CHI INNOVATE
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Shaping a Heat-Resilient City

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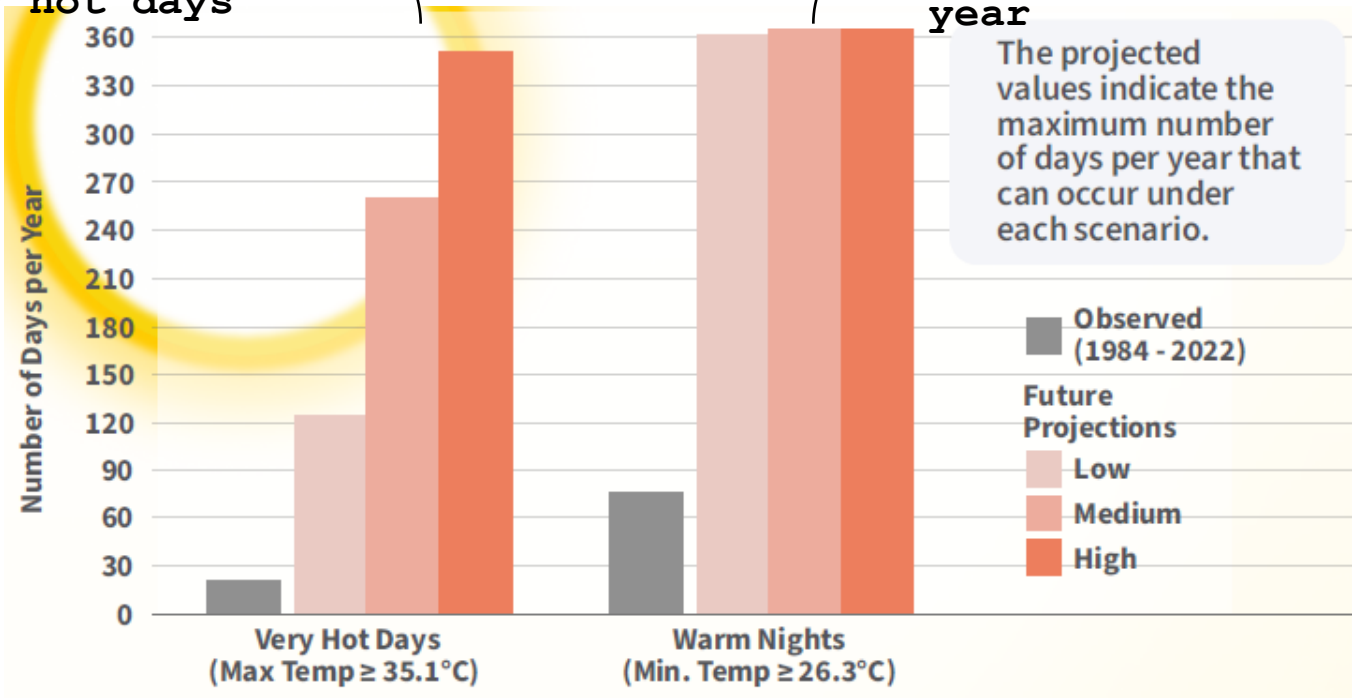
V3's Key Projections on Singapore's temperatures by End Century

~120 – 360 days per year of very hot days

Warm nights throughout the year



Range of possible outcomes under all three emissions scenarios.

