

Category :**ICU organization**

**A48 - Predictive value of the apache ii and iv score for icu mortality in critically ill patients with covid-19: a retrospective cohort study.**

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### **Introduction:**

Severity scores play a crucial role in comparing predicted versus observed outcomes, allowing evaluation of treatment and benchmarking of ICU performance. Acute physiology and chronic health evaluation (APACHE) scoring systems are designed for ICU mortality prediction. APACHE scoring systems are not validated in critically ill COVID-19 patients. This study aims to assess and compare the predictive value of APACHE II and IV for ICU mortality in critically ill COVID-19 patients.

### **Methods:**

All adult patients with a laboratory-confirmed diagnosis of COVID-19 pneumonia admitted to the ICU of Jessa Hospital, Hasselt, Belgium between March 13, 2020, and October 17, 2020, were included in this retrospective, cohort study. APACHE II and APACHE IV scores were calculated within 24 hours after admission. The performances of the APACHE scoring systems were evaluated by means of logistic regression models with ICU mortality as the dependent variable and one of the scoring systems as an independent variable. Discrimination for mortality was assessed by receiver operating characteristic curves. 10-fold cross-validation was used to obtain more conservative estimates of the discriminative abilities of the prediction tools. The Hosmer-Lemeshow goodness-of-fit (HL) test was used to assess calibration.

### **Results:**

In total, 116 COVID-19 patients were admitted to the ICU between March 13, 2020, and October 17, 2020. 13 COVID-19 patients were excluded for various reasons, leaving 103 patients in the statistical analysis of the overall population. Baseline characteristics are presented in table 1. Table 2 shows the results of the cross-validated discriminative abilities and the HL test.

### **Conclusion:**

APACHE IV on admission provided the best discrimination and calibration for ICU mortality in critically ill COVID-19 patients compared to APACHE II. Nevertheless, discriminative abilities of APACHE IV scores were only moderate (AUC 0.67) after correction for optimism.

### **Table:**

Severity Score	OR (95% CI)	AUC	AUC (after crossvalidation)	HL statistics
APACHE II	1.10 (1.01, 1.21)	0.67	0.63	10.98 (0.1394)
APACHE IV	1.05 (1.02, 1.08)	0.70	0.67	2.54 (0.9234)

comparison of AUC ROC

APACHE IV versus APACHE II

*Results of univariate logistic regression model*