

NEWSLETTER Volume 10, Issue 1

Fall 2020

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.

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PROGRAM NEWS

Successful thesis defense by PhD candidate, Sarah Kramer



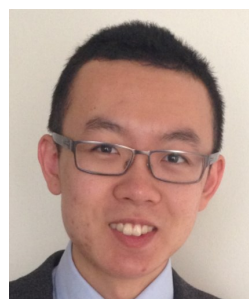
Sarah Kramer completed her PhD in Environmental Health Sciences in the Climate and Health Program in July 2020. For her thesis, entitled "Forecasting influenza in Europe and globally: the role of absolute humidity and human travel, and the potential for use in public health decision making," she first developed and assessed influenza forecasting systems for 64 countries, including 18 with tropical or subtropical climates. She then explored the utility of accounting for human travel, including air travel and commuting, when generating forecasts in Europe. She also generated real-time forecasts of influenza

for 37 countries over the course of 3 influenza seasons, and published these forecasts online. Finally, she assessed familiarity with and use of models and forecasts among public health practitioners in the US.

Sarah also had the opportunity to share her real-time forecasting results with representatives from the WHO and other modelers around the world through regular conference calls, and was invited to give a talk at the WHO's headquarters in Geneva. Additionally, prior to the COVID-19 pandemic, she helped to analyze coronavirus diversity among bats in Latin America, Africa, and Asia.

Sarah will be starting a postdoc position in October at the Max Planck Institute for Infection Biology in Berlin.

Successful thesis defense by PhD candidate, Mike He



Mike He completed his PhD in Environmental Health Sciences in the Climate and Health Program in July 2020. His doctoral thesis, titled "Air Pollution and Adverse Health Effects: Assessing Exposure Windows and Sensitivity to Modeling Choices," investigated the availability of air pollution monitors in China, the intermediate-term effects of air pollution on mortality, the sensitivity of epidemiologic estimates to the choice of exposure models, and the health impacts of climate change on air pollution.

In addition, Mike has had productive collaborations both within Columbia with the Children's Center for Environmental Health and the Lamont-Doherty Earth Observatory, as well as with outside of Columbia with colleagues at the Chinese Center for Disease Control and Prevention and Tsinghua University. Projects include evaluating the impact of the Clean Heat Program on air pollution levels in NYC, exploring the climate change impacts on air quality under potential future scenarios, as well as numerous air pollution epidemiologic studies in China.

Mike started as Postdoctoral Fellow in the Department of Environmental Medicine and Public Health at the Icahn School of Medicine at Mount Sinai in September with Dr. Itai Kloog.

PROGRAM NEWS

New doctoral students



Vivian Do

Vivian is from San Francisco, CA and completed her BA in Mathematics/Statistics and American Studies at Carleton College in MN. After working as a healthcare policy analyst, she received an MPH in Epidemiology with a Climate & Health certificate at Columbia. Since then, she has worked on substance use projects at the San Francisco Dept. of Public Health, evaluated mental health programs at the NYC DOH, and conducted air pollution research with the University of Hong Kong. At Columbia, Vivian is interested in environmental epidemiology, climate change, and the built environment through a health equity lens.



Nina Flores

Nina completed her BS in Computational Biology at the University of Texas at Austin in Spring 2020. While at UT, she contributed to projects assessing the factors and impacts of school-based marginalization in grades K-12. At Columbia, she hopes to explore gaps in health outcomes associated with climate change based on racial, ethnic, and socioeconomic groups.



Emma Gorin

Emma grew up in NYC and received an MSPH in Global Disease Epidemiology and Control from Johns Hopkins University in 2019, where her research included investigating sanitation availability in northern India and mobility among female sex workers in Guinea-Bissau. She also spent a semester in Cameroon working on implementation research and programming for key populations at risk for HIV. Prior to starting her master's program, she worked in health education, clinical research, and international non-profit settings. Emma is interested in infectious disease dynamics and, while at Columbia, hopes to apply mathematical modelling methods to issues of emerging infectious diseases.



