ROAD TRAFFIC NOISE AND SOCIOECONOMIC STATUS: ENVIRONMENTAL INEQUALITIES AT THE SMALL-AREA LEVEL IN MARSEILLES, FRANCE

Pierre Verger, *INSERM, U912 (SE4S), Marseille, France ; Université Aix Marseille, IRD, UMR-S912, Marseille, France ; ORS PACA, Observatoire Régional de la Santé Provence Alpes Côte d'Azur, Marseille, France.*
Sébastien Cortaredona, *INSERM, U912 (SE4S), Marseille, France ; Université Aix Marseille, IRD, UMR-S912, Marseille, France ; ORS PACA, Observatoire Régional de la Santé Provence Alpes Côte d'Azur, Marseille, France*
Aurélie Bocquier, *INSERM, U912 (SE4S), Marseille, France ; Université Aix Marseille, IRD, UMR-S912, Marseille, France ; ORS PACA, Observatoire Régional de la Santé Provence Alpes Côte d'Azur, Marseille, France*
Boutin Céline, *Soldata Acoustic, Lyon, France*
Bigot Alexis, *Soldata Acoustic, Lyon, France*
David Aude, *Soldata Acoustic, Lyon, France*

Background and Aims: Although numerous studies show that ethnic minorities and people with low socioeconomic status (SES) are more exposed than others to some environmental risks (e.g., proximity to hazardous facilities and air pollution), few have focused on environmental noise exposure despite its significant potential non-auditory health effects (sleep disturbance, psychological distress, and cardiovascular diseases). This study analyzed the associations between SES and potential exposure to road traffic noise at the small-area level in Marseilles, France's second largest city.
Methods: Five SES variables were constructed at the census block level from census data: a deprivation index, 3 thematic indicators (economic, social, and national origin), and a residential mobility index. In accordance with European Directive 2002/49/EC, we calculated two indicators of potential exposure to road traffic noise with the noise propagation prediction model CadnaA: L_{den} for 24-hour and L_n for night periods. Loess diagrams described the associations between SES and noise exposure, which were further analyzed by regressions controlling for spatial autocorrelation (simultaneous autoregressive or SAR models). Sensitivity analyses were conducted with different models (SAR_{lag}, SAR_{err}, and SAR_{mix}) and neighborhood matrices.
Results: Only the mobility index was linearly related to noise indicators. SAR models showed that L_{den} and L_n were both higher in the intermediate than in the least deprived class. Results were similar for the economic index, and no relation at all was observed for the social index. A significant link with noise was found for areas with the lowest, but not the highest, percentages of non-French residents. L_{den} and L_n increased with residential mobility. Sensitivity analyses confirmed these results.
Conclusions: This study reports original results about noise-related environmental inequalities and about methods of adjustment for spatial autocorrelation. The results are discussed in relation to theoretical mechanisms of environmental inequalities and Marseilles's historical development.