



Australia &
New Zealand Dialysis
& Transplant Registry

Chapter 9

Kidney Donors

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Suggested Citation:

ANZDATA Registry. 38th Report, Chapter 9: Kidney Donors. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2016. Available at: <http://www.anzdata.org.au>

Deceased Kidney Donors

The data for this section come from the Australia and New Zealand Organ Donor (ANZOD) Registry. Much more information about deceased organ donors in Australia and New Zealand can be found on the ANZOD website,

<http://www.anzdata.org.au/anzod/v1/indexanzod.html>

Figure 9.1 shows the different types of deceased kidney donors in each country over 2005-2014. In Australia there has been a large increase in the number of donors since 2008, driven primarily by an increase in expanded criteria (ECD) and in particular circulatory death (DCD) donors. In New Zealand the donor numbers are steady and the proportions of donors classified as ECD and DCD are much lower than in Australia.

Figure 9.1.1 Deceased Kidney Donor Type
Australia 2005-2014

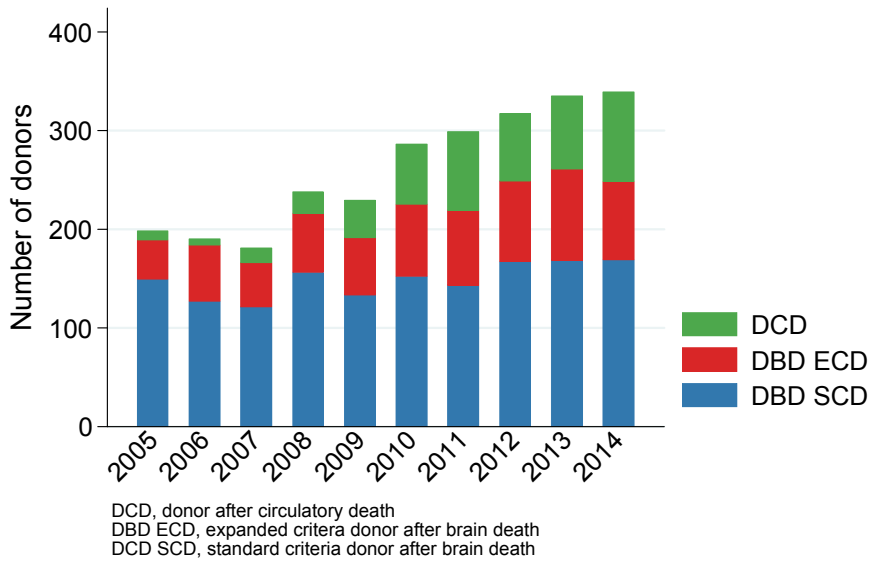
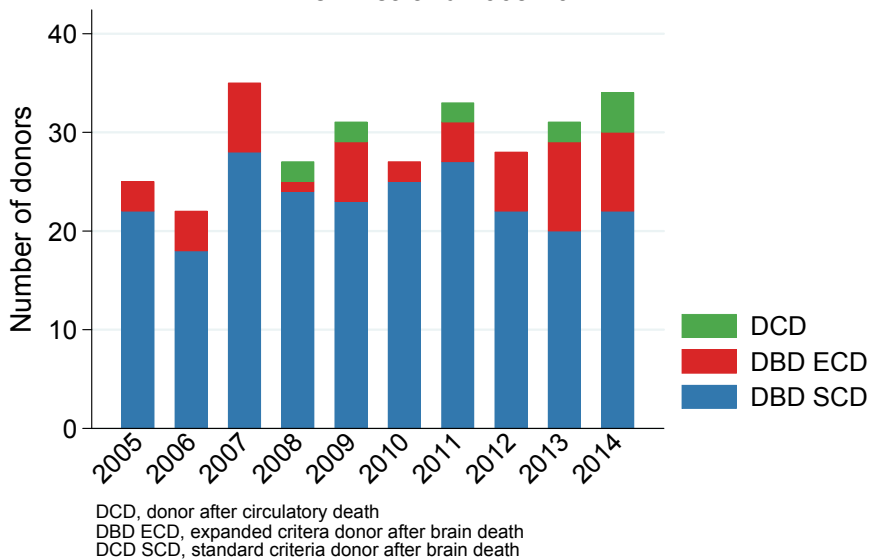


Figure 9.1.2 Deceased Kidney Donor Type
New Zealand 2005-2014



The causes of death of deceased donors are shown in Figure 9.2. Stroke remains the most common cause of kidney donor death in both Australia and New Zealand. In Australia there has been a slight reduction in the

proportion of deaths due to road trauma, with a corresponding increase in the proportion due to hypoxia/anoxia.

