



Quantifying the Accuracy of Clinician Risk Assessment for Postpartum Hemorrhage



Ashley Lewis MD, Holly Ende MD, Diego Villela Franyutti MD, Henry Domenico, Dan Byrne, Michaela Farber MD

Background

- Postpartum hemorrhage (PPH) is a leading cause of maternal mortality worldwide
- Many adverse events related to PPH are preventable
- Accurate prediction of PPH may improve outcomes
- The ideal method of PPH prediction remains unknown. Options include:
 - Individual clinician assessments
 - Category-based risk tools
 - Machine learning methods

Aim

To measure the accuracy of PPH risk prediction performed by individual clinicians without the aid of a specific tool

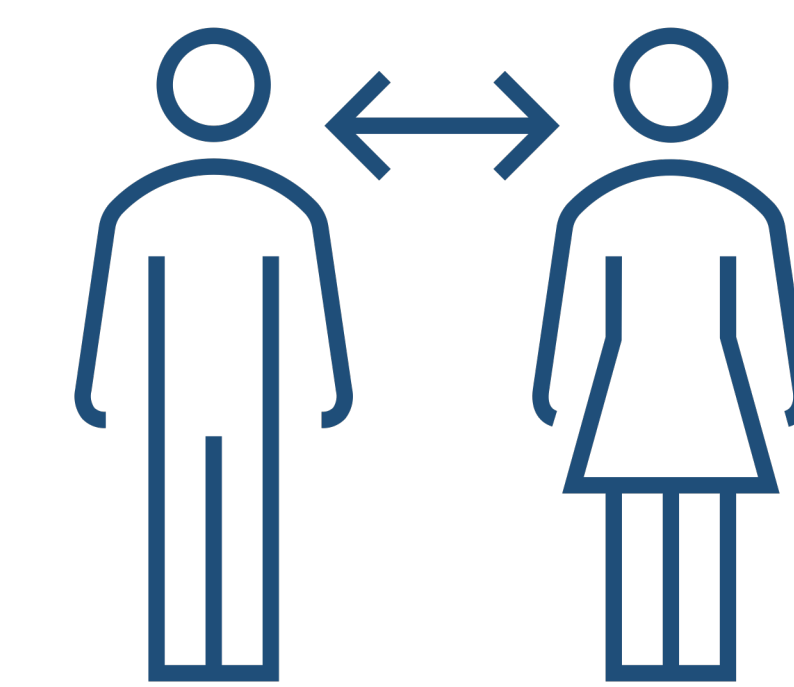
Methods



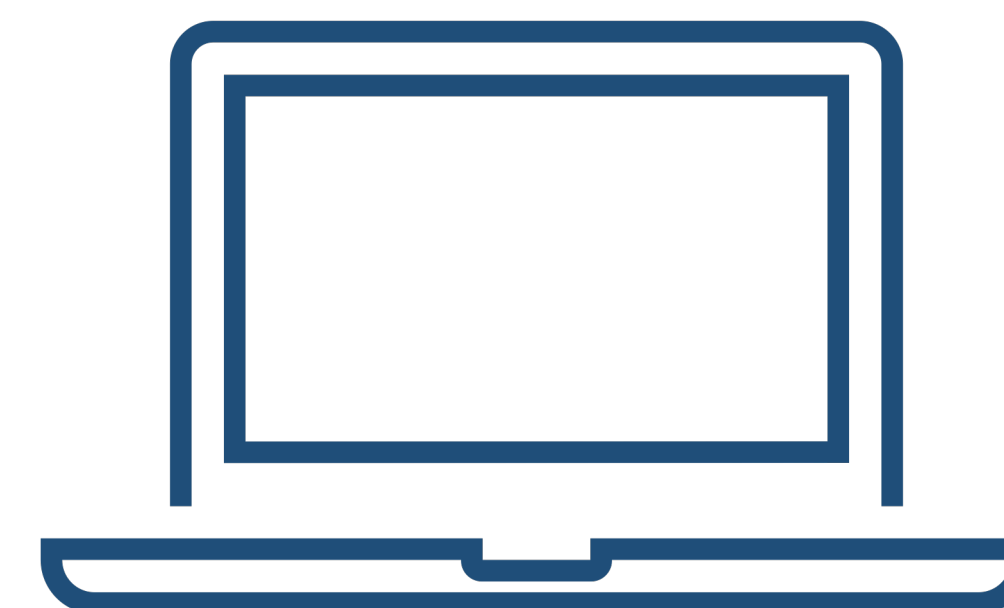
IRB approval from 2 participating institutions (VUMC, BWH)



