Assignment Description

The fellow will be placed in the Community Exposure Research Section (CERS) in the Bureau of Environmental and Occupational Epidemiology (BEOE) in the Division of Environmental Health Assessment (DEHA). The Community Exposure Research Section designs and conducts exposure and health outcome research for communities with environmental exposure concerns or where unusual environmental exposures have been documented. CERS is currently involved in two major biomonitoring projects for communities with unusual exposures to per-and polyfluorinated alkyl substances (PFAS) from contamination of public drinking water supplies. The fellow will be supported by two mentors in BEOE and will be offered opportunities to analyze epidemiologic data already collected, develop proposals for additional data collection, participate in data collection and field work, develop proposals for follow-up health outcome research in these communities, and potentially participate in additional follow-up health outcome data collection and analysis.

Day-to-Day Activities

Day-to-Day, the fellow will learn about the existing datasets containing blood testing results and questionnaire data on exposure assessment and health outcomes. The fellow will have opportunities to learn every step of the process of data cleaning (for some variables not yet evaluated) and preparation of data for analysis. The fellow will work with a team that includes biostatisticians to develop plans for additional descriptive data evaluations and analyses and will be involved in analysis addressing a specific set of questions using a subset of the data. Through completion of specific assignments and mentoring the fellow will develop skills for creating result tables, graphics, public presentations, written reports, and journal articles. The fellow will be able to attend public events and meetings with stakeholders where the blood testing projects are discussed. The fellow will be offered a variety of opportunities to work on other projects and to shadow and/or assist in other activities in the Center for Environmental Health's Division of Environmental Assessment. Information about the two communities with major biomonitoring projects is available on the NYSDOH website, here:

Potential Projects

Surveillance Activity

Surveillance of Air pollution related health effects using remote sensing

Surveillance of health effects of air pollution has traditionally relied on sparse monitoring data for exposure assessment. Satellite derived estimates of NOx and Aerosol Optical Depth are increasingly being used to provide an estimate of ambient nitrous oxide and particulate matter. CEH has been involved in NASA’s Health and Air Quality Applied Sciences team to evaluate the utility of multiple remote-sensing databases for use in health studies. NYS is poised to significantly reduce emissions under the state’s Reforming the Energy Vision (REV) plan leading to changes to air pollution profiles. Consequently, there is a need to establish baseline estimates for health burden related to air pollution and estimate health benefits of reduced air pollution due to changing energy policy.
The proposed fellow will assist in an ongoing project to establish statewide estimates for health burden in New York due to air pollution exposures using a contiguous exposure surface derived from satellite and modeled data. Specifically, the fellow will assist in data management, GIS and statistical analysis of mortality estimates from Vital records data, morbidity estimates from all-payer hospital admissions and ED visits along with clinic visits and prescription data from Medicaid, to facilitate a comprehensive assessment of the public health impacts of air pollutant exposure and subsequent benefits (or possible dis-benefits or tradeoffs) of changing emissions scenarios in the future. The fellow will also assist in cost-benefit analysis using EPA’s BenMAP tool to calculate the associated public health cost savings.

**Surveillance Evaluation**

**NYS Congenital Malformations Registry Surveillance System Evaluation**

The fellow will focus on an evaluation of the 12 birth defects tracked in the National Environmental Public Health Tracking (EPHT) Network using nationally consistent case definitions developed jointly by the National Birth Defects Prevention Network and EPHT Birth Defects Working Group. The surveillance evaluation will compare NYS CMR prevalence rates for the 12 EPHT birth defects to those of other active surveillance systems in the U.S. The evaluation will compare what CMR has passively collected to what is actively ascertained for the National Birth Defects Prevention Study areas in NY. In addition, the evaluation will examine timeliness of reporting, completeness of variables, and prevalence by Health Service Area to detect potential differences in reporting.

