25-Year Attributable Risk Of Death Following Living Kidney Donation:

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Abstract:

***Purpose:** Prior studies have demonstrated no attributable risk of death following living kidney donation, through 15 years of follow-up. However, most donors are healthy young adults who hope to live for many more decades. Here, we estimate the attributable risk of death following donation with follow-up through 25 years.

***Methods:** We compared 138,530 adult, U.S. citizen/permanent resident living kidney donors (1994-2019) from the SRTR to 52,573 participants (non-donors) from the National Health and Nutrition Examination Survey (NHANES) (1988-2019). Mortality and cause of death were ascertained via novel linkage to the National Death Index. We quantified mortality risk using weighted Cox regression, and then according to subgroups (age, sex, race/ethnicity).

***Results:** Over 25 years, there were 10,969 deaths; 24.0% of which were attributed to donors. Although donors had higher mortality at 90 days (0.02% vs. 0.0%), long-term mortality was lower for donors throughout the 25-year follow-up period (10-year: 0.9% vs. 2.8%, 15-year: 2.0% vs. 5.4%, 25-year: 6.9% vs. 15.1%, p<0.001) (Figure 1). This translated into a 62% lower risk of mortality for donors compared to non-donors (weighted hazard ratio [wHR]: 0.38, 95%CI: 0.36-0.41, p<0.001). Among donors, the most common causes of death were cancer (36.3% vs. 26.5%; 15-year: 0.8% vs. 2.0%, 25-year: 2.3% vs. 5.3%), cardiovascular disease (14.1% vs. 24.5%; risk at 15-year: 0.3% vs. 1.0%, 25-year: 1.0% vs. 2.9%), and accidents/unintentional injuries (9.2% vs. 3.7%; risk at 15-year: 0.4% vs. 0.2%, 25-year: 0.5% vs. 0.7%) (Figure 2 A-C). Findings were consistent across subgroups of age, sex, and race/ethnicity.

***Conclusions:** While living kidney donors did not experience a statistically significant increase in mortality compared to the general population over 25 years, the lower risk observed is likely related to selection bias from pre-donation screening. Encouragingly, there was no increase in the absolute mortality risk from cardiovascular disease. These findings offer reassurance that this practice is a reasonable and safe modality in expanding the donor pool.

Figure 1

Are we saying the same thing 15 years later?

