

NEWSLETTER Volume 8 Issue 2

Spring 2019

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.

## TABLE OF CONTENTS

<b>PROGRAM NEWS.....</b>	<b>2</b>	<b>PAST EVENTS.....</b>	<b>7</b>
<ul style="list-style-type: none"> <li>• Science, Health and Climate Change</li> <li>• Sick? 'Tis the Season</li> <li>• EPA should consider children when assessing risks of burning fossil fuels</li> <li>• Staff transition</li> <li>• New staff as of fall 2018</li> </ul>		<ul style="list-style-type: none"> <li>• Children's Environmental Health Symposium</li> <li>• Air Pollution Extremes Workshop</li> <li>• Using Influenza Data for Severity</li> <li>• NASA HAQST Meeting</li> <li>• Conference to Increase Diversity in Mathematical Modeling and Public Health</li> <li>• Workshop on Household Energy Impact Evaluation</li> <li>• CCCEH 20th Anniversary Celebration</li> </ul>	
<b>CERTIFICATE NEWS.....</b>	<b>4</b>		
<ul style="list-style-type: none"> <li>• Meet our new master's students</li> </ul>			
<b>RESEARCH.....</b>	<b>5</b>		
<ul style="list-style-type: none"> <li>• Recent findings</li> <li>• Awards</li> <li>• Other recent publications</li> </ul>			

## PROGRAM NEWS

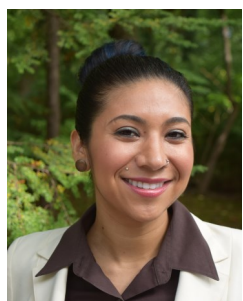
### **Science, Health and Climate Change**



Professor Jeffrey Shaman wrote a brief Letter to the Editor that was published in the Opinion section of The New York Times. He responded to the September article, One Thing You Can Do: Divest by noting, "One more thing you can do: Become educated on the health effects of climate change and share this information with others."

Read article [here](#).

### **Sick? 'Tis The Season**



Professor Micaela Martinez was featured on a podcast on Science Friday to discuss seasonality of diseases. We've all heard of the flu season, but did you know that chickenpox outbreaks tend to peak in the spring and historically, polio peaked in the summer?

Listen to podcast [here](#).

### **EPA should consider children when assessing risks of burning fossil fuels**



On NPR, Columbia Center for Children's Environmental Health (CCCEH) was recognized for a new study that is the first comprehensive review of the association between various fossil fuel combustion pollutants and multiple health effects in children.

Read article [here](#).

### **Staff transition**



Dr. Ruthie Birger is now a postdoctoral associate at Yale School of Public Health in the Pitzer Lab and holds an adjunct postdoctoral position at Columbia in the Shaman Lab. During her time as an Earth Institute Postdoctoral Fellow in the Shaman Lab, she worked on several projects, including an analyses on the prevalence of asymptomatic infection in ambulatory populations as part of the Virome of Manhattan study, a modeling analysis of within-host HIV dynamics among neonates, and several other infectious disease modeling efforts. In her current post, she is continuing her involvement on several projects related to the Virome of Manhattan study while beginning work at Yale on modeling cost-effectiveness for the new Typhoid conjugate vaccine.

## New staff as of fall 2018



**Zoe Anderson**  
Lab Technician

Originally from Trinidad and Tobago, Zoe received a Bachelor's Degree in Public Health Studies at Johns Hopkins University in 2017. She is a pre-medical student who has an interest in prevention and treatment of cardiovascular diseases in third world countries in the West Indies. She wishes to contribute to research demonstrating how different immediate environmental conditions correlate to specific cardiovascular diseases in different communities. With Dr. Shaman, Zoe is working on a project studying respiratory virus symptomology in Northern Manhattan.



**Chelsea Grant**  
Research Coordinator

Chelsea received a Bachelor's degree in Neurobiology with a secondary focus in Global Health and Health Policy from Harvard University. She served as a Peace Corps Health Extension Volunteer in Cameroon, where she worked on a USAID funded project developing systems and services for orphans and vulnerable children affected by HIV/AIDS. After, she was a clinical research coordinator for the Hepatitis Outreach Network at Mount Sinai, a study aimed to understand and reduce HBV and HCV prevalence in African born immigrants in NYC. With Dr. Shaman, Chelsea is working on a project studying respiratory virus symptomology in Northern Manhattan.



