



KDPI Obscures Trends in Absolute Donor Risk

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Introduction

The kidney donor profile index (KDPI) is commonly used to measure deceased donor kidney quality based on the kidney donor risk index (KDRI) (Rao, et al. 2009). To calculate the KDPI, the Organ Procurement and Transplantation Network (OPTN) performs three operations.

1. The donor-specific elements of the KDRI are applied to generate a measure of donor risk.
2. The donor-specific KDRI is rescaled so 1.0 is the median donor value.
3. The donor-specific KDRI is transformed to a percentile of donor risk (OPTN/UNOS, 2016).

Rescaling and transforming the donor-specific KDRI can distort perceptions of donor risk.

Methods

Donor-specific KDRI values were calculated for kidneys offered for transplant during 2004-2015. The KDPI was calculated for each, and the median donor-specific KDRI value within each KDPI was calculated to summarize the typical donor-specific risk for each KDPI level.

Similarly, the median donor-specific KDRI was calculated within each percentile group of transplanted kidneys

Results

Rescaling the KDPI obscures trends in median donor quality. Median KDRI for KDPI-50 kidneys increased from 2004 to 2009, peaking at 1.25, then decreased from 2009 to 2015. In 2015, the median donor risk was over 3% lower than in 2009. Calculating the risk percentile for each cohort also obscures temporal trends. The donor-specific KDRI for a KDPI-99 kidney in 2008 was 2.84. In 2015, it was 2.56, about 10% lower.

Transforming KDRI to a percentile scale also distorts the perception of donor risk and risk of posttransplant graft survival. Every 20-point change in value on the percentile scale is not the same on the absolute risk scale. In 2015, a 20-point shift from KDPI 36 to 16 would represent a 17.2% reduction in risk, but a shift from KDRI 99 to 79 would represent a 36.7% reduction in risk, according to the original KDRI values.

Figure 1 shows the median donor-specific KDRI for 5 KDPI values during 2004-2015. Figures 2 and 3 are similar to Figure 1, but are specific to donor disposition. Figure 2 shows the median donor-specific KDRI according to percentile-groups of transplanted kidneys for the same period. Figure 3 shows the median donor-specific KDRI according to percentile-groups of discarded kidneys. Figure 4 shows the donor-specific KDRI-based risk reduction for a 20-point KDPI shift for 2015.

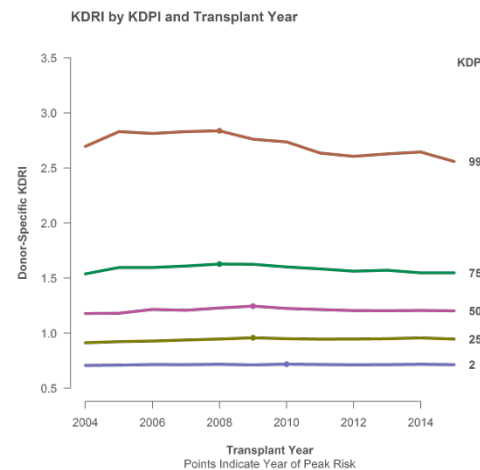


Figure 1. Median donor-specific KDRI by KDPI group and year.

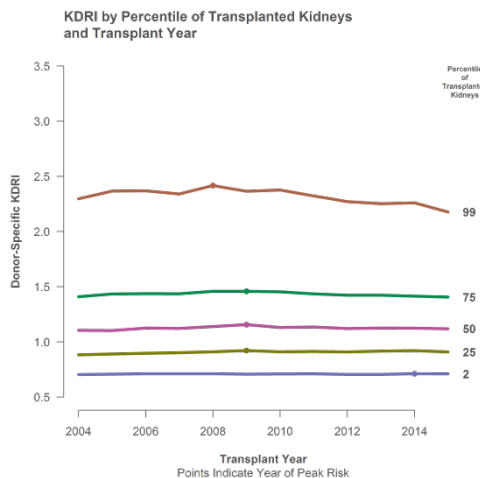


Figure 2. Median donor-specific KDRI by percentile group of transplanted kidneys and year.

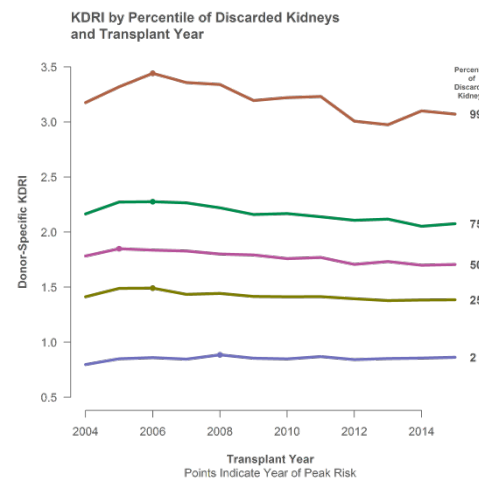


Figure 3. Median donor-specific KDRI by percentile group of discarded kidneys and year.

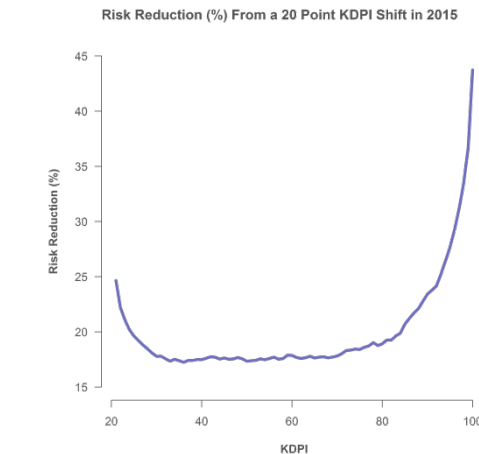


Figure 4. Donor-specific KDRI-based risk reduction from a 20-point KDPI shift.

Conclusions

When evaluating kidney donor risk, the original KDRI is better than the scaled KDRI and KDPI. Alternatively, the KDRI could be combined with a standard recipient profile to show how differences in donor quality affect predicted graft survival.

Trends in KDRI for each KDPI value show that the absolute risk for various KDPI values is decreasing. The KDRI risk for most percentile-groups of transplanted kidneys is also decreasing.

References

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OPTN/UNOS. 2016. A guide to calculating and interpreting the kidney donor profile index (KDPI). https://optn.transplant.hrsa.gov/media/1512/guide_to_calculating_interpreting_kdpi.pdf Accessed April 10, 2017.

The authors have no conflicts to report.