

Publication

Transportation noise exposure and cardiovascular mortality: 15-years of follow-up in a nationwide prospective cohort in Switzerland

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)**ID** 4651901**Author(s)** Vienneau, D.; Saucy, A.; Schäffer, B.; Flückiger, B.; Tangermann, L.; Stafoggia, M.; Wunderli, J. M.; Rössli, M.; study Group, S. N. C.**Author(s) at UniBasel** [Vienneau, Danielle](#) ; [Saucy, Apolline](#) ; [Tangermann, Louise](#) ; [Rössli, Martin](#) ;
Year 2022**Title** Transportation noise exposure and cardiovascular mortality: 15-years of follow-up in a nationwide prospective cohort in Switzerland**Journal** Environment international**Volume** 158**Pages / Article-Number** 106974**Mesh terms** Adult; Environmental Exposure, statistics & numerical data; Female; Follow-Up Studies; Humans; Male; Myocardial Infarction; Noise, Transportation, adverse effects; Prospective Studies; Switzerland, epidemiology

Death from cardiovascular diseases (CVD) has been associated with transportation noise. This nationwide cohort, with state-of-the-art exposure assessment, evaluates these associations by noise source. Road traffic, railway and aircraft noise for 2001 and 2011 were linked to 4.1 million adults in the Swiss National Cohort, accounting for address history. Mean noise exposure in 5-year periods was calculated. Time-varying Cox regression models, with age as timescale, were applied to all and cause-specific cardiovascular causes of death. Models included all three noise sources plus PM_{2.5}, adjusted for individual and spatial covariates. Nighttime noise events for all sources combined (expressed as intermittency ratio or number of events) were considered in sensitivity analyses. Absolute excess risk was calculated by multiplying deaths/100,000 person-years by the excess risk (hazard ratio-1) within each age/sex group. During a 15-year follow-up, there were 277,506 CVD and 34,200 myocardial infarction (MI) deaths. Associations (hazard ratio; 95%-CIs) for road traffic, railway and aircraft noise and CVD mortality were 1.029 (1.024-1.034), 1.013 (1.010-1.017), and 1.003 (0.996-1.010) per 10 dB L_{den}, respectively. Associations for MI mortality were a respective 1.043 (1.029-1.058), 1.020 (1.010-1.030) and 1.040 (1.020-1.060) per 10 dB L_{den}. Blood pressure-related, ischemic heart disease, and all stroke mortality were significantly associated with road traffic and railway noise, while ischemic stroke mortality was associated with aircraft noise. Associations were mostly linear, often starting below 40 dB L_{den} for road traffic and railway noise. Higher levels of noise intermittency were also independently associated with each outcome. While the absolute number of deaths attributed to noise increased with age, the hazard ratios declined with age. Relative and absolute risk was higher in males compared to females. Independent of air pollution, transportation noise exposure is associated with all and cause-specific CVD mortality, with effects starting below current guideline limits.

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