

The Rationale and Potential Benefit for Using Deceased Donors to Start KPD Chains

Nicole Turgeon, MD
Professor of Surgery
Emory University
Atlanta, GA



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Disclosure Information

Nicole A. Turgeon, MD

I have no financial relationships to disclose
I currently serve as Chair of the UNOS Kidney
Committee

SRTR Annual Report 2016

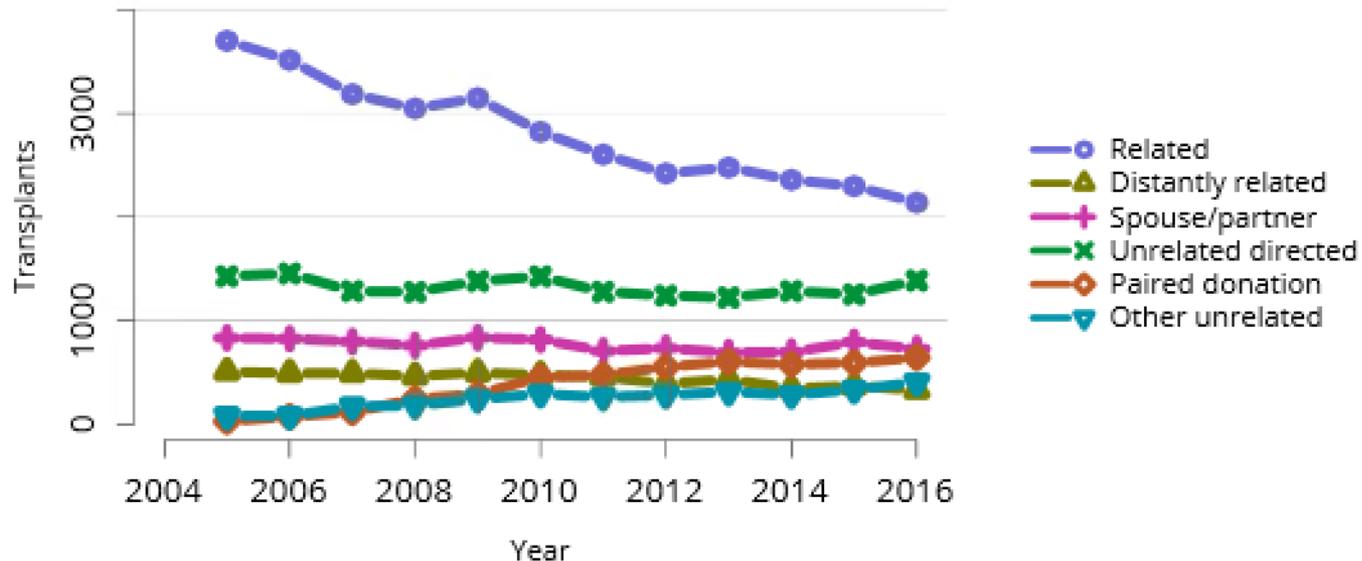


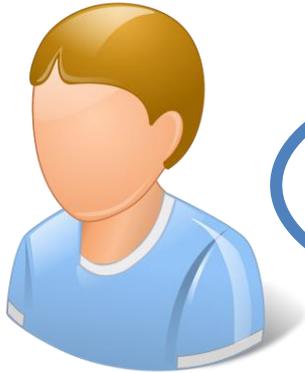
Figure KI 40. Kidney transplants from living donors by donor relation. As reported on the OPTN Living Donor Registration Form.

In the past decade PDE constitutes the fastest growing source of kidneys for transplantation

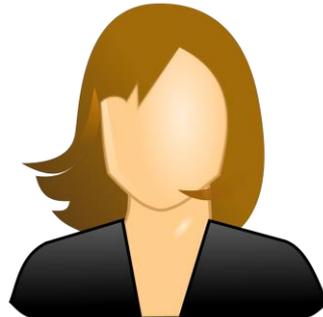
Deceased Donor Chains



Meet our KPD Pair



Candidate Carl
needs a kidney
transplant



His **Paired
Donor,
Dinah**, is
willing to
donate to
Carl, but is
not a match

Carl & Dinah's List Exchange

KPD Chain

Step by step

First...

Carl and Dinah **consent** to participate in a list exchange chain.

Dinah enters a KPD program and starts an exchange



The end of the exchange donates to the Waitlist or starts another exchange

Then...

