Climate & Health News

Newsletter of the JHU-UPF Public Policy Center Climate Change Working Group

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2nd Edition

In this second *Climate and Health News* for August, see several important policy and research pieces including NOAA's 2016 review of climate impacts worldwide showing "we crossed a climate threshold;" new evidence that suggests it is exceedingly unlikely global warming increase can be held below 1.5°C; and proposed new methods for attributing health impacts to climate change.

Also of interest in the last two weeks were news and science articles on humidity's role augmenting impacts of extreme heat on human health, a new estimate of heat impacts on workers worldwide, and news stories on wildfires in southern Europe. And watch a fascinating 35-second video that shows the evolution of global warming in countries worldwide over the last century.

This month please also take a moment to complete a short HIA survey being compiled by our colleagues at IS Global by clicking here: https://goo.gl/forms/T9l5K5AqE R4deKql3 The survey seeks to obtain an international perspective of knowledge surrounding "Health Impact Assessment" from the members of Health Professionals Associations.

Finally, we are all thinking of our colleagues and friends in Barcelona.

NEWS

EXTREME HEAT & DROUGHT

Heatwaves and humidity nearing human survivability threshold.

As global temperatures rise, river valleys in South Asia will face the highest risk of heat waves that reach the limits of human survivability. The deadly heat would threaten millions of people in some of the world's most densely populated regions in India, Pakistan and Bangladesh. – *Inside Climate News*

Heat waves that are dangerous now will get worse as global temperatures rises. A new study looks at the risks for global hot spots with climate change. Credit: Spencer Platt/Getty Images

Study: Indian farmer suicides may be linked to climate changes.

Climate change may have contributed to nearly 60,000 Indian farm worker suicides over three decades. An increase of 1°C during the growing season was associated with 67 more suicides, while increases outside the growing season showed no significant impact on suicide rates. *–The Guardian*

Farmers from Tami Nadu demonstrate in Delhi with what they say are the bones of farmers who committed suicide because of a crippling drought and high debt. Photograph: Julian Chung for the Guardian.

Europe heatwave sparks health warnings.

Parts of Europe are experiencing their most extreme heat in more than a decade as temperatures hit 44°C. Italy and the Balkans are the most severely affected. Several countries issued health warnings, wildfires spread in Italy and Albania and some regions faced the threat of severe drought. – *BBC*

A man uses a drinking tap to cool off in Saint Peter's Square in Rome EPA

Wildfires range untamed in Greece, Portugal and Corsica.

Continued extreme heat in the Mediterranean has stoked another round of wildfires across Southern Europe. Portugal broke a record with 268 single fires breaking out on one day. While many fires are started by humans, heat, drought and strong winds have contributed to their severity. –*Seattle PI*

Photo: Yorgos Karahalis, AP

SEA LEVEL RISE

Preparing for climate refugees.

Sea levels are on the rise, displacing entire populations and stirring fears for climate refugees who will be forced to relocate. The impact is being felt from Panama, to Alaska and small island Pacific states and governments appear unprepared. – *CNBC*

Elmer Martinez | AFP | Getty Images A boy wades through a flooded street in Panama City.

Miami's inexorable sea-level rise.

Several graphics demonstrate the quickly-rising sea level along the US Gulf Coast and Southeast Atlantic, and describe the likely impacts in the near term for Miami and other world cities. – *The Washington Post*

Disaster and neglect in Louisiana.

A year after the worst rainstorm in the state's history killed 13 and damaged nearly 100,000 homes, the federal government has provided less than half of what Louisiana says it needs to recover. –*Climate Central*

VECTOR AND WATERBORNE DISEASES

Arctic mosquitoes.

The Arctic's population of large mosquitos emerge earlier, grow faster and survive longer as winged pests with warming temperatures. Warming also allows mosquitos to develop faster and survive longer, avoiding being preyed upon by pond beetles and other predators. – *National Geographic*

As temperatures warm in the Arctic, mosquitoes emerge earlier, grow faster, and survive as winged pests even longer, according to new research. PHOTOGRAPH BY LAUREN CULLER

[Global warming worsening the nitrogen problem and algae blooms](#).
New research shows that increases in rainfall and extreme weather because of climate change will increase the amount of nitrogen polluting rivers and other waterways. Lakes and other freshwater bodies now routinely face toxic blue-green algae blooms that are fueled by nitrogen pollution. – *Yale e360*

AGRICULTURE

[Global warming reduces protein in food crops](#).
Rising carbon dioxide levels from global warming will drastically reduce the amount of protein in staple crops like rice and wheat, leaving vulnerable populations at risk of stunted growth and early death. – *AFP*

Wheat harvesting at a farm in Sergoit, Uasin Gishu County. A study led by Harvard University researchers now shows that global warming will drastically reduce the amount of protein in staple crops like rice and wheat. PHOTO I JARED NYATAYA I NATION MEDIA GROUP

POLICY AND RESEARCH

VIDEO: Watch a century of global warming in 35 seconds.

