End-Stage Renal Disease Network Program

Considerations for the Utilization of High KDPI Kidneys

August, 5, 2020

Meeting Reminders:

- Please mute your phone when not speaking to avoid background noise
- Be present and engaged
- Be prepared for active participation and open discussion
- Please submit questions to “All Panelists” via the chat box
    - You may enter questions at any time during the program
    - Questions will be discussed during the scheduled Q&A session

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Transplant and Hepatobiliary Surgeon
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No Relevant Financial Disclosures

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Scope of the Problem

National Data

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National Trends

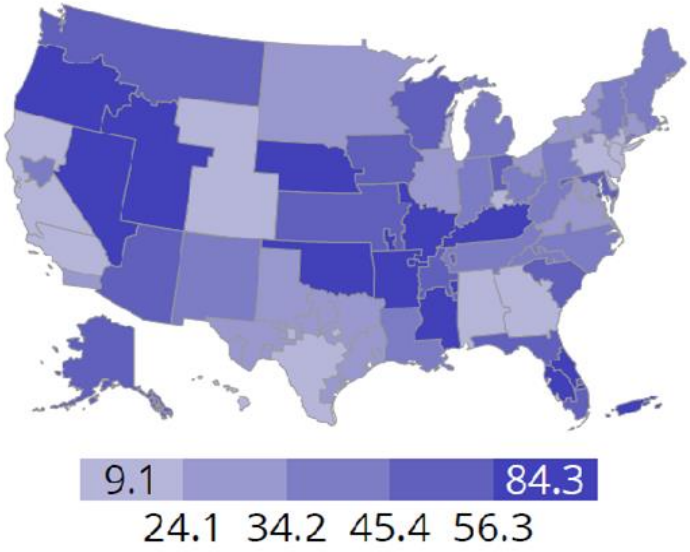

Figure KI 18. Percentage of adults who underwent deceased donor kidney transplant within 5 years of listing in 2011 by DSA. Candidates listed concurrently in a single DSA are counted once in that DSA, from the time of earliest listing to the time of latest removal; candidates listed in multiple DSAs are counted separately per DSA.

Hart A, et al. OPTN/SRTR 2016 Annual Data Report: Kidney. *Am J Transplant.* 2018 Jan;18 Suppl 1:18-113.

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National Trends

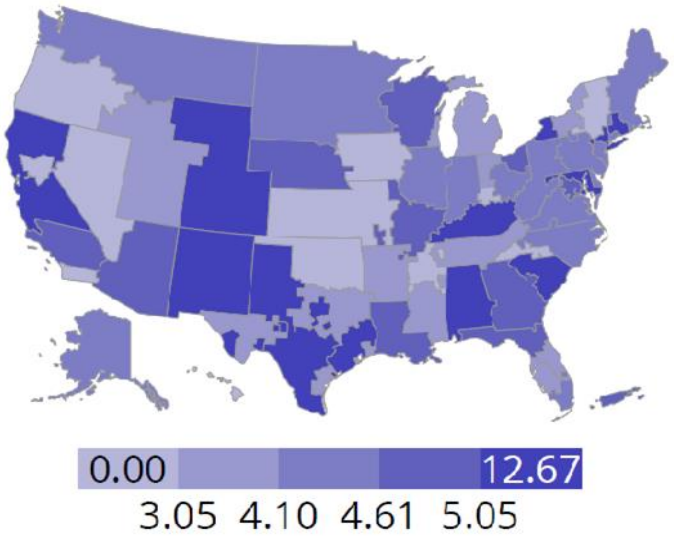

Figure KI 23. Pretransplant mortality rates among adults waitlisted for kidney transplant in 2016, by DSA. Mortality rates are computed as the number of deaths per 100 patient-years of waiting in the given year. Patients censored at waitlist removal. Individual listings are counted separately. Rates with less than 10 patient-years of exposure are not shown.

Hart A, et al. OPTN/SRTR 2016 Annual Data Report: Kidney. *Am J Transplant.* 2018 Jan;18 Suppl 1:18-113.

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National Trends

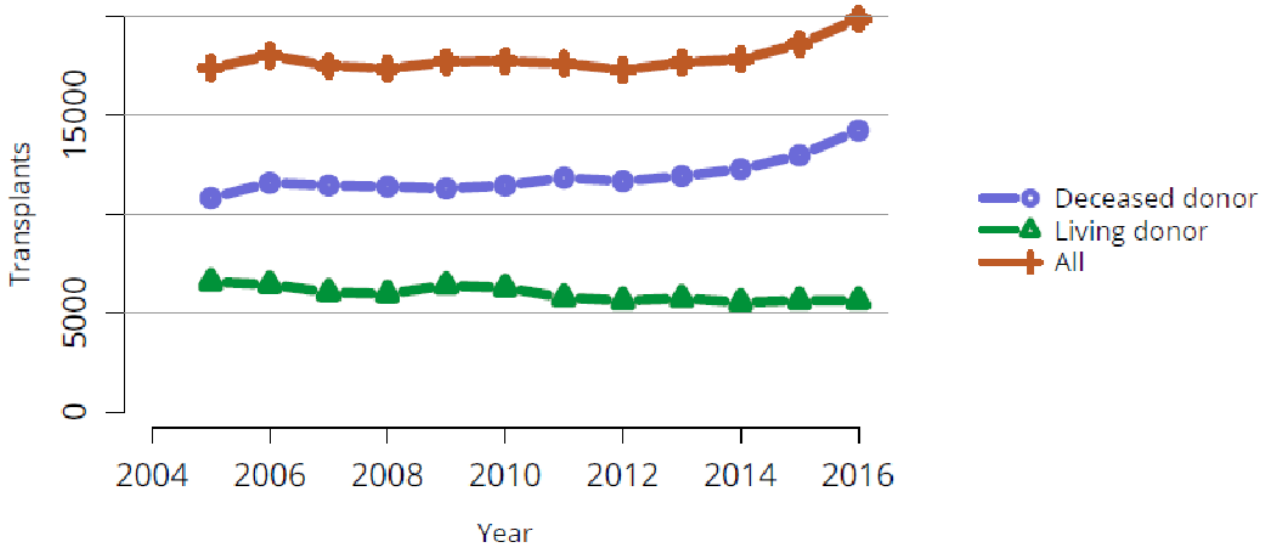

Figure KI 48. Total kidney transplants. All kidney transplant recipients, including adult and pediatric, retransplant, and multi-organ recipients.

Hart A, et al. OPTN/SRTR 2016 Annual Data Report: Kidney. *Am J Transplant.* 2018 Jan;18 Suppl 1:18-113.

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Historical Background

Kidney Allocation

December 23, 1954 – first kidney transplant at Brigham & Women's

Pre-1968 – Deceased donor kidneys allocated locally

1968 – Southeast Organ Procurement Foundation

1977 – SEOPF instituted United Network of Organ Sharing (computer-based matching)

1984 – UNOS separated from SEOPF; Congress passed the National Organ Transplant Act (Organ Procurement and Transplantation Network [regulatory body]).

1986 – UNOS and OPTN become 1 allocation and regulatory entity.

1999 – UNET (secure internet-based database system).

2000 – OPTN Final Rule to establish "equitable allocation of deceased donor organs among potential recipients".

Stegall MD, et al. Why do we have the kidney allocation system we have today? A history of the 2014 kidney allocation system. *Hum Immunol*. 2017 Jan;78(1):4-8.

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OPTN FINAL Rule

Roadmap for allocation policy and specified that allocation must be:

1. Based on sound medical judgment.
2. Seek to achieve best use of donated organs.
3. Designed to avoid wasting organs, avoid futile transplants.
4. Promote patient access to transplantation.

Stegall MD, et al. Why do we have the kidney allocation system we have today? A history of the 2014 kidney allocation system. *Hum Immunol*. 2017 Jan;78(1):4-8.

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Kidney Allocation System

Pre-KAS

1. Most allocation based on **wait time** (utility?).
    1. 20-yr old donors going to 70+ yr old recipients
2. Minority groups waited longer on wait list (justice? equity?).
3. Minority groups less likely to be referred for transplant – long periods of dialysis.
4. Regional variations in access.

Stegall MD, et al. Why do we have the kidney allocation system we have today? A history of the 2014 kidney allocation system. *Hum Immunol*. 2017 Jan;78(1):4-8.

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Kidney Allocation System

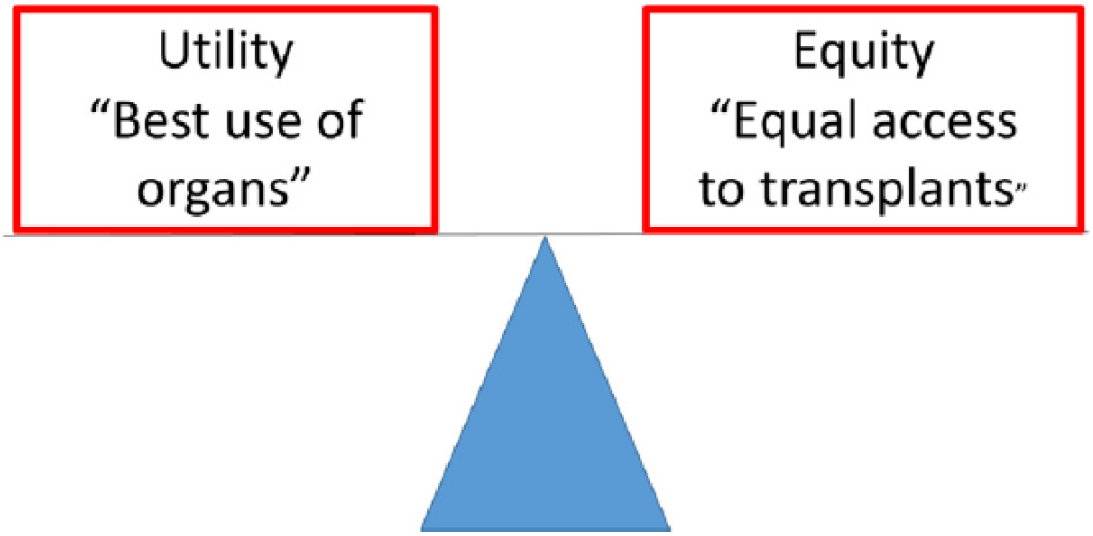

Fig. 1. Kidney allocation policy: Balancing utility and Equity.

Stegall MD, et al. Why do we have the kidney allocation system we have today? A history of the 2014 kidney allocation system. *Hum Immunol*. 2017 Jan;78(1):4-8.

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Kidney Allocation System

Standard Criteria vs Extended Criteria (binary)

Life years from Transplantation – how many more years gained from kidney transplantation

Kidney Donor Risk/Profile Index

Wait time calculation (based on initiation of dialysis or GFR)

Blood group preferences (A2, A2B to B candidates)

Elimination of the payback system

Estimated Post-Transplant Survival replaced LYFT

Age mismatch ±15 years

Highly-sensitized patients (>98% PRA)

Stegall MD, et al. Why do we have the kidney allocation system we have today? A history of the 2014 kidney allocation system. *Hum Immunol*. 2017 Jan;78(1):4-8.

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Ramifications of KAS

Highly-sensitized Patients

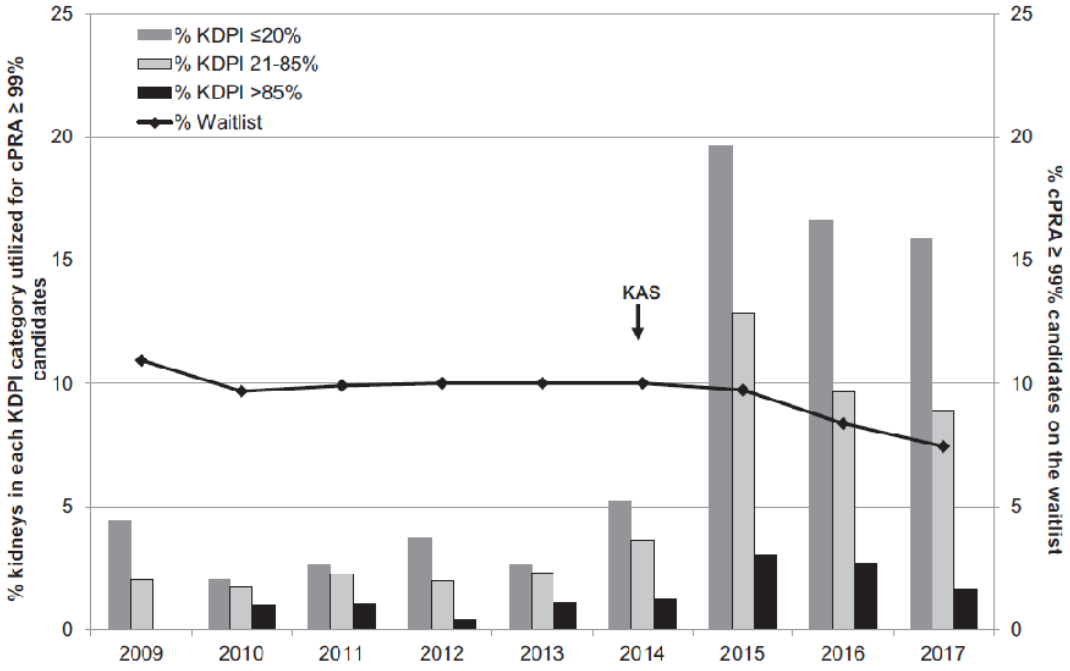

Figure 1. Percentage of kidneys in each kidney donor profile index (KDPI) category used for recipients with calculated panel-reactive antibody (cPRA) levels ≥ 99% compared to the representation of candidates with cPRA levels ≥ 99% on the waitlist. Waitlist percentage represents the percentage of the deceased donor waitlist comprising candidates with cPRA levels ≥ 99% on January 1 of each respective year. Calculations for column graph series are as shown for this example: [# of KDPI ≤ 20% kidneys used for cPRA ≥ 99% candidates/total # of KDPI ≤ 20% kidneys] × 100. Abbreviation: KAS, kidney allocation system.

Sethi S, et al Allocation of the Highest Quality Kidneys and Transplant Outcomes Under the New Kidney Allocation System. *Am J Kidney Dis*. 2019 May;73(5):605-614.