After Dinah donates, Carl receives increased **priority** on the Waitlist

Carl is **offered** a deceased donor kidney

Carl accepts the kidney and is **transplanted**



Primum non nocere: avoiding harm to vulnerable wait list candidates in an indirect kidney exchange.

S A Zenios; E S Woodle; L F Ross

- modeled impact of list exchange
 - When living donor is “ABO” random, wait times for “O” wait list candidates increase by average of 0.8%, equating to 15 additional deaths per year
 - When transplant team influences selection of “O” living donors for those with multiple donors, indirect exchanges decrease mean waiting times for O recipients ($p=0.09$) (although impact on “African Americans is muted)
 - Decreased waiting time for the entire list by 6.2-15.6%
- Preferentially choose “O” donors if recipient has multiple willing donors

Donor Kidney Exchanges

Francis L. Delmonico^{a,*}, Paul E. Morrissey^a,
George S. Lipkowitz^b, Jeffrey S. Stoff^a,
Jonathan Himmelfarb^a, William Harmon^a,
Martha Pavlakis^a, Helen Mah^a, Jane Goguen^a,
Richard Luskin^a, Edgar Milford^a,
Giacomo Basadonna^a, Michael Chobanian^a,
Beth Bouthot^a, Marc Lorber^a
and Richard J. Rohrer^a

^a*New England Organ Bank, Newton, MA, USA*

^b*LifeChoice Donor Services, Windsor, CT, USA*

^{*}*Corresponding author: Francis L. Delmonico,
francis_delmonico@neob.org*

New England Experience – List Exchange (First 17)

- All recipients of DDKT were “O” blood type except for one
- Only one of the paired living donors were blood type “O” (therefore 16 “Os” were removed and only 1 was replaced)
- Argued that the effect was transient and that the bypassed wait list candidates typically waited only weeks to months longer than they would have for the deceased donor kidney

Utilizing List Exchange and Nondirected Donation through ‘Chain’ Paired Kidney Donations

A. E. Roth^a, T. Sönmez^b, M. U. Ünver^c
F. L. Delmonico^d and S. L. Saidman^{e,*}

^aHarvard University, Department of Economics,
Cambridge, Massachusetts and Harvard Business School,
Boston, Massachusetts, USA

^bBoston College, Department of Economics, Chestnut
Hill, Massachusetts, USA

^cUniversity of Pittsburgh, Department of Economics,
Pittsburgh, Pennsylvania, USA

^dNew England Organ Bank, Newton, Massachusetts,
USA

^eDepartment of Pathology, Massachusetts General
Hospital, Boston, Massachusetts, USA

*Corresponding author: Susan L. Saidman,
ssaidman@partners.org

Introduction

Live donors are an increasing source of kidney transplants. Usually live donations are directed, meaning there is a named intended recipient of a kidney donated by a relative, friend, or spouse. However, ABO blood incompatibility or a positive crossmatch prevents some of these intended transplants from being performed.

Recently, several kidney exchange or kidney paired donation (KPD) programs have been established (1–4). In a two-way KPD, two incompatible pairs exchange donor kidneys so one KPD-IR receives the kidney of the other KPD-D (5). Three-way exchanges, in which three pairs participate, can also be utilized. To expand the opportunity for KPD, optimal matching algorithms were designed to identify maxi-

Performed simulations using data derived from NEPKE and OPTN/SRTR recipient-donor distributions

- Blood type O List exchange donors and NDD result in highest number of transplants

First...

Carl & Dinah's Candidate- Driven KPD Chains *Step by step*

Carl and Dinah **consent** to participate in a deceased donor chain

Carl is **registered** on the Waitlist. He receives elevated **priority** due to the pair's willingness to participate in an chain

Carl receives a deceased donor kidney offer, he accepts, and is **transplanted**



Then...

After Carl is transplanted, Dinah's KPD program conducts a **match run** for her kidney



Dinah donates her kidney, **continuing** the deceased donor chain

The donor at the end of the chain **donates** to the Waitlist or bridges to continue the chain