Figure 9.2.1

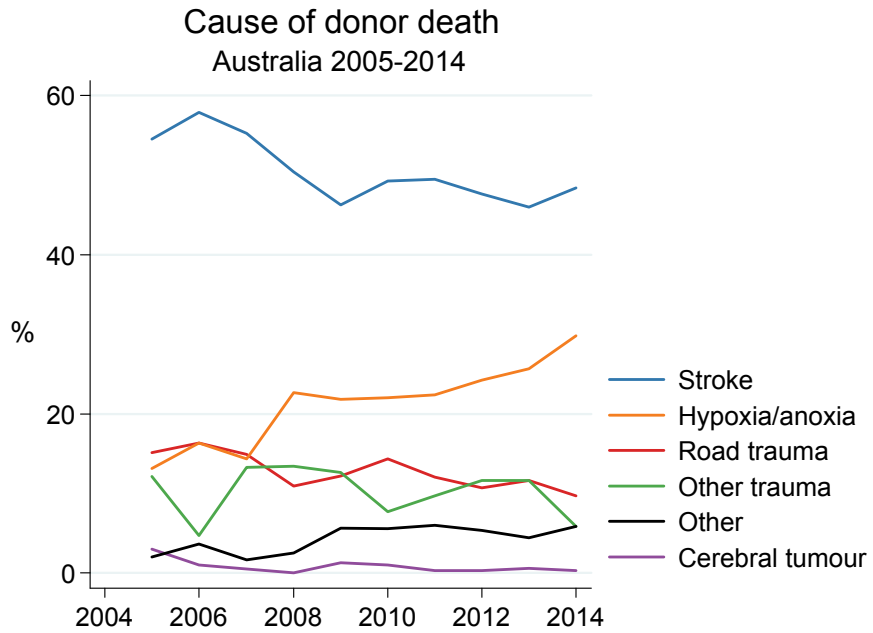


Figure 9.2.2

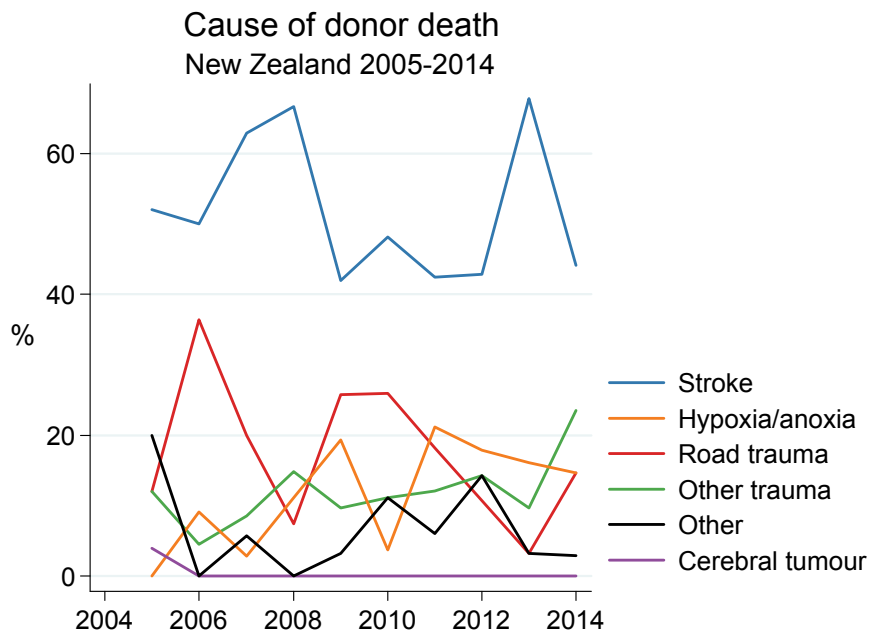


Figure 9.3 shows the mean age of deceased kidney donors in Australia and New Zealand over the last 20 years. In Australia the mean age has increased steadily from 35 years in 1995 to 47 years in 2014. In New

Zealand the trend is less clear, and donors are generally younger than in Australia.