**Dona Sangapalaarachchi**  
Research Coordinator

Dona received her MD in General Medicine from Nizhny Novgorod State Medical Academy in Russia. She did her post graduate studies in anesthesiology in Sri Lanka and was a practicing physician in anesthesiology/intensive care and ER for the last ten years. During her work in the ICU, she engaged in hospital-based research in infectious diseases in dengue hemorrhagic fever and leptospirosis and studied the severity of clinical outcomes associated with patient admission time to the hospital. She earned her ECFMG certification after completing the US Medical Licensing Exams. With Dr. Shaman, Dona is currently working on a project studying symptom response to respiratory viral infections.



**Mariam Youssef**  
Lab Coordinator

Mariam 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-resistant bacteria related to urinary tract infection. With Dr. Shaman, Mariam is working on a project studying shedding and symptomatology of respiratory viral infections associated with host transcription factors.

## CERTIFICATE NEWS

### *Meet our new master's students*



**Katy Coomes** is from Santa Rosa, CA. She received her BS in Biochemistry and Cell Biology from UC San Diego in 2017, and has been working at Agilent Technologies in the Mass Spectrometry division as a Software Test Intern since 2016. Moving forward, she is very interested in mitigating the effects of natural disasters on vulnerable populations and hopes to pursue a career in this area after she graduates.



**Katherine Koziel** is from Needham, MA and studied International Affairs with a concentration in Global Public Health at George Washington University. Previously, she's worked as a project coordinator at UMass for the ACCEL program, which provided support during the Ebola crisis, and at MedEdNow, where she focused on healthcare communications. She is in the Department of Pop Fam, and is interested in how climate change impacts migration, communicable diseases, water sanitation, and food security.



**Natalia Quiroz** is from Monroe, NY. She graduated last May from Binghamton University with a degree in Biochemistry and a double minor in Italian and Global Studies. She has previously interned at the New York City Council, and has done research in asymmetric organocatalysis. She hopes to have a better understanding of current and anticipated health impacts from climate change before continuing onto medical school.



**Victoria Sanders** is from California's San Francisco Bay Area. She received her BS in Psychology from UC Davis four years ago. She worked in Human Resources for three years before discovering what she truly wanted to do – public health. At Mailman, she hopes to gain the skills, knowledge, and connections needed to launch her career in public health in order to make contributions that make noticeable differences in the world. By working in Environmental Health/Climate and Health, she hopes to make both the planet and people on it healthier for generations to come.



## RESEARCH

### Recent findings

#### Experiences with the Mass Distribution of LPG Stoves in Rural Communities of Ghana

Affiliated Investigators: Daniel Carrion and Darby Jack

Journal: *Ecohealth*



To limit household air pollution exposure and environmental degradation from biomass fuel use, the Government of Ghana promotes liquefied petroleum gas (LPG) use in rural Ghana via the Rural LPG program. Experiences with the program were assessed through focus group discussions, in-depth interviews, and surveys. They found that <5% of LPG beneficiaries used their stoves, citing reasons such as financial constraints, distance to LPG filling point, and fear of burns. Their results underscore a need for innovative funding mechanisms contextualized within an overall economic empowerment of rural folks to encourage sustained LPG use.

#### Hydrometeorology and flood pulse dynamics drive diarrheal disease outbreaks and increase vulnerability to climate change in surface-water-dependent populations: A retrospective analysis

Affiliated Investigators: Alexandra Heaney and Jeffrey Shaman

Journal: *PLOS Medicine*



In flood pulse river—floodplain systems, hydrology and water quality dynamics can be highly variable, potentially impacting conventional water treatment facilities and production of safe drinking water. In Southern Africa, climate change is predicted to intensify hydrological variability and frequency of extreme weather events, amplifying public health threat of waterborne disease in surface-water-dependent populations. Using the Chobe River in northern Botswana, they applied multi-model inference approaches assessing the influence of river height, water quality, and meteorological variability on weekly diarrheal case reports among children <5 presenting to health facilities. They found that season had an important influence on the type of diarrhea and age group of the patient, and increases in diarrheal case reports were closely tied to meteorology, flood recession, and decreases in surface water quality, with the highest number of cases occurring in the dry season.