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Highly-sensitized Patients

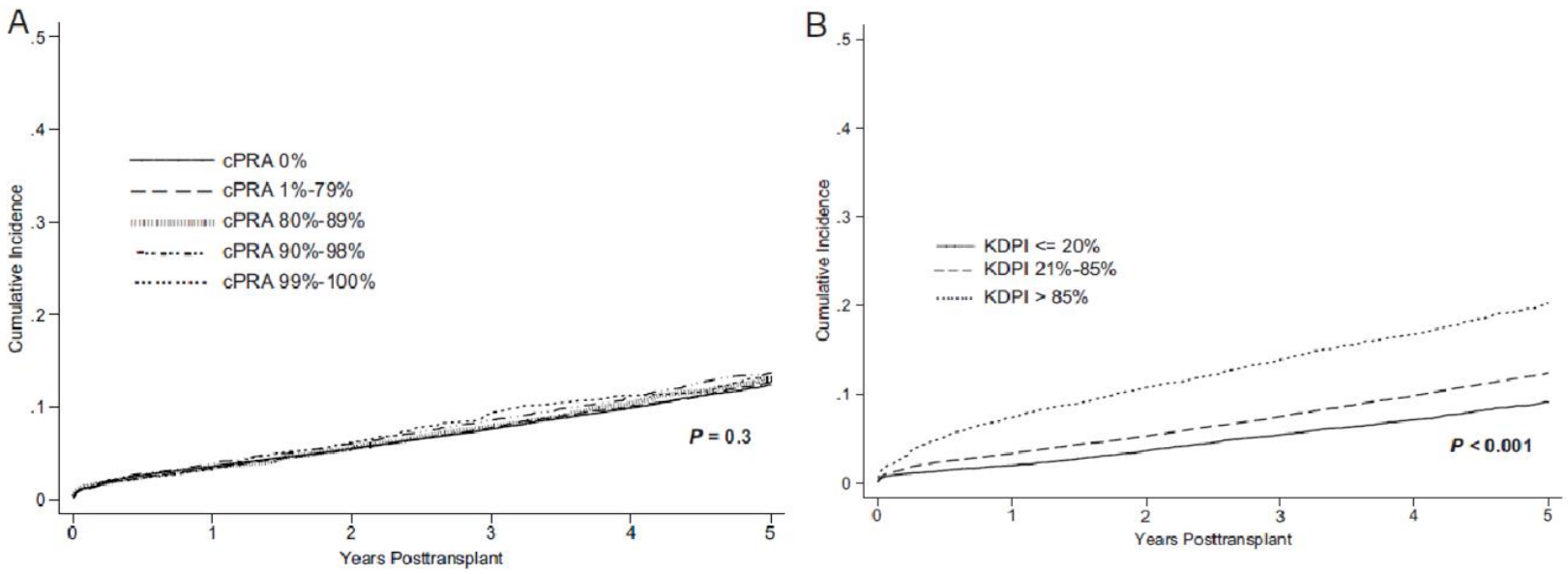

Figure 4. Cumulative incidence of kidney graft failure stratified by (A) calculated panel reactive antibody (cPRA) level and (B) kidney donor profile index (KDPI) score.

Sethi S, et al Allocation of the Highest Quality Kidneys and Transplant Outcomes Under the New Kidney Allocation System. *Am J Kidney Dis*. 2019 May;73(5):605-614.

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Access to DDKT post-KAS

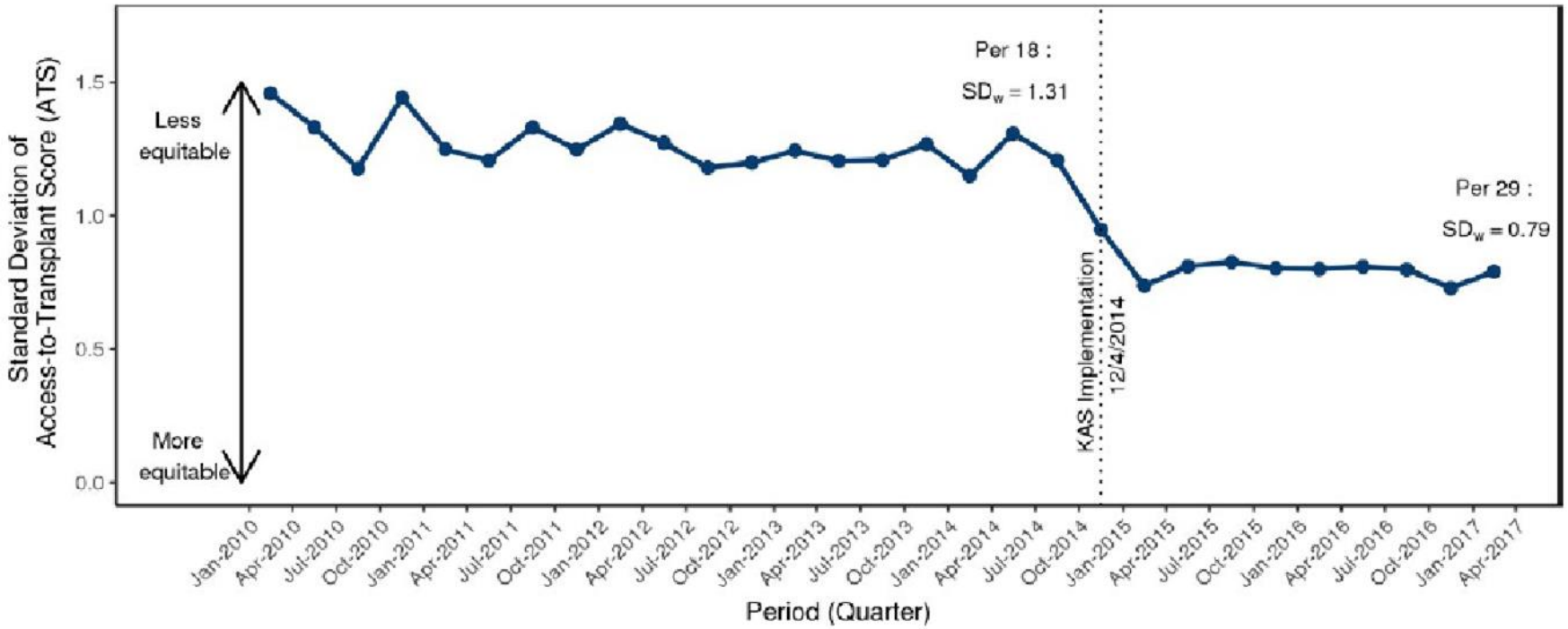

FIGURE 1 Access to transplant score (ATS) standard deviations (SD_w) by quarter, 2010-March 31, 2017. The Winsorized SD_w of ATS quantifies the degree of disparity in access to deceased donor transplantation among active kidney-alone waiting list candidates. High values are associated with greater disparities in access. Before the kidney allocation system (KAS), SD_w ranged between 1.15 and 1.46 but fell ≈40% with the new (KAS), suggesting improved equity

Stewart DE, et al. Measuring and monitoring equity in access to deceased donor kidney transplantation. *Am J Transplant*. 2018 Aug;18(8):1924-1935.

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Access to DDKT post-KAS

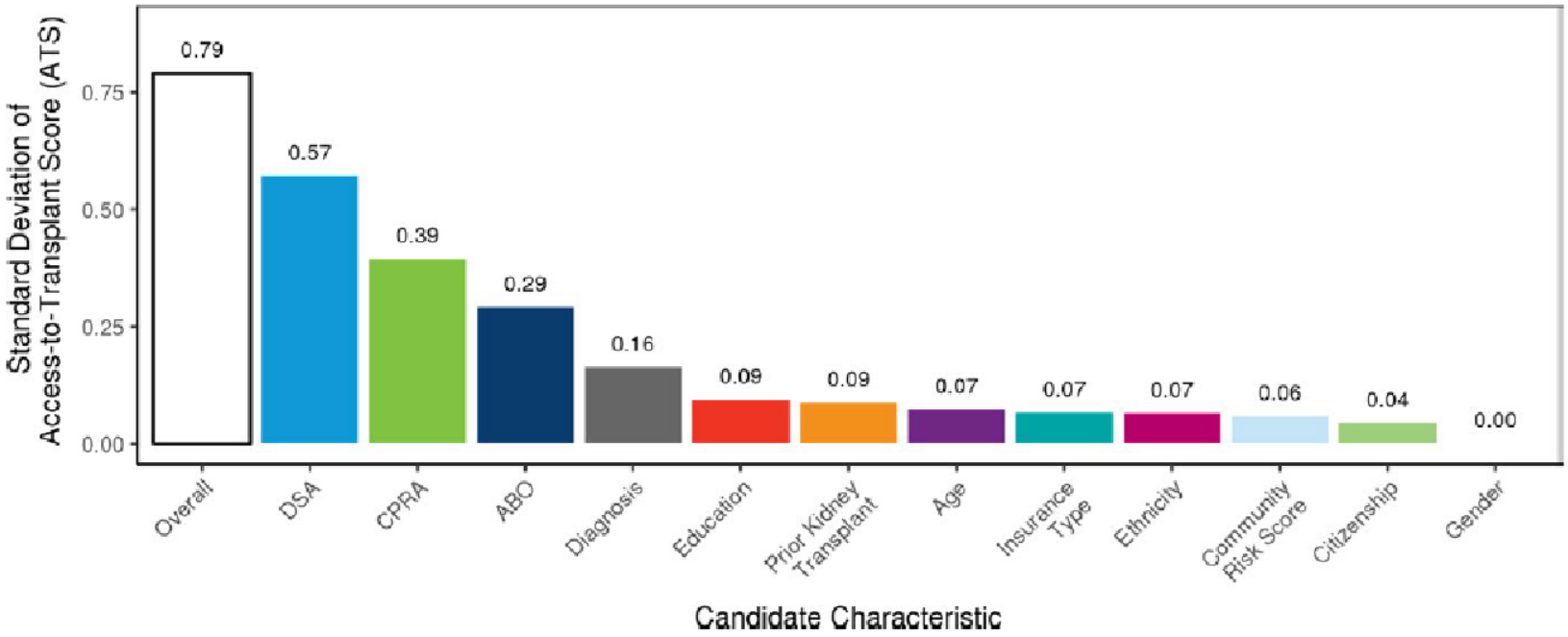

FIGURE 3 Comparison of factor-specific standard deviations (SD_w), January 1-March 31, 2017. For the most recent period, DSA of listing had the strongest association with disparities in access to deceased donor kidney transplantation, as reflected by the highest SD_w of 0.57. Candidate CPRA, blood type (ABO), and diagnosis had the next highest SD_w values. SD_w was <0.10 for all demographic and socioeconomic factors. CPRA, calculated panel-reactive antibody; DSA, donor service area

Stewart DE, et al. Measuring and monitoring equity in access to deceased donor kidney transplantation. *Am J Transplant*. 2018 Aug;18(8):1924-1935.

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Ethnic Minorities

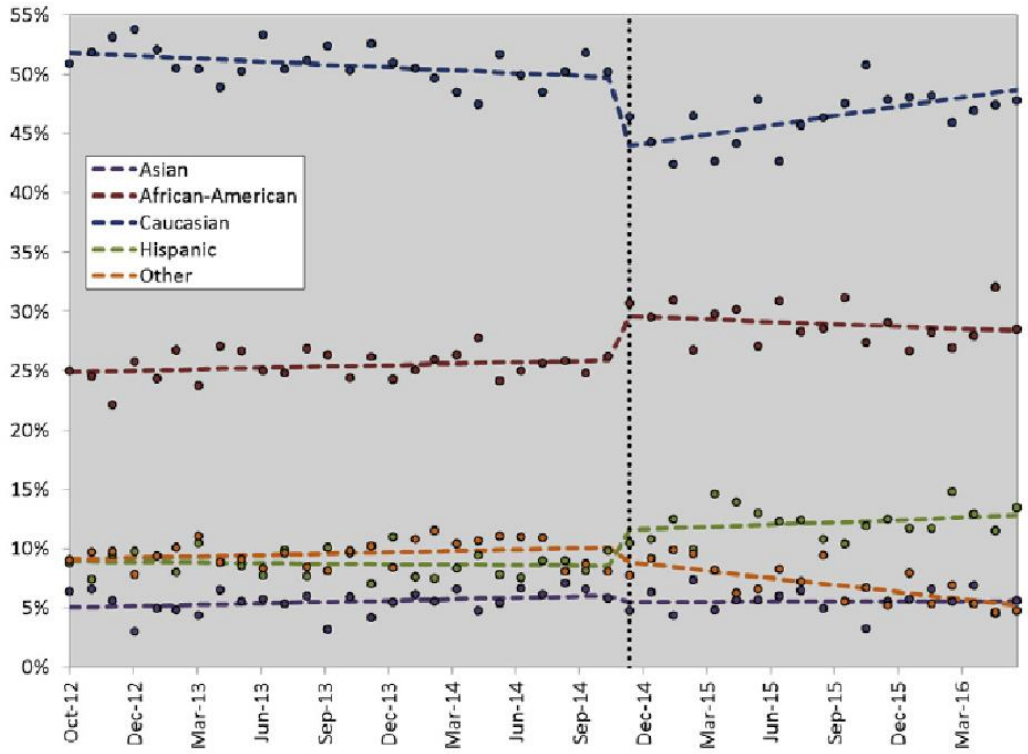

Figure 1. Estimated impact (using segmented regression) of kidney allocation system (KAS) on race and ethnicity composition for adult kidney transplant recipients over time. The dotted vertical line represents when KAS was implemented across the US; the dots represent data points and the horizontal dotted lines represent regression estimates.

Taber DJ, et al. Impact of the New Kidney Allocation System on Perioperative Outcomes and Costs in Kidney Transplantation. *J Am Coll Surg*. 2017 Apr;224(4):585-592.

