

## **CHAPTER 9**

### **ORGAN PROCUREMENT**

**(Data from the ANZOD Registry)**

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## ORGAN DONORS IN AUSTRALIA AND NEW ZEALAND

(Summarised from the Australia and New Zealand Organ Donation Registry Report 2008)  
 For more detail please refer to Website: [www.anzdata.org.au/anzod/anzodwelcome.htm](http://www.anzdata.org.au/anzod/anzodwelcome.htm).

**Figure 9.1**

<b>Number of Donors** by Retrieval State<sup>x</sup> 2002 - 2007</b>					
<b>( ) Donors Per Million</b>					
	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
Queensland	40 (11)	39 (10)	35 (9)	36 (9)	39 (9)
New South Wales + *	46 (7+) (7*)	63 (10+) (9*)	54 (8+) (8*)	49 (7+) (7*)	53 (8+) (8*)
ACT + *	8 (15+) (25*)	6 (12+) (19*)	9 (17+) (28*)	4 (7+) (12*)	1 (2+) (3*)
Victoria	42 (9)	45 (9)	50 (10)	46 <sup>x</sup> (9)	55 (11)
Tasmania	2 (4)	2 (4)	2 (4)	8 (16)	1 (2)
South Australia	22 (14)	39 (25)	20 (13)	36 (23)	27 (17)
Northern Territory	1 (5)	1 (5)	4 (20)	2 (10)	3 (14)
Western Australia	18 (9)	23 (12)	30 (15)	21 (10)	19 (9)
<b>Australia</b>	<b>179 (9)</b>	<b>218 (11)</b>	<b>204 (10)</b>	<b>202 (10)</b>	<b>198 (9)</b>
<b>New Zealand</b>	<b>40 (10)</b>	<b>40 (10)</b>	<b>29 (7)</b>	<b>25 (6)</b>	<b>38 (9)</b>

x Refers to donors retrieved by retrieval State (ie Albury-NSW donors retrieved by Victoria)  
 + NSW population excludes residents of the NSW Southern Area Health Service (included in ACT population)  
 \* NSW population includes residents of the NSW Southern Area Health Service (excluded from ACT population)  
 Medical services from the ACT service the NSW Southern Area Health Region. Population data—June 2007 ABS 3101.0

\*\* This figure relates to the number of donors for whom the retrieval operation commenced for the purpose of transplantation. It includes donors who may have been deemed medically unsuitable at the time of surgery or after removal of organs.

Donor figures for Australia for 2007 include six donors who went to the operating theatre but organs were not retrieved. Donor (dpmp) figures in Australia have remained fairly static over time, ranging from 9-11 dpmp during the past five years.

Three donors had an ischaemic bowel, two were found to have organs not suitable and one had a suspected malignancy, which later proved to be benign.

All New Zealand donors had organs retrieved.

In 2007 there was a range between the States of two donors per million population (dpmp) in Tasmania and the ACT to 17 dpmp in South Australia.

The ACT had three donors dpmp when the New South Wales Southern Area Health Service population was excluded.

