

CORONER'S CASES

In Australia, 40% of donors in 2006 were subject to Coronerial inquiry, compared to 48% in 2005.

In New Zealand it was 60% for 2006, compared to 31% in 2005 and 43% in 2004.

Figure 43

Coroner's Cases 2002 - 2006										
	Australia					New Zealand				
	2002	2003	2004	2005	2006	2002	2003	2004	2005	2006
Yes	93	88	108	97	80	18	22	17	9	15
No	113	91	110	107	122	20	18	23	20	10
Total	206	179	218	204	202	38	40	40	29	25

Figure 44

Australian States Coroner's Cases 2006 (2005)								
	QLD	NSW	ACT	VIC	TAS	SA	NT	WA
Yes	14 (19)	20 (25)	1 (7)	19 (21)	1 (1)	18 (10)	0 (2)	7 (12)
No	22 (16)	30 (29)	3 (2)	26 (29)	7 (1)	18 (10)	2 (2)	14 (18)
Total	36 (35)	50 (54)	4 (9)	45 (50)	8 (2)	36 (20)	2 (4)	21 (30)

SUMMARY - ORGANS REQUESTED, CONSENT GIVEN, RETRIEVED AND TRANSPLANTED

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 further details see Appendix I for Australia and Appendix II for New Zealand.

Figure 45 shows the outcome of organs requested in 2006 (2005).

Figure 45

Outcome Following Request for Organ Donation 2006 (2005)						
		Kidneys	Liver	Heart	Lungs	Pancreas
Australia	Requested	402 (406)	193 (194)	167 (170)	332 (336)	174 (158)
	Consent Given	402 (406)	191 (193)	162 (164)	326 (326)	170 (152)
	Retrieved	385 (391)	163 (159)	83 (87)	181 (161)	92 (67)
	Recipients Transplanted	368 (373)	161 (164)	76 (78)	181 (159)	+41 (+34)
New Zealand	Requested	50 (58)	25 (28)	23 (24)	46 (48)	22 (20)
	Consent Given	50 (58)	25 (28)	19 (24)	44 (48)	22 (20)
	Retrieved	42 (55)	24 (22)	9 (16)	26 (22)	6 (2)
	Recipients Transplanted	41 (51)	24 (23)	9 (16)	24 (21)	6 (2)
Kidneys and lungs are counted as separate organs						
+ Includes (7) 2006 and (1) 2005, pancreas islet transplants						

ORGANS REQUESTED

The requests for specific organs in Australia in 2006 from 202 organ donors were: kidneys 99.5%, liver 96%, heart 83%, lungs 82% and pancreas 86%.

From the 25 New Zealand donors in 2006, the requests for specific organs were: kidneys 100%, liver 100%, heart 88%, lungs 92% and pancreas 88%.

MULTIPLE ORGAN RETRIEVAL

There were 23 (11%) of Australian donors in 2006 who donated solid organs, who had a single organ retrieved shown in Figure 46. Kidney only donation occurred in 20 cases.

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

New Zealand had two single organ donors in 2006, one donating kidneys and one donating a liver.

In Australia and New Zealand respectively, 87% and 92% of donors had two or more organs retrieved for the purposes of transplantation.

Figure 46

Multiple Organ Retrieval 2002 - 2006										
Number of Organs	Australia					New Zealand				
	2002	2003	2004	2005	2006	2002	2003	2004	2005	2006
Single	19%	18%	15%	17%	11%	13.5%	7%	13%	14%	8%
Two	24%	27%	27%	22%	23%	43%	28%	46%	34%	24%
Three	25%	20%	22%	17%	23%	30%	25%	30%	21%	44%
Four	24%	26%	23%	32%	23%	13.5%	35%	11%	28%	12%
Five	8%	9%	12%	10%	18%	0%	5%	0%	3%	12%

Figure 47

State by State Comparison of Multiple Organ Retrieval 2006										
Number of Organs	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ
Single	2 (6%)	11 (22%)	1 (25%)	2 (5%)	0 (0%)	5 (14%)	1 (50%)	1 (4%)	23 (11%)	2 (8%)
Two	16 (44%)	11 (22%)	0 (0%)	5 (11%)	2 (25%)	7 (19%)	0 (0%)	6 (29%)	47 (23%)	6 (24%)
Three	7 (19%)	8 (16%)	1 (25%)	9 (20%)	3 (37.5%)	12 (33%)	1 (50%)	6 (29%)	47 (23%)	11 (44%)
Four	10 (28%)	10 (20%)	0 (0%)	15 (33%)	1 (12.5%)	6 (17%)	0 (0%)	5 (24%)	47 (23%)	3 (12%)
Five	1 (3%)	10 (20%)	2 (50%)	14 (31%)	2 (25%)	5 (14%)	0 (0%)	2 (10%)	36 (18%)	3 (12%)
No organs	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (3%)	0 (0%)	1 (4%)	2 (1%)	0 (0%)
Total	36	50	4	45	8	36	2	21	202	25

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 had 3.7 organ recipients per donor used for transplantation in 2006. New Zealand had 3.8 recipients per donor (Figure 48).

The number of organs transplanted per donor each year for 2002-2006 in Australia and New Zealand is shown in Figure 49.

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

Victoria had the highest number of organs transplanted, 4.0 per donor, followed by New South Wales and Tasmania, both 3.8, Western Australia, Queensland and the ACT, all 3.5, South Australia 3.2 and the Northern Territory 3.0 per donor.

These figures exclude tissue transplantation.