Personal Viewpoint

Utilization of Deceased Donor Kidneys to Initiate Living Donor Chains

**M. L. Melcher¹, J. P. Roberts^{2,*},
A. B. Leichtman³, A. E. Roth⁴ and M. A. Rees^{5,6}**

¹*Surgery, Stanford University, Palo Alto, CA*

²*Surgery, University of California at San Francisco, San Francisco, CA*

³*Arbor Research Collaborative for Health, Ann Arbor, MI*

⁴*Economics, Stanford University, Stanford, CA*

⁵*Urology, University of Toledo Medical Center, Toledo, OH*

⁶*Alliance for Paired Donation, Perrysburg, OH*

*Corresponding author: John P. Roberts,
john.roberts@ucsf.edu

intended original recipients are matched with other pairs in similar circumstances to find combinations of transplants that allow the donors to fulfill their intention to donate and their original intended recipients to receive transplants from a different compatible LD (1). Nonsimultaneous extended altruistic donor (NEAD) chains of kidney transplants, initiated by a nondirected LD (NDLD), enabled further expansion of this practice because the availability of the NDLD's kidney without a designated recipient increases the number of potential matches (2,3). Donor and recipient chains, assembled by computer algorithms, lead to a remarkable number of kidney transplants and improve opportunities for difficult-to-

Reduce the deceased donor kidney waitlist and increase the quality of the donor pool

- DD kidney allocated to KPD recipient
- Incompatible donor donates in KPD program or to DD Waitlist

Carl & Dinah's **Donor-Driven** DD Chains

First

Carl and Dinah **consent** to participate in a KPD exchange

Then...

A deceased donor kidney is **redirected** from Waitlist allocation to a KPD program

Carl is **matched** with the deceased donor kidney, accepts the offer and is **transplanted**



Then

...

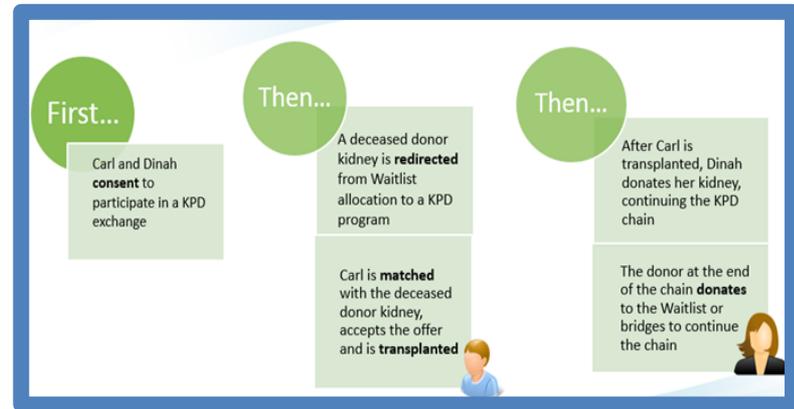
After Carl is transplanted, Dinah donates her kidney, continuing the KPD chain

The donor at the end of the chain **donates** to the Waitlist or bridges to continue the chain

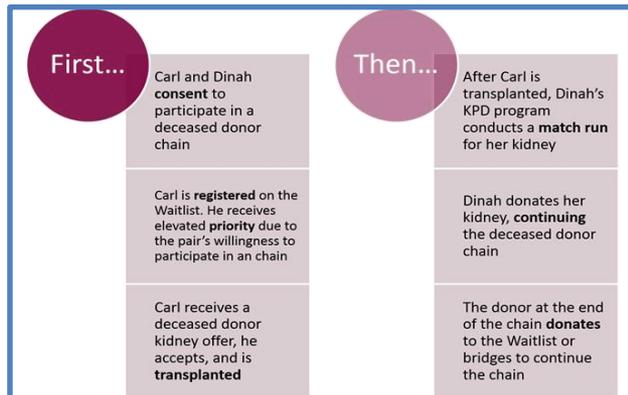


Weighing the Benefits & Challenges

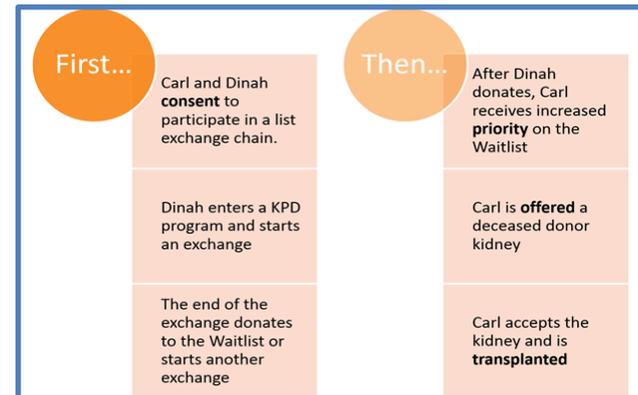
Donor Driven



Candidate Driven



List Exchange Chains



Current Landscape

- Blood type “O” recipients have longest waiting time for deceased donor kidneys
- Non-white ethnic minorities are less likely to have living donors
- Concern that many donor-recipient pairs are incompatible due to unfavorable blood type combination (A/B/AB donor with “O” recipient)
 - If “O” deceased donor organs are removed and not replaced with living donor “O” organs, then this already “worst off” group becomes further disadvantaged

