Optimal Booking Control for Physical Examination considering Late Cancellation and Overbooking

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Abstract

Background: Late cancellation of physical examination has a severe impact on the profit of a healthcare center since it is often too late to fill the vacancy. A booking control policy that considers overbooking is then one natural solution.

Case presentation: In this study, we consider a healthcare center providing different examination sets using different resources. As each resource has its unique cost, revenue, and capacity, the optimal booking limits of all examination sets are hard to be calculated. We propose a probabilistic optimization model that maximizes the expected profit given the late cancellation probability of each type of customer, where the probabilities are estimated through logistic regression and customer grouping using historical booking and cancellation records. To test the performance of our proposed solution, we collaborate with a leading healthcare center. We simulate the presence and absence of customers generated by historical records and compare different strategies of overbooking.

Conclusions: Through the experiment, we show that our method can significantly increase the expected profit of the healthcare center by around 11%.

Full Text

Due to technical limitations, full-text HTML conversion of this manuscript could not be completed. However, the manuscript can be downloaded and accessed as a PDF.

Figures
Figure 1

Boxplot of Simulated Fifty-Year Revenue of Different Booking Policies