A new video uses NASA temperature anomaly data to show that despite year-to-year variations, countries around the world experience significantly warmer temperatures since the early 20th century. – *Yale e360*

New evidence: can we avoid dangerous global warming?

Two new studies find little chance the world will stay within limits prescribed by the Paris Accord. The first finds a mere 1 percent chance that warming can be limited below 1.5°C; the second that we have already committed to 1.5°C even if emissions were to stop immediately and entirely. –*The Washington Post*

2016 weather report: "the year we crossed a new threshold.

The US National Oceanic and Atmospheric Administration (NOAA) released its annual checkup of the Earth, which found the hottest year, highest sea level, and lowest sea ice in the Arctic and Antarctica. A record large El Nino (warming of the central Pacific) was also a factor. –*Chicago Tribune*

In this July 21, 2016 file photo, the sun sets beyond visitors to Liberty Memorial as the temperature hovers around 100 degrees in Kansas City, Mo. A new U.S. report says last year's weather was far more extreme or record breaking than anything approaching normal. (Charlie Riedel / AP)

Lawsuits may help bring climate action.

A report from the United Nations Environment Program (UNEP) found nearly 900 climate litigation suits in more than 20 countries worldwide, many of them suing oil companies or electricity producers and resembling the tobacco litigation of the 1990s that the industry knew of and concealed the dangers. – *New York Times*

Read the draft US climate report.

A final draft report by scientists from 13 federal agencies concludes that Americans are feeling the effects of climate change right now. The report was completed this year and is part of the National Climate Assessment, which is congressionally mandated every four years. The full report was made available by the New York Times, pending US government approval. – *New York Times*

SCIENCE

EXTREME HEAT

Humid heat waves at different warming levels

The co-occurrence of consecutive hot and humid days during a heat wave can strongly affect human health. Here, we quantify humid heat wave hazard in the recent past and at different levels of global warming. We find that the magnitude and apparent temperature peak of heat waves, such as the ones observed in Chicago in 1995 and China in 2003, have been strongly amplified by humidity. Highly populated regions, such as the Eastern US and China, could experience heat waves with magnitude greater than the one in Russia in 2010 (the most severe of the present era). The apparent temperature peak during such humid-heat waves can be greater than 55 °C, conditions in which humans are very likely to suffer heat stroke.

In Prague, people took to local parks to sunbathe as parts of the Czech Republic reached 38C

Estimating population heat exposure and impacts on working people in conjunction with climate change

We describe methods that can be used to produce quantitative estimates of the impacts of climate change on work-related activities. We show in maps the increasing heat exposures in the shade, expressed as the occupational heat stress index Wet Bulb Globe Temperature. Even the lowest target for climate change (average global temperature change = 1.5 °C) will
increase the loss of daylight work hour output due to heat in many tropical areas from less than 2% now up to more than 6% at the end of the century.

Climate and the eye: Case-crossover analysis of retinal detachment after exposure to ambient heat

We analyzed 14,302 individuals with inpatient procedures for retinal detachment from April through September between 2006 and 2013 in the province of Quebec, Canada. Exposure to elevated temperature the preceding week was associated with a higher likelihood of traction detachment, but not other forms of retinal detachment. Associations were stronger at <75 years of age in both men and women.

Diurnal Temperature Range in Relation to Daily Mortality and Years of Life Lost in Wuhan, China

Diurnal temperature range (DTR) is an important meteorological indicator associated with global climate change, and has been linked with mortality and morbidity in previous studies. In Wuhan, central China, between 2009 and 2012 we found every 1 °C increase in DTR (at a lag of 0-1 days) was associated with an increase of 0.65% (95% CI: 0.08-1.23) and 1.42 years (-0.88-3.72) for mortality and years of life lost (YLL) due to non-accidental deaths, respectively. Relatively stronger DTR-mortality/YLL associations were found for cardiovascular deaths. Females, the elderly (75+ years), and those with higher education attainment (7+ years) suffered more significantly from both increased YLL and mortality due to large DTR.