Figure 48

Organ Recipients Transplanted per Donor 2006										
	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ
No. Organs Transplanted	128	188	14	184	30	114	6	74	738	97
No. of Donors	36	49	4	46	8	36	2	21	202	25
Mean per Donor	3.5	3.8	3.5	4.0	3.8	3.2	3.0	3.5	3.7	3.8

Figure 49

Mean Number of Recipients Per Donor Transplanted 1996 - 2006

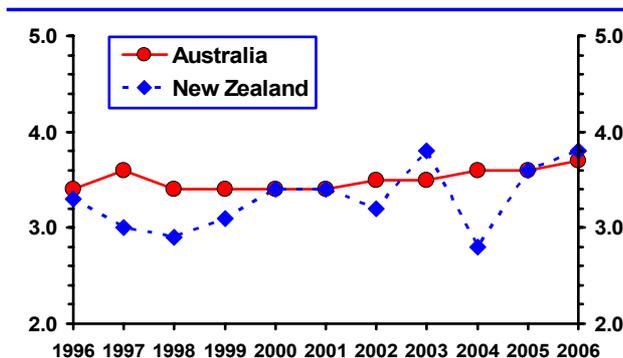


Figure 50

Organs Transplanted by Donor State in Australia and New Zealand 2006										
Organs Transplanted	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ
Kidney	69	90	6	87	14	61	4	37	368	41
Liver	27	26	3	38	6	25	0	17	142	20
Liver (Left)	1	8	0	1	0	1	0	0	11	4
Liver (Right)	1	6	0	1	0	0	0	0	8	4
Heart	13	16	2	17	3	9	1	9	70	9
Heart/Lungs	1	1	0	4	0	0	0	0	6	0
Lungs	9	21	2	22	3	13	1	6	77	11
Lung (Left)	1	2	0	2	1	0	0	2	8	1
Lung (Right)	1	2	0	2	1	0	0	1	7	1
Pancreas	5	10	1	9	2	5	0	2	34	6
Pancreas Islets	0	6	0	1	0	0	0	0	7	0
Total	128	188	14	184	30	114	6	74	738	97

EXCHANGE OF ORGANS

The number of organs that were sent and received between Australian States and New Zealand in 2006 and 2005 is shown in Figure 51.

A balance is maintained between Australian regions for the allocation of kidneys. For this purpose Victoria/Tasmania, South Australia/Northern

Territory and New South Wales/Australian Capital Territory (ACT) are considered Regions.

This is achieved by the National Organ Matching System (NOMS) in which all Australian Regions participate. There is no monitoring of State balance for the allocation of other organs.

Figure 51

Exchange of Organs Between States and New Zealand 2006 (2005)									
Organs Transplanted	Exchange	Kidneys	Liver ⁺	Heart	Heart/ Lung *	Lungs *	Pancreas	Islets	Total
Queensland	Sent	19 (14)	3 (5)	2 (6)	0 (1)	6 (10)	5 (2)	0 (0)	35 (38)
	Received	8 (9)	5 (10)	5 (5)	1 (1)	6 (19)	0 (0)	0 (0)	25 (44)
New South Wales	Sent	20 (21)	6 (5)	5 (1)	1 (0)	10 (2)	1 (0)	0 (0)	43 (29)
	Received	35 (48)	19 (21)	8 (12)	1 (1)	30 (25)	17 (15)	1 (1)	111 (123)
ACT	Sent	6 (17)	3 (11)	2 (4)	0 (0)	4 (11)	1 (4)	0 (0)	16 (47)
Victoria	Sent	17 (20)	10 (7)	2 (2)	2 (0)	6 (6)	4 (4)	1 (1)	42 (40)
	Received	29 (27)	10 (5)	14 (11)	1 (0)	35 (19)	3 (2)	0 (0)	92 (64)
Tasmania	Sent	14 (4)	6 (2)	3 (1)	0 (0)	8 (2)	2 (2)	0 (0)	33 (11)
South Australia	Sent	11 (8)	12 (5)	9 (11)	0 (0)	26 (18)	5 (3)	0 (0)	63 (45)
	Received	22 (13)	0 (2)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	22 (15)
Northern Territory	Sent	4 (7)	0 (3)	1 (1)	0 (0)	2 (2)	0 (0)	0 (0)	7 (13)
Western Australia	Sent	10 (20)	4 (5)	4 (1)	0 (1)	6 (7)	2 (2)	0 (0)	26 (36)
	Received	7 (18)	6 (4)	2 (2)	0 (0)	2 (0)	0 (0)	0 (0)	17 (24)
New Zealand	Sent	0 (4)	8 (5)	1 (3)	0 (0)	5 (5)	0 (0)	0 (0)	14 (17)
	Received	0 (0)	12 (6)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	12 (6)

+ Number of recipients of livers
*Total number of lungs (not recipients) and includes two lungs from Heart/Lung transplants

Figure 52

Summary of Organs Transplanted in Australia from New Zealand Donors 1989 - 2006					
Year	Kidneys	Liver ⁺	Heart	Lungs *	Total
1989	0	1	0	0	1
1990	0	7	0	0	7
1991	0	11	0	0	11
1992	3	24	0	0	27
1993	0	16	0	0	16
1994	4	21	0	2	27
1995	0	21	5	9	35
1996	1	23	1	4	29
1997	2	22	2	2	28
1998	4	16	3	8	31
1999	2	7	1	2	12
2000	0	7	0	4	11
2001	0	2	0	4	6
2002	0	5	2	8	15
2003	0	5	3	13	21
2004	1	7	2	4	14
2005	4	5	3	5	17
2006	0	8	1	5	14
Total	21	208	23	70	322

+ Number of recipients of livers * Total number of lungs (not recipients)

New Zealand organs are sent to Australia when there are no suitable recipients in New Zealand.

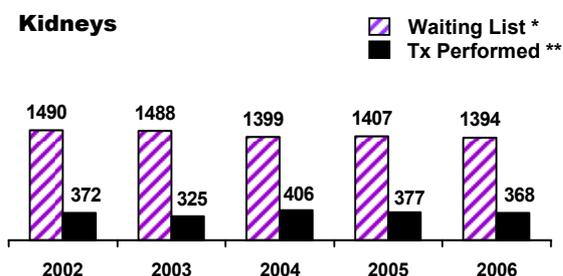
Liver transplantation commenced in New Zealand in February 1998, prior to this time, all livers were sent to Australia.

KIDNEY DONATION

Figure 53 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 2002-2006.

