New research presented at Euroanaesthesia 2022 finds that long-term exposure to air pollution is linked to a greater risk of severe COVID-19.

Findings from the study show that people living in counties with higher levels of nitrogen dioxide (NO$_2$) were more likely to need ICU care and mechanical ventilation if they had COVID-19. Long-term exposure to NO$_2$ can have harmful effects on the lungs. This includes damage to the endothelial cells, which play a key role in oxygen transfer.

Dr Susanne Koch of the Department of Anaesthesiology & Intensive Care, Charité – Universitätsmedizin Berlin, Berlin, Germany, and colleagues explored the impact of long-term air pollution on the need for ICU treatment and mechanical ventilation of COVID-19 patients.

Air pollution data from 2010 to 2019 was used to calculate the long-term annual mean level of NO$_2$ for each county in Germany. This ranged from 4.6 µg/m$^3$ to 32 µg/m$^3$, with the highest level in Frankfurt and the lowest in Suhl, a small county in Thuringia. Three hundred ninety-two out of Germany’s 402 counties were included in the analysis.

Study results show a greater need for ICU treatment and mechanical ventilation of COVID-19 patients in counties with higher long-term annual mean NO$_2$ levels. Each 1 µg/m$^3$ increase in long-term annual mean NO$_2$ concentration was associated with a 3.2% increase in the number of ICU beds occupied by COVID-19 patients and a 3.5% increase in the number of COVID-19 patients who needed mechanical ventilation.

On average, 28 ICU beds and 19 ventilators were needed for COVID-19 patients in each of the ten counties with the lowest long-term NO$_2$ exposure compared to 144 ICU beds and 102 ventilators in the ten counties with the highest long-term NO$_2$ exposure.

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These results align with other recent studies that also link long-term NO₂ exposure with a higher COVID-19 incidence and a higher fatality rate.

Source: Euroanaesthesia Congress 2022

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Published on: Tue, 7 Jun 2022