

Publication

Suicide and transportation noise: a prospective cohort study from Switzerland

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Author(s) Wicki, B.; Schäffer, B.; Wunderli, J. M.; Müller, T. J.; Pervilhac, C.; Röösl, M.; Vienneau, D.**Author(s) at UniBasel** [Wicki, Benedikt](#) ; [Röösl, Martin](#) ; [Vienneau, Danielle](#) ;**Year** 2023**Title** Suicide and transportation noise: a prospective cohort study from Switzerland**Journal** Environmental health perspectives**Volume** 131**Number** 3**Pages / Article-Number** 37013**Mesh terms** Male; Adult; Female; Humans; Adolescent; Cohort Studies; Noise, Transportation, adverse effects; Switzerland, epidemiology; Prospective Studies; Longitudinal Studies; Air Pollution; Particulate Matter; Environmental Exposure

BACKGROUND: Although plausible from a pathophysiological point of view, robust evidence for effects of transportation noise on mental health remains scarce. Meanwhile, psychiatric diseases are among the most prevalent noncommunicable diseases worldwide, and suicide as a mortality outcome highly connected to mental disorders presents a pressing public health issue. The aim of this study was to investigate the association between source-specific transportation noise, particulate matter (PM) air pollution, residential greenness, and suicide by means of a nationwide cohort study. **METHODS:** Road traffic, railway and aircraft noise exposure as well as exposure to air pollution [PM with aerodynamic diameter $\leq 2.5 \mu\text{m}$ (PM_{2.5})] and greenness [normalized difference vegetation index (NDVI)] were linked to 5.1 million adults (age 15 y and older) in the Swiss National Cohort, accounting for their address history. Mean noise exposure in 5-y periods was calculated. Individuals were followed for up to 15 y (2001-2015). Time-varying Cox regression models were applied to deaths by suicide (excluding assisted suicide). Models included all three noise sources, PM_{2.5}, and NDVI plus individual and spatial covariates, including socioeconomic status. Effect modification by sex, age, socioeconomic indicators, and degree of urbanization was explored. **RESULTS:** During the follow-up, there were 11,265 suicide deaths (10.4% poisoning, 33.3% hanging, 28.7% firearms, 14.7% falls). Road traffic and railway noise were associated with total suicides [hazard ratios: 1.040; 95% confidence interval (CI): 1.015, 1.065; and 1.022 (95% CI: 1.004, 1.041) per 10 dB day-evening-night level (L_{den})], whereas for aircraft noise, a risk increase starting from 50 dB was masked by an inverse association in the very low exposure range (30-40 dB). Associations were stronger for females than males. The results were robust to adjustment for residential greenness and air pollution. **CONCLUSION:** In this longitudinal, nationwide cohort study, we report a robust association between exposure to road traffic and railway noise and risk of death by suicide after adjusting for exposure to air pollution and greenness. These findings add to the growing body of evidence that mental health disorders may be related to chronic transportation noise exposure. <https://doi.org/10.1289/EHP11587>.

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