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Published **Online** August 6, 2020 https://doi.org/10.1016/S0140-6736(20)31714-1

This online publication has been corrected. The corrected version first appeared at thelancet.com on October 22, 2020

Seroprevalence and presentation of SARS-CoV-2 in pregnancy

One of several case series of pregnant women diagnosed with COVID-19 by PCR reports that 41 (10%) of the 427 women required admission to a critical care unit.[1] Most women described in these case series are in the third trimester of pregnancy, which could reflect reporting bias, or a higher risk of infection or increased disease severity compared with women in the first trimester of pregnancy.[2] Seroprevalence studies can detect infections that test negative on PCR, and provide information on early pregnancy, when doing PCR in asymptomatic individuals is logistically difficult. We tested for antibodies for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in 874 pregnant women consecutively attending first trimester screening (ie, at 10–16 weeks of gestation; n=372) or delivery (n=502) from April 14 to May 5, 2020, at three university hospitals (ie, Hospital Sant Joan de Déu, Hospital Clínic, and Sant Pau) in Barcelona, Spain. At enrolment, women were interviewed for COVID-19 symptoms during the previous 2 months. We tested for anti-SARS-CoV-2 IgG, IgM, and IgA antibodies in participants' serum using VIRCLIA (Vircell Microbiologist, Granada, Spain). We re-tested 107 indeterminate results using VITROS (Ortho Clinical Diagnostics, Rochester, NY, USA) and re-classified samples as positive or negative for these antibodies. Women with COVID-19 were treated according to a standard protocol.[3]

125 (14%) of the 874 women were positive for anti-SARS-CoV-2 IgG, IgM, or IgA; 54 (15%) of the 372 women in the first trimester of pregnancy and 71 (14%) of the 502 women in the third trimester. 75 (60%) of the 125 women who were seropositive reported having no previous symptoms and 50 (40%) reported one symptom or more. 31 women (25%) had at least three symptoms or anosmia and eight (6%) had dyspnoea. Seven women (6%) were admitted to hospital for persistent fever (>38°C) and dyspnoea. Of these seven women, three had pneumonia that was classified as severe (bilateral chest condensation, respiratory rate >30 breaths per min, and leucopenia), required oxygen support but not critical care, and were discharged well. Symptomatic infection, hospital admission, and dyspnoea were significantly more prevalent in women in the third trimester of pregnancy than in women in the first trimester of pregnancy (appendix pp 1–2).

See **Online** for appendix

We have found a substantially higher seroprevalence (14%) of SARS-CoV-2 than that found by use of the SARS-CoV-2 PCR-positive rates (0·78%) in women aged 20–40 years in Barcelona, Spain.[4] Our data suggest that COVID-19 is commonly asymptomatic in pregnant women[5] and illustrate that seroprevalence studies might capture undiagnosed infections and offer different estimates of infection severity. In this study, none of the 125 women who were infected with SARS-CoV-2 required critical care, compared with the 10% of women diagnosed with COVID-19 by PCR.[1] We believe these data are reassuring and relevant to pregnant women and obstetricians. Seroprevalence was similar between women in the first trimester of pregnancy and women in the third trimester, suggesting a similar risk of infection, but the proportion of women with symptoms and the proportion of women who required hospitalisation were higher in the third trimester group than in the first trimester group. This result agrees with data reported from case registries of pregnant women with COVID-19,[1] suggesting that, as with other respiratory viruses, SARS-CoV-2 might cause more severe disease and require increased surveillance in late pregnancy than in early pregnancy. These findings should be further investigated in larger studies. Samples of serum and peripheral blood mononuclear cells obtained in this study are stored at biobanks for future studies with better or complementary immunological tests. Long-term follow-up of the infants is now underway given the fact that SARS-CoV-2 is potentially neurotropic.[6]