Annual average daily mean temperature

Present	Future
27.9°C	28.5°C to 32.9°C
	↑ 0.6°C to 5.0°C

Annual average daily maximum temperature

Present	Future
31.4°C	31.9°C to 36.7°C
	↑ 0.5°C to 5.3°C

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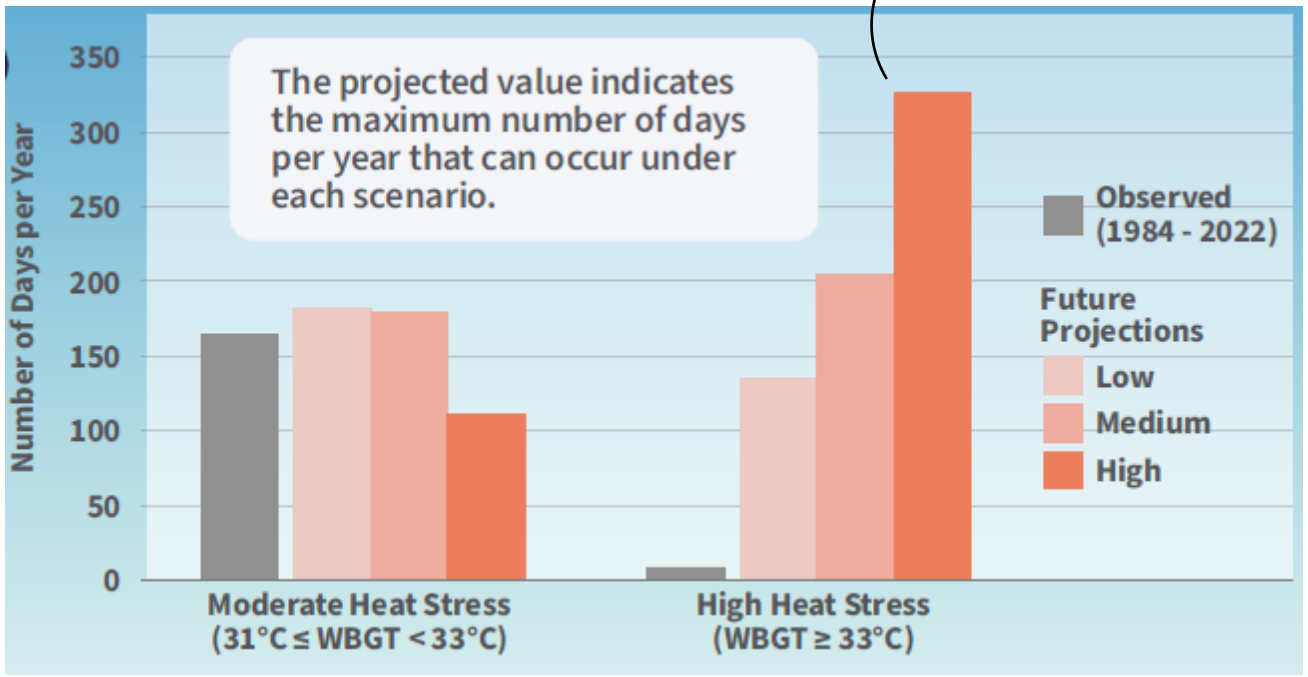
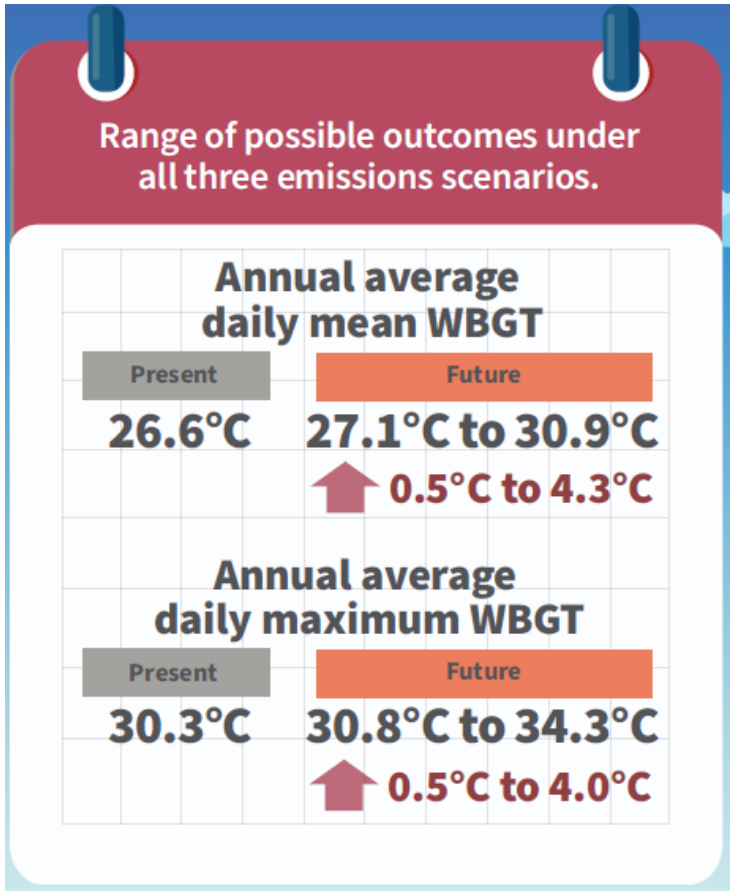
V3's Key Projections on Singapore's temperatures by End Century

