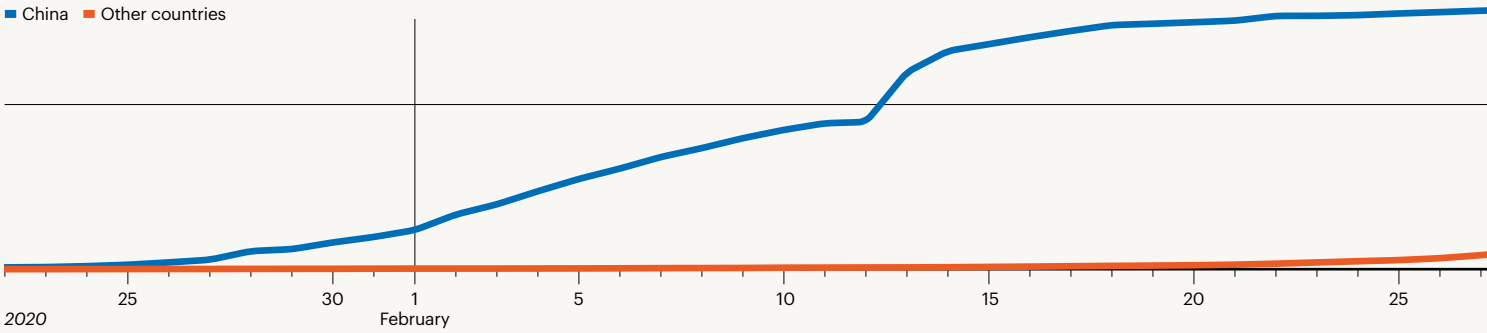
CORONAVIRUS BY THE NUMBERS

From papers published to carbon emissions to confirmed cases, these data reveal an unprecedented viral outbreak and its impacts around the world.

By Ewen Callaway, David Cyranoski, Smriti Mallapaty, Emma Stoye & Jeff Tollefson.
Design by Paul Jackman.

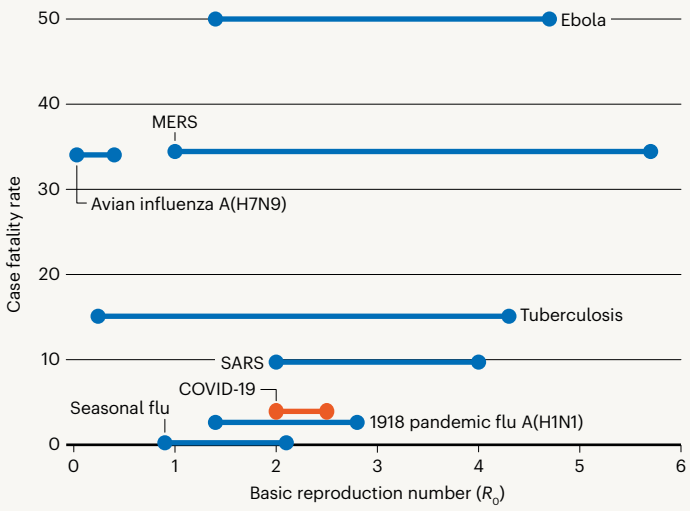
RAPID SPREAD

The coronavirus emerged in the city of Wuhan in China's Hubei province in late 2019. Confirmed cases grew by several thousand per day in the country in late January and early February. Since then, the number of infections reported each day has plummeted in China, owing in large part to containment efforts, but the outbreak is now a pandemic centred on Europe. Large outbreaks in South Korea, Iran, Italy and elsewhere meant that by mid-March the total number of confirmed cases outside China had eclipsed those inside the country.