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Cost

Table 4. Perioperative Costs Compared Pre- and Post-Kidney Allocation System

Cost	Pre-KAS (n = 21,450), mean ± SD	Post-KAS (n = 16,566), mean ± SD	p Value
Total costs, $	97,244 ± 2,561	106,503 ± 2,359	<0.001
Total direct costs, $	69,731 ± 1,751	76,334 ± 1,759	<0.001
Direct costs index	1.00 ± 0.02	1.10 ± 0.03	<0.001
Category, $			
Organ procurement	52,883 ± 1,273	57,446 ± 1,565	<0.001
Surgical	3,914 ± 155	4,372 ± 118	<0.001
Pharmacy	5,301 ± 311	5,954 ± 250	<0.001
Accommodations	4,330 ± 189	4,708 ± 180	<0.001
Laboratory	1,152 ± 44	1,214 ± 44	<0.001
Transfusion	1,083 ± 143	1,268 ± 156	<0.001
Medical/surgical supplies	1,266 ± 62	1,329 ± 74	<0.001
Imaging	275 ± 15	286 ± 10	<0.001

KAS, kidney allocation system.

Taber DJ, et al. Impact of the New Kidney Allocation System on Perioperative Outcomes and Costs in Kidney Transplantation. *J Am Coll Surg*. 2017 Apr;224(4):585-592.

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Cost

Longer CIT associated with increased rate of DGF (OR, 1.41) and increased LOS (OR, 1.04).

Recipients who developed DGF had longer LOS (OR, 1.71).

After adjusting for LOS, an increased LOS resulted in an increase in TRC by $3422 per additional day.

Effect of CIT on TRC is partially mediated through LOS.

Serrano OK, et al. The Relationships Between Cold Ischemia Time, Kidney Transplant Length of Stay, and Transplant-related Costs. *Transplantation*. 2019 Feb;103(2):401-411.

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Cost

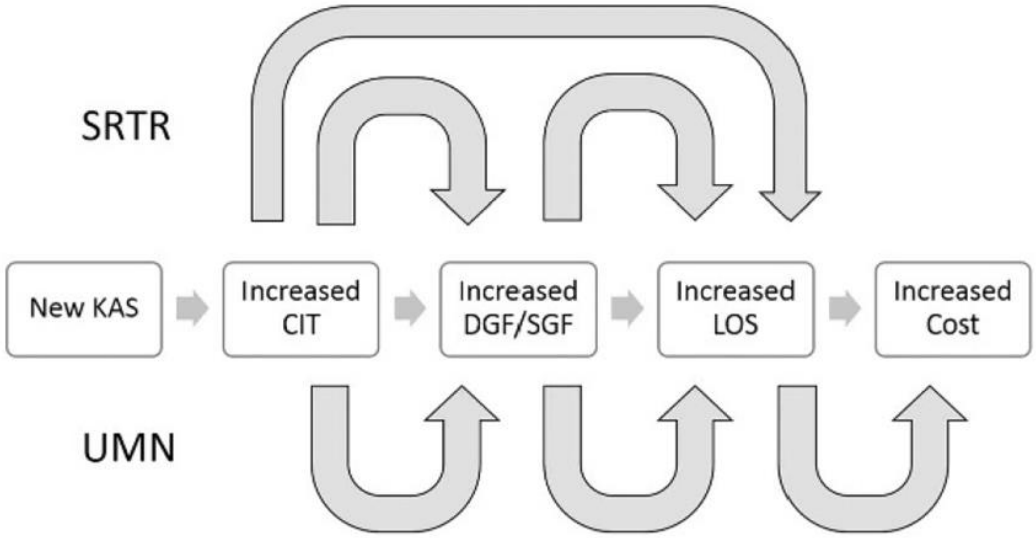

FIGURE 1. Schematic representation of the putative direct and indirect association of kidney allocation system (KAS), cold ischemia time (CIT), delayed graft function (DGF)/slow graft function (SGF), length of stay (LOS), and their impact on transplant-related cost. The arrows demonstrate points of statistical association and build a model demonstrating association of increased transplant-related cost and increased in CIT associated with the revised KAS. SRTR, Scientific Registry of Transplant Recipients; UMN, University of Minnesota.

Serrano OK, et al. The Relationships Between Cold Ischemia Time, Kidney Transplant Length of Stay, and Transplant-related Costs. *Transplantation*. 2019 Feb;103(2):401-411.

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Kidney Discard

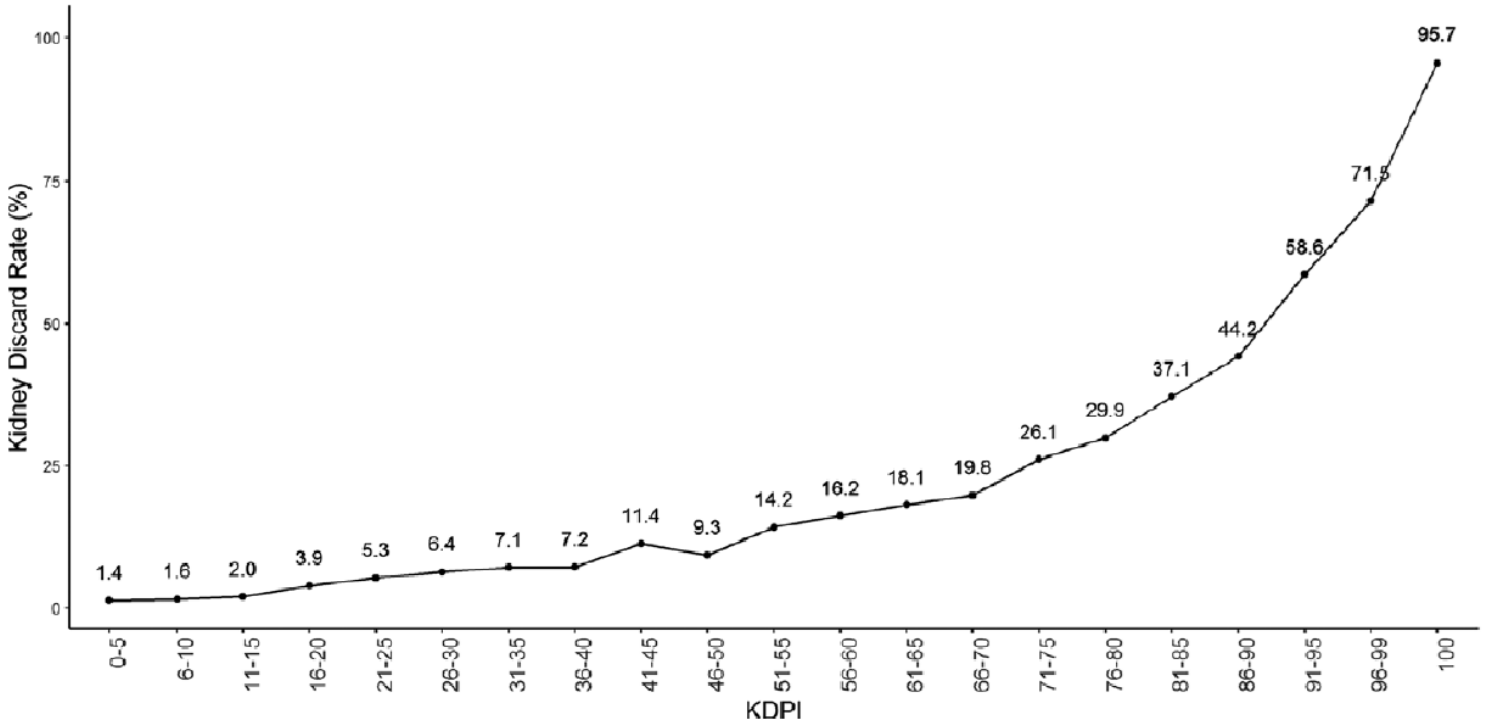

Figure 2: Relationship between the kidney discard rate and the Kidney Donor Profile Index (KDPI). As the KDPI increases, the percentage of recovered kidneys that are not transplanted (i.e. the discard rate) rises precipitously. Analyses are based on kidneys recovered for transplantation between December 4, 2014, and May 31, 2016, and for which KDPI was correctly calculated in DonorNet.

Stewart DE, et al. New Insights Into the Alleged Kidney Donor Profile Index Labeling Effect on Kidney Utilization. *Am J Transplant*. 2017 Oct;17(10):2696-2704

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Kidney Discard

1. 3% kidneys KDPI 0-20%; 60% KDPI >85%.
2. System level factors: cold ischemia time, increasing refusal number, nighttime offer (11.00 p.m. to 5.00 a.m.), absence of kidney photograph on DonorNet, and neither kidney placed at time of offer.
3. **18-19% procured kidneys are discarded.**

Sharma N, Mahajan A, Qazi YA. Marginal kidney transplantation: the road less traveled. *Curr Opin Organ Transplant.* 2019 Feb;24(1):92-96.

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Kidney Discard

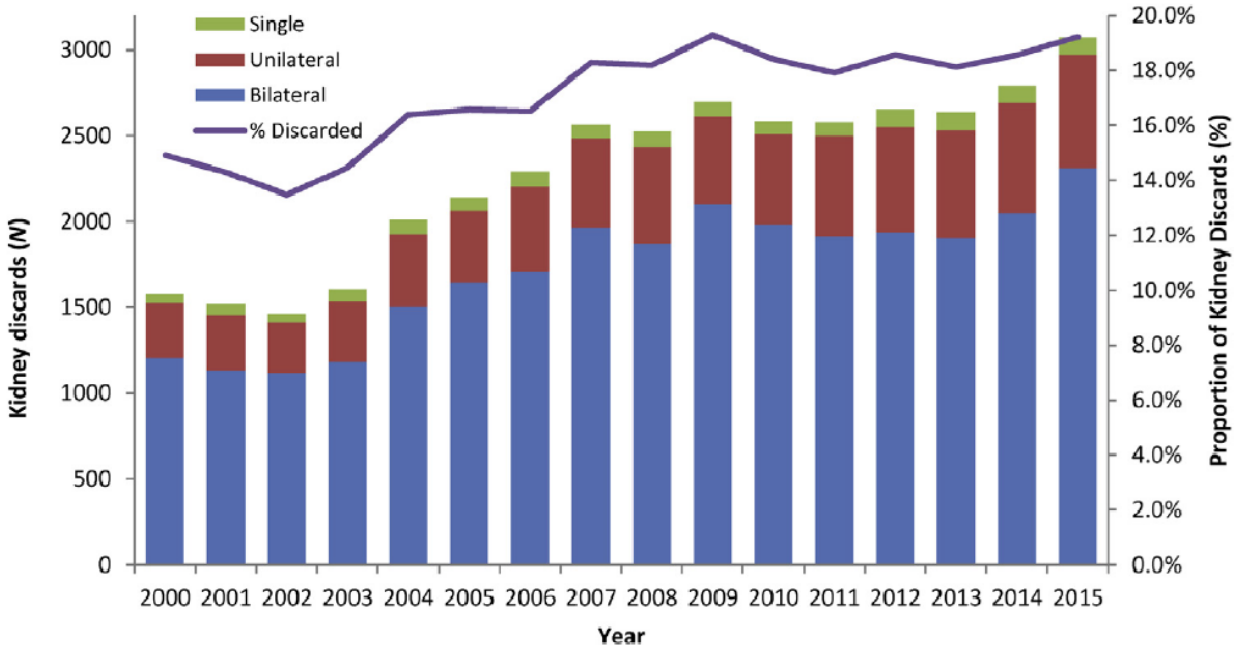

Figure 2 | The frequency, type (single, unilateral, or bilateral), and proportion of US deceased donor kidney discards stratified by year of procurement (n = 36,700), 2000 to 2015.

Mohan S, et al. Factors leading to the discard of deceased donor kidneys in the United States. *Kidney Int.* 2018 Jul;94(1):187-198.

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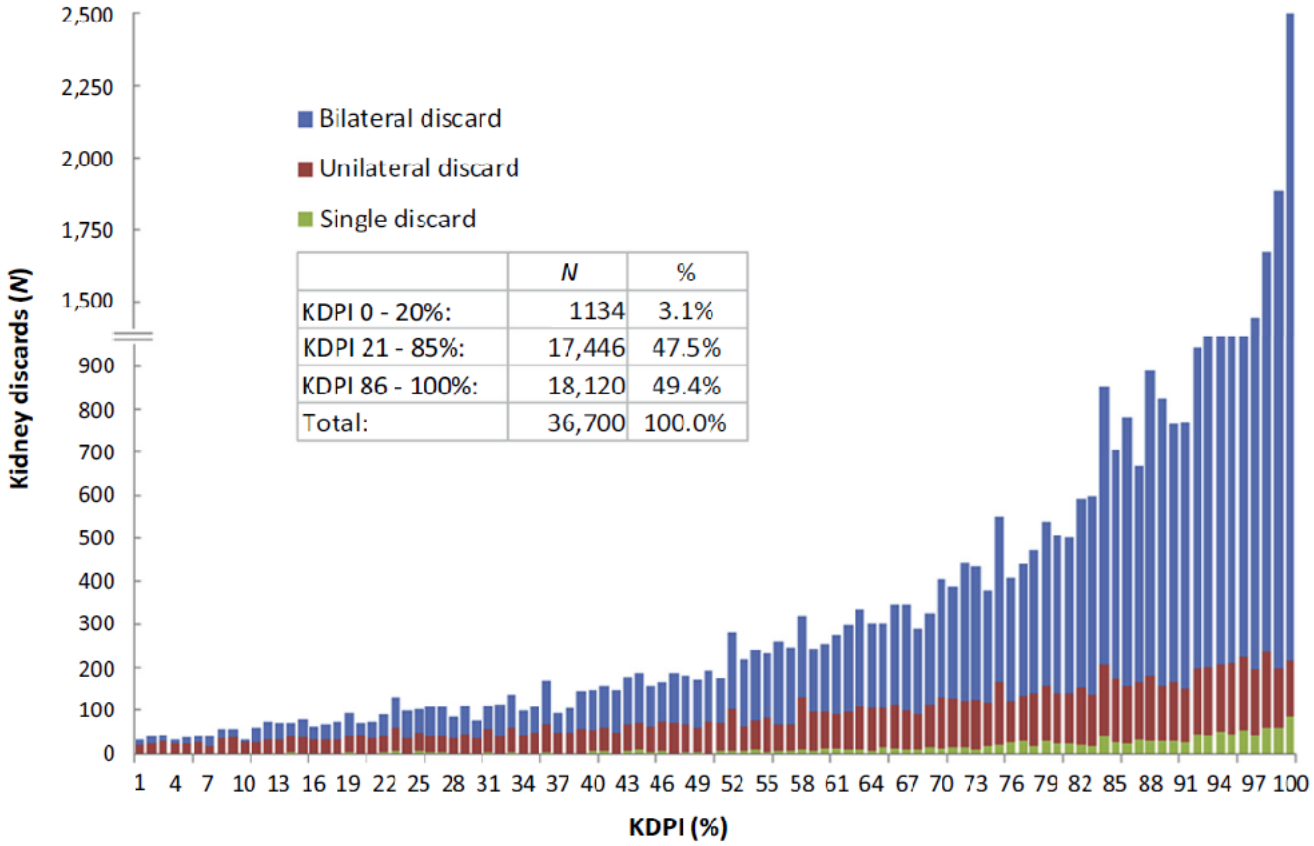
Kidney Discard



	N	%
KDPI 0 - 20%:	1134	3.1%
KDPI 21 - 85%:	17,446	47.5%
KDPI 86 - 100%:	18,120	49.4%
Total:	36,700	100.0%

Figure 4| US organ quality (Kidney Donor Profile Index [KDPI]) of deceased donor kidney discards stratified by discard type (*n* =36,700), 2000 to 2015.

