

# Science for Environment Policy

## Transport noise mitigation must consider the medical impacts

**People living close to road, rail and aircraft noise** are likely to experience negative health effects. Long-term noise exposure may lead to problems with their heart and circulatory (cardiovascular) system and night-time noise is particularly disruptive of sleep patterns, which in turn may lead to cardiovascular health problems, a review of research into the effects of noise on cardiovascular diseases has found.

**In addition to annoyance and a perception** of a lower quality of life, long-term exposure to environmental noise can affect people's health in other ways. This study, based on current literature, reviewed research into the impact that exposure to transport noise has on the cardiovascular system, to help improve noise mitigation policies.

Night-time noise may have more of an impact on cardiovascular health than day-time noise, and noise exposure at night is a particular problem because sleep is disturbed. Exposure to noise may lead to changes in the way the body functions: laboratory studies have demonstrated that the body reacts to acute noise exposure by releasing stress hormones, such as adrenaline.

As shown by field studies, these acute effects occur not only at high sound levels in workplace settings, but also at relatively low environmental noise levels when concentration, relaxation, or sleep is disturbed. This flight-or-fight reaction is automatic and does not even require a conscious awareness to occur. As a result, people do not get enough sleep and their sleep pattern is broken - disrupted sleep can lead to cardiovascular health problems.

For example, exposure to aircraft noise at night has been linked with increased blood pressure. As night-time noise levels stimulate high blood pressure—preventing blood vessels from relaxing to restore themselves overnight—this can lead to continued high blood pressure, hardening of the arteries and cardiovascular diseases, such as heart attacks and strokes.

Population studies on long-term exposure to road, rail traffic and aircraft noise have used different research methods, but in general reveal a link between noise exposure and raised blood pressure, heart attacks and strokes.

The World Health Organisation (WHO) considers night-time noise levels of less than 55 dBA to be necessary to prevent adverse health effects from noise in the short term, although the long-term goal is 40 dBA. Around 40% of the European population is exposed to road-traffic noise of more than 55 dBA  $L_{DN}$ , according to the WHO. Results from a number of studies suggest that the risk of heart disease increases for people exposed to road traffic noise of between 55 and 60 dBA. The risk of having a stroke has also been found to increase, particularly in the elderly.

Several studies on people living near airports have found a link between increased exposure to aircraft noise and the risk of having high blood pressure. Recent studies have also associated exposure to day and night-time aircraft noise with an increased risk of heart disease and strokes in people living close to airports.

The researchers suggest that the association between road, rail and aircraft traffic noise with adverse health effects requires policies to reduce the burden of noise that take into account the associated medical effects. They suggest that noise should be targeted at source, for example, take-off and landing procedures should be controlled to reduce noise levels and traffic curfews could be imposed. If source control measures are not feasible, other measures, such as better sound insulation, could be considered.



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