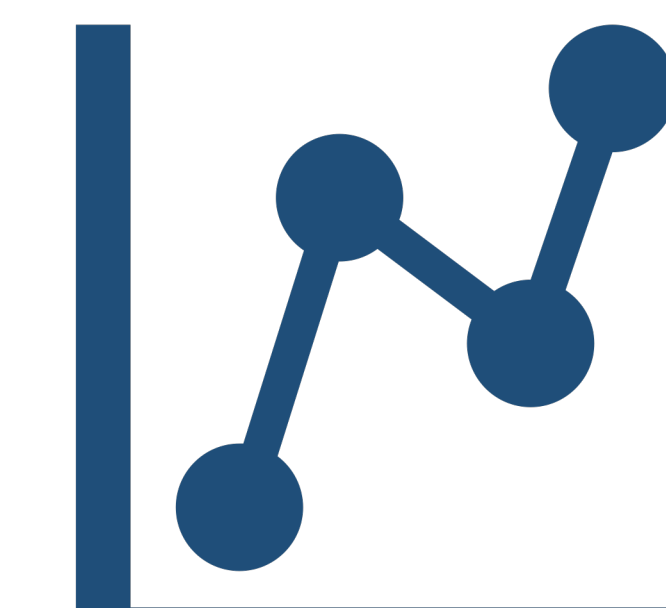
Written informed consent from all participating clinicians



