

Air pollution and noise increase risk for heart attacks

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Considering transportation noise should be an integral part of any studies looking at the impact of air pollution on health Credit: Jana Sönksen / Swiss TPH

Where air pollution is high, the level of transportation noise is usually also elevated. But car, train and aircraft noise also increase the risk for

cardiovascular diseases and diabetes, as previous research has demonstrated. Studies investigating the effect of air pollution without sufficiently taking into account the impact of noise on health might overestimate the effect of air pollution. These are the results of a comprehensive study conducted by the Swiss Tropical and Public Health Institute (Swiss TPH), which was published today in the peer-reviewed *European Heart Journal*.

The study looked at the combined effects of air [pollution](#) and transportation noise for [heart attack](#) mortality by considering all deaths that occurred in Switzerland between 2000 and 2008. Analyses that only included fine particulates (PM_{2.5}) suggest that the risk for a heart attack rises by 5.2 percent per 10 µg/m³ increase in the long-term concentration at home. Studies that also account for road, railway and [aircraft noise](#) reveal that the risk for a heart attack attributable to fine particulates increases considerably less; 1.9 percent per 10 µg/m³ increase. These findings indicate that the negative effects of air pollution may have been overestimated in studies that fail to concurrently consider noise exposure.

"Our study showed that transportation noise increases the risk for a heart attack by 2.0 to 3.4 percent per 10 decibels increase in the average sound pressure level at home," said Martin Röösli, head of the Environmental Exposures and Health Unit at Swiss TPH, and lead author of the published research. "Strikingly, the effects of noise were independent from [air pollution exposure](#)."

Effect of noise and air pollution are additive

The study also found that people exposed to both air pollution and noise are at highest risk of heart attack. Hence, the effects of air pollution and noise are additive. "Public discussions often focus on the negative health effects of either air pollution or noise, but do not consider the combined

impact," said Rösli. "Our research suggests that both exposures must be considered at the same time."

This has implications for both policy as well as future research. Hence, Rösli and co-researchers recommend including transportation [noise exposure](#) in any further research related to air pollution and health to avoid overestimating the negative effects of air pollution on the cardiovascular system.

Data from across Switzerland

The study included all deaths (19,261) reported across Switzerland from the period 2000 to 2008. The air pollution (PM_{2.5}) was modeled using satellite and geographic data, calibrated with air pollution measurements from 99 measurement sites throughout Switzerland. Nitrogen dioxides (NO₂) were also modeled using 9,469 biweekly passive sampling measurements collected between 2000 and 2008 at 1,834 locations in Switzerland. Transportation noise was modeled by well-established noise propagation models (sonRoad, sonRAIL and FLULA 2) by Empa and n-sphere. The [air pollution](#) and the transportation [noise](#) models were applied for each address of the 4.4 million Swiss adult citizen (aged 30 years and above).

More information: Harris Héritier et al. A systematic analysis of mutual effects of transportation noise and air pollution exposure on myocardial infarction mortality: a nationwide cohort study in Switzerland, *European Heart Journal* (2018). [DOI: 10.1093/eurheartj/ehy650](https://doi.org/10.1093/eurheartj/ehy650)

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