Mohan S, et al. Factors leading to the discard of deceased donor kidneys in the United States. *Kidney Int.* 2018 Jul;94(1):187-198.

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Kidney Discard

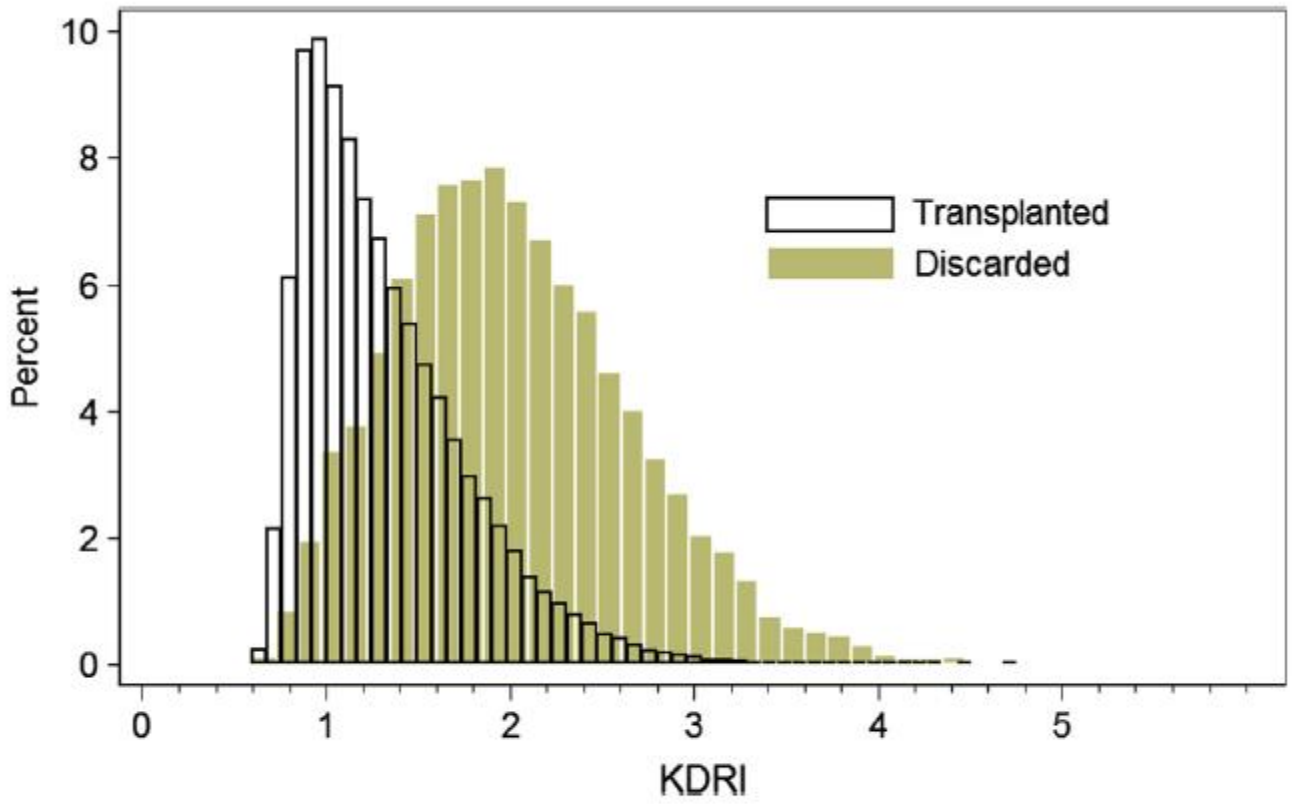

Figure 5 | Kidney Donor Risk Index (KDRI) overlap of transplanted and discarded kidneys recovered from 2000 to 2015.

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Mohan S, et al. Factors leading to the discard of deceased donor kidneys in the United States. *Kidney Int.* 2018 Jul;94(1):187-198.

Kidney Discard

Table 2 | Common causes of kidney discard by discard quality and type of organs procured in the US between 2000 and 2015 (*N* = 36,700)

	Extended ischemia	Organ damage	Anatomical abnormality	Poor function	Donor history	Biopsy findings	No recipient located	Other	
N (row %)	912 (2.5)	1333 (3.6)	2527 (6.9)	3534 (9.6)	3019 (8.2)	14,032 (38.2)	5368 (14.6)	5975 (16.3)	*P* value
Discard type									
Single	1.9	6.5	9.6	10.0	7.2	29.0	18.0	18.0	<0.001
Bilateral	1.8	1.6	5.2	9.8	8.8	43.7	15.1	14.1	
Unilateral	5.0	10.2	12.4	9.2	6.5	20.6	12.4	23.8	
Organ quality									
Median KDRI (IQR)	1.59 (0.61)	1.29 (0.71)	1.66 (0.75)	1.73 (0.73)	1.65 (0.74)	1.90 (0.72)	1.83 (0.74)	1.64 (0.75)	<0.001
Median KDPI (IQR)[a]	76.5 (32.5)	57 (54)	80 (37)	84 (31)	80 (35)	89 (22)	87 (25)	79 (36)	<0.001
Median terminal sCr (mg/dl) (IQR)	1.10 (0.70)	1.0 (0.70)	1.10 (0.70)	1.40 (1.34)	1.10 (0.80)	1.30 (0.90)	1.20 (0.98)	1.10 (0.90)	<0.001
Biopsy performed	2.3	1.8	4.9	9.3	5.8	46.4	15.8	13.9	<0.001
Discarded locally									
Yes	2.0	3.8	7.2	9.0	9.8	37.2	17.2	14.0	<0.001
No	4.4	3.5	6.4	11.5	5.0	43.8	3.7	21.7	
Unknown	2.0	3.2	6.4	9.8	6.3	34.8	19.4	18.2	

IQR, interquartile range; KDPI, Kidney Donor Profile Index; KDRI, Kidney Donor Risk Index; sCr, serum creatinine; UNOS, United Network of Organ Sharing.
[a]KDPI is calculated based on a scaling factor of 1.2175005163, a median KDRI value among all deceased donor kidneys procured during 2015.

Mohan S, et al. Factors leading to the discard of deceased donor kidneys in the United States. *Kidney Int.* 2018 Jul;94(1):187-198.

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Kidney Discard

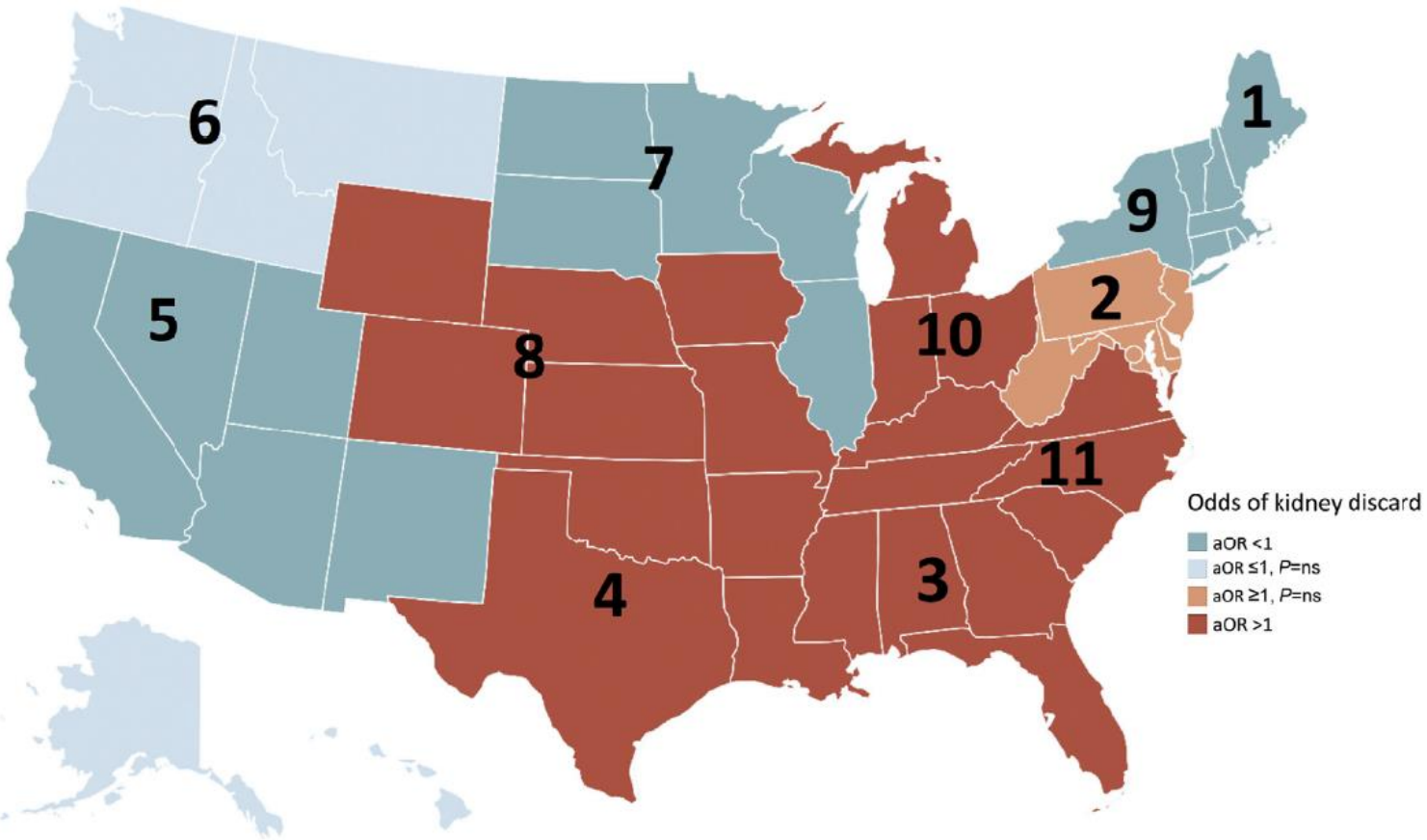

Figure 6| The adjusted odds ratio (aOR) of discard by United Network for Organ Sharing region, 2000 to 2015.

Mohan S, et al. Factors leading to the discard of deceased donor kidneys in the United States. *Kidney Int.* 2018 Jul;94(1):187-198.

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KDPI Criticism

1. Developed in USA
2. Any midsized Caucasian donor >63 y.o. without any known comorbidities will present with a KDPI >85%.
    1. In Europe, 32.4% of donors in 2015 were >70 y.o.; only 46.8% were <60 y.o.
3. Adequate for GFR prediction.
4. Does not provide any additive discrimination above donor age alone in terms of graft failure prediction.

Stallone G, Grandaliano G. To discard or not to discard: transplantation and the art of scoring. *Clin Kidney J.* 2019 Apr 16;12(4):564-568.

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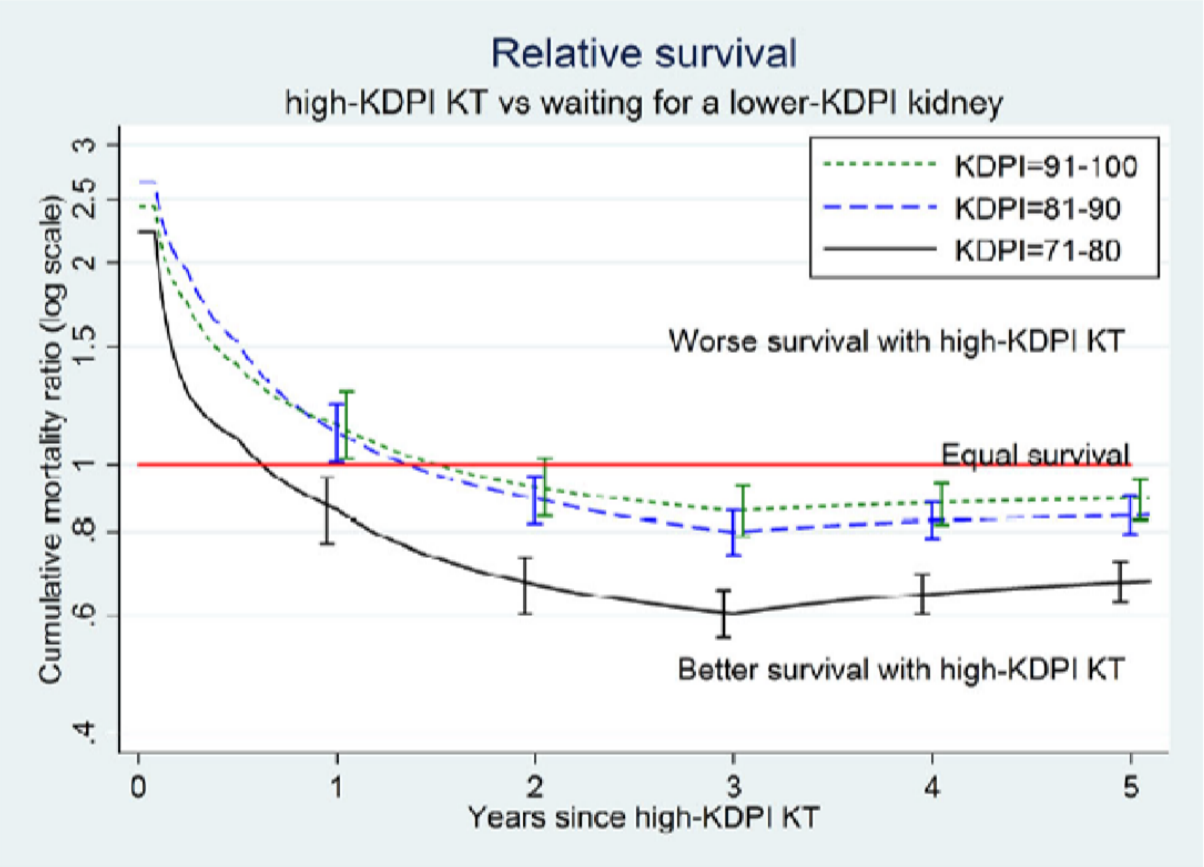
High KDPI (>85%) Kidneys

Survival Benefit of High KDPI Kidney



Massie AB, et al. Survival benefit of primary deceased donor transplantation with high-KDPI kidneys. *Am J Transplant.* 2014 Oct;14(10):2310-6.

