The COVID-19 health care emergency is an unprecedented opportunity to obtain prospective and longitudinal data on the short- and long-term outcomes of prenatal stress exposure on child development. Additionally, by studying these outcomes, we can further bridge the gap between research and clinical practice, providing data to health care regulators and policymakers that may be useful in the development and delivery of adequate and timely preventive support for mother-child health during and after the COVID-19 pandemic.

Livio Provenzi, PhD
Serena Grumi, PhD

Author Affiliations: Child Neurology and Psychiatry Unit, IRCCS Mondino Foundation, Pavia, Italy.

In Reply In their response to our article, Provenzi and Grumi make the point that, in considering the long-term impact of maternal COVID-19 infection on a fetus, the impact of social and personal stress experienced during pregnancy in the midst of the pandemic environment must be considered. Factors such as isolation, employment uncertainty, and fear of the virus itself represent potential stressors to a pregnant mother. Indeed, research has observed worsening mental health outcomes in the face of the COVID-19 pandemic, with factors such as personal protective measures, exposure to COVID-19-related news, health communication, occupation, place of living, and income contributing. The distribution of such problems was heterogenous among the public, patients, and physicians, supporting the idea that a “psychiatric epidemic is cooccurring with the COVID-19 pandemic” in the face of increased stressors.

Stress has been shown to promote negative birth outcomes, such as preterm labor, the potential impacts of which we discussed in our article. It is postulated that this is not only owing to increased inflammatory activity during high-stress...
periods, but also to indirect factors, such as how people respond to stress. Smoking, poorer nutrition, disordered sleep, and less exercise are common stress responses, and each can contribute to negative prenatal and perinatal outcomes, potentially leading to long-term health outcomes as well.\(^3\),\(^4\)

Attention has also been paid to the impact of pregnancy-specific stressors,\(^4\) which is particularly salient with respect to our research. Becoming ill with a dangerous yet relatively unknown virus in the midst of a pandemic could be a substantial stressor, not only out of a mother’s concern for her own well-being, but for that of her child as well. Any impact that COVID-19 infection may have on fetal development (and any potential long-term impact) could be compounded by the additional stress the mother may feel out of concern for the effect of COVID-19 on the pregnancy.

We noted in our article\(^1\) that this pandemic has not affected all demographic groups equally. Research has suggested that disparities in health care, poverty, and other socioeconomic factors can increase the burden of COVID-19 infection. In studies of children and adolescents, social vulnerabilities have been found to increase risk of death, emphasizing the impact of such factors.\(^5\) It is reasonable to assume that these could affect COVID-19-related stress as well and should be considered in future studies.

The effect of pandemic-related stress on long-term fetal outcomes is worth investigating. Not only does pandemic-related stress serve as a potential confounder in determining the impact of maternal COVID-19 infection on long-term fetal health, but it represents a potential public health issue by itself. More mothers were impacted by pandemic-related stressors than were infected with COVID-19 during pregnancy, so the impacts have a much wider reach. Just as impacts of maternal COVID-19 infection are worth studying, so too is the impact of pandemic-related stressors. Provenzi and Grummi make a salient point, and we appreciate their response.

John McCarthy, BS
Diane Liu, MD
Frederick Kaskel, MD, PhD

Author Affiliations: Albert Einstein College of Medicine, Bronx, New York (McCarthy); Division of Pediatric Nephrology at Weill Cornell, New York, New York (Liu); Pediatric Nephrology Division at the Children’s Hospital at Montefiore, Bronx, New York (Kaskel).

Corresponding Author: John McCarthy, BS, Albert Einstein College of Medicine, 1300 Morris Park Ave, Bronx, NY 10461 (john.mccarthy@einsteinmed.org).

Published Online: November 1, 2021. doi:10.1001/jamapediatrics.2021.4339

Conflict of Interest Disclosures: None reported.


CORRECTION

Misspelled Author Name in the Byline: In the Original Investigation “Maternal and Neonatal Morbidity and Mortality Among Pregnant Women With and Without COVID-19 Infection: The INTERCOVID Multinational Cohort Study,”\(^1\) published in the August 2021 issue, there was an error in the byline. The 46th author given as “Enrico Ferrari, MD,” should have appeared as “Enrico Ferrazzi, MD.” This article has been corrected online.


Incorrect Affiliation and Address: In the article titled “Avoidant Restrictive Food Intake Disorder—What Are We Missing? What Are We Waiting for?” published online October 11, 2021, in JAMA Pediatrics, the author’s first affiliation and mailing address were given incorrectly. The corrected affiliation now reads, “Division of General Pediatrics and Adolescent Medicine, Department of Pediatrics, Tufts Children’s Hospital, Boston, Massachusetts,” and the corrected mailing address now reads, “Laura K. Grubb, MD, MPH, Division of General Pediatrics and Adolescent Medicine, Department of Pediatrics, Tufts Children’s Hospital, 800 Washington St, PO Box 351, Boston, MA 02132 (lgrubb@tuftsmedicalcenter.org).” The article has been corrected online.