

infection might have killed the olfactory sensory neurons.

How does permanently losing the chemical senses affect a person?

Although the condition is not as well studied as is the loss of other senses such as vision and hearing, researchers know that the consequences can be severe.

One effect is that it leaves people vulnerable to dangers such as food poisoning and fire. For instance, people with anosmia are less able to detect spoiled foods and smoke. A 2014 study found that people with anosmia were more than twice as likely to experience a hazardous event, such as eating spoiled food, as people without smell loss⁷.

Other effects are more difficult to measure. “Most people don’t acknowledge the importance of smell in their lives – until they lose it,” says Moein. Being unable to appreciate the flavour of food is obviously a major loss, but other sensations are important, too. Hayes points, for instance, to the loss a parent would feel if they couldn’t connect to their child through the ‘newborn baby smell’. And Moein says that smell dysfunction has been linked with depression, although the biological mechanism involved is unclear.

Are treatments available for restoring these senses?

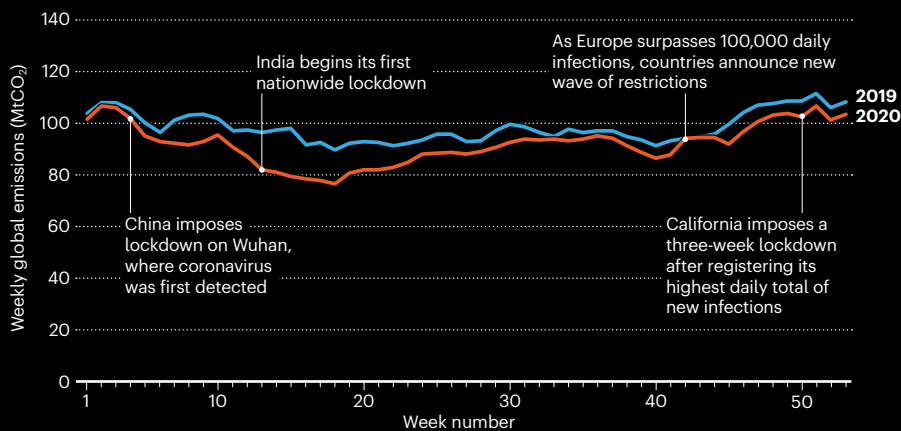
A lack of research means few established treatments exist. But one option is smell training, in which people sniff prescribed odours regularly to relearn them. Hopkins is working with a charity called AbScent in Andover, UK, to get the word out to the public about this training. There is evidence⁸ from before the pandemic that it can improve smell function in some people with such impairments, but it doesn’t seem to work for everyone.

In longer-term research, Richard Costanzo and Daniel Coelho at Virginia Commonwealth University in Richmond are developing an olfactory implant – a device embedded in the nose that would sense odorant chemicals and send electrical signals to the brain. However, the device is still “many years” from being offered in clinics, says Coelho. In particular, the researchers need to figure out which areas of the brain the implant should stimulate, he adds, so “there’s still some science to work out”.

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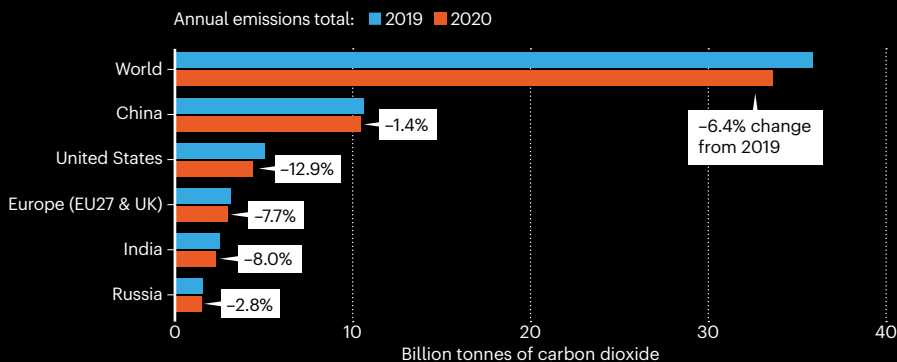
EMISSIONS BOUNCE BACK

After a sharp drop early in the COVID-19 pandemic, global carbon dioxide emissions rose as globaleconomic activity recovered in 2020. This trend continued even though some countries put fresh restrictions in place as coronavirus infections soared.



CARBON CUTS

The pandemic took a bite out of CO₂ emissions in many countries, but trends varied. China saw a minor decrease because its economy recovered after outbreaks in early 2020. The United States tallied the largest reduction, driven by outbreaks lasting throughout the year.



COVID curbed 2020 carbon emissions – but not by much

After rising steadily for decades, global carbon dioxide emissions fell by 6.4%, or 2.3 billion tonnes, in 2020, as the COVID-19 pandemic squelched economic and social activities worldwide, according to new data. The decline (see ‘Carbon cuts’) is roughly double Japan’s yearly emissions, but many researchers do not expect it to last once the virus is brought under control.

Researchers published emissions data for the first half of 2020 in October (Z. Liu et al. *Nature Commun.* **11**, 5172; 2020), but have now provided a complete set to *Nature*.

“The emissions decline is already less than what we expected” given the scale of the pandemic, says Zhu Liu, an Earth-system scientist at Tsinghua University in Beijing who co-leads the international Carbon Monitor programme that provided the data. “I imagine that when the pandemic ends, we probably will see a very strong rebound” (see ‘Emissions bounce back’).

The energy sector most affected by pandemic restrictions was aviation, where emissions fell by 48% from their 2019 total.

The pandemic has provided a unique lens on the challenge for nations committed to fighting climate change. The United Nations Environment Programme estimates that the world needs to cut carbon emissions by 7.6% per year for the next decade to prevent the globe from warming by more than 1.5°C above pre-industrial levels — a goal set in the 2015 Paris climate agreement.

By Jeff Tollefson