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Survival Benefit of in >60 y.o.

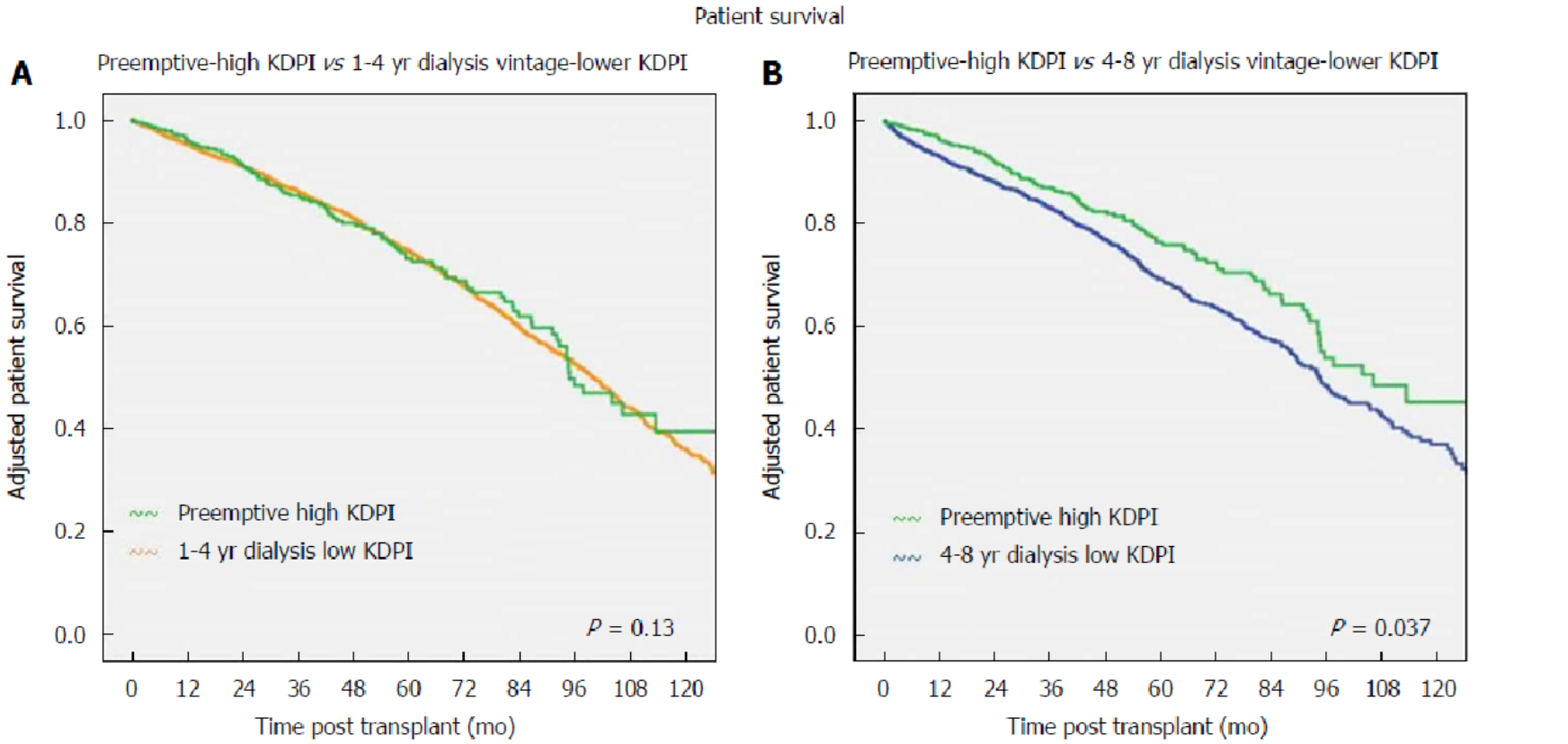

Figure 2 Adjusted patient survival. A: Patient survival for recipients of preemptive-high KDPI kidneys compared to 1-4 years dialysis vintage-lower KDPI kidneys; B: Patient survival for recipients of preemptive-high KDPI kidneys compared to 4-8 years dialysis vintage-lower KDPI kidneys. KDPI: Kidney donor profile index.

Chopra B, et al. Kidney transplantation in older recipients: Preemptive high KDPI kidney vs lower KDPI kidney after varying dialysis vintage. *World J Transplant*. 2018 Aug 9;8(4):102-109.

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Survival Benefit of in >60 y.o.

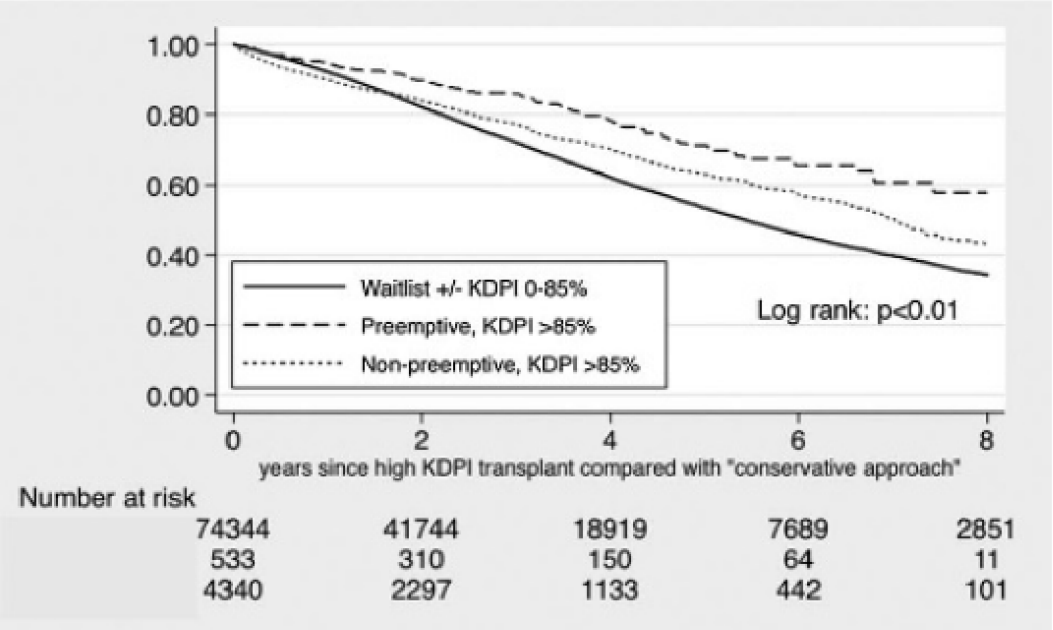

FIGURE 1. Patient survival for preemptive and non-preemptive KDPI > 85% kidney transplant compared with waitlist including KDPI 0 to 85% transplantation in patients > 60 years old.

Jay CL, et al. Survival Benefit in Older Patients Associated With Earlier Transplant With High KDPI Kidneys. *Transplantation*. 2017 Apr;101(4):867-872.

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Survival Benefit of in >50 y.o.

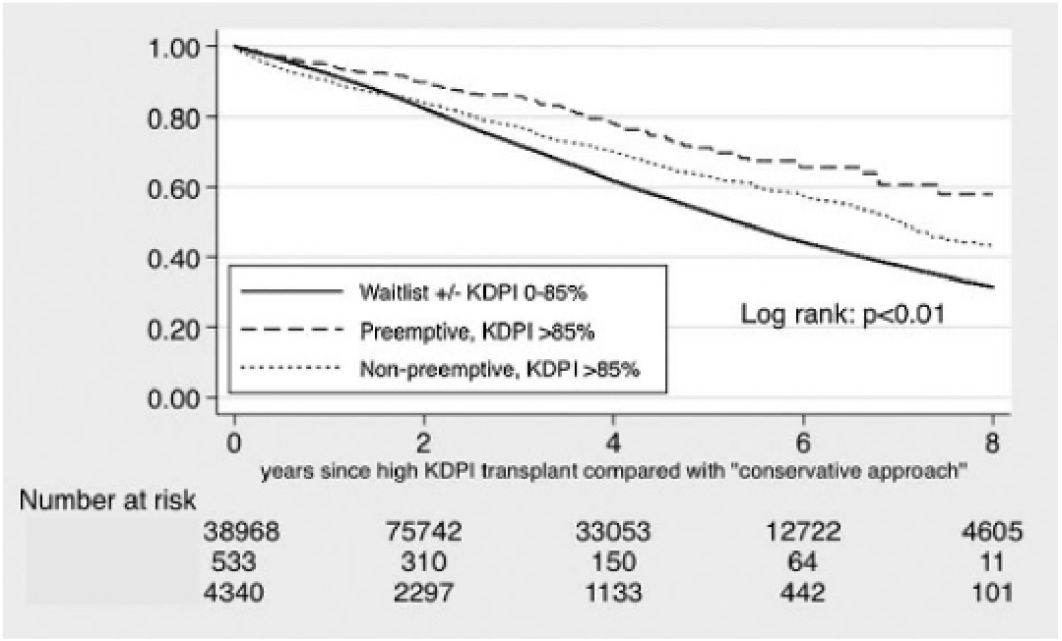

FIGURE 3. Patient survival for preemptive and non-preemptive KDPI > 85% kidney transplant compared with waitlist including KDPI 0 to 85% transplantation in patients > 50 years old.

Jay CL, et al. Survival Benefit in Older Patients Associated With Earlier Transplant With High KDPI Kidneys. *Transplantation*. 2017 Apr;101(4):867-872.

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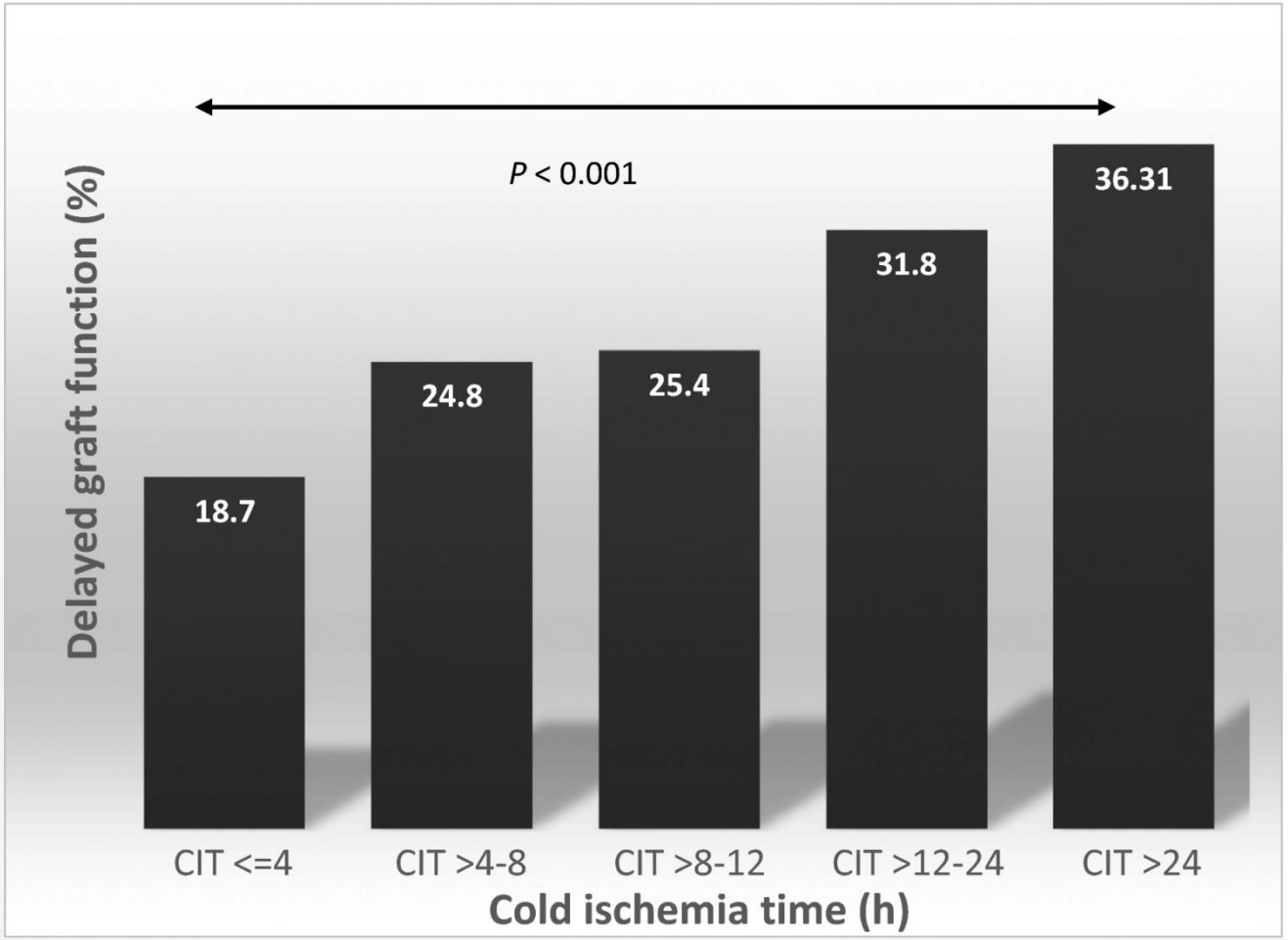
Kidney Mate Analysis: Cold Ischemia Time



Incidence of delayed graft function among 7402 mate kidneys with Kidney Donor Profile Index ≥85%.