### Awards

**Drs. Sen Pei, Sasi Kandula, Wan Yang, and Jeffrey Shaman**, received first prize in the 2019 Award for Outstanding Research Articles in Biosurveillance, Scientific Achievement Category for their paper on *Forecasting the spatial transmission of influenza in the United States*, published in *Proceedings of the National Academy of Sciences*.

**Professor Micaela Martinez** received the Columbia University Calderone Award for Junior Investigators (\$25,000) for her work on *Investigation into seasonal changes in human immune function*.

## Other recent publications

- Biggerstaff M, Johansson M, Alper D, Brooks LC, Chakraborty P, Farrow DC, Hyun S, **Kandula S**, McGowan C, Ramakrishnan N, Rosenfeld R, **Shaman J**, et al. Results from the second year of a collaborative effort to forecast influenza seasons in the United States. *Epidemics*. 2018 Sep 1;24:26-33.
- Ananth CV, **Kioumourtzoglou MA**, Huang Y, Ross Z, Friedman AM, Williams MA, Wang S, Mittleman MA, Schwartz J. Exposures to air pollution and risk of acute-onset placental abruption: a case-crossover study. *Epidemiology*. 2018 Sep 1;29(5):631-8.
- Lee AG, Kaali S, Quinn A, Delimini R, Burkart K, Opoku-Mensah J, Wylie BJ, Yawson AK, Kinney PL, Ae-Ngibise KA, Chillrud S, **Jack D**, Asante KP. Prenatal household air pollution is associated with impaired infant lung function with sex-specific effects: Evidence from GRAPHS, a cluster randomized cookstove intervention trial. *American journal of respiratory and critical care medicine*. 2018 Sep 26(ja).
- Yang W**, Cummings MJ, Bakamutumaho B, Kayiwa J, Owor N, Namagambo B, Byaruhanga T, Lutwama JJ, O'Donnell MR, **Shaman J**. Transmission dynamics of influenza in two major cities of Uganda. *Epidemics*. 2018 Sep 1;24:43-8.
- Kioumourtzoglou MA**, Weisskopf MG. Grandmaternal Diethylstilbestrol and Attention-deficit/hyperactivity Disorder in Children—reply. *JAMA pediatrics*. 2018 Dec 1;172(12):1204-5.
- Martinez ME**. The calendar of epidemics: Seasonal cycles of infectious diseases. *PLoS pathogens*. 2018 Nov 8;14(11):e1007327.
- Pei S**, Morone F, Liljeros F, Makse H, **Shaman JL**. Inference and control of the nosocomial transmission of methicillin-resistant *Staphylococcus aureus*. *eLife*. 2018 Dec 18;7:e40977.
- Perera F**, Ashrafi A, Kinney P, Mills D. Towards a Fuller Assessment of Benefits to Children's Health of Reducing Air Pollution and Mitigating Climate Change Due to Fossil Fuel Combustion. *Environmental Research*. 2018 Dec 12.
- Kioumourtzoglou MA**, Raz R, Wilson A, Fluss R, Nirel R, Broday DM, Hacker MR, McElrath TF, Grotto I, Koutrakis P, Weisskopf MG. Traffic-related Air Pollution and Pregnancy Loss. *Epidemiology*. 2019 Jan 1;30(1):4-10.
- Smith CM**, Chillrud SN, **Jack DW**, Kinney P, Yang Q, Layton AM. Laboratory Validation of Hexoskin Biometric Shirt at Rest, Submaximal Exercise, and Maximal Exercise While Riding a Stationary Bicycle. *Journal of Occupational and Environmental Medicine*. 2019 Jan 19.
- McGowan CJ, Biggerstaff M, Johansson M, Apfeldorf KM, Ben-Nun M, Brooks L, Convertino M, Erraguntla M, Farrow DC, Freeze J, Ghosh S, Hyun S, **Kandula S**, Lega J, Liu Y, Michaud N, **Morita H**, Niemi J, Ramakrishnan N, Ray EL, Reich NG, Riley P, **Shaman J**, Tibshirani R, Vespignani A, Zhang Q, Reed C. Collaborative efforts to forecast seasonal influenza in the United States, 2015–2016. *Scientific reports*. 2019 Jan 24;9(1):683.
- Yang W**, Li J, **Shaman J**. Characteristics of measles epidemics in China (1951-2004) and implications for elimination: A case study of three key locations. *PLoS computational biology*. 2019 Feb 4;15(2):e1006806.
- Galanti M**, Birger R, **Ud-Dean M**, Filip I, **Morita H**, Comito D, Anthony S, Freyer GA, Ibrahim S, Lane B, Ligon C, Rabadan R, Shittu A, Tagne E, **Shaman J**. Longitudinal active sampling for respiratory viral infections across age groups. *Influenza Other Respir Viruses*. Feb 15 2019.

