



Clean household air for the Americas

OPEN ACCESS

We should be aiming to eliminate polluting cooking fuels from the PAHO region

Agnes Soares da Silva *environmental epidemiology adviser*¹, Kirk R Smith *professor*²

¹Pan American Health Organization (PAHO), Washington DC, USA; ²School of Public Health, University of California Berkeley, California, USA

Elimination of disease is a fundamental aspiration of public health, and the Americas have a remarkable history of success. The Pan American Health Organization (PAHO) region was the first WHO region to eliminate smallpox (1971), polio (1994), rubella and congenital rubella syndrome (2015), and measles (2016). It is now on the way to eliminating malaria¹ and interrupting the transmission of eight neglected infectious diseases.²

Partly because of these successes, most ill health in the region now comes from non-communicable diseases. As non-communicable diseases cannot be eliminated directly, their control depends mainly on reducing risk factors. Building on its record with elimination of diseases, PAHO could also become the first region to eliminate a major risk factor for disease: household air pollution.³

Exposure to household air pollution is greatest in poor countries, particularly among their poorest citizens. Globally, some 3–4 million premature deaths a year are attributed to exposure to smoke from biomass and coal used in household cooking.⁴ Additional burden derives from the portion of ambient pollution that is caused by these household fuels. About 80 million people in the Americas, just 8% of the population, rely on these cooking fuels, so a commitment to reduce their use substantially among the poor populations at highest risk seems manageable.

In five countries in the PAHO region, more than 30% of the population uses household solid fuels (Haiti, Guatemala, Nicaragua, Honduras, and Paraguay). One third of the total exposed population lives in Mexico and Peru. Another 11% live in Brazil despite successful measures to reduce use of biomass cooking fuels to less than 5% of the population through promotion of liquefied petroleum gas.⁵ Overall, in 14 out of the 35 countries in the region 10% or more of the population still use polluting cooking fuels.⁴

Exposure to household air pollution is a major avoidable health hazard that increases the risk of acute lower respiratory infections in children and risk of chronic obstructive pulmonary disease, lung cancer, cataracts, ischaemic heart disease, and stroke in adults.^{6–8} The contribution of household air pollution

to these diseases leads to an estimated loss of 2.3 million disability adjusted life years every year in the PAHO region, along with 82 000 premature deaths.⁴ The age standardised mortality rate attributed to household air pollution varies widely among countries and contributes substantially to the large and avoidable health inequities within the region, particularly affecting rural areas.

Targeted action works

Household air pollution is a poverty problem that can be overcome by political will and modest investment. It is a health risk that has already been eliminated in all developed countries and has been recently reduced in developing countries where concerted efforts have been made. Brazil, Bolivia, Peru, El Salvador, and Ecuador are a few of the countries in the region that have made great progress promoting clean fuels, even to the most vulnerable population groups.⁵ Even greater success is being achieved in India, Indonesia, and China.^{9–11} Several African countries, including Ghana, Cameroon, and Kenya are also introducing programmes.¹² Without government intervention, clean household fuels are adopted only slowly as countries develop, but there is plenty of evidence that the transition can be accelerated by intelligent policies, such as the targeted subsidies in Brazil and India.

The inequities that operate within countries in the PAHO region are reflected by similar inequities among countries. The poorest countries, particularly Haiti and those in Central America, will require international help to cut household air pollution. In others, however, a targeted realignment of resources within countries should be sufficient. India embarked on its massive programme to promote clean fuel when the country's income was comparable to Bolivia's, the fifth poorest country in the PAHO region. India's policy makers understand that expenditure on household air pollution is a social investment not a subsidy: the whole of society benefits by improving the health and productivity of the most disadvantaged groups.⁹

Total eradication—the complete elimination of the risk—is probably not practical, but an aspirational target of 98% of households primarily using clean cooking methods might be.

Like other elimination objectives on PAHO's list, the last mile is difficult but still achievable. Provision of clean household cooking is already enshrined in goal 7 of the sustainable development goals (SDGs).¹³ Leadership from the health sector is now required to focus other relevant sectors (including energy, housing, and development) on this important health objective. Adding household air pollution to PAHO's elimination list would engage the health sector directly, facilitating, accelerating, and monitoring progress towards the SDGs.

A reasonable definition of public health is to find ways to make people healthy before they are wealthy, and to keep them that way. Accelerating the household energy transition needed to clean up household environments for good is one important way to achieve this.

