

Finalv3 - SUBMITTED

Category: Administrative - Quality Assurance Process Improvement & Regulatory Issues

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Title: Optimize Waitlist Times for Transplant Candidates with Algorithmically Personalized Recommendations from Inverse Classification

Background: Many organ transplant candidates die while waiting or have substantial wait times. Significant disparities in access to organ transplantation persist despite continuous and progressive allocation changes. There is a need for personalized recommendations for transplant candidates to optimize their time on the waitlist and reduce mortality.

Methods: We performed an inverse classification analysis on the UNOS STAR Files data containing transplant candidates from 2010 - 2018 in the USA. We assigned an estimated effort function mapped to changes in each of the candidate variables. Candidate variables were modeled as predictors for wait time until transplant or death. We ranked each variable by their corresponding impact on the wait time to transplant. We analyzed the impact of multiple effort totals for candidates distributed optimally among their variables.

Outcomes: According to this model, we expect to find a list of variables that most significantly impact wait time (e.g. BMI or location) and estimate the effort associated with each unit change in those variables. Thus we will determine how much change effort a candidate must account for to make a meaningful optimization in waiting time. Based upon the results of this experiment and a specific candidate, we may be able to recommend certain changes to diet, lifestyle, medication, waitlist location, etc. that may optimally reduce that candidate's wait time before they are transplanted according to this model.