

A call for action for COVID-19 surveillance and research during pregnancy



A worldwide public health response has been engaged to address the impact of the coronavirus disease 2019 (COVID-19) pandemic. The almost exclusive emphasis on high-risk populations, including older people and people with serious underlying medical conditions, could obscure the specific risks and needs of other susceptible populations. Pregnant women are currently not recognised as a population at increased risk; however, they might still be vulnerable for not only medical but also social risks. Additionally, prenatal and delivery care provides unique opportunities to answer key questions about COVID-19, including the collection of population-based estimates of asymptomatic severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections.

During pregnancy, women experience immunological and physiological changes that might make them more susceptible to viral respiratory infections, such as influenza, and adverse pregnancy outcomes have been observed from severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS).¹ Beyond the virus-specific risks, illnesses with high fevers early in pregnancy are associated with specific birth defects, such as neural tube defects.² Few data on the effect of SARS-CoV-2 infection and COVID-19 in pregnancy are available. Published studies to date seem to be reassuring that pregnant women with COVID-19 might not be at increased risk for severe complications or adverse reproductive health outcomes. However, studies have been limited to case series and case reports and lack sufficient numbers to discern infrequent risks attributable to COVID-19 infection. Reports have also been conflicting and inconclusive as to whether vertical transmission of SARS-CoV-2 can occur.^{3,4}

Multiple strategies need to be deployed to address the knowledge gaps surrounding the effect of COVID-19 in pregnancy, including sentinel surveillance, seroprevalence surveys, and sociobehavioural and psychological research. Sentinel surveillance systems could be enhanced or implemented to improve understanding of the disease course and complications of SARS-CoV-2 infection in pregnant women and their effect on adverse pregnancy, fetal, and infant outcomes.

Leveraging existing pregnancy registries and mother-baby linked longitudinal surveillance to capture clinical and outcome information for COVID-19 could help to facilitate rapid data collection for public health action.⁵ Additionally, population-based studies could help to elucidate the risks of infection and whether risk varies by gestational age and other medical and social factors. The large global network of cohort studies launched to study Zika virus and pregnancy could be mobilised rapidly to organise such global data collection.⁶ As new COVID-19 treatments and vaccines become available, a global research network will be crucial in evaluating their use among pregnant women.

From a broader perspective, prenatal and delivery care offer a unique opportunity to collect population-based data from an asymptomatic population. These data could be particularly important for SARS-CoV-2 infections, many of which have been reported to be asymptomatic.⁷ Blood samples collected during prenatal care or at delivery can be used to generate population-based estimates of infectious disease seroprevalence. For example, population-based estimates of HIV seroprevalence are often derived from sentinel prenatal clinics.⁸ Although prenatal care might be interrupted during the pandemic and case-based surveillance of acute infections delayed or restricted, serology after circulation allows estimation of past infections and an improved understanding of the epidemiology of affected pregnancies. In addition to prenatal care, samples can be collected at delivery during the SARS-CoV-2 pandemic period. Cohort studies also allow access to stored blood samples. Control samples collected before the SARS-CoV-2 pandemic period would allow detection of previous circulation of similar viruses and potential background cross-reactivity.

Finally, the broad public health measures implemented to decelerate SARS-CoV-2 infections, such as physical distancing and travel restrictions, might help to alleviate the stress on health-care systems but have unintended consequences for women and families. Such consequences could include gender-based and family violence; reduction in preventive health-care-seeking behaviours, such as prenatal care and well-child

Published Online
April 22, 2020
[https://doi.org/10.1016/S2214-109X\(20\)30206-0](https://doi.org/10.1016/S2214-109X(20)30206-0)

visits; and an increase in post-partum depression and the exacerbation of other mental health concerns.⁹ The organisation of labour and delivery rooms dedicated to women with COVID-19 and restriction of visitors is another example of unavoidable changes that could have a psychological effect on isolated women.

Cooperation between countries is needed to address the gaps in knowledge about COVID-19 and its effect on pregnant women and their babies. Additionally, researchers must ensure transparency of reporting to guarantee the accuracy of data.¹⁰ The crucial information obtained from key surveillance and research studies will help to inform clinical recommendations and public health guidance and messages tailored to local contexts. Pregnant women and their neonates should not be ignored.

We declare no competing interests.

Copyright © 2020 The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY-NC-ND 4.0 license.

**Pierre Buekens, Jackeline Alger, Gérard Bréart, Maria Luisa Cafferata, Emily Harville, Giselle Tomasso*
pbuekens@tulane.edu

Department of Epidemiology, Tulane School of Public Health and Tropical Medicine, New Orleans, LA 70112, USA (PB, EH); Departamento de Laboratorio Clínico, Hospital Escuela and Instituto de Enfermedades Infecciosas y Parasitología Antonio Vidal, Tegucigalpa, Honduras (JA); Institut National de la Santé et de la Recherche Médicale U1153, Paris, France (GB); Paris University, Paris, France (GB); Instituto de Efectividad Clínica y Sanitaria, Buenos Aires, Argentina (MLC); and Unidad de Investigación Clínica y Epidemiológica, Montevideo, Uruguay (GT)

- 1 Rasmussen SA, Smulian JC, Lednický JA, Wen TS, Jamieson DJ. Coronavirus disease 2019 (COVID-19) and pregnancy: what obstetricians need to know. *Am J Obstet Gynecol* 2020; published online Feb 24. DOI:10.1016/j.ajog.2020.02.017.
- 2 Kerr SM, Parker SE, Mitchell AA, Tinker SC, Werler MM. Periconceptual maternal fever, folic acid intake, and the risk for neural tube defects. *Ann Epidemiol* 2017; **27**: 777–82.
- 3 Dong L, Tian J, He S, et al. Possible vertical transmission of SARS-CoV-2 from an infected mother to her newborn. *JAMA* 2020; published online March 26. DOI:10.1001/jama.2020.4621.
- 4 Zhu H, Wang L, Fang C, et al. Clinical analysis of 10 neonates born to mothers with 2019-nCoV pneumonia. *Transl Pediatr* 2020; **9**: 51–60.
- 5 Frey MT, Meaney-Delman D, Bowen V, et al. Surveillance for emerging threats to pregnant women and infants. *J Womens Health (Larchmt)* 2019; **28**: 1031–36.
- 6 Wilder-Smith A, Wei Y, Araújo TVB, et al. Understanding the relation between Zika virus infection during pregnancy and adverse fetal, infant and child outcomes: a protocol for a systematic review and individual participant data meta-analysis of longitudinal studies of pregnant women and their infants and children. *BMJ Open* 2019; **9**: e026092.
- 7 Mizumoto K, Kagaya K, Zarebski A, Chowell G. Estimating the asymptomatic proportion of coronavirus disease 2019 (COVID-19) cases on board the Diamond Princess cruise ship, Yokohama, Japan, 2020. *Euro Surveill* 2020; **25**: 2000180.
- 8 Eaton JW, Rehle TM, Jooste S, et al. Recent HIV prevalence trends among pregnant women and all women in sub-Saharan Africa: implications for HIV estimates. *AIDS* 2014; **28** (suppl 4): S507–14.
- 9 Brooks SK, Webster RK, Smith LE, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet* 2020; **395**: 912–20.
- 10 Sahu KK, Lal A, Mishra AK. COVID-19 and pregnancy: a plea for transparent reporting of all cases. *Acta Obstet Gynecol Scand* 2020; published online March 19. DOI:10.1111/aogs.13850.