

18e04ed Prediction of small-for-gestational-age at 35-36 weeks of gestation using a machine learning model

Mar Gil^{1,2}, Catalina de Paco Matallana³, Nuria Valiño⁴, Raquel Martin-Alonso¹, Valeria Rolle¹, Javier Sanchez-Romero³, Juan Luis Delgado³, Yoram Louzoun⁵, Belen Santacruz¹

¹Hospital Universitario de Torrejón, Madrid, Spain | ²Baylor College of Medicine, Houston, TX, USA | ³Hospital Clínico Univ. Virgen de la Arrixaca, Murcia, Spain | ⁴Complejo Hospitalario Universitario A Coruña, Spain | ⁵Bar-Ilan University, Israel

OBJECTIVE & METHODS

Develop a machine-learning model to predict birthweight (BW) and detect SGA at 35-36+6 weeks.

- 4,474 consecutive singleton pregnancies; 3 Spanish centers
- XGBoost regression with custom-weighted loss
- Maternal characteristics + fetal biometry
- 70% training / 30% test set
- Outcomes: BW <3rd, <5th and <10th centiles

Model accuracy

MAE 0.6 | RMSE 0.8 | Pearson r 0.7

Most influential predictors EFW • maternal height • maternal age • previous FGR

TEST-SET PERFORMANCE

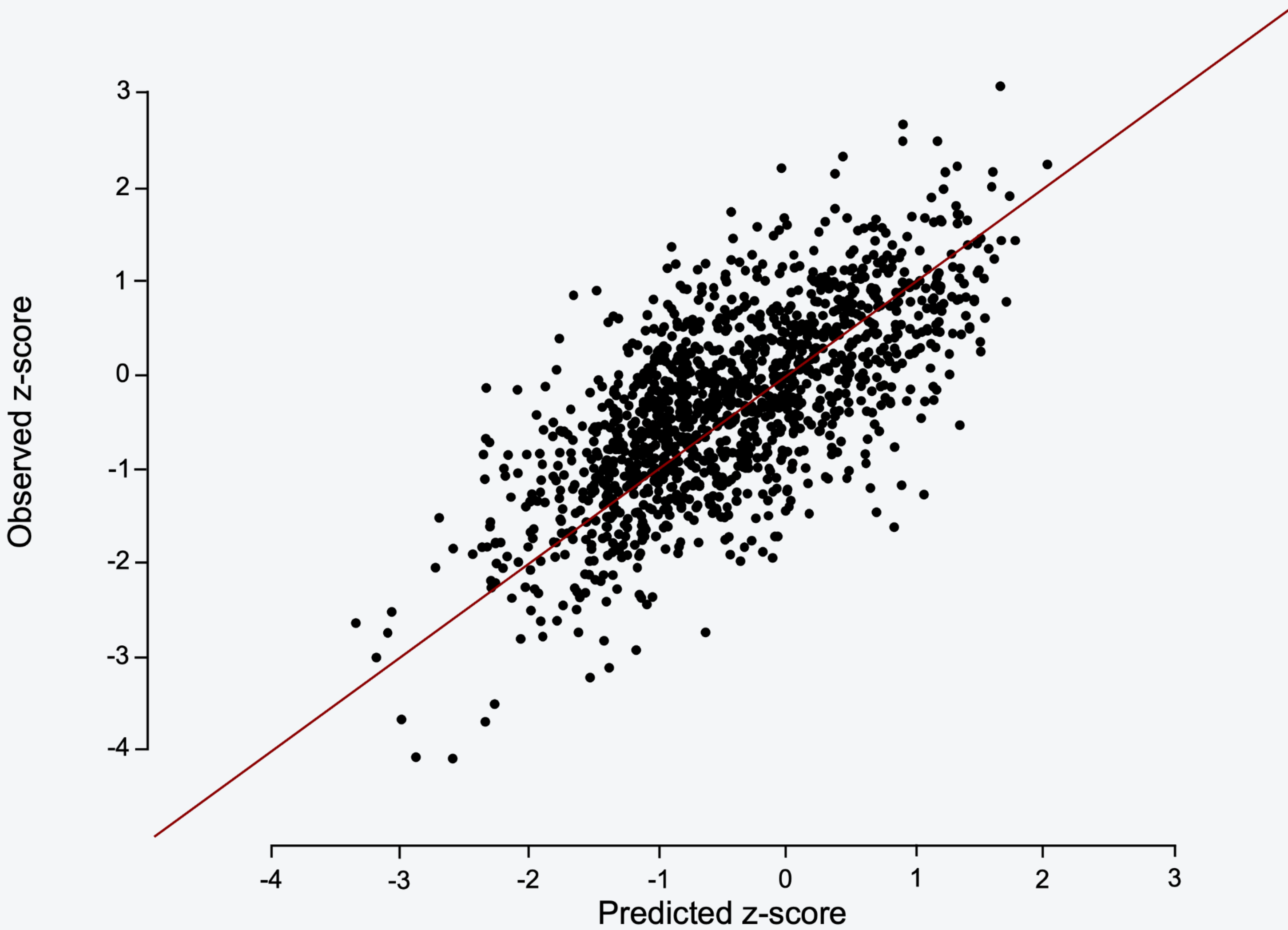
BW <3rd AUC 0.91

BW <5th AUC 0.88

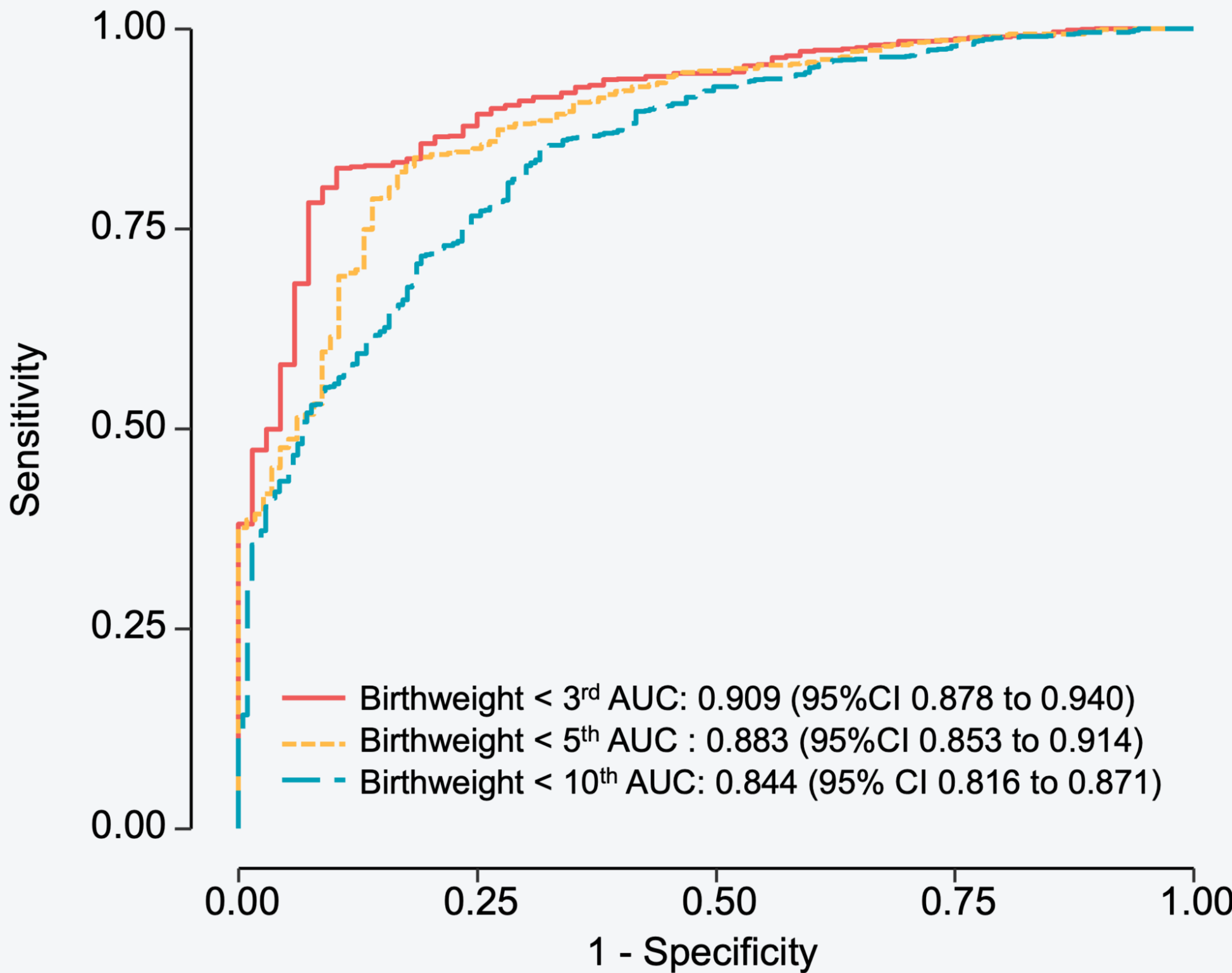
BW <10th AUC 0.84

At 10% screen-positive rate
DR 63.2% (<3rd)
DR 54.4% (<5th)
DR 39.2% (<10th)

