

# EFFECTS OF TRANSPORTATION NOISE ON BLOOD PRESSURE

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**Background and Aims:** Laboratory experiments on humans and animals, occupational noise studies with high noise levels and transportation noise studies with lower noise levels support the evidence that environmental noise is associated with high blood pressure. The biological plausibility is determined by the general stress concept, referring to the activation of the autonomic nervous system and the endocrine system. Most transportation noise studies looked at aircraft noise and road traffic noise. A recent meta-analysis investigating the relationship between aircraft noise and hypertension reported an odds ratio of 1.06 (95% CI: 1.00-1.13) per 5 dB(A) increase of the weighted day-night aircraft noise level L<sub>dn</sub> (range 47-67 dB(A)). Despite the fact that during the last decade the number of studies investigating the association between road traffic noise and high blood pressure increased substantially, no reliable exposure-response relationship is as yet available. A meta-analysis was carried out to fill the gap.

**Methods:** Based on review papers and an electronic data-base search, epidemiological studies investigating the relationship between road traffic noise exposure and measured high blood pressure and/or use of antihypertensive treatment were considered for a meta-analysis. The studies were published between 1970 and 2010.

**Results:** Eventually 27 studies were evaluated. Preliminary results showed that road traffic noise was positively and significantly associated with the prevalence of hypertension: data-aggregation produced an OR of 1.03 (95% CI: 1.01-1.06) per 5 dB(A) increase of the 16 hour average road traffic noise level (L<sub>Aeq,16hr</sub>) (range 45-75 dB(A)).

**Conclusions:** Overall evidence shows that road traffic exposure is associated with high blood pressure. Based on a meta-analysis a quantitative relationship is derived that can be used for health impact assessment. The results of this meta-analysis are consistent with a slight increase of cardiovascular disease risk in populations exposed to transportation noise.