From top: Wuhan and the Yangtze River, Yellow Crane Tower, Wuhan Custom House, and Wuhan Yangtze River Bridge: Wikipedia.

Unravelling Diurnal Asymmetry of Surface Temperature in Different Climate Zones

We analyzed the regional evolution of the diurnal temperature range (DTR) trend over different climatic zones in India. We report a 0.36 °C increase in overall mean of DTR till 1980, however, the rate has declined since then, with important regional variation that are more pronounced during winter and post-monsoon season. We conclude that both maximum and minimum temperature increase in response to the global climate change, however, their rates of increase are highly local and depend on the underlying climatic zone.

Comparative evaluation of human heat stress indices on selected hospital admissions in Sydney, Australia

We aimed to find appropriate regression model specifications for counts of the daily hospital admissions of a Sydney cohort and determine which human heat stress indices best improve the models' fit. Humidity and heat-humidity indices better fit counts of patients who died following admission. However, simple temperature indices are a good fallback where a narrow range of conditions and short-term impacts are investigated.

INFECTIOUS DISEASES

REVIEW: Systematic Assessment of the Climate Sensitivity of Important Human and Domestic Animals Pathogens in Europe

Climate change is expected to threaten human health and well-being via its effects on climate-sensitive infectious diseases, but the proportion of climate-sensitive pathogens is unknown. We found 63% (N = 157) of pathogens in Europe are climate sensitive, most to primary drivers such as rainfall and temperature. Protozoa and helminths, and vector-borne, foodborne, soilborne and waterborne transmission routes were associated with larger numbers of climate drivers. Thirty-seven percent of disability-adjusted-life-years arise from human infectious diseases that are sensitive to primary climate drivers.

[Human leptospirosis cases in Palermo Italy. The role of rodents and climate]

Many regions of the world are increasingly exposed to leptospirosis due to poverty, global warming and high urban density. We report a molecular survey for pathogenic Leptospira spp. in rodents and two symptomatic human cases of leptospirosis in the city of Palermo, Italy. The high prevalence of leptospirosis in rodents and the simultaneous presence of known risk factors, such as a mild/wet climate, street flooding and garbage accumulation, could explain the increasing leptospirosis incidence.

View of Palermo from Monte Pellegrino: Wikipedia.

SOLUTIONS/REVIEW: A systematic review of the literature reveals trends and gaps in integrated pest management studies conducted in the United States

Integrated pest management (IPM) is a broad-based approach for addressing pests that negatively affect human and environmental health and economic profitability. We reviewed the IPM literature and found a majority of papers have addressed insects affecting agriculture. Climate change, technology and education specific to pest management studies are increasingly being published.