Living Donors By Race

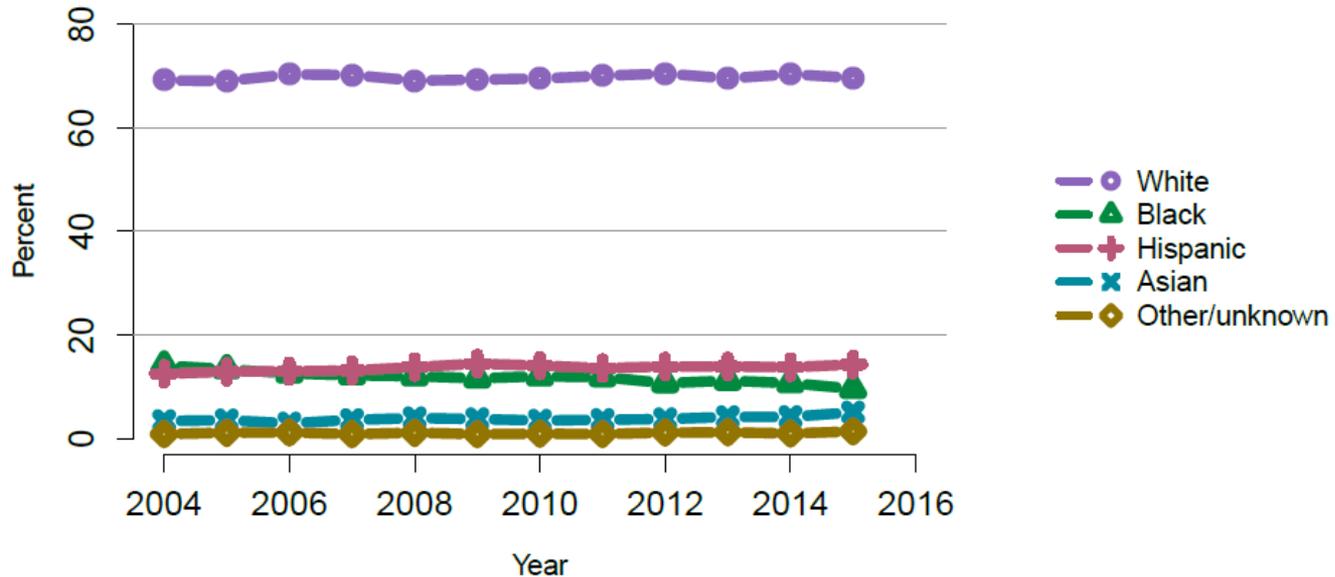


Figure KI 41. Living kidney donors by race. As reported on the OPTN Living Donor Registration Form.

Ethical Considerations

- **Equity/Access and Utility**

- Will this proposal disadvantage Blood Type “O” (and possibly “B”) candidates who don’t have living donors?
- Will this further reinforce existing disparities in access to transplantation for ethnic minority groups who are less likely to have living donors?
- Concerns that the living donor kidney that returns to wait list may be of lower quality than the deceased donor that was removed

Ethical Considerations

- Concerns about donor loss
- Bypasses allocation rules that were specifically designed for fair and equitable access to kidney transplantation
 - “Is it justifiable to be afforded improved access to deceased donor kidneys just because one has a donor?”
 - “Is it ethical for one person to move up the list above a more needy person just because that person has someone who cares enough (or is healthy enough) to give them an organ?”

Attitudes of Minority Patients with End-Stage Renal Disease Regarding ABO-Incompatible List-Paired Exchanges

P. D. Ackerman^a, J. R. Thistlethwaite, Jr^b
and L. F. Ross^{c,d,*}

^aLoyola University Stritch School of Medicine

^bDepartment of Surgery, Division of Transplantation,
University of Chicago

^cDepartment of Pediatrics, ^dMacLean Center for Clinical
Medical Ethics, University of Chicago, Maywood, IL

*Corresponding author: L. F. Ross, lross@uchicago.edu

Introduction

Living donor kidney paired exchanges involve two donor-recipient pairs in which Donor A cannot donate directly to Recipient A and Donor B cannot donate directly to Recipient B, but Donor A can donate to Recipient B and Donor B can donate to Recipient A. Despite heightened international interest in performing living donor kidney paired exchanges after the publication of a research protocol by Ross and colleagues in 1997 (1), active four-handed trans-