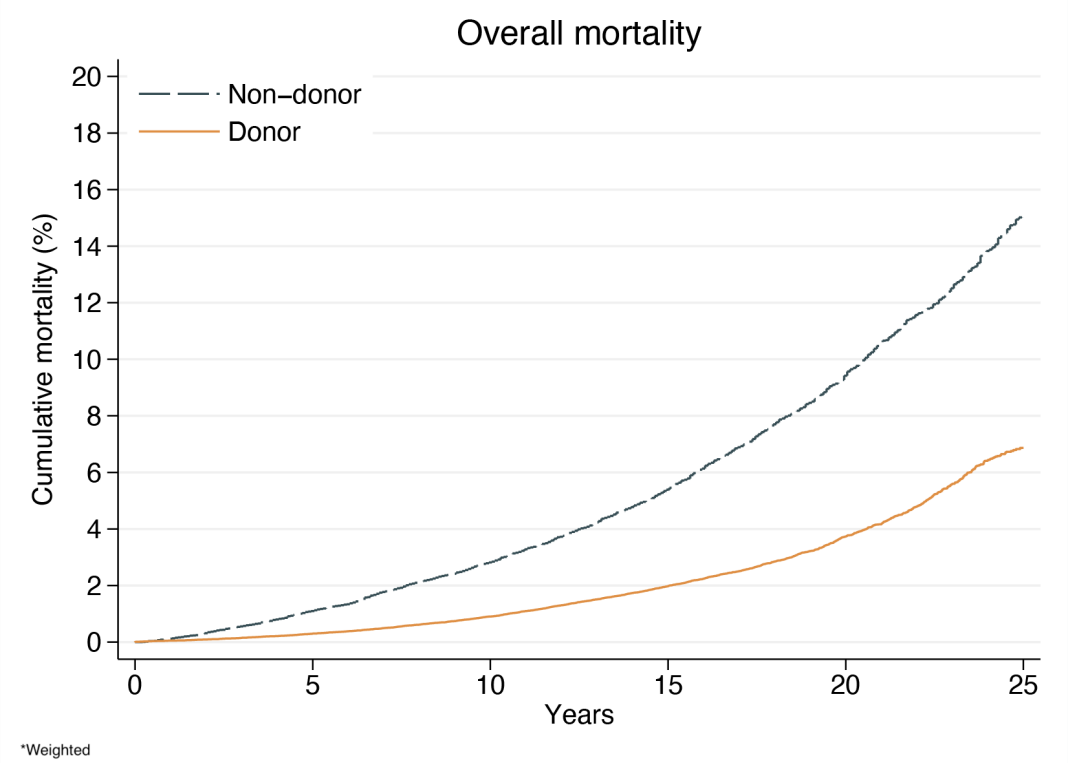
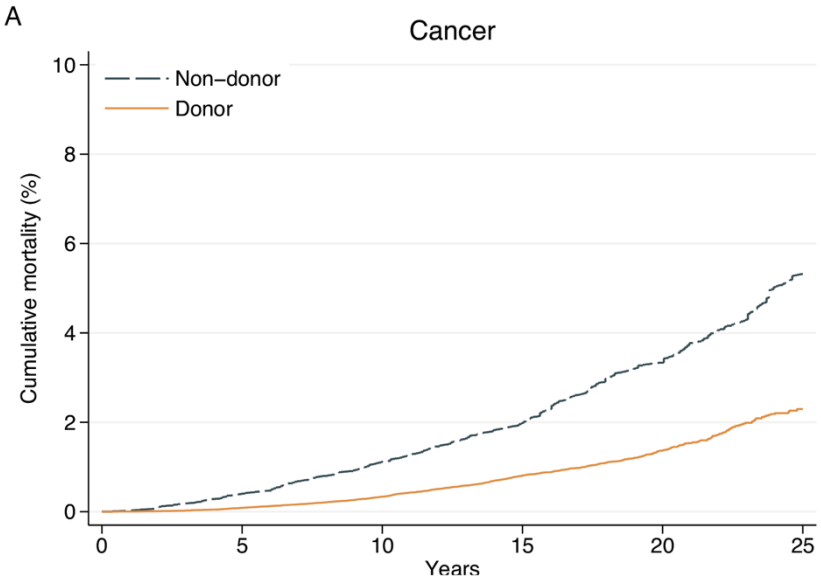
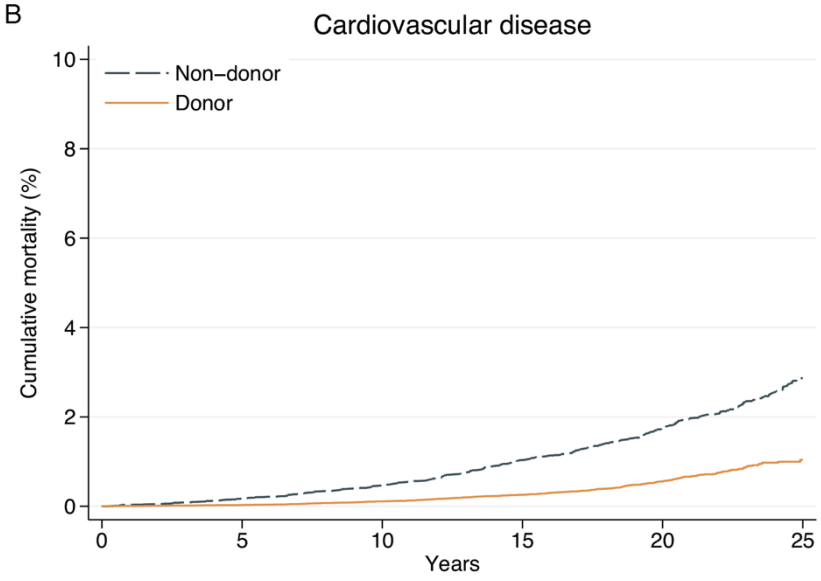
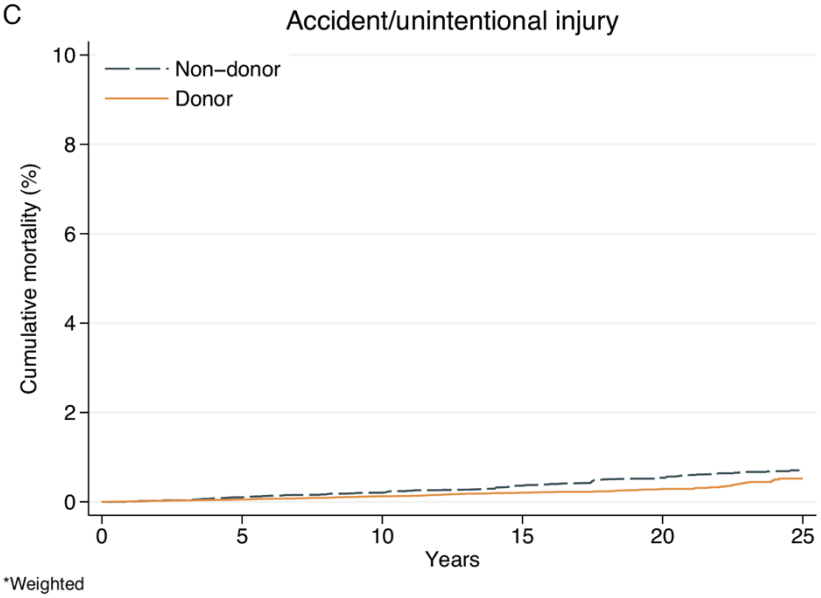

Overall mortality
Non–donor
Donor
Cumulative mortality (%)
0
2
4
6
8
10
12
14
16
18
20
0
5
10
15
20
25
Years
*Weighted

Figure 2


A
Cancer
Non−donor
Donor
Cumulative mortality (%)
0
2
4
6
8
10
0
5
10
15
20
25
Years


B
Cardiovascular disease
Non−donor
Donor
Cumulative mortality (%)
0
2
4
6
8
10
0
5
10
15
20
25
Years


C
Accident/unintentional injury
Non−donor
Donor
Cumulative mortality (%)
0
2
4
6
8
10
0
5
10
15
20
25
Years

*Weighted