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Climate change will increase injuries and deaths in USA

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By [Dr. Liji Thomas, MD \(/medical/authors/liji-thomas\)](#)
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A new study (<https://www.nature.com/articles/s41591-019-0721-y>) shows that warming of the global climate can lead to thousands more of deaths due to both unintentional and intentional injuries. This adds another and unexpected aspect to the current discussion on mitigating the effects of global climate change by adaptation. Until now, the effects of this on health have been seen to be mediated by infectious disease, cardiac disease, respiratory disease and other chronic diseases. Injury-linked deaths, which currently make up about 10% of global deaths, are now seen to be another potential consequence of global climate change. The study titled 'Anomalously warm temperatures are associated with increased injury deaths', is published in [Nature Medicine](#) (<https://www.nature.com/articles/s41591-019-0721-y>)

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Global climate change



Temperatures that are significantly above normal for a given region for a long period may be called anomalous temperatures. These are defined as deviations of monthly temperature from the local average monthly temperature over the entire analysis period. The study looked at the mortality data as well as temperature data over the 38 years between 1980 and 2017. Using a model which factored in time and space factors, they then computed the effect of anomalous temperatures on death rates by sex and age.

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The reason for the study was that injury-related deaths vary by seasons and the seasonal trends vary by age, which provokes the question: does the temperature have anything to do with these deaths? Secondly, it is possible to explain how temperature fluctuations can cause injury, such as increased drinking in warmer weather, which leads to higher rates of drunken driving and poor driving performance with increased anger, along with increased road traffic – all of which amount to the distinctly higher possibility of accidental deaths. The researchers thus wanted to look at the relationship between death from various injuries in the US and the anomalously warm temperatures of today and of the not-so-distant future.

The study made use of death registration data in the mainland USA in the study period, with the underlying cause of death, and the residential data by state and county.

The findings

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The study found that over the study period, over 4 million males and 1.8 million females died from injury in the US mainland. This was responsible for about 9% and 4% of all deaths in these categories. The overwhelming majority of deaths occurred in those who were at least 15 years old, with over 50% occurring in the age group 15-44 years.

Injury-related deaths in males were mostly (in almost 80% of cases) due to drowning, transport accidents, falls, suicide, and violence, which also caused about 72% of this male death toll. Females, on the other hand, caused most deaths in women below 75 years, and falls after that. On the other hand, transport caused most deaths in men below 35 years, after which suicide was predominant until the age of 75. After this, like elderly women, falls became the leading cause of death. Over the study period, the relative contributions of transport, drownings and assault have gone down, but falls have become a more important factor. After 2014, deaths due to assault have gone up, but those from suicide have gone up after an initial decline to

currently go beyond the levels at the beginning of the study. The death rate due to transport and drowning was highest in the summer months but no seasonal trend was observed with other major injuries.



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Using county-specific averages for the whole study period, the researchers calculated the anomalous temperature for each county, and then for the state on a monthly basis. This showed how much the temperature deviated from the long-term average in each month. Overall, there was an anomalous temperature variation of 1.2 °C. There was a clear seasonal variation, with the largest variation in December, and the least in August and September. Geographically, the northern and central states had the largest anomalous variation and the coastal and southern states the least.

Using a computational model based on monthly injury death rates in association with the anomalous temperature, the scientists estimated the risk for each type of injury by sex and age. This was then used to find out how many additional deaths would occur if the temperature in each month in every state persisted at unexpectedly and abnormally warmer levels than the local norm by 1.5 degrees Celsius (the norm being taken from the Paris Climate Agreement). Meet the Team (/medical/team)

The model shows that in such a case there would be an additional 1,600 deaths due to injury, both deliberate and inadvertent, with 92% being in people between 15 and 64 years. 84% of these deaths would occur in males between adolescence and middle age. Most would be due to transport injuries, followed by suicides. At the same time, there would be fewer deaths due to falls in the elderly (above 85 years). At the same time, drowning, though not the largest contributor, would show the largest increase by about 14% in men between 15 and 24 years. This could be because more people will swim with warmer temperatures. It is likely that most additional drowning deaths will occur in young males aged 15 to 44 years, mostly in California, Texas and Florida.

The number of excess injury deaths would go up to above 2,100 if the temperature persistently remained 2 °C warmer than the long-term average. Thus, the study shows a valid link between injury deaths and warm temperatures as well as the need to develop social and health care system interventions to soften this impact. These could range from targeted education to screening checks such as targeted blood alcohol level checks. "We need to respond to this threat with better preparedness in terms of emergency services, social support and health warnings," summed up researcher **MediKnowledge** (medical)



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Journal reference:

Parks, R.M., Bennett, J.E., Tamura-Wicks, H. et al. Anomalously warm temperatures are associated with increased injury deaths. *Nat Med* 26, 65–70 (2020) doi:10.1038/s41591-019-0721-y, <https://www.nature.com/articles/s41591-019-0721-y> (<https://www.nature.com/articles/s41591-019-0721-y>)

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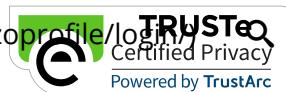
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