

# **Increasing Use of “Riskier” Deceased Kidney Donors in the US in the Past Decade.**

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**United States Renal Data System**

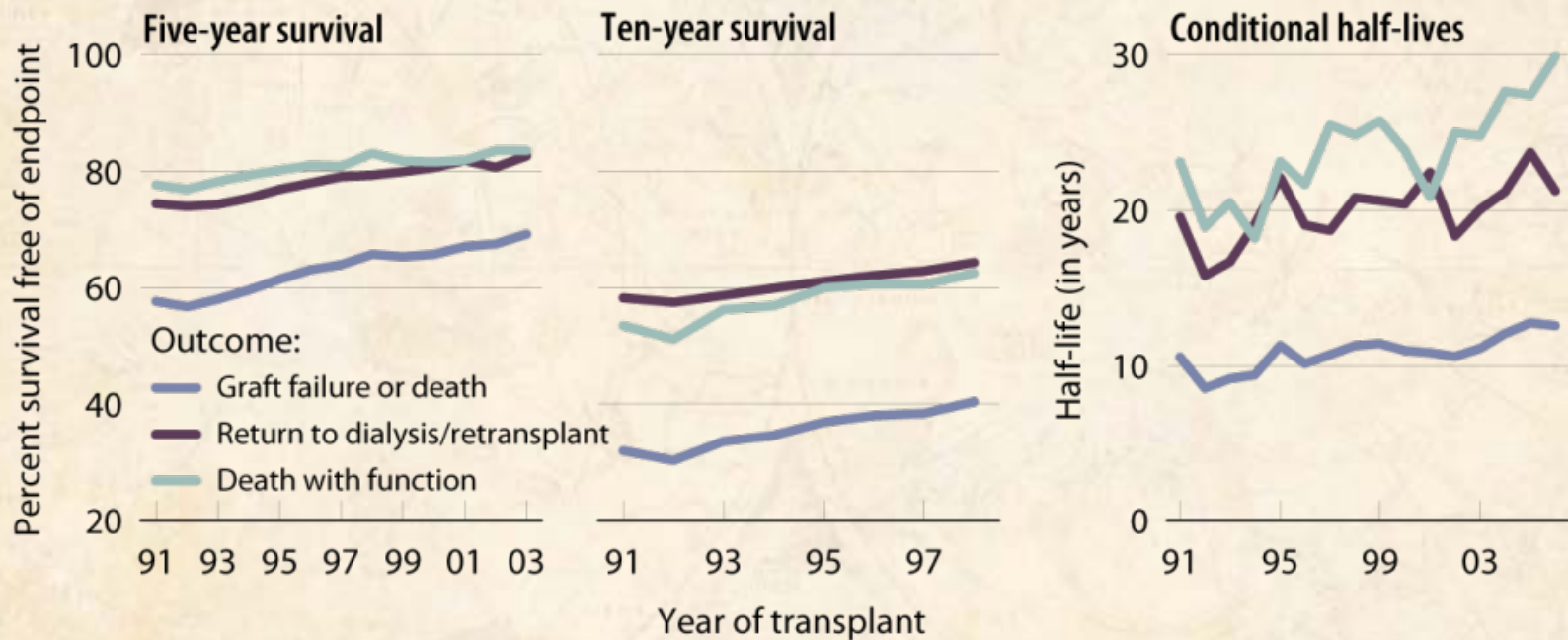
**USRDS**

# Background

- **Survival of kidney transplants from deceased donors has remained fairly stable over the past decade, with a 5-year graft survival of 67% for transplants performed in 1999 and 69% in 2003, and first-year graft survival from 88% in 1999 to 91% in 2007.**

