

Lockdown air quality boost in Oxford helped 41% reduction in adult asthma hospital stays

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Oxford residents with asthma had fewer hospital stays during 2020 compared to the previous five-year average largely due to reductions in air pollution, new research has found.

The study, published in [BMJ Open](#) investigated the link between acute

asthma hospital admissions and specific air pollutant levels in Oxford in the UK during 2020, which saw two national COVID-19 lockdowns between March–June and November–December.

In 2020, levels of air pollution fell significantly, with different pollutants dropping by between 18-33% when compared to average values for the previous five-year period.

- Nitrogen Dioxide—reduction of 26.7% from $14.6 \mu\text{g m}^{-3}$ (2015-2019 average) to $10.7 \mu\text{g m}^{-3}$ in 2020
- Particulate Matter 2.5—reduction of 33.5% from $10.1 \mu\text{g m}^{-3}$ (2015-19) to $6.7 \mu\text{g m}^{-3}$ (2020)
- Particulate Matter 10—reduction of 18.6% from $13.2 \mu\text{g m}^{-3}$ (2015-19) to $10.8 \mu\text{g m}^{-3}$ (2020)

The OxAria study team, led by the University of Birmingham working with the University of Oxford, Oxfordshire County and City Councils and Oxfordshire Clinical Commissioning Group found that the falling pollution levels strongly correlated with lower rates of acute asthma care provision for adult residents in the four postcodes in Oxford city, falling from 78 per 100k residents in 2015–19, to 46 per 100k residents, a reduction of 41%.

Dr. Suzanne Bartington, clinical associate professor of environmental health at the University of Birmingham and lead author of the study said, "The impact of lockdowns on reductions in traffic and industry led to a unique situation where air quality significantly improved for a temporary period during the COVID-19 pandemic. This study shows that for Oxford, levels of major air pollutants including nitrogen dioxide and [particulate matter](#) fell sharply on a background of ongoing improvements in recent years.

"The results of air pollution levels falling may have had an impact on the

number of severe asthma cases that need acute hospital care, with 41% fewer hospital stays compared to the previous five-year average. Furthermore, we also identified a 4% increase in risk of asthma hospital admissions for every $1 \mu\text{g m}^{-3}$ increase in mean monthly NO_2 , and an approximately 3% increase in risk for every $1 \mu\text{g m}^{-3}$ increase in mean monthly $\text{PM}_{2.5}$ levels.

"This is an important study to help us better understand how demand for NHS inpatient care may change when air quality is improved. Whereas previous studies on lockdown air pollution have focused on major cities in the UK such as London or Birmingham, Oxford is more typical of a smaller city or large town where many residents live."

Councilor Nathan Ley, Oxfordshire County Council's Cabinet Member for Public Health, Inequalities and Community Safety, said, "The pandemic was an awful period for so many, but it did give us a unique opportunity to study the impact of a reduction in traffic and other pollutants on people's health, and as this study shows the results were significant."

"We must now use what we have learned, thanks to this research with our partners, to improve our environment, in line with the Clean Air Strategy which we launched last year."

"Elevated levels of nitrogen dioxide, $\text{PM}_{2.5}$ and PM_{10} contribute towards [heart disease](#), [chronic lung disease](#), cancers, preterm births, and many other avoidable events. The vision of Oxfordshire County Council to tackle this issue remains clear. We must continue to use all the tools at our disposal to lead the country, clean up our air and save lives."

Councilor Anna Railton, cabinet member for Zero Carbon Oxford and Climate Justice, Oxford City Council, said, "This is yet more evidence about the link between [air pollution](#) and the health of residents. It is

therefore imperative that we continue to make the necessary changes to improve air quality across Oxford."

More information: Ajit Singh et al, Impacts of ambient air quality on acute asthma hospital admissions during the COVID-19 pandemic in Oxford City, UK: a time-series study, *BMJ Open* (2024). [DOI: 10.1136/bmjopen-2022-070704](https://doi.org/10.1136/bmjopen-2022-070704)

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