Figure 53

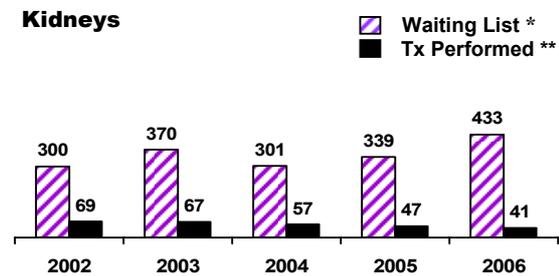
**Waiting List vs Deceased Donor Transplants
Australia 2002 - 2006**



* Source: NOMS (National Organ Matching System)

** Includes kidneys sent from New Zealand

**Waiting List vs Deceased Donor Transplants
New Zealand 2002 - 2006**

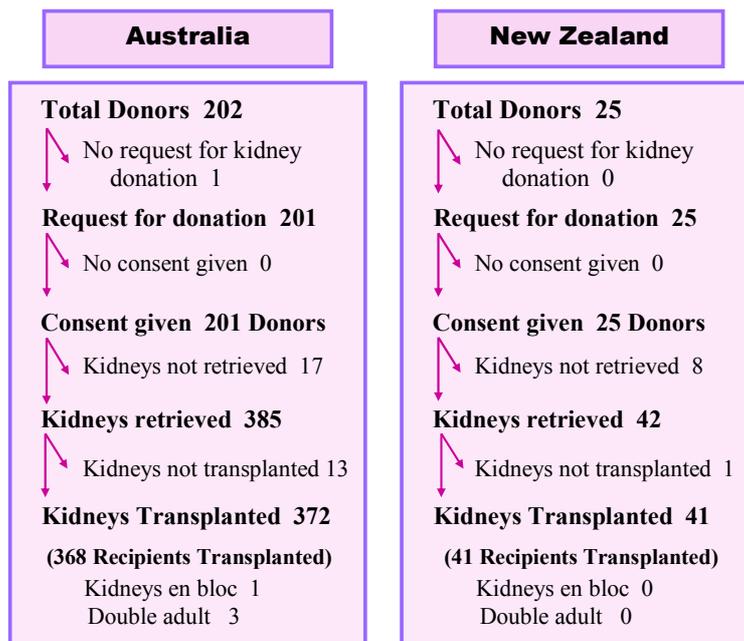


* Source of Waiting List – NZ Donor Coordinators

** Not included kidneys sent to Australia: 2004 (1) 2005 (4)

Figure 54

Outcome of Request for Kidney Donation 2006



Refer to Appendices for reasons kidneys were not requested, not retrieved and not transplanted

Figure 55

Age of Donors Providing Transplanted Kidneys 2002 - 2006												
	Year	Age Group										Total
		00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	
Australia	2002	3 (2)	14 (2)	44	17	31	42	30	11 (1x)	1	0	193
	2003	2 (2)	10	32 (1*)	15	26	39	28	9 (2x)	5	1	167
	2004	0	5 (1)	40	30	23	50	39	15 (2x)	4	0	206
	2005	6 (4)	8	27	22	36	46 (1x)	33 (1x)	13	5 (1x)	0	196
	2006	1 (1)	11	34	19	28	38	35(1x)	20 (1x)	3 (1x)	0	189
New Zealand	2002	0	3	5	2	11	10	3	1	0	0	35
	2003	0	2	11	4	8	3	6	0	1 (1x)	0	35
	2004	0	0	8	4	3	6	9	1	1	0	32
	2005	0	0	3	3	6	8	7	0	0	0	27
	2006	0	1	6	5	3	3	3	1	0	0	22

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

Figure 56

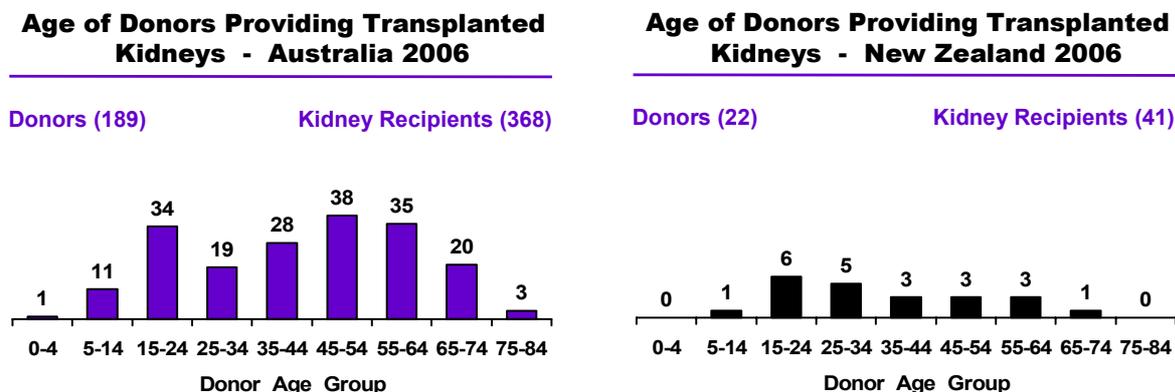


Figure 57

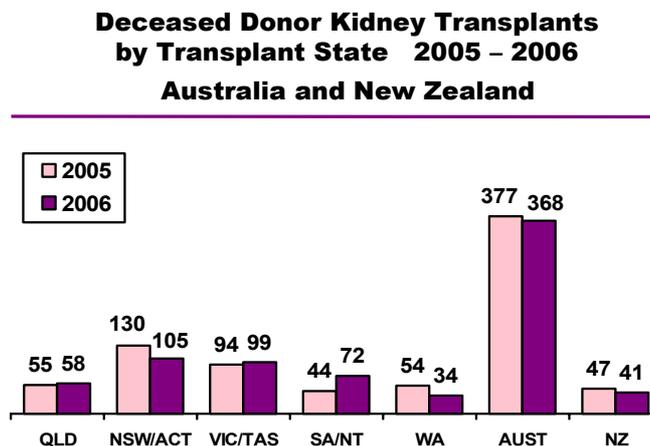


Figure 58

Regional Outcome of Requests for Kidney Donation 1989 - 2006										
	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ **
Total Donors	714	1110	86	799	62	468	37	305	3581	517
Requested	712	1099	86	787	61	460	36	303	3544	513
Consented	712	1096	86	786	61	460	36	303	3540	513
Retrieved	1386	2107	166	1527	120	878	72	584	6840	983
Transplanted *	1344	2041	159	1458	111	831	68	559	6571	934
	(11) (2x)	(9) (1x)	(2)	(7) (1x)	(2)	(5) (11x)	(1x)	(5) (3x)	(41) (19x)	(3) (5x)
* Recipients () En bloc (x) Double Adult ** New Zealand 1993 - 2006										

DONOR KIDNEY FUNCTION

TERMINAL LEVELS OF SERUM CREATININE

AUSTRALIA

In 2006, 13% of Australian donors had a terminal serum creatinine concentration of $\geq 125 \mu\text{mol/L}$ and 16.5% had a terminal serum urea concentration of $\geq 9 \text{ mmol/L}$ (Figure 59).

NEW ZEALAND

There were 16% of donors in New Zealand with a terminal serum creatinine concentration of $\geq 125 \mu\text{mol/L}$ and 15% with terminal serum urea concentration of $\geq 9 \text{ mmol/L}$ in 2006 (Figure 59).

