Environment

A third of the world now faces deadly heatwaves as result of climate change

Study shows risks have climbed steadily since 1980, and the number of people in danger will grow to 48% by 2100 even if emissions are drastically reduced

South-west heat wave: tell us how you're keeping cool

2600 | 390

Oliver Milman

@olliemilman

Monday 19 June 2017 16.00 BST



'For heatwaves, our options are now between bad or terrible,' says the lead researcher behind the new study. Photograph: Gerard Julien/AFP/Getty Images

Nearly a third of the world's population is now exposed to climatic conditions that produce deadly heatwaves, as the accumulation of greenhouse gases in the atmosphere makes it "almost inevitable" that vast areas of the planet will face rising fatalities from high temperatures, new research has found.

Climate change has escalated the heatwave risk across the globe, the study states, with nearly half of the world's population set to suffer periods of deadly heat by the end of the century even if greenhouse gases are radically cut.

"For heatwaves, our options are now between bad or terrible," said Camilo Mora, an academic at the University of Hawaii and lead author of the study.



The best strategies to keep bodies cool in a heatwave, according to researchers

Read more

High temperatures are currently baking large swaths of the south-western US, with the National Weather Service (NWS) issuing an excessive heat warning for Phoenix, Arizona, which is set to reach 119F (48.3C) on Monday.

The heat warning extends across much of Arizona and up through the heart of California, with Palm Springs forecast a toasty 116F (46.6C) on Monday and Sacramento set to reach 107F (41.6C).

The NWS warned the abnormal warmth would "significantly increase the potential for heat-related illness" and advised residents to drink more water, seek shade and recognize the early symptoms of heat stroke, such as nausea and a racing pulse.

Mora's research shows that the overall risk of heat-related illness or death has climbed steadily since 1980, with around 30% of the world's population now living in climatic conditions that deliver deadly temperatures at least 20 days a year.

The proportion of people at risk worldwide will grow to 48% by 2100 even if emissions are drastically reduced, while around three-quarters of the global population will be under threat by then if greenhouse gases are not curbed at all.

"Finding so many cases of heat-related deaths was mind blowing, especially as they often don't get much attention because they last for just a few days and then people moved on," Mora said.

"Dying in a heatwave is like being slowly cooked, it's pure torture. The young and elderly are at particular risk, but we found that this heat can kill soldiers, athletes, everyone."



Indian children bathe with buffalos during a heatwave. Photograph: Jaipal Singh/EPA

The study, published in Nature Climate Change, analyzed more than 1,900 cases of fatalities associated with heatwaves in 36 countries over the past four decades. By looking at heat and humidity during such lethal episodes, researchers worked out a threshold beyond which conditions become deadly.

This time period includes the European heatwave of 2003, which fueled forest fires in several countries and caused the River Danube in Serbia to plummet so far that submerged second world war tanks and bombs were revealed. An estimated 20,000 people died; a subsequent study suggested the number was as high as 70,000.

A further 10,000 died in Moscow due to scorching weather in 2010. In 1995, Chicago suffered a five-day burst of heat that resulted in more than 700 deaths.

However, most heat-related deaths do not occur during such widely-covered disasters. Phoenix, for example, suffered an unusually hot spell last June that resulted in the deaths of at least four people. Hyperthermia, an excess of body heat, can lead to heat stroke and a potential inflammatory response that can kill.

> Dying in a heatwave is like being slowly cooked, it's pure torture
> Camilo Mora, researcher

Mora said the threshold to deadly conditions caries from place to place, with some people dying in temperatures as low as 23C. A crucial factor, he said, was the humidity level combined with the heat.

"Your sweat doesn't evaporate if it is very humid, so heat accumulates in your body instead," Mora said. "People can then suffer heat toxicity, which is like sunburn on the inside of your body. The blood rushes to the skin to cool you down so there's less blood going to the organs. A common killer is when the lining of your gut breaks down and leaks toxins into the rest of your body."

Global warming is a potent instigator of deadly heat, with research from University of California, Irvine this month finding the probability of a heatwave killing in excess of 100 people in India has doubled due to a 0.5C increase in temperature over the past 50 years.

"The impact of global climate change is not a specter on the horizon. It's real, and it's being felt now all over the planet," said Amir AghaKouchak, UCI associate professor and co-author of that study.

