

COVID-19 During Pregnancy: Birth and Infant Outcomes

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It is largely unknown how COVID-19 in pregnancy affects a newborn. To date, studies have shown varied findings and most have had small sample sizes^{1,2}. We studied a large population of 151,548 pregnant mothers, of whom 4,054 were COVID-19 positive at some point during their pregnancy before their labor admission.

Figure 1 shows the number of babies with each of the studied outcomes by trimester in which the mother was first COVID-19 positive. Some of the outcomes we studied were rare. For example, despite our large study population of 4,054 COVID-19-positive mothers, there were 178 babies with a congenital heart defect overall, and only four of them were born to mothers who contracted COVID-19 in their first trimester. This makes it difficult to assess the trimester-specific risk associated with COVID-19 from our data.

Figure 1

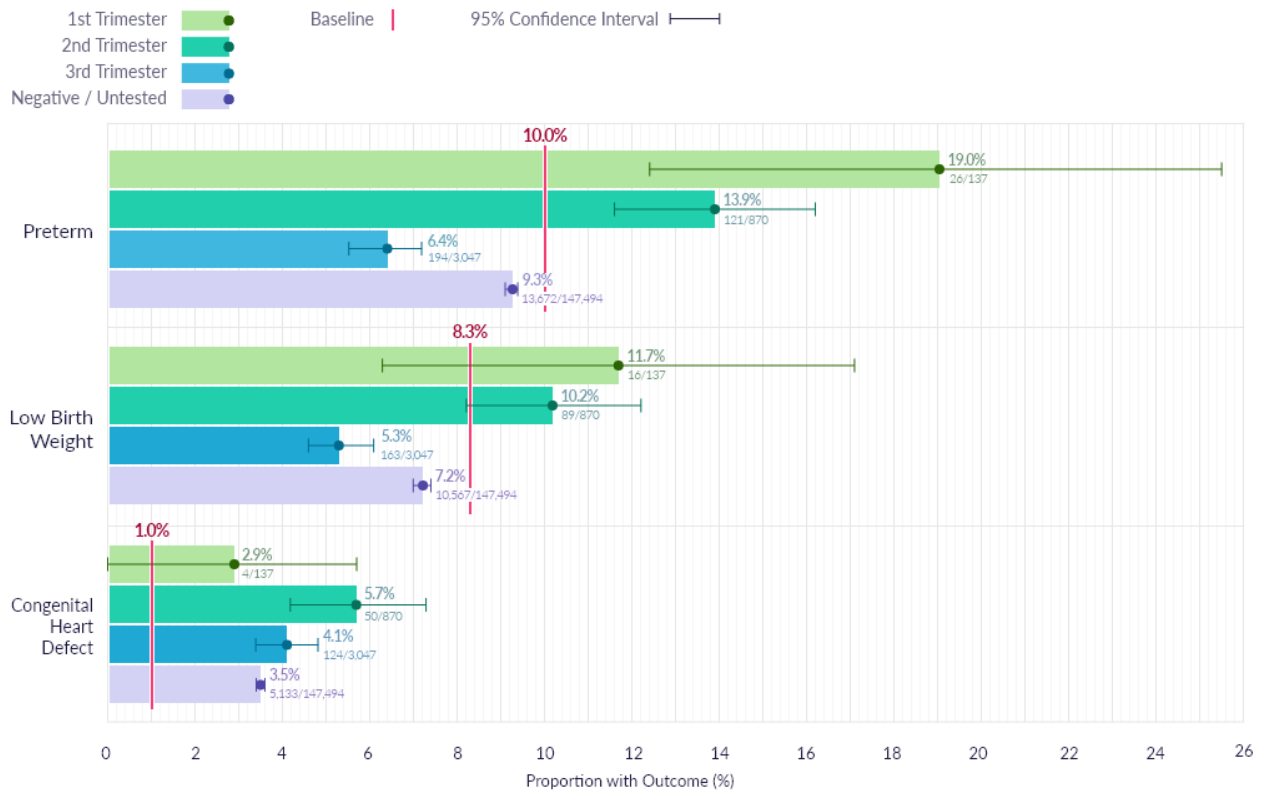
	Number of Babies	Preterm		Low Birth Weight		Congenital Heart Defect	
1 st Trimester Positive	137	26	19.0%	16	11.7%	4	2.9%
2 nd Trimester Positive	870	121	13.9%	89	10.2%	50	5.6%
3 rd Trimester Positive	3,047	194	6.4%	163	5.4%	124	4.1%
Negative / Untested	147,494	13,672	9.3%	10,567	7.2%	5133	3.5%
Baseline Rate			10.0%		8.3%		1.0%

