

# New Scientist

WEEKLY 30 July 2022

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## Climate change

# 'Net-zero' aviation won't be enough

Efforts to make flying greener mostly only account for carbon dioxide emissions

Adam Vaughan

FLIGHTS will endanger the Paris climate agreement's goals if efforts to achieve net-zero aviation don't account for the warming effect of streaks of clouds created by planes, a study has found.

The research comes after the UK government announced its Jet Zero Strategy on 19 July, with a target of cutting carbon emissions from flights to net zero by 2050 (see page 23 for more on UK plans).

Nicoletta Brazzola at ETH Zurich in Switzerland and her colleagues found that even if such efforts to reduce emissions succeed, the world's aviation sector could increase average temperatures by between 0.1°C and 0.4°C. The world has already warmed by 1.1°C since the industrial revolution, so the extra warming could compromise the Paris deal's aim of holding temperature rises to 1.5°C, says Brazzola's team.

The warming comes from the ways flights heat the atmosphere beyond the carbon dioxide emitted by burning jet fuel, which is the only impact currently counted by international and most national efforts to

decarbonise aviation. The main one of these non-CO<sub>2</sub> effects is the contrails that form because of the soot, aerosols and water vapour released by aircraft engines.

"We found the mitigation efforts needed to get aviation to a place where it's compatible with the Paris agreement are enormous," says Brazzola.

Her team explored future scenarios of demand for flights,

**Planes warm the planet by creating contrails as well as by directly emitting carbon**

technologies to power them and how much CO<sub>2</sub> would need to be removed from the atmosphere by trees or machines to hit net zero.

"Without a very strong reduction in demand and without very rapid, almost infeasible switches to clean technologies, we would in all cases need to deploy carbon removal to a very large extent," she says.

The team's modelling suggests that failing to account for aviation's non-CO<sub>2</sub> effects would ignore 90 per cent of future flights' contribution to climate change (*Nature*

*Climate Change*, doi.org/h567).

"This new study makes a compelling case for moving away from carbon-neutral aviation as the main policy goal, and focusing on climate-neutral aviation instead," says Paul Williams at Reading University, UK.

The study indicates that new fuels and flight technologies, from hydrogen to batteries, will need to be developed and deployed rapidly to stand a chance of reaching climate neutrality. It also suggests that the aviation sector's short-term carbon-offsetting plan for reducing its impact on climate change won't be enough.

Brazzola's team found that even with a moderate increase in demand for flights, the status quo of jet fuel and offsetting would require an area the size of Germany to be planted with trees to compensate for planes' effects.

"Continuing flying with passenger jet fuels and offsetting carbon removal is a very unviable pathway," says Brazzola. Reaching climate neutrality will require curbing the world's appetite for flights too, she adds. ■



SHUTTERSTOCK/JOE PHOTO

## Health

## We don't actually know what 'growing pains' are

THE term "growing pains" is often used to refer to sore or aching limbs in children. Yet, there is no clear definition of what growing pains are, and now it looks like they may not be related to growth at all.

A recent analysis of studies about growing pains notes that 93 per cent make no mention of how the symptoms of bone or muscle pain are related to growth.

"Kids and teens are being told

they have growing pains, but that is inaccurate based on our findings," says Mary O'Keeffe at the University of Sydney in Australia, who led the review. Most children diagnosed with growing pains are told the pain will subside with age and that they can take children's ibuprofen or paracetamol (acetaminophen) to manage the discomfort if needed.

"If a health professional is giving a diagnosis, it needs to be based on sound evidence. They need to be sure that growing is the cause, but we don't know this," says O'Keeffe.

To investigate, she and her colleagues identified 147 studies

that mentioned growth or growing pains in adolescents. They looked at how each study defined growing pains based on the type, location, duration, timing, severity and age of onset of pain, as well as the pain's relationship with activity and physical examinations.

They found contradictions in multiple areas. For example, 14 per cent of studies claimed that growing pains are persistent while 5 per cent

**"Kids and teens are being told they have growing pains, but that is inaccurate based on our findings"**

said they aren't. Only seven studies said the condition could be due to growth, and two said the pains had nothing to do with growth.

The closest the research came to consensus was on pain location: 50 per cent of studies concluded that growing pains primarily affect the legs. Others identified the arms, back, groin or shoulders as the main pain locations (*Pediatrics*, DOI: 10.1542/2020-052578).

"If I was a doctor, I would stop using the term, as currently it doesn't seem to serve a purpose," says O'Keeffe. ■

Grace Wade