~140 – 330 days per year of high heat stress days





UHI effect exacerbates the effect of climate change

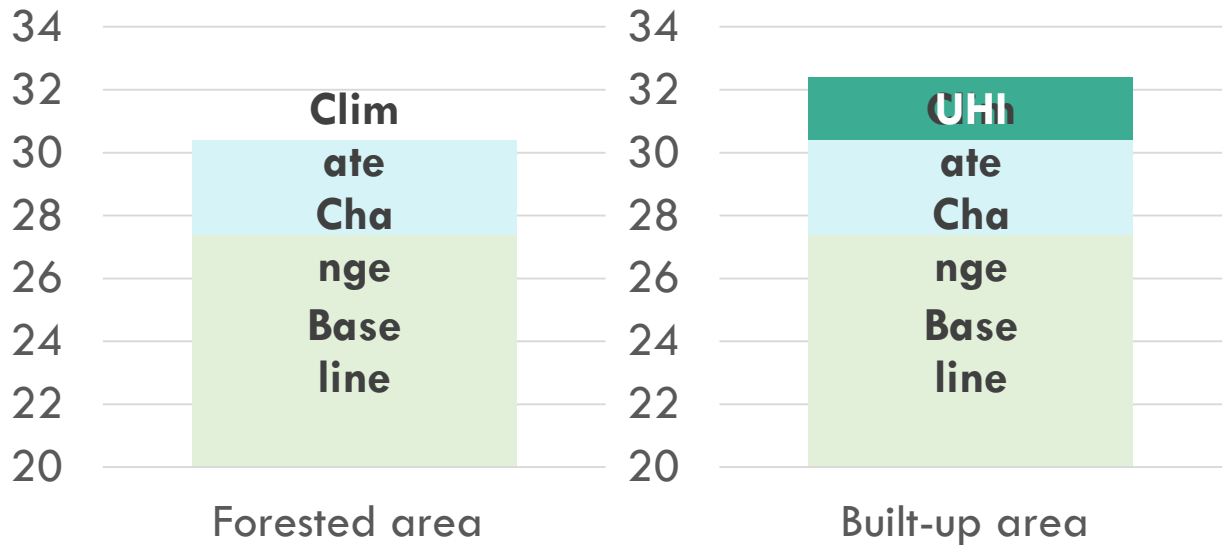
The Urban Heat Island (UHI) Effect is the phenomenon where built-up areas are hotter than rural areas

UHI effect: Additional heat arises in built-up areas, because:

there is less vegetation to cool those places

buildings absorb heat

vehicles, air-con and factories emit heat



The effects of extreme heat are becoming more real and are hitting closer to home

Over 100 temperature records in Vietnam broken in April as heatwave scorches

Pet dogs and strays suffer in Asia's relentless heatwave

30 died from heatstroke in Thailand so far in 2024 as South-east Asia bakes

Temperatures in the concrete sprawl of the Thai capital hit 40.1 deg C on April 24. PHOTO: EPA-EFE