We declare no competing interests. This study was funded by the Kids Corona Child and Mother COVID-19 Open Data and Biobank Initiative, Hospital Sant Joan de Déu, Barcelona, Spain, the LaCaixa Foundation, Barcelona, Spain, the Stavros Niarchos Foundation, Banco Santander, and other private donors of Kids Corona. We thank all the medical staff, junior doctors, midwives, and nurses of BCNatal (Hospitals Sant Joan de Déu and Clínic) and Hospital Sant Pau. We especially thank Rosalia Pascal, Marta Larroya, Cristina Trilla, Martí Cantallops, Marta Camacho, M Carmen Medina, Irene Casas, Marta Tortajada, Alex Cahuana, Patricia Muro, Marta Valdés-Bango, David Boada, and Anna Mundo for data collection; Angela Arranz for her role in the coordination of the nursing research team; Imma Mercade, Elena Casals, and Josefina Mora for their contribution to the collection of first trimester samples; Jordi Yague and M Angeles Marcos for supervising the antibodies analyses; and the biobanks of Fundació Sant Joan de Déu, Clínic-IDIBAPS, and Sant Pau in Barcelona, Spain, for management of the samples.

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Patient-reported outcomes: central to the management of COVID-19

Patient-reported outcomes—self-assessments of patient health status—are central to COVID-19 response, recovery, and resilience.

Symptom reporting using patient-reported outcomes can facilitate diagnosis of the disease, identify those who require tests, and initiate track and trace procedures. Additionally, remote monitoring of symptoms with the use of electronic patient-reported outcomes can help identify those with severe COVID-19 who are in need of urgent care and those with mild-to-moderate symptoms that can be managed at home. The use of electronic patient-reported outcome systems is especially important because rapid deterioration can occur in patients with mild symptoms. Remote monitoring could also facilitate the triage of patients with chronic conditions ensuring that in-person hospital appointments are reserved for those with potentially life-threatening issues. Individuals with lower risk could be supported virtually and monitored for signs of deterioration. This approach can relieve the strain on health-care systems and prevent unnecessary exposures to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).[1]

We are just beginning to understand the long-term effects of SARS-CoV-2 infection. The symptoms have returned in some patients a few months post-recovery, and others have developed serious conditions such as Kawasaki-like disease. Patient-reported outcomes could be used for long-term follow-up to assess the effect of the disease on a patient's quality of life and to alert physicians to the development of potentially life-threatening complications.

Work has begun in earnest to develop effective drugs and vaccines to stem the spread of SARS-CoV-2 and prevent future outbreaks. Nevertheless, some unknowns such as potency, side-effects, and adverse events might only come to light during human trials. The first in-human COVID-19 vaccine trial used diary cards completed by trial participants to monitor adverse events.[2] Although it was encouraging that participant views were sought, we recommend the use of validated patient-reported outcome instruments such as the patient-reported outcomes version of the National Cancer Institute's Common Terminology Criteria for Adverse Events (CTCAE).[3] Use of this instrument in COVID-19 trials could complement the clinical CTCAE and facilitate cross-trial comparisons of results. Evidence suggests that patient-reported outcomes can detect adverse events in patients even before clinical parameters.[4] Thus, patient-reported outcome data could alert clinical teams to the occurrence of adverse events during COVID-19 trials and provide valuable evidence on safety and tolerability from the patient perspective.

Furthermore, as there have been suggestions that vaccine hesitancy could derail vaccination initiatives,[5] publication of patient-reported outcome data from vaccine trials could help to combat this hesitancy.

Responding to the crisis and building a resilient health-care system that will allow an efficient and effective response to future pandemics is crucial. To this end, patient-reported outcomes could provide a key tool in our defence system.

OLA and MJC are involved in the development of electronic patient-reported outcome systems. OLA has received personal fees from Gilead Sciences. MJC has received funding from UCB Pharma and personal fees from Astellas, Takeda, Merck, Daiichi Sankyo, Glaukos, GSK, and the Patient-Centered Outcomes Research Institute, unrelated to this Correspondence.

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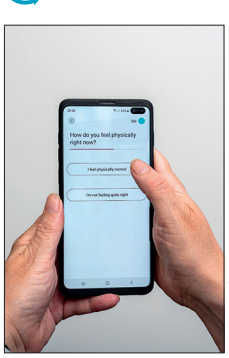

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Published **Online** August 10, 2020 https://doi.org/10.1016/S0140-6736(20)31724-4