"It's particularly alarming that the adverse effects are pummeling the world's most vulnerable populations."



The latest threat to Antarctica: an insect and plant invasion

Read more

Elevated temperatures and dry conditions have been exacerbated by the clearing of trees, which provide shade and cooling moisture, in urban areas. Mora said that while adaption such as government heat warnings and the increased use of air conditioning has helped reduce deaths, this was not a viable long-term solution.

"The heat means that we are becoming prisoners in our own homes - you go to Houston, Texas in the summer and there's no-one outside," he said.

"Also, the increased use of air conditioning means that electrical grids fail, as has happened in New York City, Australia and Saudi Arabia. We need to prevent heatwaves rather than just trying to adapt to them."

Since you're here …

… we have a small favour to ask. More people are reading the Guardian than ever but advertising revenues across the media are falling fast. And unlike many news organisations, we haven't put up a paywall - we want to keep our journalism as open as we can. So you can see why we need to ask for your help. The Guardian's independent, investigative journalism takes a lot of time, money and hard work to produce. But we do it because we believe our perspective matters - because it might well be your perspective, too.

I appreciate there not being a paywall: it is more democratic for the media to be available for all and not a commodity to be purchased by a few. I'm happy to make a contribution so others with less means still have access to information.

Thomasine F-R.

If everyone who reads our reporting, who likes it, helps to support it, our future would be much more secure.

Become a supporter → | Make a contribution →

Topics

Environment

Drought / Climate change / Water / news

Reuse this content

Paid content About

FEMSA Foundation partner zone



A dream worth having: fighting the effects of drought in La Guajira



Chingaza and Bogotá: Downstream influence on upstream health



Eight ways to develop effective water committees - in pictures



The community conservation project changing lives in Mexico

labs

Paid for by FUNDACIÓN FEMSA

Most popular in US



Seattle woman killed by police while children were home after reporting theft



Virginia Muslim teenager's death being investigated as road rage, police say



Otto Warmbier dies less than a week after being returned from North Korea



Sean Spicer said to be seeking a new role away from press briefings



Storms cut Big Sur off from the world. But for a price, the trip of a lifetime awaits

related stories



Ageing population will compound deadly effects of heatwaves caused by climate change

27 Nov 2014 | 110



California officials prepare for worst as historic drought deepens wildfire risk

19 Mar 2014 | 196



Climate change: a survivors' guide

13 Oct 2013 | 583



Children will bear brunt of climate change impact, new study says

23 Sep 2013 | 110

America's drought of political will on climate change
Naomi Wolf

8 Aug 2012 | 351

Drought in east Africa the result of climate change and conflict

4 Jul 2011 | 66

Climate change could push staple food prices up 130% - study

2 Dec 2010 | 57

Climate change will devastate Africa, top UK scientist warns

28 Oct 2009

comments (390)

Sign in or create your Guardian account to join the discussion.

Order by Newest | Threads Collapsed | 1 2 3 4

Delaware 21m ago | 0

That's the whole point, isn't it? The plan to drastically reduce the world's population by doing nothing about climate change. Trump and all the rest of the elite must be delighted at the way they've brainwashed the little people into believing there's nothing wrong.

Reply | Share | Report

technophile50 40m ago | 0

Shouldn't we refer to them as "deadly hot Chinese hoaxes"? Or "extreme Chinese precipitation hoaxes" leading to "Chinese flooding hoaxes" and "deadly Chinese hoax mudflows"?

Reply | Share | Report

View more comments

most viewed

across the guardian | in environment

1 Otto Warmbier dies less than a week after being returned from North Korea
2 UK caves in to EU demand to agree divorce bill before trade talks
3 Hitler bust among Argentina's biggest haul of Nazi artefacts found in secret room
4 Gareth Malone: the excruciating downfall of Mr Choir
5 London attack: man arrested on suspicion of terrorism
6 Finsbury Park suspect named as Cardiff resident Darren Osborne
7 Nasa's Kepler telescope finds 10 Earth-like planets: 'We are not alone'
8 Frazzled David Davis guides UK to 3-0 defeat in first round
9 How to handle the heat (with science)
10 Some Grenfell Tower victims may never be identified, lawyer says