Columbia University
MAILMAN SCHOOL
OF PUBLIC HEALTH

Climate and Health Program
Department of Environmental Health Sciences

NEWSLETTER Volume 4, Issue 1 *Fall 2014*

The ***Climate and Health Program***, launched in 2008, has a mission to foster innovative scholarship on the human health dimensions of climate change impacts and vulnerabilities, and to provide information of direct value in climate adaptation and mitigation planning. We train PhD and DrPH students, and postdoctoral scientists in the design and conduct of cutting edge research on mechanisms linking climate to ill-health as well as on methods for assessing health impacts and benefits of future climate policy scenarios. We also offer the first ever MPH certificate in climate and health.

PROGRAM UPDATES

NIH T32 Training Grant Awarded

Drs. Patrick Kinney and **Jeffrey Shaman** were awarded funding for a T32 training grant submitted in May 2013 to the National Institutes of Health called Interdisciplinary Training in Climate and Health. The grant will fund three PhD students and two postdoctoral researchers each year. This grant includes 23 faculty mentors from various departments at Columbia University, including Center for International Earth Science Information Network (CIESIN); Lamont Doherty Earth Observatory; Ecology, Evolution, and Environmental Biology; Earth and Environmental Engineering; Population and Family; NASA GISS; and Medicine; and from the Mailman School of Public Health, the Epidemiology and Population and Family Departments.

We welcome our first postdoc, **Dr. Jennifer Nguyen,** and PhD student, **Alex Heaney**, to be supported on this grant. See page two for their bios.

New Climate and Health Program Website

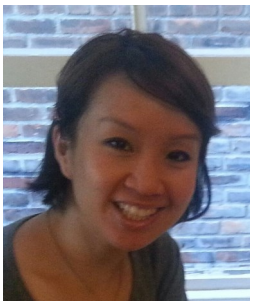
We launched a new Climate and Health Program website. A cleaner look allows visitors to navigate through our faculty and students, research projects, academic programs, and other program information with greater ease. It also lists upcoming Climate and Health Seminars, held on Thursdays at 3pm in the EHS conference room. Check out our site: chp.columbia.edu.

Staff Transitions

Dr. Ying Li was an Earth Institute Postdoc Fellow from 2011-2014, and she collaborated with Dr. Patrick Kinney on two projects: 1) assessing the health impacts of PM2.5 air quality regulation in the US, and 2) assessing the co-benefits of greenhouse gas reduction in the transportation sector in Beijing, China. She recently joined the Department of Environmental Health Sciences at East Tennessee State University as an Assistant Professor. She will be teaching Human Ecology in Fall 2014 and Environmental Analysis in Spring 2015. Her future research will continue to focus on health impact assessments for ambient air pollution.

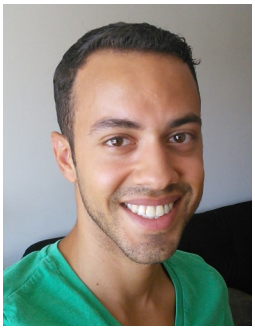
Dr. Elisaveta Petkova, DrPH '14, has recently joined the research team of the National Center for Disaster Preparedness (NCDP) at the Earth Institute as a Research Associate. She is currently working on projects related to environmental health policy, public health preparedness and response to natural disasters, radiological safety, and the human health impacts of climate change. Prior to joining NCDP, she spent four years as a DrPH student at the Columbia Climate and Health Program where she carried out multidisciplinary research on the population health impacts of air pollution and temperature extremes. Dr. Petkova has also served as a consultant on a variety of initiatives related to environmental health risk assessment, communication, and management.

New Staff and PhD Students



Dr. Jennifer Nguyen received her ScD at the Harvard School of Public Health (HSPH) and her MPH from Boston University, both in Environmental Health and Epidemiology. She is interested in the effects of weather and air pollution on cardiovascular health. Her most recent work as a post-doctoral fellow at HSPH focused on the association between outdoor air pollution and cardiovascular outcomes in Brazil and Mexico. In the Climate and Health Program, she will be examining the link between weather conditions and the seasonal occurrence of cardiovascular and respiratory conditions.

Alex Heaney, a first year doctoral student from Portola Valley, California, studied human biology with a focus on climate change and global health at Stanford University. Her previous research projects focused on the health impacts of climate driven migration in Tanzania, and the impacts of climate change on the global distribution of H5N1 influenza. At Columbia, she looks forward to continuing these research projects, while also exploring other ways in which climate change will influence human health.