**Figure 9.2**

<b>Donors per Thousand Deaths Aged &lt;75 years 2002 - 2006</b>										
<b>( ) Represents % of Total Deaths Aged &lt; 75 years *</b>										
<b>Year</b>	<b>QLD</b>	<b>NSW</b>	<b>ACT</b>	<b>VIC</b>	<b>TAS</b>	<b>SA</b>	<b>NT</b>	<b>WA</b>	<b>AUST</b>	<b>NZ</b>
<b>2002</b>	4.4 (40%)	3.0 (38%)	11.6 (38%)	3.8 (34%)	3.9 (38%)	7.4 (35%)	2.7 (79%)	3.2 (40%)	<b>4.0 (38%)</b>	<b>3.3 (41%)</b>
<b>2003</b>	4.1 (40%)	2.5 (37%)	8.3 (42%)	3.5 (36%)	1.3 (38%)	5.0 (34%)	1.5 (76%)	3.9 (40%)	<b>3.4 (38%)</b>	<b>3.4 (40%)</b>
<b>2004</b>	4.0 (39%)	3.7 (35%)	10.1 (42%)	3.7 (34%)	1.4 (36%)	9.8 (34%)	1.4 (78%)	4.8 (40%)	<b>4.3 (37%)</b>	<b>3.4 (48%)</b>
<b>2005</b>	3.6 (39%)	3.2 (36%)	16.5 (36%)	4.4 (35%)	1.3 (37%)	4.8 (34%)	5.1 (78%)	6.3 (39%)	<b>4.1 (37%)</b>	<b>2.7 (40%)</b>
<b>2006</b>	3.8 (38%)	2.9 (34%)	7.0 (38%)	4.0 (33%)	5.6 (36%)	9.0 (32%)	2.8 (76%)	4.6 (39%)	<b>4.1 (36%)</b>	<b>2.3 (39%)</b>

\* The number of actual donors is compared to the number of deaths that are aged less than 75 years (Figure 9.2).

Australian Bureau of Statistics - Deaths 3302.0 and Statistics NZ

## DONOR PROFILE

### AGE AND GENDER DISTRIBUTION

In Australia in 2007, 12% (23 donors) were 65 years or older and 4% (seven donors) were aged 75 years or older. The oldest donor was 80.4 years.

Donor gender in each State, Australia and New Zealand is shown in five year cohorts in Figure 9.3.

The mean age for donors in Australia, 43.4 years, remained similar to the past four years. The mean age for Australian States ranged from 37.5 years in Queensland and Tasmania to 58.9 years in the ACT.

The median age for Australia in 2007 was 45.2, similar to the past two years. The age range was between 8.7 months and 80.4 years.

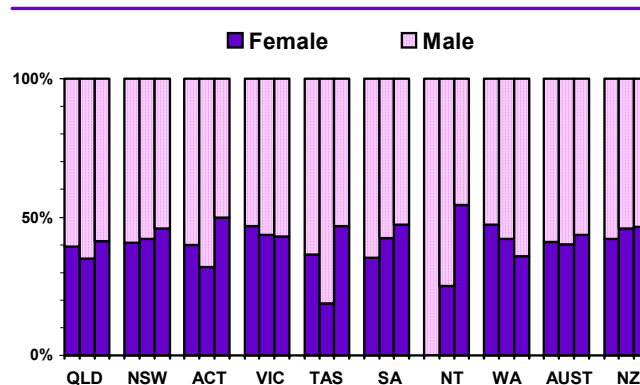
In Australian States the median age ranged from 42.3 years in Queensland to 59.2 years in the Northern Territory, excluding Tasmania and the ACT, who both had only one donor each.

The mean and median age for donors from 1990 to 2007 for each State are shown in three year cohorts in Figures 9.4 and 9.5.

In New Zealand in 2007 the mean age increased from 36.5 years to 46.6 years and the median age from 35.4 years to 48.8 years in 2007. Two donors were over 65 years. The age range was 11.9 years to 71.6 years.

**Figure 9.3**

**Donor Gender – States, Australia, New Zealand  
1993-1997 1998-2002 2003-2007**



**Figure 9.4**

Australian States Mean Age of Donors								
Years	QLD	NSW	ACT	VIC	TAS	SA	NT	WA
1990 - 1992	31.5	36.8	31.3	35.2	27.0	34.7	34.9	32.5
1993 - 1995	33.1	38.6	37.7	39.4	25.8	37.9	32.1	37.4
1996 - 1998	34.7	40.4	46.0	43.4	39.8	41.2	37.9	33.0
1999 - 2001	40.3	41.2	35.5	42.3	37.0	38.9	32.6	36.6
2002 - 2004	37.8	44.1	43.6	44.3	33.4	40.8	54.0	36.7
2005 - 2007	39.7	45.4	39.2	42.4	35.3	46.6	41.0	43.3