Prospective data collection regarding PPH risk and confidence



Outcome data collected from medical record 24 hours after delivery



Analyzed by area under receiver operating characteristic curves



Subgroup analyses performed by a variety of factors



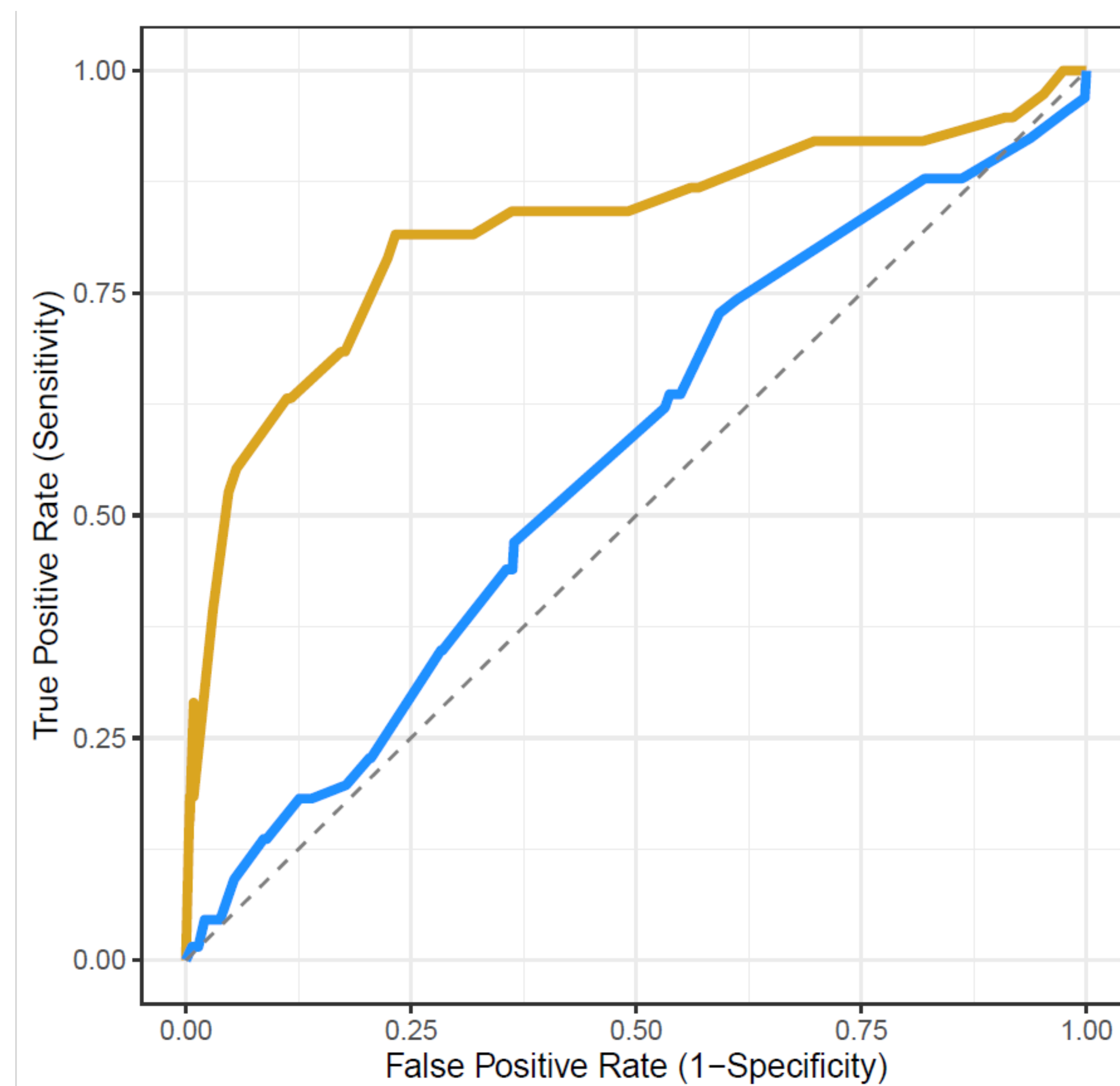
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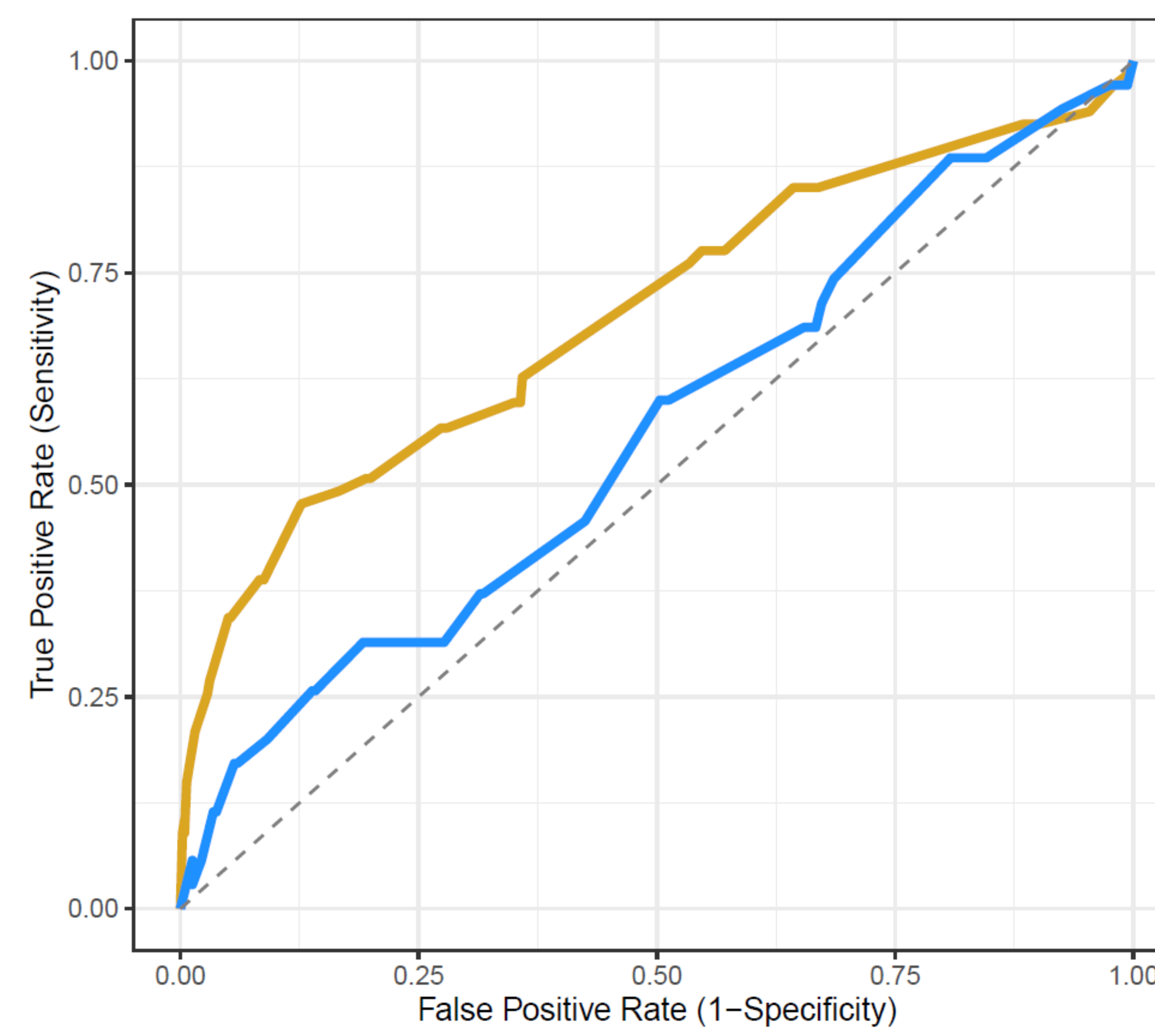
Results