Sampaio MS, et al. Impact of cold ischemia time on the outcomes of kidneys with Kidney Donor Profile Index ≥85%: mate kidney analysis - a retrospective study. *Transpl Int.* 2018 Jul;31(7):729-738.

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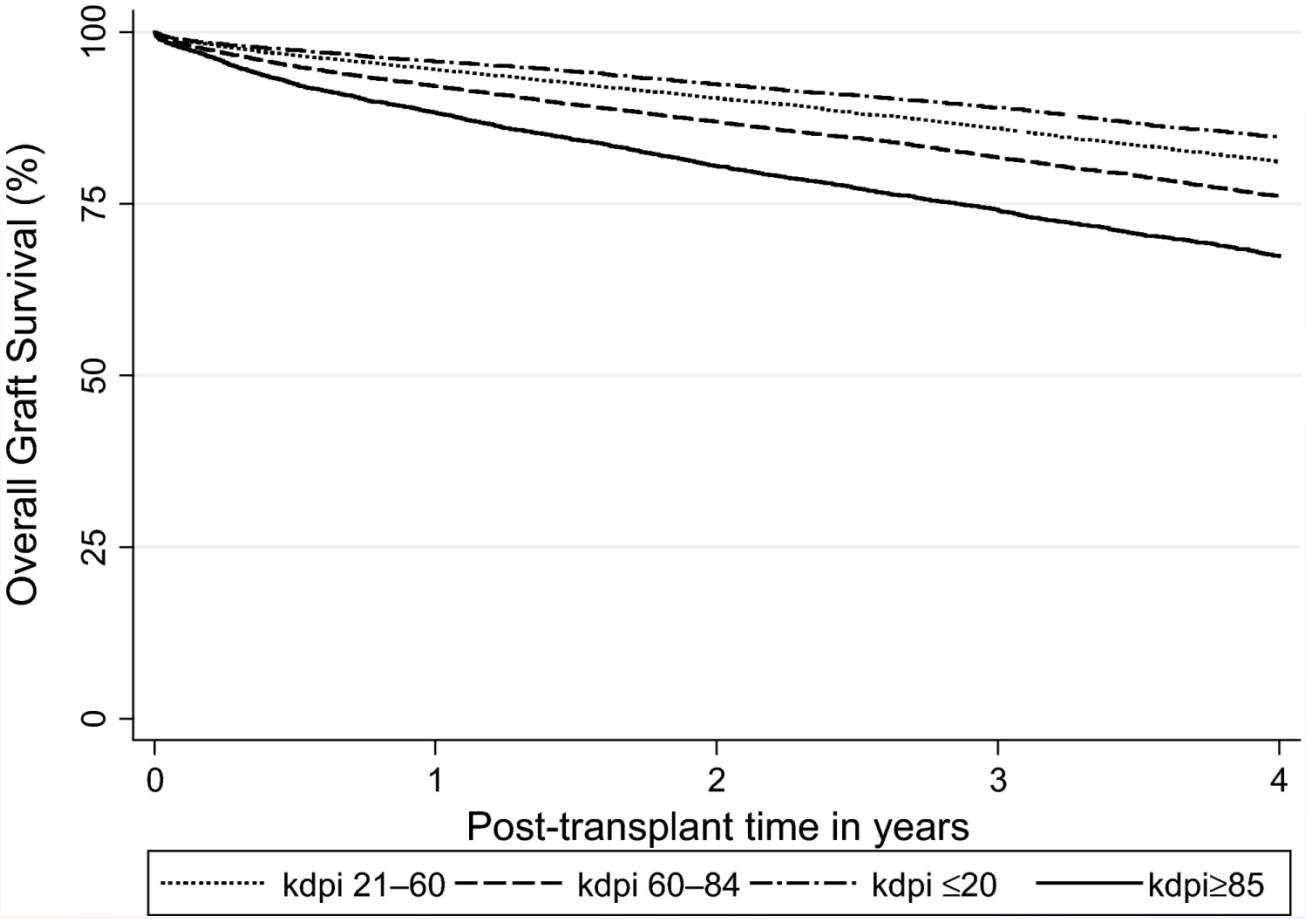
Kidney Mate Analysis: Cold Ischemia Time



Overall graft survival stratified by Kidney Donor Profile Index among 64,970 mate kidneys.

Sampaio MS, et al. Impact of cold ischemia time on the outcomes of kidneys with Kidney Donor Profile Index ≥85%: mate kidney analysis - a retrospective study. *Transpl Int.* 2018 Jul;31(7):729-738.

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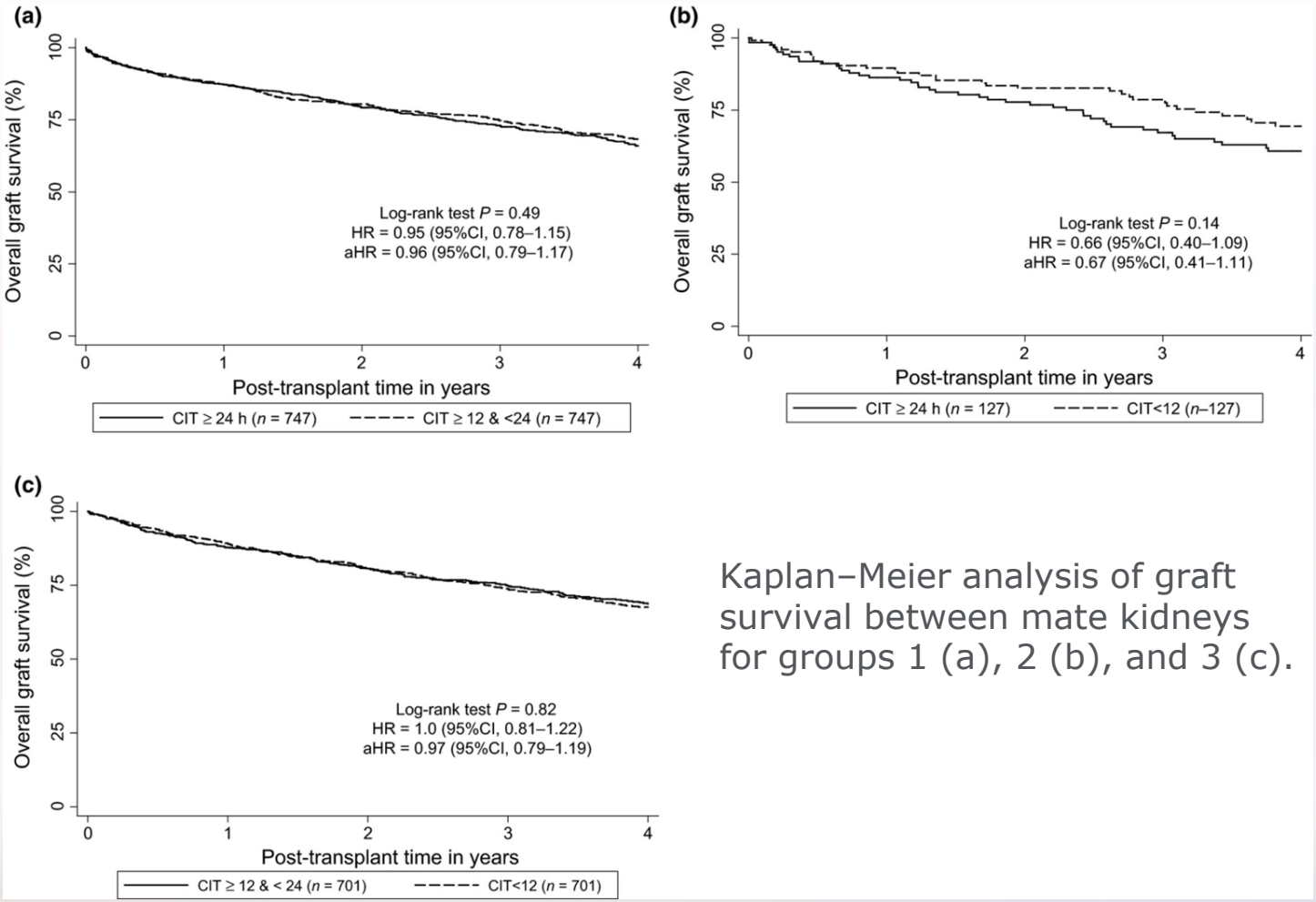
Kidney Mate Analysis: Cold Ischemia Time



Kaplan–Meier analysis of graft survival between mate kidneys for groups 1 (a), 2 (b), and 3 (c).

Sampaio MS, et al. Impact of cold ischemia time on the outcomes of kidneys with Kidney Donor Profile Index ≥85%: mate kidney analysis - a retrospective study. *Transpl Int.* 2018 Jul;31(7):729-738.

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Effect of Delayed Graft Function

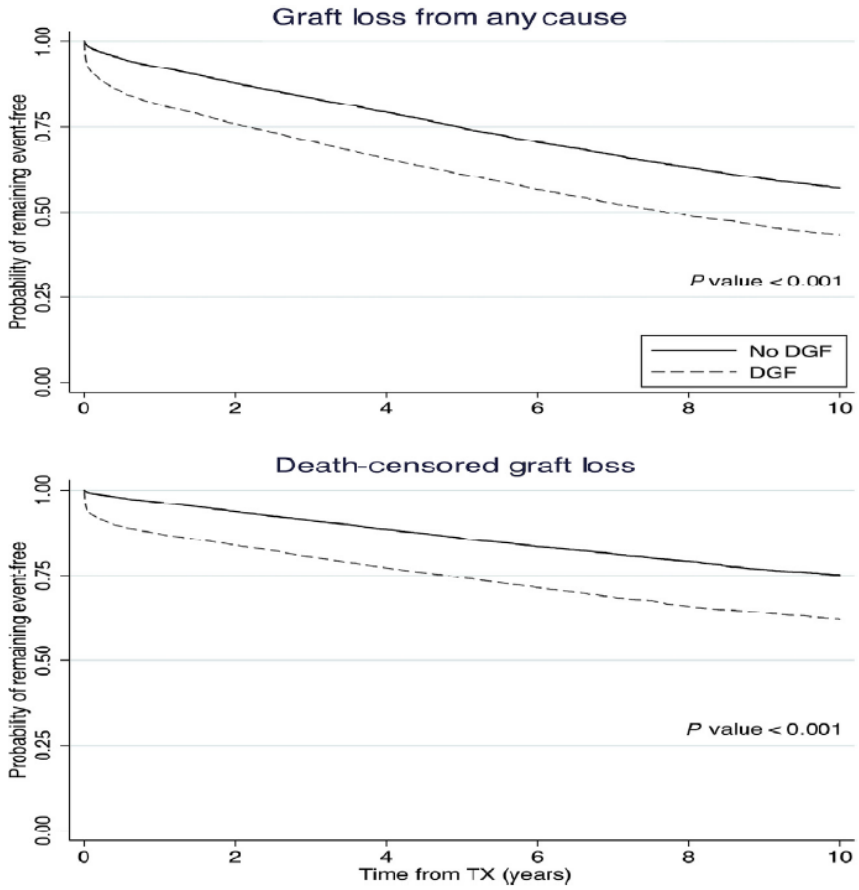

Figure 1| Graft and patient survival in DGF and non-DGF cases in a paired analysis. Deceased donor kidney transplant recipients who developed delayed graft function (DGF) had inferior unadjusted graft survival and functional graft survival, particularly in the first year, when compared with recipients who received the mate kidney from the same donor but did not develop DGF. TX, transplantation.

Gill J, et al. The risk of allograft failure and the survival benefit of kidney transplantation are complicated by delayed graft function. *Kidney Int.* 2016 Jun;89(6):1331-6.

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Effect of Delayed Graft Function

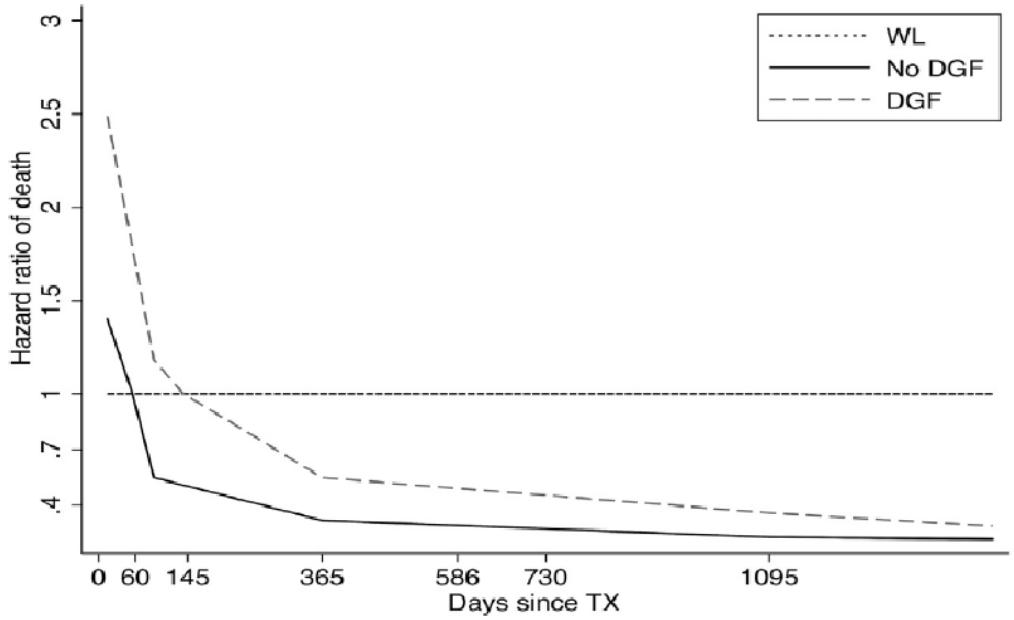

Figure 2 | The relative risk of death with transplantation (with and without DGF) compared with those remaining on WL. The relative risk of death in deceased donor transplant recipients who developed delayed graft function (DGF) and who did not develop DGF (No DGF) compared with wait-listed (WL) patients. Transplant recipients in each group were compared with wait-listed patients of similar risk who had been on dialysis for equal lengths of time but who had not yet received a kidney transplant. The risk of death immediately after transplantation (TX) was higher in transplant recipients than in wait-listed patients and was highest in recipients who developed DGF. The long-term risk of death was lower with transplantation, but patients with DGF took longer to achieve an equal risk of death than did wait-listed patients.