**Figure 9.5**

Australian States Median Age of Donors								
Years	QLD	NSW	ACT	VIC	TAS	SA	NT	WA
1990 - 1992	32.5	36.7	36.7	33.3	28.6	35.0	31.8	32.9
1993 - 1995	31.5	39.9	34.8	40.8	22.2	38.3	29.9	36.2
1996 - 1998	37.3	41.0	46.4	47.4	37.9	46.1	35.5	31.7
1999 - 2001	43.4	43.1	35.6	45.7	40.9	43.4	26.3	37.8
2002 - 2004	40.3	45.3	45.6	48.5	29.7	44.1	54.4	36.2
2005 - 2007	42.3	48.3	40.4	46.6	36.2	45.8	42.4	45.1



## CAUSE OF DEATH - ALL DONORS

Figure 9.6 shows the cause of death for all organ donors in Australia since 1989 and for New Zealand since 1993.

In Australia and New Zealand road trauma is a reducing cause of death. In contrast cerebrovascular accident (CVA) has been steadily increasing in Australia since 1989 although this does not appear to be the case in New Zealand, where figures have remained relatively steady.

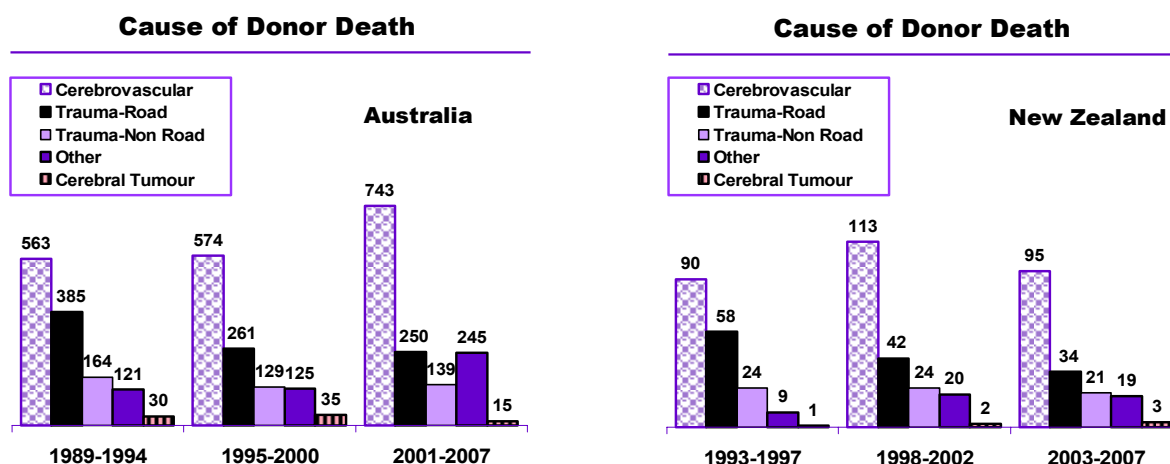
In the period 2001-2007, CVA accounted for 53% of donor deaths and road trauma 18%.

Figure 9.7 shows the cause of death by percentage in Australia and New Zealand and each Australian State, from 2001 to 2007.

Figure 9.8 shows detailed cause of death by gender for 2007.

Figure 9.9 shows that CVA is the main cause of death in donors 55 years and older, 73% in Australia and 67% in New Zealand, whereas in the 15-34 year age group, trauma accounted for 49% of all deaths in Australia and 100% in New Zealand in 2007.

