

Air pollution and child health: What can health care professionals do?



Air pollution is a major environmental health threat. Recent data released by the World Health Organization (WHO) revealed that air pollution has a vast and terrible impact on child health and survival. Globally, 93% of all children live in environments with air pollution levels above the WHO guidelines. More than one in every four deaths of children under 5 years is directly

or indirectly related to environmental risks. Both ambient air pollution (AAP) and household air pollution (HAP) contribute to respiratory tract infections that resulted in 543 000 deaths in children under 5 years in 2016. Ambient air pollution (AAP) alone imposes enormous costs on the global economy, amounting to more than US\$5 trillion in total welfare losses in 2013.¹

In addition, the WHO reports that although air pollution is a global problem, the burden of disease attributable to particulate matter in air is heaviest in low- and middle-income countries (LMICs), particularly in the WHO African, South-East Asia, Eastern Mediterranean and Western Pacific regions. LMICs in these regions – especially the African region – have the highest levels of exposure to HAP due to the widespread use of polluting fuels and technologies for basic daily needs, such as cooking, heating and lighting.² Poverty is correlated with high exposure to environmental health risks and can also compound the damaging health effects of air pollution, by limiting access to information, treatment and other health care resources. The sources of pollution differ in urban and rural contexts,³ the main sources in urban settings being fossil fuel combustion for energy production, transport, residential cooking and heating (household fuel use) and waste incineration.⁴

So what are the effects of pollution on children's health? There is a wealth of evidence that links air pollution to a number of health problems in children. The list is not exhaustive but identifies the following conditions in children⁵:

- a. Adverse birth outcomes:** Growing evidence that maternal exposure especially to fine particulate matter (PM) increases the risk of preterm birth and low birth weight.
- b. Childhood obesity:** Positive associations between exposure to air pollution in utero and postnatal weight gain or attained body mass index (BMI) for age, and an association between traffic-related air pollution and insulin resistance in children.
- c. Acute lower respiratory infection:** Exposure to air pollutants such as PM_{2.5}, nitrogen dioxide (NO₂) and ozone (O₃) is

associated with pneumonia and other respiratory infections in young children.

- d. Asthma:** Substantial evidence exists that exposure to AAP increases the risk of children for developing asthma and that breathing pollutants exacerbates childhood asthma as well.
- e. Otitis media:** Clear, consistent evidence of an association between AAP exposure and occurrence of otitis media in children.
- f. Childhood cancers:** Substantial evidence that exposure to traffic-related air pollution is associated with increased risk of childhood leukaemia.

WHO therefore recommends the following actions by health care professionals in the management of childhood exposure to air pollution: be informed; recognise exposure and related health conditions; research, publish and disseminate knowledge; prescribe solutions and educate families and communities; educate colleagues and students; advocate solutions to other sectors and policy- and decision-makers.⁵ These may be difficult for health care professionals to accomplish without political and industry support in reducing air pollution. However, if nothing is done, the children will continue to be exposed to air pollution and suffer from the various health conditions, which will have a direct effect on the burden of disease in the paediatric population. This is a call to action to stem the impact of air pollution on our children's health. It will, in part, involve informing parents and guardians on alternative options to the widespread use of polluting fuels and technologies for basic daily needs, such as cooking, heating and lighting. Advanced biomass cook stoves (ACS) and clean renewable cooking alternatives such as biogas, solar and liquid biofuels are now available in Africa and should be up-scaled to replace conventional coal as the main source for cooking, heating and lighting.

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References:

1. WHO. Air pollution and child health: prescribing clean air. WHO reference number: WHO/CED/PHE/18.01. [Accessed 21 Nov 2018]. Available from: <http://www.who.int/ceh/publications/air-pollution-child-health/en/>
2. Barone-Adesi F, Dent JE, Dajnak D, Beevers S, Anderson HR, Kelly FJ, et al. Long term exposure to primary traffic pollutants and lung function in children: cross-sectional study and meta-analysis. *PLoS One*. 2015;10(11):e0142565.
3. Landrigan PJ, Sly JL, Ruchirawat M, Silva ER, Huo X, Diaz-Barriga F, et al. Health consequences of environmental exposures: changing global patterns of exposure and disease. *Ann Global Health*. 2016;82(1):10.
4. WHO. Burning opportunity: clean household energy for health, sustainable development, and wellbeing of women and children. Geneva: World Health Organization; 2016 [accessed 21 Nov 2018]. Available from: <http://www.who.int/iris/handle/10665/204717>
5. WHO Report. Air Pollution and Child Health: Prescribing Clean Air. Executive summary – Children's exposure to air pollution. WHO 2018 [accessed 21 Nov 2018]:9-20. Available from: http://www.who.int/ceh/publications/Advance-copy-Oct24_18150_Air-Pollution-and-Child-Health-merged-compressed.pdf?ua=1