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Interventions in LICs and LMICs to improve air quality and/or mitigate its impacts - Summary[1]

This summary is based on a rapid review that surveyed evidence on air quality interventions in low-income (LICs) and lower-middle-income (LMICs) to improve air quality and/or mitigate its impacts. **The review found limited evidence derived from such countries and instead draws on evidence from reviews and compilations compiled by bodies such as Public Health England (PHE) and the World Health Organization (WHO).** In particular, the review draws heavily on two key sources of information; a review commissioned by the Department for Health and Social Care (DHSC) to review the evidence for practical interventions to reduce harm from outdoor air pollution and WHO guidance on interventions to address indoor and outdoor air pollution.

The evidence base for what works where and why is limited, inconsistent, and requires further assessment. This is particularly the case when trying to identify interventions that are focused on children under 5 years old – indeed, such interventions are often embedded within broader air quality management efforts. Interventions can have co-benefits, e.g. encouraging more active travel or addressing sources of inequality; or unintended consequences, e.g. disproportionately impacting upon socially disadvantaged groups; or rebound effects, e.g. reduction in expected gains due to behavioural or system responses. These considerations entail the need for long term monitoring of interventions using a broad range of outcome measures.

There is a particular paucity of evidence on interventions to improve air quality and mitigate its impact on human health in LMICs. There exists a need for more research in the intervention space in LMICs which integrates research and evaluation into projects and programmes.

It is broadly acknowledged that cooperation across sectors and at different levels – city, regional, and national – is crucial to effectively address air pollution. According to the WHO, policies and investments supporting cleaner transport and power generation, as well as energy-efficient housing and municipal waste management, can reduce key sources of outdoor air pollution. These interventions not only improve health but also reduce climate pollutants and serve as a catalyst for local economic development and the promotion of healthy lifestyles.

Within government ministries, air pollution cuts across environment, health, social welfare, energy, finance, and regulatory sectors. It also needs to be addressed across the public, private, and civil society sectors and requires harmonised approaches to address the multitude of forces that cause air pollution – from consumer behaviour patterns to organisational and regulatory actions (Rees, 2016). This, in turn, requires more institutional capacity and coordination, as well as resources for programming. It will require working in a more integrated and effective manner, in line with the 2030 Agenda for Sustainable Development.

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[1] Avis, W. & Bartington, S. (2020). *Interventions in LICs and LMICs to improve air quality and/or mitigate its impacts*. K4D Helpdesk Report 777. Brighton, UK: Institute of Development Studies. Retrieved from https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/15691

In the UK, PHE (2019), conducted an evidence review of interventions to improve outdoor air quality and public health, suggesting that a systems or model approach may provide a means to develop a hierarchy of measures to address air pollution. The hierarchy provides a way of prioritising interventions to address air pollution problems, from the polluting activities, to the environment, to the people who are exposed to the pollution.

- **Prevention**: Prevention applies to emissions of pollutants rather than activities. The global shift to clean growth and development of clean energy and innovative technologies offers future economic opportunities.
- **Mitigation**: If emissions cannot be fully eliminated, one should consider how environmental pollution could be reduced. Examples are keeping sources of pollution away from people, redesigning spaces to introduce barriers to separate people from pollution, and displacing pollutant emissions outside hotspots and populated areas to reduce population exposure.
- **Avoidance**: If environmental pollution cannot be reduced or displaced, the last step is to consider how people can avoid exposure, setting out interventions to support exposure reduction (such as using travel plans based on less polluted routes).

An array of interventions have been identified and clustered around seven areas. It is important to note that these interventions require further interrogation and an appraisal of the context in which they may be implemented. Issues surrounding the uptake of clean cookstoves highlights that whilst interventions may have a beneficial impact on air quality, matters such as perception awareness and socio-cultural proclivities may hinder uptake. Intervention areas include:

- **Cities**: Energy-efficient transport, healthy urban planning, healthy urban diets, slum upgrading, healthy energy-efficient housing, and improved urban waste management.
- **Transport**: Public transport, active travel (walking and cycling), land use and built environment, vehicle technologies, and fuel technologies.
- **Housing**: Switching to cleaner fuel sources and household design.
- **Industry**: Improved brick kilns and coke ovens, control of fugitive emissions.
- **Power generation**: Switching from fossil fuels to renewables and preplacing or supplementing diesel generators.
- **Agriculture**: Alternating irrigation, improved manure management, reduced open burning, and moving towards plant-based diets.
- **Regulation**: Improved regulatory mechanisms and legislative processes, improvements in achieving clean air policy implementation and compliance.

It is important to note that single interventions are unlikely to have a significant impact on long-term air pollution trends, but a set of well-designed and implemented interventions can reap benefits. The effectiveness of various intervention components depends on local geography and meteorology, as well as on environmental, social and political situations and behavioural responses. Because each location is unique, similar interventions may not result in consistent effects across cities or regions. Each intervention project is unique and should be evaluated individually. Particular attention should be given to socio-economic and health inequalities, as deprived communities are susceptible to the adverse effect of air pollution.

References

Rees, N. (2016). *Clean the air for children: The impact of air pollution on children*. New York, NY: UNICEF. Retrieved from https://www.unicef.org/publications/files/UNICEF_Clear_the_Air_for_Children_30_Oct_2016.pdf

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