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# Extreme heat linked to increase in mental health emergency care

by Boston University School of Medicine



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During periods of extreme heat, clinicians should expect to see an increase in patients requiring mental health services, according to a new study led by Boston University School of Public Health researchers.

Published in the journal *JAMA Psychiatry*, the study found that days with higher-than-normal temperatures during the summer season in the United States were associated with increased rates of emergency department (ED) visits for any [mental health](#)-related condition, particularly substance use, anxiety and stress disorders, and mood disorders.

The impact of [heat](#) on [physical health](#) is well documented, but few studies have examined the effects of [extreme heat](#) on mental health. This nationwide study is the largest and most

comprehensive analysis of daily ambient temperature and mental health-related ED visits among US adults of all ages. As days of extreme heat are expected to increase due to worsening [climate change](#), the findings fill a critical gap in research and provide evidence-based support for proactive interventions and policy solutions that can reduce heat-related crises.

"Emergency department visits represent some of the costliest interactions within the healthcare system," says study lead author Dr. Amruta Nori-Sarma, assistant professor of environmental health at BUSPH. "Addressing the needs of the most vulnerable to preempt some of these visits can have a [positive impact](#) on individual health and costs, as well as preserve healthcare resources for other emergencies."

The new findings should prompt healthcare providers to prepare for an increased need in [mental health services](#) during times when extreme heat is predicted, Nori-Sarma says. "When heat waves are forecasted, clinicians and public health experts may use our findings to prepare especially for outreach to patients with existing mental health conditions."

The general public can also benefit from this insight, says study senior author Dr. Gregory Wellenius, professor of environmental health and director of the Climate and Health Program at BUSPH.

"On days of extreme heat, it is important that we each take the precautions necessary to take care of ourselves and our loved ones," he says, which can include checking on neighbors or family members who may be susceptible to health impacts of heat exposure.

For the study, Nori-Sarma and colleagues obtained medical claims data on mental health-related ED visits from OptumLabs Data Warehouse, which contains de-identified, longitudinal health information on more than 200 million commercial and Medicare Advantage enrollees throughout the US. The researchers analyzed approximately 3.5 million ED visits among 2.2 million adults ages 18 or older who had commercial or Medicare Advantage health insurance during the warm season (May to September) from 2010 to 2019.

Days of extreme heat—defined as temperatures above the 95<sup>th</sup> percentile of temperature distributions by county—were most strongly linked with ED visits for childhood-onset behavioral disorders and substance use disorders, followed by anxiety, stress-related, and somatoform disorders, and mood disorders. Extreme heat was also associated with ED visits for schizophrenia.

The researchers found that the impact of heat on mental health was similar across age groups, and evident in both men and women and in every region of the country. "These results show that heat can profoundly impact the mental health of people regardless of age, sex, or where they live," says Wellenius.

The authors found the the impact of heat was slightly higher in the Northeast, Midwest, and Northwest. Although those regions generally have lower temperatures than the southeast or southwestern US, "that is exactly why the populations in these areas might suffer the most during times of high temperatures," Nori-Sarma says. "They don't necessarily have the skills or resources in place to cope during times of extreme heat. Heat events will become even more extreme as the

climate continues to warm, so it's doubly important to identify the populations that are most vulnerable and to help them adapt to warmer summertime conditions."

In future studies, the researchers aim to identify public health strategies that will help alert people to the risks posed by extreme heat and better protect the most vulnerable community members. Subsequent research will also explore the impact of elevated temperatures on mental health during longer periods of time (i.e. heat waves), as well as the impact on vulnerable groups that this study did not assess, including the uninsured, low-income, and various race/ethnicities, and those experiencing less urgent situations.

The continuing effects of COVID-19 on mental health will also shape this work. Lockdowns, social isolation, and general uncertainty during the early days of the pandemic increased the need for—and limited the availability of—mental health services simultaneously as EDs were overwhelmed with patients experiencing physical emergencies, Nori-Sarma says.

"As we approach the upcoming summer season, it is important to keep in mind that the combination of stressors—pandemic and climate—might exacerbate existing mental health conditions," she says. "The mental healthcare system should plan accordingly."

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**More information:** Association Between Ambient Heat and Risk of Emergency Department Visits for Mental Health Among US Adults, 2010 to 2019, *JAMA Psychiatry* (2022). DOI: [10.1001/jamapsychiatry.2021.4369](https://doi.org/10.1001/jamapsychiatry.2021.4369) , [jamanetwork.com/journals/jamap ... psychiatry.2021.4369](https://jamanetwork.com/journals/jamap...psychiatry.2021.4369)

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