Figure 59

Terminal Serum Creatinine Levels 2002 - 2006										
Creatinine ($\mu\text{mol/L}$)	Australia					New Zealand				
	2002	2003	2004	2005	2006	2002	2003	2004	2005	2006
00-99	76%	75%	72%	75%	77%	80%	82%	75%	59%	74%
100-124	12%	12%	14%	13%	10%	7%	9%	19%	23%	10.5%
125-149	4%	3%	5%	5%	6%	13%	3%	0%	9%	10.5%
150-174	3%	4%	1.5%	2%	2%	0%	6%	3%	9%	5%
175-199	1%	1%	1.5%	1%	1%	0%	0%	0%	0%	0%
200-224	2%	1%	1%	2%	<1%	0%	0%	3%	0%	0%
225-249	<1%	1%	2%	0%	1%	0%	0%	0%	0%	0%
>250	<1%	3%	3%	2%	3%	0%	0%	0%	0%	0%

REASONS KIDNEYS WERE UNUSABLE

KIDNEY BIOPSY AT RETRIEVAL

There were 28 donors (14%) who had a biopsy of the kidneys taken at retrieval in 2006 in Australia and six donors (27%) in New Zealand.

Since 2000, there have been 13% (172) biopsies from 1327 kidney donors in Australia and 30% (70) from 231 kidney donors in New Zealand.

The reasons for kidneys that were unusable and the donor age are shown in Figures 60 and 61.

Figure 60

Reasons Kidneys Unused 2002 - 2006		2002	2003	2004	2005	2006
Australia	Renal disease in donor	2	5	2	5	8
	Cancer in donor	0	2	2	1	1
	Anatomical	0	10	0	1	0
	Surgical	1	1	1	0	3
	Trauma	0	2	0	2	0
	Recipient problems	0	0	0	0	1
	Hepatitis B Core Antibody	0	0	0	2	0
	Surgeons not available	0	0	1	0	0
Total	3	10	6	11	13	
New Zealand	Renal disease in donor	1	3	3	3	1
	Cancer in donor	0	2	0	0	0
	Surgical	0	1	0	0	0
	Recipient unsuitable	0	0	0	1	0
	Total	1	6	3	4	1

Figure 61

Donor Age of Unused Kidneys 2002 - 2006		Age Groups									Total
		00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	
Australia	2002	0	0	0	0	1	0	0	2	0	3
	2003	0	0	3	0	0	2	1	4	0	10
	2004	0	1	0	0	0	2	1	0	2	6
	2005	0	0	0	2	2	3	2	2	0	11
	2006	0	0	0	2	0	2	5	2	2	13
New Zealand	2002	0	0	0	0	0	0	1	0	0	1
	2003	0	1	2	0	0	0	1	2	0	6
	2004	0	0	0	1	0	0	2	0	0	3
	2005	0	0	0	0	0	1	3	0	0	4
	2006	0	0	0	0	0	0	1	0	0	1

KIDNEY PERFUSION METHODS

Where kidneys were perfused with only one solution, HTK (68%), Ross (29%) and Celsior (3%) were the solutions used in Australia in 2006.

In New Zealand UW (100%) was the only solution used (Figure 62).

UW was used as the second perfusion solution in 98% with Ross and HTK both 1% of cases in Australia (Figure 63).

Figure 62

Kidney Perfusion with Only One Solution 2002 - 2006										
	Australia					New Zealand				
	2002	2003	2004	2005	2006	2002	2003	2004	2005	2006
Ross	14	12	6	24	16	2	0	2	4	0
UW	4	10	2	4	0	66	72	61	49	42
Celsior	0	0	0	0	2	0	0	0	0	0
HTK	0	8	14	23	38	0	0	0	0	0
Hartman's	0	0	2	0	0	0	0	0	0	0
Total	18	30	24	51	56	68	72	63	53	42

Figure 63

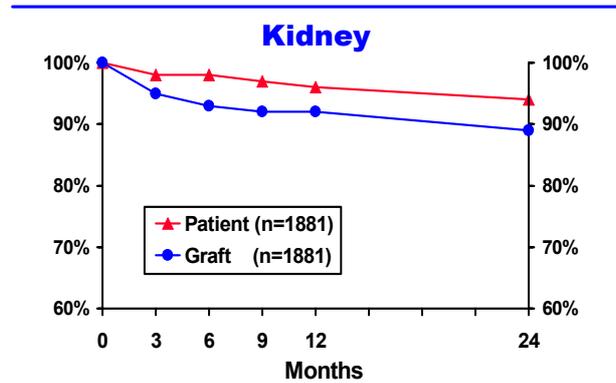
Second Perfusion Solution - Kidneys 2002 - 2006										
	Australia					New Zealand				
	2002	2003	2004	2005	2006	2002	2003	2004	2005	2006
Ross	54	37	42	0	4	0	0	0	0	0
UW	296	267	344	338	323	2	1	2	2	0
Collins	8	6	0	0	0	0	0	0	0	0
HTK	4	0	0	2	2	0	0	0	0	0
Hartman's	0	0	2	0	0	0	0	0	0	0
Total	362	310	388	340	329	2	1	2	2	0

KIDNEY TRANSPLANT OUTCOME

Figure 64 shows the patient and graft outcome for kidney transplants performed over the preceding five years in Australia and New Zealand.

Figure 64

**Primary Deceased Patient and Graft Survival
Australia 2000 - 2005**



**Primary Deceased Patient and Graft Survival
New Zealand 2000 - 2005**

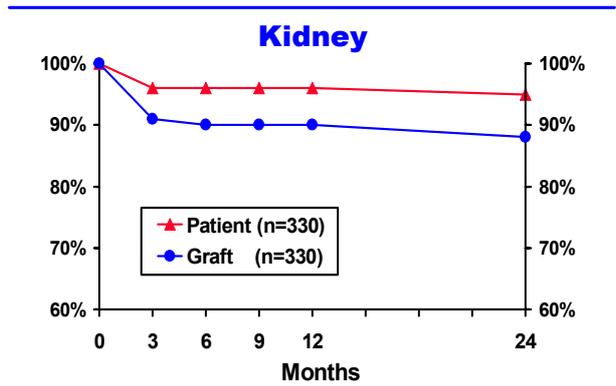
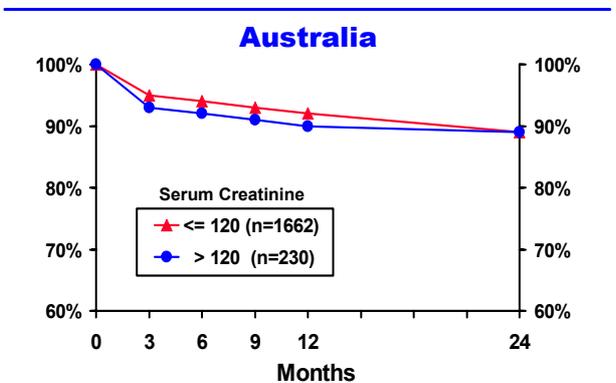