Figure 9.3.1

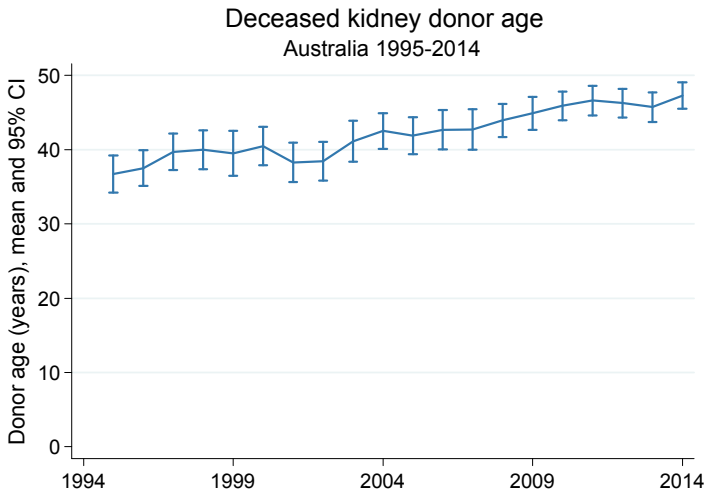


Figure 9.3.2

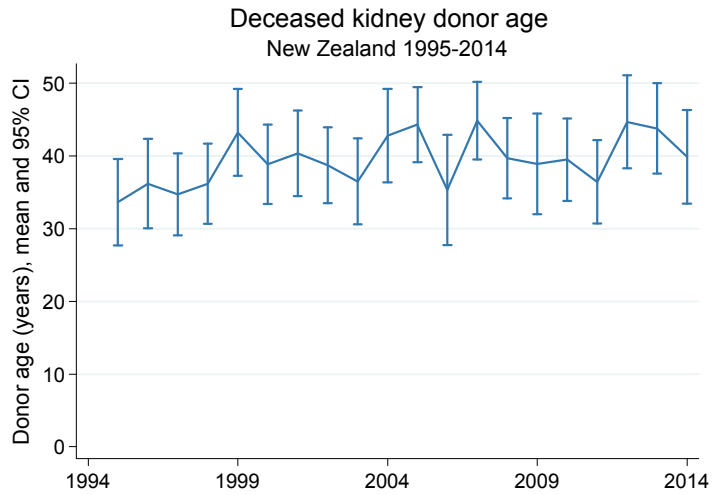


Figure 9.4 shows the discard rate of retrieved kidneys – the proportion of kidneys that were retrieved for the purpose of transplantation, but not ultimately transplanted into a recipient (either due to an absence of suitable recipients, or the kidney being found to be medically unsuitable after retrieval). Despite the

increasing age and complexity of donors in Australia the discard rate remained steady at around 3% over 2005-2012. However, this rate rose in 2013-14. In New Zealand discard rates have historically been slightly higher than in Australia (note the different y-axis scales).

Figure 9.4.1

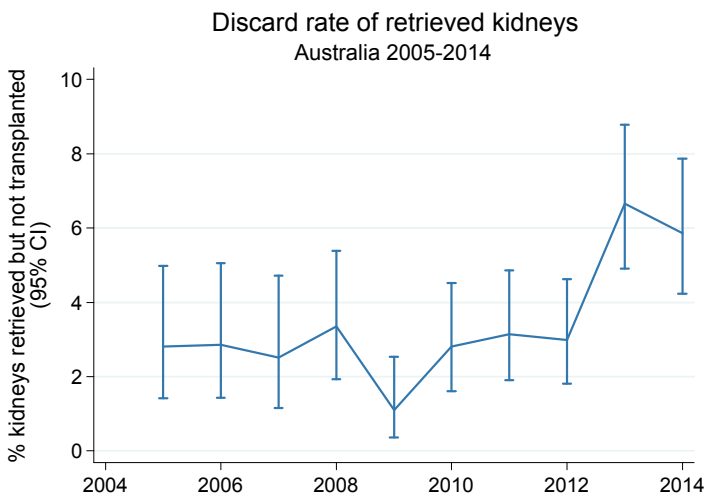
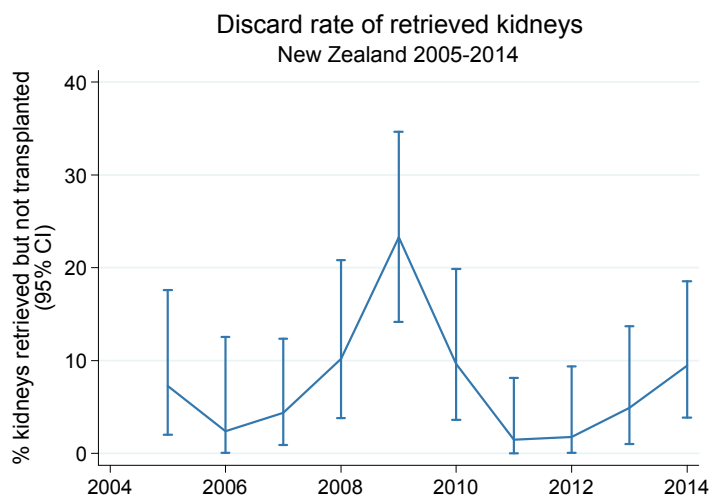