The New York State Congenital Malformations Registry (CMR) is one of the largest statewide population-based birth defects registries in the nation. It was established as part of the Environmental Disease Surveillance Program in 1981, by enactment of Part 22 of the New York Sanitary Code. Part 22.1 stipulates that every hospital and physician shall submit a supplemental report of spontaneous fetal death. Part 22.3 stipulates that every physician and hospital in attendance on an individual diagnosed within two years of birth as having one or more congenital anomalies, shall file a supplementary report with the State Commissioner of Health within 10 days of diagnosis. Data collected by the CMR are, by law, to be used for surveillance and to facilitate epidemiologic research into the prevention of environmental diseases, as prescribed by Public Health Law 225(5)(t). Public Health Law 206(1)(j) provides for scientific research and surveillance to reduce morbidity and mortality. A limitation of the CMR is that it is a passive case ascertainment system where hospital personnel who identify a fetus or neonate with a birth defect report this information directly to the CMR. In New York State, cases are also ascertained by searching administrative databases (e.g. hospital discharge data and insurance databases). With passive case ascertainment, the information reported to the surveillance system is not verified by medical record abstraction. This type of case ascertainment is less expensive because fewer resources and personnel are required. However, the reporting burden falls on hospitals or clinics, which requires time and effort of busy hospital staff. This could result in underreporting, less complete documentation, and/or less timely reporting. In addition, because reported information is not validated, certain congenital anomalies may be overestimated. The CSTE fellow will evaluate the CMR using standardized CDC evaluation criteria for public health surveillance systems.
**Major Project  Biomonitoring and epidemiological analyses of exposed populations**

NYS has conducted extensive biomonitoring for per and poly fluorinated alkyl substances (PFAS) in multiple populations exposed to PFAS via drinking water, with approximately 8,000 blood samples collected and analyzed to date. Results are shared with participants and descriptive statistics for group results have been released via the NYSDOH website. There are multiple staff working on additional analyses of the data examining, for example, the data for mother/child pairs. Additional analyses need to be conducted to better estimate the joint effects of gender, age and length of residence on an affected water supply on blood PFAS levels. Specifically, the fellow would work with the team planning and conducting statistical analyses of two rounds of blood testing and exposure history information from questionnaires for one community. Because the second round data are already available, the fellow could participate in pathbreaking investigations of factors contributing to shorter versus longer half-lives for these chemicals in blood after exposures have ended. As part of this project, the fellow would assist with developing and administering an in-depth exposure and health history questionnaire for a subset of blood testing participants. The fellow would also be involved in planning and implementing a 2nd round of blood sampling for a second community where 1st round sampling was completed approximately 2 years prior to the fellowship. An additional related activity the fellow could pursue as time allows: developing a proposal for a statewide biomonitoring program similar to the NHANES national program, developing budget estimates and seeking grant funding.

**Additional Project  Determining social and environmental determinants of health at a regional level**

Many communities experience a disproportionate burden of poor health due to environmental stressors resulting from social or economic conditions. This may be from a greater proximity to contaminated sites or because individuals lack resources to avoid exposure to air pollution and/or receive adequate health care. The fellow will assist with an ongoing GIS and spatial epidemiologic study to identify local areas (census tracts) with high/moderate/low air pollution and quantify associated health impacts. These will be done using hot spot analysis and spatial error models to determine the joint contributions of social and environmental determinants of health in specific communities. Results can provide an understanding of key determinants affecting to policymakers and planners including in programs at NYSDOH and NYSDEC for future environmental and health policies.

**Additional Project  National Violent Death Reporting Data**

NYSDOH has been collecting violent death data now for approximately two years. These data are incident-based and therefore can be used to evaluate factors contributing to violent death events where more than one death occurs. National data are available for 20+ years. Dr. Kitty Gelberg of the Bureau of Occupational Health and Injury Prevention, a Ph.D. epidemiologist, would oversee this project.
Preparedness Role

The fellow will be able to shadow and assist the Emergency Preparedness staff in the Center for Environmental Health as they conduct routine preparedness planning activities. If emergency response activities occur during the fellow’s tenure, the fellow can shadow and assist as appropriate for developing an understanding of emergency preparedness coordination and activities. The fellow could be included on a special project such as exploring the use of Emergency Preparedness models and resources to assist with strengthening opioid poisoning prevention and response activities.

Additional Activities

Division and Center level exposure to other areas of expertise and other activities in environmental health: The fellow will have opportunities to attend public events, stakeholder meetings, shadow staff, and attend internal meetings to better understand the role of a state health department in promoting environmental health goals and protecting people from hazardous environmental exposures.

Mentors

Primary
Tabassum Insaf PhD, MPH, MBBS
Research Director, Bureau of Environmental and Occupational Epidemiology

Secondary
Alissa Van PhD, MS, BS
Assistant Bureau Director, Bureau of Environmental and Occupational Epidemiology