Daniel Carrion is a first year doctoral student. He received a BA in Environmental Studies from Ithaca College in 2008 and an MPH from New York Medical College in 2011. His experiences in the workforce have been diverse: working for a Latin American solidarity organization, a county's solid waste division, a community health center, and most recently Columbia's College of Physicians & Surgeons directing the Summer Public Health Scholars Program. He is eager to learn about the field of Climate & Health, specifically hoping to explore strategies to utilize adaptation and mitigation strategies to simultaneously address health disparities.

CERTIFICATE UPDATES

Practicums

Second year climate and health students completed their practicums this summer. Learn where they worked:

Augusta Williams worked with Dr. Madeleine Thomson at Columbia's International Research Institute for Climate and Society, where she learned how health outcomes are influenced by El Nino events. She and her team created and distributed a global bulletin communicating how the El Nino forecasted for later this year may impact health throughout the world. They also focused on malaria in East Africa, working towards a more targeted bulletin for this specific locality.
Check out their press release and bulletin.

Erika Eitland worked as a research assistant to Dr. Stephen Zebiak at the International Research Institute for Climate & Society to define Climate Service Ethics. As an emerging field, Climate Services would like to write a code of ethics that will be recognized by the United Nations and Global Framework for Climate Services. In collaboration with international climate researchers, she has been analyzing other codes of ethics and the relationship between climate science information and vulnerable populations.

Denise Patel proposed a research project to evaluate climate change impacts on salinity in aquifers of drinking water sources in Puerto Rico and its association with heart disease and diabetes, both linked to hypertension and salt consumption. She used ArcGIS to show which populations in Puerto Rico may be vulnerable if drought conditions continue to increase along the South Coast over the next few decades, as predicted by climate models. Hosted by the Caribbean Landscape Conservation Consortium, this is their first public health project in their environmental conservation work.

Alia ElKadi worked at Mujeres en Desarrollo (MUDE), a local NGO in Santo Domingo, Dominican Republic. The aim of her project, sponsored by the National Institute for Potable Water and Sanitation, was to ensure access to potable water and sanitation to rural and peri-urban communities in San Juan, as well as develop a risk management strategy to ensure continued access during natural disaster emergencies. Her work involved meeting with community members, conducting questionnaires and SWOT analyses, and analyzing data and developing a risk management training program for community members.

Recent MPH Graduates

The first cohort of MPH climate and health certificate students graduated this past May. See where they work:

Claire Shea is still living in NYC and began working at the NYC Department of Health and Mental Hygiene this April as a Project Assistant on their CDC BRACE (Building Resilience Against Climate Effects) program. Her project focuses on health effects of heat waves and coastal storms, and she is working on outreach to populations vulnerable to heat waves.

Sunny Jeong is a research assistant at the World Lung Foundation in NYC. She works on health advocacy projects, such as researching for the Tobacco Atlas, a book illustrating the extent of the tobacco epidemic. She will be headed to medical school in fall of 2015.

RESEARCH UPDATES

Shaman Team won the CDC Predict the Influenza Season Challenge

Last fall, **Drs. Jeffrey Shaman** and **Wan Yang**, along with Drs. Alicia Karspeck from the National Center for Atmospheric Research and Marc Lipsitch from the Harvard School of Public Health, entered the Centers for Disease Control and Prevention (CDC) 'Predict the Influenza Season Challenge' as a team (the 'Shaman Team'). The objectives of the competition were to provide bi-weekly real-time forecasts of influenza-like illness at the national and regional scale in the United States. Prediction metrics included outbreak onset, peak timing, magnitude of the peak, and duration. At the conclusion of the season, the CDC convened a panel to evaluate the accuracy of all forecasts relative to observations of influenza-like illness recorded through the CDC's ILInet surveillance system. In June, the Shaman Team was announced as the winner of the Predict the Influenza Season Challenge and was awarded a prized of $75,000.