Figure 9.4.2



Living Kidney Donors

Australia

There were 267 living donor kidney transplants performed in 2014 in Australia, representing 29% of all transplant operations (table 9.1). Living donor transplants have been falling as a proportion of all transplants since 2009 (figure 9.5).

The proportion of living donor transplants for each state and New Zealand for recipients aged 25-44 years is shown for the years 2007-2010 and 2011-2014 in figure 9.6. Overall there has been a decrease in this age group for both countries from 2007-2010 to 2011-2014, more pronounced in Australia.

Table 9.1. Proportion of Living Kidney Donor Transplants by Age Group 2009-2014

Age group	2009	2010	2011	2012	2013	2014
0-4	55%	60%	50%	67%	60%	89%
5-14	71%	60%	48%	70%	55%	52%
15-24	73%	76%	58%	58%	53%	48%
25-34	54%	44%	40%	29%	36%	44%
35-44	40%	41%	35%	32%	26%	31%
45-54	39%	26%	22%	21%	29%	24%
55-64	37%	31%	28%	21%	24%	21%
65-74	33%	18%	23%	25%	18%	23%
75-84	0%	67%	50%	50%	0%	36%
All recipients	42%	35%	31%	28%	29%	29%

Figure 9.5

Percentage Living Donor Grafts - Australia
Stratified by age, 2010 vs 2014

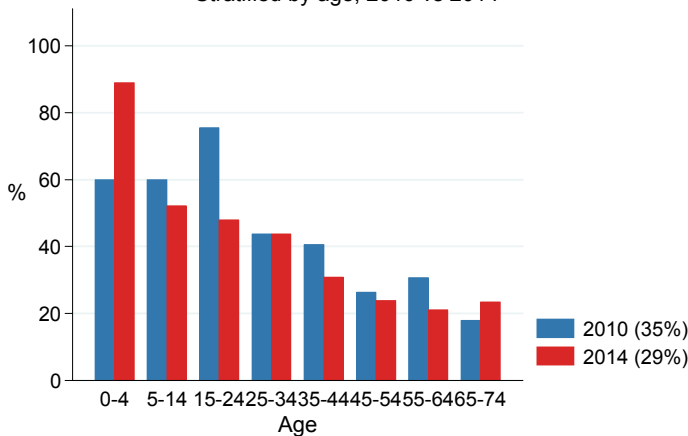


Figure 9.6

Percentage Living Donor Grafts
Age 25-44, 2007-2010 vs 2011-2014

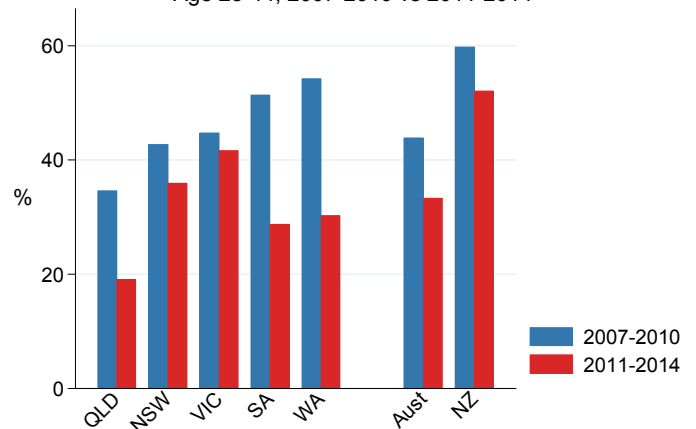
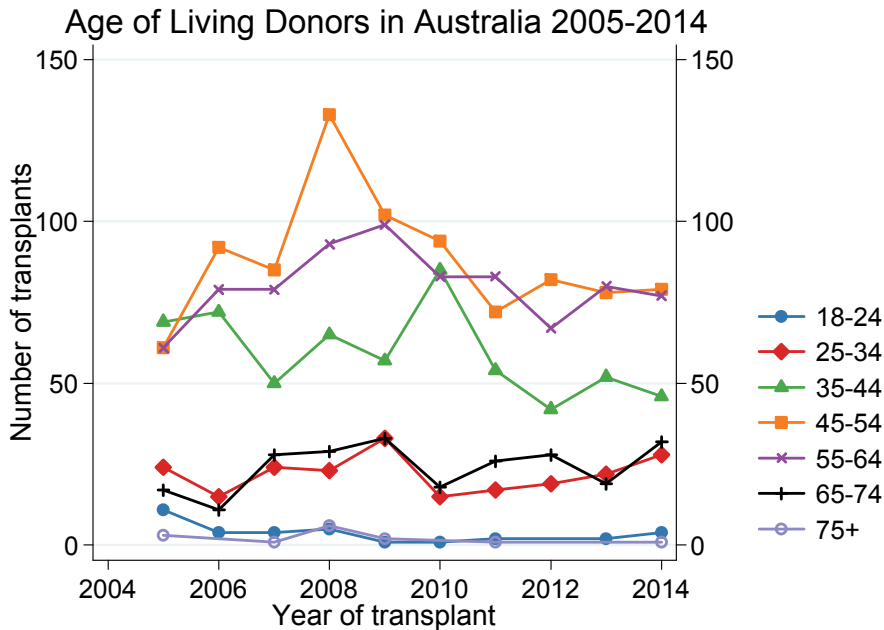


Figure 9.7 shows the number of living donors for the years 2005-2014 by donor age. Since 2008 the number of living donors decreased in the most common age groups of 35-44, 45-54 and 55-64.

The proportion of genetically unrelated donors was 49% (132 donors) in 2014 compared with 50% (126 donors) in 2013, shown in figure 9.8. Forty-one percent of living unrelated donors were spouses or partners (table 9.2).

Figure 9.7



New Zealand

There were 72 living kidney donors in New Zealand in 2014, 37 of whom were genetically unrelated to their recipient.

Overall fifty-two percent of grafts were from a living donor. There were six non-directed donors in 2014.

