

FIT4LABOUR – A POTENTIAL FOR ‘SMART’ COMPUTER-BASED TRIAGE AT LABOUR ONSET



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OBJECTIVE

Timely identification of fetal compromise at labour onset remains challenging. We developed **Fit4Labour**, a digital triage tool that analyses CTG and clinical risk factors to support clinical decision-making.

PRIMARY AIMS:

1. Evaluate accuracy in predicting severe fetal compromise* at birth.
2. Assess impact on clinical decision-making and communication.

*Severe fetal compromise defined as: intrapartum stillbirth, neonatal death, neonatal encephalopathy, HIE, or seizures.

STUDY DESIGN:

1. Retrospective analysis of routinely collected clinical data.
2. Prospective usability and feasibility studies in two UK hospitals.

DATASET OVERVIEW

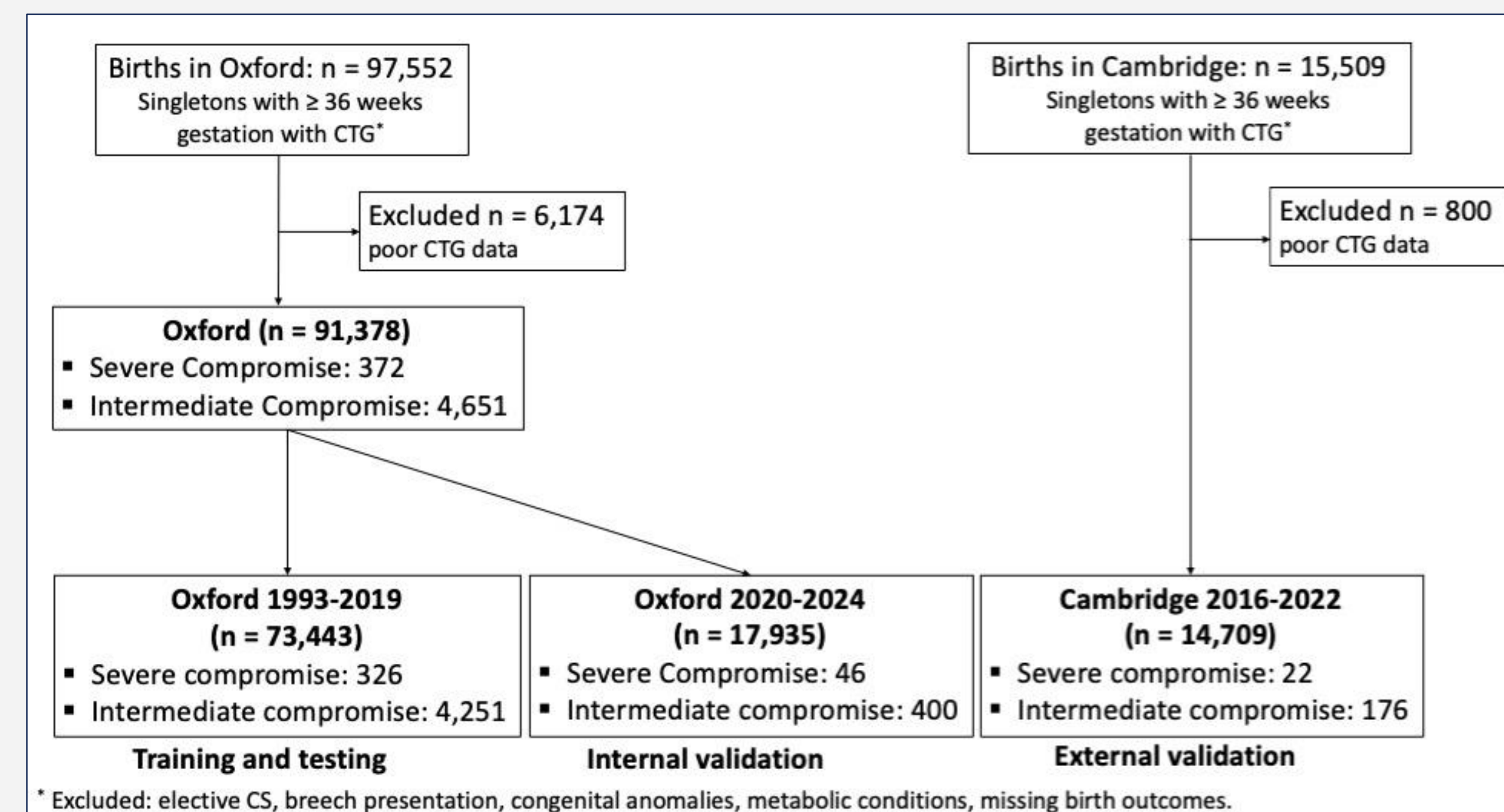


Figure 2. Cohort selection and data stratification for model development and validation, using over 100,000 births from Oxford and Cambridge. Data were split into training, internal, and external validation sets by birth year.

