Bringing heat exposure to the table

By Cassidy Araiza in Phoenix May 23, 2021

As cities become more crowded, extreme heat is putting people of color and lower-income communities at a greater disadvantage.

Heat and smog hit low-income communities and people of color hardest, scientists say

Experts point to potential improvements, such as more equitable deployment of clean energy measures, upgrading building materials such as concrete and asphalt that absorb the sun's energy experience, and planting more trees in the wrong neighborhoods. A study last month found that 92 percent of low-income communities are more impacted by heat than their wealthier neighbors.

"Knowing where to prioritize resources can hopefully inform policies that protect communities that are most vulnerable," said Lara Schwarz, co-lead author of the PNAS paper. "It's not just the people who are impacted, it's the system that needs to change." Schwarz said, adding that "we tend to have less policy at the neighborhood level, but we have a lot of policy at the national level." She said that cities need to look at the lived experiences of people who live in these neighborhoods.

"The racial disparities we see are driven by median income," Schwarz said. "We find that race influenced whether someone was more likely to be affected, but the poverty line is what was driving the disparities.

Brian Stone, director of the urban climate lab at the Georgia Institute of Technology, said he agrees with the general conclusions of the Nature Communications paper. "But it was not that people of lower income were not impacted. It was that they were impacted more than their wealthier neighbors."

"Generally urban temperatures are higher in the middle of the city," he said. "That's where the low-income neighborhoods are often located.

"The island effect," in which urban areas with little tree cover and a concentration of asphalt and concrete experience higher temperatures, may also explain why people in lower-income neighborhoods are more affected by heat. A recent study in Arizona found that the heat island effect increased temperatures by 1.37 degrees Celsius in Phoenix compared to other parts of the state. In Minneapolis, the effect increased temperatures by 2.77 degrees Celsius. People of color saw the highest urban heat exposure increase, at 3.12 degrees Celsius.

Using satellite temperature readings between 2013 and 2017, the researchers compared urban and rural areas to see how much both affected groups were exposed to the heat. They found that "heat exposure increased for both groups, but not strongly, and not equally," Stone said.

"The Nature Communications paper explored what researchers call the "urban heat island,"" he said. "It's a really common phenomenon that we see in cities, but it's not uniform. It's not the same everywhere."

"The urban heat island effect is really strong, especially for people in communities that are having an inordinate amount of heat exposure," Stone said. "That's why it's so important to look at community-level differences and how those disparities are playing out." He said that the findings may not hold on a granular level, where air temperatures are most extreme.

The study also compared the temperatures in cities with high and low median incomes. The findings showed that cities with lower median incomes had higher temperatures.

The authors, including T.C. Chakraborty, co-author of the study, said the findings show that heat exposure and related health issues are already having an inordinate impact on people of color and low-income communities.

"The disparities we see are not just temperature-related," Chakraborty said. "There are social and environmental factors that are driving the disparities."

"We know that heat exposure is a crisis," he said. "But we don't see it as much attention as hurricanes, sea level rise or other events being exacerbated by climate change.

"Heat is the number-one weather-related killer," said Ladd Keith, assistant professor of mental health and climate change at the University of Arizona, who reviewed both reports. But he said the problem often doesn't get as much attention as other climate-related issues.

"Whereas hurricanes and other severe weather events are very prominent issues, heat is a slowly developing issue that's less visible," Keith said.

"We tend to think heat is not as important as other weather events, but it's a serious problem," he said. "It's the number-one weather-related killer, and it's getting worse."

Keith noted that climate change is driving temperatures higher, putting people at greater risk for heat-related illness. "We're starting to see more extreme heat events. That's why this is such a serious issue," he said.

"We're seeing this increase in heat-related illness and death, and it's not going away," he said. "It's something we need to address now."