"COVID-19 During Pregnancy: Birth and Infant Outcomes," 2021. Epic Health Research Network (EHRN.org)

Figure 1: The total number of babies born and their outcomes, by trimester the mother was first identified as COVID-19 positive. Baseline rates are for reported outcomes in the general US population³⁻⁵.

Figure 2 shows the proportion of babies with preterm labor, low birth weight, and congenital heart defect among COVID-19-positive mothers, by trimester first identified as positive, compared to mothers who were either negative or untested. This is also compared to the baseline rate as published by the CDC³⁻⁵.

Figure 2



"COVID-19 During Pregnancy: Birth and Infant Outcomes," 2021. Epic Health Research Network (EHRN.org)

Figure 2: Outcomes for babies, by trimester the mother was first identified as COVID-19 positive, as compared to babies born to negative or untested mothers. Each baseline rate, as published by the CDC, is shown by the vertical red lines. 95% confidence intervals are shown in the horizontal lines for each bar.

About our Data:

Our data include all test results and diagnoses from delivering mothers seen at healthcare organizations contributing to the data set during the study period. People who are tested in health systems often have underlying reasons to be visiting a hospital or clinic other than just getting a COVID-19 test. These factors, such as COVID-19 symptoms, social context⁶, or increased interaction with healthcare, could affect our data. Therefore, we are unable to say whether these results are generalizable to all pregnant mothers.

This study was completed by two teams (A: GS, JG, JM, LR-M; B: AMR, NB, JL, SF, VN), each comprised of a clinician and several data scientists, who independently acquired and analyzed data. Both teams were involved in the interpretation of results and drafting of this brief. Overall, the two teams came to similar conclusions. Data are pooled from 65 healthcare organizations, analyzing 151,548 births between March 15, 2020 and November 30, 2020.

The 65 health systems represent 238 hospitals that span 48 states and cover 39 million active patients.

Term	Definition
SARS-CoV-2 test	A final result for one of the lab components identified by individual healthcare organizations for SARS-CoV-2.
COVID-19 Diagnosis	One of the following codes in one of the listed diagnosis settings. Diagnosis Code: U07.1 (ICD-10-CM); 840539006 (SNOMED-CT) Diagnosis Setting: Encounter Diagnosis, Billing Diagnosis, Problem List, Discharge Diagnosis
COVID-19-positive mother	Receiving a COVID-19 diagnosis or SARS-CoV-2 test with a “positive” value at a healthcare facility during their pregnancy, prior to their labor admission. We use the word mother to designate any person who gave birth, regardless of their gender identity.
Pregnancy trimester	First trimester includes mothers up to 14 weeks of pregnancy, second trimester includes mothers from 14 weeks and one day through 27 weeks of pregnancy, and third trimester includes mothers from 28 weeks and one day of pregnancy onwards.
Preterm birth	A live birth within 37 weeks (259 days) since the woman’s last menstrual period.
Low birth weight	Documentation of birthweight of 2499g or less.
Congenital heart defect	One of the following codes in one of the listed diagnosis settings. Diagnosis Code: Any code beginning with Q20, Q21, Q22, Q23, Q24, Q25, Q26 (ICD-10-CM) Diagnosis Setting: Encounter Diagnosis, Billing Diagnosis, Problem List, Discharge Diagnosis

References

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