

Science for Environment Policy

Air pollution from road traffic can raise blood pressure

High blood pressure is linked to long-term exposure to traffic-related air pollution, new research suggests. After accounting for lifestyle factors, socioeconomic status and pre-existing health conditions, the researchers found that a rise in traffic emissions of nitrogen dioxide corresponded to a rise in blood pressure of exposed individuals.

Long-term exposure to [air pollution](#) has previously been linked to an increase in blood pressure which in turn may increase the risk of heart attack or stroke. [Traffic](#) in particular is a major source of pollution and it is vital to understand the full range of its effects on public [health](#).

This study examined a cross-section of the population to investigate the association between traffic-related air pollution and high blood pressure. The researchers recruited 3 700 people, aged 35 to 83 years old, from Girona, Spain, who were already being followed in an existing study ([REGICOR](#)). The researchers recorded lifestyle factors (e.g. smoking habits), socioeconomic status and health conditions (e.g. diabetes or pre-existing cardiovascular disease) using a questionnaire. They also recorded whether the participants were taking medication for raised blood pressure.

For their health assessment, the researchers took a series of blood pressure readings from each participant. Blood pressure is measured using two values: the systolic pressure that records the pressure in the arteries as blood is pumped from the heart, and the diastolic pressure which is the pressure in the arteries when the heart rests between beats. For this study, the researchers defined high blood pressure as a systolic pressure of 140 millimetres of mercury (mm Hg) or more, combined with a diastolic pressure of 90 mm Hg or more.

Using data from a dense network of air pollution sensors, the researchers created a model for nitrogen dioxide (NO₂) levels in Girona and estimated the NO₂ levels outside each participant's home address, as an indicator for overall traffic pollution exposure. They also looked at how other factors, such as traffic noise, affected people's blood pressure.

Among individuals in the study who did not take medication for blood pressure, there was a statistically significant rise in systolic blood pressure of 1.34 mm Hg for each 10 micrograms per cubic metre increase in annual average NO₂, after adjusting for exposure to traffic noise. The same association was found across the entire group, including both those that did and did not take medication, although it was weaker.

Considering only those on medication, the researchers did not find any significant association between NO₂ exposure and a rise in systolic blood pressure. However, they acknowledge that trying to account for the effects of such medication is extremely difficult. There was no association between NO₂ and diastolic blood pressure in any group.

Increased blood pressure from long-term exposure to air pollution may be explained by sustained inflammation or stimulation of the body to produce toxic chemicals. These effects lead to impairment of blood vessel function and stiffening of the arteries, say the researchers.

These findings suggest that traffic-related air pollution can raise blood pressure, which in turn may lead to problems with the heart and blood vessels. The widespread nature of traffic-related air pollution suggests that this is a serious public health concern.



24 July 2014
Issue 382

[Subscribe](#) to free
weekly News Alert

Source: Foraster, M., Basagaña, X., Aguilera, I. *et al.* (2014). Association of long-term exposure to traffic-related air pollution with blood pressure and hypertension in an adult population-based cohort in Spain (the REGICOR study). *Environmental Health Perspectives*. 122(4):404–410. DOI:10.1289/ehp.1306497
This paper is free to download at: <http://dx.doi.org/10.1289/ehp.1306497>.

Contact:
maria.foraster@unibas.ch

Read more about:
[Air pollution](#),
[Environment and health](#), [Chemicals](#)

The contents and views included in Science for Environment Policy are based on independent, peer-reviewed research and do not necessarily reflect the position of the European Commission.

To cite this article/service: "Science for Environment Policy": European Commission DG Environment News Alert Service, edited by SCU, The University of the West of England, Bristol.