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Improving handwashing habits and household air quality in Africa after COVID-19



Handwashing with soap under running water is a key intervention for preventing the spread of COVID-19. However, in Africa, before the COVID-19 pandemic, this simple and effective intervention for preventing sanitation-related diseases such as cholera, diarrhoea, dysentery, typhoid, and soil-transmitted helminth infections was not practised by many people, especially in communities in rural areas and low-income urban settlements. Only 15% of the population in sub-Saharan Africa have access to basic handwashing facilities with soap and water.¹ In urban areas, less than a quarter (24%) of the population have access to handwashing facilities.¹ Prevalence of handwashing in sub-Saharan Africa after exposure to excreta has been estimated at 14%.²

Fortunately, since the outbreak of COVID-19, the handwashing practices of the African population have improved tremendously, with access to handwashing stations noticeably increasing in community centres, schools, markets, bus terminals, lorry stations, and other public spaces in rural and urban areas of African countries. After the COVID-19 pandemic, it is important that these gains are sustained to help reduce sanitation-related diseases, which contribute substantially to disease morbidity and mortality in African countries. In 2016, the number of diarrhoea deaths in sub-Saharan Africa attributed to unsafe drinking water (259 073 deaths), poor sanitation (236 134 deaths), and lack of handwashing facilities (851 666 deaths) was the highest of all the low-income and middle-income regions of the world.³ Poor sanitation also exacerbates stunting and threatens child survival. Of the number of stunted children globally, about 39% are found in Africa.⁴ When stunting is addressed, 45% of child deaths would be averted.⁵

Some African governments, as part of their COVID-19 response plans, took urgent steps to make clean water accessible to all communities by drilling boreholes and mobilising water tankers to supply water. African governments should find the fiscal space to sustain these initiatives after the COVID-19 pandemic to maintain the handwashing practices and to improve and protect public health. Local governments and community groups should also continue with the

practice of distributing handwashing facilities (eg, veronica buckets and soap) to communities for mounting in public places. Local governments and community groups could look to development partners for support. Sustained public education through mass media, community health workers, and school health programmes should also be pursued to further develop handwashing practices after the COVID-19 pandemic. In line with this recommendation, governments should consider establishing national handwashing campaigns for sustained promotion of handwashing.

Access to clean cooking also has a great potential for preventing spread and minimising severity of COVID-19 in Africa. About 80% of the population of sub-Saharan Africa, mostly in rural areas and low-income urban settlements, use solid fuels for cooking and heating.⁶ Women and adolescent members of the household often leave their homes on a daily basis to fetch these fuels thereby defying stay-at-home orders and enabling the spread of COVID-19. Also, solid fuels are typically burnt in open fires and inefficient traditional cookstoves and in poorly ventilated cooking spaces resulting in the release of high amounts of particulate matter, carbon monoxide, and other combustion by-products that pollutes the household. Exposure to household air pollution is associated with reduced lung function and increased the risk of respiratory illnesses,^{7,8} and could exacerbate the severity of COVID-19. There is some evidence linking air pollution exposure to COVID-19 deaths in the USA⁹ and northern Italy.¹⁰

Implementing clean cooking solutions (eg, supplying liquefied petroleum gas and distributing improved cookstoves with high combustion efficiencies) must therefore be part of COVID-19 response plans by African governments. After the pandemic, African governments should continue to invest in clean cooking solutions to help reduce diseases related to household air pollution, including acute lower respiratory infections, asthma and stunting among children, chronic obstructive pulmonary disease, chronic bronchitis and lung cancer among adults, and adverse birth outcomes among women.

In conclusion, the COVID-19 pandemic will leave a legacy of improved handwashing habits in many African

communities and provide many compelling reasons to address household air pollution. Governments should find the fiscal space to sustain the gains in handwashing practices and to invest in clean cooking solutions that help reduce diseases associated with poor sanitation and household air pollution, which will contribute to the achievement of Sustainable Development Goals 6 and 7.

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- 1 UNICEF. Progress on drinking water, sanitation and hygiene: 2017 update and SDG baselines. July 2017. https://www.unicef.org/publications/index_96611.html (accessed May 20, 2020).
- 2 Prüss-Ustün A, Bartram J, Clasen T, et al. Burden of disease from inadequate water, sanitation and hygiene in low- and middle-income settings: a retrospective analysis of data from 145 countries. *Trop Med Int Health* 2014; **19**: 894–905.
- 3 Prüss-Ustün A, Wolf J, Bartram J, et al. Burden of disease from inadequate water, sanitation and hygiene for selected adverse health outcomes: an updated analysis with a focus on low- and middle-income countries. *Int J Hyg Environ Health* 2019; **222**: 765–77.
- 4 WHO. Levels and trends in child malnutrition: UNICEF, WHO, World Bank group joint child malnutrition estimates. May 2018. <https://www.who.int/nutgrowthdb/2018-jme-brochure.pdf?ua=1> (accessed May 20, 2020).
- 5 Leroy JL, Frongillo EA. What does stunting really mean? A critical review of the evidence. *Adv Nutr* 2019; **10**: 196–204.
- 6 Bonjour S, Adair-Rohani H, Wolf J, et al. Solid fuel use for household cooking: country and regional estimates for 1980–2010. *Environ Health Perspect* 2013; **121**: 784–90.
- 7 Po JY, FitzGerald JM, Carlsten C. Respiratory disease associated with solid biomass fuel exposure in rural women and children: systematic review and meta-analysis. *Thorax* 2011; **66**: 232–39.
- 8 Kurmi OP, Sathra CS, Ayres JG, Sathra SS. Tuberculosis risk from exposure to solid fuel smoke: a systematic review and meta-analysis. *J Epidemiol Community Health* 2014; **68**: 1112–18.
- 9 W Xiao, Nethery RC, Sabath BM, Braun D, Dominici F. Exposure to air pollution and COVID-19 mortality in the United States. *medRxiv* 2020; published online April 27. <https://www.medrxiv.org/content/10.1101/2020.04.05.20054502v2> (preprint).
- 10 Conticini E, Frediani B, Caro D. Can atmospheric pollution be considered a co-factor in extremely high level of SARS-CoV-2 lethality in Northern Italy? *Environ Pollut* 2020; **261**: 114465.