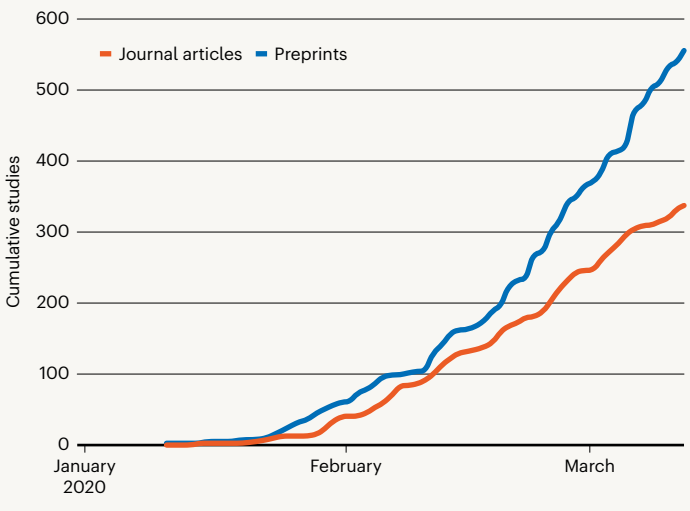
COVID-19 VERSUS OTHER DISEASES

Estimates of COVID-19's case fatality rate — the proportion of infected people who die — suggest that the coronavirus is less deadly than the pathogens behind other large-scale outbreaks, such as those of SARS (severe acute respiratory syndrome), MERS (Middle East respiratory syndrome) and Ebola. But it seems to spread more easily. Calculations of the virus's 'basic reproduction number' (R_0) suggest that each infected person will pass the virus to an average of 2–2.5 people. Like the case fatality rate, R_0 is an estimate that varies considerably, and is likely to be revised.

