COVID-19 mother-to-newborn infection rates are low, but indirect risks exist

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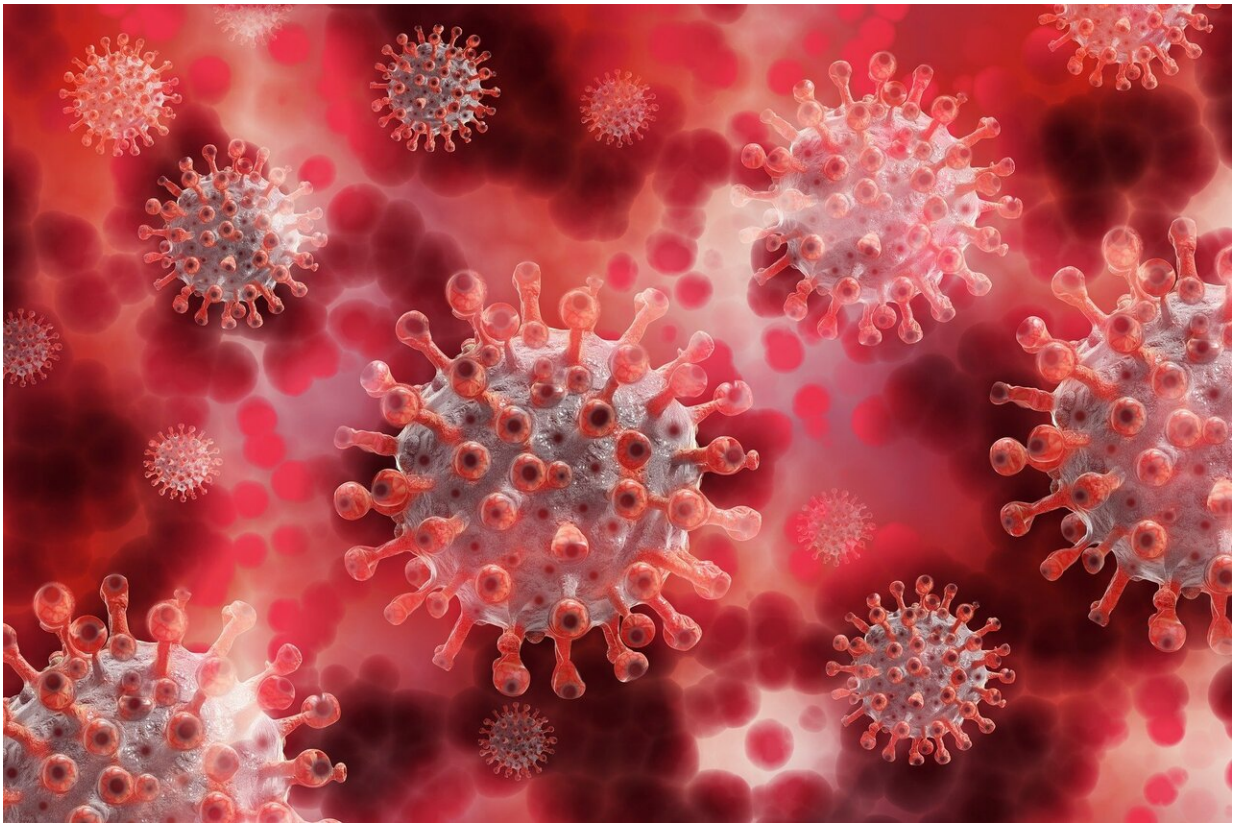

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At the start of the COVID-19 pandemic, very little was known about SARS-CoV-2, the virus that causes COVID-19. Over the past year, more evidence has become available on how the virus is transmitted, who is at

the greatest risk and best practices to prevent exposure. Yet questions still remain about how the virus impacts the health of pregnant women and newborns.

In a new study published in *JAMA Network Open*, physician-researchers from Beth Israel Deaconess Medical Center (BIDMC), Brigham and Women's Hospital, Boston Children's Hospital and Massachusetts General Hospital reveal that, while mother-to-newborn transmission of the virus is rare, newborns of expectant mothers with COVID-19 can suffer indirect adverse health risks as a result of worsening maternal COVID-19 illness.

