

# Degrees of danger

South-east Asia is one of the regions most vulnerable to rising temperatures caused by climate change and rapid urbanisation. What will it take to heat-proof the region? Experts at the First Global Heat Health Information Network (GHHIN) South-east Asia Heat Health Forum discuss how human health, well-being and livelihoods in the region can be protected in a warming world. **SHABANA BEGUM** and **CHIN HUI SHAN** look at key issues raised at the Jan 7 to 10 Forum, organised by the GHHIN South-east Asia Hub based at the National University of Singapore Yong Loo Lin School of Medicine.

To feel cooler on a hot day, set the air-conditioner at a higher temperature than you intended and also turn on the fan – doing this conserves energy, too.

The “hybrid cooling” solution was piloted at an office space in the Zero Energy Plus Building at the BCA Academy in Singapore.

Over 11 weeks, the office occupants were exposed to two indoor conditions – the office cooled to 26.5 deg C with ceiling fans running, and the space cooled to 24 deg C.

In the study published in 2023, they said that they found their comfort levels were similar in both scenarios.

As a bonus, the air-con plus fan method used 30 per cent less energy.

The pilot was led by the Berkeley Education Alliance for Research in Singapore.

One of its faculty members is Professor Stefano Schiavon, who highlighted the findings of the pilot in his lecture at the First Global Heat Health Information Network

(GHHIN) South-east Asia Heat Health Forum on Jan 7.

He is professor of architecture and environmental engineering at the University of California, Berkeley.

Using fans with air-con was one of numerous solutions that were discussed at the four-day conference, as heat health scientists, weather experts and policymakers convened to find ways to protect people living in a sweltering South-east Asia amid rising temperatures.

Other solutions discussed include setting up national heat action plans and promoting ground-up efforts that can help vulnerable communities and remote villages stay safe.

In 2023 and 2024, many South-east Asian regions were hit by severe heatwaves during the hotter months, with heat-related deaths reported in Indonesia, Malaysia, Thailand and the Philippines.

While less visible than other problems, the dangers of heat are far more wide-ranging, including

reduced productivity and economic loss, accidents at work and poor mental health.

And yet, many countries’ responses to extreme heat are often not as advanced as for other disasters like typhoons, landslides and floods.

The recently launched South-east Asia Hub under the GHHIN – housed at the National University of Singapore Yong Loo Lin School of Medicine – aims to coordinate a regional response to rising heat.

The sweltering conditions in the region are also exacerbated by the development of cities and buildings, leading to the urban heat island effect as roads and buildings retain the sun’s heat.

This makes urban places much hotter than their surrounding rural areas.

Professor of urban climate Winston Chow of Singapore Management University noted that the urban heat island effect is stronger in Asian cities than in those in the Americas or Europe.

“The likely reason speaks to the

rapid urbanisation in terms of population growth and development that has occurred within the East, South and South-east Asian cities.

“In Singapore, about 50 per cent of the increased temperature arises from urban development,” he said.

Prof Chow added that even the best designed and well-thought-out heat action plans or climate resilience plans require not just political will, but also financial resources and backing.

He noted that much of climate finance is still directed towards mitigation, that is, carbon emission reduction efforts. “More investments towards heat adaptation measures are sorely needed,” he said.

One point that was repeated throughout the Forum was the need to keep potential solutions to heat stress applicable across different countries and circumstances.

Professor Ollie Jay, a heat and health expert from the University of Sydney, emphasised that solutions have to be affordable and scalable, especially for those in the

construction and agricultural sectors.

He said: “It’s important to keep in mind that the interventions that we test are widely applicable to the most vulnerable. Often, people really want to (look at) cool tech and fancy cooling vests. That’s completely useless to a large proportion of the population.”

Prof Jay cited the use of fans, shade and misting as examples of simple, scalable interventions.

On the other hand, some solutions cannot be applied in all situations.

Prof Jay said fans can be a good cooling measure in a highly humid place up to 38 deg C. But in a hot, dry region at 45 deg C and above, fans triple the rate of overheating.

Fans help sweat evaporate, providing relief. In dry conditions, a person does not sweat, and blowing hot air on the skin would make him feel hotter, increasing strain on the heart as well.

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## SOUTH-EAST ASIA'S HEAT PROBLEM