Extreme heat in South-east Asia

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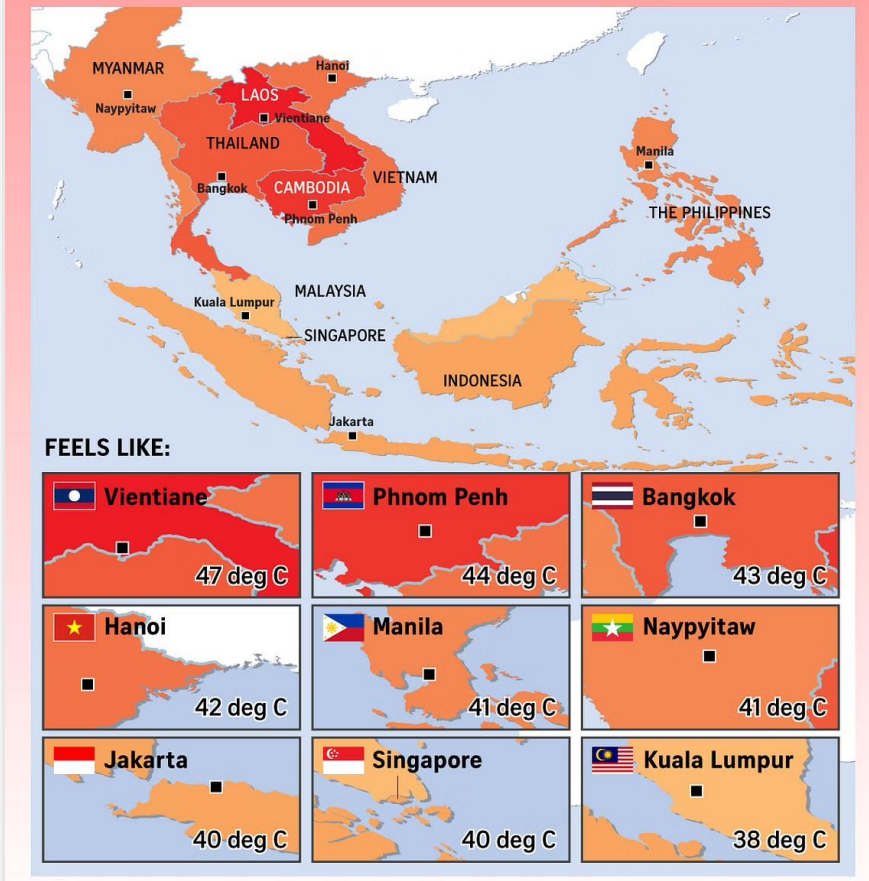
A heatwave is scorching South-east Asia. Here's how hot it feels like in some cities as the mercury soared to record highs on April 30.



Source: Accuweather

Parched farms, cancelled classes: Extreme heat scorches South-east Asia

Schools closed, warnings issued as Asia swelters in extreme heatwave

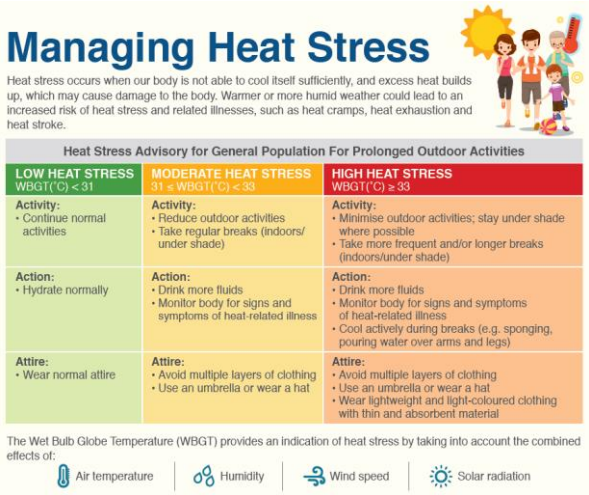
Grade 12 students use hand fans as they attend a class at the Commonwealth High School, in Quezon City, Metro Manila, on April 18. PHOTO: REUTERS

UPDATED APR 29, 2024, 10:18 PM

The government is committed to enhancing our resilience to heat

The Ministry of Sustainability & Environment (MSE) and URA co-lead a Whole-of-Government Heat Resilience Working Group. **Our work spans three key pillars:**