**Figure 9.6**



**Figure 9.7**

Cause of Donor Death 2001 - 2007										
	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ *
CVA	49%	56%	49%	60%	58%	50%	67%	47%	53%	56%
Trauma (road)	23%	17%	24%	13%	8%	16%	20%	22%	18%	21%
Trauma (non-road)	14%	8%	12%	7%	17%	7%	13%	18%	10%	12%
Hypoxia-Anoxia	11%	14%	15%	15%	17%	24%	0%	8%	15%	6%
Cerebral Tumour	1%	1%	0%	1%	0%	1%	0%	3%	1%	1%
Other	2%	4%	0%	4%	0%	2%	0%	2%	3%	4%

\* NZ 2003 - 2007

Figure 9.8

Cause of Donor Death 2007							
Causes of Death		Australia			New Zealand		
		Male	Female	Total	Male	Female	Total
CVA	Cerebral Infarct	5	10	<b>15</b>	3	2	<b>5</b>
	Intracranial Haemorrhage	21	21	<b>42</b>	3	3	<b>6</b>
	Subarachnoid Haemorrhage	16	31	<b>47</b>	2	11	<b>13</b>
Road Trauma	Cyclist	4	1	<b>5</b>	0	0	<b>0</b>
	Motor Bike Accident	6	0	<b>6</b>	1	1	<b>2</b>
	Motor Vehicle Accident	11	3	<b>14</b>	3	2	<b>5</b>
	Pedestrian	4	0	<b>4</b>	0	0	<b>0</b>
	Other Road Accident	1	0	<b>1</b>	0	0	<b>0</b>
Other Trauma	Fall	7	6	<b>13</b>	2	1	<b>3</b>
	Felony / Crime - Assault	6	0	<b>6</b>	0	0	<b>0</b>
	Gunshot	3	0	<b>3</b>	0	0	<b>0</b>
	Other Accident	2	1	<b>3</b>	0	0	<b>0</b>
Hypoxia Anoxia	Aortic Dissection	1	0	<b>1</b>	0	0	<b>0</b>
	Asthma	1	2	<b>3</b>	0	0	<b>0</b>
	Cardiac Arrest	8	5	<b>13</b>	1	1	<b>2</b>
	Drowning	1	2	<b>3</b>	0	0	<b>0</b>
	Electrocution	1	0	<b>1</b>	0	0	<b>0</b>
	Epiglottitis-Unable to intubate	1	0	<b>1</b>	0	0	<b>0</b>
	Epilepsy	1	0	<b>1</b>	0	0	<b>0</b>
	? Fit ? Subarachnoid Haemorrhage	0	1	<b>1</b>	0	0	<b>0</b>
	Hanging	3	1	<b>4</b>	0	0	<b>0</b>
	Hyperthermia	1	0	<b>1</b>	0	0	<b>0</b>
	Post Bypass Surgery	1	0	<b>1</b>	0	0	<b>0</b>
	Post Wrist Slashing	1	0	<b>1</b>	0	0	<b>0</b>
Strangulation	0	1	<b>1</b>	0	0	<b>0</b>	
Other	Cerebral Oedema	2	0	<b>2</b>	0	0	<b>0</b>
	Extradural Haematoma	2	0	<b>2</b>	0	0	<b>0</b>
	Glioblastoma (Malignant)	0	1	<b>1</b>	0	0	<b>0</b>
	Meningitis (Streptococcus)	0	0	<b>0</b>	0	1	<b>1</b>
	Paracetamol Overdose	0	1	<b>1</b>	0	0	<b>0</b>
	Respiratory Failure	0	1	<b>1</b>	0	0	<b>0</b>
	Ventricular Colloid Cyst	0	0	<b>0</b>	0	1	<b>1</b>
<b>Total</b>		<b>110</b>	<b>88</b>	<b>198</b>	<b>15</b>	<b>23</b>	<b>38</b>