Figure 9.8.1

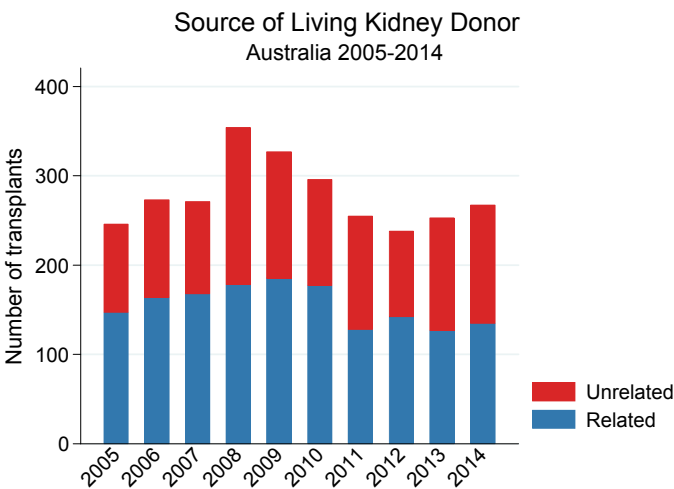


Figure 9.8.2

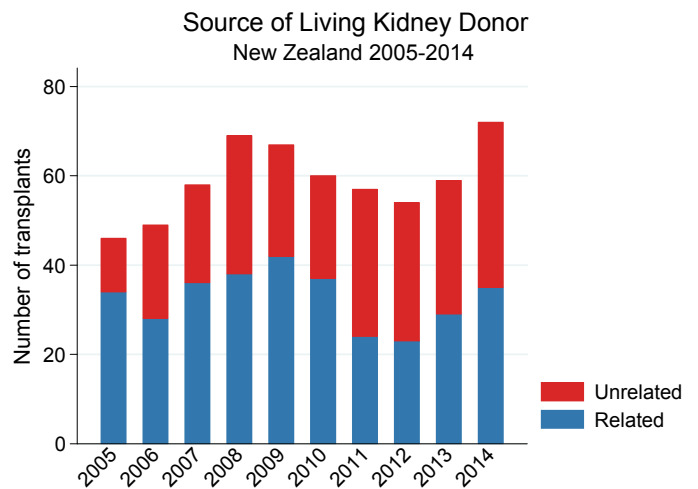


Table 9.2. Living Kidney Donor Relationship to Recipient 2010-2014, Australia

Country	Source	2010	2011	2012	2013	2014
Australia	Total	296	255	238	253	267
	Related	177	128	142	127	135
	Mother	48	38	40	29	43
	Father	37	33	35	28	22
	Sister	35	22	26	24	29
	Brother	26	18	20	24	23
	Identical twin sister	1	0	0	0	0
	Identical twin brother	0	1	0	0	0
	Non-identical twin sister	0	1	0	1	1
	Non-identical twin brother	2	0	0	0	0
	Daughter	4	5	3	2	3
	Son	7	1	3	6	5
	Grandmother	3	0	3	1	3
	Grandfather	1	1	0	1	1
	Cousin	4	2	4	6	1
	Niece	1	1	0	0	0
	Aunt	7	3	4	1	3
	Uncle	1	2	4	3	1
	Other related	0	0	0	1	0
	Unrelated	119	127	96	126	132
	Wife	47	47	32	42	31
	Husband	21	20	15	19	18
	Mother-in-law	1	0	1	0	2
	Father-in-law	1	0	1	1	0
	Stepfather	0	0	1	0	0
	Sister-in-law	0	2	1	1	1
	Brother-in-law	1	0	2	4	3
	Daughter-in-law	1	0	0	0	2
	Son-in-law	0	0	0	0	0
	Stepson	1	1	0	0	0
Partner	6	6	5	5	5	
Friend	16	12	7	14	19	
Non-directed	1	4	5	2	5	
Pathological	11	9	12	3	4	
Paired kidney exchange	8	26	11	31	38	
Other unrelated	4	0	3	4	4	

Table 9.2. Living Kidney Donor Relationship to Recipient 2010-2014, New Zealand

Country	Source	2010	2011	2012	2013	2014
New Zealand	Total	60	57	54	59	72
	Related	37	24	23	29	35
	Mother	3	0	4	6	7
	Father	5	3	6	2	5
	Sister	6	9	3	5	7
	Brother	10	5	1	9	6
	Identical twin sister	0	0	0	0	0
	Identical twin brother	0	1	0	0	0
	Non-identical twin sister	0	0	0	0	0
	Non-identical twin brother	0	0	0	0	0
	Daughter	2	2	4	2	3
	Son	3	2	4	3	4
	Grandmother	0	0	0	0	0
	Grandfather	0	0	0	0	0
	Cousin	3	1	0	1	2
	Niece	1	0	1	0	1
	Aunt	2	0	0	1	0
	Uncle	2	1	0	0	0
	Other related	0	0	0	0	0
	Unrelated	23	33	31	30	37
	Wife	5	10	8	7	12
	Husband	2	4	1	3	0
	Mother-in-law	0	0	0	1	0
	Father-in-law	0	0	0	0	0
	Stepfather	1	0	0	0	0
	Sister-in-law	0	0	0	1	1
	Brother-in-law	1	1	0	0	0
	Daughter-in-law	0	0	0	0	0
	Son-in-law	0	1	0	1	0
	Stepson	0	0	0	0	0
	Partner	2	4	1	2	0
Friend	7	5	14	5	9	
Non-directed	4	3	4	8	6	
Pathological	0	0	0	0	0	
Paired kidney exchange	0	2	2	1	4	
Other unrelated	1	3	1	1	5	

The sex distribution of living donors by relation to recipient, state and country is shown in table 9.3.