# Outcomes: deceased donor transplants

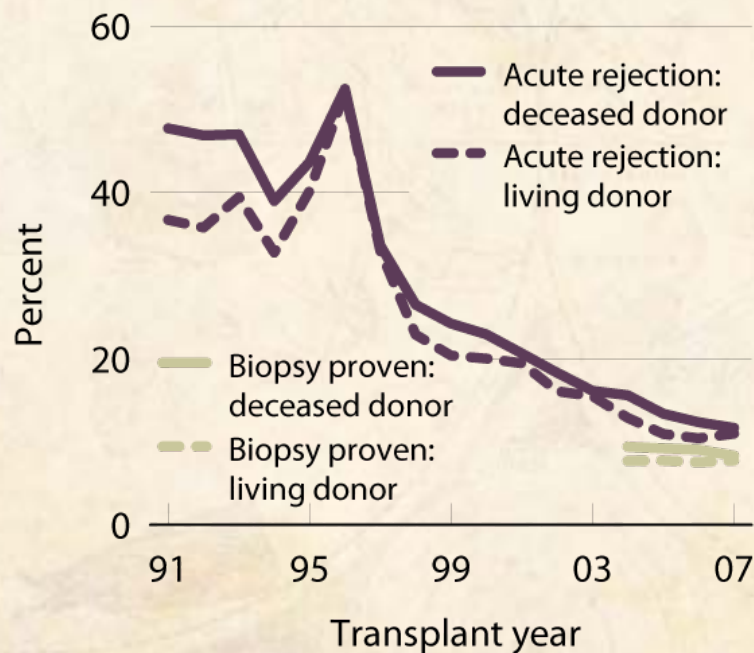
Figure 7.34 (Volume 2)



First-time, adult, kidney-only transplants. Graft survival estimates are adjusted for age, gender, race & primary diagnosis, using Cox proportional hazards models. Conditional half-life estimates are conditional on first-year graft survival.

# Background

- This is despite a 50% decline in the first-year incidence of acute rejection over the same 10-year period.



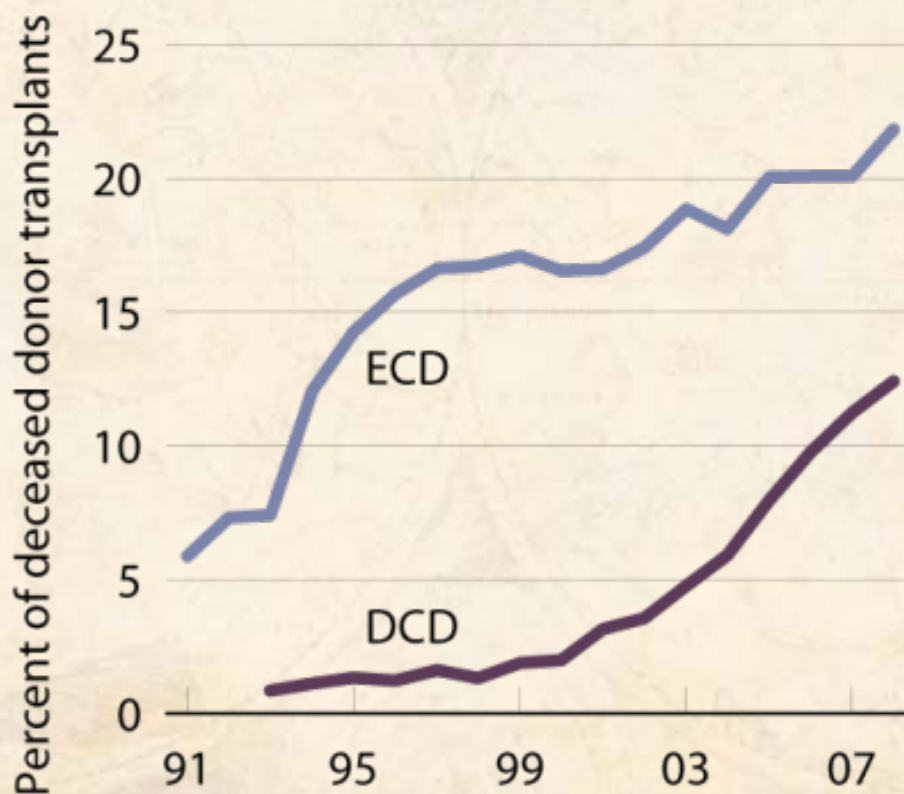
**First-time, kidney-only transplant recipients, age 18 & older, with functioning graft at discharge.**

# Background

- **Additionally, continued increases in the waiting list have lead to increased use of marginal kidney donors through the ECD program as well as increased use of DCD kidneys.**

