

Bedrooms here average a muggy 28 deg C at night: Study

Researchers looking at impact on sleep and tools for better rest as nights get warmer

Shabana Begum
Correspondent

For a nation hooked on air-conditioning, the typical night-time temperature in the Singapore bedroom is pretty steamy, and not in a good way. A first-of-its-kind study of 150 residents found that the average temperature is 28.4 deg C, which is higher than it should be for optimal sleep.

Singapore's average temperature over a year is around 28 deg C.

"28.4 deg C is above the temperatures generally linked to good sleep, which tend to be in the low-to-mid 20s," said Michele Renard, a research fellow with the Human Potential Translational Research Programme at the NUS Yong Loo Lin School of Medicine.

He pointed out, though, that most of those benchmarks come from cooler climates.

"So part of what we're trying to establish is what's actually suitable for people living here."

Over a year, 150 adults, from

those in rental flats to those in landed property, took part in the study. They kept environmental sensors in their bedrooms and wore a smartwatch for two months, for researchers to track how well they slept.

"We can use the data from these 150 people to explore the impact of a poor night's sleep, whether it was due to a hotter-than-average night, and how that affects someone's physical activity the next day," said Renard.

Another preliminary finding from the study is that air-conditioning is used only a little more than half the time at night.

"Across the 150, a third of them use AC, a third use it variably with fans, and a third don't at all," added Renard.

Singaporeans are among the most sleep-deprived worldwide, according to several reports, including a recent one coming from market research firm YouGov.

And nights are getting warmer faster than the days are, too, as the country feels the effects of climate

change. By 2050, at least 317 nights here each year are expected to be warm, with temperatures at 26.3 deg C and above, the third national climate change study has revealed.

This prompted researchers from the National University of Singapore (NUS), the University of California, Berkeley and the University of Sydney to embark on a three-year study called HEATS (Heat Exposure, Activity and Sleep).

The project, which started in 2023, is funded through the National Research Foundation's (NRF) Campus for Research Excellence and Technological Enterprise (CREATE) initiative.

HEATS was among several research projects under the initiative that was presented to the media ahead of the annual CREATE Symposium on June 25. The symposium's focus in 2026 was on climate, environment, health, and urban resilience, which NRF chairman Heng Swee Keat identified as key national concerns at the launch of the symposium.

"The (HEATS) team is not only measuring the impact of heat exposure, but also developing practical

cooling solutions and smart-watch-based nudging tools to help Singaporeans sleep better in warm conditions," said Heng.

The researchers also served as the participants' "sleep guardians", sending them tips to have a better night's rest based on environmental data, their stages of sleep and heart rate from the night before, as well as regular surveys.

Tips included avoiding exercise before bedtime, opening the windows, and having a warm shower before calling it a night.

"A warm shower introduces heat to the body to warm you up, and then when you move to a cooler room afterwards, you will lose more heat as a result... and that often helps you cool down before sleep," explained Renard.

Organised by NRF, the symposium brought together 200 participants, including leading scientists and institutions, to explore how Singapore's urban environment shapes public health outcomes. They shared research and solutions to confront challenges the world is facing, such as rising temperatures, ageing populations, and

mounting health challenges.

Under HEATS, a second project has identified and tested ways to improve the sleeping conditions in worker dormitories, which are not air-conditioned.

NUS PhD student Raagavi Mani, who is leading the dorms study, said: "Construction workers are a heat-vulnerable population, and they're exposed to extreme day-time temperatures, and they may also be returning to sleeping environments that may be hot and humid."

For these workers, continued heat exposure and warm sleeping conditions may affect their rest and recovery, which could impair alertness and raise their risk of heat illness and workplace accidents.

By using wearables to track the sleep quality of 38 construction workers in two dorms in Jalan Tukang and Kallang, the team found that a 1 deg C rise in temperature would reduce a worker's sleep duration by 10 minutes.

The dorms' indoor temperature at night was around 30 deg C.

The researchers, led by Raagavi,

tested a suite of solutions at the Kallang dorm, which housed 30 workers, including providing clip-on fans and sleeping eye masks for each worker, and replacing white ceiling lights with warm lighting.

To improve the dorm rooms' ventilation, the team bought box fans from Australia and mounted them to opposite windows of each room. One fan would bring in cooler air from the outside, and the opposite fan would push out warmer indoor air.

While this improvised ventilation system reduced the rooms' temperatures by only 0.7 deg C, the increase in air flow was more noticeable for the workers. They particularly appreciated the personal fans, added Raagavi, who is also part of the Human Potential Translational Research Programme.

Heng noted that HEATS has been developed in close partnerships with several government agencies, including the Ministry of Manpower, "providing clear pathways for its findings to be translated into real-world guidelines and policies".

nshab@sph.com.sg



National Research Foundation chairman Heng Swee Keat with Mario Frei, senior postdoctoral researcher at the Berkeley Education Alliance for Research in Singapore, and PhD student Raagavi Mani, from the NUS Yong Loo Lin School of Medicine's Human Potential Translational Research Programme, at the CREATE Symposium on June 25. ST PHOTO: SHINTARO TAY