Delivery Type



— Cesarean Delivery; AUC = .82 [.72-.91]
— Vaginal Delivery; AUC = .56 [.48-.63]

Clinician Type



— Physician; AUC = .70 [.62-.78]
— Nurse; AUC = .56 [.45-.66]

NO DIFFERENCES DETECTED:

Physician Experience Level

Attending: AUC 0.67 [0.56-0.76]

Trainee: AUC 0.76 [0.64-0.87]

Provider Specialty

Obstetrics: AUC 0.67 [0.50-0.84]

Anesthesia: AUC 0.69 [0.61-0.78]

Provider Confidence Level

Not at all confident: AUC .70 [.44-.97]

Slightly confident: AUC .49 [.36-.63]

Somewhat confident: AUC .68 [.58-.79]

Fairly confident: AUC .68 [.58-.77]

Completely confident: AUC .63 [.44-.83]

Hospital

Hospital 1 Vaginal: AUC .57 [.49-.65]

Hospital 2 Vaginal: AUC .50 [.31-.69]

Hospital 1 Cesarean: AUC .77 [.63-.91]

Hospital 2: Cesarean: AUC .91 [.86-.97]



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Conclusions

- Clinician assessment of PPH risk is more accurate for cesarean compared to vaginal delivery
- Physicians may be slightly more accurate than nurses at risk prediction, though confounding likely exists
- Predictive ability was not different based on provider specialty, trainee status, or confidence level
- There was no significant difference between participating hospitals

Strengths

- Multicenter data collection
- Large number of assessments
- Realistic representation of clinical assessments

Limitations

- Variations in prediction timing in reference to delivery
- No information collected on what clinical data points were used to make each prediction
- May not be generalizable to non-academic practices

Future Directions

- Replication of findings in additional populations
- Comparison to other methods of PPH risk prediction
- Additional work to determine ideal methods for PPH risk prediction

References

