

# Lockdown air pollution: Nitrogen dioxide halved, but sulphur dioxide doubled

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A University of Liverpool study of air pollution in the UK during the first 100 days of lockdown has revealed that whilst nitrogen oxide levels were cut by half, levels of sulfur dioxide increased by over 100%.

Researchers from the University's School of Environmental Sciences analyzed data from DEFRA air-quality sensors and UK Met Office stations to see how [lockdown](#) measures had affected levels of nitrogen

dioxide, sulfur dioxide, particle matter (PM2.5) and ozone and to compare this to the past seven years.

The study revealed that during this period (from 23rd March to 13 June 2020) nitrogen dioxide (NO<sub>2</sub>) levels were cut by half which would relate to the reduction in vehicle emissions. More surprisingly, though, the analysis found that levels of sulfur dioxide (SO<sub>2</sub>), typically created by UK industry but in sharp decline, were more than double that of previous years.

Researchers also explored the localized effects of lockdown on air-quality, on seven large UK cities: London, Glasgow, Belfast, Birmingham, Manchester, Newcastle and Liverpool.

This revealed that NO<sub>2</sub> levels in all of the cities reduced on average between 37—41% although this figure was slightly greater in Glasgow where it declined by 44%. However, northern cities were found to experience greater increases in sulfur [dioxide](#).

Lockdown in the UK came into effect on 23 March 2020 when Boris Johnson told the country that people must stay at home and certain businesses must close.

This resulted in the significant reduction in motor vehicle usage with the first day of lockdown seeing a reduction to 69% of normal. This reached a low of 23% on 13 April before steadily increasing back up to 77% of normal use 100 days after the lockdown. The first 100 days of lockdown also coincided with higher temperature and less humidity.

Lecturer in contemporary and dynamic processes, Dr. Jonny Higham, who led the study said: "The results of our analysis are surprising. It is evident that the reduction in motor vehicles and [human activity](#) had a substantial impact on air quality as demonstrated by the reduction in

nitrogen oxide. However, although it reduced one pollutant there has been a big increase in another pollutant. We think these changes could be driven by an in-balance in the complex air chemistry near to the surface exacerbated by the meteorological conditions in particularly low humidity levels and changes in pollutions concentrations. It is important to note that the complex and relatively stable air composition in the near surface layer can be disrupted in a short period of time by the significant reduction of primary emissions from human activities. For the case of UK, getting cleaner air from a large NO<sub>2</sub> reduction may not be as straightforward as it seems."

The paper, "UK COVID-19 Lockdown: 100 days of air pollution reduction?" is published in *Air Quality, Atmosphere and Health*.

**More information:** J.E. Higham et al. UK COVID-19 lockdown: 100 days of air pollution reduction?, *Air Quality, Atmosphere & Health* (2020). [DOI: 10.1007/s11869-020-00937-0](https://doi.org/10.1007/s11869-020-00937-0)

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