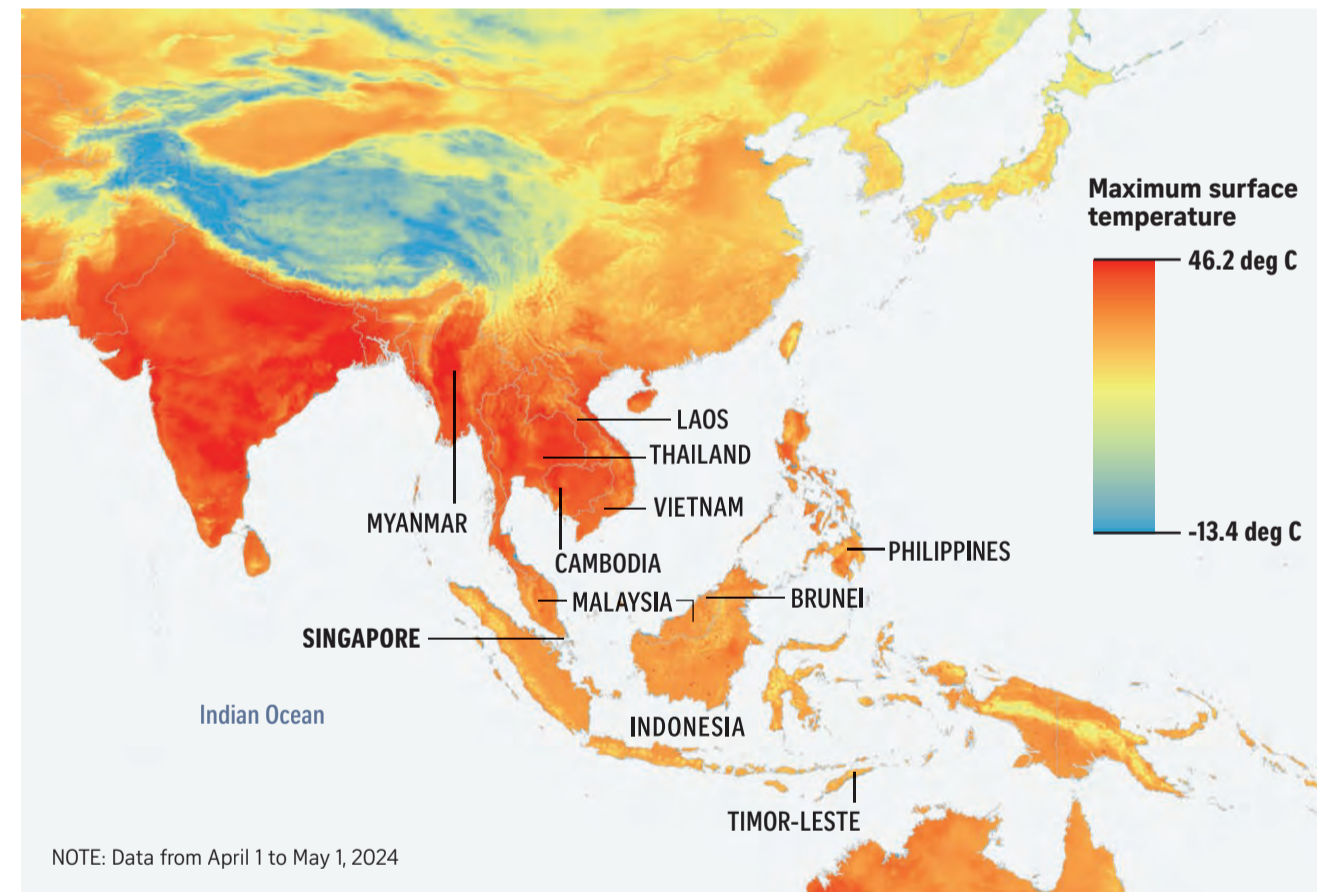
Heat in South-east Asia is unlike anywhere else. Not only are people chronically exposed to the heat in the tropics, the region’s high humidity also worsens the discomfort. For example, Singapore’s average humidity level is about 82 per cent. In this environment, it is harder for the body to cool down as sweat evaporates from the skin less readily. Not only does this cause perpetual thermal discomfort, it also leads to lower productivity and higher risk of accidents at work. The region is also rapidly ageing and heat takes a greater toll on the elderly, whose bodies cannot withstand excessive heat as well.

### SCORCHING HEAT IN RECENT YEARS

**BRUNEI**  
In March 2024, several areas experienced excessive hot weather with daily maximum temperatures reaching at least 35 deg C for three days or more.

**CAMBODIA AND MYANMAR**  
In April 2024, temperatures exceeded 40 deg C as people endured searing heat and stifling humidity.

### HEATWAVE



**LAOS**  
Farmers grappled with lower yields of crops like coffee and vegetables in May 2024 due to a heatwave.

**INDONESIA**  
Warmer weather led to a rise in dengue fever, where 35,500 infections and 290 deaths were reported between January and March 2024.

**MALAYSIA**  
At least 45 cases of heat-related illnesses were reported between January and mid-April 2024, with 33 involving heat exhaustion. Two deaths, including that of a three-year-old, were recorded.

**PHILIPPINES**  
77 heat-related illnesses were recorded from Jan 1 to April 29, 2024, with at least seven deaths.

**THAILAND**  
61 deaths were directly linked to heat between January and April 2024, although heat can also cause death indirectly.

## KEEPING COOL

Tackling rising temperatures requires all hands on deck, from individuals to country leaders.



### RESEARCHERS

- Conduct studies to better understand the heat strain risks of vulnerable groups, from seniors to delivery riders, so that targeted solutions can be developed.
- Explore innovative, affordable and scalable cooling solutions tailored for the region’s context and populations.