Rawlsian Egalitarian Theory of Justice

- Policies are morally acceptable if they benefit those who are already the worst-off (the most disadvantaged)
- Policies that don't benefit the least well off (or benefit the least well off less so than others) could be ethical only provided that the least well-off provide consent

Avoiding harm to the already “worst-off”

- Interviewed African American dialysis patients (n = 100) regarding ABO incompatible pairs undergoing list exchange
 - All expressed support for standard KPD
 - All supported ABO compatible list exchange

Avoiding harm to the already “worst-off”

- 59% supported ABO incompatible list exchange
- 50% of “O” candidates were not willing to have their wait time extended by any number of days
- 50% of other blood types were not willing to ask their blood type “O” peers to make a sacrifice to allow ABO incompatible exchanges
- All who objected asserted that blood type “O” candidates should not be asked to wait any longer than they already do

Conclusion: ABO incompatible list exchanges were not ethical because they are not supported (or do not benefit) the least well off

Public Comment

“The moral and legal requirement that UNOS take equity as well as efficiency (utility) into account in its policies should prohibit live-donor/deceased-donor swaps unless all on the deceased donor wait list are advantaged and the least advantaged approve or there is an acceptable cap on the number of days of predicted delay for organ receipt of the least well off”

Restricting Living-Donor–Cadaver-Donor Exchanges to Ensure that Standard Blood Type O Wait-List Candidates Benefit

Lainie Friedman Ross^{1,2,4} and Stefanos Zenios³

Region 1 of the United Network for Organ Sharing created a consortium that allows a person waiting for a kidney transplant to take a higher priority on the list when a relative makes a living donation to another waiting recipient. This can be done by exchanging kidneys between two living-donor–recipient pairs (living paired exchange) or by exchanging kidneys through a living-donor–cadaver-donor exchange (list paired exchange). In this article, the authors argue that a list paired exchange that allows ABO-incompatible donor-recipient pairs to participate is morally problematic because it harms standard blood type O wait-list candidates who already have the longest waiting times. We propose and model restrictions on who can participate in such exchanges to ensure that the standard blood type O wait-list candidates are made better off. We restrict list paired exchanges to (1) ABO-incompatibilities between living donors and recipients for potential recipients with blood types A, B, and AB; and (2) all recipients who have an ABO-compatible, positive-crossmatch living donor. Although these restrictions do not allow for the maximization of the number of organs potentially procured by means of list paired exchanges, they increase the number of kidneys available in an ethically fair manner.

Keywords: Kidney transplantation, Kidney exchanges, Paired exchanges, Living donors, Cadaver donors, Medical ethics.

(Transplantation 2004;78: 641–646)

Consider limiting to pairs with O donors or ABO compatible pairs with HLA incompatible donors

- Modeling revealed 5-16% decrease in waiting times for all blood groups including a decrease in blood group “O” waiting time (4.5-19.5% decrease)
- Estimated 414-1150 additional transplants that would be done (this was roughly half of the increase that would have been expected if no restrictions were placed)

Policy Considerations

- A UNOS strategic priority is to increase the number of transplants. The Final Rule dictates that equity must be considered and weighed
 - Will the impact of deceased donor chains be too small to justify potentially undermining equity?
 - How do we avoid disadvantaging the already disadvantaged?

Audience Polling

Are we as a transplant community ready for Deceased Donor Chains?

- Yes
- No
- Maybe
- Don't know

Audience Polling

How many transplants gained (utility) justifies disadvantaging certain groups (“O”s and minorities)?

- 0- Should not pursue
- 10
- 100
- 1000
- Don't know

Audience Polling

Do we need to ensure living donor kidney is “similar quality” to the deceased donor removed from the list?

