# NEWS IN FOCUS



MAMUNUR RASHID/NURPHOTO/GETTY

**Flooding in Bangladesh could become more common as global temperatures rise.**

CLIMATE

# Telltale warming likely to hit poorer countries first

*Climate–inequality tool reveals how quickly abnormal weather will appear around globe.*

**BY QUIRIN SCHIERMEIER**

Nations such as Bangladesh and Egypt have long known that they will suffer more from climate change than will richer countries, but now researchers have devised a stark way to quantify the inequalities of future threats.

A map of "equivalent impacts", revealed at the annual meeting of the European Geosciences Union this month in Vienna, shows that global temperatures would have to rise by a whopping 3 °C before most people in wealthy nations would feel departures from familiar climate conditions equal to the changes that residents of poorer nations will experience under moderate warming.

The Paris climate agreement, adopted by 195 countries in 2015, aims to limit the rise in global mean temperature to 1.5–2 °C above pre-industrial levels. The world has already warmed by one degree or so — and, since 1900, the mean number of record-dry and record-wet months each year has also increased.

But the effects of global warming are uneven, and poor regions in the tropics and subtropics are thought to be most vulnerable, for several reasons. They have limited financial resources with which to prepare for shifts in temperature and precipitation, and they are expected to face bigger changes in climate than will countries in the mid-latitudes. Researchers have had difficulty quantifying those inequalities because the impacts of climate change depend on many factors, such as future economic growth ▶

and technological progress, which are hard to forecast.

Luke Harrington, a climate researcher at the University of Oxford, UK, took a different approach by developing the concept of equivalent impacts, which doesn't specify societal consequences. Instead, it focuses on quantifying the uneven distribution of extreme weather around the globe.

Harrington looked at changing patterns of extreme daily heat and rainfall in global climate projections based on fast-rising greenhouse-gas emissions. He then determined how much warming was required for a clear climate-change signal — such as extreme temperatures or precipitation — to emerge from the 'noise' of natural climate variability at each spot on the globe. The resulting maps show how quickly regional changes in weather extremes will manifest in response to different levels of global warming.

"I wanted to wrap numbers around the unevenness of impacts," he says. "Climate-mitigation policies focus on a global threshold — but global mean temperature isn't a very meaningful metric to assess what climate change might mean in specific parts of the world," says Harrington, whose work has not yet been accepted for publication.

***"I wanted to wrap numbers around the unevenness of impacts."***

For changes in regional heat extremes, the pattern is particularly stark. Africa, large parts of India and most of South America are likely to experience changes clearly attributable to climate warming early on, after a 1.5 °C increase in global temperatures. But mid-latitude regions — where most greenhouse gases are produced — won't see such pronounced changes until global temperatures rise by 3 °C or so.

"This is an elegant way to tie global climate targets and regional impacts," says Erich Fischer, a climate scientist at the Swiss Federal Institute of Technology Zurich, who was not involved in the study. He says that the model would need to be adapted to include metrics of specific climate-change impacts, such as those on human health and food security, for it to be useful for planning adaptation efforts or for informing international climate-finance programmes. Some proposed schemes would compensate poor countries for climate-change-related harm.

The equivalent-impacts index, says Fischer, could help quantify how climate change will affect different countries, because it focuses on identifying when they will start to face weather outside their natural variability.

"Our study provides a framework," say Harrington. "We want to know what information others care about most, then we can start to look at metrics of more-specific climate impacts." ■

FUNDING

# Early success fuels further grants

*Researchers who just miss cut-off for postdoc grant fall behind those who narrowly qualify.*

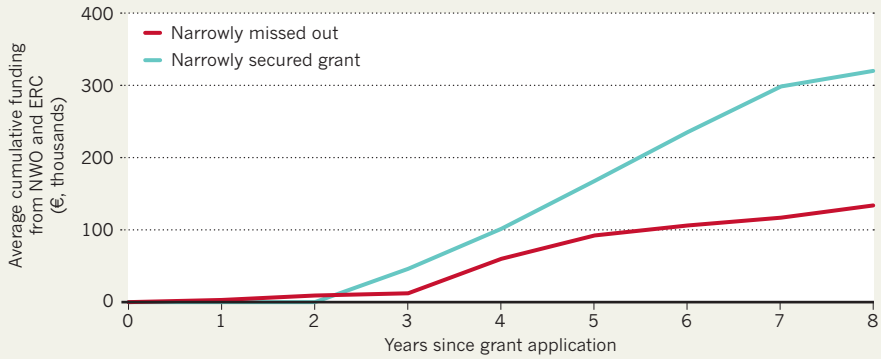
BY HOLLY ELSE

The career-defining effect of winning a postdoctoral research grant has been laid bare in an analysis of thousands of young researchers' professional trajectories. The work compared the fate of junior scientists in the Netherlands who just met the bar to qualify for post-PhD research funding with that of people who just missed out on the money. The successful group went on to secure more than twice as much research funding in the subsequent eight years, the analysis found. And the grant-winners were also 50% more likely to become professors than were the ones who fell short. The study was published on 23 April (T. Bol *et al. Proc. Natl Acad. Sci USA* https://doi.org/cnrr; 2018).

What is most striking is that winning the initial grant did not have any effect on the scientists' publications or academic impact in the following years, says Shulamit Kahn, an economist at Boston University in Massachusetts. Funders often consider previous awards when making decisions about whom to give money to. "Why are they doing this if it doesn't increase productivity?" asks Kahn,

**THIN LINE**

Researchers who just qualified to win a certain early-career grant went on to receive much more research funding in the years afterwards than did those who just missed out, an analysis finds.




NWO, Netherlands Organization of Scientific Research; ERC, European Research Council

T. BOL *ET AL. PROC. NATL ACAD. SCI. USA* HTTP://DOI.ORG/CNRR (2018)

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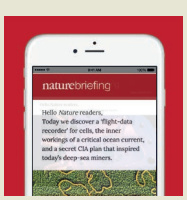


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