Columbia University MAILMAN SCHOOL OF PUBLIC HEALTH

Columbia Climate and Health Program

Department of Environmental Health Sciences

NEWSLETTER Volume 3, Issue 1 *Fall 2013*

Climate and Health Certificate Updates

The new MPH certificate in climate and health was successfully launched in the fall semester of 2012. We look forward to welcoming four new certificate students this fall!

Our biweekly seminar series will resume in September, with a mix of research updates and journal article discussions on current topics in climate and health. Seminars take place on alternating Thursdays in the EHS conference room at 3:00.

2013 Award for Outstanding Research Article in Biosurveillance

Dr. Jeffery Shaman, Associate Director of the Columbia Climate and Health Program, received the 2013 Award for Outstanding Research Article in Biosurveillance by the International Society for Disease Surveillance (ISDS) for Scientific Achievement category. His paper, "Forecasting Seasonal Outbreaks of Influenza," describes a framework for forecasting seasonal influenza outbreaks in real-time, using a data assimilation technique commonly applied in numerical weather prediction. The findings suggest that real-time skillful predictions of peak timing can be made more than seven weeks in advance of the actual peak, and represents an initial step in the development of a statistically rigorous system for real-time forecast of seasonal influenza. Dr. Shaman will present his research at the ISDS Conference in New Orleans, LA, in December.
Read more on his paper here.

IPCC Fifth Assessment Report (AR5)

The Intergovernmental Panel on Climate Change (IPCC) assesses the scientific, technical and socio-economic information relevant for the understanding of the risk of human-induced climate change and produces a report about roughly every five years. The final government review draft of AR5 is expected to be completed in October 2013, and its release is expected in 2014. **Dr. Patrick Kinney** is a lead author on Chapter 26, "North America," in Working Group II that focuses on Impacts, Adaptation, and Vulnerability. Find more information on the report here.

ISEE Conference Abstract Acceptances

A number of our faculty, postdoctoral fellows, and students had abstracts accepted for the 25th International Society for Environmental Epidemiology (ISEE) conference, which took place during August 19-23 in Basel, Switzerland. Congratulations!
Find more information on the conference here.

Kate Weinberger PhD candidate	*Spatial Variation of Ragweed Pollen Across New York City*
Ashlinn Quinn PhD candidate	*Summertime indoor-outdoor temperature and humidity relationships in New York City residences*
Ying Li, Post-doc fellow	*Assessing the National Public Health Burden Associated with Exposure to Ambient Black Carbon in the United States*
Jaime Madrigano Post-doc fellow	*Vulnerability to Extreme Heat in New York City*
Darby Jack Assistant professor	*Evaluating the impacts of an advanced stove intervention on traditional cooking patterns and pollutant exposures in India using Stove Use Monitors* *What determines the adoption and continued use of advanced clean cookstoves?* *Design and implementation of household air pollution intervention studies in relation to birth outcomes: Results from Phase I activities in Ghana and India* *Evaluation of acceptability and performance of stove options for reducing household air pollution in rural west Kenya*
Amruta Sarma MPH alumna	*Heat related deaths in India: An insidious environmental threat*

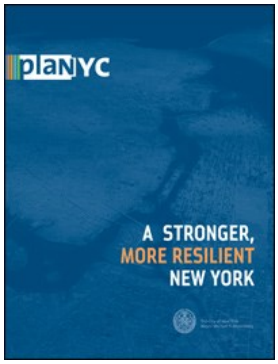
National Climate Assessment (NCA) report

The NCA report is produced under the Global Change Research Act of 1990. The Federal government is responsible for producing these reports through the U.S. Global Change Research Program (USGCRP), a collaboration of 13 Federal science agencies. The assessment aims to accomplish the following:

- Inform the nation about already observed changes, the current status of the climate, and anticipated trends for the future
- Integrate scientific information from multiple sources and sectors to highlight key findings and significant gaps in our knowledge
- Establish consistent methods for evaluating climate impacts in the U.S. in the context of broader global change
- Provide input to Federal science priorities and are used by U.S. citizens, communities, and businesses as they create more sustainable and environmentally sound plans for the nation's future.

Dr. Kim Knowlton is the co-convening lead author of Chapter 9 on Human Health. The third NCA report is expected to be completed early in 2014.
Find more information on the report here.

