Society for Risk Analysis
New England Chapter

2017-2018 Event Series
MEETING ANNOUNCEMENT

Ambient Air Pollution in Massachusetts: Inequality Trends and Residential Infiltration

Anna Rosofsky, Ph.D.
Health Effects Institute

Predicting Traffic-Related Ultrafine Particle Concentrations in Urban Neighborhoods

Matthew Simon, Ph.D.
Boston University

Wednesday February 28, 2018 from 5:30-7:30pm

Refreshments: 5:30 pm – 6:00 pm
Presentations: 6:00 pm – 7:00 pm
Discussion: 7:00 – 7:30 pm

Location
Health Effects Institute
75 Federal Street, #1400
Boston, MA

Please RSVP by **February 23rd** to Julie Lemay (JLemay@gradientcorp.com)
or Rebecca DeVries (Rebecca.DeVries@erg.com)

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About the Presentations

Dr. Rosofsky's Presentation:
Exposure to pollutants of ambient origin contributes significantly to the global disease burden. Mounting evidence has demonstrated disproportionately high ambient $PM_{2.5}$ and NO_2 concentrations in the U.S. among nonwhite and low-income populations, potentially contributing to environmental health disparities. There is limited understanding of temporal trends and underlying drivers of exposure inequalities, and whether residential building characteristics differentially modify infiltration of ambient pollutants into the indoor environment. This presentation will describe the speaker's recent dissertation work on: 1) quantifying longitudinal $PM_{2.5}$ and NO_2 inequalities between sociodemographic groups in Massachusetts over a decade, and 2) estimating residential infiltration of ambient $PM_{2.5}$ across all Massachusetts residential parcels and assessing whether residential building characteristics exacerbates or ameliorate exposure inequalities. The presentation will focus on the publicly available data used to perform these analyses and the study results.

Dr. Simon's Presentation:
Traffic-related ultrafine particles (UFP; <100 nanometers diameter) are ubiquitous in urban air. While animal studies have shown that UFP are toxic, epidemiological evidence of health effects, which is needed to inform risk assessment at the population scale, is limited due to challenges of accurately estimating UFP exposures. Model improvements are needed to better predict UFP concentrations for use in epidemiological studies. This presentation will discuss a novel methodology to model UFP exposure in urban neighborhoods, specifically Chelsea and Boston, MA. Over 12,000 hours of continuous measurements at central sites, 1,000 hours of continuous measurements at each of 20 residential sites in the two study areas, and >120 hours of mobile measurements over the course of >1 year (all four seasons, all days of the week, 05:00-21:00) in each study area were used to develop highly temporally- (i.e., 1 hr) and spatially- (i.e., 10 m) resolved models of particle number concentration (PNC; a proxy for UFP). Combining mobile and stationary monitoring substantially improved model predictions at residences when compared to a mobile-monitoring-only approach: Pearson correlations of modeled and measured natural log-transformed PNC were 10-50% higher with the combined approach and increased model precision by as much as 32%. Additionally, these models demonstrated they can be applied to time periods outside of the original monitoring window (by at least 9 years) and maintain high correlations with ambient measurements suggesting that PNC models informed by both mobile and stationary monitoring can be applied to longitudinal epidemiological studies.

About the Presenters

Dr. Anna Rosofsky is a Staff Scientist at Health Effects Institute since November 2017. In this role she supports technical work within and implementation of the Energy Research Program, to identify and conduct research on potential human exposure and health impacts from onshore unconventional oil and gas development. She recently received a Ph.D. in Environmental Health from Boston University School of Public Health, where she studied spatiotemporal patterns of ambient air pollution concentrations and early-childhood health impacts. Prior to her doctoral studies, she investigated environmental health disparities at the Center for Puerto Rican Studies and at the Mosakowski Institute for Public Enterprise. She received an M.A. in Environmental Science and Policy from Clark University.

Dr. Matthew Simon joined the Department of Environmental Health at the Boston University School of Public Health as a Postdoctoral Research Associate in September 2017. There, he is conducting research on (1) human exposures to aircraft emissions in neighborhoods near Logan International Airport, and (2) the impacts of aircraft noise on human health in a nationwide study of 90 major U.S. airports. He recently received a Ph.D. in Civil and Environmental Engineering from Tufts University where he built exposure models of ultrafine particulates (UFP) in Boston and Chelsea, MA to be used in longitudinal epidemiological studies on UFP as part of the Boston Puerto Rican Health Study. Previously, Dr. Simon was a consultant for the U.S. Department of Energy, Fuel Cell Technologies Office in Washington, DC and a high school science teacher in Halifax, NC through the Teach For America program. He received a B.S. in Mechanical Engineering from the University of Washington.

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GETTING TO THE EVENT

Directions to the Health Effects Institute can be found at: https://www.healtheffects.org/directions

From the MBTA Subway (on foot):

The office is two blocks north of South Station, connecting you to the Red Line, Silver Line, and the Commuter Rail. Two blocks to our west is Downtown Crossing, connecting to the Red and Orange Lines. Three blocks to our west is Park Street, connecting to the Green Line. (See the map of the downtown Boston area subway system.)

Driving Directions:

From Logan Airport

Take the Sumner Tunnel to I-93 South; then follow the directions below for From Points North. With light traffic, this is a ten-minute trip; at busier times, such as Friday evenings, plan on an hour. The Silver Line bus connects Logan International Airport to South Station, which is two blocks from our office. (See the street map to make your way from South Station to our offices.)

From Points North

From points north of Boston, take I-93 South into the city. After entering the Central Artery Tunnel, stay to your right, following signs for Exit 23/Purchase Street and South Station. Take the Purchase Street exit and drive southwest on Purchase Street until you come to Summer Street. Turn right onto Summer Street, and take the first right onto High Street. Then take you first left onto Federal Street. There is a public garage that abuts 75 Federal Street on the left. (See the street map for additional details.)

From Points South

From points south of Boston, take I-93 North into the city. Take the South Station exit, staying to the right for the ramp to downtown Boston/Kneeland Street. At the end of the ramp, take a left onto Kneeland Street. Drive west along Kneeland Street and take your third right onto Lincoln Street. Drive north on Lincoln Street for 4-5 blocks until you come to Summer Street. At Summer Street, take a right and then an immediate left onto High Street. Follow the directions above from High Street to our offices.

From Points West

Take the Mass. Pike (I-90) east to Exit 24 A-B-C. Exit to the left, following the signs for I-93/South Station/Quincy. Take Exit 24-A to South Station, staying to the right for the ramp for downtown Boston/Kneeland Street. At the end of the ramp, take a left onto Kneeland Street. Follow the directions above from Kneeland Street to our offices.