# Deceased donor transplants from ECD & DCD donors

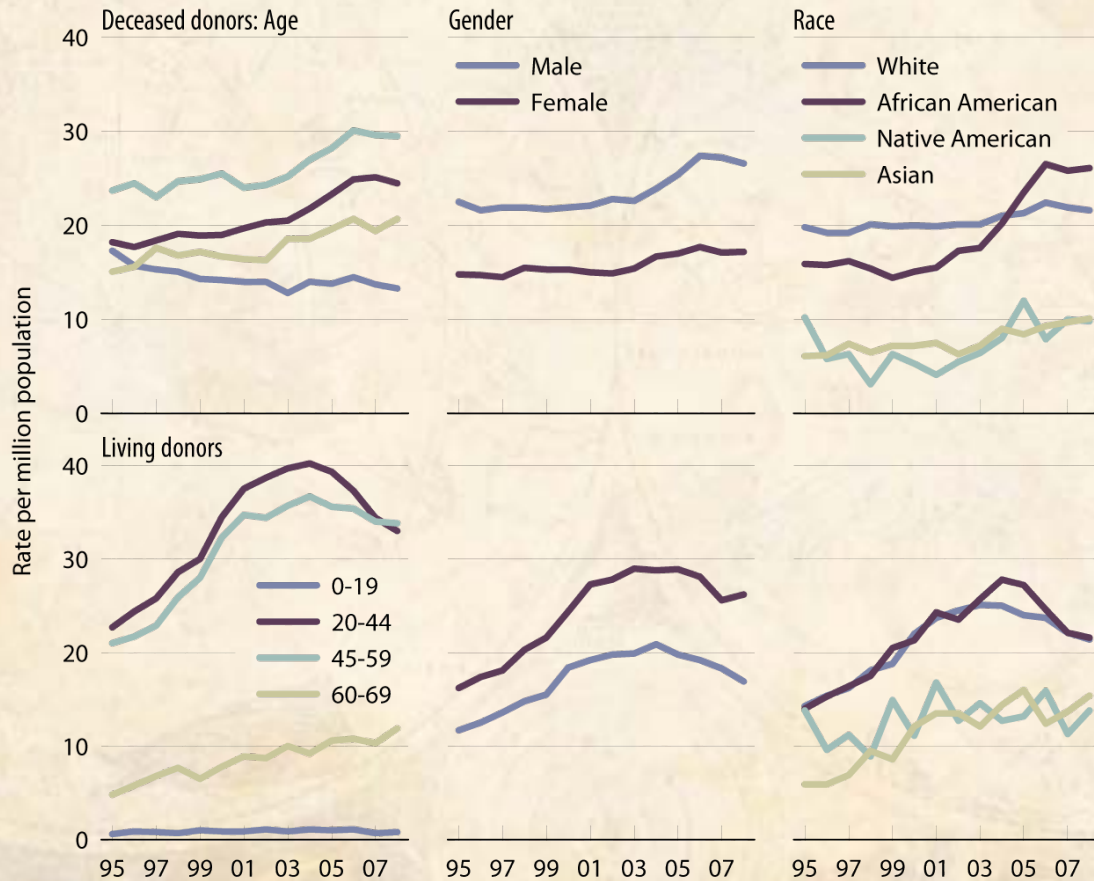
Figure 7.16 (Volume 2)



Patients age 18 & older receiving a first-time, kidney-only, deceased donor transplant, 1991–2008.

# Donation rates, by age, gender, & race

Figure 7.13 (Volume 2)



**Donors younger than 70, whose organs are eventually transplanted.**

# Background

- We hypothesized that transplant programs were accepting higher risk deceased donor kidneys in many aspects of deceased donor quality.