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Gill J, et al. The risk of allograft failure and the survival benefit of kidney transplantation are complicated by delayed graft function. *Kidney Int.* 2016 Jun;89(6):1331-6.

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Kidney Utilization Around the World

French Comparison

Time Frame: 2004-2014

United States: 156,089 DD kidneys; 27,987 (17.9%) discarded

France: 29,984 DD kidneys; 2,732 (9.1%, $p<0.001$) discarded

Kidney quality showed little change in the United States over time (mean KDRI, 1.30 in 2004 vs 1.32 in 2014); rising KDRI in France (mean KDRI, 1.37 in 2004 vs 1.74 in 2014; $p<0.001$).

Aubert O, et al. Disparities in Acceptance of Deceased Donor Kidneys Between the United States and France and Estimated Effects of Increased US Acceptance. *JAMA Intern Med*. 2019 Aug 26.

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French Comparison

The French-based allocation model applied to the US population found that **17,435 (62%)** discarded kidneys would have been transplanted in France.

Redesigned system with more aggressive organ acceptance practices would generate an additional **132,445 allograft life-years** in the United States over the 10-year observation period.

Aubert O, et al. Disparities in Acceptance of Deceased Donor Kidneys Between the United States and France and Estimated Effects of Increased US Acceptance. *JAMA Intern Med*. 2019 Aug 26.

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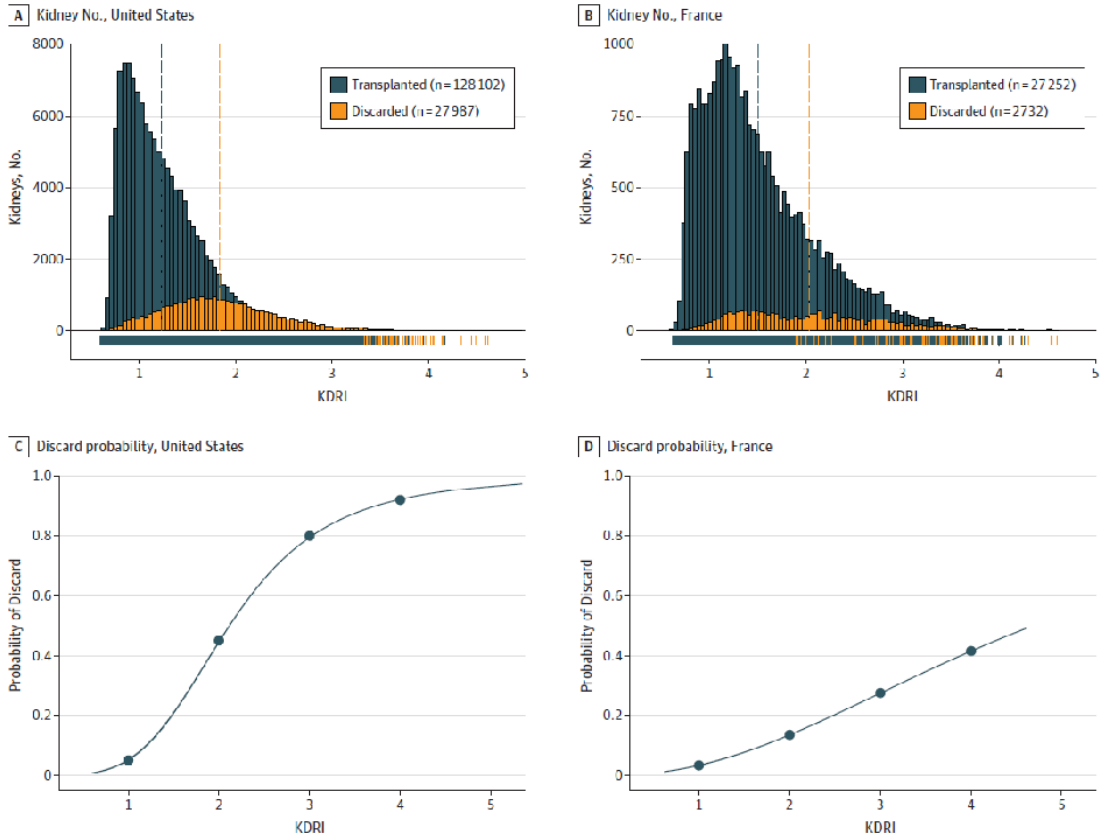
French Comparison

Figure 1. Deceased Donor Kidneys Transplanted and Discarded in the United States and France Between 2004 and 2014 and Their Kidney Donor Risk Index (KDRI) Scores[a]



Data are based on 156 089 recovered kidneys in the United States, including 128 102 transplanted and 27 987 discarded kidneys, and on 29 984 recovered kidneys in France, including 27 252 transplanted and 2732 discarded kidneys. A, The distribution of KDRI scores for transplanted (blue) and discarded (orange) kidneys in the United States. B, The distribution of the KDRI score for transplanted (blue) and discarded (orange) kidneys in France. Dashed vertical lines correspond to the mean KDRI of transplanted kidneys (dashed blue) and discarded (dashed orange) kidneys. C, The probability of discard in the United States by KDRI; and D, The probability of discard in France by KDRI. The blue curve corresponds to the probability of discard according to the KDRI in the United States (C) and in France (D).

[a] Lower KDRI indicates better kidney quality.

Aubert O, et al. Disparities in Acceptance of Deceased Donor Kidneys Between the United States and France and Estimated Effects of Increased US Acceptance. *JAMA Intern Med*. 2019 Aug 26.

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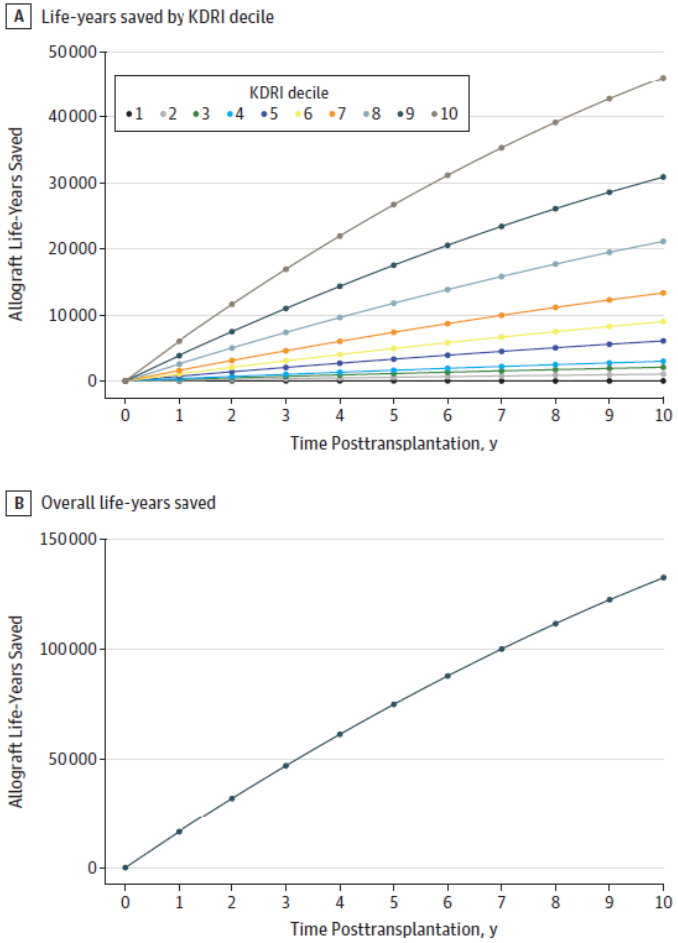
French Comparison

Figure 3. Estimation of the Allograft Life-Years Gained From Reducing Kidney Discard Rates in the United States Through a Redesigned System



KDRI Indicates Kidney Donor Risk Index. The greatest gain in life-years is achieved through reduced discard of the lowest-quality kidneys.
A, The life-years saved by decile of the Kidney Donor Risk Index (KDRI) by applying French acceptance-based patterns to the pool of US kidneys.
B, The life-years saved overall if organ acceptance patterns in the United States had followed the French acceptance model.

Aubert O, et al. Disparities in Acceptance of Deceased Donor Kidneys Between the United States and France and Estimated Effects of Increased US Acceptance. *JAMA Intern Med*. 2019 Aug 26.

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German Comparison

Time Frame: 1991 - 2014

Population: 987 adult kidney transplants at single center.

Median KDPI: 66%; higher proportion of >85% KDPI kidneys compared with US cohort (32.3% vs 9.2%).

Elderly patients (≥65 y.o.), 62% received >95% KDPI kidneys.

Lehner LJ, et al. Assessment of the Kidney Donor Profile Index in a European cohort. *Nephrol Dial Transplant*. 2018 Aug 1;33(8):1465-1472.

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German Comparison

Patients receiving ≥99% KDPI kidneys had a 5-year death-censored graft survival (72.9%).

The 5-year survival rate of patients living with a functioning graft exceeded the matched OPTN data, despite a higher proportion of elderly recipients.

Multivariate analysis revealed KDPI as an independent risk factor for graft loss (hazard ratio 1.14/10%, $P < 0.001$).

Lehner LJ, et al. Assessment of the Kidney Donor Profile Index in a European cohort. *Nephrol Dial Transplant*. 2018 Aug 1;33(8):1465-1472.

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German Comparison

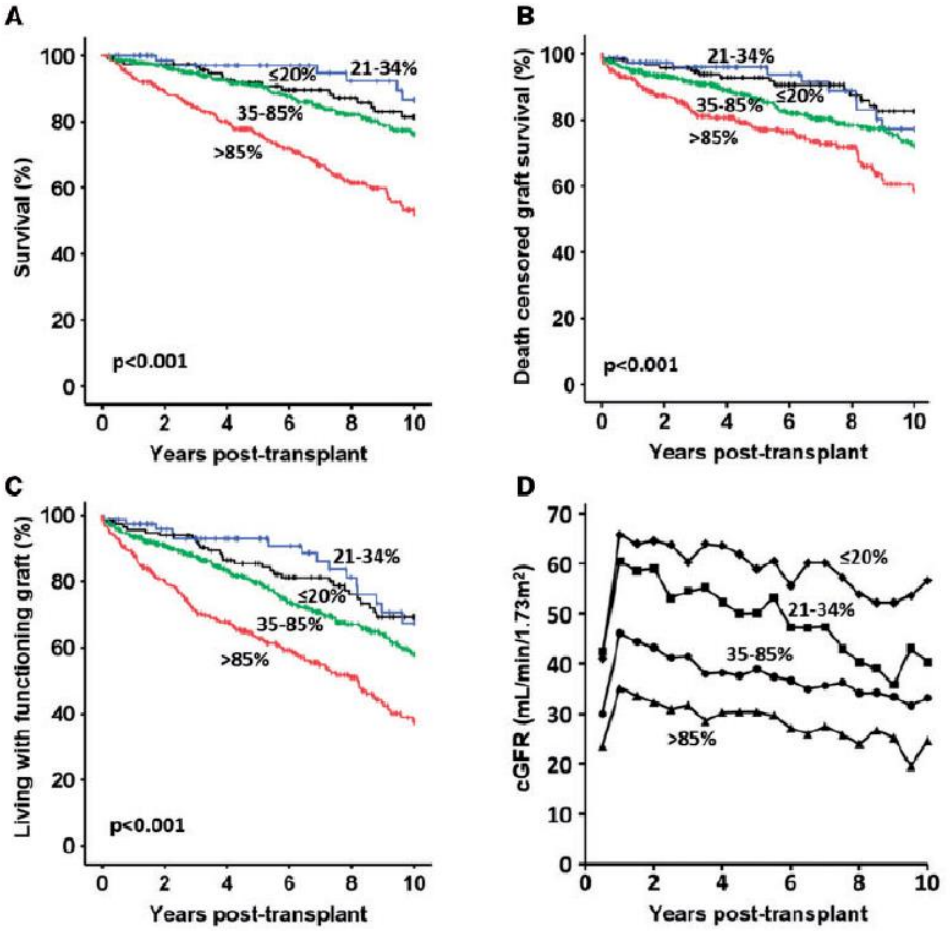

FIGURE 2: Patient (A), graft survival (B, C) and graft function (D) by KDPI category. Median eGFR using imputation for values after graft loss (patients with graft loss; GFR = 0 mL/min/1.73 m^2). eGFR was calculated using the Modification of Diet in Renal Disease formula [19].

Lehner LJ, et al. Assessment of the Kidney Donor Profile Index in a European cohort. *Nephrol Dial Transplant*. 2018 Aug 1;33(8):1465-1472.