Proposals

Submitted:

- **Dr. Patrick Kinney** submitted a proposal to NASA's Research Opportunities in Space and Earth Sciences (ROSES) program to study how future U.S. air quality and public health are influenced by emission reductions in the US, long-range transport of pollution from Asia, and global climate change.
- In April, **Dr. Patrick Kinney** submitted a proposal to NSF's Sustainability Research Networks (SRN) Competition to build and deploy a prototype fine-grained air quality sensor network testbed consisting of static and mobile platforms to collect measurements and conduct empirical studies in Los Angeles and New York City.
- **Dr. Patrick Kinney** submitted a proposal to NASA's Research Opportunities in Space and Earth Sciences (ROSES) program to develop an automated surface-to-air temperature conversion for urban settings by combining LandSat observations of vegetation and albedo with city building data and weather prediction.
- **Dr. Patrick Kinney** submitted an R01 to NIH for a study to improve the identification and measurement of heat-related mortality, in order to improve the use of heat-related mortality in assessments of observed and projected impacts of climate change, and strategies for mitigation and adaptation.
- **Dr. Jeffrey Shaman** submitted an R01 to NIAID to document and analyze the spatial-temporal prevalence of airborne and surface respiratory viruses in NYC subways, to document rates of respiratory virus shedding, and to determine how host shedding is associated with respiratory virus presence, prevalence, and viability on surfaces and in air.

Funded:

- In May 2014, **Drs. Patrick Kinney** and **Jeffrey Shaman** were awarded a T32 training grant from the NIH for Interdisciplinary Training in Climate and Health. The grant will fund three PhD students and two postdocs each year.
- In August 2014, **Dr. Darby Jack** received an R01 award from NIEHS to study adoption of clean household energy technologies in Ghana.
- **Dr. Jeffrey Shaman** received funding from bioCSL to support operation of their real-time influenza forecast website: cpid.iri.columbia.edu
- In August 2014, **Dr. Jeffrey Shaman** received funding for a 5-year grant from NIGMS through the Models of the Infectious Disease Agent Study (MIDAS) program, entitled 'Development and Dissemination of Operational Real-Time Respiratory Virus Forecast.' The grant funds further testing and validation of model-assimilation systems for the prediction of influenza and other respiratory pathogens, and the establishment of a dedicated site for the generation and dissemination of operation real-time forecasts.

ISEE Conference Abstract Acceptances

Several of our faculty, alumna, and students had abstracts accepted for the 26th International Society for Environmental Epidemiology (ISEE) conference, which took place during August 24-28 in Seattle, Washington. Congratulations!
Find more information on the conference here.

Richard Remigio PhD candidate	Optimal sampling duration for household air pollution: Evidence from the Ghana randomized air pollution and health study (GRAPHS)
Kate Weinberger PhD candidate	Spatial variation in allergenic pollen across New York City
Elisaveta Petkova DrPH '14	• Towards more comprehensive projections of urban temperature-related mortality • Heat and mortality in New York City since the beginning of the 20th century
Patrick Kinney Director of Climate and Health Program	Health dimensions of New York City's climate mitigation and adaptation initiatives

Recent Findings

Predicting indoor heat exposure risk during extreme heat events

Affiliated Investigators: Ashlinn Quinn, James Tamerius, and Jeffrey Shaman
Journal: Science of the Total Environment

This study demonstrated the strong linear relationship between summertime indoor heat and humidity measurements and local outdoor conditions in low- and middle-income NYC homes. Employing these models, the authors simulated indoor conditions for the 10-day heat wave in NYC in 2006 and the 9-day heat wave in Paris in 2003. They found that during these events, many homes would experience extremely high heat index levels, and that with increasing severity of heat waves due to climate change, the homes would experience conditions dangerous for human health. This study underscores the need for improved management of indoor conditions.
Learn more about the study here.

Leveraging the climate for improved malaria control in Tanzania

Affiliated Investigator: Madeleine Thomson
Journal: Health Theme

Very few countries in Africa have the capability to deliver relevant, accurate, and timely information to the health community, which can inform decision-support tools. This article discusses a new approach, "Enhancing National Climate Services" (ENACTS), piloted by the Tanzania Meteorological Agency (TMA) and the International Research Institute for Climate and Society (IRI), which is designed to improve the availability, access, and use of climate data. ENACTS can produce historical rainfall and temperature data that would be useful in advancing the capabilities of national meteorological agencies, working in partnership with stakeholders and researchers.
Learn more about the study here.

Recent Findings

Heat and mortality in New York City since the beginning of the 20th century

Affiliated Investigators: Elisaveta Petkova and Patrick Kinney
Journal: Epidemiology

The impacts of high temperatures on mortality have been researched extensively; however, only a few studies have assessed the effect that population adaptation plays on heat-related mortality. This study analyzed the relationship between heat and mortality in adults 15 years and older in NYC during the period of 1900-1948 and 1973-2006, and found that excess mortality due to high temperature declined in the latter time period. Further, adults 65 years and older had a greater risk in the first half of the century and that risk was less evident in the latter half of the period analyzed in this study. These results are indicative of population adaption to heat in the last several decades.
Learn more about the study here.