## PAST EVENTS

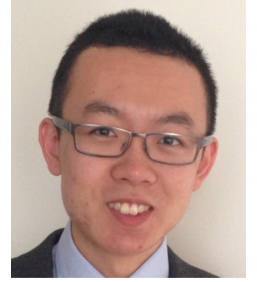
### ***Children's Environmental Health Symposium***

Professor Frederica Perera presented on 'Combustion-related air pollution and cognitive/behavioral dysfunction: Benefits of action' at the California Office of Environmental Health Hazard Assessment's (OEHHA) Children's Environmental Health Symposium on Air Pollution and Lifecourse Neurological Impacts on October 2nd.



### ***Air Pollution Extremes Workshop***

Doctoral student, Mike He, attended the Air Pollution Extremes Workshop hosted by the Columbia Initiative on Extreme Weather and Climate at Lamont on November 1-2. He gave an oral presentation on 'Short- and intermediate-term exposure to NO<sub>2</sub> and mortality: A multi-county analysis in China.'



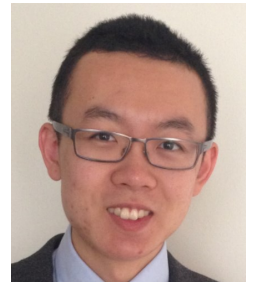
### ***Using Influenza Data for Severity***

Doctoral student, Sarah Kramer, attended the WHO Meeting on Using Influenza Data for Severity in Geneva, Switzerland, on November 27-29. She gave a talk on 'Retrospective and real-time forecasting of influenza outbreaks at the country level.'



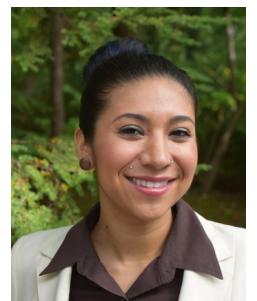
### ***NASA HAQST Meeting***

Doctoral student, Mike He, attended the NASA Health and Air Quality Applied Sciences Team's 5th Biannual Meeting in Phoenix, Arizona on January 3-4. He gave an oral presentation titled 'Short-term PM<sub>2.5</sub> and cardiovascular admissions in NY state: Assessing sensitivity of exposure model choice.'



### ***Conference to Increase Diversity in Mathematical Modeling and Public Health***

Professor Micaela Martinez attended the Conference to Increase Diversity in Mathematical Modeling and Public Health, hosted by Harvard Center for Communicable Disease Dynamics on November 30th. She gave a talk on 'Integrating clinical, cross-sectional, and time-series data to infer cross-scale disease dynamics and inform control.'



## Workshop on Household Energy Impact Evaluation

Professor Darby Jack co-facilitated, and doctoral students Daniel Carrión and Carlos Gould attended, the Workshop on Household Energy Impact Evaluation at the University of Colorado School of Public Health on December 17-18. This workshop introduced international attendees to impact evaluation methods to understand the implications of household energy policies.



## CCCEH 20th Anniversary Celebration

Columbia's Children Center on Environmental Health had their 20th anniversary celebration event at the Vagelos Education Center on January 31st. The Center's research has linked *in utero* environmental exposures to adverse health effects such as low birth weight, childhood asthma, obesity, and ADHD. Below are some research highlights:

- Climate Change: Documented co-benefits to children's health of reducing fossil fuel combustion
- Air Pollution: Supported policy that reduced emissions from transportation, heating, and other combustion sources in NYC, Poland, and China



## FEEDBACK

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