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COVID-19 and maternal and perinatal outcomes

We commend Barbara Chmielewska and colleagues¹ for undertaking a timely and comprehensive systematic review on a topic of pivotal global health importance. The increase in maternal mortality and stillbirths during the COVID-19 pandemic, particularly in low-resource settings, is of considerable concern. Although a substantial number of studies were collated, many have a substantial risk of bias. For example, of the 18 included studies assessing the link between the pandemic and preterm birth, only two had a quasi-experimental design, many did not have detailed methods, few adjusted for potential confounding factors, and only three included population-level data. Only one study accounted for time trends in preterm birth,² which is important to ensure that any changes during the pandemic are independent of underlying temporal patterns. Of the 18 studies, that study also had the largest sample size and the maximum Newcastle-Ottawa score, indicating a high quality. Because systematic

reviews serve an important role in summarising the best available evidence, it is remarkable that the meta-analysis by Chmielewska and colleagues excluded this study. Using inverse-variance rather than Mantel-Haenszel weighting allows for its inclusion,³ with little effect on the association between the COVID-19 pandemic and preterm birth (odds ratio [OR] 0.90; 95% CI 0.83–0.98; 13 studies; n=1 919 726 [figure] compared with 0.91; 0.84–0.99; 12 studies; n=852 854).¹

A thorough assessment of how the COVID-19 pandemic and lockdowns have affected maternal and perinatal outcomes is crucial and has important public health implications. Accordingly, more robust studies are needed that are based on high-quality longitudinal data. Ideally, population-level data should be used, because the pandemic probably influenced health-seeking behaviours and access to maternity care, leading to potential ascertainment bias if institutional-level data are relied on.⁴ Also, the inclusion of both pregnancy and neonatal data (rather than just one or the other) is important to assess any disparate effect of the pandemic on

competing events (eg, stillbirth and preterm birth). Applying appropriate quasi-experimental designs to population-level maternity and birth data, accounting for underlying temporal trends in the outcomes of interest, has the highest potential to attribute causality and reduce confounding.

Now is the time for the perinatal research community to collaboratively take advantage of the unique natural experiment provided by the COVID-19 pandemic to accelerate progress in maternal and child health globally. We call on researchers to undertake robust studies and contribute to joint international efforts such as the international Perinatal Outcomes in the Pandemic (iPOP) study.⁵ Together we can learn from experiences from the pandemic and start identifying mechanisms that might contribute to a healthier start for future generations.

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- 1 Chmielewska B, Barratt I, Townsend R, et al. Effects of the COVID-19 pandemic on maternal and perinatal outcomes: a systematic review and meta-analysis. *Lancet Glob Health* 2021; **9**: e759–72.
- 2 Been JV, Burgos Ochoa L, Bertens LCM, Schoenmakers S, Steegers EAP, Reiss IKM. Impact of COVID-19 mitigation measures on the incidence of preterm birth: a national quasi-experimental study. *Lancet Public Health* 2020; **5**: e604–11.

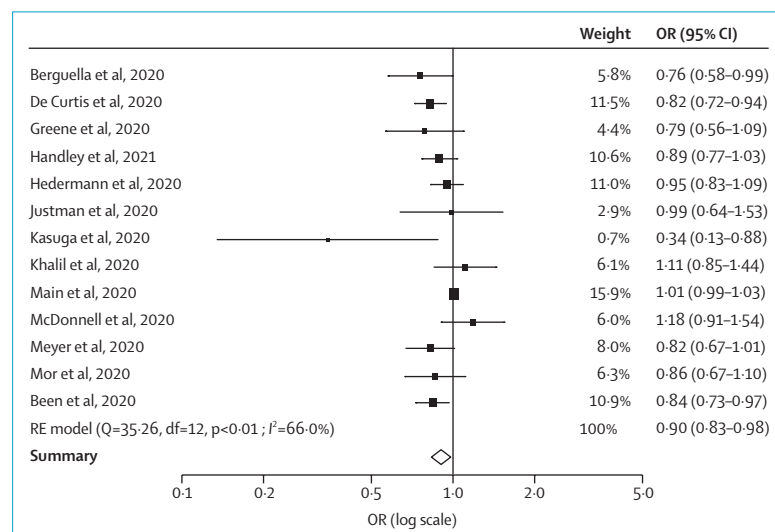


Figure: Forest plot of pooled ORs for the association between start of the COVID-19 pandemic and the incidence of preterm birth (<37 weeks gestation) within high-income countries. Results from random effects inverse-variance meta-analysis. ORs derived from Chmielewska and colleagues¹ and Been and colleagues.² df=degrees of freedom. OR=odds ratio.

- 3 Egger M, Smith GD, Altman DG. Systematic reviews in health care: meta-analysis in context. London: BMJ Books; 2001.
- 4 KC A, Gurung R, Kinney MV, et al. Effect of the COVID-19 pandemic response on intrapartum care, stillbirth, and neonatal mortality outcomes in Nepal: a prospective observational study. *Lancet Glob Health* 2020; **8**: e1273–81.
- 5 Stock SJ, Zoega H, Brockway M, et al. The international Perinatal Outcomes in the Pandemic (iPOP) study: protocol. *Wellcome Open Res* 2021; **6**: 21.