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Título	A prognostic model for use before elective surgery to estimate the risk of postoperative pulmonary complications (GSU-Pulmonary Score): a development and validation study in three international cohorts
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Resumo	Background: Pulmonary complications are the most common cause of death after surgery. This study aimed to derive and externally validate a novel prognostic model that can be used before elective surgery to estimate the risk of postoperative pulmonary complications and to support resource allocation and prioritisation during pandemic recovery. Methods: Data from an international, prospective cohort study were used to develop a novel prognostic risk model for pulmonary complications after elective surgery in adult patients across all operation and disease types. The primary outcome measure was postoperative pulmonary complications at 30 days after surgery, which was a composite of pneumonia, acute respiratory distress syndrome, and unexpected mechanical ventilation. Model development with candidate predictor variables was done in the GlobalSurg-CovidSurg Week dataset. Two structured machine learning techniques were explored (XGBoost and the LASSO), and the model with the best performance (GSU-Pulmonary Score) underwent internal validation using bootstrap resampling. The discrimination and calibration of the score were externally validated in two further prospective cohorts: CovidSurg-Cancer and RECON. The model was deployed as an online web application. T Findings: Prognostic models were developed from 13 candidate predictor variables in data from 86 231 patients (1158 hospitals in 114 countries). External validation included 30 492 patients from CovidSurg-Cancer (726 hospitals in 75 countries) and 6789 from RECON (150 hospitals in three countries). The overall rates of pulmonary complications were 2·0% in derivation data, and 3·9% (CovidSurg-Cancer) and 4·7% (RECON) in the validation datasets. Penalised regression using LASSO had similar discrimination to XGBoost, was more explainable, and required fewer covariables. The final GSU-Pulmonary Score included ten predictor variables and showed good discrimination and calibration upon internal validation.
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