



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

## COVID-19's lost generation of unvaccinated children

In their modelling study, Kaja Abbas and colleagues (October, 2020)<sup>1</sup> state that routine childhood immunisation is “at risk of suspension” and “should be sustained in Africa as much as possible... during the COVID-19 pandemic”. It is now more than 6 months since the paper was first posted as a working paper, approximating the 6-month COVID-19 risk period modelled by the authors. We now know that immunisation programmes in Africa (and beyond) were severely disrupted.<sup>2</sup>

The authors' two scenarios show how uncertain our understanding is of the pandemic's indirect health effects on immunisation services. The deaths due to the disruption of routine immunisation were estimated to be between 25 584 ( $[194\,388 + 10\,282] \times 12.5\%$ ) in the low-impact scenario and 701 828 in the high-impact scenario. That is a 27-times difference, driven exclusively by whether catch-up activities occur.

Countries with electronic immunisation registries can provide insights into how many children who missed out during lockdowns are eventually vaccinated.<sup>3</sup> For example, in Pakistan's Sindh province with a population of 48 million, of 424 371 children who missed vaccinations during the lockdown (March 23 to May 9, 2020), 62% were vaccinated by September. The catch-up vaccinations used the defaulter lists from the electronic immunisation registry to trace and vaccinate the children. However, although the programme is successfully tracing and vaccinating some of the missed children, the data from Pakistan show a continuously expanding pool of missed children since the lockdown period. Most African countries do not have electronic immunisation registries,<sup>4</sup> so the numbers of children who were unvaccinated because of the pandemic

and who die prematurely will remain unknown.

We applaud Abbas and colleagues<sup>1</sup> for taking a benefit-risk approach that compares health benefits to COVID-19 mortality risk. There is a need for more modelling efforts that look at both sides of the equation instead of reporting separate sets of estimates that are of little use to policymakers and programme managers. It is crucial that modellers revisit the assumptions in their papers in light of new evidence about the effects of the virus, compliance with policy measures, and the indirect health effects. Failure to do so might mean that inaccurate or misleading estimates continue to circulate. However, until large household surveys are done, estimation of the full extent of the COVID-19 impact on childhood immunisation will continue to be a stab in the dark. Our inability to generate a realistic estimate of the number of missed children will lead to suboptimal planning and implementation of catch-up efforts, leaving behind a generation of under-immunised and zero-dose children.

We declare no competing interests.

Copyright © 2021 The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY-NC-ND 4.0 license.

\**Damian Walker, Subhash Chandir*  
damiangwalker@gmail.com

Center for Global Development,  
Washington DC 20036, USA (DW); Maternal  
and Child Health Program, IRD Global, Baltimore,  
MD, USA (SC)

- 1 Abbas K, Procter SR, van Zandvoort K, et al. Routine childhood immunisation during the COVID-19 pandemic in Africa: a benefit-risk analysis of health benefits versus excess risk of SARS-CoV-2 infection. *Lancet Glob Health* 2020; **8**: e1264–72.
- 2 WHO. Pulse survey on continuity of essential health services during the COVID-19 pandemic: interim report, 27 August 2020. [https://www.who.int/publications/i/item/WHO-2019-nCoV-EHS\\_continuity-survey-2020.1](https://www.who.int/publications/i/item/WHO-2019-nCoV-EHS_continuity-survey-2020.1) (accessed Oct 22, 2020).
- 3 Chandir S, Siddiqi DA, Setayesh H, Khan AJ. Impact of COVID-19 lockdown on routine immunisation in Karachi, Pakistan. *Lancet Glob Health* 2020; **8**: e1118–20.
- 4 Namageyo-Funa A, Samuel A, Boland P, Macneil A. Considerations for the development and implementation of electronic immunization registries in Africa. *Pan Afr Med J* 2018; **30**: 81.



Published Online  
January 6, 2021  
[https://doi.org/10.1016/S2214-109X\(20\)30535-0](https://doi.org/10.1016/S2214-109X(20)30535-0)