Wil Lieberman-Cribbin

Originally from NY, Wil received his MPH at Mount Sinai and a BA in Physics and Geography at Colgate University. For the last five years, he was a Clinical Research Coordinator at Mount Sinai. His research there included mental health impacts of natural disasters, racial and health disparities in cancer surgery and outcomes, and impacts of World Trade Center exposure on cancer etiology and outcomes in the WTC Health Program cohort. Most recently he focused on socioeconomic and racial disparities in COVID-19 testing and outcomes in NYC. He plans to continue incorporating geographic analyses to identify disparities in environmental exposures in the context of climate change at Columbia.

New staff as of spring 2020



Yanelli Nunez
Postdoctoral
Research Fellow

Yanelli Nunez earned her PhD in Environmental Health Science at Columbia University and her BS in Biology with a focus on neuroscience and a minor in Public Health from San Diego State University. She is an environmental epidemiologist and her primary research interest is on understanding the adverse effects air pollution have on the nervous system. She is also interested in mixture methods and their incorporation into environmental epidemiology. Her doctoral research examined the association between exposure to fine particulate matter and particle components with clinical disease aggravation of neurodegenerative diseases. As a fellow in the Climate and Health program, she is working on identifying sources of air pollution mixtures and the association of such sources with adverse neurological outcomes using novel pattern recognition methods.

Staff transitions



**Mariam
Youssef**
Lab Manager

Mariam Youssef received her MD from Egypt. She has a Masters degree in Medical Microbiology and Immunology and has worked as a teaching assistant in the Department of Microbiology and Immunology, Faculty of Medicine, Minia University, Egypt. She has been certified with the Certification Board of Infection Control and Epidemiology (CBIC). Her previous research focused on studying multidrug resistance bacteria related to urinary tract infection. With Professor Shaman, Mariam was Lab Manager and worked on a project studying the clinical symptomatology and viral shedding of respiratory viral infections associated with host transcription factors. She is now Research Coordinator at the Department of Pediatrics at Columbia.

Faculty and staff in the news

- Micaela [Mailman News](#)
Martinez Mar 26: Visualizing COVID-19 in the Country's Epicenter
[The NY Times](#)
May 18: Where Chronic Health Conditions and Coronavirus Could Collide
[The Wall Street Journal](#)
May 29: New York Drives Back Coronavirus's Deadly March
- Lewis Ziska [Charleston Post Courier](#)
Mar 28: Climate change is stretching allergy season, but effects are less clear in SC
- Marta [The Scientist](#)
Galanti Aug 18: Studies on SARS-CoV-2's milder cousins hint that our immune systems are quick to forget the viruses, but it's unclear whether the same is true for the agent that causes COVID-19.
- Joan Casey [The Daily Californian](#)
Jun 11: Study shows oil and gas wells have adverse effects on pregnancy