POTENTIAL CLINICAL USE

1 in 3 babies
compromised were correctly identified
at 20 minutes.

Predicted Early
6.5-12 hours before birth

Fit4Labour generates early risk predictions with accuracy comparable to clinical judgement, identifying risk on average 10 hours before delivery (Figures 3 and 4). In labours scoring below the 50th centile, the tool offers clinician and maternal reassurance, as the likelihood of severe compromise was significantly reduced.

Usability: Consistently rated highly for ease of use (SUS scores >80) in over 25 clinicians.

Feasibility: Tested in over 90 mothers in early labour, demonstrating reliable, real-time risk assessment.

MODEL DEVELOPMENT

Fit4Labour is a prognostic model developed using data from 73,443 monitored term deliveries, including 326 cases of severe compromise (0.44%) (Figure 1 and 2).

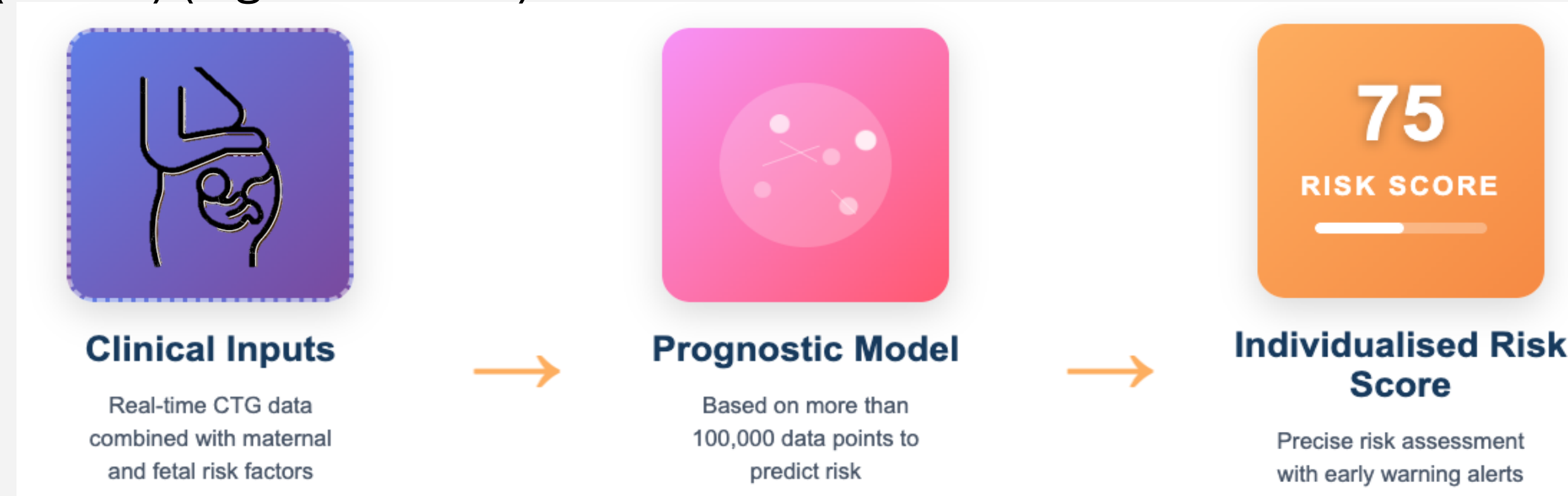


Figure 1. Using a Prognostic Model to Derive Risk Scores from Real-Time CTG and Clinical Data.

The model incorporates the following:

Clinical risk factors

- Maternal age and gestation age
- Temperature in labour
- Preeclampsia status
- Diabetes
- Meconium