ABO incompatible transplant numbers have been stable over the last four years (table 9.4).

Table 9.3. Sex Distribution of Living Donors by Relation to Recipient, State and Country 2010-2014

Donor source	Year	2010			2011			2012			2013			2014		
	Tx state	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total
Related	NSW/ACT	37%	63%	46	41%	59%	46	43%	57%	46	40%	60%	58	36%	64%	56
	VIC/TAS	42%	58%	66	50%	50%	44	40%	60%	50	65%	35%	34	39%	61%	44
	QLD	57%	43%	21	45%	55%	20	38%	62%	21	44%	56%	18	40%	60%	15
	SA/NT	40%	60%	20	30%	70%	10	57%	43%	14	60%	40%	5	44%	56%	9
	WA	42%	58%	24	50%	50%	8	55%	45%	11	83%	17%	12	55%	45%	11
	Aust.	42%	58%	177	45%	55%	128	44%	56%	142	52%	48%	127	39%	61%	135
	NZ	57%	43%	37	50%	50%	24	48%	52%	23	48%	52%	29	43%	57%	35
Unrelated	NSW/ACT	41%	59%	37	43%	57%	42	41%	59%	27	32%	68%	50	33%	67%	54
	VIC/TAS	41%	59%	39	43%	58%	40	47%	53%	36	49%	51%	49	53%	47%	45
	QLD	36%	64%	22	25%	75%	16	30%	70%	10	50%	50%	10	73%	27%	11
	SA/NT	38%	63%	8	50%	50%	6	33%	67%	9	43%	57%	7	50%	50%	8
	WA	23%	77%	13	43%	57%	23	36%	64%	14	60%	40%	10	36%	64%	14
	Aust.	38%	62%	119	41%	59%	127	41%	59%	96	43%	57%	126	45%	55%	132
	NZ	43%	57%	23	42%	58%	33	26%	74%	31	33%	67%	30	24%	76%	37

Table 9.4. Transplant Numbers by Blood Group Status 2005-2014

Year	Country	Compatible	Incompatible	Unknown
2004	Australia	244	1	1
	NZ	46	0	0
2005	Australia	264	9	0
	NZ	48	1	0
2006	Australia	249	22	0
	NZ	58	0	0
2007	Australia	318	36	0
	NZ	68	1	0
2008	Australia	295	30	2
	NZ	65	2	0
2009	Australia	254	40	2
	NZ	59	1	0
2010	Australia	217	35	3
	NZ	52	3	2
2011	Australia	193	28	17
	NZ	47	5	2
2012	Australia	204	36	13
	NZ	52	6	1
2013	Australia	217	37	13
	NZ	62	9	1

Living Donor Characteristics

Table 9.5 shows the clinical characteristics of living kidney donors over 2005-14. Donors were predominantly Caucasian and commonly overweight or

obese. A history of smoking was common. Australian donors were older and more likely to have hypertension.

Table 9.5. Living Donor Clinical Characteristics 2005-2014

Factor	Australia	New Zealand
N	2698	591
Age (years), mean (SD)	50.0 (11.1)	44.2 (11.1)
Sex		
Female	1562 (57.9%)	345 (58.4%)
Male	1136 (42.1%)	246 (41.6%)
Race		
Caucasian	2349 (87.1%)	487 (82.4%)
Aboriginal/TSI	13 (0.5%)	0 (0.0%)
Asian	211 (7.8%)	24 (4.1%)
Māori	11 (0.4%)	46 (7.8%)
Pacific	25 (0.9%)	20 (3.4%)
Other	62 (2.3%)	5 (0.8%)
Not reported	27 (1.0%)	9 (1.5%)
Body mass index		
<18.5 (underweight)	21 (0.8%)	1 (0.2%)
18.5-24.9 (normal)	939 (34.8%)	221 (37.4%)
25-29.9 (overweight)	1158 (42.9%)	256 (43.3%)
≥30 (obese)	471 (17.5%)	94 (15.9%)
Not reported	109 (4.0%)	19 (3.2%)
Hypertension	388 (14.6%)	39 (6.8%)
Glycaemic status		
Normal	2578 (95.6%)	564 (95.4%)
Impaired fasting glucose	12 (0.4%)	1 (0.2%)
Impaired glucose tolerance	59 (2.2%)	1 (0.2%)
Diabetic	9 (0.3%)	1 (0.2%)
Not reported	40 (1.5%)	24 (4.1%)
Cigarette Smoking		
Never	1568 (58.1%)	350 (59.2%)
Former	962 (35.7%)	138 (23.4%)
Current	136 (5.0%)	82 (13.9%)
Not reported	32 (1.2%)	21 (3.6%)

Timing of Living Kidney Transplants

The timing of primary living donor transplants relative to the start of dialysis is shown in table 9.6.

