# Air pollution could help London transport planners fight COVID-19

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Measuring air quality across London could help fight COVID-19 by providing a rapid means of deciding whether to reduce public transport movement—given strong links between exposure to air pollution and COVID-19 transmission, a new study reveals.

Analysis of air pollution, COVID-19 cases and fatality rates in London demonstrates a connection between increased levels of nitrogen dioxide (NO2) and particulate matter (PM2.5) and higher risk of viral transmission.

Scientists at the Universities of Birmingham and Cambridge say that this shows air pollution could be used as an indicator to rapidly identify vulnerable parts of a city such as London—informing decisions to suspend or reduce operation of busses, trains, and Underground.

Researchers have published their findings today in Science of The Total Environment, highlighting that using public transport in the UK during a pandemic outbreak has a six-fold increased risk of contracting an acute respiratory infection.

City boroughs with access to London Underground interchange stations also have higher pandemic case rates as users are exposed to higher number of individuals compared to through stations.

Report author Dr. Ajit Singh, from the University of Birmingham, commented: "Short-term exposure to NO2 and PM2.5is significantly linked to an increased risk of contracting and dying from COVID-19. Exposure to such air pollutants can compromise lung function and increase risk of death from the virus. Levels of airborne PM2.5in the London Underground during summer are often several times higher than other transport environments such as cycling, busses or cars. We recommend a strategy that tailors the level of public transport activity in cities like London according to COVID-19 vulnerability based on air pollution levels across the city. This could help decision-makers take the right measures to counter COVID-19 in London—for example deploying transport staff and arranging dedicated services for key workers."

Scientists have earlier found the greatest PM2.5 concentrations across the London Underground network on the Victoria Line (16 times higher than the roadside environment), followed by the Northern, Bakerloo, and Piccadilly lines.

Routine cleaning and maintenance of the London Underground ranges from litter removal to preventing safety incidents rather than reducing PM concentrations.

Co-author Dr. Manu Sasidharan, of the University of Cambridge, commented: "Human-mobility reduction measures provide the greatest benefit in the fight against COVID-19. We need to balance the public health benefits of closing public transport during a pandemic against the socio-economic impacts of reducing mobility. Determining the vulnerability of city regions to coronavirus might help to achieve such trade-offs—air pollution levels can serve as one of the indicators to assess this

vulnerability."

The number of positive COVID-19 cases considered in the study were only those reported at hospitals—it does not include people self-isolating due to COVID-19.

  **More information:** Manu Sasidharan et al. A vulnerability-based approach to human-mobility reduction for countering COVID-19 transmission in London while considering local air quality, *Science of The Total Environment* (2020). DOI: 10.1016/j.scitotenv.2020.140515

  Provided by University of Birmingham

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