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Background:

In environmental epidemiology, air pollution exposure is often estimated at the population level. To avoid the risk of exposure misclassification, one possibility is to interpolate air pollution measures at the residence through Geographical Information Systems. However, this might imply cumbersome administrative procedures. Data on air pollution annoyance from surveys can be an alternative to assess individual exposure to air pollution. This study investigates the association between air pollution annoyance and individual air pollution exposure.

Methods:

Analyses were carried out based on a linkage of data from the Belgian Health Interview Survey (HIS 2008 and 2013; >15 years; n = 9347) and annual means of air pollution concentration at the residence. Self-reported air pollution annoyance was assessed through a five-point Likert scale. Statistical analyses included Spearman correlation coefficient, analysis of variance and multivariable ordinal logistic regressions (OLR).

Results:

A significant exposure-response relationship was observed between long-term air pollution exposure and self-reported air pollution annoyance. However, Spearman coefficients were low (0.18-0.24), meaning a high heterogeneity of annoyance levels for a given exposure. In multivariable OLR, the odds of being annoyed by air pollution was 2.10 (95% CI: 1.86-2.67) times higher for each Interquartile range (IQR) increase in NO_2 concentration (PM2.5: 1.77 [95% CI: 1.53-2.07], PM10: 1.61 [95% CI: 1.33-1.67], black carbon: 1.45 [95% CI: 1.27-1.67]). Air pollution annoyance depended largely on individual factors especially health status.

Conclusions:

Air pollution exposure has a significant influence on self-reported air pollution annoyance. However, many other factors were found to influence annoyance, independently of the exposure. We found a limited validity of self-reported air pollution annoyance to assess individual long-term exposure to air pollution.

Key messages:

- Significant exposure-response relationship between individual long-term air pollution exposure and self-reported air pollution annoyance.
- Limited validity of self-reported air pollution annoyance for assessing individual long term exposure to air pollution.