Faculty and staff in the news

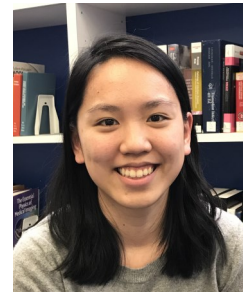
- Frederica Perera [WNYC: Science Friday](#)
May 22: Degrees Of Change: Regulatory Rollbacks
- Wan Yang [The Guardian](#)
Jul 04: 'We don't want things to get out of hand again': as New York reopens, dangers lie ahead
[The Wall Street Journal](#)
Jul 22: New York Makes Quarantines Main Defense Against Coronavirus Surges in Other States
[The NY Times](#)
May 20: Why Jails Are So Important in the Fight Against Coronavirus
[The Washington Post](#)
Sep 15: New York City's Shutdown Reduced Spread of Coronavirus by 70 Percent, Study Finds
- Teresa Yamana [Vox](#)
May 12: 4 reasons state plans to open up may backfire — and soon
- Sen Pei [Bloomberg](#)
May 04: Trump's 100,000-Dead Projection Gets Muddied by Reopenings
[NPR](#)
May 13: Fauci Says U.S. Death Toll Is Likely Higher. Other COVID-19 Stats Need Adjusting, Too
[The Wall Street Journal](#)
Sep 19: Reopening Colleges Likely Fueled Covid-19 Significantly, Study Finds
- Jeffrey Shaman [The Washington Post](#)
Mar 11: Coronavirus may have a seasonal cycle, but that doesn't mean it will go away this summer, experts warn
[Politico](#)
Apr 27: We're not ready to reopen America
[New Yorker](#)
May 08: When Will It Be Safe to End Coronavirus Lockdowns?
[The NY Times](#)
May 20: Lockdown Delays Cost at Least 36,000 Lives, Data Show
[Slate](#)
Jun 17: It Doesn't Look Like the Protests Are Causing a COVID-19 Spike
[NPR](#)
Jun 21: Yes, Wearing Masks Helps. Here's Why
[Smithsonian](#)
Jul 23: What Scientists Know About How Children Spread COVID-19
[National Geographic](#)
Aug 26: 'Everything has changed': How hurricane preparations are adapting to a deadly pandemic
[Bloomberg](#)
Sep 15: New York City Prepares for a Second Wave, With a Chance to Blunt the Worst

CERTIFICATE NEWS

Second years' summer practicum experiences



Kunsorya Chhea worked remotely with South Bronx Unite on a community based participatory research project. Their goal was to assess the impact of COVID-19 on South Bronx residents, as the pandemic has disproportionately affected communities of color. She helped draft a survey to assess impacts on healthcare, mental health, food access, and remote learning. She also held a focus group with community members to get feedback on the survey as well as helped map resources in the area to connect the community members with during the pandemic.



Nalyn Siripanichgon worked with Professors Darby Jack and Steve Chillrud on a research project developing a black carbon model using an environmental pollutant proxy. This project involved two components, the first of which was a data analysis involving cleaning and combining data from various sources to construct the final dataset for analysis. Once all the data is compiled, she will be developing a model. The second was a lab component at Lamont Doherty Earth Observatory, which involved analyzing collected filter samples for black carbon.



Kidd Solomon worked in the Office of Governor Polis in Colorado. He helped map out a climate change and public health framework for the state. Colorado has the most aggressive climate reduction plan in the nation that is focused almost entirely on GHG emissions and not on health impacts related to climate change. Kidd conducted research and drafted policy memos on the relationship between climatic shifts and negative health outcomes. He also offered recommendations on ways for the state to reduce agency silos and develop cross-agency collaborations. Finally, he sat on the Climate Equity Advisory, which was created to help build a climate justice framework that will be applied to new rules and legislation.



Felice Tsui worked at the Global Psychiatric Epidemiology Group as a research intern looking at the association between neighborhood advantage (as measured by socioeconomic status) and agoraphobia in urban youth in the Bronx, NY. She downloaded, cleaned, and managed Census data and conducted a factor analysis.

RESEARCH

Awards

In March, **Professor Frederica Perera** received the NIEHS Spirit Lecture Award, which honors Women's History Month by recognizing a notable woman who has made substantial contributions to society.

Professor Marianthi-Anna Kioumourtzoglou was awarded an NIEHS R01 grant on 'Integrating Air Pollution Prediction Models: Uncertainty Quantification and Propagation in Health Studies.'

Professors Jeffrey Shaman and Katherine Keyes were awarded an NIH R01 grant, titled 'Suicide as a Contagion: Modeling and Forecasting Emergent Outbreaks.'

Professors Jeffrey Shaman, Gary Miller, and Pam Factor-Litvak were awarded an NIEHS T32 training grant on 'Advanced Training in Environmental Health and Data Science: Molecules to Populations.' This award is a consolidation of three NIEHS T32 grants at the Mailman School into a unified training program designed to address critical needs in the field of environmental health sciences. Trainees will pursue training in mechanisms of disease, environmental epidemiology, or climate and health.