CTG features at 20 minutes

- Baseline heart rate
- Variability
- Accelerations
- Prolonged deceleration

DATA & RESULTS

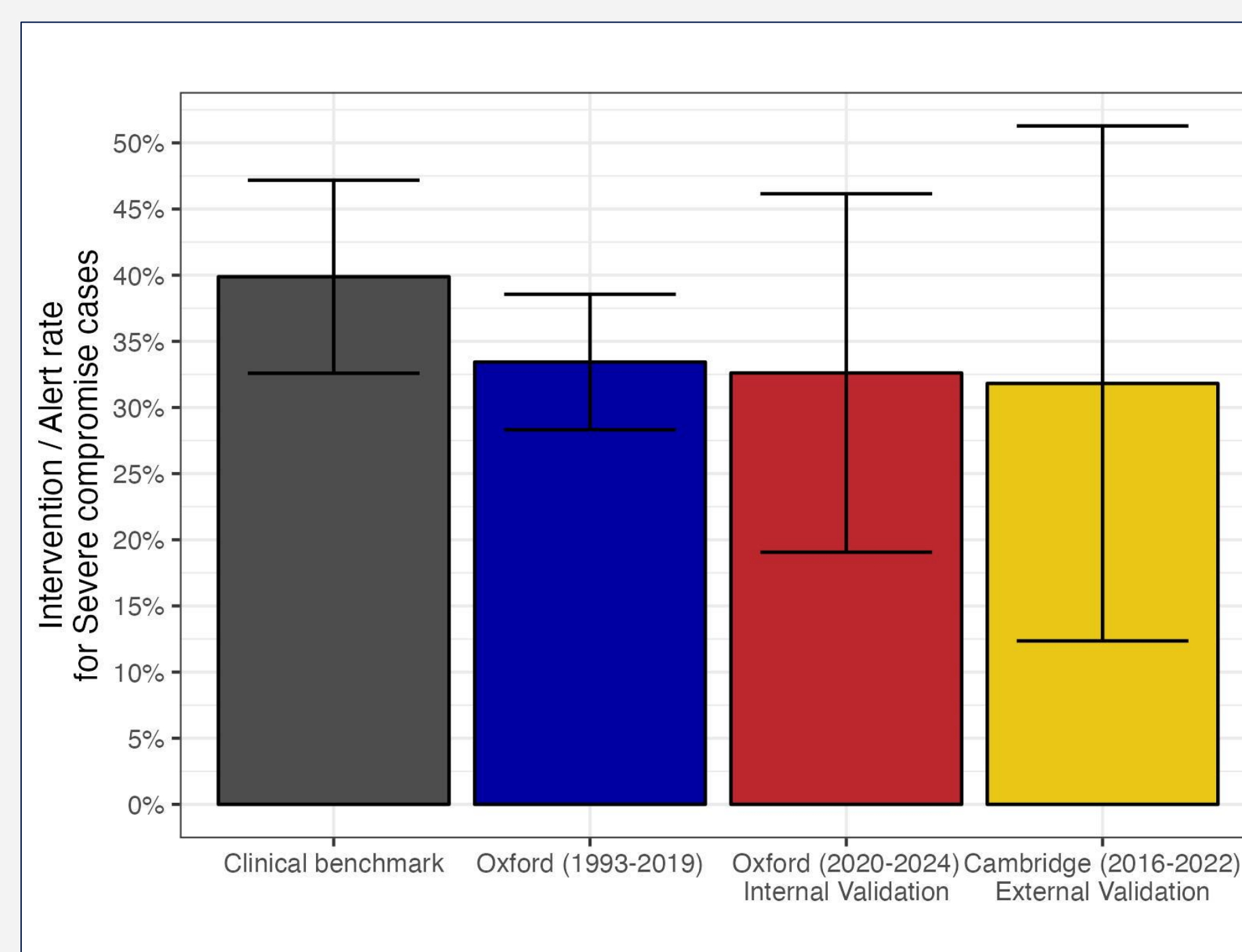


Figure 3. **Fit4Labour** sensitivity at fixed 15% FPR matches the clinical benchmark for detecting cases of severe compromise. Error bars denote 95% confidence intervals for the detection rates in each group, and are wider in the validation datasets, which have a smaller number of severe compromise cases.