# A Comprehensive Risk Quantification Score for Deceased Donor Kidneys: The Kidney Donor Risk Index

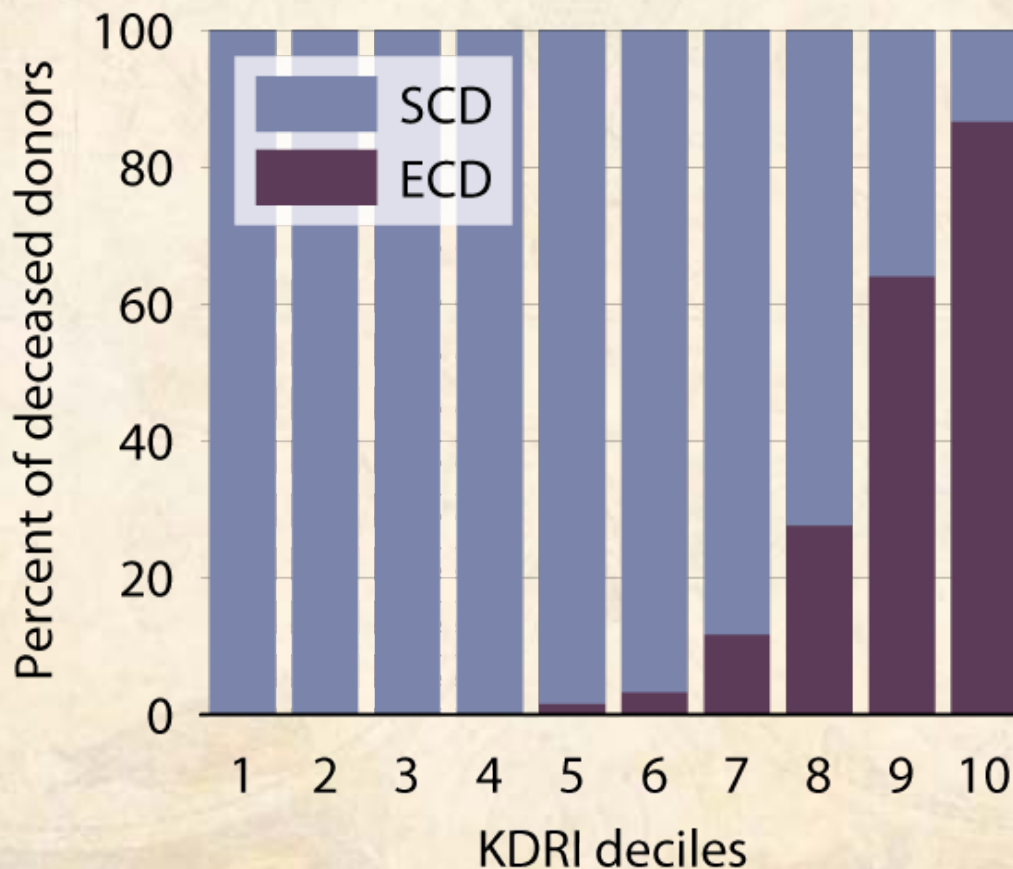
*Panduranga S. Rao,<sup>1,2,7</sup> Douglas E. Schaebel,<sup>2,3</sup> Mary K. Guidinger,<sup>2,4</sup> Kenneth A. Andreoni,<sup>5</sup> Robert A. Wolfe,<sup>2,4</sup> Robert M. Merion,<sup>2,6</sup> Friedrich K. Port,<sup>2,4</sup> and Randall S. Sung<sup>2,6</sup>*

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- **Developed on 1995-2005 kidney donors**
- **KDRI formula includes (all donor elements):**
  - **Age**
  - **Race (African American vs. Other)**
  - **History of Hypertension**
  - **History of Diabetes**
  - **Terminal Serum Creatinine**
  - **Cause of death (CVA vs. Other)**
  - **Height**
  - **Weight**
  - **DCD**
  - **HCV+ Serology**
  - **HLA B & DR Mismatches**
  - **Cold Ischemia Time**
  - **Transplant Type (single, en bloc, double)**

# Kidney donor risk index (KDRI) & ECD status, 2008

Figure 7.17 (Volume 2)



Patients age 18 & older receiving a first-time, kidney-only, deceased donor transplant, 2008.

