

## Noise Annoyance Is Associated with Depression and Anxiety in the General Population- The Contribution of Aircraft Noise

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### Abstract

#### Background

While noise annoyance has become recognized as an important environmental stressor, its association to mental health has hardly been studied. We therefore determined the association of noise annoyance to anxiety and depression and explored the contribution of diverse environmental sources to overall noise annoyance.

#### Patients and Methods

We investigated cross-sectional data of  $n = 15.010$  participants of the Gutenberg Health Study (GHS), a population-based, prospective, single-center cohort study in Mid-Germany (age 35 to 74 years). Noise annoyance was assessed separately for road traffic, aircraft, railways, industrial, neighborhood indoor and outdoor noise (“during the day”; “in your sleep”) on 5-point scales (“not at all” to “extremely”); depression and anxiety were assessed by the PHQ-9, resp. GAD-2.

#### Results

Depression and anxiety increased with the degree of overall noise annoyance. Compared to no annoyance, prevalence ratios for depression, respectively anxiety increased from moderate (PR depression 1.20; 95%CI 1.00 to 1.45; PR anxiety 1.42; 95% CI 1.15 to 1.74) to extreme annoyance (PR depression 1.97; 95%CI 1.62 to 2.39; PR anxiety 2.14; 95% CI 1.71 to 2.67). Compared to other sources, aircraft noise annoyance was prominent affecting almost 60% of the population.

#### Interpretation

Strong noise annoyance was associated with a two-fold higher prevalence of depression and anxiety in the general population. While we could not relate annoyance due to aircraft noise directly to depression and anxiety, we established that it was the major source of annoyance in the sample, exceeding the other sources in those strongly annoyed. Prospective follow-up data will address the issue of causal relationships between annoyance and mental health.

### Figures