

Category : **Outcome scores**

**A76 - PREMIUMS: predicting mortality in ICU patients by healthcare workers, scoring systems and artificial intelligence.**

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### **Introduction:**

Healthcare workers (HW) often have a gut feeling concerning the probability of a patient surviving an admission in the ICU. However, limited data is available on the accuracy of this estimation. Our goal was to compare mortality predictions in ICU patients made by healthcare workers, validated scoring systems and a machine learning model.

### **Methods:**

ICU staff (physicians and nurses) of a Belgian university hospital were asked to give a prediction of mortality (both ICU and in hospital (IHM)) for patients in their care within the first 24 hours of admission. All adult patients were eligible for the study, elective surgery patients with anticipated length of stay less than 48 hours were excluded. Comparison was made with validated scoring systems (APACHE II, SAPS II, SOFA) and a machine learning model (Random Forest (RF)) trained on a dataset of 15.000 patients from the same hospital.

### **Results:**

A total of 602 patients were admitted during this 12 week intervention. Mean ICU mortality was 8.5% (IHM 14.1%) which HW overestimated in most cases (ICU mortality 15.1% +/- 22.7 and IHM 19.9% +/- 25.1). Area under the curve (AUC) for prediction of ICU mortality was 0.922 (95% CI 0.877 – 0.968) for HW, compared to 0.739 (95% CI 0.663 – 0.815); 0.864 (95% CI 0.813 – 0.915); 0.84 (95% CI 0.785 – 0.896) and 0.812 (95% CI 0.74 – 0.885) for SOFA, APACHE II, SAPS II and RF respectively. For prediction of IHM, AUC was 0.871 (95% CI 0.828 – 0.915) for HW, compared to 0.633 (95% CI 0.56 – 0.705); 0.768 (95% CI 0.709 – 0.828); 0.75 (95% CI 0.69 – 0.811) and 0.768 (95% CI 0.728 – 0.843) for SOFA, APACHE II, SAPS II and RF respectively.

### **Conclusion:**

Healthcare workers are at least as accurate in predicting mortality as validated scoring systems and a trained Random Forest model.