Figure 65

**Primary Deceased Kidney Graft Survival
Terminal Serum Creatinine 2000 - 2005**



This data has been provided by the ANZDATA (Australia and New Zealand Dialysis and Transplant) Registry and further information on kidney transplant outcome is available from their website - www.anzdata.org.au

LIVER DONATION

There were 189 liver transplants performed in 2006, 157 in Australia and 32 in New Zealand.

Twelve livers were donated from Australia and transplanted into New Zealand recipients and eight livers donated from New Zealand were transplanted into Australian recipients.

There were 153 Australian donors, who provided 161 recipients with transplanted livers and 24 New Zealand donors provided livers for 28 recipients.

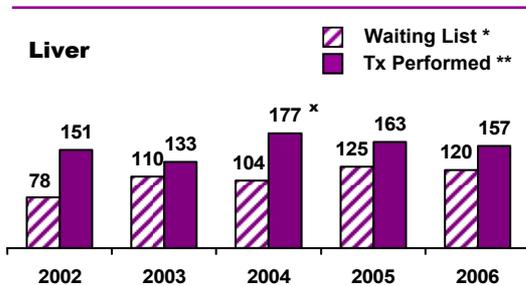
Twenty four transplants were performed using the “split” liver technique [transplanting one liver into two recipients]

- * 7 Royal Prince Alfred Hospital, NSW
- * 7 The Children’s Westmead, NSW
- * 2 Princess Alexandra Hospital, Queensland
- * 1 Royal Children’s, Victoria
- * 1 Royal Children’s, Queensland

- * 6 Auckland Hospital, New Zealand

Figure 66

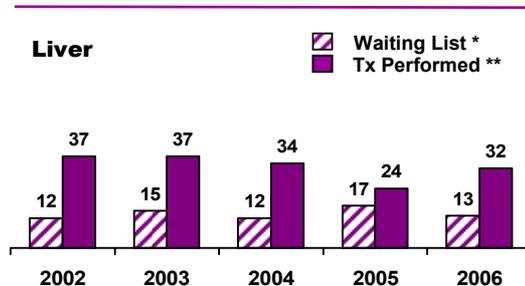
Waiting List vs Deceased Donor Transplants Australia 2002 - 2006



** Includes split livers and NZ livers transplanted in Australia
 x Includes one hepatocyte transplant

* National Liver Registry and NOMS (National Organ Matching Service)

Waiting List vs Deceased Donor Transplants New Zealand 2002 - 2006



** Includes livers from Australia transplanted in New Zealand (11) 2002, (8) 2003, (7) 2004, (6) 2005, (11) 2006

* Source of Waiting List - NZ Donor Coordinators

Figure 67

Outcome of Request for Liver Donation 2006



* Includes split livers and number of recipients

Recipients transplanted, refers to outcome of livers donated in Australia or New Zealand
 Refer to Appendices for reasons livers were not requested, not retrieved and not transplanted

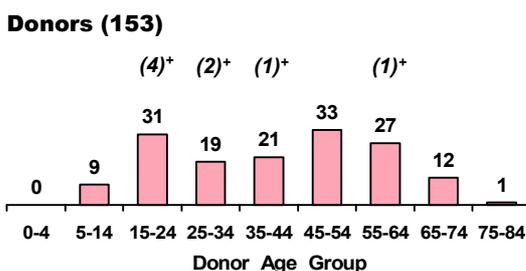
Figure 68

Age of Donors Providing Transplanted Livers 2002 - 2006											
		Age Groups									
	Year	00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	Total
Australia	2002	5	11 (1+)(1*)	39 (4+)	14 (1+)	28	27 (3+)	17	6	1	148
	2003	2	8	30 (3+)	9 (1+)	20 (1+)	32 (2+)	16 (1+)	6	5 (1*)	128
	2004	1	4 (1+)(1#)	37 (1+) (2*)	29 (3+)	20 (3+)	31 (5+)	30	10	2	164
	2005	3	7 (1+)	24 (2+) (2*)	18 (2+)	27 (3+)	39 (3+) (2*)	20	12	3	153
	2006	0	9	31 (4+) (1*)	19 (2+) (1*)	21 (1+)	33 (1*)	27 (1+)	12	1	153
New Zealand	2002	0	3 (1*)	5 (1+) (1*)	2	9	7	3	1	0	30
	2003	0	1	11 (1+)	4 (1+) (1*)	8 (1+)	1	5	0	1	31
	2004	1	0	9	4	3 (1+) (1*)	5	11	1	1	35
	2005	0	0	3 (1+)	3	5 (1*)	6 (1+)	4	0	0	21
	2006	0	1	6 (3+)	5 (1+)	6	2	3	1	0	24

+ One liver transplanted into two recipients * One liver split and used for one patient only # Hepatocytes transplanted

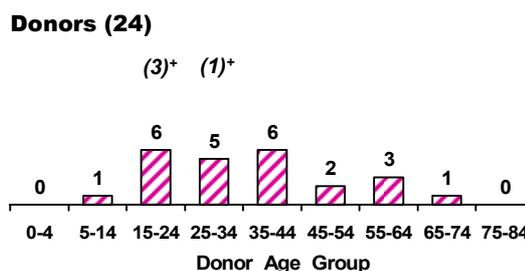
Figure 69

Age of Donors Providing Transplanted Livers - Australia 2006



+ Number of livers transplanted into two recipients

Age of Donors Providing Transplanted Livers - New Zealand 2006



+ Number of livers transplanted into two recipients

Figure 70

Liver Transplants by Transplant State Australia and New Zealand 2005 - 2006



PERFUSION OF LIVERS

Australia

University of Wisconsin (UW) solution was used as the final perfusion for 88% and HTK for 12% of all livers. The initial flush solution was either Ross, Hartmann's, Saline or HTK solution. There was only one liver perfused with UW only.

