

Study: Spike in premature births caused by COVID, halted by vaccines

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COVID-19 caused an alarming surge in premature births, but vaccines were key to returning the early birth rate to pre-pandemic levels,

according to a new analysis of California birth records.

"The effect of maternal COVID infection from the onset of the pandemic into 2023 is large, increasing the risk of [preterm](#) births over that time by 1.2 percentage points," says Jenna Nobles, a University of Wisconsin–Madison sociology professor. "To move the needle on [preterm birth](#) that much is akin to a disastrous environmental exposure, like weeks of breathing intense wildfire smoke."

But the first two years of the pandemic alone were far worse for many pregnancies, according to findings Nobles and co-author Florencia Torche, a Stanford University sociology professor, [published](#) in the *Proceedings of the National Academy of Sciences*.

The virus that causes COVID-19 endangers pregnancies by causing immune and inflammation responses, and via deterioration of the placenta. One consequence is early interruption of the pregnancy and birth well in advance of the end of the expected 39- to 40-week gestation.

As the virus spread from July to November of 2020, the likelihood that a mother with COVID-19 in California would give birth more than three weeks before the due date was 5.4 percentage points higher than anticipated—12.3% instead of 6.9%—according to the new study.

The researchers measured the impact of the pandemic with the help of [birth records](#) for California's nearly 40 million people, using information on birth timing and the comparison of sibling births to help control for the pandemic's disparate impacts on different demographic groups.

They found the excess risk of preterm birth fell slightly in early 2021 before dropping steeply in 2022, at which point maternal COVID-19 infection in pregnancy caused no excess risk of preterm birth for infants.

Vaccines contributed to that decrease, the researchers say, an effect that jumps out when the birth records are divided up geographically.

"In ZIP codes with the highest vaccination rates, the excess risk of preterm birth declines much faster. By summer 2021, having COVID-19 in pregnancy had no effect on preterm birth risk in these communities. It takes almost a year longer for that to happen in the ZIP codes with the lowest vaccine uptake," Nobles says.

"That highlights how protective COVID vaccines have been. By increasing immunity faster, early vaccination uptake likely prevented thousands of preterm births in the U.S."

Preterm birth is associated with a host of short- and long-term health problems and deficiencies for the children and their families. It's the leading contributor to [infant mortality](#), and cutting short development in the womb can require additional medical attention that costs, on average, more than \$80,000 per child. Preterm birth by even just a few weeks reduces expected [educational attainment](#), health and earnings as an adult.

"And we found similar increases, of about 38%, in the risk of very preterm birth—that is pre-32 weeks—when a child is likely to need [neonatal intensive care](#), with the possibility of developmental delays and serious implications for their families as well," Nobles said.

The evidence showing the positive effects of vaccination in preventing premature births could help allay some of the most prominent concerns voiced as COVID-19 vaccines became available to pregnant patients.

"One big contributor to vaccine hesitancy is that people are worried about safety for the fetus and about the ability to get pregnant," Nobles says. "We already know there is very little evidence of adverse effects of vaccination on fetal development. The results here are compelling

evidence that what will actually harm the fetus is 'not' getting vaccinated. That's a message practitioners can share with concerned patients."

The results should be a compelling argument in favor of getting vaccinations and boosters, according to the researchers, even after COVID-related premature [birth](#) risk ebbed in California.

"This is still an evolving epidemic, and the rate of vaccine boosters among pregnant people right now is very low," Nobles says.

"The question is, how many more iterations of viral evolution does this need to escape the immunity that we have? It's miraculous and incredible that we're now down to essentially zero additional preterm births, but it does not indicate that it's going to be that way in perpetuity."

More information: Torche, Florencia et al, Vaccination, immunity, and the changing impact of COVID-19 on infant health, *Proceedings of the National Academy of Sciences* (2023). [DOI: 10.1073/pnas.2311573120](#). doi.org/10.1073/pnas.2311573120

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