- Find out how traditional practices could potentially complement conventional treatments for heat injuries. For example, traditional Chinese medicine treatments – such as herbs, cupping, scraping, acupuncture and tu na – may prevent heat illnesses or help to rehabilitate patients after a heat injury, although further studies are needed to determine this. But conventional medicine remains effective, especially for acute onset of some heat injuries which require immediate medical attention.



### INDIVIDUALS

- People should know about the threats of extreme heat and the risks they face, and whether they are vulnerable to heat stress.
- Within communities and groups, people should watch out for the vulnerable. Seniors and young children are especially at risk of heat stress as their bodies cannot withstand excessive heat as well as others.
- Spur ground-up and community-led efforts to reduce heat stress. For example, the Indonesian Red Cross Society organises events and taps social media to raise public awareness of heat in Surabaya and Medan.
- Engaging in aerobic exercises like running and cardio workouts will help improve one’s thermal tolerance.



### POLICYMAKERS

- Work with the private sector or non-profits to unlock financing for countries to adapt to extreme heat. This includes heatwave insurance schemes for workers.
- Urban planners should keep cooling and heat-proofing solutions in mind when designing new housing or industrial projects. These include creating wind corridors, intensifying greenery and using cool paint on building facades.
- Set workplace regulations to protect workers from heat illnesses and exertional heat stress. These include enforcing rest breaks at cool and ventilated rest areas, providing cool water and conducting heat acclimatisation programmes.
- Explore how early warning systems can be developed and implemented as there has been evidence to show that the economic damages avoided will outweigh the initial investments of the system.
- Form a multi-agency task force, representing the healthcare sector, workers and schools, that can put in place measures before and during a heat emergency. Singapore had one such task force during the Covid-19 pandemic.



### URBAN HEAT

What this is  
• South-east Asia is a rapidly urbanising region – by 2050, over 542 million people are expected to live in cities, up from 335 million today.

• Cities tend to be hotter than rural areas because they have more built-up areas – this is the urban heat island effect. Nights are also getting warmer due to the urban heat island effect and climate change, affecting urban dwellers’ rest and sleep quality.



### HEAT AT WORK

What this is  
• South-east Asia is known as the world’s rice bowl, contributing 26 per cent of global rice production and 40 per cent of rice exports. According to an OECD report, agriculture contributed on average about 11 per cent of gross domestic product in Asian countries in 2020.

• Outdoor workers, like those working in agriculture, are exposed to heat for long periods and bear the brunt of rising temperatures.

• Indoor workers are not spared from heat stress, especially those in environments with poor ventilation or no air-conditioning. These include garment workers in Cambodia, and more.

### Why it is important

- Prolonged heat exposure can cause kidney and heart damage due to severe dehydration. It can also increase chances of getting heatstroke and cause fatigue and loss of concentration, which may lead to accidents at work.
- Workers are also at risk of exertional heat stress, where the body overheats during physical exertion. This can also happen during the slightly cooler, rainy season when some employees work harder, inadvertently crossing their thermal limits.
- Working under extreme heat conditions can compromise productivity, especially in economies reliant on manual labour, in sectors like agriculture, construction and manufacturing.

## SOLUTIONS

## PROBLEMS



### FEELING THE BURN

How a city is built, how outdoor workers are protected, and how communities perceive the threat of heat can determine how heat-resilient a population is. South-east Asia is home to a wide range of communities, from urban to rural dwellers, each with its own perceptions of heat risk and solutions. During the Forum, three areas were discussed: urban heat, heat at work, and traditional and cultural practices.



### TRADITIONAL AND CULTURAL PRACTICES

- What they are  
• South-east Asia – comprising 11 countries – is a diverse region known for its cultural richness.
- Different groups of people may have different perceptions of what heat means to them. Some may not even see heat stress as a threat, as it is unlike other more tangibly fearsome hazards such as storms and wildfires.
  - In this part of the world, particularly in rural areas, traditional medicine plays a huge role in treating many health conditions.



### Why they are important

- Cultural and traditional beliefs and practices play a crucial role in many areas of South-east Asian communities’ lives. While these are often overlooked in policies, traditional practices should also be studied further to measure their effectiveness in combating heat risks.
- Some communities may historically have developed knowledge or resources to withstand the heat. In places where temperatures are usually high, it may be a part of the community’s identity and practices to adapt and cope with heat, reducing its risks. But with climate change, there will be greater risks to come.
- The vulnerable groups – such as the very young and the elderly – may not think of themselves as being vulnerable to heat stress despite research that says the contrary.
- When it comes to managing heat stress, different communities may have different beliefs and practices. Some may subscribe to conventional medicine, others to traditional medicine. Experts are exploring how the two approaches can be harmonised.



Sources: COPENHAGEN CENTRE ON ENERGY EFFICIENCY, BRANDON YEW, INDOONESIAN RED CROSS, JASON LEE, METEOROLOGICAL SERVICE SINGAPORE, NATURE FOOD, OECD, OLIVIA JENSEN, ST FILE, UN OFFICE FOR THE COORDINATION OF HUMANITARIAN AFFAIRS, URA  
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