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Traffic noise increases heart attack risk



Acute heart attack is the second-most frequent cause of death in Germany. More than 50,000 persons die here every year from circulation problems of the heart muscle. Many factors that increase the risk of heart attack have been known for years, including high blood pressure, strong overweight, and lack of movement. Different studies of the past have suggested that permanent traffic noise also increase the probability of suffering a heart attack. The study on health risks dealt with this question with a higher degree of precision than many earlier examinations did – among others with more precise noise calculations.

The heart attack risk in figures

1. *The figure shows no statistically significant risk change, since the "basic risk" of 1.0 is within the light-violet hatched 95 %-trust range.*
2. *The figure shows a linear risk increase (violet line) of 2.8 % per 10 decibel (statistically significant).*

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3. *The figure shows a linear risk increase (violet line) of 2.3 % per 10 decibel (statistically significant).*

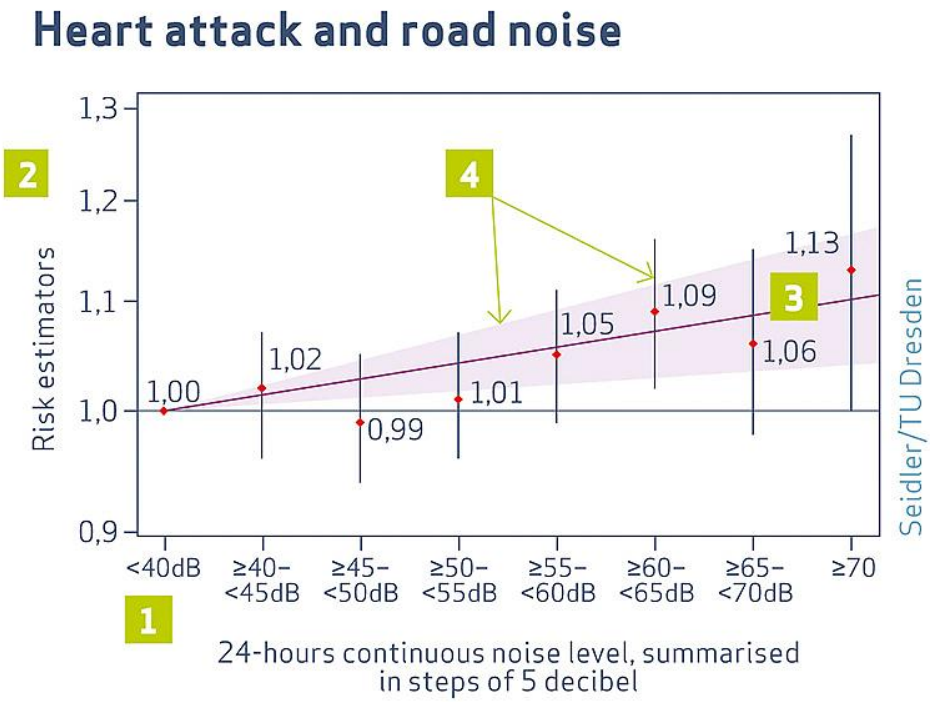
The scientists were able to confirm with NORAH that traffic noise is a heart attack risk:

- When the 24-hours continuous noise level of road noise increases by ten decibel the risk of heart attack increases by 2.8 percent.
- The heart attack risk increases by 2.3 percent per ten decibel railway traffic noise.
- Aviation noise shows no statistically significant connection between the even noise increase and heart attack. However, fewer people in the examination area were exposed to loud aviation noise: Only about two percent of the persons had an aviation noise continuous noise level above 55 decibel, and it never exceeded 65 decibel. For comparison: The road noise level was above 55 decibel in 26 percent of the insured persons, and the railway noise level in seven percent of the persons. Therefore, it is more difficult to map the risk progress for aviation noise.

Deceased patients with heart attack: Connection to aviation noise found

Heart attacks often have a fatal result. 53 percent of the insured persons who had a heart attack according to health insurance data from 2005 to 2010 had already died by 2014/15. However, the NORAH team did not know what they died of. For this partial group, the scientists performed separate analyses. They were able to document a statistically significant connection in the persons affected between aviation noise exposure and heart attack risk – among others if the 24-hour-continuous noise level at their addresses was at 60 decibel or above. An aviation noise increase of ten decibel increased the risk of fatal heart attack by 3.2 percent. For road and railway noise, similarly high risks were found. The results suggest that traffic noise not only is a risk for the occurrence, but also for the severe progression of a heart attack.

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A reading aid for this issue of NORAH Knowledge

The study on health risks examines whether the risk of developing one of the five examined diseases increases when exposed to more traffic noise. The scientists present the results of their research in exposure-effect curves). Since you will find many of these curves on the following pages, we are providing a reading aid here:

1 | Continuous noise level

This axis shows the continuous noise level. The noise increases from the left to the right. For some calculations, the scientists also used "Noise level classes". If, e.g., the continuous noise level at the address of an insured person was at 63.7 decibel, his health data was included in the calculation for the noise level class "≥ 60 dB – < 65 dB".

2 | Risk estimators

Risk estimators indicate how high the "relative illness risk" is. 1 corresponds to the "basic risk" of a person not subject to traffic noise. If the value is higher, this suggests that noise at this degree may contribute to the disease. Additional calculations must show whether an increased or reduced relative risk is statistically significant and thus with a high probability not coincidental.

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3 | Exposure-effect-curve

The exposure-effect-curve shows how the health risk changes with increasing noise. In this example, the risk increases by 2.8 percent per ten decibel. Additional calculations show whether this increase is statistically significant.

4 | Confidence intervals

The confidence interval is a statistically calculated trust range above or below the risk estimator. The smaller the confidence interval, the more reliable and indicative the risk estimator. It is usual to apply 95-percent confidence interval. Simplified, this means that the “actual” risk is within this range with a probability of 95 %. The figures show the 95-percent confidence intervals of the individual risk estimators (black vertical lines) as well as the 95-percent confidence interval above and below the exposureeffect curve (pink area).

Do you have any questions?

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