Figure 9.9

Cause of Donor Death Related to Age Group 2007										
	Australia					New Zealand				
	Age Groups				Total	Age Groups				Total
	0-14	15-34	35-54	55 on		0-14	15-34	35-54	55 on	
CVA	1	19	37	47	<b>104 (53%)</b>	0	0	16	8	<b>24 (63%)</b>
Trauma (road)	1	25	2	2	<b>30 (15%)</b>	1	5	0	1	<b>7 (18%)</b>
Trauma (non-road)	2	8	6	9	<b>25 (13%)</b>	0	1	0	2	<b>3 (8%)</b>
Hypoxia-Anoxia	2	12	12	6	<b>32 (16%)</b>	0	0	1	1	<b>2 (&lt;5%)</b>
Cerebral Tumour	0	1	0	0	<b>1 (&lt;1%)</b>	0	0	0	0	<b>0 (0%)</b>
Other	1	2	3	0	<b>6 (3%)</b>	0	0	2	0	<b>2 (&lt;5%)</b>
<b>Total</b>	<b>7</b>	<b>67</b>	<b>60</b>	<b>64</b>	<b>198</b>	<b>1</b>	<b>6</b>	<b>19</b>	<b>12</b>	<b>38</b>



## ORGANS REQUESTED

The information relating to the request for organ donation refers only to those patients who become organ donors. If consent was sought and refused, the Registry has no record of these potential donors.

The difference between a request and a consent is a known objection by the donor or family refusal for the specific organ. Reasons for not requesting organs, not retrieving and not transplanting are documented for all of the specific organs.

For more detail please refer to Website: [www.anzdata.org.au](http://www.anzdata.org.au)

The requests for specific organs in Australia in 2007 from 198 organ donors were: kidneys 97%, liver 95%, heart 81%, lungs 80% and pancreas 84%.

From the 28 New Zealand donors in 2007, the requests for specific organs were: kidneys 97%, liver 100%, heart 87%, lungs 84% and pancreas 68%.

## MULTIPLE ORGAN RETRIEVAL

There were 31 (15.5%) of Australian donors in 2007 who donated solid organs, who had a single organ retrieved shown in Figure 9.10. Kidney only donation occurred in 25 cases.

Six donors in Australia went to theatre, but no solid organs were retrieved.

New Zealand had six single organ donors in 2007, five donating kidneys and one donating a liver.

In Australia and New Zealand respectively, 82% and 84 % of donors had two or more organs retrieved for the purposes of transplantation.

**Figure 9.10**

Trend to Multiple Organ Retrieval 2002 - 2007												
Number of Organs	Australia						New Zealand					
	2002	2003	2004	2005	2006	2007	2002	2003	2004	2005	2006	2007
Single	19%	17%	15%	17%	11%	15.5%	13%	7%	13%	14%	8%	16%
Two	24%	27%	27%	22%	23%	23%	42%	28%	43%	34%	24%	40%
Three	24%	20%	22%	17%	23%	23%	29%	25%	27%	21%	44%	26%
Four	23%	26%	23%	32%	23%	20%	13%	35%	10%	28%	12%	18%
Five	8%	8%	12%	10%	18%	15.5%	0%	5%	0%	3%	12%	0%
No organs	<1%	2%	1%	2%	1%	3%	3%	0%	7%	0%	0%	0%

**Figure 9.11**

State by State Comparison of Multiple Organ Retrieval 2007											
Number of Organs	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ	
Single	7 (18%)	13 (25%)	0 (0%)	7 (13%)	0 (0%)	1 (4%)	0 (0%)	3 (16%)	<b>31 (15.5%)</b>	<b>6 (16%)</b>	
Two	15 (38%)	11 (21%)	0 (0%)	6 (11%)	1 (100%)	7 (26%)	0 (0%)	4 (21%)	<b>45 (23%)</b>	<b>15 (40%)</b>	
Three	6 (15%)	10 (19%)	1 (100%)	13 (23%)	0 (0%)	11 (41%)	1 (33%)	3 (16%)	<b>45 (23%)</b>	<b>10 (26%)</b>	
Four	8 (21%)	3 (5%)	0 (0%)	17 (31%)	0 (0%)	5 (18%)	1 (33%)	6 (32%)	<b>40 (20%)</b>	<b>7 (18%)</b>	
Five	1 (3%)	15 (28%)	0 (0%)	12 (22%)	0 (0%)	1 (4%)	1 (33%)	2 (10%)	<b>31 (15.5%)</b>	<b>0 (0%)</b>	
No organs	2 (5%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	2 (7%)	0 (0%)	1 (5%)	<b>6 (3%)</b>	<b>0 (0%)</b>	
<b>Total</b>	<b>39</b>	<b>53</b>	<b>1</b>	<b>55</b>	<b>1</b>	<b>27</b>	<b>3</b>	<b>19</b>	<b>198</b>	<b>38</b>	