Professor Darby Jack received funding from the President's Global Innovation Fund to foster new projects and collaborations for research, teaching, and service within and across the nine sites of the Columbia Global Centers. His project is entitled 'Towards Closing the Air Pollution Data Gap in Sub-Saharan Africa through International Collaboration and Capacity Building.'

Carlos Gould, PhD candidate, was awarded an NIEHS F31 grant for his proposed work on 'Estimating the Health Benefits of National Clean Cooking Fuel Scale-up: A case study in Ecuador Using National Health Data,' which will test the hypothesis that the widespread replacement of solid fuel cooking with clean cooking fuels reduces pneumonia mortality in children under 5 years of age.

Professor Darby Jack received funding from the Fogarty International Center for his project, titled 'Resilient clean cooking: Maintaining household clean cooking in Ecuador during the COVID-19 pandemic.'

Robbie Parks, postdoctoral research scientist, is co-I on a grant that was awarded through the President's Global Innovation Fund for their proposed work, titled 'The Impact of Extreme Heat on Children's Health in Africa Project.'

Recent findings

Assessment of climate-health curricula at international health professions schools

Affiliated Investigators: Brittany Shea, Jeffrey Shaman, and Kim Knowlton

JAMA Network Open



To understand the state of climate-health curricula among health professions institutions internationally, a survey was conducted among 160 institutional members of the Global Consortium on Climate and Health Education. The survey assessed existing climate-health educational offerings, method of teaching climate-health education, whether institutions are considering adding climate-health education, whether institutions received a positive response to adding climate-health curricula and/or encountered challenges in adding curricula, and opportunities to advance climate-health education. Current climate-health educational offerings appear to vary considerably among health professions institutions; 53 institutions offer climate-health education and 61 reported offerings are under discussion to add. Most respondents have received a positive response to adding climate-health content.

Can ultra short-term changes in ambient temperature trigger myocardial infarction?

Affiliated Investigators: Sebastian Rowland and Marianthi-Anna Kioumourtzoglou

Environment International



Both low and high ambient temperatures have been associated with elevated mortality; however, little is known about the cardiovascular impacts of hourly temperature. We assessed the association between hourly ambient temperature and risk of myocardial infarction (MI) across adult residents of New York State from 2000-2015. We employed a time-stratified case-crossover study design matching case to control periods on hour of day, day of week, month and year. Of the 791,695 primary MI hospital admissions, 45% were female, the mean (SD) age was 70 (15) years. The observed temperature range was -29°C to 39°C , with a mean of 10.8°C (10.5°C). Temperature in the 6 h preceding the MI was positively associated with risk of MI, across the range of observed temperatures, with null or nearly null associations for earlier hours. We estimated a cumulative percent increase in hourly myocardial infarction rate of 7.9% (95% confidence interval [CI]: 5.2%, 10.6%) for an 11°C (median) to 27°C (95th percentile) temperature increase for lag hours 0–5. Men, Medicare-ineligible individuals (age < 65), and those experiencing their first MI were most sensitive. Our study provides evidence that increases in hourly ambient temperature can trigger MI.

