

Risk model discrimination statistics.

PREVIOUS SUBMISSION

The c-statistic was 0.708 for the original RSSR model in the original submission, which means that the probability that predicting the survival to discharge outcome is better than chance. This method is used to compare the goodness of fit of logistic regression models. The range is between 0.5 to 1.0. A value of 0.5 indicates that the model is no better than chance at making a prediction of membership in a group and a value of 1.0 indicates that the model perfectly identifies those within a group and those not. Models typically considered of good predictive accuracy are those for which the C-statistic is 0.70 or higher. (Hosmer & Lemeshow, 2000).

CURRENT SUBMISSION

In this Maintenance of Measure submission, we have re-derived the RSSR measure, given the impact of COVID-19 on IHCA survival.

- a) *Derivation Cohort*
 - i. *Full Model: C-statistic = 0.721*
 - ii. *Reduced Model: C-statistic = 0.719*
- b) *Validation Cohort for Reduced RSSR Model*
 - i. *Full Model: C-statistic = 0.722*
 - ii. *Reduced Model: C-statistic = 0.721*

In the revised RSSR model for this submission, the discrimination of the model (C-statistic) improved from 0.708 in the original model to 0.721 for the full model in the derivation cohort and 0.722 in the validation cohort. The discrimination remained robust in the reduced model at 0.719 in the derivation cohort and 0.721 in the validation cohort. Therefore, the new RSSR model showed good discrimination.

Statistical risk model calibration statistics (e.g., Hosmer-Lemeshow statistic).

We obtained a slope of 0.987 and 0.996, respectively, for the full and reduced models, suggesting excellent calibration. See Figures in next question.

