

Subject Area: Infectious Disease

Assignment Description

The Arkansas Department of Health (ADH) is a single centralized health department serving Arkansas' entire diverse population of 2.9 million people. The Fellow will be stationed in the central office campus in Little Rock in our Infectious Disease (ID) branch which includes the immunization program, vaccine preventable disease response, tuberculosis, STDs, HIV, hepatitis, food-borne diseases, healthcare acquired infections, zoonotic diseases, arthropod borne diseases, and bioterrorism preparedness.

We anticipate that the Fellow's primary duties would fall within the purview of the Communicable Disease and Immunization Section. However, a major strength of our billet relates to the breadth of potential projects and widespread interest and support among our staff. Every effort will be made to accommodate a Fellow who has interest in other ID areas as well as non-ID areas such as environmental health, chronic disease, injury, or health disparities. Our current Fellow's major project involved designing and implementing a hepatitis C surveillance program, and her minor projects to-date include: an ecologic investigation of influenza vaccination coverage and school absenteeism, evaluation of our pertussis surveillance system, investigation into factors associated with vertical transmission of HIV, and an enormous multi-species outbreak of salmonella in the Arkansas prison system.

Experience in statistical analysis, geographic information systems, survey design, and health literacy would be beneficial but is not required. A positive attitude, good communication skills, and a willingness to learn are essential.

Day-to-Day Activities

The Fellow will participate in ongoing surveillance activities, outbreak investigations, formal evaluations of our surveillance systems, manuscript development, and special projects as opportunities arise.

While not common, some in-state travel is expected - so an active, unrestricted driver's license would be helpful.

The Fellow will also be expected to attend weekly communicable disease/epidemiology meetings, public health grand rounds, and meetings with mentors/advisors. The Fellow will be encouraged to attend weekly ID fellow lectures, SAS classes, and College of Public Health lecture series.

Potential Projects

Arkansas has unique opportunities for infectious disease research. Our state has the highest rates of ehrlichia, the 2nd highest rates of tularemia, and among the highest rates of STDs and animal rabies in the US. Our tuberculosis control program has been a national leader in the creation of diagnostics and evaluation of therapies. We were early to recognize the problem with immunization exemptions and we've just reestablished a hepatitis C surveillance program and are investigating taking on the role of screening large numbers of baby boomers for infection. Opportunities for interesting and impactful

work abound. What follows are some examples, but this list is not intended to be exhaustive. Other opportunities are also available.

Immunizations:

In 2013, we implemented a new immunization registry. Through an unfortunate arrangement with our previous vendor, we never before had access to individual level data for research purposes. Now that we do, numerous potential projects are conceivable. We could geographically link the prevalence of immunization exemption with illness data. We could investigate school vaccination coverage and geotemporal rates of illness. We could identify areas with high exemption rates and implement an educational campaign. State law recently allowed the registry to retain information on individuals over 21 years of age. We could investigate the trends of use of the registry for adult patients by adult providers and target interventions accordingly.

CD & Foodborne Diseases:

Within communicable disease, there are many opportunities for surveillance improvement projects. In particular, we have unusually high endemic rates of infection with shigella and salmonella genera in Arkansas, and would benefit from describing species-specific geotemporal trends. As clusters of salmonella or shigella are identified, the Fellow could perform detailed investigation to identify potential common exposures or behaviors that may be incorporated in future investigation forms. We would also benefit from evaluating timeliness and completeness of shigella and salmonella investigations from initial reporting, posting for investigation, starting the investigation, completing the investigation, designation of case status, serotyping, pulse field gel electrophoresing (PFGE), and uploading to the national PFGE database.

Outbreaks:

It is not uncommon for outbreaks of foodborne disease or vaccine preventable diseases to occur, and we would encourage the Fellow to actively participate in them. Recent outbreaks have included, but are not limited to: salmonella in the AR prison system, shigella in NW AR, histoplasmosis in NE AR, cryptococcosis in a community hospital, influenza in a cancer treatment center, novel influenza at a county fair, and investigation into unsafe injection practices at an impaired dentist's office. We regularly participate in multistate outbreak investigations as well. Recent multistate investigations include fungal infections associated with steroid injections, and listeria and salmonella associated with contaminated food products.

Hepatitis C Virus:

The current Applied Epidemiology Fellow designed and implemented our current hepatitis C surveillance system and surveillance strategy. An incoming Fellow could evaluate the system to identify and implement improvements to data quality and case surveillance protocols. Additionally, the Fellow could use our current surveillance strategies to conduct surveillance of another group, such as persons born 1945 – 1965 (a group recommended to receive screening for hepatitis C), incarcerated individuals, dialysis patients, blood donors, individuals co-infected with HIV or hepatitis B, or other groups depending on the Fellow's interests. The fellow could also design and conduct a survey of chronic hepatitis C patients to assess whether they've received vaccinations against hepatitis A and B.

Healthcare Acquired Infections (HAI) & Antimicrobial Resistance:

The HAI program has recently begun monitoring central line associated bloodstream infections (CLABSI), catheter-associated urinary tract infections (CAUTI), colon and abdominal hysterectomies surgical site infections (SSI), MRSA, and C. difficile infections from acute care hospitals. So far, none of this data has been validated. The Fellow could develop and implement a pilot validation study based off the CDC validation toolkit that could be used to further refine Arkansas-specific protocols. This may include investigating nontraditional ways to validate the HAI data including using hospital discharge information and Medicare/Medicaid claims data.

Hospital antibiograms have been assembled from participating hospitals over the last two years to describe resistance patterns seen in infections reported in AR. The Fellow could develop and disseminate a state-wide antibiogram that could be mapped to regions within the state. This effort would likely help us focus attention on regions or hospitals where certain resistance patterns are higher than others.

Tuberculosis (TB):

Most of the TB cases in US-born persons is now reactivation of prior latent TB infections. However, there still exists explosive TB transmission in some sub-populations in Arkansas. Transmission in those settings could be characterized to formulate strategies to mitigate propagation of TB spread in such settings in the future.

Unique Population in AR:

NW AR is home to the largest number of Marshallese citizens outside of the Marshall Islands. This poorly enumerated population has high rates of sexually transmitted diseases, tuberculosis, and Hansen's disease (Leprosy). The majority of Hansen's cases in AR present late with the most severe

form of the disease - lepromatous leprosy. Projects aimed at enumerating this population and characterizing factors associated with delayed diagnosis need to be performed to guide initiatives in control and management of this disease. Further, the Marshallese are known to be poorly insured and it would be very interesting to determine how well the implementation of the Affordable Care Act increases their access to care. Remaining barriers to care could be described.

Preparedness Role

The Fellow will be expected to complete online certifications in Incident Command and Emergency Response. He/she could serve as one of our epidemiologists on call for our emergency operations center. He/she could participate in forensic epidemiology educational opportunities with the FBI and preparedness and epidemiology colleagues. He/she could participate in national pharmaceutical stockpile dispensing exercises or mass vaccination clinics; two ways the ADH prepares for a bioterrorism or mass casualty event. Last, the Fellow could participate in the Fusion Center, a multi-agency law enforcement center as an ADH epidemiology representative assisting with their investigations of potential biological events not thought to be naturally occurring.

Assignment Location: Arkansas Department of Health
Little Rock, Arkansas

Primary Mentor: Dirk Haselow, MD, PhD, MS
State Epidemiologist, Medical Director for Communicable Disease
Arkansas Department of Health

Secondary Mentor: Stewart Matthews, MPH
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