

Research brief

Fuel switching and energy stacking in low-income households in South Africa: A review with recommendations for household air pollution exposure research

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<https://doi.org/10.17159/caj/2024/34/1.18555>

Household air pollution (HAP) caused by domestic burning practices for cooking was linked to almost nine thousand deaths in South Africa in 2012 (Roomaney et al., 2022). Domestic burning, as practised by millions of South African low-income households, proves complex and multi-faceted. Fuel use practices are made up of various fuel stacking and switching habits for cooking, heating and lighting (DoE 2012, Shupler et al., 2019). The levels of HAP and related health impacts vary based on factors such as fuel type, duration of use, and combinations of fuels used to meet energy needs. In scenarios where direct HAP measurements are unavailable, detailed information from field surveys on household fuel use patterns can serve as a proxy for HAP exposure, the accuracy of which depends on the quality and extent of the information gathered during the field surveys.

This Research Brief summarises the findings of the review study *Fuel switching and energy stacking in low-income households in South Africa: A review with recommendations for household air pollution exposure research*, which emphasises that when more detailed information is gathered through surveys about fuel use patterns, our understanding of associated HAP exposure improves (Wernecke et al., 2024). Based on the findings of a thorough review study, the paper put forward recommendations for improved questionnaire design for optimized data collection and improved exposure HAP proxy development without physical HAP measurements. These recommendations can be grouped into the following overarching themes:

- Context-specific data collection: Tailor data collection to reflect the specific spatial and temporal contexts of the surveyed households.
- Longitudinal and comprehensive analysis: Include analyses of all fuel types used within households, not just the primary fuels.
- Economic and behavioural factors: Consider the economic dynamics and behavioural factors influencing fuel use, including access to and availability of various fuels.
- Integration of cultural and sensory factors: Incorporate aspects of cultural preferences, perceptions, and demographics to understand fuel choice motivations.

Adopting these recommendations would lead to more effective interventions and policies aimed at reducing HAP and improving health outcomes in vulnerable populations. The study ultimately calls for an integrated approach that combines quantitative and qualitative data to provide a more comprehensive understanding of the impact of fuel use on air quality and health. While this study focused on South African households, the findings and recommendations are applicable to similar contexts globally, particularly in regions where low-income communities face similar HAP and health challenges.

References

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