic-resistant infection each year in the United States. Antibiotic use in both companion and food animals can contribute to this growing problem.

The Maricopa County Department of Public Health Office of Epidemiology (MCDPH OE) utilizes zoonotic partnerships to monitor the transmission or potential transmission of infectious diseases in Maricopa County. Participating agencies are asked to communicate any incidents of public health concern communicated to MCDPH OE through appropriate channels for further evaluation. This partnership allows for a robust, multisectoral surveillance and response system, achieving optimal health outcomes for people, animals, plants, and our environment. MCDPH OE is looking to strengthen this reporting process and extend its application to antimicrobial stewardship among the One Health community.

The Fellow will use CDC’s guidelines for evaluating public health surveillance systems to evaluate MCDPH One Health surveillance processes. Based on the evaluation, the Fellow will outline opportunities for incorporating One Health antimicrobial stewardship surveillance in Maricopa County, AZ.

**Major Project Illicit Drug Use and Infectious Diseases in Maricopa County**

Drug overdose deaths continue to increase in the United States, and CDC is committed to supporting state, local, and territorial health agencies to prevent these deaths. MCDPH is one of 15 city/county health departments funded through the CDC’s Overdose Data to Action (OD2A) grant, which aims to increase the timeliness and comprehensiveness of data and to use those data to inform public health response and prevention activities. The MCDPH Office of Epidemiology is responsible for three major surveillance initiatives that will help the county understand issues related to drug use, overdose, co-occurring health conditions, and access to healthcare. These activities include: (1) interviewing patients who are positive for hepatitis C virus; (2) interviewing patients who experienced a non-fatal opioid overdose; and (3) assessing the health and experience of special groups in the community who use substances.

Arizona administrative code requires providers to report suspect or confirmed cases of Hepatitis C virus (a proxy for injection drug use) and opioid overdose (non-fatal and fatal) to the local health department. MCDPH uses these reports to track the number of patients with each condition in our county but has not had the bandwidth to investigate these cases. Through interviews, MCDPH will gain insight into patients’ medical history, behavioral risk factors, substance use patterns, and access to substance use disorder treatment or harm reduction services. Enhancing surveillance will help the county measure the impact of linkage to care initiatives on health outcomes.

MCDPH is currently participating in the statewide vulnerability assessment funded by the 2018 CDC Opioid Crisis Cooperative Agreement. To complement the state analysis, MCDPH employed a community survey based on methods used by CDC’s National HIV Behavioral Surveillance (NHBS) to both estimate the number of people who inject drugs in the county and assess their health and experience.
More than 650 people responded, and preliminary analyses suggest underrepresentation from groups with known susceptibility to substance use disorder (e.g., people who engage in sex work, people experiencing homelessness, and those who identify as LGBTQ). This hampers the ability to develop targeted, timely and appropriate evidence-based drug policies and interventions for these community members. MCDPH plans to develop an ongoing and systematic collection and analysis of data to identify baseline risk behaviors, prevention service utilization, and access to care, with attention to subpopulations underrepresented in the ongoing community survey.

The Fellow will assist in data collection and analysis to understand the association between drug use and infectious diseases in Maricopa County. Activities will include supporting the team with patient investigations, survey design, sampling in the field, survey distribution, incentives for participation, and data management and analysis. With over 4 million residents, MCDPH is the third largest local public health jurisdiction in the U.S. The Fellow will be in a unique position to conduct surveillance and analyze data in a large, diverse community.

**Additional Project: Assessing Maricopa County Services for Women Who Use Opioids**

The United States is experiencing a national epidemic. Pharmaceutical opioids and heroin overdose deaths have continued to increase annually for more than 15 years. Our nation now loses more than 90 people to opioid overdose death every day. Hundreds more are hospitalized for non-fatal overdoses and other opioid-related complications.

Arizona’s governor declared the opioid epidemic a public health emergency on June 5, 2017. In response, Arizona Department of Health Services began collecting real-time data on suspect opioid deaths, suspect opioid overdoses, neonatal abstinence syndrome, and life-saving naloxone administration. These surveillance data helped the state agency produce a list of recommendations for reducing the incidence of opioid overdose, which included increasing access to medication-assisted treatment (MAT). However, overdose is just one of many health outcomes associated with this epidemic. To name a few, people who use opioids report more food insecurities, mental health disorders, risky sexual behavior, and less access to family planning and prenatal care, compared to those who do not use opioids.