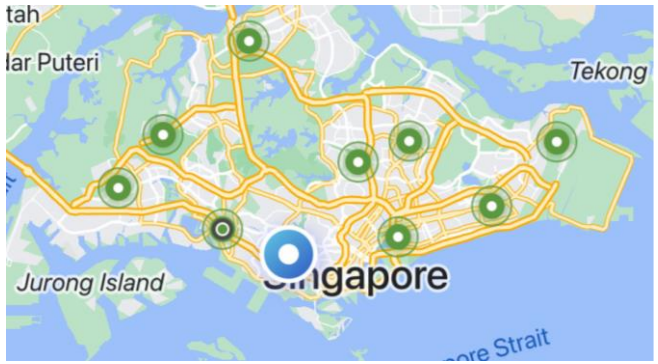
Strengthen community resilience to heat



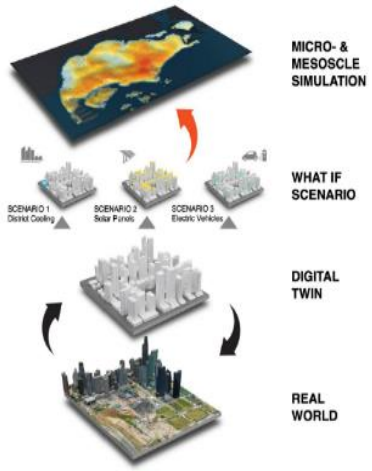
Launched **Heat Stress Advisory** for the public

