COVID-19 vaccines and boosters found to be beneficial for maternal-fetal health, study finds

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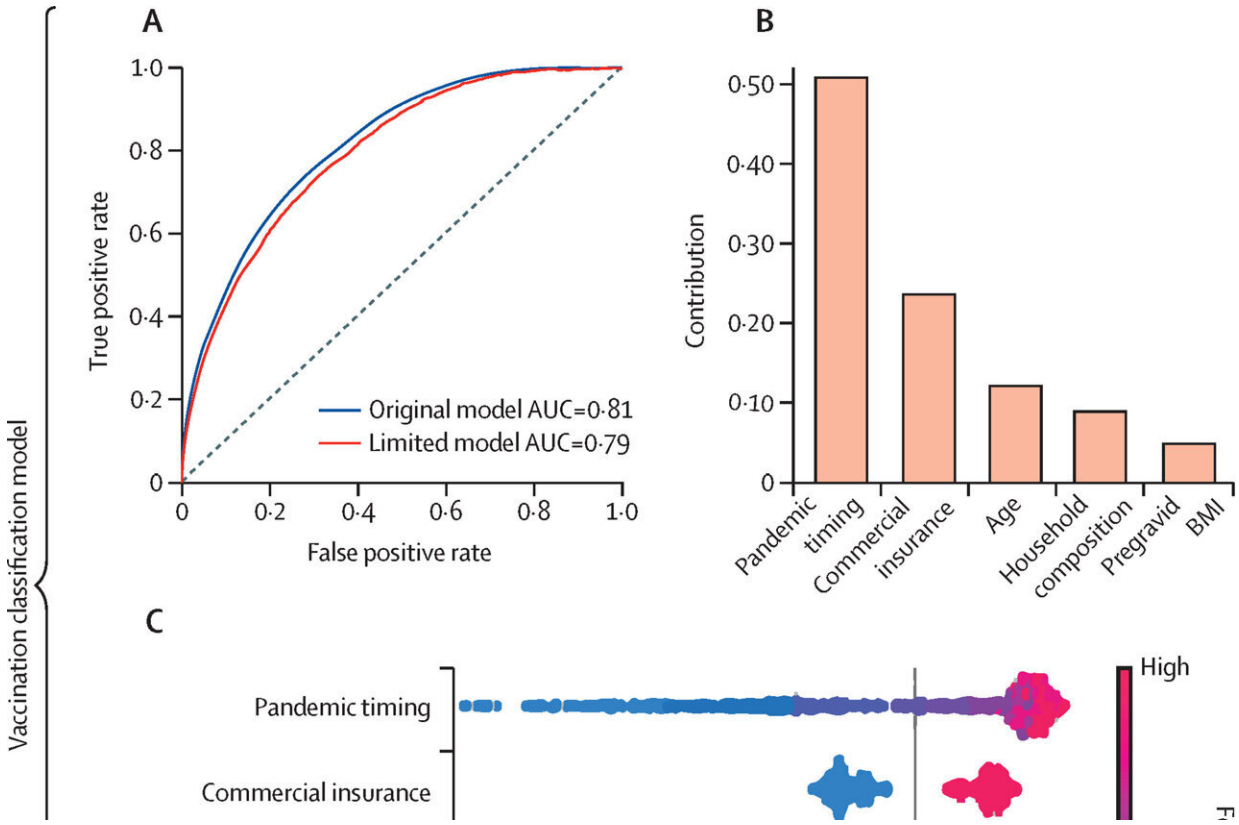

Most important features for vaccination and booster status at delivery(A) The AUC of the gradient boosting model predicting vaccination status of pregnant people at delivery based on 21 demographic, comorbidity, geographical, and chronological features (blue) or the top five most important features only (red). (B) Gini-feature importance evaluating the contribution of the five features in the limited gradient boosting model, which predicts vaccination status at

delivery. The importance of a feature is computed as the normalized total reduction of the criterion brought by that feature. The higher the value, the more important the feature. (C) The contribution of the five features in the gradient boosting limited model towards predicting vaccination status at delivery as measured by the Shapley algorithm and reported as the SHAP value. This value is the average marginal contribution of a feature value across all permutations of features providing insight into the degree of influence of the feature on an individual's predicted vaccination status at delivery. Each line represents a feature, and each dot represents a sample. The dot color represents the value of the feature for the sample, with red being a high value and blue being a low value for that feature across all samples. This evaluation was performed on a background of 1000 people randomly selected from the test set (appendix p 1). (D) The AUC of the gradient boosting model predicting vaccination status of pregnant people at delivery based on 24 demographic, comorbidity, geographical, chronological, and vaccination features (pink) or the top five most important features only (blue). (E) Gini-based feature importance evaluating the contribution of the five features in the limited gradient boosting model, which predicts booster status at delivery. (F) The contribution of the five features in the gradient boosting limited model towards predicting vaccination status at delivery as measured by the Shapley algorithm and reported as the SHAP value. This evaluation was performed on a background of 1000 people randomly selected from the test set. AUC=area under the curve. SHAP=Shapley additive explanations. Credit: *The Lancet Digital Health* (2023). DOI: 10.1016/S2589-7500(23)00093-6

In light of the recent FDA and CDC decision to approve two updated messenger RNA COVID-19 booster shots, it is imperative to alert the pregnant population of the importance and effectiveness of these vaccines and boosters.

In research published in *Lancet Digital Health*, researchers from the Institute for Systems Biology showed two important findings:

- Vaccinated pregnant people are less likely to have poor birth outcomes like preterm birth, stillbirth, or very low birth weight (below 3.3 pounds) compared to unvaccinated pregnant people, and those who had a booster are even less likely to have stillbirth compared to those vaccinated without boosters.
- Pregnant people who are vaccinated are less likely to contract COVID-19 than unvaccinated pregnant people, and those vaccinated and boosted are less likely to get COVID than those who are vaccinated only.

Three of the research paper's authors commented.

"The take-home message is COVID-19 vaccination is associated with better maternal-fetal outcomes, and boosters are associated with further reduced rates of stillbirth," said Jennifer Hadlock, MD, Associate Professor and Director of Medical Data Science, Institute for Systems Biology.

"We found that vaccinated pregnant people had lower COVID-19 rates than those who were unvaccinated, and that the pregnant people who were vaccinated and boosted had even lower rates," said Samantha Piekos, Ph.D., Research Scientist and K. Carole Ellison Fellow in Bioinformatics, Institute for Systems Biology.

"I cite this data to my patients. Vaccines and boosters help keep mom and baby safe," added Tanya Sorensen, MD, Executive Medical Director, Women and Children's Institute and Acute Care Services, Providence Swedish.

This research builds on the authors' previously published study that showed even mild cases of COVID-19 during pregnancy can increase risk for poor birth outcomes.

More information: Samantha N Piekos et al, Effect of COVID-19 vaccination and booster on maternal–fetal outcomes: a retrospective cohort study, *The Lancet Digital Health* (2023). DOI: 10.1016/S2589-7500(23)00093-6