New Zealand

University of Wisconsin solution only was used for 23 of the 24 livers retrieved. One liver had Hartmann's as the initial perfusion, followed by UW.

Figure 71

Regional Outcome of Requests for Liver Donation 1989 - 2006										
	QLD	NSW	ACT	VIC	TAS	SA	NT	WA	AUST	NZ **
Total Donors	714	1110	86	799	62	468	37	305	3581	517
Requested	704	1010	83	724	54	412	32	271	3290	458
Consented	694	987	78	702	51	402	32	262	3208	455
Retrieved	536	692	60	506	43	298	20	195	2350	380
Transplanted *	555	705	65	459	41	288	19	189	2321	375

* Refers to number of recipients - use of split liver and hepatocytes
** New Zealand 1993 - 2006

REASONS LIVERS WERE UNUSED AFTER RETRIEVAL

The liver is only retrieved when a compatible recipient has been identified. Figure 72 shows reasons the liver was not able to be transplanted into the identified recipient. The use of the liver (and other organs) for research purposes requires specific permission from the most senior available next of kin.

Figure 72

Reasons Livers Were Unused 2002 - 2006						
		2002	2003	2004	2005	2006
Australia	Biopsy - Fatty Disease	3	3	2	2	5
	Anatomical	1	1	1	3	2
	Surgical	1	1	0	0	0
	Research	0	0	0	0	1
	Cancer in Donor	2	2	0	0	0
	Recipient Issue	0	0	1	0	1
	Total	1	1	3	1	1
New Zealand	Biopsy - Fatty Disease	0	2	0	0	0
	Cancer in Donor	0	1	0	0	0
	Disease	0	0	0	1	0
	Recipient Issue	1	0	0	0	0
	Total	1	3	0	1	0

Figure 73

Donor Age of Unused Livers 2002 - 2006											
		Age Groups									Total
	Year	00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	
Australia	2002	0	0	1	0	1	3	3	0	0	8
	2003	0	0	0	1	2	0	1	3	0	7
	2004	0	0	0	0	0	2	3	1	1	7
	2005	0	0	0	0	0	2	3	1	0	6
	2006	0	0	0	0	1	1	4	2	2	10
New Zealand	2002	0	0	0	0	1	0	0	0	0	1
	2003	0	0	0	0	0	2	0	1	0	3
	2004	0	0	0	0	0	0	0	0	0	0
	2005	0	0	0	0	0	0	1	0	0	1
	2006	0	0	0	0	0	0	0	0	0	0

DONOR LIVER FUNCTION

The results of the serum tests for liver function for 163 Australian and 24 New Zealand donors in 2006, who had livers retrieved, is shown below.

There were 82% (134 donors) in Australia and 62.5% (15 donors) in New Zealand who had all five tests performed.

Figure 74 shows the number of donors whose liver function was above the normal range.

Figure 74

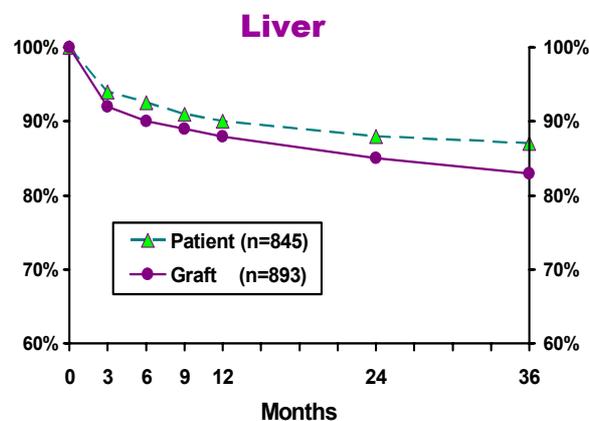
Number of Donors with Liver Function Tests above Normal Range 2006						
Liver Function Tests	Australia			New Zealand		
	Donors with value recorded *	Above Normal	Maximum recorded 1989-2006	Donors with value recorded *	Above Normal	Maximum recorded 1993-2006
Alanine Transaminase ALT > 40 u/L	163	59 (36%)	1240 (1103) x	21	7 (33%)	393 (83) x
Aspartate Transaminase AST > 40 u/L	135	67 (50%)	1480 (848)	18	6 (33%)	461 (301)
Gamma Glutamol Transferase GGT > 60 u/L	161	34 (21%)	750 (239)	18	0 (0%)	226 (60)
Alkaline Phosphatase > 116 u/L	162	12 (7%)	422 (422)	24	1 (4%)	264 (137)
Total Bilirubin > 20 umol/L	163	20 (12%)	114 (70)	24	2 (8%)	57 (24)

* Not all donors have all tests
x (2006) Maximum

LIVER TRANSPLANT OUTCOME

Figure 75

Deceased Patient and Graft Survival Australia 2000 - 2005



Source: Australia and New Zealand Liver Transplant Registry

SPECIAL SECTION

INNOVATIVE SURGICAL TECHNIQUES IN LIVER TRANSPLANTATION

Ms GLENDA BALDERSON AND PROFESSOR STEPHEN LYNCH

Data from the 17th Report of the Australia and New Zealand Liver Transplant Registry
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Liver transplantation is the only therapeutic option for patients with end stage liver disease [ESLD]. Since its acceptance in the 1980's as the treatment modality for these patients, liver transplantation results have significantly improved with one year patient survival rates of 90%.

The liver is a unique organ because of the vascular and biliary anatomy and the ability of liver to regenerate. The liver has two distinct halves each composed of segments [Figure 78] which provide the basis for current surgical practice in hepatic resection. Several surgical techniques have been developed to utilise these unique features of the liver in order to increase the number of donor organs available for transplantation.