NB: 2 kidneys = 1 organ, 2 lungs = 1 organ  
On occasions when only one kidney is retrieved, this is also defined as one organ

## ORGAN RECIPIENTS TRANSPLANTED

Australia and New Zealand both had 3.3 organ recipients per donor used for transplantation in 2007, as shown in Figure 9.12.

The mean number of recipients transplanted per donor each year for 1997-2007 in Australia and New Zealand is shown in Figure 9.13.

The number of recipients transplanted is used for this calculation, rather than the number of organs.

The ACT had the highest number of organs transplanted, 4.0 per donor, followed by New South Wales and Victoria both 3.5, Western Australia 3.4, Queensland 3.2, the Northern Territory 3.0, South Australia 2.8 and Tasmania 2.0 per donor.

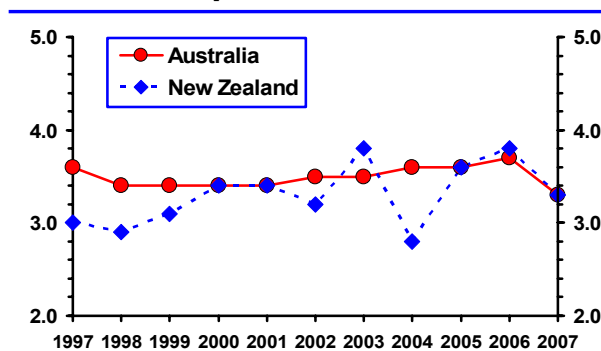
These figures exclude tissue transplantation.

**Figure 9.12**

Organ Recipients Transplanted per Donor 2007										
	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ
No. Organs Transplanted	123	186	4	192	2	76	9	65	<b>657</b>	<b>125</b>
No. of Donors	39	53	1	55	1	27	3	19	<b>198</b>	<b>38</b>
<b>Mean per Donor</b>	<b>3.2</b>	<b>3.5</b>	<b>4.0</b>	<b>3.5</b>	<b>2.0</b>	<b>2.8</b>	<b>3.0</b>	<b>3.4</b>	<b>3.3</b>	<b>3.3</b>

**Figure 9.13**

**Mean Number of Recipients Per Donor Transplanted 1997 - 2007**



**Figure 9.14**

Age of Donors Providing Transplanted Kidneys 2002 - 2007												
	Year	Age Group										Total
		00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	
<b>Australia</b>	2002	3 (2)	14 (2)	44	17	31	42	30	11 (1x)	1	0	<b>193</b>
	2003	2 (2)	10	32 (1*)	15	26	39	28	9 (2x)	5	1	<b>167</b>
	2004	0	5 (1)	40	30	23	50	39	15 (2x)	4	0	<b>206</b>
	2005	6 (4)	8	27	22	36	46 (1x)	33 (1x)	13	5 (1x)	0	<b>196</b>
	2006	1 (1)	11	34	19	28	39	36 (1x)	20 (1x)	3 (1x)	0	<b>191</b>
	2007	3 (3)	4	35	25	21	32 (1x)	40	14 (2x)	6 (1x)	0	<b>180</b>
<b>New Zealand</b>	2002	0	3	5	2	11	10	3	1	0	0	<b>35</b>
	2003	0	2	11	4	8	3	6	0	1 (1x)	0	<b>35</b>
	2004	0	0	8	4	3	6	9	1	1	0	<b>32</b>
	2005	0	0	3	3	6	8	7	0	0	0	<b>27</b>
	2006	0	1	6	5	3	3	3	1	0	0	<b>22</b>
	2007	0	1	5	1	6	12	9	1	0	0	<b>35</b>

