

 AIR QUALITY

Air quality during COVID-19

Governments worldwide have instated lockdowns in efforts to halt the spread of COVID-19. The slowing of personal travel and economic activity has led to marked decreases in air pollution during the months following the restrictions. Two new studies detail the air quality impacts in China.

Fei Liu of the Universities Space Research Association, USA, and colleagues examined tropospheric nitrogen dioxide (NO₂) — emitted largely by fossil fuel consumption — over China, using satellite sensing. The initial COVID-19 lockdowns generally coincided with the Lunar New Year,

when NO₂ emissions are lower relative to the rest of the year owing to holiday-related factory shutdowns. However, in contrast with other years, the NO₂ concentrations did not rebound post-holiday season. Instead, the concentrations declined by an average of 16% after the first public report of COVID-19 in each province and by a further 15% following the instatement of lockdown policies (usually within 4 days after the public announcements). In total, NO₂ pollution in China was reduced by ~20% for 30–50 days.

Guojun He of the Hong Kong University of Science and Technology,

China, and colleagues evaluated the air quality index (AQI) and small particulate matter (PM_{2.5}) concentrations over 95 locked-down cities in China (defined by the authors as having prohibitions on gatherings and non-essential commercial activities, and restrictions on travel). Compared with the 229 cities that were not locked-down ('control' cities), the AQI and PM_{2.5} both declined by 17%, indicating cleaner air. Even the control cities, though, saw slight improvements in these metrics after the Lunar New Year. Nevertheless, the PM_{2.5} in locked-down cities remained four times higher than the 'safe' levels (as recommended by the World Health Organization), partially attributed by the authors to the use of coal-fired central heating in some cities.

Lockdowns have been critical to the public health response to COVID-19, with unintended benefits to the environment. It is unknown how long the changes to human behaviour and positive environmental impacts, and indeed the pandemic, will last.

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ORIGINAL ARTICLES Liu, F. et al. Abrupt decline in tropospheric nitrogen dioxide over China after the outbreak of COVID-19. *Sci. Adv.* **6**, eabc2992 (2020) | He, G., Pan, Y. & Tanaka, T. The short-term impacts of COVID-19 lockdown on urban air pollution in China. *Nat. Sustain.* <https://doi.org/10.1038/s41893-020-0581-y> (2020)



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