Figure 76
Patient Survival by Era

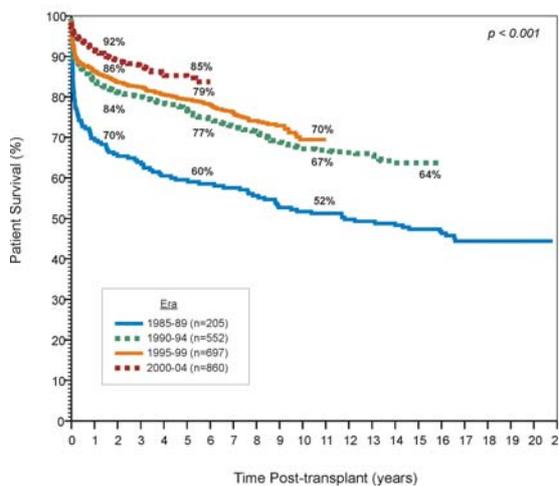


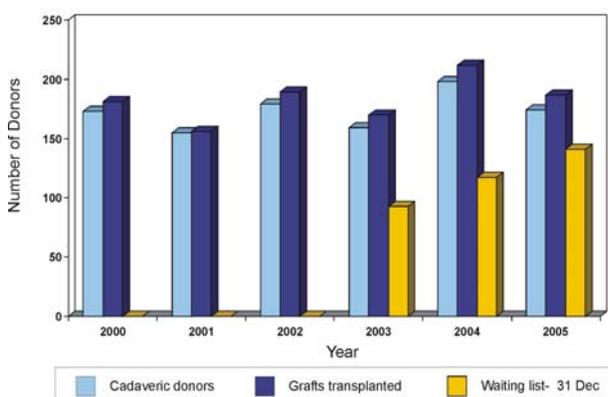
Figure 78
Liver Segments



In recent years, growing numbers of patients have presented with ESLD as a result of Hepatitis C infection. This has led to increasing waiting list numbers and, as a result, increasing waiting list times and more deaths on the waiting list. Also during this time the number of available organs for transplantation has remained static and this has resulted in a dramatic narrowing of the gap between people on the waiting list and the number of available organs.

The first technique widely applied was the reduction of a larger donor liver to “fit” the size of a smaller recipient. Adult livers that cannot be used in a suitable adult recipient are “cut down” to smaller grafts, usually incorporating Segments 2 and 3, and transplanted into a much smaller recipient. In an extreme case a single segment, usually Segment 3, can be used in a very small baby.

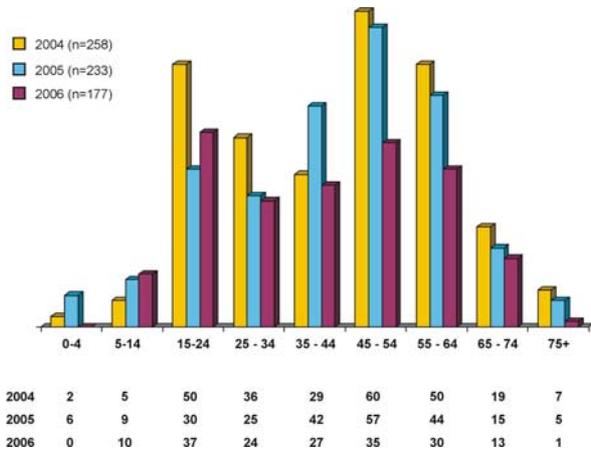
Figure 77
Grafts from Deceased Donors



The ultimate application of this technique is when the liver can be reduced or “split” into two viable grafts usually transplanted into an adult and a child. The contribution of split livers to increasing the number of liver grafts transplanted from deceased donor livers in recent years can be seen in Figure 77.

The application of these innovative surgical techniques has proved to be of greatest benefit for paediatric recipients because of the low number of paediatric donors.

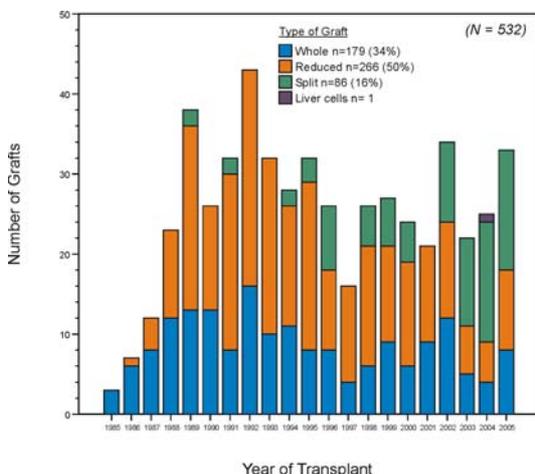
Figure 79
Age Group of Deceased Liver Donors - Australia and New Zealand



The median age of paediatric patients receiving a liver transplant in Australia or New Zealand is 2.5 years with a range of 24 days to 14.9 years. In 2005, 33 paediatric liver transplants were performed.

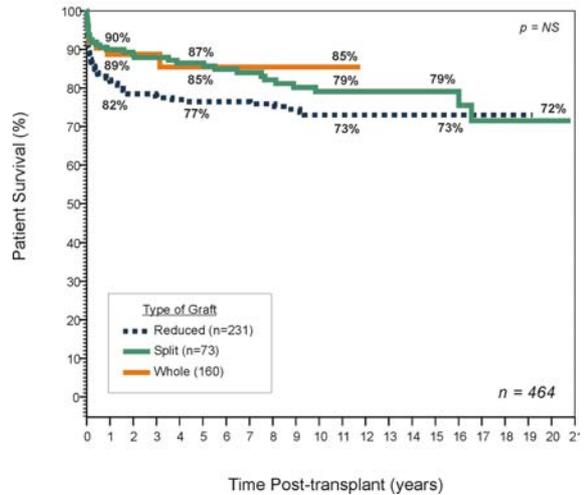
As a consequence of the small paediatric donor numbers, only 34% of paediatric recipients have received a whole donor organ (Figure 80) and in the early years of liver transplantation in Australia and New Zealand, many children and infants died on the waiting list awaiting a whole graft. However the introduction of graft reduction surgery has minimised deaths on the waiting list in this age group. Initially the majority received a reduced size graft from an adult donor but in recent years increasing adult needs has reduced the available number of such grafts. This has led to an expansion of split liver graft surgery and most paediatric recipients now receive a graft from a split liver.

Figure 80
Type of Graft by Year of Transplantation in Children



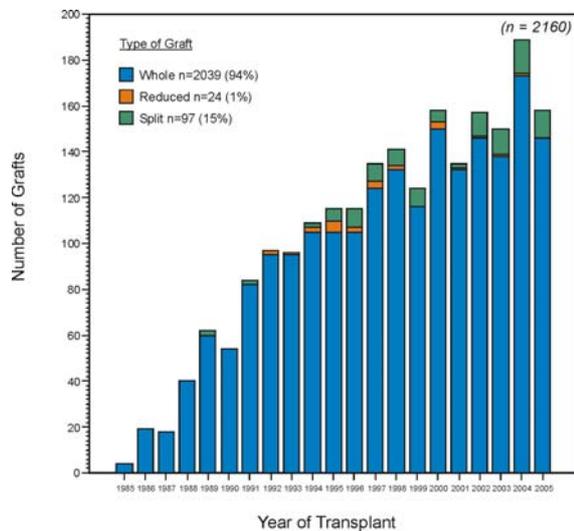
Patient survival is not affected by the type of graft transplanted.

