

Clear health benefits for cleaner air

Air pollution is a major cause of poor health and premature death, but evidence on the impact of changing levels of air pollution on mortality rates is scarce. A recent study in *The BMJ* shows that relocating to an area with improved air quality is associated with decreased mortality.



Credit: Pixabay

Exposure to air pollution is a major cause of cardiorespiratory disease and death, largely due to inhalation of ambient particulate matter less than 2.5 μm in diameter ($\text{PM}_{2.5}$). Sources of fine particles of this size include the combustion of fuels in industrial and residential settings, as well as emissions from road vehicles.

While associations have been drawn between $\text{PM}_{2.5}$ exposure and adverse health outcomes, including mortality, evidence to show that reducing exposure to $\text{PM}_{2.5}$ has a beneficial effect is more limited. There are ethical implications of trying to address this hypothesis experimentally, given that a control group would need to be exposed to higher levels of $\text{PM}_{2.5}$.

To circumvent this issue, [Chen and colleagues](#) used a quasi-experimental design in which they studied a sample of over 400,000 Canadians drawn from the Canadian Census Health and Environment Cohort who, over the period studied, had relocated to an area with lower or higher $\text{PM}_{2.5}$ levels¹. As such, it was possible to determine the impact of changes in residential $\text{PM}_{2.5}$ exposure on deaths without researcher intervention.

Participants were grouped into three groups including those moving into areas with high, intermediate or low $\text{PM}_{2.5}$ levels. Those who moved from an area with high $\text{PM}_{2.5}$ levels to an area with intermediate or low levels had a 6.8% or 12.8% reduction in mortality, respectively, compared to participants who moved from an area with high $\text{PM}_{2.5}$ levels to another area

with high levels. Conversely, mortality increased by 1.8% in those who moved from an area with low $\text{PM}_{2.5}$ levels to an area with intermediate levels and by 13.2% in those moving from a low to a high $\text{PM}_{2.5}$ area. Decreases in $\text{PM}_{2.5}$ levels were most strongly protective against deaths from cardiometabolic causes and increases in $\text{PM}_{2.5}$ levels were mostly associated with deaths from respiratory causes.

While some important covariables were accounted for, such as socioeconomic status and comorbidities, data on others such as smoking status and neighbourhood-level deprivation were not available. Further studies will also be needed to determine the magnitude of the effect in areas with higher levels of air pollution than Canada. However, this large population-based study provides strong evidence in support of efforts to improve air quality and the positive effects these might yield on population health.

Ben Abbott[✉]

[✉]email: ben.abbott@nature.com

Published online: 17 November 2021

Reference

1. Chen, H. et al. Changes in exposure to ambient fine particulate matter after relocating and long term survival in Canada: quasi-experimental study. *BMJ*. 375, n2368 (2021).



Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.

© Springer Nature Limited 2021