( ) En-Bloc Kidneys      \* Horseshoe Kidney (Adult)      x Double Adult

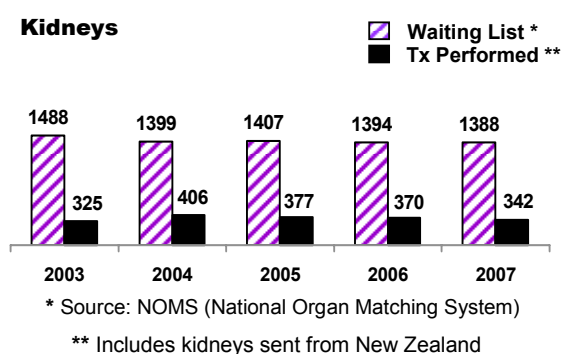


### KIDNEY DONATION

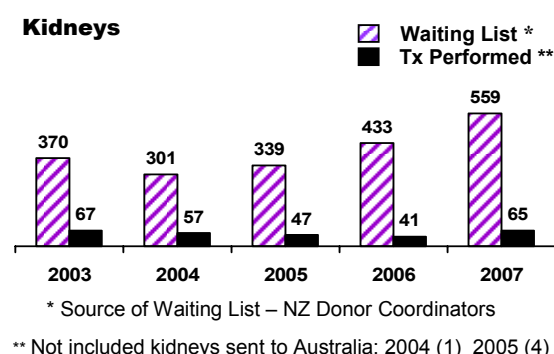
Figure 9.15 shows the number of Australian and New Zealand patients waiting for a kidney transplant and the number of deceased donor transplants performed for each year from 2003-2007.

**Figure 9.15**

**Waiting List vs Deceased Donor Transplants  
Australia 2003 - 2007**

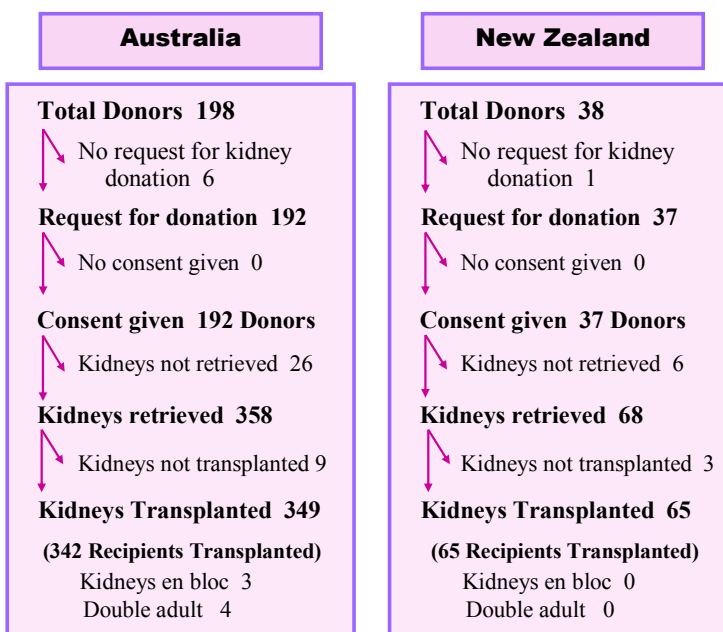


**Waiting List vs Deceased Donor Transplants  
New Zealand 2003 - 2007**



**Figure 9.16**

### Outcome of Request for Kidney Donation 2007



Refer to the Website: [www.anzdata.org.au](http://www.anzdata.org.au) ANZOD 2008 Annual Report.  
See Appendices for reasons kidneys were not requested, not retrieved and not transplanted