

## **HEALTH EFFECTS OF RISING TEMPERATURES: Evidence from mortality rates in nineteenth and twentieth century London**

Cities in the developing world, where the mortality burden of digestive diseases remains high, can adapt to rising temperatures by improving their public health infrastructures. That is one of the conclusions of research by **Casper Worm Hansen** and colleagues, to be presented at the annual congress of the European Economic Association in Manchester in August 2019.

Their study of the health effects of high temperatures in London in the nineteenth and early twentieth century shows that weeks with high temperatures were much more deadly in the period before World War I due to a high mortality burden of infectious digestive diseases among infants. As London developed, and these infectious diseases were progressively eliminated by public health improvements, the mortality effects of periods of unusually high temperatures declined.

### **More...**

How does development alter the health effects of rising temperatures? This is an urgent question as global climate change advances, yet it is difficult to study because poorer locations often lack detailed mortality statistics over longer periods.

A novel solution to this problem is to turn to historical settings, such as nineteenth century London, where detailed mortality statistics are available in an environment where the lack of modern medical care and poor sanitation resulted in mortality patterns comparable to those experienced in very poor developing countries today.

This new study – by economists from New York University and the University of Copenhagen – collects novel weekly mortality statistics for London from the mid-nineteenth century to 2006 and uses them, together with daily weather reports from Oxford's Radcliffe Observatory, to study the impact of temperature on mortality and how this relationship changed as London developed.

The study documents that weeks with high temperatures were much more deadly in the period before World War I due to a high mortality burden of infectious digestive diseases among infants. As London developed, and these infectious diseases were progressively eliminated, the mortality effects of periods of unusually high temperatures declined.

Simple calculations based on the changing relationship between temperature and mortality indicate that roughly 600-870 high-temperature-related deaths per year were averted in London after 1918 due to the shift in the relationship between temperature and mortality relative to the late nineteenth century.

The study argues that this dramatic change between temperature and mortality was ultimately driven by public health improvements that had sharply reduced the mortality burden of digestive disease by World War I. This finding illustrates how cities in the developing world, where the mortality burden of digestive diseases remains high, can adapt to rising temperatures by improving their public health infrastructures.

One striking pattern that emerges from this study is that economic development reduced the mortality effects of unusually high temperatures (mainly driven by infectious causes of deaths among the young), much more than mortality effects associated with unusually cold temperatures (mainly due to pneumonia, influenza and other respiratory disease deaths among the elderly).

As a result, the rise in temperature in London across the twentieth century ultimately resulted in fewer temperature-related deaths. Strikingly, however, this was possible only because of the sharp reduction in the mortality effects of high temperatures, due to progress in reducing infectious causes of deaths in the early 20<sup>th</sup> century.

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