

## #EA22: Long-Term Exposure to Air Pollution Increases Risk of Severe COVID-19



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<sub>2</sub>) were more likely to need ICU care and mechanical ventilation if they had COVID-19. Long-term exposure to NO<sub>2</sub> 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<sub>2</sub> for each county in Germany. This ranged from 4.6 µg/m<sup>3</sup> to 32 µg/m<sup>3</sup>, 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<sub>2</sub> levels. Each 1 µg/m<sup>3</sup> increase in long-term annual mean NO<sub>2</sub> 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<sub>2</sub> exposure compared to 144 ICU beds and 102 ventilators in the ten counties with the *highest* long-term NO<sub>2</sub> exposure.

These results align with other recent studies that also link long-term NO<sub>2</sub> exposure with a higher COVID-19 incidence and a higher fatality rate.

Source: [Euroanaesthesia Congress 2022](#)

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