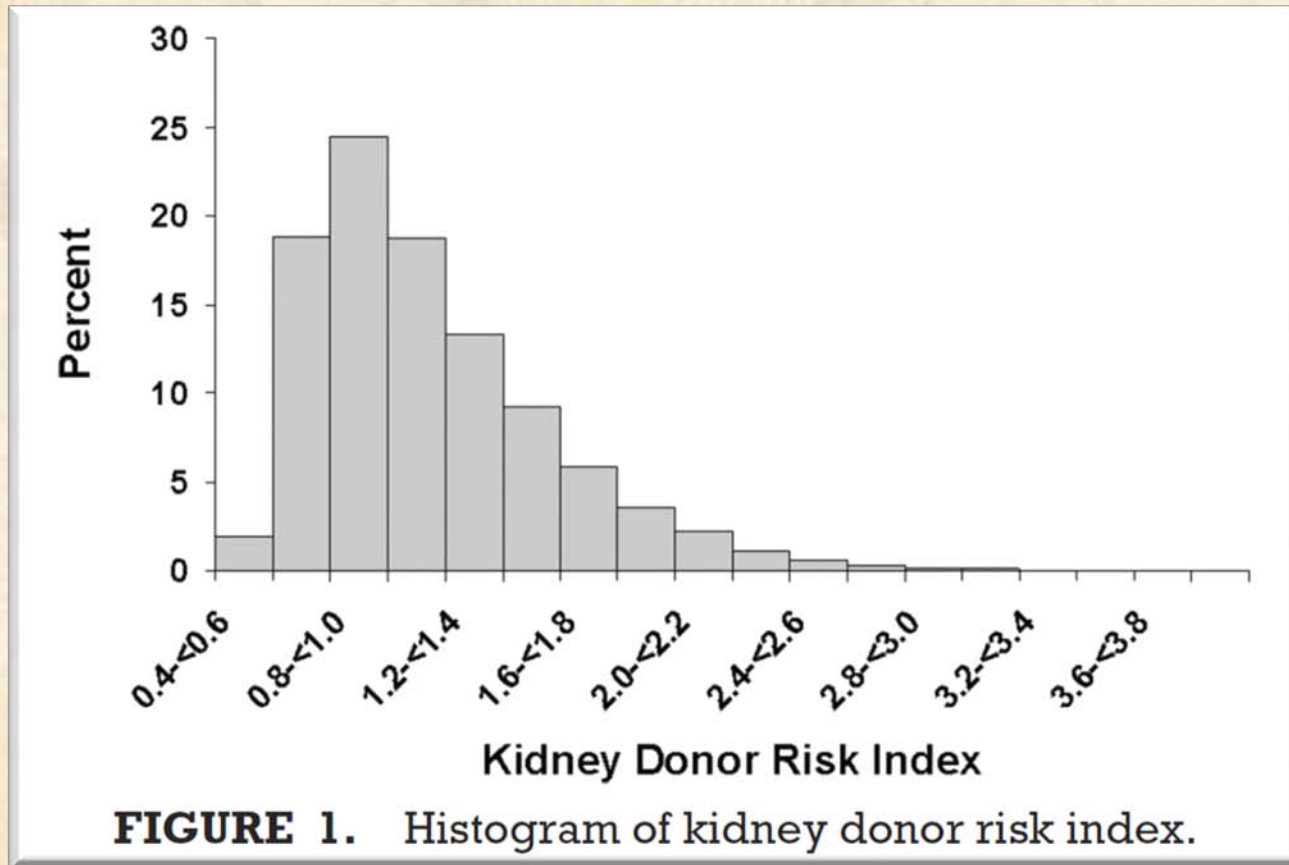
## **Population & Methods**

- **We examined trends in the kidney donor risk index (KDRI, Rao, Transplantation 2009) as well as trends in the individual components of the KDRI in first-time, adult, deceased donor kidney recipients in the US (N=83,901) using data from the United States Renal Data System (USRDS).**
- **Linear trends across transplant years were assessed using a logistic regression model.**

## Reference Donor in the KDRI Formula, Results in KDRI = 1.0:

- 40 years old
- Non-black
- Non-hypertensive
- Non-Diabetic
- Terminal Serum Creatinine = 1.0 mg/dL
- Non-CVA Cause of Death
- Height = 170 cm (5' 10")
- Weight = 80 kg (176 lbs.)
- HCV seronegative
- 2 HLA B mismatches
- 1 HLA DR mismatch
- 20 hours of cold time
- Single Kidney

