

29 January 2018

Majid Ezzati FMedSci
Professor of Global Environmental Health
Director, Wellcome Trust-Imperial Centre for Global Health Research
Director, WHO Collaborating Centre on NCD Surveillance and Epidemiology

Professor Prabhat Jha
Senior Editor, *eLife*

Dear Prabhat:

My colleagues and I would like to submit the enclosed manuscript titled “Seasonal dynamics of mortality in the United States from 1982 to 2013” for consideration in *eLife*. The paper makes novel and important contributions to our knowledge of how weather and climate impacts health in the United States, and to methodologies for studying these impacts across the world.

Whether a warmer world will be associated with an overall reduction in deaths in temperate climates by reducing so-called excess winter deaths remains a common but empirically unresolved hypothesis. This debate persists at least partly because there is the formal analytical frameworks for studying seasonality of mortality, and probing how it varies over space and time, are underdeveloped. Yet methods for studying periodicity, and its long-term dynamics, have been utilised in other areas of weather and climate, e.g., for El Niño-Southern Oscillation.

We use geo-coded data and novel methods to analyse seasonality of mortality over three decades in the USA, nationally as well as in subnational climatic regions, for all-cause and cause-specific mortality. We find that seasonality of death rates in older middle- and older ages, when most deaths occur, is remarkably robust over time and climatic zone. In contrast, seasonality of deaths has largely disappeared in young children and weakened in adolescents and young adults. Deaths in young men have the largely-overlooked feature of peaking in summer, due to the summer rise in injury deaths.

The findings are important both for selecting environmental and health system interventions that can reduce weather-related deaths today, and for understanding how changes in weather regimes may influence different population subgroups. Our approach to studying seasonality also harmonises methodologies used for analysing weather and climate, and their consequences for human health. Therefore, the paper will be of interest to scientists and policy makers in a range of disciplines with interest in both human mortality and the human consequences of global environmental change.

The paper is around 2,800 words and has six figures, with additional figures that provide details by a combination of cause and climate region designated as supplementary figures.

We would of course be happy to take guidance from the Editors in adjusting the manuscript length and figures as needed. This manuscript is the original work of the authors. It has not been previously published and is not under review in any other journal. All authors have contributed to the paper, have approved its submission, and take responsibility for its contents.

The following people are qualified to assess its contents and their implications, and are independent of this work:

1) Professor Marcia Castro (climate change health effects; statistical methods; population health and environmental health)

Harvard University

E-mail: mcastro@hsph.harvard.edu

2) Professor C Arden Pope (environmental health; statistical methods)

Brigham Young University

E-mail: cap3@byu.edu

3) Professor Howard Hu (environmental health; climate change health effects)

University of Toronto

E-mail: howard.hu@utoronto.ca

4) Professor Brent Coull (environmental health; time-series statistical methods)

Harvard University

E-mail: bcoull@hsph.harvard.edu

5) Professor Ted Cohen (disease dynamics and modelling)

Yale University

E-mail: theodore.cohen@yale.edu

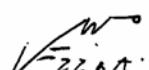
5) Professor Julian Marshall (environmental health; climate change health effects)

University of Washington

E-mail: jdmars@uw.edu

We look forward to your response and would be happy to answer any questions that you may have on this paper.

Sincerely,



Majid