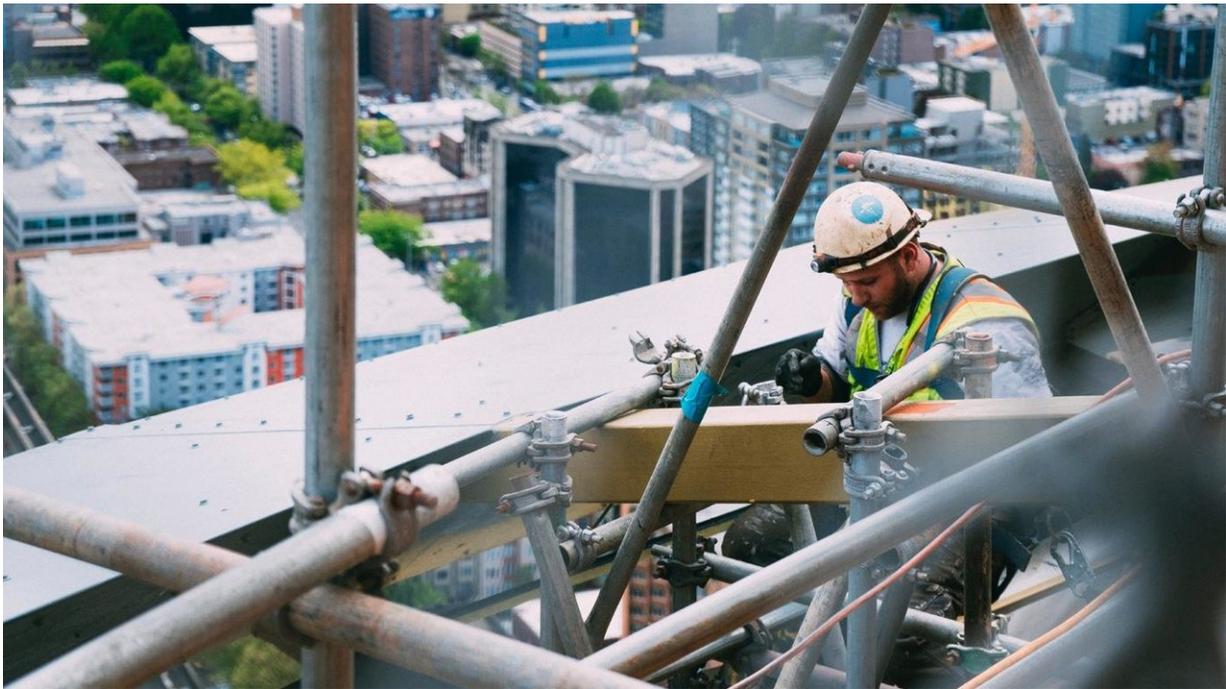


Rising temperatures harm worker productivity, causing global losses

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A new study finds higher temperatures may cause significant global economic losses because workers are less productive and absent more often when it is hot. Credit: Anthony Ginsbrook

From Montreal to Mount Washington, heat records are being broken this summer in places not accustomed to sweltering temperatures. Studies have found that [unusually hot weather is linked](#) to lower economic output in countries around the world. Although several factors—from

poor crop yields to heat-related illnesses—probably share part of the blame, there is also a more fundamental variable at play: When we get hot, we find it difficult to work.

"Because human physiology is the same whether you live in India, the United States or anywhere else in the world, the connection between hot temperatures and lower productivity has fundamental implications for how we should think about the costs of climate change going forward," said Anant Sudarshan, the South Asia Director at the Energy Policy Institute at the University of Chicago.

In a new study, Sudarshan and his coauthors analyzed the productivity of workers in India, the world's third-largest economy. They looked at both labor-intensive and highly automated manufacturing processes. In the first category, they found that the productivity of workers engaged in cloth weaving or garment manufacturing dropped by as much as 4 percent per degree as temperatures rose above 80 degrees Fahrenheit. However when studying workers in the steel industry who were operating in plants with highly automated production, they found that productivity did not fall when it got hot outside.

Heat did more than influence productivity at work. It also increased absenteeism. A one-degree increase in the ten-day temperature average increased the probability that a [worker](#) would be absent by as much as 5 percent. Interestingly, this remained true, even where the workplace used automation. Mechanization might reduce the effects of temperature on the shop floor, but may not solve the problem of employees missing work.

Less productive workers mean a less productive business, and a less productive economy. To determine if the declines in worker productivity decreased the output of factories, Sudarshan and his colleagues looked at data from almost 70,000 plants across India. They found that the value

of output declined by about 3 percent for every degree above the average [temperature](#). This loss is large enough to explain the entire reduction in India's economic output in hot years.

To adapt to hotter temperatures, businesses could install climate control measures such as [air conditioning](#). Sudarshan and his coauthors collected data from a number of garment plants in the midst of a phased roll-out of shop floor cooling, providing the researchers with the opportunity to compare workers on the same day in nearby plants who did and did not have climate control. They found that workers in plants with climate control were more productive. But the [climate control](#) measures didn't remove absenteeism.

"Air conditioning is expensive, and poor countries are unlikely to move to universal cooling anytime soon. However if cooling the workplace doesn't prevent people from skipping work, then adapting to hotter temperatures will be difficult even in richer countries," Sudarshan said. "In the long run, countries may need to prepare for bigger changes. Factories may decide to relocate to cooler regions or automate more of their work to compensate for the lost [productivity](#). This may have wide-ranging impacts on employment rates and wages in areas that are already struggling to grow, and is clearly an important area for further research and policy attention."

More information: Working Paper: The Impact of Temperature on Productivity and Labor Supply: Evidence from Indian Manufacturing: drive.google.com/file/d/1AZayI...oiuEazVveWoKgH8/view

Provided by University of Chicago

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