# Distribution of KDRI

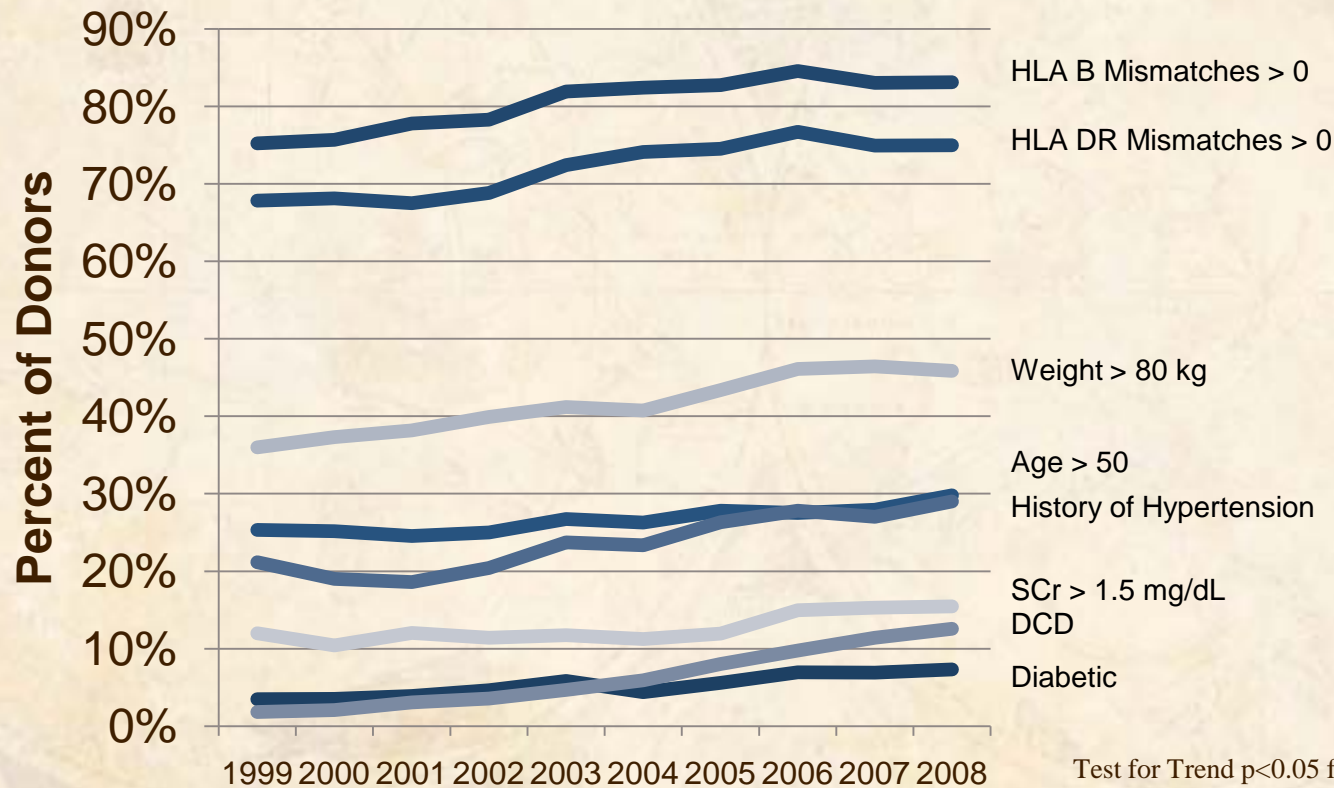


Rao, et. al. A Comprehensive Risk Quantification Score for Deceased Donor Kidneys: The Kidney Donor Risk Index. *Transplantation* 2009; 88(2):231-236.

