

# Age dependent risk of graft failure in young kidney transplant recipients



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## Background

- Age at kidney transplantation (KTx) is known to be associated with graft failure risk
- Recent US studies suggest that adolescents and young adults have a higher risk of graft loss due to poorer compliance with the immunosuppressive regimen
- However, these results may be specific to US policy of KTx and US population
- We aim to describe the graft loss hazard evolution across current age, adjusted for age at KTx and time since transplantation, in France
- Data from 2 French RRT registries (REIN and CRISTAL) were used

## Patients and Methods

### Study design

Prospective cohort study of patients who received a first kidney transplant before the age of 30 years between January 1<sup>st</sup> 1993 and December 31<sup>st</sup> 2012 in France

### Outcome

First event within a composite endpoint defined as return to dialysis, pre-emptive retransplantation, or death during follow-up

### Statistical analysis

#### ✓ Description of instantaneous hazard evolution

A Weibull model adjusted for age at KTx was used to estimate the graft failure mean hazard at each current recipient age, stratified by patient and donor characteristics

#### ✓ Estimation of hazard ratio

A time-dependent Cox model with time-varying covariate to estimate the hazard ratio of graft loss at age 13-23 years compared to ages <13 or >23 years adjusted for time since KTx and other confounders

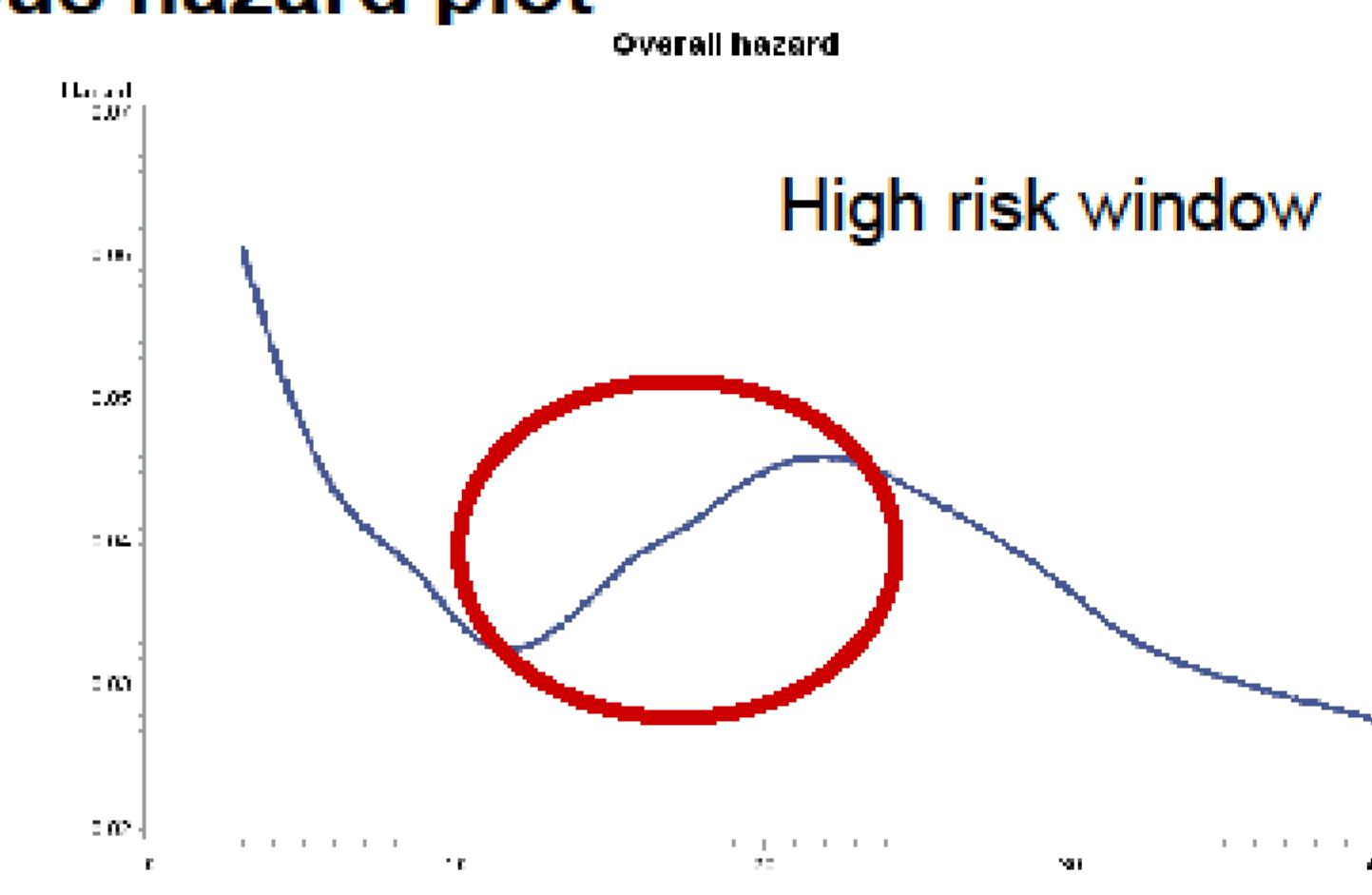
## Results

### 1. Population characteristics (N=5983)

Covariates	Modalities / Units	N (%)	Mean (SD)
<b>Factors related to the recipient</b>			
Age at KTx	(years)		20.9 (7.2)
Recipient's sex			
	Female	2396 (40.0)	
	Male	3587 (60.0)	
Renal disease			
	Glomerulonephritis/vascular diseases	2413 (40.3)	
	Genetic diseases	751 (12.6)	
	CAKUT	1346 (22.5)	
	Other/missing	1473 (24.6)	
<b>Factors related to the donor</b>			
Donor age	(years)		29.4 (15.0)
Donor type			
	Deceased	5017 (85.6)	
	Living	854 (14.4)	
<b>Factors related to the transplantation</b>			
Type of KTx			
	Pre-emptive	895 (15.0)	
	After dialysis	5047 (85.0)	
Era of KTx			
	1993 - 1997	1530 (25.6)	
	1998 - 2002	1480 (24.7)	
	2003 - 2007	1522 (25.4)	
	2008 - 2012	1451 (24.2)	