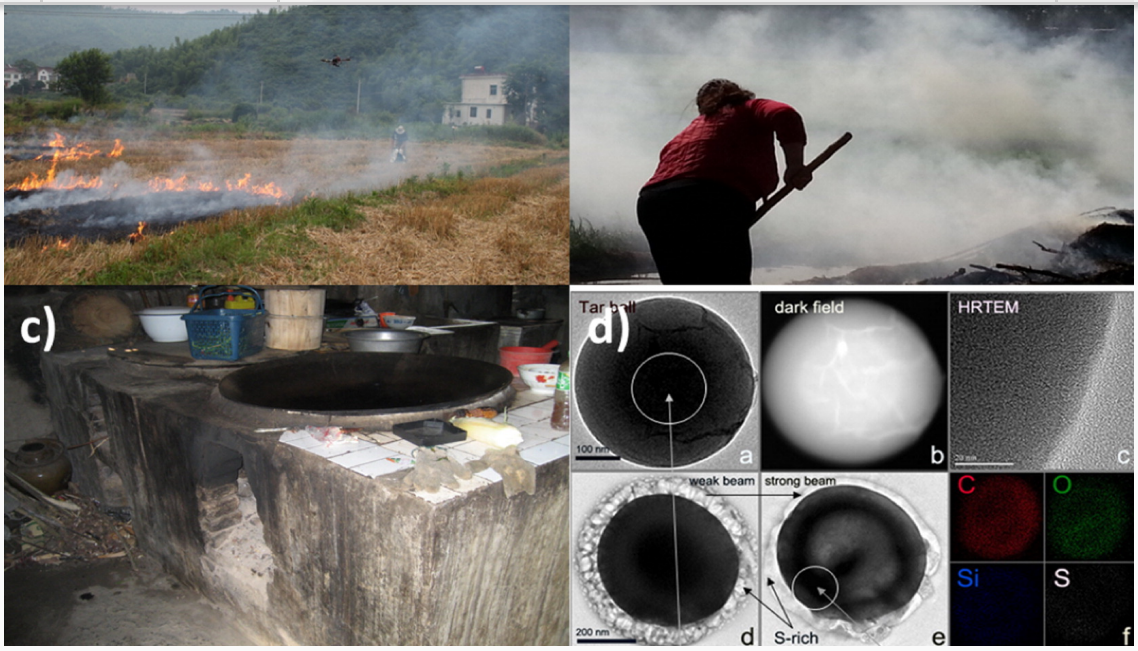
AIR POLLUTION

SOLUTIONS: The impact of climate change and emissions control on future ozone levels: Implications for human health

Gaps remain in our understanding concerning the impacts of climate change mitigation policies on ozone (O3) concentrations and health. We evaluated the separate impact of climate change and emission control policies on O3 levels and associated excess mortality in the US in the 2050s. By the 2050s, the largest increases in O3 are seen in the Northeast, the Southeast, the Central, and the West regions of the US. When O3 increases are examined by climate change and emissions contributions separately, the benefits of emissions mitigation efforts may significantly outweigh the effects of climate change mitigation policies on O3-related mortality.

REVIEW: Biomass burning in Indo-China peninsula and its impacts on regional air quality and global climate change

We document the current status of biomass burning (BB) emission in the Indo-China Peninsula (ICP) region, and impact on climate change. Our review confirms that ICP is one of the hotspot regional source for aerosols in terms of BB emissions, and regional BB emissions have significant implications for air quality especially in countries of the region. There remains a general lack of reliable data and research studies addressing BB related issues in context of environmental and human health, suggesting need to improve the current knowledge base.



Open field biomass burning causes severe air pollution, public health risk and potential climate impact. a) Photo taken in Changzhou rural area on June 10, 2015; b) Photo taken in Hebei rural area on October 23, 2013; c) A traditional indoor burner in rural area in China; d) Tar ball emitted from biomass burning. Retrieved from http://www.sciencedirect.com/science/article/pii/S0048969716324561.

Air pollution in China: Status and spatiotemporal variations

Three years' time series (January 2014 to December 2016) concentrations data of air pollutants including particulate matter (PM2.5 and PM10) and gaseous pollutants (SO2, NO2, CO, and O3) from over 1,300 national air quality monitoring sites were studied to understand the severity of China's air pollution. In 2014 (2015, 2016), just 7% (14%, 19%), 17% (27%, 34%), 51% (67%, 70%) and 88% (97%, 98%) of the population in China lived in areas that meet the national PM2.5, PM10, NO2, and SO2 standards. Though the air quality has been improving recent years, PM2.5 pollution in wintertime is worsening, especially in the Northern China. The complex air pollution caused by PM and O3 is an emerging problem that threatens the public health, especially in Chinese mega-city clusters.

POLICY AND RESEARCH

Detecting and Attributing Health Burdens to Climate Change

Detection and attribution of health impacts caused by climate change uses formal methods to determine a) whether the occurrence of adverse health outcomes has changed, and b) the extent to which that change could be attributed to climate change. There have been limited efforts to undertake detection and attribution analyses in health. Our goal was to show a range of approaches for conducting detection and attribution analyses. Case studies for heatwaves, Lyme disease in Canada, and Vibrio emergence in northern Europe highlight evidence that climate change is adversely affecting human health.

Research protocol: Household preferences for reducing greenhouse gas emissions in four European high-income countries: Does health information matter? A mixed-methods study

The present study protocol describes the transdisciplinary project HOPE (HOuseholds' Preferences for reducing greenhouse gas emissions in four European high-income countries) that investigates the role of health co-benefits in households' decision making on climate change mitigation measures in urban households in France, Germany, Norway and Sweden. This is one of the first comprehensive mixed-methods approaches to

investigate which mitigation measures households are most willing to implement in order to reach the 1.5° target set by the Paris Agreement, and whether health co-benefits can serve as a motivator for households to implement these measures.

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