

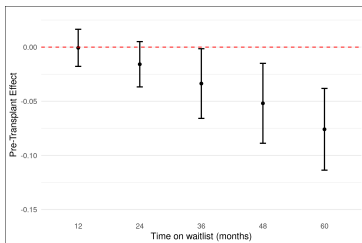
Response to Yulong Wang's discussion
Who Benefits from Higher Treatment Rates?

Stephen Kastoryano
(University of Reading)

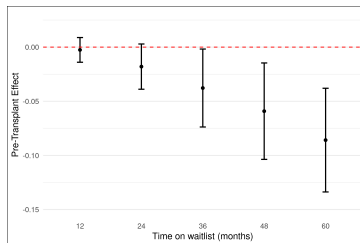
Annual Health Econometrics Workshop, 2026

Q1. LIVING DONORS

- ▶ Theoretically interesting: are people with certain observed or unobserved characteristics - which may themselves be correlated to unobserved health - more likely to seek out and find living donor matches? But selection effect unclear:
 - ▶ Assuming poorer people are simultaneously less healthy but with larger families, meaning they have more chances to find a living donor in their family, then censoring might lead to negative selection.
 - ▶ But perhaps richer people are more likely to partake in donor chains, then censoring might lead to positive selection?
- ▶ Empirical answer. Point estimates are quantitatively very similar:



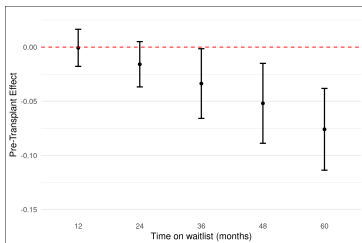
(a) main effect (Fig. 2c).



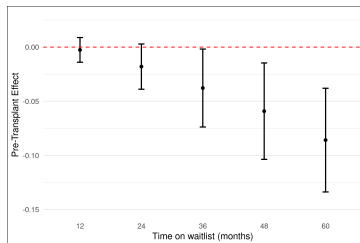
(b) With living donors (App. C Fig. A4b).

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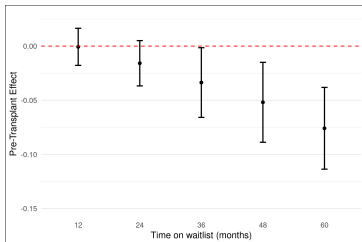
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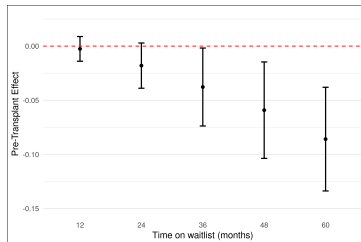
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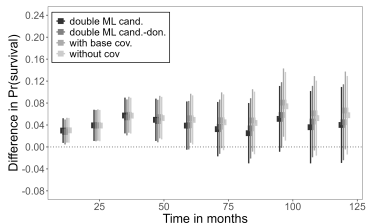
- ▶ Note: deceased donors are over seventy percent of U.S. kidney transplants.

Q2. SCALE OR SKEW

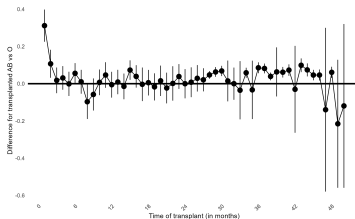
- ▶ Yulong's point. Transplanting more AB candidates under a common selection rule mechanically leaves a sicker remaining AB pool. True.

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- ▶ Yulong's point. Transplanting more AB candidates under a common selection rule mechanically leaves a sicker remaining AB pool. True.
- ▶ Direct test for skew. At matched short waitlist duration D , conditional on X :
 - ▶ Data: AB recipients at matched short D have higher post-transplant survival *and* higher functional ability than O. Wrong sign for scale-only.



(a) Survival for transplanted in months 1-3



(b) difference effect (Fig. 4d).

SETUP RECAP

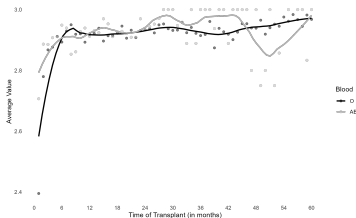
- ▶ A center has a waitlist of candidates of all blood types and health levels.
- ▶ For each candidate, compatible organ offers arrive at different rates. AB candidates see offers roughly twice as often as O candidates
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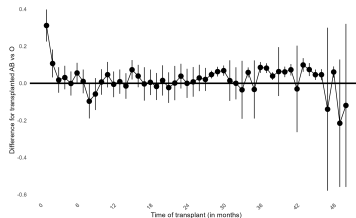
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- ▶ The center decides accept-or-wait on each offer, candidate by candidate, with the objective of maximising expected post-transplant survival.
- ▶ For each candidate, two things matter:
 - ▶ how sick they are (sick candidates can't afford to wait, they deteriorate fast)
 - ▶ how fast offers come in for them (more offers means the center can afford to pass on a mediocre match and wait for a better one).

