Improving Societal Outcomes in the Organ Donation Value Chain

Presenting Author: Dr. Ravi Subramanian, Scheller College of Business, Georgia Tech
Co-author: Priyank Arora, PhD Student, Scheller College of Business, Georgia Tech

The mismatch between demand and supply of organs for transplantation is wide and results in significant socio-economic costs. We examine a unique principal-agent problem in the cadaver organ donation value chain (ODVC) where the principal in our case is a social planner that has an overall quality-adjusted-life-year (QALY) improvement objective. The agents include a non-profit organ procurement organization (OPO) with a volume-of-care objective and a for-profit hospital (trauma center). The main contributions of our work are two-fold: First, while the majority of the literature focuses on the demand side of an ODVC, we develop an analytical model and study the effects of contextual parameters and decisions of the supply-side entities in an ODVC on their respective payoffs as well as on societal outcomes. This model interrelates key components, including organ recovery reimbursement rates for the hospital, cost of inpatient waiting, shared operating room capacity where organ recovery and other inpatient procedures take place, and QALY increments for organ recipients as compared to the hospitals other patients. Our analysis highlights the misalignment in the objectives of the social planner, the non-profit OPO, and the for-profit hospital. Second, we recommend administratively feasible and Pareto-improving contracts (composite criteria-based and penalty-based) that a social planner can use to help the ODVC achieve socially-optimal performance. By showing the existence of a Pareto-improving contractual mechanism in our context, we illustrate the possibility for social value for the non-profit participants to not necessarily be at the expense of economic value for the for-profit participants.