

Air pollution, even at low levels, made COVID worse for patients and hospitals: Study

June 20 2023



Credit: Pixabay/CC0 Public Domain

Exposure to air pollution meant an average of four extra days in hospital for COVID-19 patients, further increasing the burden on health care

systems, according to a new study published in the *European Respiratory Journal*.

The researchers say the effect of pollution on patients' time in [hospital](#) was equivalent to being a decade older. Conversely, the effect of reducing exposure to pollution was 40 to 80% as effective in reducing patients' time in hospital as some of the best available treatments.

In a second study, also published in the *European Respiratory Journal*, researchers have used data on all 3.7 million Danish people aged 30 or older to establish the impact of [air pollution](#) on COVID-19. They found that long-term exposure to pollution at levels well below current EU limits increased the risk of contracting COVID-19, being hospitalized and dying of the disease.

The first study was led by Professor Tim S. Nawrot from Hasselt University in Belgium. It included 328 patients who were hospitalized for COVID-19 between May 2020 and March 2021.

The research team used data on levels of three pollutants—[nitrogen dioxide](#), soot and fine particles (PM_{2.5})—at the patients' home addresses before they were hospitalized with COVID-19. They also measured the amount of soot in the patients' blood.

The researchers compared this data with clinical outcomes, such as how long patients had to remain in hospital before they were well enough to go home, and whether they were treated in intensive care. They took account of other factors that are known to affect COVID-19 infection, such as age, sex and body mass index.

This showed that people exposed to higher levels of fine particles and nitrogen dioxide in the week before they were hospitalized had to stay in hospital for more than four extra days on average. However, all levels of

exposure were below the EU threshold. The size of the effect of air pollution on time in hospital was equivalent to the effect of a ten-year increase in age. The results also suggested that average exposure to higher levels of nitrogen dioxide and soot over the previous four years meant COVID-19 patients stayed longer in hospital on average.

Researchers found that higher levels of soot in the patients' blood increased the likelihood of their needing [intensive care](#) treatment by 36%.

Professor Nawrot said, "Our findings indicate that people who were exposed to air pollution, even at relatively low levels, were sicker and needed more time in hospital to recover. The pandemic placed an enormous strain on doctors, nurses and other healthcare workers. Our research suggests that air pollution made that burden even greater."

Researchers in the second study used data from the Danish National COVID-19 Surveillance System from the first 14 months of the pandemic combined with detailed information on the levels of air pollution at people's home addresses over the previous 20 years.

They found that increases in long-term exposure to nitrogen dioxide and [fine particles](#), even at levels well below current EU limits, increased the risk of contracting COVID-19, being hospitalized and dying of the disease. People living with certain medical conditions, such as heart disease, asthma, diabetes and dementia, and those from more deprived backgrounds were even more susceptible to the combined effects of air pollution and COVID-19.

Study author Dr. Zorana Jovanovic Andersen, from the University of Copenhagen, Denmark, said, "These results show how air pollution can compromise our [immune system](#) and leave us vulnerable to COVID-19 and other respiratory infections.

"Reduction of air pollution should be in the heart of preventive measures for current and future pandemics, as well as a strategy for dealing with seasonal influenza pandemics. Cleaner air would make populations more resilient to respiratory infections, seasonal epidemics, and major pandemics in future."

Professor Charlotte Suppli Ulrik from the University of Copenhagen, Denmark, is Head of the European Respiratory Society Assembly on the Environment and Epidemiology and was not involved in the research. She said, "We are finding more and more evidence that breathing polluted air is contributing to lung diseases, including infections. These studies show how exposure to air pollution at levels that are common in cities around Europe increased people's risk of contracting COVID-19, becoming seriously ill and dying. The research also indicates how pollution exacerbated the strain on our hospitals and [health services](#). Although the COVID-19 global health emergency is over, the impact of pollution on our health is continuing and we need governments to take action for the sake of our health and our health services."

More information: Vos S, De Waele E, Goeminne P, et al. Pre-admission ambient air pollution and blood soot particles predict hospitalisation outcomes in COVID-19 patients, *European Respiratory Journal* (2023). [DOI: 10.1183/13993003.00309-2023](https://doi.org/10.1183/13993003.00309-2023)

Zhang J, Lim Y-H, So R, et al. Long-term exposure to air pollution and risk of SARS-CoV-2 infection and COVID-19 hospitalization or death: Danish nationwide cohort study, *European Respiratory Journal* (2023). [DOI: 10.1183/13993003.00280-2023](https://doi.org/10.1183/13993003.00280-2023)

Editorial: Sunyer J, Dadvand P. Air pollution and COVID-19 severity, *European Respiratory Journal* (2023). [DOI: 10.1183/13993003.00818-2023](https://doi.org/10.1183/13993003.00818-2023)

Provided by European Respiratory Society

Citation: Air pollution, even at low levels, made COVID worse for patients and hospitals: Study (2023, June 20) retrieved 29 April 2024 from <https://medicalxpress.com/news/2023-06-air-pollution-covid-worse-patients.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.