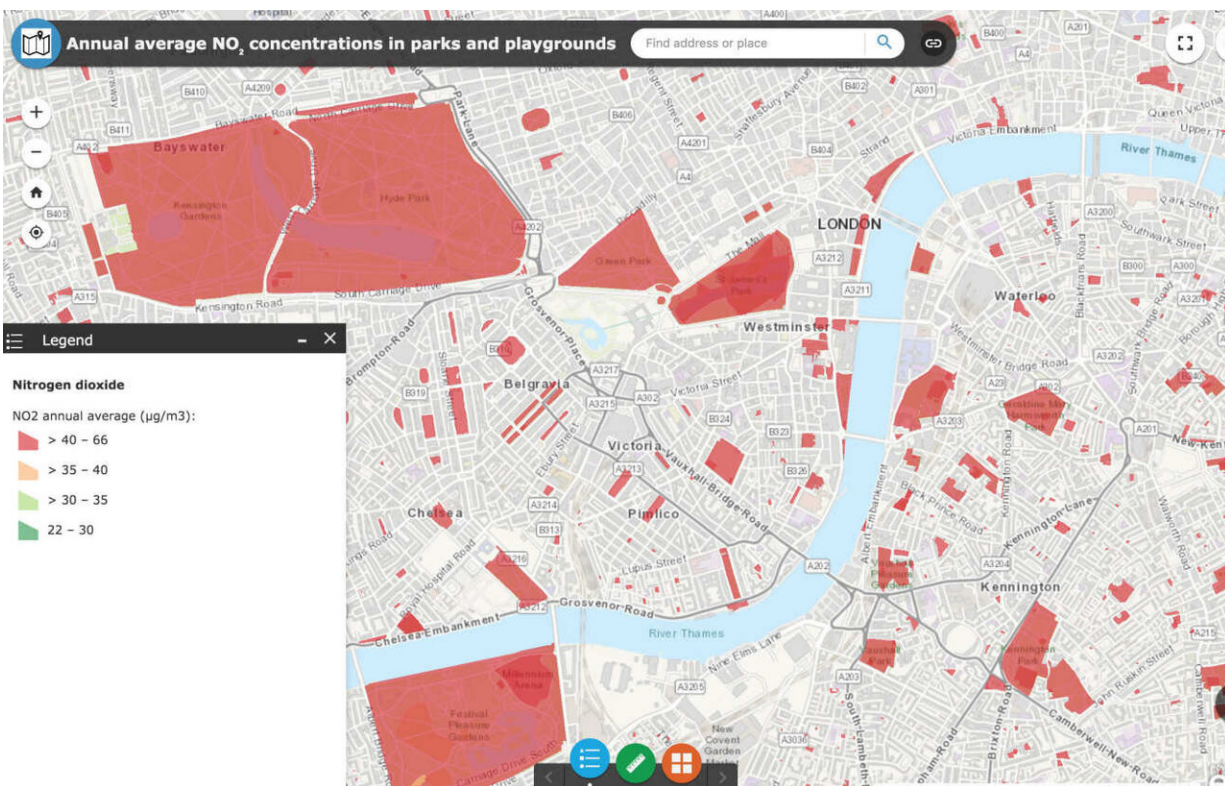


One in four of London's green spaces breaches air quality safety limits

October 10 2019, by Ryan O'hare



The team have launched an online tool that reveals nitrogen dioxide levels in London's parks and green spaces. Credit: Imperial College London

More than one quarter of London's parks, playground, and open spaces exceed international safety limits for air quality.

The researchers warn this could potentially put thousands of [children](#) and vulnerable Londoners at risk.

In an analysis of the annual [air quality](#) levels in green spaces across the capital's 33 boroughs, researchers from Imperial College London and the University of Leicester used [nitrogen dioxide](#) (NO₂) estimates, comparing them against safety limits set by the European Union and World Health Organisation.

They found that 24 percent of play spaces and 27 percent of [public parks](#) had NO₂ limits exceeding safety standards, with 67 percent of private parks failing to keep within safe levels. The closest play [space](#) for 250,000 children under the age of 16 (14 percent of the city's children) had NO₂ concentration averages exceeding European Union limits, with the majority of children affected living in the most deprived areas of the city.

In response to the findings, the team is launching an interactive website which lets people check their local green spaces to get information about average annual NO₂ levels.

"Dangerously high levels of nitrogen dioxide are a genuine concern for people living in the capital, especially for those with children, the elderly and those with [poor health](#)," said Dr. Daniela Fecht, from the MRC Centre for Environment and Health within Imperial's School of Public Health.