Select recent publications

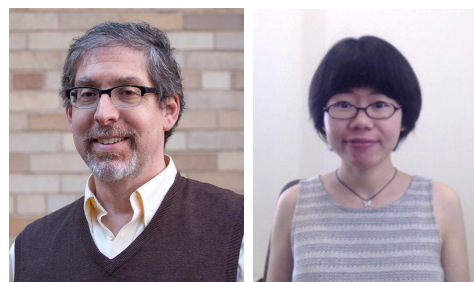
- Li R, **Pei S**, Chen B, Song Y, Zhang T, **Yang W**, **Shaman J**. Substantial undocumented infection facilitates the rapid dissemination of novel coronavirus (SARS-CoV-2). *Science*. 2020 May 1;368(6490):489-93.
- Branas CC, Rundle A, **Pei S**, **Yang W**, Carr BG, Sims S, Zebrowski A, Doorley R, Schluger N, Quinn JW, **Shaman J**. Flattening the curve before it flattens us: hospital critical care capacity limits and mortality from novel coronavirus (SARS-CoV2) cases in US counties. *medRxiv*. 2020 Jan 1.
- Hall KS, Samari G, Garbers S, Casey SE, Diallo DD, Orcutt M, Moresky RT, **Martinez ME**, McGovern T. Centring sexual and reproductive health and justice in the global COVID-19 response. *The Lancet*. 2020 Apr 11;395(10231):1175-7.
- Leung JM**, **Martinez ME**. Circadian Rhythms in Environmental Health Sciences. *Current environmental health reports*. 2020 Jul 13:1-0.
- He MZ**, Kinney PL, Li T, Chen C, Sun Q, Ban J, Wang J, Liu S, Goldsmith J, **Kioumourtzoglou MA**. Short-and intermediate-term exposure to NO₂ and mortality: a multi-county analysis in China. *Environmental Pollution*. 2020 Jun 1;261:114165.
- Nunez Y**, Gibson EA, Tanner EM, Gennings C, Coull BA, Goldsmith JA, **Kioumourtzoglou MA**. Reflection on modern methods: Good practices for applied statistical learning in epidemiology. *arXiv:2006.07305*. 2020 Jun 12.
- Sun Z, Chen C, Yan M, Shi W, Wang J, Ban J, Sun Q, **He MZ**, Li T. Heat wave characteristics, mortality and effect modification by temperature zones: a time-series study in 130 counties of China. *International Journal of Epidemiology*. 2020 Jul 25.
- Gould CF**, Schlesinger SB, Molina E, Bejarano ML, Valarezo A, **Jack DW**. Long-standing LPG subsidies, cooking fuel stacking, and personal exposure to air pollution in rural and peri-urban Ecuador. *Journal of Exposure Science & Environmental Epidemiology*. 2020 May 15:1-4.
- Ziska LH**. An Overview of Rising CO₂ and Climatic Change on Aeroallergens and Allergic Diseases. *Allergy, Asthma & Immunology Research*. 2020 Sep;12(5):771.
- Perera F**, Cooley D, Berberian A, Mills D, Kinney P. Co-Benefits to Children's Health of the US Regional Greenhouse Gas Initiative. *Environmental Health Perspectives*. 2020 Jul 29;128(7):077006.
- Lovinsky-Desir S, Jung KH, Montilla M, Quinn J, Cahill J, Sheehan D, **Perera F**, Chillrud SN, Goldsmith J, Perzanowski M, Rundle A. Locations of Adolescent Physical Activity in an Urban Environment and their Associations with Air Pollution and Lung Function. *Annals of the American Thoracic Society*. 2020 Aug 19(ja).
- Parks RM**, Bennett JE, Tamura-Wicks H, Kontis V, Toumi R, Danaei G, Ezzati M. Anomalously warm temperatures are associated with increased injury deaths. *Nature medicine*. 2020 Jan;26(1):65-70.
- Kontis V, Bennett JE, Rashid T, **Parks RM**, Pearson-Stuttard J, Guillot M, Asaria P, Zhou B, Battaglini M, Corsetti G, McKee M. Magnitude, demographics and dynamics of the impact of the first phase of the Covid-19 pandemic on all-cause mortality in 17 industrialised countries. *medRxiv*. 2020 Jan 1.
- Hilpert M, Johnson M, **Kioumourtzoglou MA**, Domingo-Relloso A, Peters A, Adria-Mora B, Hernández D, Ross J, Chillrud SN. A new approach for inferring traffic-related air pollution: Use of radar-calibrated crowd-sourced traffic data. *Environment international*. 2019 Jun 1;127:142-59.

PAST EVENTS

COVID-19 Virtual Symposium

Professors Jeffrey Shaman and Wan Yang spoke at several COVID-19 virtual symposia, hosted by the Zuckerman Institute at Columbia.

All videos from the symposia are available [here](#).



FEEDBACK

Please email the Program Coordinator, Haruka Morita, at hm2487@cumc.columbia.edu with questions or suggestions for future newsletter content. For more information about the Program, please visit our [website](#).