

Rising temperatures and flaring tempers linked, says study

Study published in “Science” tracks climate change, human conflict and their interplay since 8,000 BC.

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In this July 19, 2013 photo, a boy plays in the waters of Massachusetts Bay framed by a large sand sculpture on a hot day at Revere Beach in Revere, Massachusetts. A study published in “Science” has found a strong positive correlation between rising global temperatures due to climate change and human violence.

As the world gets hotter, so do our tempers. A study published in *Science* on August 1, 2013 has found a strong positive correlation between rising global temperatures due to climate change and human violence. While economists who conducted the study have no explanation for why this could be happening, they speculate that those factors that link climate to human well-being could be driving aggression — in forms ranging from blaring horns to more violent rapes.

“For instance, when it gets very hot, there may be changes to individuals’ neurophysiology that makes them more predisposed to violence,” said [Edward Miguel](#), Oxfam Professor of Environmental and Resource Economics, University of California, Berkeley, and one of the

study's authors. To back this up, Prof. Miguel and colleagues have a massive dataset: their study tracked climate change, human conflict and their interplay since 8,000 BC.

The findings could have critical implications for understanding the impact of future climate change on societies, as many global climate models project temperature increases of at least 2°C over the next half century. The paper notes: "...For each 1 standard deviation change in climate toward warmer temperatures or more extreme rainfall, median estimates indicate that the frequency of interpersonal violence rises 4 per cent and the frequency of intergroup conflict rises 14 per cent."

This suggests that a global temperature rise of 2°C could increase the rate of intergroup conflicts, such as civil wars, by over 50 per cent in many parts of the world, especially in tropical regions where such conflicts are most common, by 2050.

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For many reasons, not the least of which is that the scope of this study is wide ranging for the sheer number of causes and events it takes into account, it'd be silly to think climate change, say, caused World War II. Instead, Prof. Miguel's work — this and past — could be seen as contributing to a growing body of literature since 2004 that has been able to say climate change and violence are linked, but not specifically as much as empirically.

With this comprehensive study, however, the paucity of quantitative literature has been removed. There is now strong empirical evidence that adverse climate makes us more violent, "both at the interpersonal level (i.e., violent crime in the U.S.) and at the larger societal level (i.e., civil war in Africa)," Prof. Miguel said. "We examine 60 quantitative studies in our paper, and the results are strikingly consistent."

In one section, the paper focuses on 27 instances from history where temperature could be the key climatic variable driving conflict. All 27 out of 27 were found to show a positive correlation between temperature and violence: if the former increased, so did the latter and without fail.

"We conclude that there is a very large and robust link between adverse climate and violence, at multiple scales and time periods, across the globe," Prof. Miguel said. The data covers all major regions of the world and shows similar patterns of conflict linked to climatic changes, such as increased drought or higher than average annual temperature.

"Apart from neurophysiology, Miguel believes that another key channel is economic, and in particular agricultural. "In less developed countries where a large share of the population relies on their own farm production for food, extreme temperatures and rainfall can wreak havoc with their crops, leading to large drops in income," he explained. The resulting desperation could be a large contributor to violence."

Examples include spikes in domestic violence in India and Australia; increased assaults and murders in the United States and Tanzania; ethnic violence in Europe and South Asia; land invasions in Brazil; police using force in Holland; civil conflicts throughout the tropics; and even the collapse of Mayan and Chinese empires. Prof. Miguel explained, "There is currently much debate about the nature of this link, and our results provide the most comprehensive evidence yet assembled on this critical question."

Drawing from archaeology, criminology, economics, geography, history, political science, and psychology, the study examined 45 datasets (from the 60 studies) in total, and subjected them to a rigorous statistical method called a regression framework. It accounts for both time and space in a systematic way, throwing up the amount of correlation between conflict and the climate variable of interest in that dataset.

"Taken together, the findings indicate that the risk of future conflict and violence is another reason why serious efforts must be made now to deal with future climate change, through both mitigation and adaptation strategies," concluded Prof. Miguel. Describing the precise nature of this intriguing interplay is going to be the economists' next step.



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