

## Homicide and rates of renal transplantation in the United States and Australia

Matthew M Large

**TO THE EDITOR:** Critics of the proposal to legalise trade in kidneys have pointed out the low rates of renal transplantation in Australia compared with the United States,<sup>1</sup> where the trade in organs is also illegal. However, it is unclear if the lower rate of renal transplantation in Australia is a result of a shortfall in transplants from living or deceased donors.

First, I ranked renal transplantation rates in 2005 in US states and from Australia using the numbers of transplants from deceased and living donors from the United States Renal Data System (Beth Forrest,

### Association between rates of renal transplantation from deceased donors and rates of mortality from homicide, suicide and motor vehicle accidents in the United States in 2005\*

#### Analysis of variance

	Sum of squares	Degrees of freedom	Mean square	F	P
Regression	299.42	4	74.857	6.699	<0.001
Residual	514.04	46	11.175		

#### Coefficients

	Unstandardised		Standardised		P
	B <sup>†</sup>	Standard error of B	Beta <sup>‡</sup>	t	
Constant	14.122	2.974		4.748	<0.001
Living donor transplantation	0.02	0.073	0.034	0.273	0.79
Motor vehicle accident deaths	0.016	0.010	0.241	1.539	0.13
Suicide	-0.004	0.018	-0.031	-0.203	0.84
Homicide	0.050	0.011	0.559	4.508	<0.001

\* Calculated with SPSS, version 15.0 for Windows (SPSS Inc, Chicago, Ill, USA) using non-age-adjusted rates per 1000 population. No variable was significantly skewed. Missing values for cadaveric donation from North Dakota and living donation from Wyoming were replaced with mean values. Data include those for the District of Columbia. † Unstandardised regression slope in SPSS. ‡ Standardised regression slope in SPSS. ◆

Coordinating Center, US Renal Data System, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, Md, personal communication), the Australia and New Zealand Dialysis and Transplant Registry,<sup>2</sup> and populations from the US Census Bureau.<sup>3</sup>

In 2005, there were 12.1 per million population renal transplants from living donors in Australia. All of the states of the US except Oklahoma had higher rates of renal transplantation from the living, and the rate in Minnesota was four times higher. In contrast, the rate of renal transplantation from deceased donors in Australia was 18.6 per million population, which was higher than 24 American states and lower than 26 states and the District of Columbia. Some US states had twice the Australian rate of kidney donation from the deceased.

I then used multiple linear regression to examine associations between rates of renal transplants from the deceased and rates of homicide, suicide and motor vehicle accident deaths in US states.<sup>4</sup> Rates of renal transplantation from living donors were included as a covariable to control for differing degrees of development in US state transplant services. Homicide rates were associated with rates of transplants from the deceased ( $R = 0.607$ ,  $R^2 = 0.386$ ; Box), but deaths from suicide and motor vehicle accidents were not. Hence, the higher rate of renal transplantation from deceased donors in the US appears to be the result of greater availability of organs from homicide victims.

The high mortality and morbidity associated with endstage renal failure, despite renal dialysis treatment, suggests a need for new approaches to increasing the availability of donor kidneys. Assumed consent for organ donation might increase donation rates from the deceased, but this has been resisted in both Australia and the US on the grounds that failure to opt out might only indicate lack of forethought and not consent. While Australia continues with an opt-in system for deceased donation, measures to encourage live donation might have more realistic prospects of success than attempts to increase the rate of renal transplantation from the deceased.

**Matthew M Large**, Psychiatrist  
Mental Health Services, Prince of Wales  
Hospital, Sydney, NSW.  
mmb@bigpond.com

1 Mathew T, Faull R, Snelling P. The shortage of kidneys for transplantation in Australia. *Med J Aust* 2005; 182: 204-205.

2 Australia and New Zealand Dialysis and Transplant Registry. The 28th annual report. 2005 report — data to 2004. [http://www.anzdata.org.au/v1/reports\\_2005.html](http://www.anzdata.org.au/v1/reports_2005.html) (accessed Jun 2008).

3 US Census Bureau. National and state population estimates. Annual population estimates 2000 to 2005. <http://www.census.gov/popest/states/NST-ann-est2005.html> (accessed Feb 2009).

4 Kung HC, Hoyert DL, Xu J, Murphy SL. Deaths: final data for 2005. *Natl Vital Stat Rep* 2008; 56: 1-120. □