The proportion of all primary living donor transplants performed “pre-emptively” in Australia was 37%, a number that has been stable for the last 5 years. The gradual reduction in the numbers of pre-emptive transplants over 2009-12 has stopped (figure 9.9). Thirty-one percent of recipients had received dialysis

treatment for twelve months or longer prior to a first living donor graft.

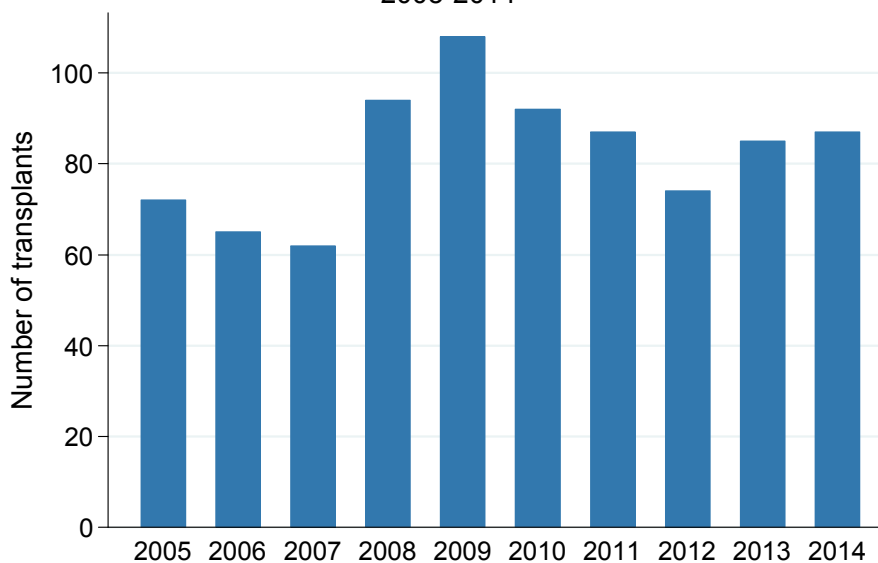
The proportion of pre-emptive primary living donor transplants in New Zealand was 33% in 2014, a relatively stable number that is consistently slightly lower than that in Australia. Forty-eight percent received dialysis for twelve months or longer prior to being transplanted.

Table 9.6. Timing of Living Kidney Donor Transplants 2010-2014

Country	Timing of transplant	2010	2011	2012	2013	2014
Australia	Pre-emptive	92 (35%)	87 (37%)	74 (35%)	85 (38%)	87 (37%)
	<1 month post dialysis	6 (2%)	7 (3%)	6 (3%)	9 (4%)	4 (2%)
	1 month to <1 year post dialysis	62 (23%)	66 (28%)	72 (34%)	65 (29%)	73 (31%)
	≥1 year post dialysis	106 (40%)	73 (31%)	62 (29%)	65 (29%)	73 (31%)
NZ	Pre-emptive	15 (25%)	12 (23%)	15 (31%)	15 (26%)	22 (33%)
	<1 month post dialysis	1 (2%)	1 (2%)	1 (2%)	2 (4%)	-
	1 month to <1 year post dialysis	10 (17%)	11 (21%)	12 (24%)	9 (16%)	13 (19%)
	≥1 year post dialysis	33 (56%)	28 (54%)	21 (43%)	31 (54%)	32 (48%)

Figure 9.9

Pre-emptive Transplants - Australia 2005-2014



Suggested Citation:

ANZDATA Registry. 38th Report, Chapter 9: Kidney Donors. Australia and New Zealand Dialysis and Transplant Registry, Adelaide, Australia. 2016. Available at: <http://www.anzdata.org.au>

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