

00312 Development of Discrete Event Simulation Model to Assess Lead Time Improvement in Using Predictive Scoring Model for Risk Stratification of No-show at Specialist Outpatient Clinic

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Aims: No-shows are patients who miss scheduled Specialist Outpatient Clinic (SOC) appointments. A predictive risk score was developed to stratify patients by their risk of no-shows at SOC. This study aimed to develop a Discrete Event Simulation (DES) Model to examine improvement in appointment lead time for new cases by increasing appointment slots based on the number of patients predicted to be at high risk of no-show.

Methodology: A baseline DES model to simulate earliest possible appointment for new subsidized appointments was developed using Orthopaedic SOC appointment request administrative records from January to October 2017 (n= 11,780) to determine demand and arrival rate. Calendar setup of appointments slots were analysed together with Orthopaedic doctor schedule to determine the slots available in the same period. The model generated mean, median and 95th percentile lead time and the percentage of cases waited > 60 days. The what-if DES model considers the impact of additional slots which derived from the number of patients who were at high risk of no-show multiplied by predictive risk scoring model accuracy rate before rounding down to the nearest integer.

Result: The rate of appointments request and slots available differed on different day of the week. During simulation, the model was able to consider the different request rate over the different day of week and dynamically allocate earliest possible appointment based on the slots available at the end of each workday. Baseline model was validated to be similar to historical lead time report. What-if analysis showed that the mean, median and 95th percentile lead time and percentage of cases waited > 60 days can be improved by 21%, 49%, 15% and 20% respectively.

Conclusion: DES offers a cost-effective framework of evaluating new technologies and complex processes to mitigate operational risk and poor high cost investments.