

## Development of the National Kidney Transplantation Program in Uruguay

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### ABSTRACT

The first kidney transplantation (KT) in Uruguay was performed in 1969. We report the rates of KT and survival of patients and grafts up to December 2014. The country has a surface of 176,215 km<sup>2</sup> and a population of 3,286,314 inhabitants (18.6 inhabitants per km<sup>2</sup>). Till December 31, 2014, 1,940 KT have been performed in Uruguay (41.8 pmp that year); 90.4% of them were from cadaveric donors (CD). Median age of recipients (R) was 44 ± 14 years; R older than 55 years increased from 0 to 27% during the period. Our pre-emptive KT program started in 2007. Optimal donors (D) decreased from 65.2% to 35.5%, and D older than 45 years old increased from 9% to 37%. Trauma as cause of death decreased from 49% to 32% and stroke as cause of death increased from 25% to 39%. Patient survival rates at 1, 5, and 8 years were 93%, 87%, and 78%, respectively for KT performed between 1980 and 1989; they were 98%, 93%, and 89%, respectively, for KT performed between 1990 and 1999; they were 97%, 91%, and 90%, respectively, for KT performed between 2000 and 2010. In December 2013, there were 1098 patients pmp in renal replacement therapy, 758 pmp in dialysis, and 340 pmp (30.9%) with a functioning graft. Our national KT program is mainly based (90.6%) on cadaveric donation. Epidemiological changes in the characteristics of R and D followed the changes in aging that occurred in the general population and the dialysis population. The survival rates from patients and kidneys are similar to those reported by the European and the American registries.

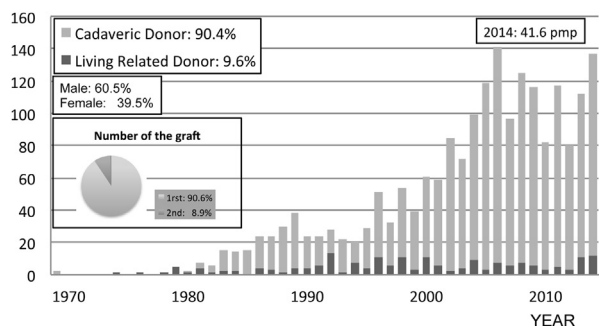
URUGUAY has a surface of 176,215 km<sup>2</sup> with a population of 3.251 million, with 94.7% living in cities. Less than 1% of the population is illiterate. Life expectancy at birth is 79.7 years and 72.4 years for females and males, respectively. Infant mortality was 12.0 per 1000 newborns in 2012. Data from the Mundial Bank in 2012 showed that Uruguay has a per capita Gross Domestic Product of US\$ 14,711 and per capita income of US\$ 620. The unemployment rate was 6%.

Since 1972, Uruguay has a law that regulates transplantation. Living organ donation can be done only among close family members. A national institute of transplantation with a histocompatibility laboratory facility was implemented. Kidneys are assigned according to predetermined criteria with

a unique national organ recipient waiting list. Three transplantation teams perform kidney transplantation (KT).

In 1981 a National Fund was created to finance highly expensive medical treatments and procedures, including dialysis and KT for the whole population. The creation of this fund allowed full and unrestricted access to these treatments. The Uruguayan health system offers both a public health care system and a prepaid one. In 2007 a new system called the National Health

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**Fig 1.** Incidence of new grafts, gender, and percentage per number of grafts.

Care System was created with the purpose of improving access and articulates both systems.

Our aim is to report the KT rates and outcomes in Uruguay since 1981 until December 2014.

**PATIENTS AND METHODS**

In 1981 a national KT database was created to keep a record of the demographic and follow-up variables of donors and recipients.

The rates of KT are analyzed till December 2014, however, the survival rates are analyzed until December 2012.

The SPSS statistical software package (IBM Corp. Released 2010, IBM SPSS Statistics for Windows, Version 15.0., Armonk,

NY, United States), Fisher *t*, Wilcoxon, and log-rank tests were used to test survival distributions. The survival curves were compared using the log-rank test. To test the equality of proportions in contingency tables, Fisher exact test was used. *P* < .05 was considered significant.