# Change in KDRI Distribution over the Past Decade

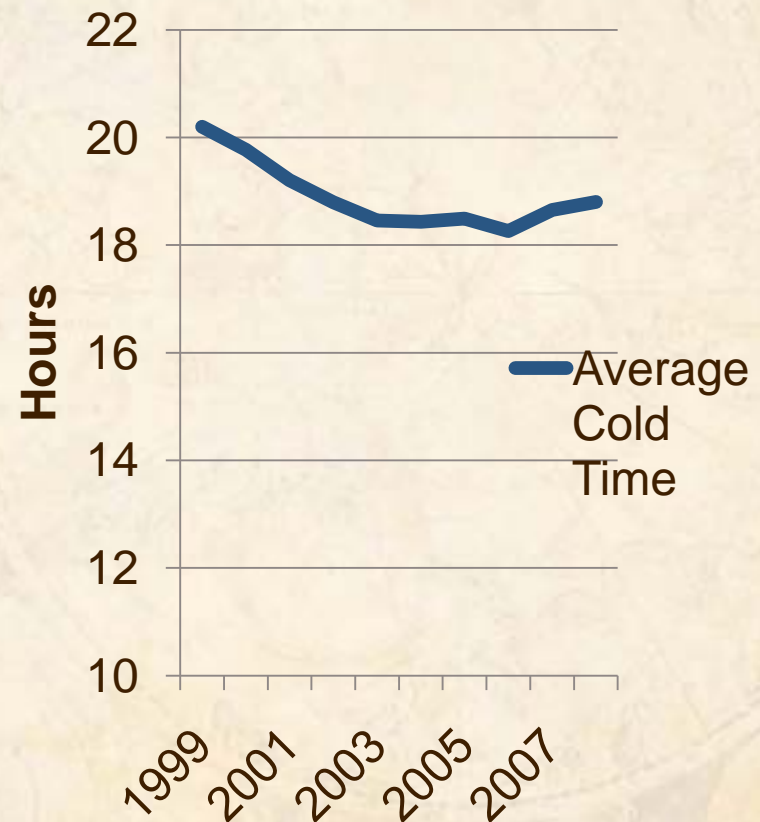
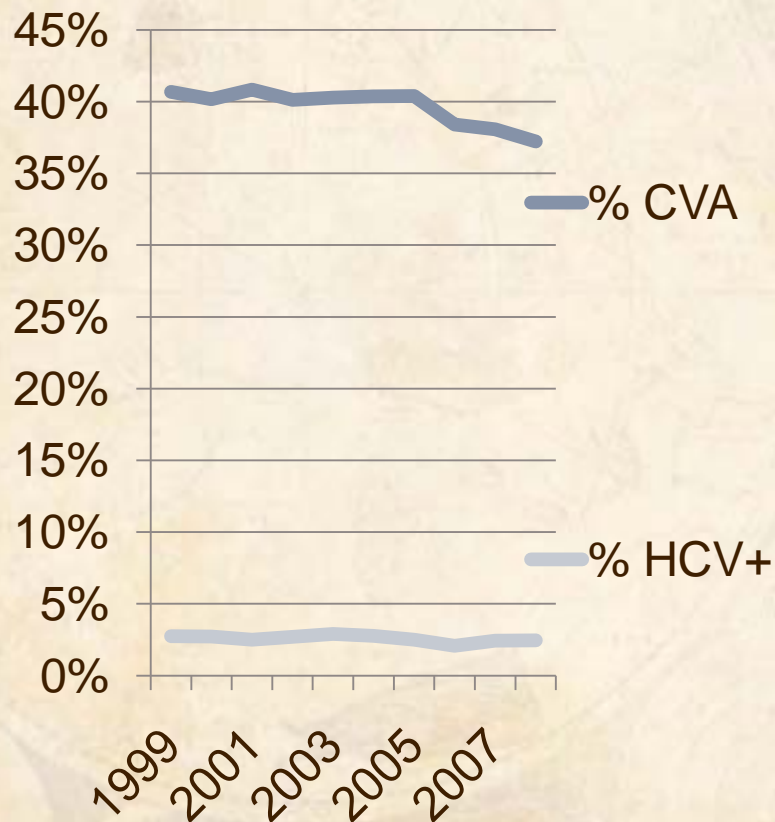


# KDRI factors that have seen a significant increase over the decade:



Test for Trend  $p < 0.05$  for all factors shown here.