The goal of this project is to assess the local availability of services for women who use opioids by surveying MAT facility clinicians and community organization leaders in Maricopa County. With stakeholder input, the Fellow will develop a survey that asks MAT clinicians and community organizations about their on-site services, referral procedures, and special challenges in providing care in Arizona. Specifically, we plan to ask about: overdose treatment, routine healthcare, emergency healthcare, mental health counseling, social services, reproductive services, infection prevention, harm-reduction, and evidence-based public health interventions. The assessment will include questions about programs that specifically address family planning and prenatal care. The methods for this pilot project are adapted from work by a former CSTE Applied Epidemiology Fellow in Louisiana that assessed opioid treatment centers’ capacity to address reproductive healthcare needs.

The Fellow will calculate descriptive statistics of the survey results and summarize key findings in a final report. The report will provide perspectives from two professional groups (MAT clinicians and community organization leaders) on issues related to care and prevention services for women who use opioids in Maricopa County. It will also provide a public health perspective on opportunities for
improvement and potential next steps. Findings from the report may also be presented at local or national meetings and or published in a scholarly journal article if so desired.

**Additional Project Analyzing the Costs and Benefits of Hospitals’ Community Benefit Spending On Maternal And Child Health**

To retain their tax-exempt status, nonprofit hospitals are required by federal tax law to contribute to population health through investment in or provision of community health services. Qualifying expenditures include improving access to services, providing free or low-cost clinical care, and advancing medical knowledge. Under the Affordable Care Act, nonprofit hospitals must also conduct community health needs assessments every three years and develop plans to address those needs. Several local hospitals have partnered with MCDPH to identify the county’s top public health needs. Maricopa County’s 2017 Coordinated Community Health Needs Assessment (CCHNA) identified "access to care", "access to healthy food", and "early childhood development", as the three top priorities for improving local community health. In response, local hospitals are spending money on goods and services that impact maternal or child health.

The goal of this project is to determine whether investments by Maricopa County’s nonprofit hospitals are making an impact on health. The Fellow will work with the MCDPH health economist to carefully review hospital reports on community benefit activities and spending. The Fellow will also perform primary data collection to assess the availability, scope, and populations served by hospitals’ community health services for maternal or child health. The Fellow will prepare a summative assessment of the costs and benefits of nonprofit hospitals’ community health spending as it relates to maternal and child health in Maricopa County.

Through this project the Fellow will gain experience in health economics epidemiology, health policy and administration, and community health needs assessments.

**Preparedness Role**

Maricopa County is home to 4 million people and several large venues, which hold major events. Recent events include: NCAA Final Four, Super Bowl, BCS National Championship, Fiesta Bowl, and the PGA Tour’s Waste Management Open. The Fellow will have an opportunity to use syndromic surveillance systems to monitor all hazards during public health emergencies or scheduled large-scale events.

The Office of Preparedness and Response (OPR) and the Office of Epidemiology are housed in MCDPH’s Disease Control Division. The Offices are located in the same office suite, which helps facilitate the exchange of knowledge, staff, and resources. The Fellow will have opportunity to participate in emergency preparedness and response initiatives, such as the annual Preparedness Expo, tabletop simulations, Point of Dispensing (POD) evaluations, and Incident Command Center (ICC) activation. The primary mentor will arrange for the Fellow to be trained in FEMA’s Incident Command System (ICS) and National Incident Management System (NIMS).
**Additional Activities**

In addition to the above-mentioned projects, there are many projects available for a motivated Fellow. The MCDPH Office of Epidemiology is a large, diverse group of epidemiologists, analysts, nurses, investigators, and senior managers that works closely with local universities and community organizations. Our team members regularly propose new projects that require varying degrees of leadership and support from the office. You may elect to participate in projects that align with your interests. Current projects with opportunities for you to contribute to include:

- Syndromic surveillance queries for special populations: pregnant women
- Developing a surveillance system for latent tuberculosis infections
- Evaluating respiratory syncytial virus (RSV) infection surveillance in Maricopa County
- Comparing sensitivity and specificity of rapid influenza test kits
- Bridging Climate Change and Public Health in Maricopa County
- Assessing lead levels in subsidized housing
- Reviewing policies for the Health Information Exchange

We, as mentors, are dedicated to preparing you to become a competent, well-rounded public health professional. Together, we will discuss a plan for applying the skills you gained in school to real-world scenarios. If you feel that you are not gaining specific skills during day-to-day activities, projects, or rotations, then we will strive to provide the appropriate experiences.

**Mentors**

**Primary**  
Jessica White DrPH, MS  
Public Health Scientist

**Secondary**  
Melissa Kretschmer CVT, MA  
Epizoologist