Validation of Full Model

C-stat	0.722
Calibration Slope	0.9871
Calibration Intercept	-0.0107

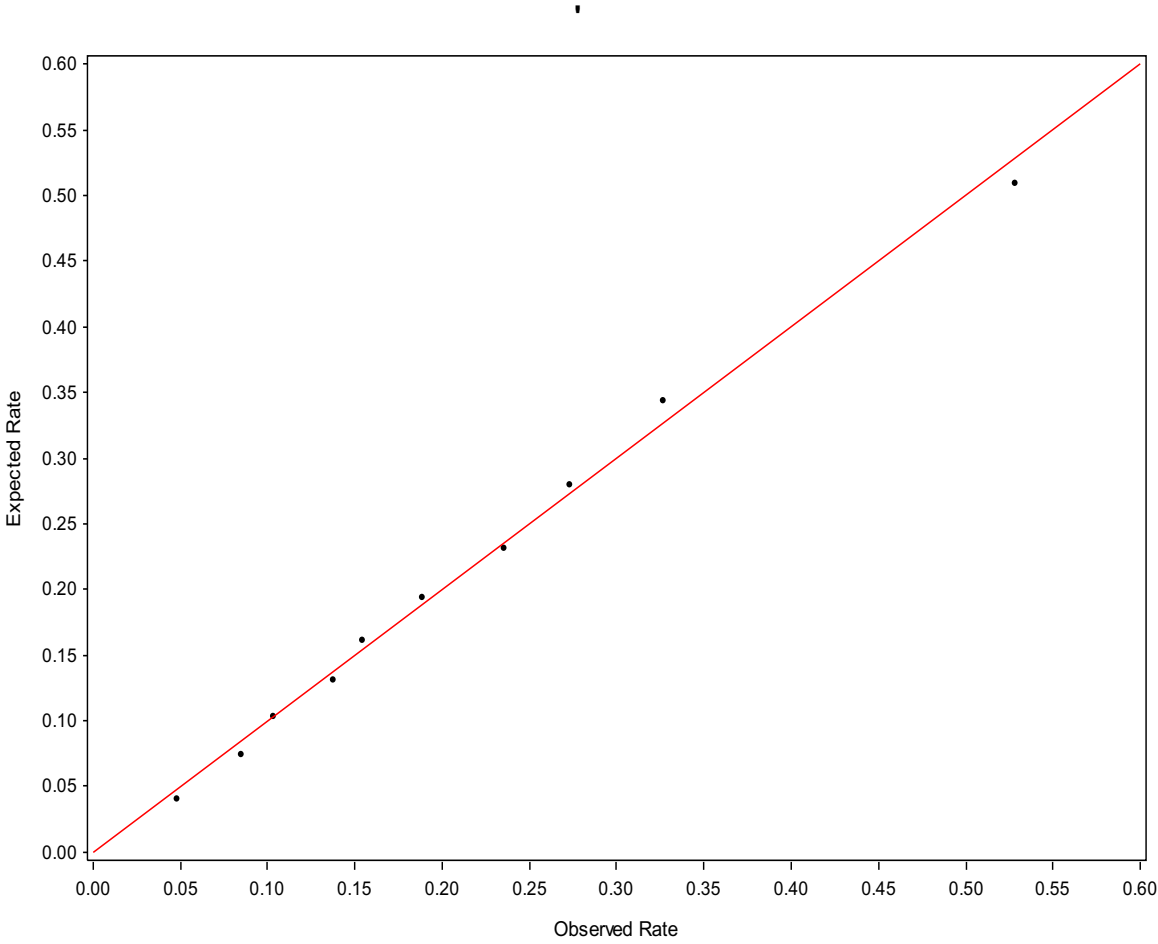
Validation of Reduced Model

C-stat	0.721
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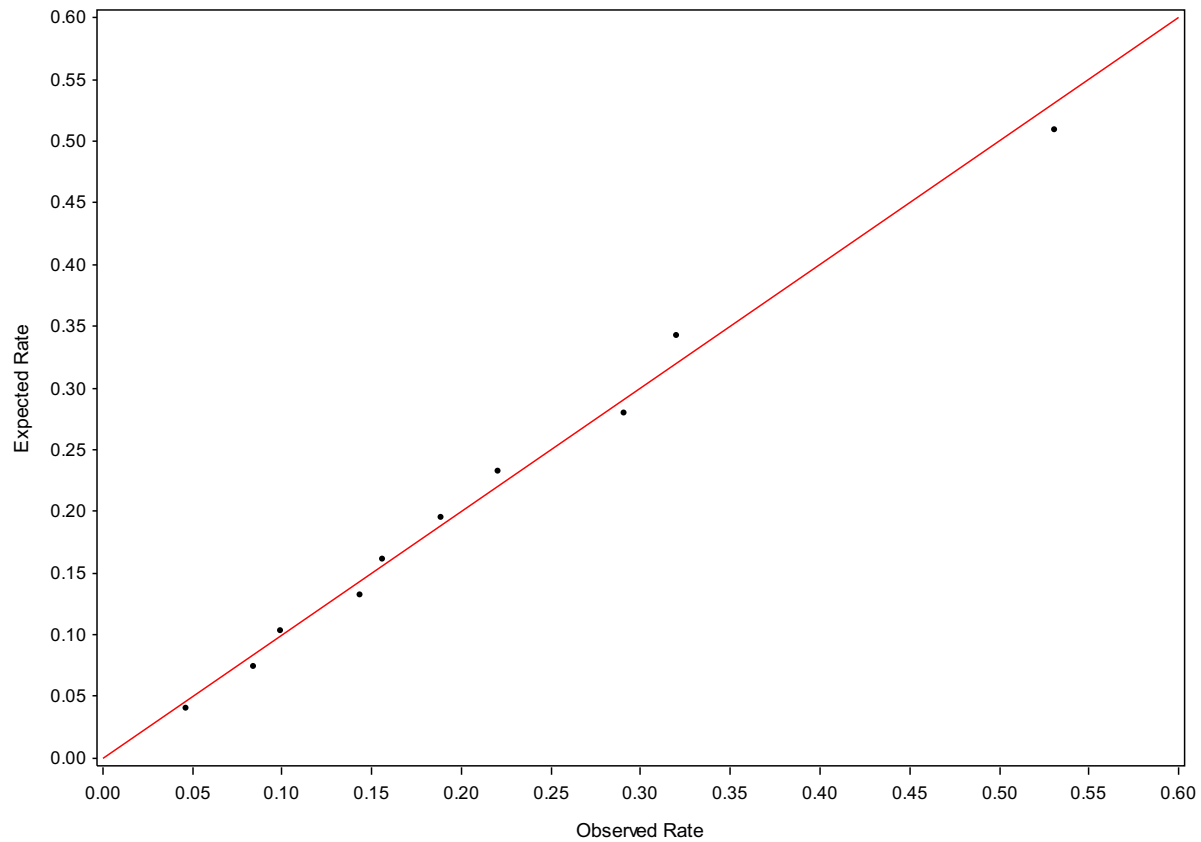
Calibration Slope	0.9962
Calibration Intercept	-0.0017

Calibration Plots

Calibration Plot for Full Model



Calibration Plot for Reduced Model



Results of the risk stratification analysis.

For 03/01/2020 to 12/31/2021 data, the risk stratification adequately segregated deciles of IHCA survival from <5% to >50% at the patient level. At the hospital level, we observed a broad range of unadjusted risk, which was partly mitigated after adjusting for patient characteristics in the risk-standardization model.

The distribution of RSSR for IHCA across hospitals is shown below.

Distribution of Adjrate