- Yes
- No
- Maybe

Audience Polling

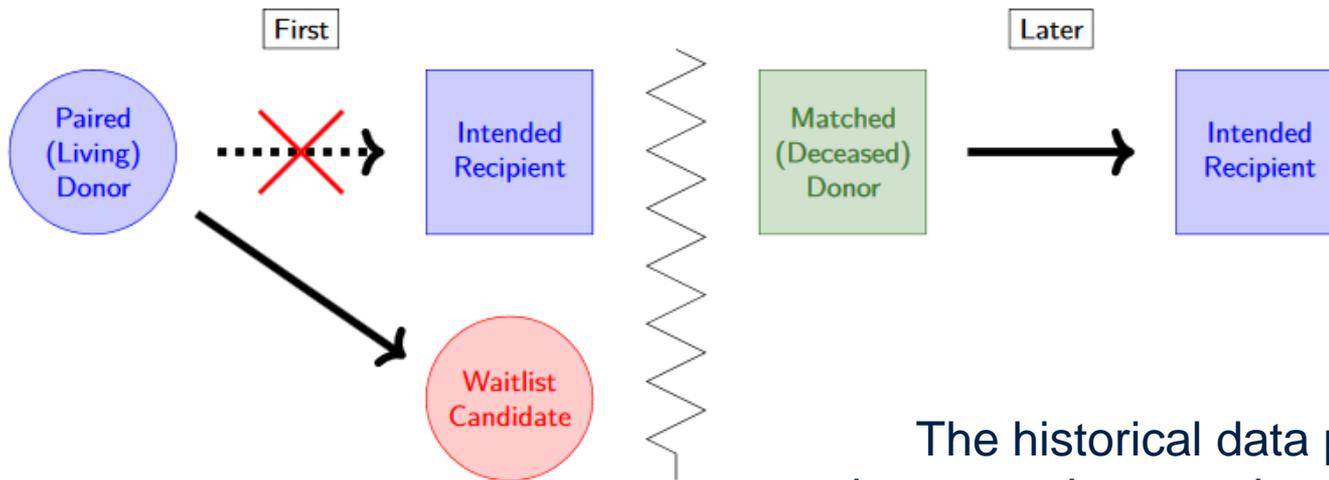
Do “O” candidates become “unlocked” through KPD, resulting in shorter wait times for “O” candidates without a living donor on the deceased donor list?

- Yes
- No
- Maybe
- Don't know

Thank You

Extras

UNOS List Exchange Data, 2001-2014

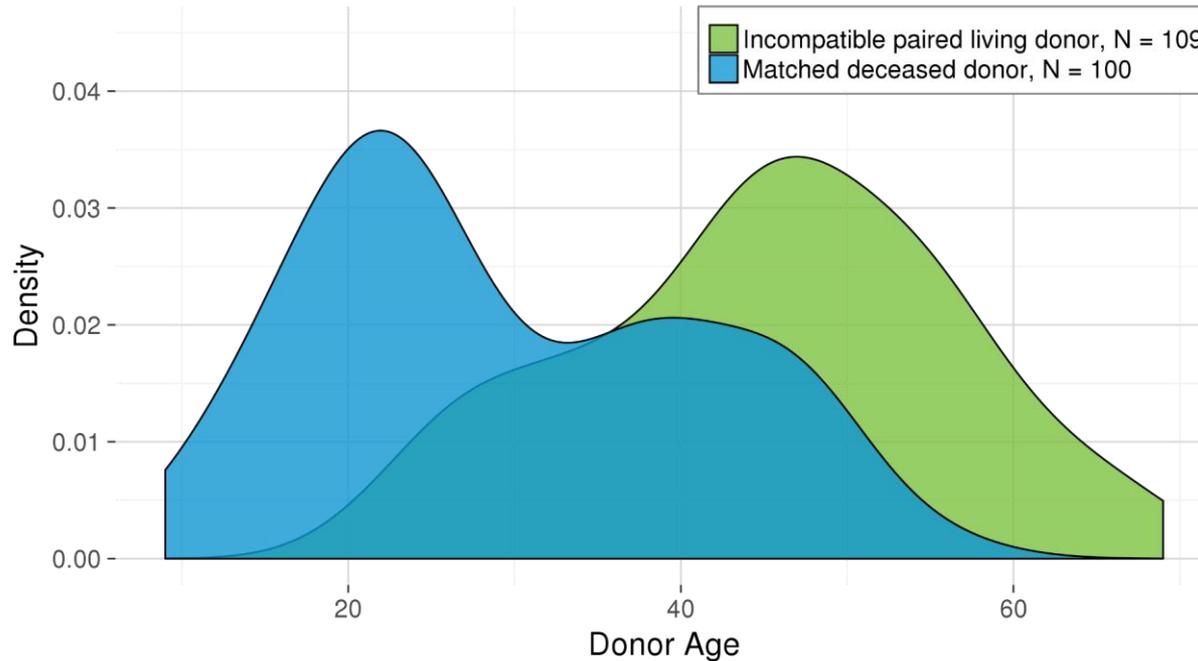


The historical data presented is for list exchange variances where the **paired living donor donated to a waitlist candidate.**

