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Shifting gender barriers in immunisation in the COVID-19 pandemic response and beyond

2 years into the COVID-19 pandemic, gender remains marginalised in the global vaccine response. As a stark example, of the 157 countries that reported on COVID-19 vaccine coverage to WHO in April, 2022, only 21 (13%) provided sex-disaggregated data.

Before the COVID-19 pandemic, gender-related vaccine coverage challenges affected child populations with low and zero vaccine coverage.1 Similarly, women were less likely than men to receive relevant or trustworthy vaccine information because of literacy, education, and digital gaps. Women were also less likely to get vaccinated because of work and domestic care obligations. Compared with men, women had less trust in vaccines, were less able to make health-care decisions because of limited household decision-making power, and had greater difficulty reaching vaccination sites because of limited mobility.2

During the pandemic, concerns about potential side-effects, disinformation and misinformation, overall declines in health-seeking behaviour, and confusing messaging compounded these barriers for women.

In Ghana, an analysis of vaccine rollout data by the Greater Accra Regional Health Directorate (unpublished) showed that childcare and informal sector work duties prevented women from travelling to fixed-site vaccination centres, whereas women in the formal workforce could access staff vaccination programmes. This disparity led to a new community-based strategy to bring vaccines to where women work and live to increase coverage.

In India, a progressive digital-first approach to vaccine roll-outs was used; had this approach been augmented by an analysis of the country’s gendered digital divide in terms of technological literacy, access, and usage,3 a more inclusive delivery campaign to reach women could have been delivered.

It is possible to change the status quo. First, sex-disaggregated data must be made non-negotiable. This requires making disaggregated data collection mandatory and supporting the development of necessary capacity and resources for compliance and cooperation.

Second, we must stop waiting for change, which has still not happened decades after the adoption of requirements for gender-disaggregated data by the Convention on the Elimination of All Forms of Discrimination Against Women and the World Health Assembly. International agencies and governments must support an effective push-and-pull strategy that requires countries to report sex-disaggregated and gender-disaggregated data and provide support to meet this requirement.

Finally, women-led and girls-led groups must be included in programme development and design. Acting upon their knowledge of community needs, these groups can be empowered with data to drive experience-informed and evidence-informed change.4 The UN-endorsed WHO checklist for tackling gender-related barriers to equitable COVID-19 vaccine deployment gives step-by-step guidance on this. The example from Ghana shows how a process of community participation can inform planning and day-to-day operations in vaccine delivery.

Given the billions of dollars spent on COVID-19, we must emerge from the pandemic with a robust data system that allows for real-time collection and the use of sex-disaggregated and other disaggregated data for pandemic response and beyond.

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1 Wendt A, Santos TM, Cata-Preta RIO, et al. Children of more empowered women are less likely to be left without vaccination in low- and middle-income countries: a global analysis of 50 DHS surveys. J Glob Health 2022; 12: 04022.

2 Flor LS, Friedman J, Spencer CN, et al. Quantifying the effects of the COVID-19 pandemic on gender equality on health, social, and economic indicators: a comprehensive review of data from March, 2020, to September, 2021. Lancet 2022; published online March 2. https://doi.org/10.1016/ S0140-6736(22)00088-3.

3 Johri M, Aganwal S, Khullar A, et al. The first 100 days: how has COVID-19 affected poor and vulnerable groups in India? Health Promot Int 2021; 36: 1276–26.

4 Schwalbe N, Crowley S, Lehtimaki S, Alloety, P. Deaths from COVID-19 could be the tip of the iceberg. 2020. https://blogs.bmj.com/ bnj/2020/05/20/deaths-from-covid-19-could-be-the-tip-of-the-iceberg/ (accessed June 1, 2022).