Deepen understanding of the science on the effect of heat in Singapore

Current distribution of WBGT sensors

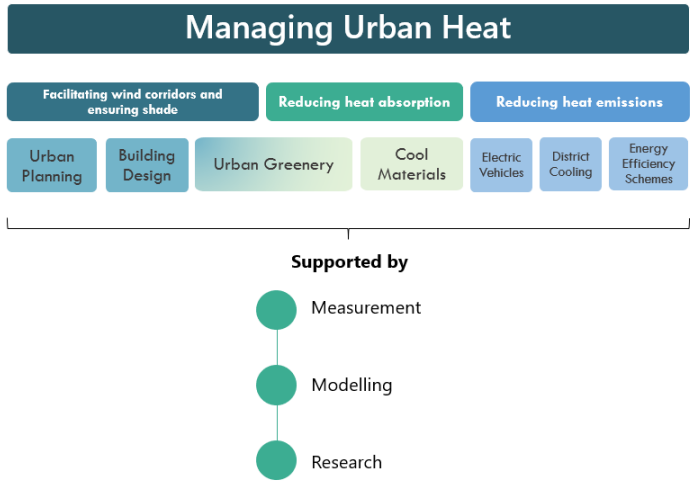


Enhancing our sensor network for more granular heat monitoring

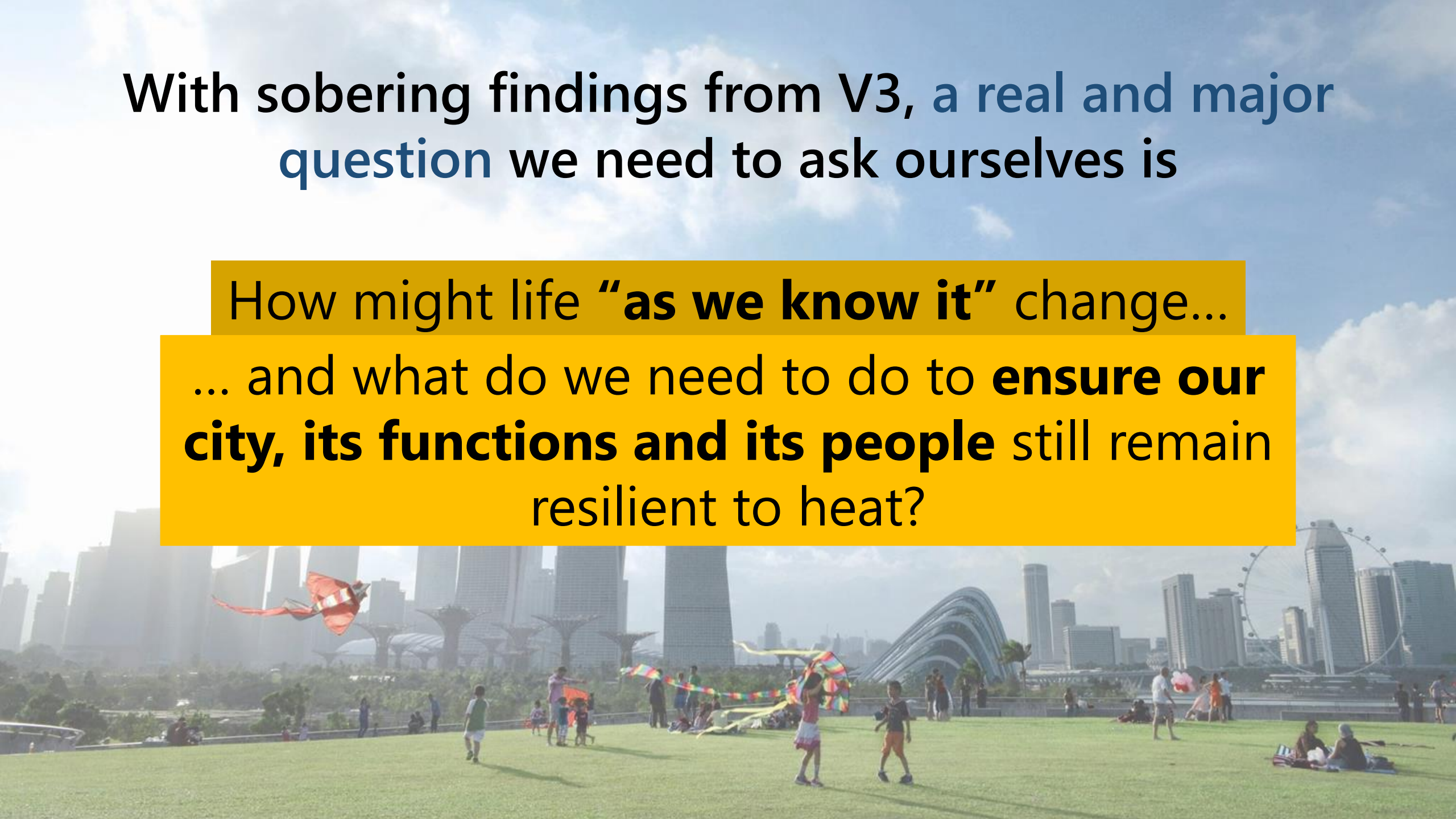


Carry out modelling efforts (e.g. Cooling Singapore 2.0)

Design effective heat mitigation strategies and scale them up



Employing a **suite of cooling strategies** in the built environment



With sobering findings from V3, a real and major question we need to ask ourselves is

How might life **"as we know it"** change…

… and what do we need to do to **ensure our city, its functions and its people** still remain resilient to heat?

Some possible scenarios we could face

… Would work hours need to change, as it might be too hot for workers to work in the day?

‘Staggering’ number of workers facing climate change-induced health hazards: UN

Workers who carry out heavy labour in hot climates are exposed to a “cocktail of hazards”, the ILO has warned. PHOTO: REUTERS

Further 1 deg C warming endangers 800m outdoor workers: Study

Humidity and heat are a lethal combination because the high moisture in the air makes it hard for sweat to evaporate from the skin. PHOTO: ST FILE