PlaNYC Report Release



The New York Panel on Climate Change (NYPCC) released the report, "A Stronger, More Resilient New York," and is now engaged in phase 2 work that includes looking at health effects of climate extremes in NYC, led by **Dr. Patrick Kinney**. PlaNYC is an effort undertaken by Mayor Michael Bloomberg to prepare for growing population, strengthen the economy, fight climate change, and enhance the quality of life for New Yorkers. This released report includes actionable recommendations both for rebuilding the communities impacted by Sandy and increasing the resilience of infrastructure and buildings citywide. Read the full report here.

Student highlight

On March 4, 2013, Climate and Health PhD candidate, **Ashlinn Quinn**, presented a seminar on ongoing work she is conducting with Earth Institute Postdoctoral Fellow Dr. James Tamerius, Dr. Shaman, and Dr. Kinney on "Summertime Indoor-Outdoor Temperature and Humidity Relationships in New York City Residences." This project is part of a body of work in the Climate and Health department focusing on health-relevant conditions in the indoor residential environment. The NYC Department of Health estimates that 80% of heatstroke victims in the city are exposed at home, but very little is actually known about the levels of heat and humidity experienced in the residential environment. In her research, Ashlinn analyzed data from indoor temperature and humidity monitoring of almost 300 homes in the New York City area. She demonstrated that outdoor and indoor temperature and humidity have strong linear relationships, with some evidence of modification by socioeconomic factors. Methods she is currently developing will extend this research with the goal of predicting residential heat and humidity levels during heat waves in NYC.

Staff Transitions

Dr. James Tamerius accepted a teaching position at the University of Iowa in the Dept. of Geography starting in fall semester of 2013. During his fellowship with the Columbia Climate and Health Program and the Earth Institute, he worked with Dr. Jeffrey Shaman on the effects of climate on the transmission of communicable respiratory diseases, and the determinants of temperature and humidity conditions in households across New York City.

Dr. Jaime Madrigano accepted a faculty position at the Rutgers University School of Public Health, Department of Environmental and Occupational Health starting in the fall semester of 2013. During her fellowship with the Columbia Climate and Health Program and the Earth Institute, she worked with Dr. Patrick Kinney on projects examining vulnerability to heat and ozone-related mortality. She has also collaborated with members of Columbia's Center for Research on Environmental Decisions to examine public health co-benefits as a motivator for climate mitigation.

Recent Findings

Projections of seasonal patterns in temperature-related deaths for Manhattan, New York

Affiliated Investigator: Patrick Kinney
Journal: Nature Climate Change ***(Featured on cover page of the August issue!)***

The global warming trend has accelerated in recent decades, and further warming is expected in the near future, resulting in more frequent, intense, and persistent periods of hot temperatures in summer and higher temperatures in winter. Rising temperatures may results in more heat-related mortality but may also reduce cold-related mortality. This study looked at the net impact on annual mortality using 16 downscaled global climate models and two emissions scenarios (A2 and B1) to estimate present and future seasonal patterns in temperature-related mortality in Manhattan, NY. All 32 projections yielded warm-season increases and cold-season decreases, with positive net annual temperature-related deaths. Largest percentage increases in deaths may occur between May and September. These results suggest that increases in heat-related mortality could outweigh reductions in cold-related mortality, with shifting season patterns.
Learn more about the study here.

Environmental predictors of seasonal influenza epidemics across temperate and tropical climates

Affiliated Investigators: James Tamerius and Jeffrey Shaman
Journal: PLOS Pathogen

Human influenza infections exhibit a strong seasonal cycle in temperate regions where low specific humidity conditions facilitate the survival and transmission of the virus. However, influenza in tropical and subtropical regions often occurs during the rainy season or transmits year-round. This study assessed the role of specific humidity and other local climatic variables on influenza virus seasonality. Models were developed to predict the month of peak influenza activity to identify climatic thresholds accounting for the diversity of the global influenza seasonality patterns. Results suggest two types of environmental conditions associated with seasonal influenza epidemics: ‘‘cold-dry’’ and ‘‘humid-rainy,’’ and that the best predictors of influenza peaks are temperature and specific humidity. The models could potentially predict influenza activity in locations with little or no observational data, and help target surveillance efforts and optimize the timing of seasonal vaccine delivery.
Learn more about the study here.

