

Science for Environment Policy

Road traffic noise increases risk of diabetes

Increasing noise levels are a global environmental concern, and have been linked to important health issues, such as heart disease and cognitive development. New Danish research has now shown that it is also associated with an increased risk of diabetes.

It has been estimated that approximately a third of the population of the EU is exposed to traffic [noise](#) in the home that exceeds World Health Organization guidelines. Noise levels, especially in urban areas, are often high enough to disrupt sleep and cause stress. In this study, partly conducted under the EU QUIET¹ project, researchers investigated whether noise exposure is related to the risk of developing diabetes.

Between 1993 and 1997, 50,187 residents of the Danish cities Copenhagen and Aarhus, aged between 50 and 64, were signed up to the study, which ran until 2006. To assess how much noise each person was exposed to, the researchers recorded the residential addresses of every individual since 1988 and combined this with spatial information on noise. The amount of road traffic noise at each address was estimated using data on factors including the average number of vehicles, their speed, the type of road, and the height of surrounding buildings. Finally, instances of diabetes diagnoses for the participating residents during the study were obtained.

When analysing the data, the researchers were careful to rule out aspects which might also affect the risk of diabetes, such as sex, weight, diet and smoking. One factor which was particularly important to control for was air pollution, since this is higher in areas of higher traffic noise, and has also been linked to diabetes.

Overall, 3,869 individuals were diagnosed with diabetes during the study. The results demonstrated that an increase in average noise exposure of 10 decibels (at all residences in the five years before diagnosis) was associated with a significantly higher risk of diabetes. Long-term exposure (five years) was linked with higher diabetes risk than shorter periods (one year). The study was unable to control for such factors, such as bedroom location, noise from neighbours or hearing impairment, all of which may have had an impact on the actual noise experienced. However, adjustments to account for air pollution did not alter the overall conclusions, suggesting that noise has an effect that is independent of this influence.

The researchers were further unable to distinguish between type 1 diabetes (which is largely genetically determined) and type 2 diabetes (which is often triggered by lifestyle factors) in this study. However, these results are very likely to reflect the effects of noise on type 2 diabetes, since this constitutes 90-95% of all cases of diabetes, and type 1 is generally diagnosed during childhood. They also acknowledge that because many people live with undiagnosed diabetes, the date of diagnosis may not accurately represent when the disease developed.

Finally, the study discusses why noise pollution may lead to diabetes. They note that, among other possible causes, stress hormones can cause reduced insulin production which can contribute to diabetes.



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10.1289/ehp.1205503.
This study is free to view at:

<http://ehp.niehs.nih.gov/1205503/>

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http://cordis.europa.eu/search/index.cfm?fuseaction=proj.document&PJ_LANG=EN&PJ_RCN=12702684&pid=0&q=786153363631647AAB095BA2E5CB4415&type=sim