FUNCTIONAL ABILITY OF ACCEPTED OFFER CANDIDATES

- ▶ Early transplants skew toward the sick because:
 - ▶ Sick candidates get transplanted early with whatever reasonable offer (marginal) comes along, because waiting is dangerous for them.
 - ▶ Center waits for healthy candidates with high tissue mismatches.



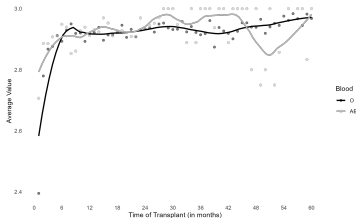
(a) Functional ability trend (Fig. 4c).



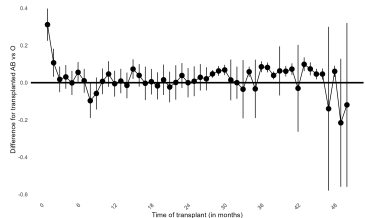
(b) difference effect (Fig. 4d).

FUNCTIONAL ABILITY OF ACCEPTED OFFER CANDIDATES

- ▶ AB-O gap in functional ability wider at early because:
 - ▶ Sick AB candidate: center accepts quickly, but has more offers to pick from, so accepts a better match.
 - ▶ Sick O candidate: center accepts quickly, but has fewer offers to pick from, so accepts a worse one.
 - ▶ Healthy AB candidate: a well-matched organ arrives faster, so more healthy AB are transplanted early.
 - ▶ Healthy O candidate: a well-matched organ arrives slower, so fewer healthy O are transplanted early



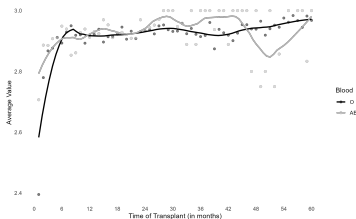
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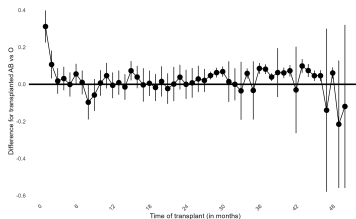
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FUNCTIONAL ABILITY OF ACCEPTED OFFER CANDIDATES

- ▶ Functional ability of candidates who accepted offers same for AB and O later on waitlist, and higher than early because:
 - ▶ O has relatively more healthy candidates remaining and relatively easier to match
 - ▶ AB has relatively fewer healthy candidates remaining but relatively higher rate of match for them
 - ▶ Functional ability does not go down over time because of constant new candidate inflow



(a) Functional ability trend (Fig. 4c).



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BUT CAN WE DO MORE ON SKEW ARGUMENT?

- ▶ All of the previous are consistent with a search-theoretic model with reservation-value acceptance decision by risk averse transplant centers
- ▶ The paper's Appendix G shows that applying the same reservation-value logic to candidates flips the sign (healthy would hold out longer for a better organ).

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- ▶ The paper's Appendix G shows that applying the same reservation-value logic to candidates flips the sign (healthy would hold out longer for a better organ).
- ▶ So even under a homogeneous institutional mechanism, reservation-based acceptance rule can change, so the scale effect can lead to a skew effect.
- ▶ To do empirical test: look at quality of accepted kidneys. Under no skew they should be distributed equally among AB and O candidates early on.

Q3. BUT ISN'T THIS ALL FINE?

- ▶ Not clear transplant centers should be making ethical decisions at scale. This task is, at least partly under the remit of the Organ Procurement and Transplantation Network (OPTN)

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- ▶ Not clear transplant centers should be making ethical decisions at scale. This task is, at least partly under the remit of the Organ Procurement and Transplantation Network (OPTN)
- ▶ Institutional trajectory: OPTN has been walking away from the pre-2023 regime:
 - ▶ Pre-July 2023: centers evaluated on one-year post-transplant risk-adjusted survival *only*.
 - ▶ July 2023: risk-adjusted offer-to-acceptance score added.
 - ▶ July 2024: pre-transplant waitlist-mortality score added.
- ▶ Both additions directly penalise behaviours we document (declining offers for lower-health candidates; concentrated waitlist mortality).