

# When the heat races ahead, sports enthusiasts need stronger safeguards to keep pace

The casualty rate at the StanChart marathon highlights the need for greater awareness – and action – when competing in rising temperatures.

**Marcus Ong and Kenneth Tan**

The Standard Chartered Singapore Marathon on Dec 1 broke new ground in having more than 55,000 runners over the three-day event, the highest number of participants in the last decade. They included a record-high number of 13,000 international runners from more than 84 countries, a 33 per cent increase from 2023.

However, the marathon was also notable for different reasons. Singapore General Hospital (SGH) is traditionally the main receiving hospital for this annual event, due to its location in downtown Singapore. In 2022, SGH received six serious casualties related to the marathon. In 2023, there were 10 casualties.

This year, 20 casualties were transported to the hospital within a short period of time. Participants were reported to be struggling during the last leg of the route, with direct sun and high temperatures after the 30km mark. According to AccuWeather, Singapore registered a high of 34 deg C and a low of 26 deg C on Dec 1.

Of these 20 casualties, five were heatstroke victims showing altered mental states and the rest were experiencing various heat or exertion injuries of different severity. One casualty died. It was the third death in the history of the event, which began in 2002. The previous fatalities were in 2011 and 2016, linked to underlying heart conditions.

With the increasing popularity of endurance runs in Singapore, SGH's emergency department has treated patients with heat injuries from such events over the years. Examples include the 2XU Compression Run, Singapore T100 Triathlon and many others.

However, as climate change continues to have an impact on human health and activities, Singapore is expected to experience an increase in ambient heat and humidity in the near future.

## THE CLIMATE CHANGE EFFECT

In a report published on Dec 27 by scientific research organisation World Weather Attribution and Climate Central, it was estimated that Singapore experienced 122 extra days of dangerous heat in 2024. Dangerous heat days were defined as days when mean

sporting fraternity better prepare and plan for heat-related risks.

But, event organisers need to strictly and comprehensively implement this code of practice in order to reduce risks to participants and save lives. There needs to be better preparation, planning and coordination with emergency medical services and adoption of best practices.

## ADAPTING TO EXTREMES IN TEMPERATURE

Most, if not all, heat injuries in sports are preventable even as the mercury rises. Awareness, prevention and early treatment are the keys to reducing them.

Such injuries occur when there is build-up of core body temperature, and heat load exceeds heat loss. This can reach a dangerous situation where prolonged, elevated body temperatures damage the brain and other vital organs and may even lead to cardiovascular collapse.

Heat stress is exacerbated in situations of heavy exertion, such as during marathons and other extreme sports. In addition, high ambient heat and heavy exertion can trigger heart problems, such as abnormal heart rhythms that

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can result in a cardiac arrest.

Given this, event organisers in Singapore must meticulously plan medical support for mass events, focusing on mitigating risks like heat. This involves decisions such as scheduling events to avoid midday heat, selecting appropriate locations and routes, and implementing precautionary measures like pre-screening participants.

To avoid the Gulf heat, the 2019 Doha World Athletics

Championships Women's Marathon, for example, started just before midnight. Despite this, 28 out of 68 starters failed to complete the marathon due to the high temperatures and humidity.

Planning also involves ensuring adequate medical coverage, with trained personnel, necessary equipment on standby, and well-established treatment protocols. It's important to establish coordination between those overseeing the medical response, emergency medical services, and hospitals.

## THE ROLE OF THE INDIVIDUAL

Sports participants can play a big role in ensuring their own safety. Most organisers of mass events require self-screening for relevant medical history and risk factors. This should be taken seriously and might be a good opportunity to consult your doctor for your routine medical screening and check-up.

Adequate training and race preparation are important to condition your body to undertake endurance challenges or strenuous activities.

Other basic measures are having adequate rest, hydration and nutrition just before a race;

withdrawing from such activities when unwell; and wearing lightweight, appropriate clothing to enhance heat loss. You also need to recognise early symptoms of heat injury such as dizziness, nausea, vomiting, hot and dry skin, cramps, cold and clammy limbs, and confusion. Oh, and do run with a buddy.

## THE ROLE OF EARLY TREATMENT

The good news is that early treatment can make a lot of difference.

The Tokyo Marathon uses a system of rapid responders with mobile teams on bicycles and on foot with automated external defibrillators (AEDs), advanced medical communication with Global Positioning System-enabled phones, and first-aid stations. As a result, runners there who suffer cardiac arrest have had a 90 per cent survival rate.

The StanChart marathon uses a similar system with mobile AED teams. In 2023, two race participants collapsed in cardiac arrest, and both were successfully resuscitated with complete recovery.

Similarly, early treatment for heat-related injuries is crucial. We know from research that the earlier heat injuries are recognised, and aggressive cooling is initiated, the better the outcome. It is important that this occurs on-site and during transport, before the patient arrives at the hospital.

Simple first-aid measures by bystanders, such as moving casualties into the shade, fanning them, removing their clothes (if appropriate) and providing conscious patients with fluids, can make the important difference.

At the hospital, we now have advanced cooling devices that can effectively treat and continue the management of these patients at the emergency department and intensive care units, if needed.

## LESSONS FROM THE SAF

The number of Singapore Armed Forces (SAF) servicemen with heat exhaustion injuries fell from six in 2021 to two in 2023, with no deaths from heatstroke since 2018. This was the result of a combination of increased awareness from leadership to the servicemen on the ground, heat acclimatisation training, early identification of symptoms, monitoring of weather conditions, and enhanced safety practices.

The SAF also has detailed protocols for early recognition and treatment of potential heatstroke, including field medical cover, rapid initiation of cooling, and early evacuation with continued cooling using advanced cooling suits.

All these lessons could be applied in the civilian setting for mass sports events.

Importantly, amid climate change, as Singapore strives to promote healthy living, everyone, from casual joggers to professional athletes to event organisers, has a role in ensuring safety in the prevention and treatment of medical emergencies.

• Professor Marcus Ong is the director of Duke-NUS Medical School's Pre-hospital & Emergency Research Centre and a senior consultant and clinician scientist at Singapore General Hospital's department of emergency medicine. Associate Professor Kenneth Tan is head and senior consultant at the same department.



Runners in the elite event at the Standard Chartered Singapore Marathon on Dec 1. During the marathon, 20 casualties were taken to the hospital within a short period. Participants were reported to be struggling during the last leg of the route, with direct sun and high temperatures after the 30km mark. ST PHOTO: NG SOR LUAN