NORAH
Lärmwirkungsstudie

More depression for traffic noise

The scientists found statistically clear connections for depression. The noise from airplanes, cars and trains increases the risk of suffering a depressive episode. The disease, which usually happens in episodes is one of the most frequent mental illnesses in Germany. Every fifth person experiences at least one depressive episode in his or her life. The causes of depression are frequent, but usually several factors come together. One possible factor is stress, which in turn may be caused by chronic traffic noise.

Clear connection with all three noise types

In fact, the scientists were able to find a connection: between traffic noise and the medical diagnosis of a depressive episode with NORAH. Increase of the continuous noise level by ten decibel increases the depression risk

- by 8.9 percent in case of aviation noise.
- by 4.1 percent in road noise.
- by 3.9 percent in railway noise.

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The time spent living in the noisy area may also influence the risk of depression, as the data suggests. Future studies are to track this result of the NORAH study.

The risk drops in very loud regions

1. *The depression risk increases first with rising noise, but drops again at high noise exposures. This figure shows no linear risk increase, but the average risk estimators in 5-decibel-steps each. The vertical dashes above and below the risk estimators indicate the "confidence interval" in which the actual value will be found with a likelihood of 95 % (also see reading aid on page 5). From this data, an increase of the depression risk of 8.9 % per 10 decibel can be calculated (statistically significant).*
2. *The figure shows a linear risk increase (violet line) of 4.1 % per 10 decibel (statistically significant).*
3. *The depression risk increases first with rising noise, but drops again at high noise exposures. This figure shows no linear risk increase, but the average risk estimators in 5-decibel-steps each. The vertical dashes above and below the risk estimators indicate the "confidence interval" in which the actual value will be found with a likelihood of 95 % (also see reading aid on page 5). From this data, an increase of the depression risk of 3.9 % per 10 decibel can be calculated (statistically significant).*

The rather unexpected results of the study included the results for depression at aviation and railway noise: The curve is an inverted U. This means: The risk for depressive disease increases with rising noise level first. In areas with very high aviation or railway noise exposure, however, the static risk drops again. The cause of this unusual distribution as compared to the other results cannot be determined by the NORAH study. One explanation may be that persons suffering under noise very strongly and tending to develop depression will move less often in areas with high aviation or railway noise exposure, or may move away from there more often. Whether this is accurate and why this is different for road noise than for aviation and railway noise must be determined in future studies.

A reading aid for this issue of NORAH Wissen

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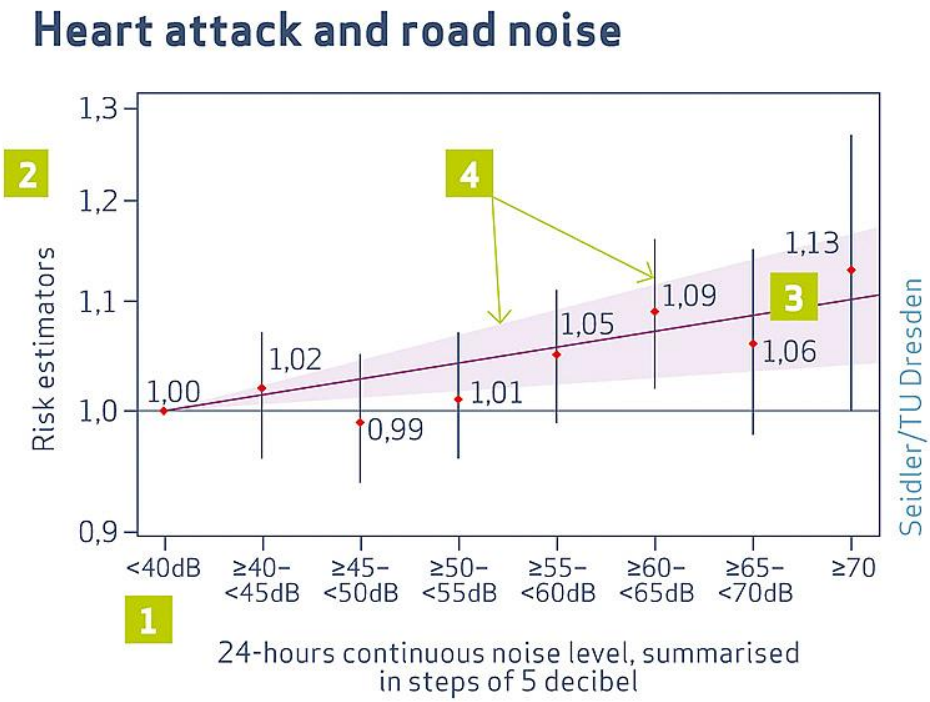

The study on health risks examines whether the risk of developing one of the five examined diseases increases when exposed to more traffic noise. The scientists present the results of their research in exposure-effect curves). Since you will find many of these curves on the following pages, we are providing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

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.

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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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