



The Surgical Workforce and Its Relationship to Kidney Transplant Numbers and Nonuse

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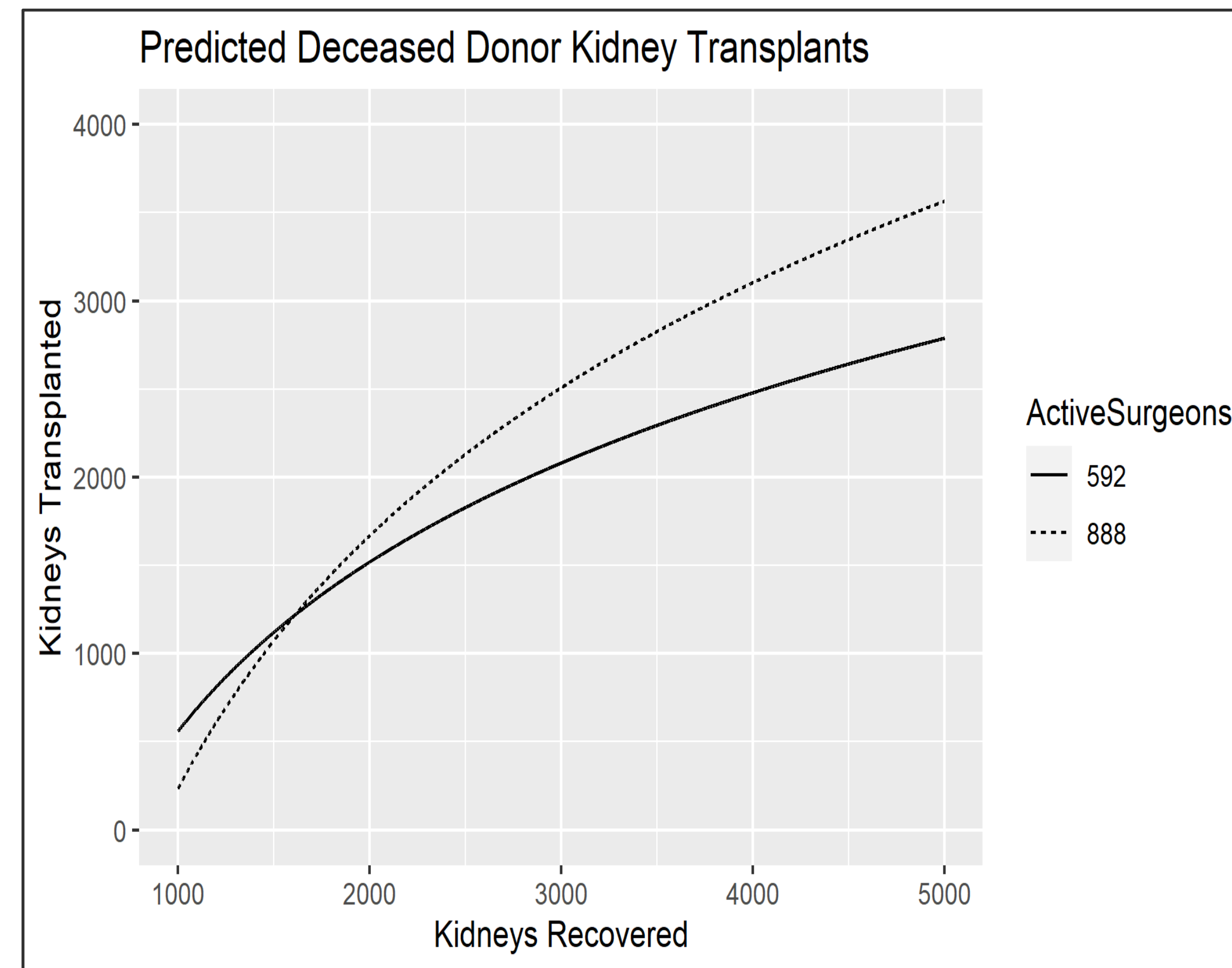
Introduction

- Concern and attention have increased for nonuse of kidneys recovered for transplant. The OPTN Expeditious Task Force recently set a bold aim of increasing total US transplants to 60,000 by 2026. This study presents a model of the relationship between kidneys transplanted and kidneys recovered and the size of the active surgical workforce. This model can be used to predict workforce needs to meet rising levels of kidneys recovered for transplant.

Methods

- Kidneys recovered for the purpose of transplant from January 1, 2010, through August 31, 2023, in the Scientific Registry of Transplant Recipients (SRTR) December 2023 dataset were considered. A linear regression model was fit with an outcome of kidneys transplanted each month and predictors: natural logarithm of kidneys recovered for purpose of transplant in that month, number of unique surgeons performing any kidney transplant in previous 30 days, mean kidney donor risk index (KDRI) of kidneys recovered in that month and mean cold ischemic time (CIT) of kidneys transplanted in that month, and 2-way interactions of natural logarithm of kidneys recovered for purpose of transplant in that month with number of unique surgeons and mean KDRI. This model was used to predict kidney transplants and nonuse as a function of the predictor variables.

Figure 1: Comparison of predicted kidneys transplanted as a function of kidneys recovered across two scenarios for the average number of active surgeons in a month.



Results

- The model explained 98.7% of the variation in the number of kidneys transplanted in a month. For the average monthly number of active surgeons, KDRI, CIT, and number of kidneys recovered in 2022, the model predicts 20,703 deceased donor kidney transplants, which compares well to the actual number of 20,446 transplants in 2022. The prediction of 20,703 transplants represents a nonuse rate of 25.7%. If all other predictors were held constant, but the average monthly number of kidneys recovered were increased from 2,321 to 3,000, the predicted yearly transplants is 24,966, representing a nonuse rate of 30.6%. However, if the average monthly number of active surgeons is also increased by 1.5 times (from 592 to 888), the predicted yearly transplants is 30,092, representing a nonuse rate of 16.4%.

Conclusions

- While our model predicts that transplants will increase with the number of organs recovered, we also predict that this increase will be limited by the size of the surgical workforce as well as the size of the general transplant workforce, for which data beyond the number of surgeons are not readily available. SRTR will produce tools that present estimates of how much the surgical workforce may need to increase to meet goals for transplant numbers and rates of nonuse.