"We know already that hundreds of primary schools and nurseries are located within, or very close to, areas that exceed legal safety limits for NO₂, potentially putting children's long-term health at risk, but we may think our green spaces are clean. Our research shows this is often not the case, with a large number of public and private parks in the capital exceeding legal limits for harmful air pollutants."

Most polluted parks identified

The findings, published recently in the *International Journal of Environmental Research and Public Health*, used data (breaking London into a grid of 20 metres squares) from the London Atmospheric Emissions Inventory (LAEI), developed by King's College London.

Using data from 2016, the latest estimates available, the Imperial team applied measures from the closest grid squares to green spaces to give an NO₂ average for the year for 4,470 parks, gardens and open spaces. Census data from 2011 provided information on number of children under the age of 16 in close proximity to green spaces.

Green spaces included public parks, private parks (including Kew Gardens and Buckingham Palace Gardens), allotments, cemeteries, playing fields, golf courses, tennis courts and other sports areas, and other play spaces—including playgrounds.

The European Union safe limit for NO₂, in accordance with the World Health Organisation, is set at an average of 40 µg/m³ per year.

The highest average annual levels of NO₂ in green spaces were found in inner London boroughs, with City of London, Westminster, Camden, Kensington and Chelsea and Islington having the highest levels of all London boroughs. Five of the 10 most polluted parks in London were found in Westminster, and the worst air quality was found to be Victoria Embankment Gardens (annual average NO₂ 59.7 µg/m³) and Parliament Square Gardens (58.7 µg/m³).

Lung damage

According to the researchers the findings offer more insights into the exposure of children to air pollutants, as well as highlighting variations in

exposure linked to social deprivation. The average NO₂ levels for open spaces in the most deprived areas were 6 µg/m³ higher than the average for the least deprived areas. The authors highlight in their study that the concentrations of NO₂ steeply declines with distance from source, so levels in the centre of a large [park](#) are likely to be far lower than at the edge, close to a road.

Dr. Laure de Preux, from Imperial College Business School's Centre for Health Economics and Policy Innovation and co-author on the report, added: "We call London's green spaces the 'lungs of the city', but increasingly we are seeing that these lungs are being poisoned by air pollution and not enough is being done about it. These latest findings help us to quantify the risk from average nitrogen dioxide exposure, by mapping exactly which areas are exceeding safety and legal limits. We hope this work will help to highlight those areas that can benefit most from mitigation by local authorities and the Mayor of London to reduce air pollution, protecting the health of residents and children."

Nitrogen dioxide is a pollutant which in London is predominately emitted from vehicles, but also wood-burning stoves, and other domestic, commercial and industrial sources. Prolonged exposure to high levels of NO₂ can damage the lungs and in children is linked to conditions such as asthma, reduced lung growth and even reduced brain function. Previous studies estimated the effects of high levels of background NO₂ in the environment as being as bad for children's lungs as maternal smoking.

Online tool to reveal pollution in your area

The researchers will unveil an online platform that allows people to explore air pollution levels in their local parks and playgrounds at an event hosted at Imperial this week.

Lucy Facer, a co-founder of Islington Clean Air Parents who is supporting the event said: "I'm absolutely horrified by the results of the study. As a mother of two, I spend hours every week in the park with my children. It's so important for them to be outside and exercising. Politicians must act urgently so that children don't have to breathe toxic air while playing outside."

Dr. Penny Woods, Chief Executive of the British Lung Foundation, said: "For many of London's children, particularly those in the inner-city, parks and play spaces are some of their few refuges from the noise and pollution of the capital's traffic. Parents will be shocked to discover that in London's [green spaces](#) many children still run the risk of being exposed to health-damaging traffic fumes as they play. Air pollution has been linked to asthma and can stunt the growth of children's lungs, putting them at risk of years of poorer health. Sadly, this research highlights that, for some children, there is little respite from toxic air.

She continued: "Extending London's Ultra Low Emissions Zone will go some way to reducing the capital's illegal levels of pollution. We also need to see bolder action to encourage people out of their cars and into less-polluting forms of transport across London."

More information: Charlotte E. Sheridan et al. Inequalities in Exposure to Nitrogen Dioxide in Parks and Playgrounds in Greater London, *International Journal of Environmental Research and Public Health* (2019). [DOI: 10.3390/ijerph16173194](https://doi.org/10.3390/ijerph16173194)

Provided by Imperial College London

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