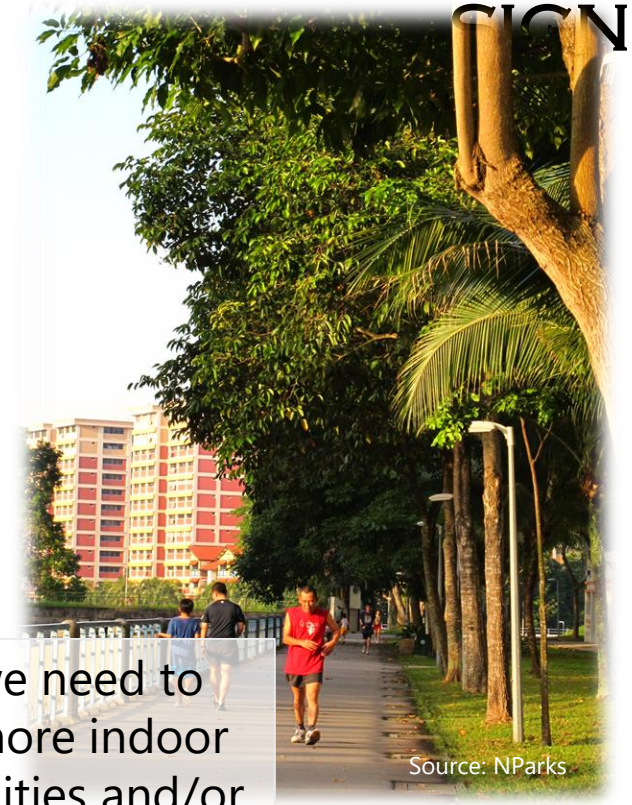
Source: Straits Times

Some possible scenarios we could face

… Would the number of hours where it remains thermally comfortable be shortened significantly in the day?

Source: Nathaniel Yeo, Unsplash

Would sports activities and classes need to be shifted to be held in the night instead?



Source: NParks

Would we need to provide more indoor sports facilities and/or more shelters in parks?

Source: Straits Times

Would heat affect our willingness to walk? How would this this affect our public transport plans for Walk, Cycle, Ride, as well as health outcomes?

Some possible scenarios we could face

… Would we be seeing a stark increase in the number of heat stress illnesses over time?

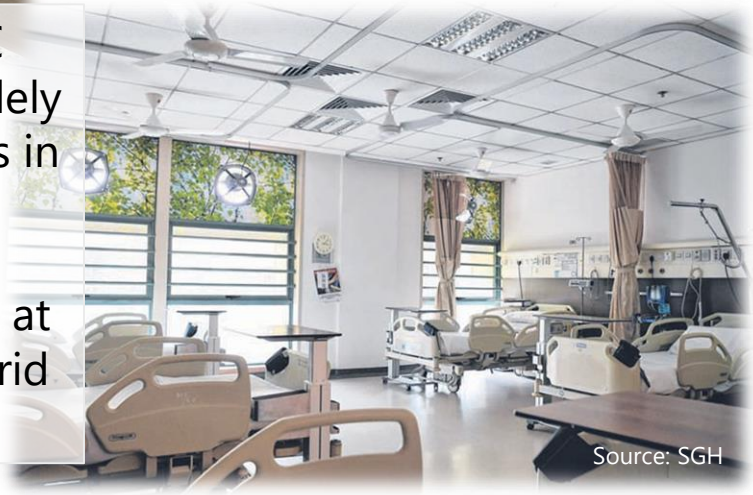
Would our healthcare services be prepared for the rise in heat stress illnesses?

Some possible scenarios we could face

… WOULD DEPENDING ON NATURAL VENTILATION NO LONGER BE SUFFICIENT TO KEEP BUILDINGS AND INDIVIDUALS COOL?

Would nursing homes, Class B2/C hospital wards for e.g., be able to solely depend on natural ventilation & fans in the future?

Would designs need to be relooked at to incorporate air-conditioning/hybrid cooling as a default?



Would healthcare facilities need to implement more passive cooling design strategies than what is done today, to ensure heat resiliency?

Is more investment required to focus on building up infrastructure to cope with rising heat?

There are many possible scenarios that could pan out over the next few decades, but one thing is certain

With these sobering findings, **the government is committed to taking more proactive steps** to strengthen Singapore's heat resilience and enhance the liveability of our city.

As we work together, we invite the healthcare sector to reflect upon:

What **mental models and policies/practices** would the healthcare sector need to relook at to **maintain service delivery and operations** as heat becomes a bigger and realer issue?

Thank you

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