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Peer Review

Review of: "Electric Vehicle Fleet Penetration and Air Pollution Mortality in Europe"

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Evaluation of the Topic and Title

The topic of the article is timely and scientifically relevant, as it addresses the relationship between transport electrification and public health at the European scale. The issue of the impact of electric vehicles on air quality and PM2.5-related mortality is important both environmentally and politically, fitting into the broader debate on energy transition. A strength is the use of real fleet data (vehicle stock rather than sales), which potentially increases the study's cognitive value. At the same time, the topic is framed somewhat broadly and partially in a publicistic manner, which reduces its analytical precision. The title is clear and broadly consistent with the scope of the paper; however, it suggests stronger causal conclusions than are justified by the applied method (correlational analysis). From a scientific perspective, the title may therefore be considered slightly overstated.

Introduction

The introduction appropriately situates the study within the context of EU climate policy and the public health burden associated with PM2.5. The author clearly outlines the research motivation and objective. It is commendable that the complexity of the relationship between electromobility and air quality is acknowledged, including potential confounding factors (meteorology, emission sources, environmental policies). However, the introduction partially anticipates conclusions before presenting the results, which weakens the logical structure of a scientific paper. Some passages adopt a normative tone (e.g., suggesting the need to accelerate electrification), which should not dominate at the introductory stage. Moreover, the lack of a structured literature review and insufficient positioning within the existing body of research limit the scholarly depth of the section.

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Research Methodology

The methodology is simple and transparent: cross-sectional data from 28 countries were analyzed using Pearson correlation. A strength is the explicit identification of data sources and acknowledgment of limitations inherent in the study design. The use of actual fleet composition data represents a solid methodological element. However, the approach has significant limitations. The analysis is purely correlational and does not control for confounding variables (e.g., GDP, energy mix, emission structure, urbanization). There is no multivariate modeling, multiple regression, or quasi-experimental design that could support even limited causal inference. Additionally, combining data from different years (2023 and 2024) is reasonable but would require a more formal justification. While suitable for exploratory analysis, the methodology is insufficient to support strong policy-oriented conclusions.

Presentation of Results

The results are presented clearly, with the use of maps and a correlation plot. The descriptive narrative is readable and logically structured. The author appropriately interprets the moderate strength of the relationship and highlights regional differences across Europe. However, the presentation remains more descriptive than analytical. The absence of numerical tables, confidence intervals, sensitivity analyses, or alternative model testing weakens the rigor of the results section. In the discussion, the boundary between results and interpretation becomes blurred—extended systemic interpretations are not directly supported by additional quantitative analyses. From a scientific standpoint, the results section should be more concise and clearly separated from interpretive discussion.

Conclusions

The conclusions are logically linked to the presented findings, particularly in emphasizing the moderate correlation and the multifactorial nature of air pollution. It is commendable that the author explicitly acknowledges the study's limitations and formulates some conclusions cautiously. However, parts of the final interpretation extend beyond the empirical evidence. Statements regarding the necessity of specific policy actions or systemic transitions are normative and not directly derived from the applied methodology. The conclusions carry a somewhat essayistic and publicistic tone rather than a strictly analytical one. From a scientific perspective, they should be shortened, limited to implications supported by correlational analysis, and more clearly separated from policy-oriented reflections.

Overall Assessment

The article addresses an important and timely research problem, and its strengths include the use of real-world fleet data and a clear narrative structure. Nevertheless, the work is more exploratory than analytical. The main limitations concern the methodology (lack of multivariate analysis), structure (blurring of results and interpretation), and occasional normative tone. **In its current form, the paper can be considered an interesting preliminary analysis or scholarly commentary.**

Declarations

Potential competing interests: No potential competing interests to declare.