

Supplementary Information S5 - Model assessment

Goodness of fit plots for the longitudinal model

The following goodness of fit plots showed the adequacy of the longitudinal model.

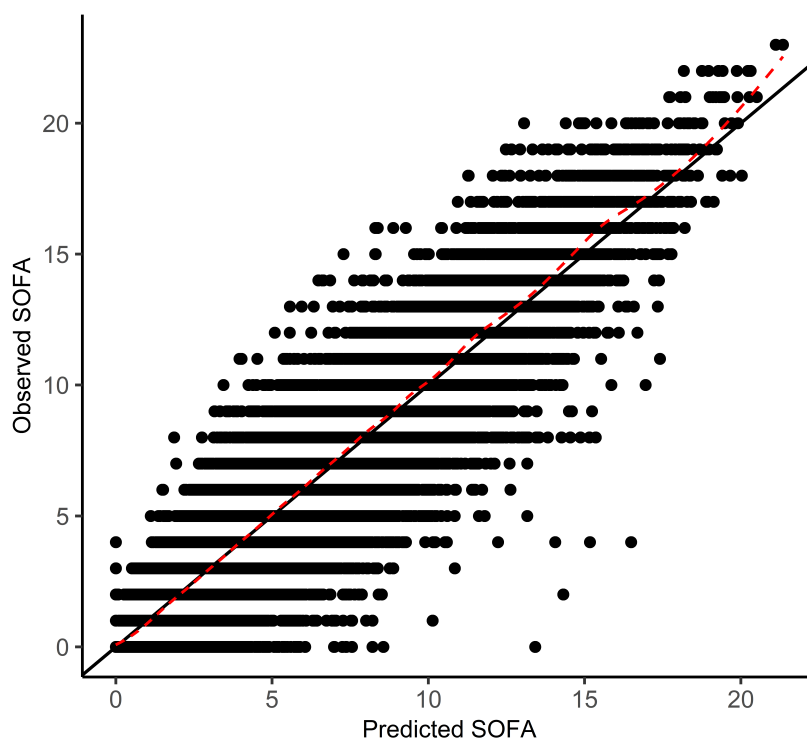


Figure A: Observations versus individual predictions of the SOFA score, on the training data set. The solid black line represents the identity line and the dashed red line the spline line.

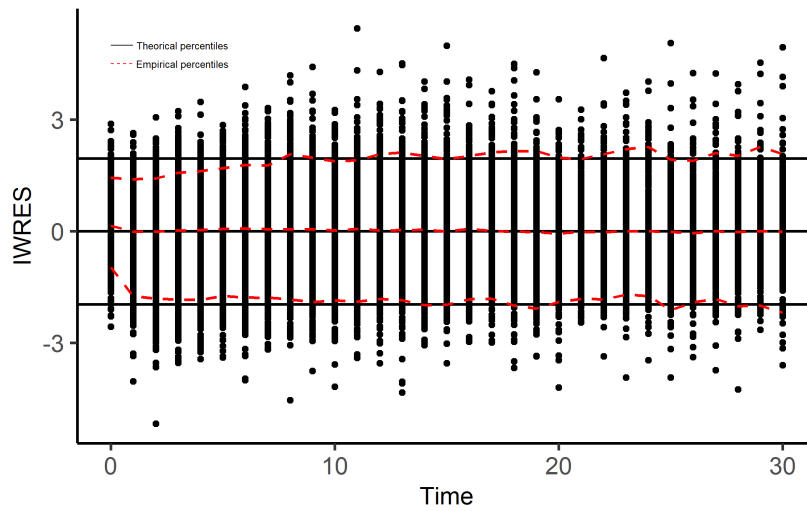


Figure B: Individual Weighted Residuals (IWRES) versus time for SOFA score, on the training data set. The solid black lines denote respectively the 2.5th, 50th and 97.5th theoretical percentiles and the dashed red lines the corresponding empirical percentiles.

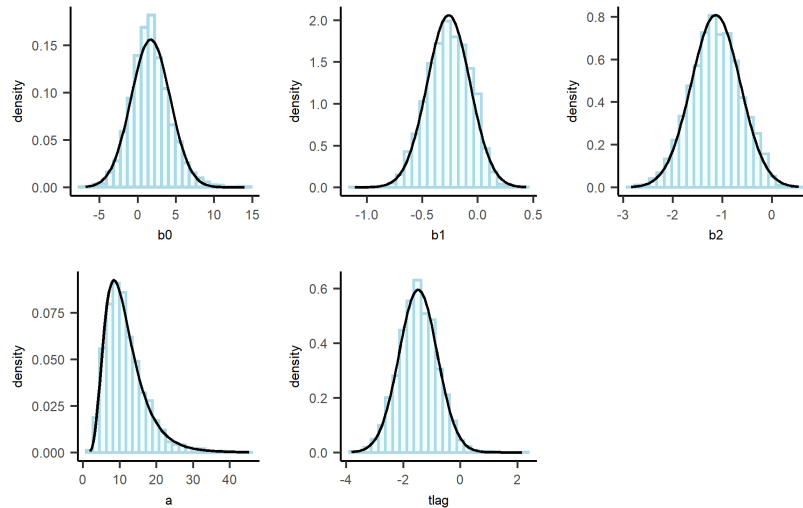


Figure C: Distribution of longitudinal individual parameters ($b_0, b_1, b_2, a, t_{lag}$) of the training data set. Blue bars correspond to the histogram of the estimated individual parameters and the black curve to the distribution predicted using estimated means and variances.

Adequacy of the joint model

To assess the adequacy of the joint model on the training data set, we computed two indicators: ROC AUC and Brier score at day 30 for both event (death and discharge), using all the information available up to day 30. We obtained very good performances: ROC AUC = 0.96 (with 95% CI [0.94,0.97]) and Brier score = 0.059 (with 95% CI [0.054,0.064]) for predicting the risk of ICU death and ROC AUC = 0.98 (with 95% CI [0.95,1.00]) and Brier score = 0.046 (with 95% CI [0.042,0.051]) for the risk of discharge.