"At the start of the pandemic, there was very little data to guide evidence-based newborn care practices," said corresponding author Asimenia Angelidou, MD, Ph.D., a neonatologist at BIDMC. "We believe ours is the first study to dive into the risk factors for mother-to-newborn SARS-CoV-2 transmission. We expected the mode of delivery and/or the degree of maternal illness to increase the risk of newborn infection, but were surprised to find that this was not the case."

Examining neonatal outcomes during the first month of life for babies born at 11 hospitals that represent approximately 50 percent of all births in Massachusetts, the team identified 255 neonates delivered between March 1-July 31, 2020, to mothers with a recent positive SARS-CoV-2 test result. The researchers used the American Academy of Pediatrics' National Registry for Surveillance and Epidemiology of Perinatal COVID-19 Infection complemented by a Massachusetts-specific Registry. Out of the 255 neonates studied, 88.2 percent were tested for SARS-CoV-2, and only 2.2 percent had positive results. However, while infection rates among newborns were relatively low, worsening maternal illness accounted for 73.9 percent of preterm births. Premature birth can often lead to acute and chronic complications, including respiratory distress, chronic health problems and developmental disabilities.

"We found that of babies born to mothers with COVID-19, very few babies tested positive," said senior author Mandy Brown Belfort, MD, MPH, Director of Clinical Research in the Department of Pediatric Newborn Medicine at Brigham and Women's Hospital and Associate Professor of Pediatrics at Harvard Medical School. "Instead, the adverse health impact of maternal COVID-19 on the newborn was from preterm delivery, usually prompted by a mother's worsening illness. Our findings support the need for thoughtful and collaborative decision-making around delivery timing in the setting of maternal COVID-19 illness."

Other indicators of adverse infant health outcomes the researchers incorporated in their analysis included low birth weight or very low birth weight, need for delivery room resuscitation, length of hospital stay and healthcare utilization for non-routine visits within a month after discharge.

The team found that short-term adverse outcomes were most closely associated with preterm birth and its consequences, rather than infection of the newborn with the virus. However, newborns of socially vulnerable mothers, as determined using a tool created by the Centers for Disease Control and Prevention using residential zip-codes, were at an increased risk for testing positive. The specific pathways by which social vulnerability might affect mother-to-child transmission of COVID-19 include differential access to care and clinician bias. Discrimination may also be a factor in chronic stress, which can diminish antiviral immune responses.

"This observation that newborns of socially vulnerable mothers were five times more likely to have COVID-19 highlights that health disparities are very complex and extend beyond race, ethnicity and language status," said Angelidou, who is also Instructor in Pediatrics at Harvard Medical School. "Social vulnerability likely affects health and immunity and our study supports further research in this area. Reallocation of resources to

socially vulnerable communities could go a long way in decreasing human suffering and economic loss during disease outbreaks."

The authors suggest further research on perinatal viral transmission should include women with COVID-19 early in pregnancy in order to identify the window of highest susceptibility to the virus for mother and baby during pregnancy. Conversely, future research including pregnant women immunized against COVID-19 is important to inform the optimal window for maximal neonatal protection after maternal immunization.

"While the low rates of neonatal infection we observed are reassuring, it is important that providers remain vigilant." said Angelidou, who is also a scientist at the Precision Vaccines Program in the Division of Infectious Diseases at Boston Children's Hospital. "Even during public health emergencies like the ongoing pandemic, providers need to carefully monitor newborns for atypical signs of the illness, while also trying to avoid unnecessary premature deliveries that pose inherent risks for both mother and child."

More information: Asimenia Angelidou et al. Association of Maternal Perinatal SARS-CoV-2 Infection With Neonatal Outcomes During the COVID-19 Pandemic in Massachusetts. *JAMA Netw Open.* 2021 DOI: 10.1001/jamanetworkopen.2021.7523

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