

## 00047 Derivation of a Novel Inpatient Mortality Prediction Model for Emergency Department Patients in Singapore

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**Aims:** Inpatient mortality is an indicator of hospital performance and patient care. In this retrospective cohort study, we aimed to develop and validate an inpatient mortality model for use during ED consultation to efficiently risk stratify patients for better care and resource allocation.

**Methodology:** Data was extracted from the Electronic Health Records of Singapore General Hospital in the year of 2014. Patients admitted through the ED were included and patients <21 were excluded. The outcome of this study was inpatient mortality, defined as the loss of palpable pulse with attempted resuscitation prior to discharge. Variables, such as demographics, co-morbidities, socioeconomic status and laboratory tests, were selected through literature review and clinician judgement before analysis with univariable and multivariable logistic regression. The model was assessed with receiver operating characteristic area under the curve.

**Result:** Among the 35,699 patients admitted from ED in 2014, 690 died in-hospital. Univariate-analysis showed males, lower socioeconomic status, multiple co-morbidities and increased acuity of illness as significant variables contributing to inpatient mortality. The final model included gender, use of medifund (financial aid), Charlson Comorbidity Index (CCI), albumin, creatinine, white blood cell counts, and number of ED visits within the past 1 year. This novel model (AUC 0.847, CI 0.822-0.873 ) performed the best compared to other models using CCI, age, gender and principal diagnosis (AUC 0.718, CI 0.685-0.750), with laboratory results alone (AUC 0.802, CI 0.767-0.838), or a model with just patient demographics (AUC 0.742, CI 0.712-0.772).

**Conclusion:** Both patient demographics and level of acuity of illness on index admission contribute to the risk of inpatient mortality. A novel model for predicting inpatient mortality could effectively risk stratify patients early in the ED. This model may have future applications to improve monitoring, management and disposition.