External validation performance of the RCRI model suggests the need for an updated non-cardiac surgery postoperative risk model

External Validation of the Revised Cardiac Risk Index (RCRI) Clinical Prediction Model in Observational Health Care Databases

Background A more recent external validation of the model could inform clinicians better on the current performance of the model and give incentive to its improvement

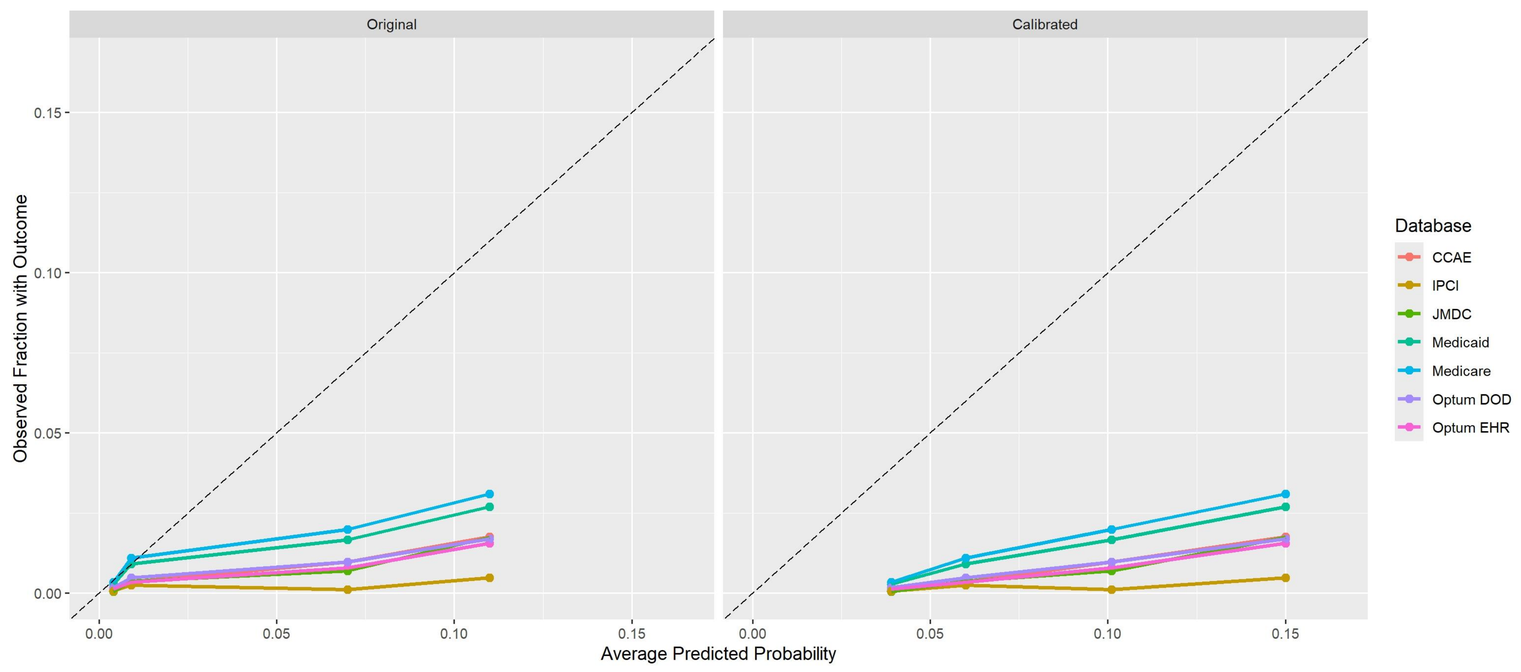
Result 1 Sample size, outcome and AUC of the RCRI model across different OMOP CDM databases*

*Recalibration did not influence discrimination

OMOP CDM Databases	Target cohort (n)	Outcome (%)	AUC
IPCI	68,202	0.0894	0.625
Medicaid	193,393	1.26	0.697
Medicare	757,956	1.38	0.699
Optum DOD	1,173,505	0.580	0.725
Optum EHR	281,389	0.404	0.747
CCAE	1,276,210	0.327	0.783
JMDC	38,795	0.291	0.795

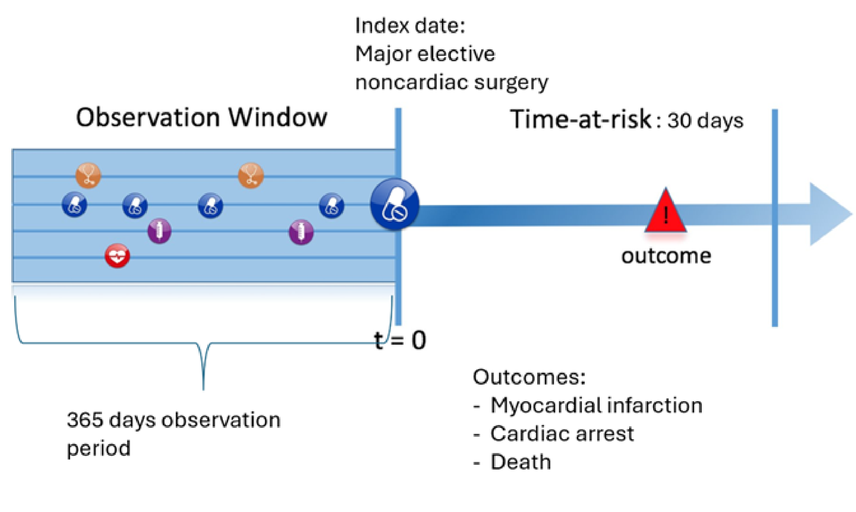
Result 2 Calibration plot of the original RCRI model across different OMOP CDM databases

Result 3 Calibration plot of the calibrated RCRI model across different OMOP CDM databases



Methods

1 Design of the RCRI model



2 Calculation of the RCRI score

RCRI predictors	Score
Elevated-risk surgery	1
History of ischemic heart disease	1
History of congestive heart failure	1
History of cerebrovascular disease	1
Pre-operative treatment with insulin	1
Pre-operative creatinine >2mg/dL/176.8µmol/L	1

RCRI score	Risk percentage	
	Original RCRI (1)	Calibrated RCRI (2)
0	0.4	3.9
1	0.9	6.0
2	7	10.1
≥3	11	15

References

1. Lee TH, et al. Derivation and prospective validation of a simple index for prediction of cardiac risk of major noncardiac surgery. Circulation. 1999;100(10):1043–9

2. Duceppe E, et al. Canadian cardiovascular society guidelines on perioperative cardiac risk assessment and management for patients who undergo noncardiac surgery. Can J Cardiol. 2017;33(1):17–32

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