Figure 81
Patient Survival by Type of Graft for Children



Fewer adult patients have received reduced or split liver grafts but the proportion is increasing more recently.

Figure 82
Adult Grafts



Although initially, there is a lower graft survival for reduced grafts, long term outcome is similar.

Figure 83
Graft Survival by Type of Graft

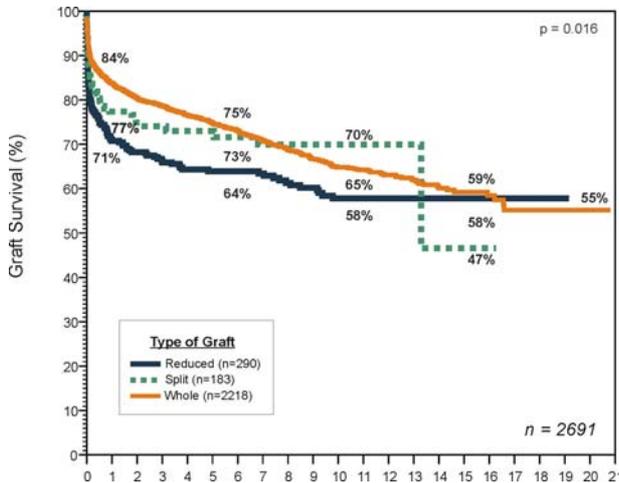
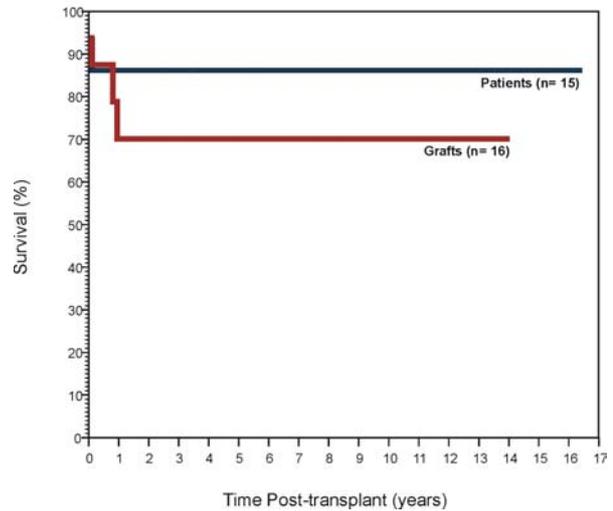


Figure 84
Living Donor Patient and Graft Survival



Liver donation from a living donor is another source of liver grafts for transplantation and is now widely used in other parts of the world.

Selected liver segments are resected from the living donor’s liver and transplanted. In paediatric recipients or small adults, a Segment 2/3 graft may be adequate but larger potential adult recipients require a much larger graft and the right hemi liver (Segments 5 - 8) can be used.

Living liver donation particularly right lobe donation in adult to adult transplantation is not without risk to the donor. Living donor transplantation has been approached with caution in Australia and New Zealand and only a small number have been performed with the majority in children.

To 31st December 2005, sixteen living donor liver transplants had been performed (fifteen primary and one second graft).

The application of all these innovative surgical techniques has had a significant impact on liver transplantation particularly paediatric transplantation.

Future application to more adult recipients is inevitable as waiting list mortality increases.

CARDIO-THORACIC ORGAN DONATION

AUSTRALIA

In 2006 Australia performed 71 heart transplants, six heart/lung, 79 double and 16 single lung transplants.

The first perfusion fluid of choice for heart retrieval was crystalloid cardioplegia. The first perfusion fluid for lung retrieval was perfadex (43%) and Pneumoplegia (42%). Cardioplegia followed by pneumoplegia was used in 10% and Celsior in 5% of lung retrievals.

ECG AND ECHOCARDIOGRAM

Seventy five percent (63 heart donors) had a normal ECG. Two were unknown. Eighty percent (67 heart donors) had an echocardiogram.

NEW ZEALAND

New Zealand performed eight heart, nine double lungs and one single lung transplant in 2006.

One heart, two double lungs and one single lung were sent for transplantation in Australia.

The first perfusion fluid for heart retrieval was crystalloid cardioplegia with perfadex used for twelve lung donors and pneumoplegia for one donor.

ECG AND ECHOCARDIOGRAM

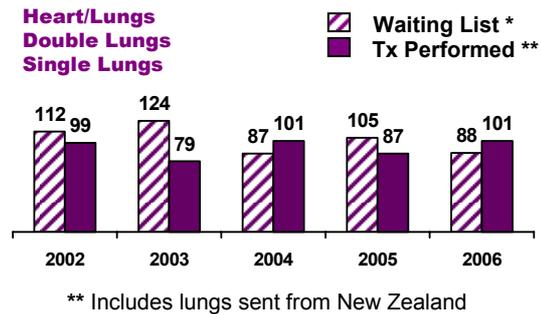
All nine heart donors had a normal ECG and eight had an echocardiogram.

Figure 85

**Waiting List vs Deceased Transplants
Australia 2002 - 2006**



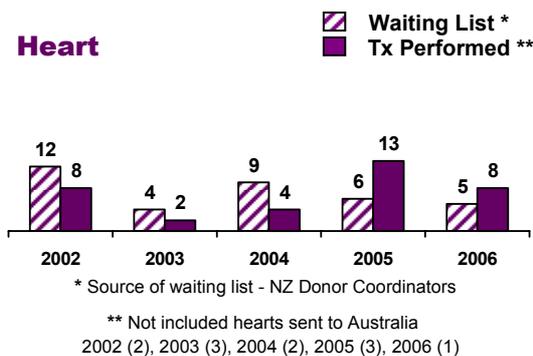
**Waiting List vs Deceased Transplants
Australia 2002 - 2006**



* The Cardio-Thoracic Registry

Figure 86

**Waiting List vs Deceased Transplants
New Zealand 2002 - 2006**



**Waiting List vs Deceased Transplants
New Zealand 2002 - 2006**

