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Improving the Prediction of Re-admissions Amongst Medicare Patients in a California Hospital

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Predictive models for hospital readmission rates are in high demand due to the Centers for Medicare and Medicaid Services (CMS) Hospital Readmission Reduction Program (HRRP). The LACE index is one of the most popular predictive tools among hospitals in the United States. The LACE index is a simple tool with four parameters: Length of stay, Acuity of admission, Comorbidity, and Emergency visits in the previous 6 months. We built two models using patient level data with more specific patient information (including 13 explanatory variables). One model is a general model for all patients, and the second model is specialized for patients targeted by the CMS penalty (characterized as age 65 or older with select conditions). The two resulting logistic regression models have a higher sensitivity rate compared to sensitivity of the LACE index. The c-statistic values for both models demonstrate moderate levels of predictive power. We also built an economic model to demonstrate the potential financial impact of the use of the model for targeting high-risk patients in a sample hospital.