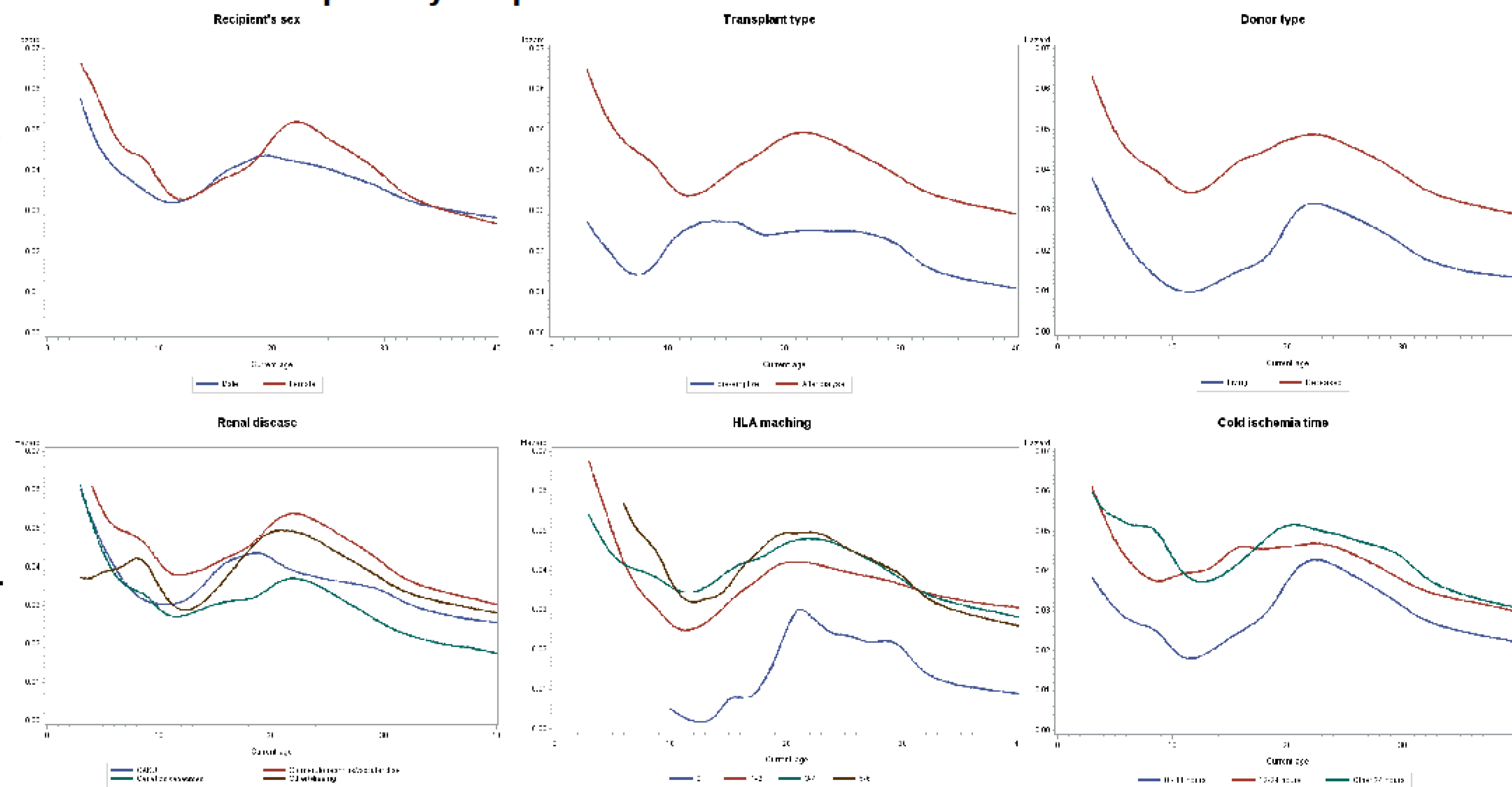
### 2. Hazard of graft loss across current recipient age

#### ✓ Overall instantaneous hazard plot



The hazard provides the current graft failure rate at a given age conditional on graft survival up to that age

#### ✓ Hazard plots by recipient and donor characteristics



### 3. Multivariate analysis

Renal disease	Main analysis			Sensitivity analyses										
	13 - 23 years			Analysis with different thresholds for the period at higher risk				Analysis with primary outcome (return to dialysis or preemptive re-KTx) censored for death			Analysis further adjusted for pre-KTx dialysis duration			
	HR*	95% CI	P-value	HR*	95% CI	P-value	HR*	95% CI	P-value	HR	95% CI	P-value		
Adolescents and young adults vs younger	1.92	2.56 - 1.43	<0.001	1.54	2.17 - 1.08	0.001	1.75	2.22 - 1.37	<0.001	2.08	2.86 - 1.52	0.001	1.79	2.44 - 1.32
Adolescents and young adults vs older	1.19	1.37 - 1.04		0.88	1.10 - 0.70		1.35	1.54 - 1.19		1.20	1.39 - 1.05		1.16	1.35 - 1.00

\*adjusted for sex, donor type, type of KTx, era of KTx, primary disease, cold ischemia time, HLA mismatch

## Conclusion

Among first kidney transplant recipients receiving Tx before the age of 30 years in France, those currently in adolescence and early adulthood (13-23 years) have the greatest hazard of graft failure, irrespective of age at Tx and time since Tx. This age window include the transition period from pediatric to adult medicine. Comprehensive transition programs are needed to reduce graft loss in this age group.

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