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Annoyance and sleep disturbance due to vibrations from trains in The Netherlands: results from “Living in the vicinity of the railway”.

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ABSTRACT

In 2013, RIVM investigated how people, living in the vicinity of railways, experience vibrations from trains. As a follow-up, RIVM was commissioned to carry out a second study in 2021. The main objective was to derive exposure-response relationships between exposure to vibrations caused by trains and annoyance and sleep disturbance. To this end, in total 17,189 people of 16 years and older, living within 300 meters of a railway track (excluding bridges and/or tunnels) were invited to participate. By means of an online questionnaire, information was gathered about annoyance and sleep disturbance due to vibrations, and their co-determinants. In total, 5,611 persons (33.2%) completed the questionnaire. Exposure to both average and maximum rail traffic vibration levels was estimated by means of the Dutch calculation model for railway vibrations (OURS), and linked to the addresses of the 5,611 participants. It was estimated that in 2021 almost 11% of the Dutch population of 16 years and older, living within 300 meters of a railway track (excluding bridges and/or tunnels), was severely annoyed due to vibrations from rail traffic. In 2013, this was more than 19%. Similar to 2013, for all rail traffic sources, in 2021 also clear relationships could be observed between exposure to vibrations and severe annoyance due to vibrations from these sources. The strongest relationships were observed for freight trains. For sleep disturbance the picture was comparable. Although the correlation between the different vibration exposure metrics was high, their feasibility to predict annoyance and sleep disturbance due to vibrations differed.

Keywords (3-6): Rail traffic, Vibrations, Annoyance, Sleep disturbance, Exposure-response relationship