**RESULTS**

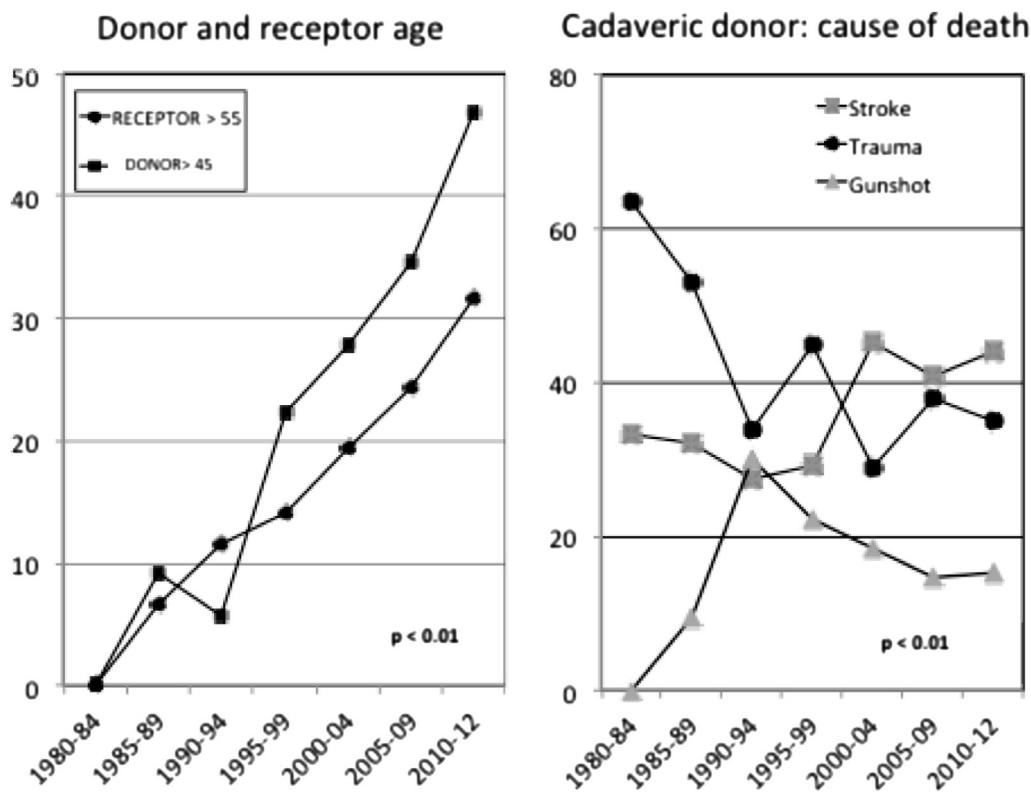
The first KT was performed in 1969 from a cadaveric donor (CD). To December 2014, 1940 KT were performed, 90.4% from CD and 9.6% from living related donor (LRD).

In 2014, 41.6 pmp KT were performed. Fig 1 refers to the evolution of the number of KT with LRD and CD per year. Considering all the recipients, 39% were female.

The median age of the recipients was 44 ± 14 years and the percentage of recipients older than 55 increased from 0 to 27%. In 2007 pre-emptive renal transplantation was introduced.

The number of KT with optimal CD decreased from 65.2% to 35.5%; the CD older than 45 years increased from 9% to 37%. Trauma as cause of death decreased from 49% to 32% whereas stroke as cause of death increased from 25% to 39% (Fig 2).

The survival rate of patients with CD KT after 1, 5, and 8 years performed between 1980 and 1989 was 93%, 87%, and 78%, respectively; for 1990–1999, it was 98%, 93%, and 89%, respectively; for 2000–2010, it was 97%, 91%, and



**Fig 2.** Evolution of donor and recipient age and CD cause of death.

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