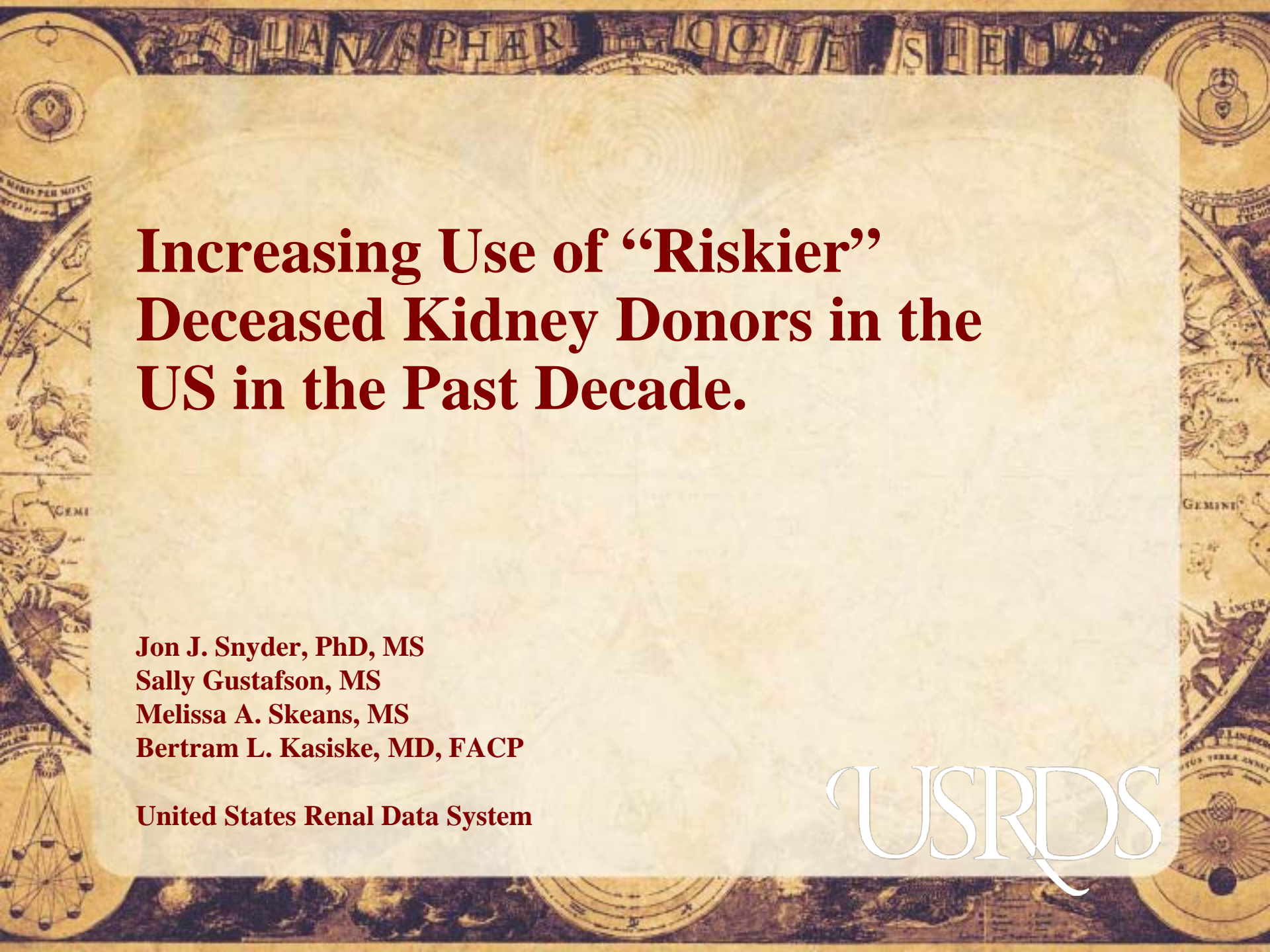
# KDRI factors that did not significantly increase over the decade:





## Conclusions

- **KDRI can be used to track changes in the risk profile of donors whose kidney(s) is/are used for transplant.**
- **The distribution of kidney donor risk has been increasing on a population level over the past decade.**
- **A few donor risk factors have seen a decline over the decade: CVA, HCV+, and cold ischemia time.**
- **KDRI supports the contention that transplant programs are transplanting higher risk kidneys on average over time.**



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