

Teens feel the heat of climate change

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Credit: Wits University

In 2017, when the drought in Cape Town was at its worst in over a century, aid organisation Gift of the Givers made an urgent call to South Africans to help farmers; suicide rates, amongst both small- and large-scale farmers, had surged in the few months prior. This and other evidence paints a bleak future picture in the context of climate change, and southern Africa is one of the areas that will suffer the most.

Adolescent moody blues

So say Professor Matthew Chersich and Dr. Fiona Scorgie in the Wits Reproductive Health and HIV Institute (Wits RHI), who have been studying the effects of climate change on adolescents.

"Today's youth will inherit a world made hazardous by greenhouse gases. The world's temperature has already risen by 1°C above pre-industrial levels and, without major intervention, will rise a further 0.5°C by 2040. Heat waves and other extreme weather events have become frequent and intense. In southern Africa, temperatures are expected to rise at twice the global rate, creating virtually intolerable conditions for people in settings where buildings are poorly insulated and ventilated," says Scorgie.

The effects are so severe, in fact, that Chersich predicts an increase in violence, mental health disorders, and suicide, as well as poorer matric pass rates, if nothing is done.

"Exposure to high temperatures alters one's physiology, raising anxiety, depressive symptoms, irritability and aggression. People feel powerless when they have no means of keeping cool, when they can neither fight nor flee the hot weather. The effects will be most pronounced amongst those who can't afford [air conditioning](#) and we have no idea how communities who are not acclimatised to high temperatures will cope with several days of 40 plus degrees in houses with tin walls and roofs, zero insulation, and no [cold water](#)."

Diminishing the bright sparks

And when learners must write matric in overcrowded and stuffy prefabricated or shipping container-classrooms in hot weather, even the smartest will struggle, he says.

In Climate change and adolescents in South Africa: The role of youth

activism and the health sector in safeguarding adolescents' health and education, published in August 2019 in the South African Medical Journal, Chersich, lead author, says that while the Department of Basic Education mentions environmental factors such as ventilation and the hazards of non-brick structures in its school infrastructure standards, these have not yet been fully actualised.

"In many schools, classrooms are made of converted shipping containers or prefabricated sheeting with corrugated iron roofs. Most container classrooms have poor insulation, little natural ventilation and as many as 50 children in a class, who themselves generate a considerable heat load. In one study in Johannesburg, which has a relatively mild climate, temperatures reached as high as 47.5°C in the containers and the majority of students reported experiencing heat-health symptoms every day, including drowsiness, poor concentration and thirst."

And even at much [lower temperatures](#), the effects are profound. A meta-analysis of 18 studies calculated that students in classrooms with an indoor temperature of 30°C scored 20 percent lower on tests than those in classes around 20°C. "The performance of adolescents appears to be more heat sensitive than the performance of adults in occupational settings. Nevertheless, teachers exposed to high temperatures may also become lethargic and irritable. In classes with poor ventilation, levels of CO² or stuffiness rise together with temperature, and children experience symptoms that further affect concentration and learning," writes Chersich.

A psychology of sustainability

Professor Andrew Thatcher, Chair in Industrial and Organisational Psychology at Wits, is currently researching the [psychological factors around the adoption of sustainable technologies](#). So-called green buildings can increase productivity, he says.

"For our research, we looked at close to 20 buildings. Each of them was given an indoor environmental quality (IEQ) score out of 27 as determined by the Green Building Council of South Africa's green building rating tool [GreenStar SA], which considers air quality, ventilation and ventilation rates, ambient temperature, noise and lighting. It's incredibly difficult to get a perfect IEQ score, but those at the top end, with a score of 22-23 points, had productivity gains of 17 percent, which would translate to enormous improvements in large corporations, for example."

And the solutions offered by IEQ principles aren't restricted to corporate budgets. In container classrooms, simple adjustments could already make a difference, says Thatcher. "Orienting the container to avoid direct sunlight will help or placing it next to a tree for shade. A deciduous tree that offers shade in summer and loses its leaves in winter to let the sun in would also be a helpful solution in colder climates."

Fresh air and flip-flops

Adding windows, he says, could make a crucial difference, referencing a Californian study. "The researchers hypothesised that daylight is an important component in classrooms. They measured performance in two southern Californian classrooms—one with big windows, one with small windows—and found that the kids with the bigger windows fared better, confirming [the researchers'] beliefs. But when they repeated the experiment in northern California, where it's cooler, big windows made no difference. It turned out that daylight didn't play a role in performance, but fresh air did—the classes in warmer southern California had their windows open."

Scorgie and Chersich are awaiting funding to conduct a study measuring these and other impacts in South Africa, and to investigate how exposure to ambient heat impacts children's health, wellbeing and educational

achievement. "We will test whether these impacts—such as dehydration, heat exhaustion, lethargy and poor concentration—can be reduced by using low-cost, low-electricity cooling methods, including natural ventilation, the installation of fans on classroom walls, painting the classroom roof white, placing plants and cold water dispensers in the classroom, and wearing sandals and loose, single-layered, cotton clothing," says Scorgie.

These measures could inform policy to mitigate climate change, says Chersich. "There is much that can be done using low-cost interventions and little electricity. We urgently need sensible public health initiatives and ground-up activism to start to undo the effects already occurring."

More information: M F Chersich et al. Climate change and adolescents in South Africa: The role of youth activism and the health sector in safeguarding adolescents' health and education, *South African Medical Journal* (2019). [DOI: 10.7196/SAMJ.2019.v109i9.14327](https://doi.org/10.7196/SAMJ.2019.v109i9.14327)

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