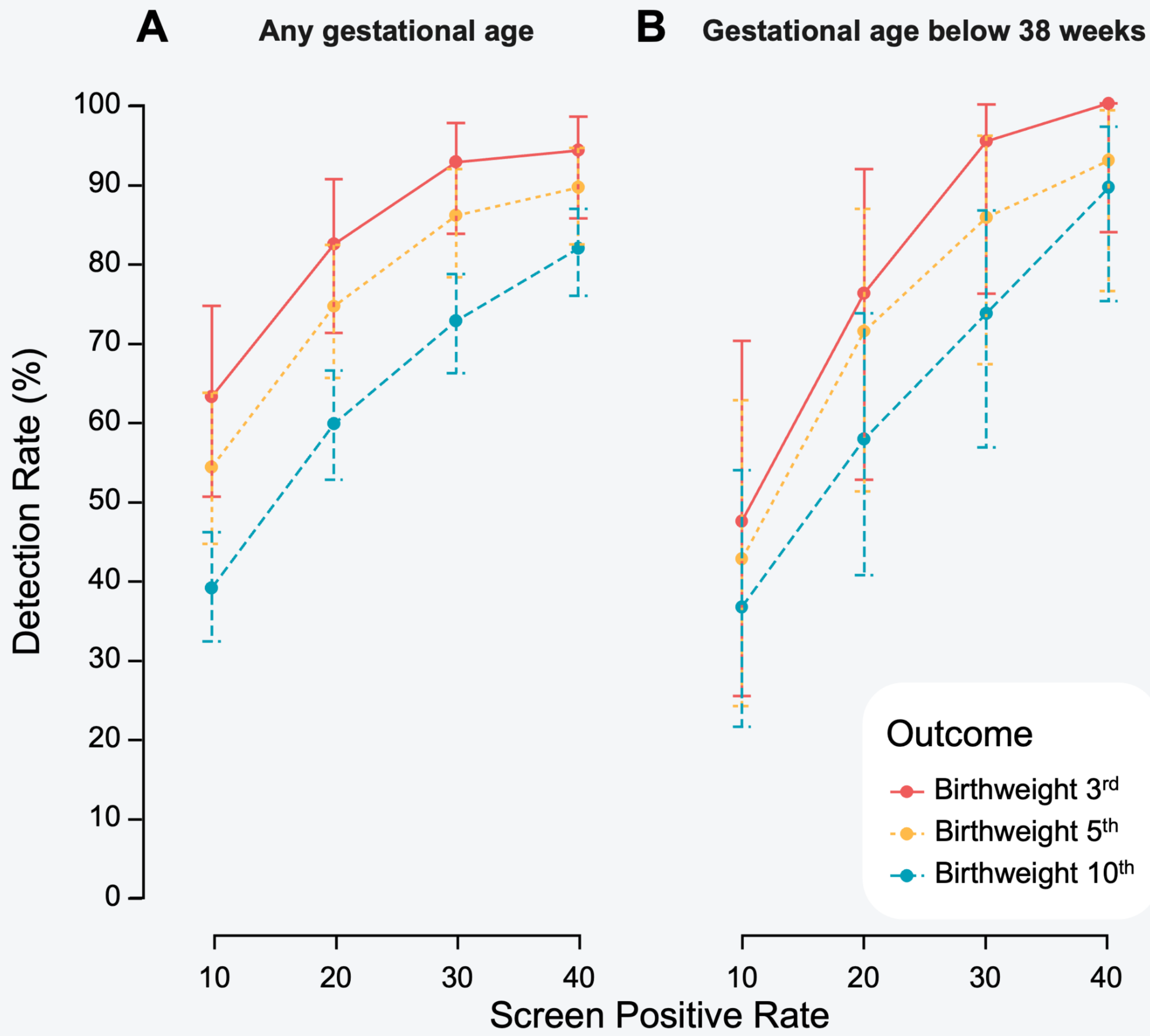
Best performance was for severe SGA.



Predicted vs observed BW z-score



Comparison of performance of the different models



TAKE-HOME
MESSAGE

Using routine clinical data, the model showed strongest discrimination for severe SGA and may support late-pregnancy risk stratification.