Some variances may have had a KPD exception allowing the paired living donor to donate to a KPD candidate, **but the data presented today focuses on deceased donor recipients.**

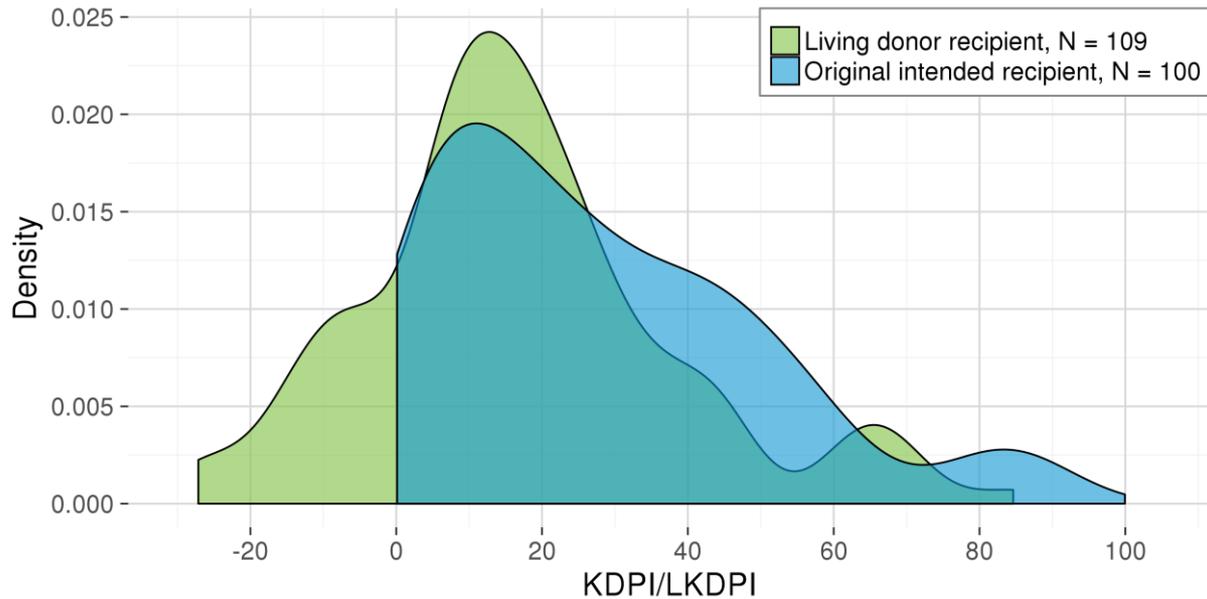
List Exchange Data, 2001 – 2014

Donor Age



List Exchange Data, 2001 – 2014

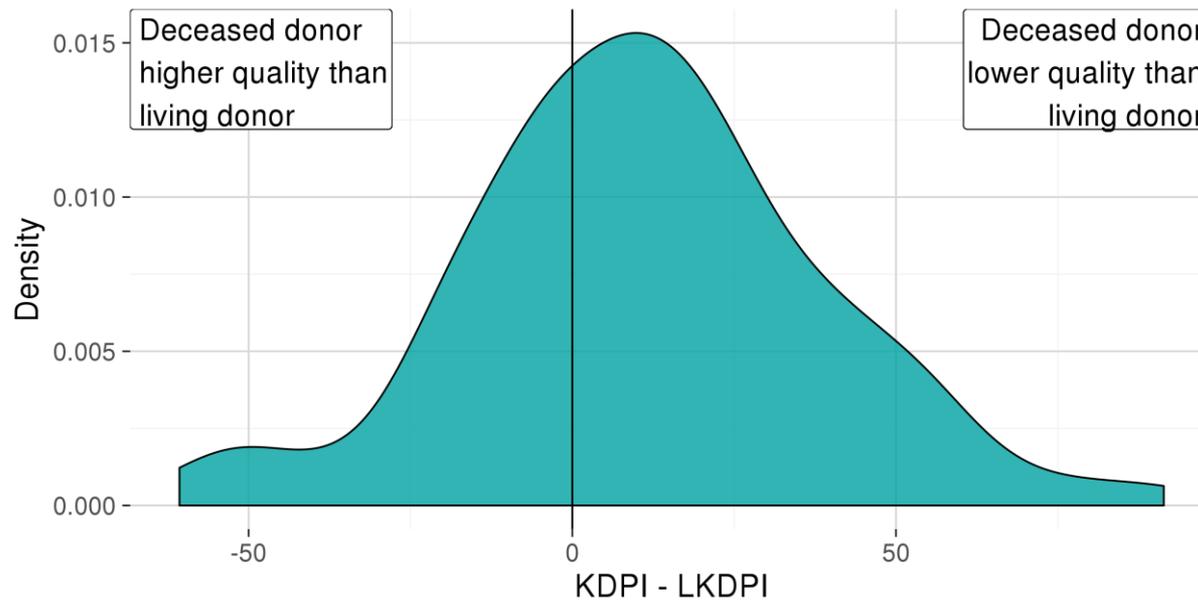
Donor LKDPI/KDPI



Note: LKDPI is calculated based on the specific recipient characteristics, including HLA mismatch

List Exchange Data, 2001 – 2014

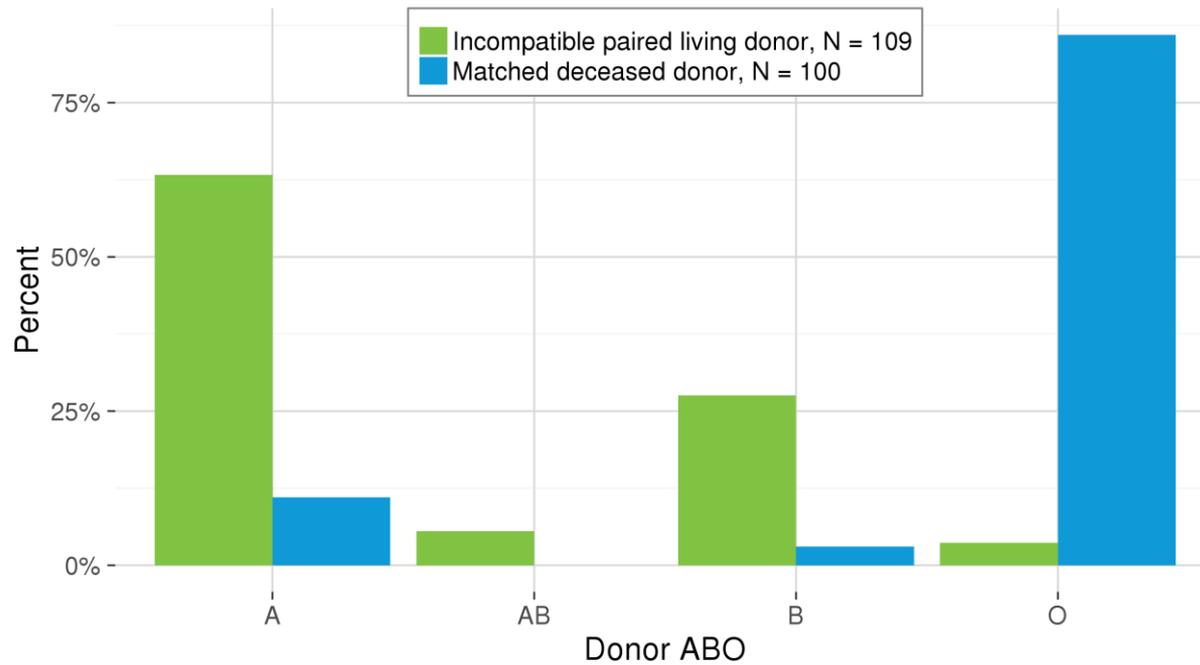
Donor LKDPI/KDPI



Note: LKDPI is calculated based on the specific recipient characteristics, including HLA mismatch

List Exchange Data, 2001 – 2014

Donor ABO



Outcomes (2001-2014)

- 102/109 (94%) of Original Intended Candidates received transplants through list exchange
 - 1 died
 - 1 switched to Kidney-Pancreas
 - 5 received transplants though lower allocation
- Median time to transplant nationally: 26 days
- Participation:
 - Region 1: 37%
 - Region 2: 11%
 - Region 5: 6%
 - Region 9: 6%
 - Region 11: 40%

Policy Considerations

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 - Will the impact of deceased donor chains be too small to justify potentially undermining equity?
 - How many transplants gained (utility) justifies disadvantaging certain groups (“O”s and minorities)?
 - How do we avoid disadvantaging the already disadvantaged?

Policy Considerations

- Do we need to ensure living donor kidney is “similar quality” to the deceased donor removed from the list?
- Do “O” candidates become “unlocked” through KPD resulting in shorter wait times for “O” candidates on the deceased donor list?