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### Burden of disease due to air pollution and noise: a scoping review of methods and input data

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**Background:** Air pollution and noise are major contributors to the environmental burden of disease (BoD) in Europe. Choice of methods and input data in BoD calculations impact the resulting estimates and can complicate comparability. This study aims to provide an overview of the input data used in studies quantifying BoD attributable to air pollution and environmental noise.

**Methods:** Under the EU project BEST-COST, we performed a scoping review. We searched the literature databases MEDLINE, Embase, Global Health and Web of Science for studies published between January 2000 and October 2023. Eligible studies estimated BoD due to long-term exposure to ambient particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), nitrogen dioxide (NO<sub>2</sub>) or ozone (O<sub>3</sub>), and/or environmental noise (road, rail or aircraft traffic). For each study, we extracted information on key input data: BoD metrics, health data, exposure, exposure-response functions, and uncertainty.

**Results:** A total of 85 studies met the inclusion criteria. Of these, 62 quantified BoD due to air pollution, 14 to environmental noise, and 9 addressed both. PM<sub>2.5</sub> was the most frequently included exposure, while road traffic was the most common noise source. A variety of exposure models were used for air pollution, while noise exposure was often estimated according to the European Noise Directive. The BoD was estimated for a wide range of health outcomes, with considerable variation in the exposure-response functions used across studies. Uncertainty intervals for the BoD estimates were reported in 65% of the studies. Many studies lacked information of key input data, especially regarding exposure data (36%) and the choice of cut-off or counterfactual values in the calculations (27%).

**Conclusions:** This study revealed large variation in input data used in BoD calculations for air pollution and noise, as well as insufficient reporting. Transparent reporting is essential to ensure the applicability and comparability of environmental BoD estimates.

#### Key messages:

- Input data used in burden of disease calculations for air pollution and noise varies significantly across studies.
- Transparent reporting is crucial to assess comparability of burden of disease estimates.