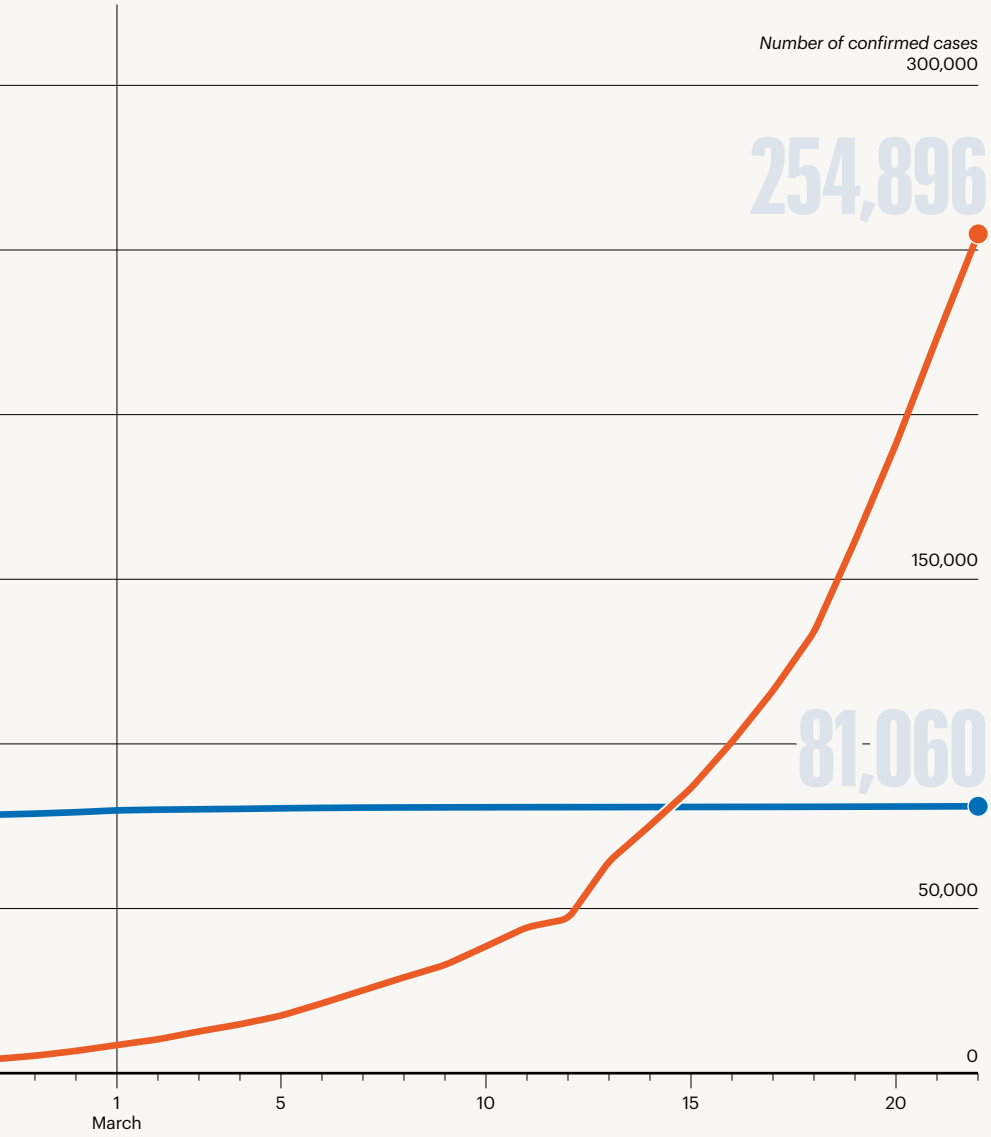


RESEARCH RISES

The outbreak has prompted an explosion of research. To estimate the scale, *Nature* searched for studies containing the terms 'novel coronavirus', 'ncov', 'COVID-19' or 'SARS-CoV-2' on the bioRxiv, medRxiv, ChemRxiv and ChinaXiv preprint servers, as well as compiling publications listed by the World Health Organization and Google Scholar. *Nature*'s analysis does not include genomic data shared using online platforms, clinical-trial reports or studies published in Chinese-language journals.

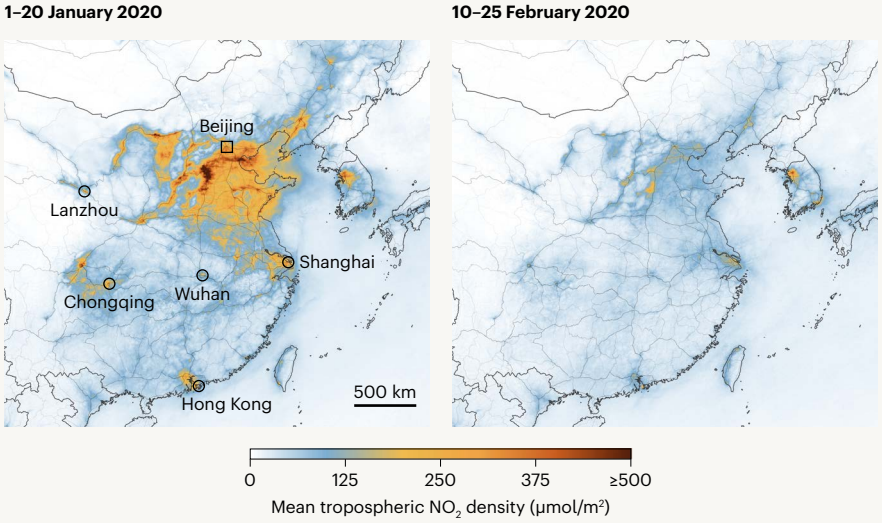


SOURCES: RAPID SPREAD: WHO; TIMELINE/COVID-19 VS OTHER DISEASES: COMPILED BY *NATURE* NEWS TEAM; RESEARCH: ANALYSIS BY *NATURE* NEWS TEAM; CLEANER AIR: NASA EARTH OBSERVATORY



CLEANER AIR

China's efforts to control the outbreak seem to have curbed energy consumption — and pollution. Satellite data from NASA and the European Space Agency show a sharp, countrywide reduction in atmospheric nitrogen dioxide (NO_2), which is produced when fossil fuels burn. Each year, businesses and factories close for the lunar New Year, causing a brief dip in NO_2 levels, which typically rise again after about a week. A preliminary analysis suggests that NO_2 levels after this year's festival, which began on 25 January, were 10–30% lower than in the same period in previous years.



HOW COVID-19 UNFOLDED

The COVID-19 pandemic has been compared with the 2002–03 outbreak of SARS. In both, new coronaviruses originated in and China spread around the world, causing chaos and economic disaster. But the outbreaks have progressed very differently, especially in the speed and extent of spread. COVID-19 is not as lethal as SARS, but has proved much more pervasive. It took less than two months to clock up more confirmed cases than SARS reached over several months. And COVID-19 has already killed nearly 20 times as many people as SARS.