Competing interests: We have read and understood BMJ policy on declaration of interests and have no relevant interests to declare. The authors are responsible for the views expressed, which do not necessarily represent the decisions or policies of PAHO.

Provenance and peer review: Commissioned; not externally peer reviewed.

- 1 Pan American Health Organization. Plan of action for malaria elimination 2016-2020: Midterm review. (Document CD56/INF22). 2018. https://www.paho.org/hq/index.php?option=com_docman&task=doc_download&gid=45937&Itemid=270&lang=en
- 2 Pan American Health Organization. Plan of action for the elimination of neglected infectious diseases and post-elimination actions 2016-2022. (Document CD55/15). 2018. <https://www.paho.org/hq/dmdocuments/2016/CD55-15-e.pdf>
- 3 Pan American Health Organization. Workshop report: toward the elimination of the use of solid fuels and kerosene in urban homes in the Americas, 11-14 Sep 2018, Mexico City, Mexico. Executive summary. https://www.paho.org/hq/index.php?option=com_

- 4 World Health Organization. Global Health Observatory (GHO) data. Mortality from household air pollution: situation and trends. Nov 2018. https://www.who.int/gho/phe/indoor_air_pollution/burden/en/
- 5 Coelho ST, Sanches-Pereira A, Tudeschini LG, Goldemberg J. The energy transition history of fuelwood replacement for liquefied petroleum gas in Brazilian households from 1920 to 2016. *Energy Policy* 2018;123:41-52. [10.1016/j.enpol.2018.08.041](https://doi.org/10.1016/j.enpol.2018.08.041).
- 6 Balakrishnan K, Ghosh S, Ganguli B, et al. State and national household concentrations of PM_{2.5} from solid cookfuel use: results from measurements and modeling in India for estimation of the global burden of disease. *Environ Health* 2013;12:77. [10.1186/1476-069X-12-77](https://doi.org/10.1186/1476-069X-12-77)
- 7 Burnett RT, Pope CA3rd, Ezzati M, et al. An integrated risk function for estimating the global burden of disease attributable to ambient fine particulate matter exposure. *Environ Health Perspect* 2014;122:397-403. [10.1289/ehp.1307049](https://doi.org/10.1289/ehp.1307049)
- 8 Smith KR, Bruce N, Balakrishnan K, et al. HAP CRA Risk Expert Group. Millions dead: how do we know and what does it mean? Methods used in the comparative risk assessment of household air pollution. *Annu Rev Public Health* 2014;35:185-206. [10.1146/annurev-publhealth-032013-182356](https://doi.org/10.1146/annurev-publhealth-032013-182356)
- 9 Smith KR, Pradhan Mantri Ujjwala Yojana: Transformation of Subsidy to Social Investment in India. In: Debroy B, Ganguli A, Desai K, eds. *Making of New India: transformation under Modi government*. Dr Syama Prasad Mookerjee Research Foundation and Wisdom Tree, 2018: 401-10.
- 10 Thoday K, Benjamin P, Gan M, Puzzolo E. The mega conversion program from kerosene to LPG in Indonesia: lessons learned and recommendations for future clean cooking energy expansion. *Energy Sustain Dev* 2018;46:71-81. [10.1016/j.esd.2018.05.011](https://doi.org/10.1016/j.esd.2018.05.011)
- 11 Zhao B, Zheng H, Wang S, et al. Change in household fuels dominates the decrease in PM_{2.5} exposure and premature mortality in China in 2005-2015. *Proc Natl Acad Sci U S A* 2018;115:12401-6. [10.1073/pnas.1812955115](https://doi.org/10.1073/pnas.1812955115)
- 12 Van Leeuwen R, Evan E, Hyseni B. *Increasing the use of LPG in developing counties, #74 Live Wire*. World Bank Group, 2017.
- 13 United Nations Department of Economic and Social Affairs. Sustainable development goals. <https://unstats.un.org/sdgs/metadata/files/Metadata-07-01-02.pdf>

Published by the BMJ Publishing Group Limited. For permission to use (where not already granted under a licence) please go to <http://group.bmj.com/group/rights-licensing/permissions>. This is an Open Access article distributed under the terms of the Creative Commons Attribution IGO License (<https://creativecommons.org/licenses/by-nc/3.0/igo/>), which permits use, distribution, and reproduction for non-commercial purposes in any medium, provided the original work is properly cited.