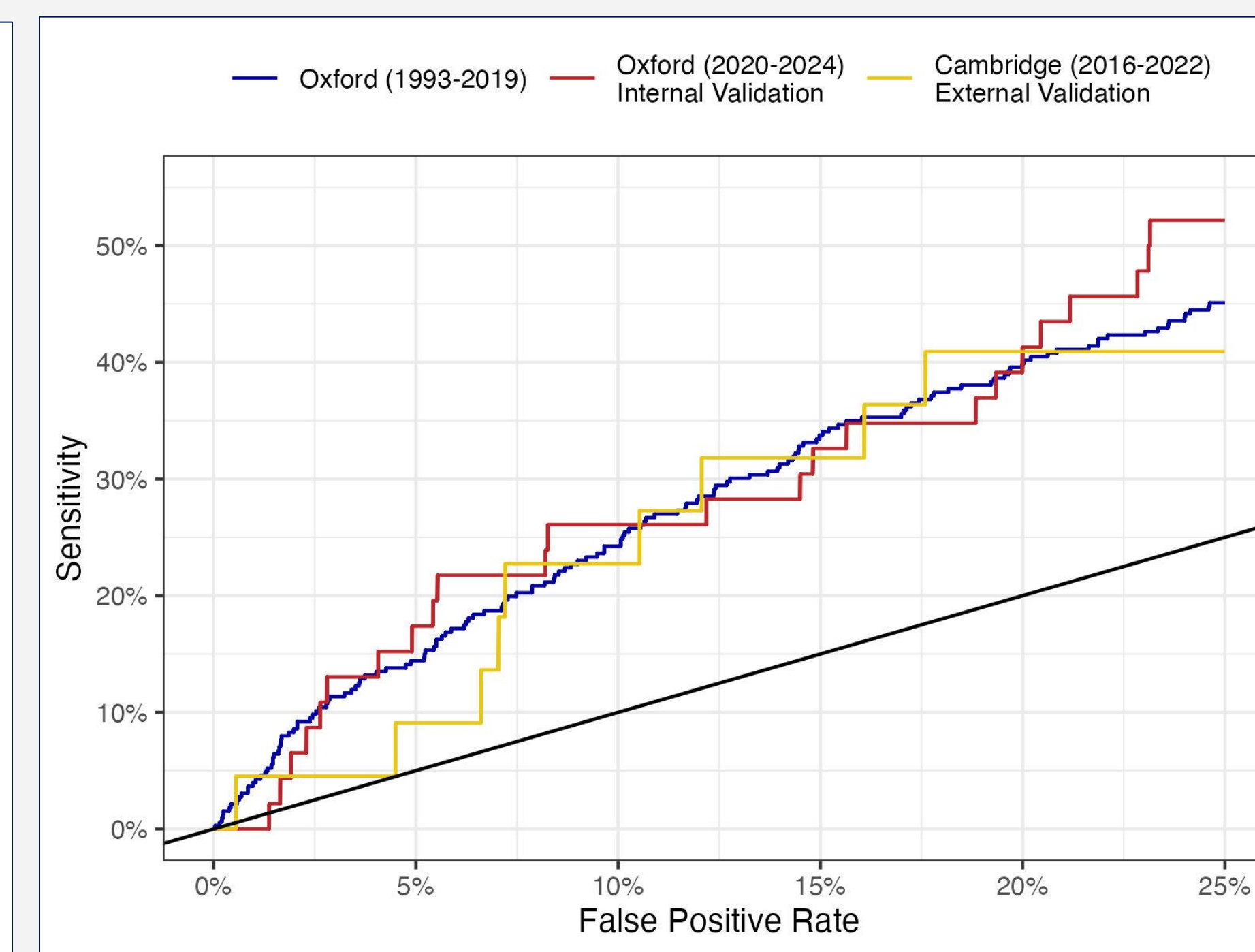


Figure 4. Partial ROC (Receiver Operating Characteristic) curve showing **Fit4Labour** performance on Oxford 1993–2019 (Training and Testing), Oxford 2020–2024 (Validation) and Cambridge (External Validation) datasets.

CONCLUSIONS

Fit4Labour is an innovative digital decision support tool that, at labour onset, could identify an important proportion of babies who will develop severe compromise.

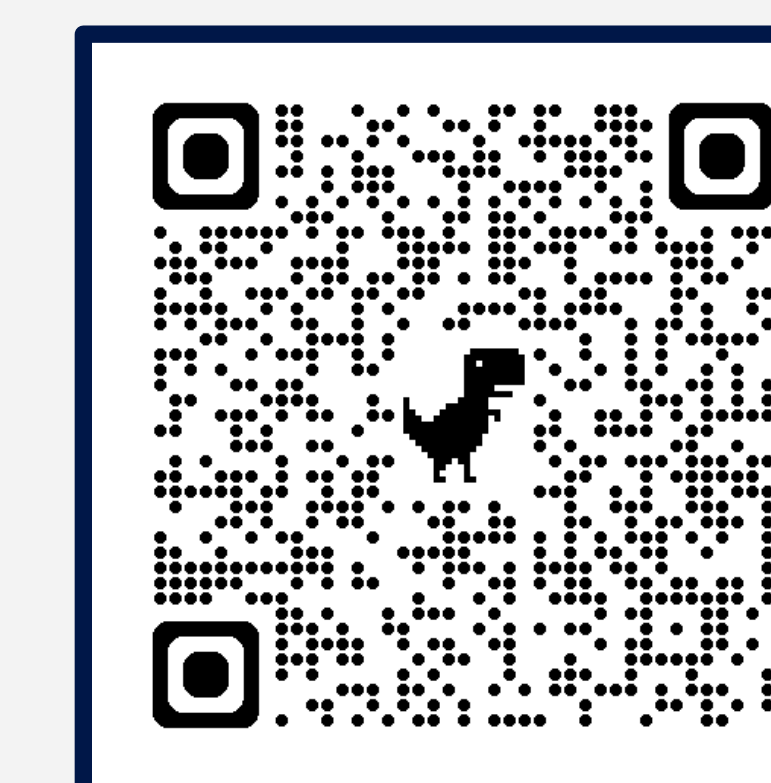
Clinical Potential: the tool has the potential to enhance maternity care through timely, objective risk assessment, supporting clinical decision-making, improving communication, and facilitating early escalation where needed.



Oxford Sparks video



Oxford Labour Monitoring



Fit4Labour subscription
for updates