Particulate matter pollution in African cities

Affiliated Investigators: Elisaveta Petkova, Darby Jack, and Patrick Kinney
Journal: Air Quality and Atmospheric Health

Despite the rising burden of air pollution-related morbidity and mortality in African cities due to the rapid urban population growth, air pollution emissions, and changing patterns of disease, air pollution monitoring is limited. This review focuses on particulate matter (PM) air monitoring studies in Africa to compare reported air quality data with international guidelines. Studies were identified for 12 countries throughout the continent. Collective evidence of short- and long-term air monitoring studies shows that pollution levels exceed international guidelines. PM sources vary in Africa and in America; sources in Africa include emissions from waste and biomass burning for household and commercial needs, industrial activities, emissions from vehicles, and suspension from unpaved roads. Implementation of systematic PM data collection would enable air pollution-related health impact assessments, the development of strategies to reduce air pollution health burden, and facilitate urban planning and transportation policy related to air quality and health.
Learn more about the study here.

Recent Findings

A cross-sectional, randomized cluster sample survey of household vulnerability to extreme heat among slum dwellers in Ahmedabad, India

Affiliated Investigators: Perry Sheffield and Kim Knowlton
Journal: International Journal of Environmental Research and Public Health

Extreme heat is a significant public health concern in India, and it is projected to increase in frequency and intensity with climate change. To facilitate public health preparedness, an assessment of factors affecting vulnerability among slum dwellers was conducted in summer 2011, in Ahmedabad, Gujarat, India. Indicators of heat exposure, susceptibility to heat illness, and adaptive capacity were assessed through a cross-sectional household survey. Age, preexisting medical conditions, work location, and drinking water sources were all associated with increased odds of self-reported heat illness, while access to health information and resources decreased the odds. Heat-health education, increasing awareness of heat-related illnesses among health care providers, targeted interventions among the elderly and in non-shaded work settings, and access to piped water, and a heat illness and mortality tracking system are recommended to reduce heat illness vulnerability.
Learn more about the study here.

Post-Sandy preparedness policies lag as sea levels rise

Affiliated Investigators: Kim Knowlton and Perry Sheffield
Journal: Environmental Health Perspectives

While health risks rise along with sea levels, policies to help prepare coastal communities for future threats are lagging. Hurricane Sandy caused a record-breaking flood height of 13.88 ft. This level of storm surge inundation was not projected until 2050 under global climate change scenarios, expected to result from 100-year storm events. Further, recent estimates of damage costs from Hurricane Sandy were roughly $70 billion. Hurricane Sandy was a wakeup call for Federal Emergency Management Administration (FEMA) to push for actions that will protect coastal communities by updating new maps with latest climate vulnerability projections and encouraging states to account for climate change in their hazard mitigation planning. The recently updated FEMA flood maps do not incorporate climate change vulnerability. Studies have shown that preparedness for flood events are indeed cost effective. It is imperative to secure coastal communities against future climate change to save lives and money.
Learn more about the study here.

Temperature, Myocardial Infarction, and Mortality: Effect Modification by Individual- and Area-Level Characteristics

Affiliated Investigator: Jaime Madrigano
Journal: Epidemiology

Although several studies have examined the associations between temperature and cardiovascular disease-related mortality, fewer have investigated the association between the incidence of cardiovascular disease and ambient temperature. This study examined the association between temperature and occurrence of acute MI as well as subsequent mortality. Further, effect modification of the association between temperature and acute MI as well as subsequent mortality, by sociodemographic characteristics, medical history, clinical complications, and physical environmental was assessed. Results suggest that extreme cold and decreases in apparent temperature increased the risk of acute MI and exposure to heat increased the risk of dying in people with a prior acute MI. Persons living in areas with greater poverty were more susceptible to heat. These findings point to the importance of accounting for sociodemographic vulnerability as cities and towns prepare to adapt to weather fluctuations that result from climate change.
Learn more about the study here.

Emerging Climate Findings

Check out our *Emerging Climate Findings* page for selected monthly papers on global, national, and local climate and health research findings.

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