

Science for Environment Policy

Noise pollution may make people less likely to exercise

Physical inactivity raises the risk of ill health, so environmental factors that reduce the level of physical activity in people should be of concern to policymakers as well as to individuals. A new study has associated long-term annoyance with transportation noise with reduced physical activity in Swiss residents, which may indirectly contribute to diseases including cardiovascular disease, diabetes and obesity.

Exposure to noise pollution can affect peoples' health. Previous studies have linked exposure to long-term noise from transport, due to living under a flight path or near to a busy road for example, with cardiovascular diseases, such as stroke or heart disease.

Noise may directly contribute to cardiovascular disease through automatic, physiological stress reactions in the body. There is also a psychological aspect; people may suffer 'noise annoyance' due to hearing unwanted and disturbing sound.

This study is the first to demonstrate that long-term annoyance caused by transportation noise may indirectly contribute towards cardiovascular disease, as well as to diabetes and obesity, by reducing physical activity. Physical activity, along with a good quality and quantity of sleep, is important for health and wellbeing.

Since 1991, the [SAPALDIA](#)¹ project, which is partly supported by the European Commission, has been following volunteers, recruited from different parts of Switzerland, to explore how personal and environmental factors affect the respiratory and cardiovascular health of adults. For this study, the researchers selected a sample of 3 842 participants from the SAPALDIA study.

In 1991, 2001 and 2011, participants were interviewed about their health and lifestyle and given heart and respiratory examinations. In all three interviews, the participants were asked whether they experienced noise annoyance at home due to transportation and, if so, to rate the annoyance on a scale from 0–10. In 2001 and 2011, the participants were also asked whether they engaged in physical activity and if so, about the intensity, frequency and duration of activities. Finally, in 2011, they were asked about the source of the transportation noise that had annoyed them (at night) over the previous year.

Using the 1991 and 2001 data, the researchers modelled the long-term association between noise annoyance and physical activity reported by the participants in 2011, adjusted for factors that might influence any association, including age, sex, body mass index (BMI), socioeconomic status and lifestyle factors, including smoking, alcohol consumption and diet.

The results revealed that long-term annoyance due to transportation noise at home was associated with reduced (mainly moderate) physical activity. Other studies have found that physical inactivity is a risk factor for death, cardiovascular disease, diabetes and obesity, as well as loss of healthy life years. This study therefore suggests there may be an indirect connection between noise annoyance and cardiovascular disease, diabetes and obesity.

Using the 2011 data, the researchers also modelled the effect of annoyance with specific sources of night-time noise on physical activity levels. Road traffic noise and then aircraft noise caused the most annoyance and were also linked to reduced levels of physical activity.

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annoyance is associated with subsequent lower levels of physical activity. *Environment International* 91: 341–349. DOI:10.1016/j.envint.2016.03.011. This study is free to view at: <http://www.sciencedirect.com/science/article/pii/S0160412016300897>

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1. [SAPALDIA](#) (Swiss study on Air Pollution and Lung Disease in adults) is part of the European Commission's [GABRIEL](#) project (A multidisciplinary study to identify the genetic and environmental causes of asthma in the European Community), funded through its Sixth Framework Programme.

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Further analysis suggested long-term annoyance with transportation noise particularly reduced physical activity in people who had daytime sleepiness, chronic diseases and in women. For example, the researchers suggest that people who are ill might be more susceptible to being annoyed by noise at night and have disturbed sleep. This, in turn, is followed by sleepiness the next day which affects their behaviour by disrupting their intended physical activities. One possible explanation for women being especially affected is that they spend more time at home, the researchers suggest. In this study, more male participants were out of the house at work compared with female participants.

The researchers say that although the effect of noise annoyance on physical activity was modest (a 3.2% decrease in moderate physical activity for each point on the noise annoyance scale), this is concerning because even low levels of noise annoyance were associated with reduced physical activity. Worldwide, there are millions of people who are annoyed by noise, which could be contributing to the global burden of disease.

However, more research is needed to better understand the role of long-term noise annoyance in sleep disturbance and physical activity, say the researchers.

