

Environmental Health

New York City Department of Health and Mental Hygiene, Bureau of Environmental Surveillance and Policy

New York, New York

Assignment Description

The Fellow will be assigned to the Bureau of Environmental Surveillance and Policy (BESP) at the New York City Department of Health and Mental Hygiene, one of the largest and oldest public health agencies in the country. Home to NYC's Environmental Public Health Tracking program, the New York City Community Air Survey, and Climate and Health Program (CHP), BESP's multi-disciplinary team works to influence environmental health policies and programs through innovative health surveillance, research, and informatics across topics ranging from air quality and climate change to child care and restaurant regulation. The Bureau provides analytic and epidemiologic support across the Environmental Division for example, monitoring trends in pesticide poisonings; evaluating the impacts of restaurant grading on health and consumer behavior; and estimating the burden of illness and death attributable to air pollution and benefits that could be realized from policy changes to improve air quality in New York City.

The Fellow will conduct surveillance and analyses of climate-health impacts, especially with respect to episodes of extreme heat, cold and other weather events, such as coastal storms and power outages. Additional areas of investigation and day-to-day work will food safety and foodborne disease, climate-health indicator development, and potentially assessment of air quality health impacts, including particulate matter and ozone.

At the beginning of the fellowship, the Fellow and Mentors will create a work-plan and timeline that fulfills the fellowship requirements while meeting the Fellow's interests and expanding their epidemiologic skill set. The Fellow will work closely with the Climate and Health team and the Food Safety Analytics team, both of which include epidemiologists with extensive applied epidemiology experience who can support the Fellow as they begin their career and develop their skills. In addition, the Fellow would be encouraged and supported in publishing results of their major project or surveillance evaluation.

Day-to-Day Activities

The Fellow will work closely with their Mentors to conduct descriptive and other analyses of the impact of weather conditions on health outcomes. Sources of health data include, but are not limited to, Vital Statistics and medical examiner records (mortality), hospital discharge and emergency department records, Poison Control Center call data, and syndromic surveillance. The Fellow will also work with the Bureau's Food Safety Analytics team. They will be encouraged to participate in meetings with other DOHMH programs, City agencies, and community groups, as the opportunity arises, to identify and prioritize strategies to prepare for and respond to the public health impacts of climate change. The Fellow will assist in developing automated data reports, and scientific reports and materials for technical and lay audiences.

Potential Projects

Surveillance Activity Weather-related mortality and morbidity surveillance

The Fellow will assist with review and analysis of Vital Statistics and medical examiner records for weather-related deaths, including hyperthermia (heat stroke), hypothermia, and carbon monoxide poisoning. This mortality surveillance allows BESP to characterize the burden of these deaths in NYC and informs public health prevention efforts. For example, understanding environmental circumstances surrounding these deaths and who is most at risk helps DOHMH refine and target health messaging during periods of extreme weather or power outages. The Fellow will also assist in summarizing yearly counts and rates of certain weather-related health outcomes in hospital discharge data, such as hyperthermia, hypothermia, and carbon monoxide poisoning.

Surveillance Evaluation Carbon monoxide poisoning surveillance and/or evaluating impact of foodborne disease coding changes in hospital discharge data

- 1) Carbon monoxide (CO) exposure and poisonings follow a seasonal pattern and are often related to weather emergencies, such as hurricanes with power outages. In NYC, CO poisoning and exposure is reportable and CO detectors have been required in all homes, institutional, and educational facilities since 2004. DOHMH conducts CO surveillance using several data sources, with varying lags in data availability. In 2014, the health department began collecting electronic lab reports of carboxyhemoglobin (COHb) levels. Working closely with Mentors, colleagues from the Poison Control Center and other health department programs, the Fellow would take the lead on a project to conduct case-level matching using COHb reports, hospital discharge data, Poison Control Center calls, and syndromic surveillance data to help us better understand case capture by data source. This evaluation would inform improvements to the CO surveillance system.
- 2) BESP conducts routine surveillance of foodborne disease using NYC emergency department and hospitalization administrative data. Until October 1, 2015, hospitals used the ICD-9CM system. However, starting October 1, hospitals transitioned to using the ICD-10CM system. We propose to evaluate comparability across the ICD-10CM and ICD-9CM coding systems to inform interpretation of surveillance findings. As a first step, we will create case definitions for a standard set of foodborne diseases using the ICD-10CM system. We will graph counts and rates over time starting in 2000. We will use a variety of approaches to determine whether we will be able to validly assess trends over a timeframe that spans the two coding systems.

Major Project Characterizing citywide and neighborhood-specific morbidity related to temperature

BESP's Climate and Health program conducts surveillance of weather-related health outcomes, estimates potential impacts of climate change, and participates in the City's climate adaptation planning efforts to ensure that public health is incorporated. Program staff have characterized the burden in NYC of temperature-related mortality (including heat stroke deaths and deaths from natural causes exacerbated by heat). The program would like to better understand the relationship of temperature and hospital visits for chronic conditions, such as respiratory and cardiovascular conditions. With support from mentors, the Fellow will design a study to estimate and characterize citywide and neighborhood-specific morbidity (for example, emergency department visits in hospital

discharge data) related to temperature and, potentially, other current weather hazards, such as extreme precipitation, storms and power outages. This would include a description of New York City populations most vulnerable to the health impacts under investigation.

Additional Project **Other potential projects**

- 1) Support the Race to Justice Initiative in Environmental Health by evaluating monitoring and regulatory inspection programs for potential disparities
 - i. Analyze adjudication outcomes for food safety and childcare inspection data. Are there differences in adjudication results across geographic, racial, or socioeconomic groups in NYC?
 - ii. In addition to routine monitoring we respond to complaints related to food safety, childcare, and air quality. Characterize complaint data and evaluate if/how this affects inspection coverage across neighborhoods.

Additional Project **Other potential projects**

- 2) Investigate potential impacts in asthma/allergy prevalence from changes in pollen levels and characteristics, and potential impacts in vector prevalence from rising temperature and precipitation; characterize the various uncertainties in these areas.

Preparedness Role

Emergency preparedness activities could include:

- 1) Investigate a foodborne outbreak with the DOHMH's Bureau of Communicable Disease
- 2) Participate in an environmental inspection/investigation such as a restaurant or mobile food vending inspection
- 3) Participate in extreme heat surveillance and citywide emergency planning meetings, providing epidemiologic interpretation to trends in ambulance calls and emergency department visits for heat (hyperthermia).
- 4) The Fellow could also potentially assist with other public health emergencies if they occur, for example supporting coastal storm response by collecting and analyzing environmental health data in hurricane shelters. Should the opportunity arise to participate in Environmental or Agency-wide preparedness trainings, the Fellow will be encouraged to do so.

Additional Activities

Other activities, based on the Fellow's interest, could include:

- 1) Assisting the Food Safety Data Analytics Unit with routine work related to restaurant and mobile food vending grading programs including developing reports and responding to data requests from internal and external collaborators
- 2) Participating in foodborne disease investigations

- 3) Participating in Environmental Public Health Tracking surveillance activities and workgroups, including the development of standard, national indicators to monitor climate-related health outcomes;
- 4) Attending divisional and agency meetings and workgroups, for example Epidemiology Grand Rounds and Data Task Force meetings;
- 5) Taking part in internal and external training opportunities, such as courses in R, SAS and SQL programming, or public health communications courses.

Mentors

Primary Wendy McKelvey PhD, MS
Executive Director of Environmental Health Surveillance

Secondary Kathryn Lane MPH, MA
Senior Environmental Epidemiologist