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German Comparison

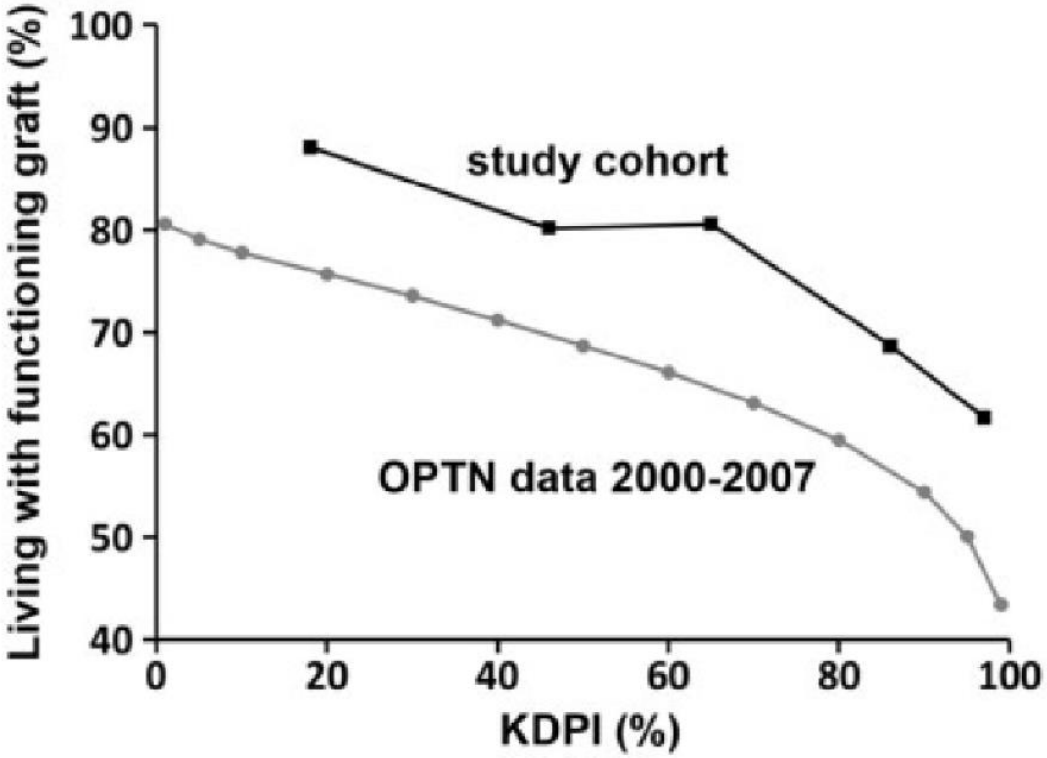

FIGURE 3: Comparison of living with functioning graft at 5 years post-transplant: study cohort versus OPTN data.

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Lehner LJ, et al. Assessment of the Kidney Donor Profile Index in a European cohort. *Nephrol Dial Transplant*. 2018 Aug 1;33(8):1465-1472.

Spanish Comparison

Time Frame: Jan 2006 to Dec 2015

KDPI accurately discriminates optimal organs from suboptimal or marginal ones.

Multivariate analysis identified the KDPI, donor age, donation after circulatory death, recipient age and gender as predictive factors of graft survival.

Lehner LJ, et al. Assessment of the Kidney Donor Profile Index in a European cohort. *Nephrol Dial Transplant*. 2018 Aug 1;33(8):1465-1472.

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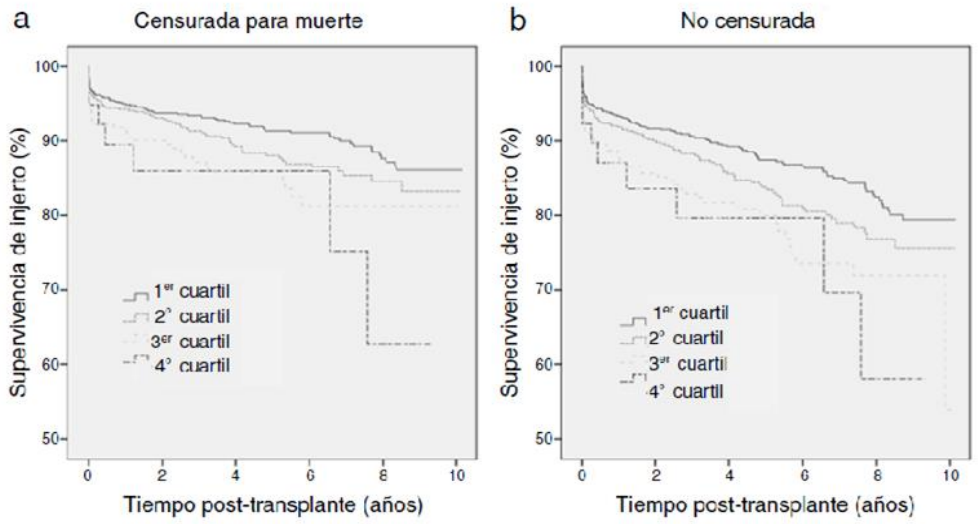
Spanish Comparison



Individuos en riesgo	Inicio	Año 2	Año 4	Año 6	Año 8	Año 10
Cuartil 1	885	674	543	377	189	14
Cuartil 2	639	457	315	202	90	5
Cuartil 3	258	172	104	64	28	2
Cuartil 4	39	22	11	9	5	0

Figura 2 – Supervivencia del injerto por Kaplan-Meier de acuerdo con el cuartil de KDPI para receptores entre 18 y 59 años: a) censurada para muerte; b) no censurada.

Lehner LJ, et al. Assessment of the Kidney Donor Profile Index in a European cohort. *Nephrol Dial Transplant*. 2018 Aug 1;33(8):1465-1472.

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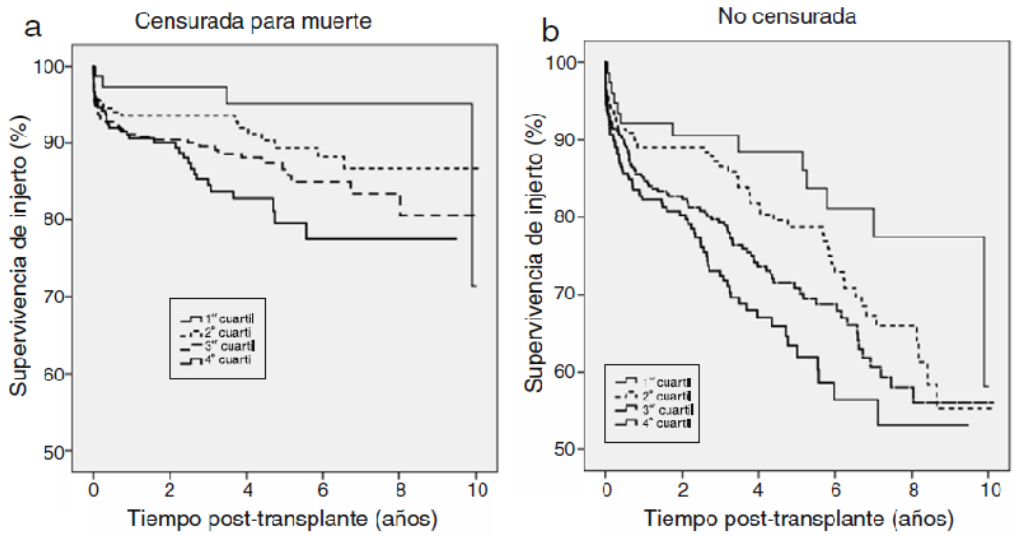
Spanish Comparison



Individuos en riesgo	Inicio	Año 2	Año 4	Año 6	Año 8	Año 10
Cuartil 1	76	57	41	27	16	0
Cuartil 2	225	168	115	70	31	1
Cuartil 3	364	230	149	82	29	5
Cuartil 4	248	143	70	26	7	0

Figura 3 – Supervivencia del injerto por Kaplan-Meier de acuerdo con el cuartil de KDPI para receptores mayores de 60 años: a) censurada para muerte; b) no censurada.

Lehner LJ, et al. Assessment of the Kidney Donor Profile Index in a European cohort. *Nephrol Dial Transplant*. 2018 Aug 1;33(8):1465-1472.

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Research at Hartford Hospital on High KDPI Kidneys

Donor-Recipient Matching to Optimize the Utility of High KDPI Kidneys

Objective: To understand donor and recipient characteristics that yield a successful high KDPI DDKT.

Study Time Period: December 2014-July 2019

Methods: Multivariable regression of High KDPI recipients, stratified according to 1-year creatinine; modeling of donor and recipient characteristics predictive of a creatinine <1.7.

Study Population: 55 High KDPI recipients (377 DDKT; 14%)

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T. L. Blake-Popham et al. Unpublished Data.

Donor Characteristics

	Donors
N	55
Age (years)	61.15
Male Gender (%)	54.5
African American (%)	11
Hypertensive (%)	83
Diabetic (%)	42
Serum Creatinine (mg/dL)	1.042
Cardiovascular Cause of Death (%)	60
BMI (kg/m2)	31.9
DCD (%)	25
Hepatitis C (%)	0
Cold Time (hours)	17.44
KDPI	91%

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T. L. Blake-Popham et al. Unpublished Data.

Donor Characteristics

	Donors
Glomerulosclerosis (%)	5.2
Presence fibrosis/atrophy (%)	50
Presence of arteriosclerosis (%)	47.2
Presence of hyalinosis (%)	18.1
Pump Flow	134
Pump Resistance	0.23

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T. L. Blake-Popham et al. Unpublished Data.

Recipient Characteristics

	Recipients
N	55
Age	62.27
Male Gender (%)	67.2
African American (%)	32.7
Hypertensive (%)	92.7
Diabetic (%)	49
Time Listed (days)	1181
BMI	29.5

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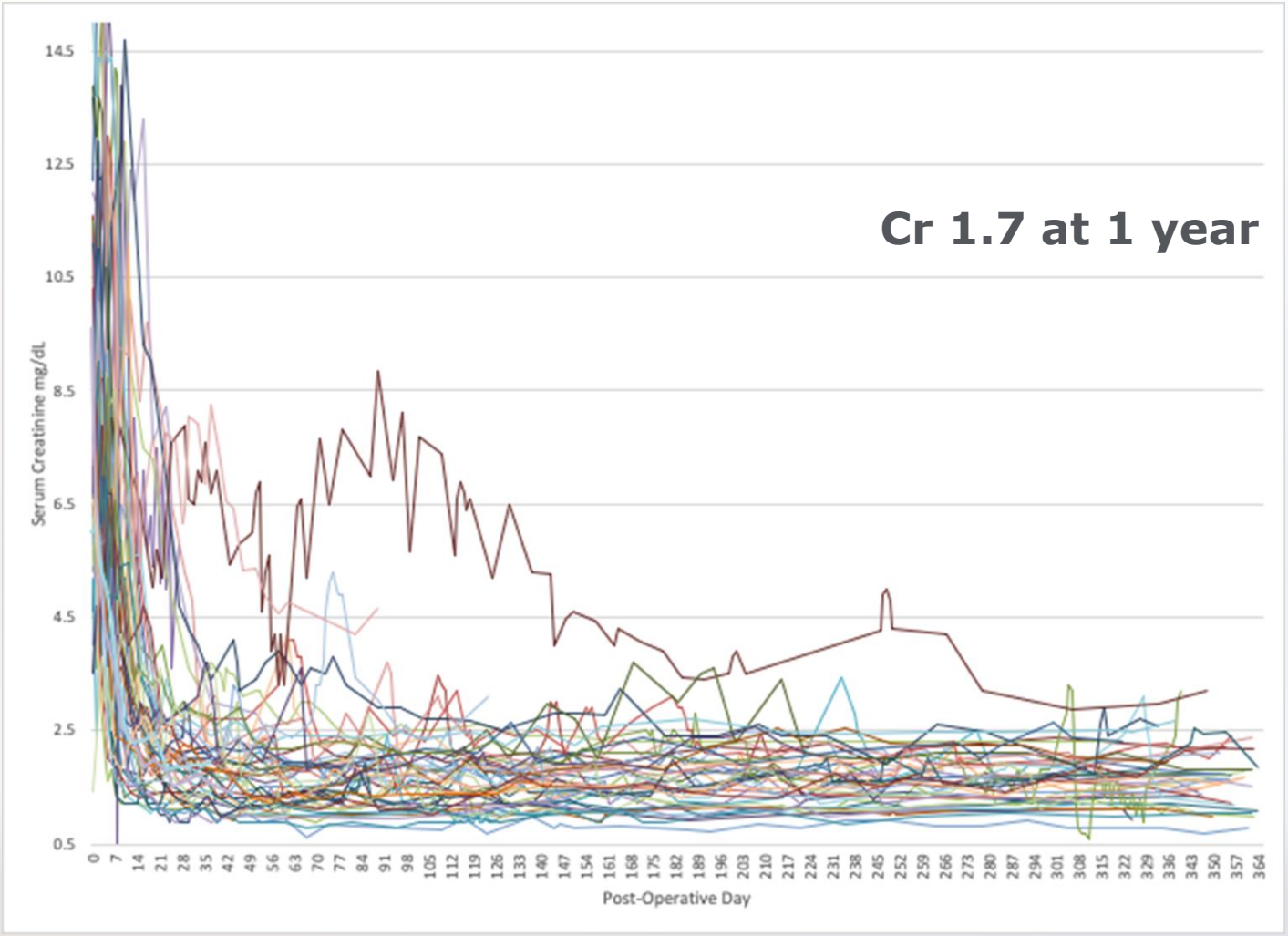
T. L. Blake-Popham et al. Unpublished Data.

Kinetics of Kidney Function After DDKT



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T. L. Blake-Popham et al. Unpublished Data.

Outcomes

LOS: 6.8 days

30-day readmission rate: 43%

DGF: 54%

6-month creatinine: 1.73±0.66 (n=43)

1-year creatinine: 1.67±0.52mg/dL (n=37)

Graft survival: 92.7%

Death-censored graft survival: 96.2%

Patient survival: 96.4%

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T. L. Blake-Popham et al. Unpublished Data.

Multivariable Model Predictive of 1-year Cr 1.7

Donor characteristics suggestive of Cr >1.7 at one year:

Fibrosis on biopsy (p=0.07)

Recipient characteristics suggestive of Cr >1.7 at one year:

Younger age (p=0.075)

Recipient characteristics predictive of Cr >1.7 at one year:

Male gender (p=0.016)

African American race (p=0.039)

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T. L. Blake-Popham et al. Unpublished Data.

Conclusions

The wait list for KT continues to grow each year.

Wait time for a KT is highly dependent on geography.

Kidney allocation is a balance between equity, fairness, justice, and utility.

A KT (of any quality) is better than HD for all age groups.

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Conclusions

Discard rates in the US are exceedingly high.

Utilization of kidneys is highly dependent on geography.

Kidney travel ➡ increased CIT ➡ increased LOS ➡ increased Cost

Improvements in High KDPI kidney utilization in the US must improve.

High KDPI kidney utilization requires a multifaceted evaluation that takes into account donor and recipient characteristics for an ideal match.

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Thank you

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Do all the good you can.
By all the means you can.
In all the ways you can.
In all the places you can.
At all the times you can.
To all the people you can.
As long as ever you can.

- John Wesley

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