Health impacts of heat in a changing climate: How can emerging science inform urban adaptation planning?

Affiliated Investigators: Elisaveta Petkova, Haruka Morita, and Patrick Kinney
Journal: Current Epidemiology Reports

Extreme heat is one of the leading causes of global, weather-related deaths, and heat waves are occurring in increasing frequency and severity due to climate change. This literature review on heat-related mortality and morbidities suggests that locally-derived short- and long-term adaptation planning, increased awareness of heat impacts on mortality and morbidity, vulnerability mapping, and multidisciplinary research are necessary for better heat adaptation planning, to reduce adverse health effects among vulnerable populations, and evaluate the effect of new interventions.
Learn more about the study here.

Soil dust aerosols and wind as predictors of seasonal meningitis incidence in Niger

Affiliated Investigator: Madeleine Thomson
Journal: Environmental Health Perspectives

Meningococcal meningitis is epidemic to sub-Saharan Africa during the dry season when the dry and dusty winds of Harmattan blow. Models including climate, dust, population, and meningitis cases were used to assess the ability of these variables to predict seasonal incidence of meningitis in Niger. This study found that data on dust, wind, and meningitis incidence in the early dry season can predict some of the inter-annual variability of the seasonal meningitis incidence in Niger at the national and district level.
Learn more about the study here.

Heat-related mortality in India: excess all-cause mortality associated with the 2010 Ahmedabad heat wave

Affiliated Investigators: Perry Sheffield and Kim Knowlton
Journal: PLOS ONE

Ahmedabad, India experienced a heat wave in May 2010, in which a high temperature of 46.8 °C was recorded, as well as an increase in mortality. The study found that this heatwave was associated with 1,344 excess deaths due to all-causes, out of the total 4,462 deaths. This is equivalent to a 43.1 % increase compared to the reference periods of 2009 and 2011.
Learn more about the study here.

UPCOMING EVENTS

Sept. 21 *People's Climate March*	Leading up to the UN Climate Summit, there will be a march called People's Climate March, in which various NY based community groups, international NGO's, grassroots networks, churches, and faith-based organizations are collaborating to start a social movement calling for action on the climate crisis. Learn how you can join here.
Sept. 23 *United Nations Climate Summit 2014 in NYC*	The Secretary-General, Ban Ki-moon, called upon global leaders to convene in NYC at the UN headquarters to incite climate action. The Summit will focus on actions and solutions to reduce emissions, strengthen climate resilience, and motivate the development of a global legal agreement in 2015 on climate change. Leaders invited include Heads of State and those from government, finance, business, civil society, and local leaders from public and private sectors. **Drs. Patrick Kinney** and **Madeleine Thomson** will be attending the Summit. Find out more here.
Sept. 22-28 *Climate Week NYC*	This year's Climate Week NYC will collaborate with the UN Climate Summit and events will be in support of the Summit. **Drs. Patrick Kinney** and **Madeleine Thomson** are invited to participate in an event hosted by the Wellcome Trust, called Sustaining Health: Linking Environment, Nutrition and Health on Monday, Sept 22nd. Check out other events here.
Sept. 28 *Panel Discussion*	The Ligo Project is hosting a panel discussion called The Science of Environment & Climate Change, at which **Dr. Patrick Kinney** will be a panelist. It will be held at the Open Source Gallery in Brooklyn from 11am-12:30pm. See more information on the event here.

PAST EVENTS

Workshop on Forecasting Seasonal Influenza

Dr. Jeffrey Shaman and **Haruka Morita**, MPH, organized a two-day workshop called "Preparing for and Responding to Influenza Outbreaks: Public Health Decision Making and a Role for Influenza Forecast" held on May 1-2, 2014 at the Alfred Lerner Hall Jed D. Satow Conference Room. The purpose of the workshop was to share current practices on vaccine distribution, surveillance, and response decision-making implemented at the various city and state health departments across the nation and federal agencies, as well as introduce the influenza forecast system developed by Dr. Shaman's team. A total of 43 individuals attended from city and state health departments in NY, VA, CA, OH, OK, ND, MN, AK, ID, and IN; federal agencies including CDC, NIH, US DHHS, and The White House; and schools including Johns Hopkins and Harvard School of Public Health. The workshop served as an opportunity to learn from each other and assess the state of seasonal influenza preparedness, surveillance, forecast, and mitigation response systems.

FEEDBACK

Please email the Program Coordinator, Haruka Morita, at hm2487@columbia.edu with questions and suggestions about future newsletter content. For more information about the Program, please visit our website.