CHAPTER 8

TRANSPLANTATION

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TRANSPLANTS PERFORMED IN 2006

Figure 8.1

Number of Renal Transplant Operations
(Live Donors)

Year	Australia						New Zealand				
	1st	2nd	3rd	4th	5th	Total	1st	2nd	3rd	4th	Total
1963	5	1	0	0	0	**6 (1)**	0	0	0	0	**0**
1964	2	0	0	0	0	**2 (0)**	0	0	0	0	**0**
1965	12	1	1	0	0	**14 (3)**	1	0	0	0	**1 (1)**
1966	18	2	0	0	0	**20 (5)**	10	3	0	0	**13 (0)**
1967	69	2	0	0	0	**71 (2)**	18	4	1	0	**23 (1)**
1968	97	10	0	0	0	**107 (0)**	17	4	0	0	**21 (2)**
1969	149	12	0	0	0	**161 (0)**	39	5	0	0	**44 (0)**
1970	168	12	2	0	0	**182 (1)**	21	3	1	0	**25 (0)**
1971	207	22	1	0	0	**230 (1)**	26	6	0	0	**32 (1)**
1972	183	16	0	0	0	**199 (2)**	43	8	0	0	**51 (1)**
1973	213	30	1	0	0	**244 (7)**	50	10	2	0	**62 (0)**
1974	224	35	4	0	0	**263 (6)**	35	5	1	0	**41 (3)**
1975	271	29	3	1	0	**304 (7)**	61	13	0	0	**74 (2)**
1976	223	41	4	0	0	**268 (10)**	38	13	1	0	**52 (1)**
1977	265	57	4	0	0	**326 (16)**	46	10	2	0	**58 (4)**
1978	269	43	2	0	0	**314 (17)**	43	11	3	0	**57 (11)**
1979	293	35	5	0	0	**333 (14)**	61	13	3	2	**79 (16)**
1980	287	63	9	0	0	**359 (36)**	57	13	4	0	**74 (18)**
1981	306	58	9	1	0	**374 (35)**	51	8	1	0	**60 (10)**
1982	321	72	6	0	0	**399 (53)**	48	17	0	0	**65 (8)**
1983	272	63	10	2	0	**347 (48)**	69	25	4	0	**98 (11)**
1984	362	72	10	1	0	**445 (48)**	63	11	0	0	**74 (16)**
1985	318	79	17	1	0	**415 (36)**	60	25	3	0	**88 (6)**
1986	366	63	7	2	0	**438 (32)**	79	19	6	1	**105 (13)**
1987	310	58	21	3	0	**392 (40)**	57	17	4	1	**79 (20)**
1988	391	62	10	2	1	**466 (46)**	61	11	6	0	**78 (8)**
1989	433	46	10	2	0	**491 (48)**	71	11	1	0	**83 (12)**
1990	387	45	9	2	0	**443 (59)**	86	14	2	0	**102 (23)**
1991	386	70	11	3	0	**470 (78)**	62	10	4	1	**77 (13)**
1992	404	57	13	3	0	**477 (70)**	105	5	5	0	**115 (17)**
1993	385	63	6	4	1	**459 (66)**	69	13	2	0	**84 (20)**
1994	384	41	12	2	1	**440 (103)**	70	11	1	1	**83 (20)**
1995	371	60	11	0	0	**442 (94)**	84	7	3	0	**94 (24)**
1996	416	50	9	0	0	**475 (115)**	88	7	1	0	**96 (26)**
1997	444	51	6	1	0	**505 (147)**	101	10	1	0	**112 (31)**
1998	443	62	11	2	0	**518 (161)**	95	10	1	0	**106 (31)**
1999	403	43	9	0	0	**455 (169)**	97	11	4	0	**112 (42)**
2000	476	47	7	1	0	**531 (181)**	91	13	2	0	**106 (31)**
2001	488	45	6	2	0	**541 (213)**	101	9	0	0	**110 (43)**
2002	537	60	5	2	0	**604 (230)**	103	12	2	0	**117 (48)**
2003	472	60	10	1	0	**543 (218)**	94	13	4	0	**111 (44)**
2004	583	53	11	3	0	**650 (244)**	98	7	0	0	**105 (48)**
2005	539	67	15	2	0	**623 (246)**	87	5	0	1	**93 (46)**
2006	549	70	17	5	0	**641 (274)**	80	8	2	0	**90 (49)**

AUSTRALIA

The 641 transplant operations performed in 2006 represents an increase of 3% compared to 2005 (623 operations) (Figure 8.1). This number was the second highest ever recorded, the highest being 650 operations in 2004. This represents a transplant rate of 31 per million population per year, the same as in 2005. There was an increase of 11% for live donors from last year, though there was a decrease of 3% for deceased donors (Figure 8.2).

For more up to date figures on the deceased organ donor rate, see www.anzdata.org.au/anzod/updates/anzodupdate.htm

Live donor transplants accounted for 43% (274 grafts) in 2006, compared to 39% (246 grafts) in 2005. This proportion continues to increase over time.

Primary recipients (those receiving a first transplant) received 86% of all kidneys transplanted in 2006, compared to 87% in 2005.

NEW ZEALAND

The number of transplant operations (90) performed in 2006 represents a transplant rate of 22 per million population per year (a decrease of 3% from 2005) and the lowest number since 1994 (Figure 8.1).

The percentage of live donors increased from 49% to 54% of all operations in 2006 (Figure 8.3).

Of the grafts performed in 2006, 89% were to primary recipients, (94% in 2005).

Figure 8.2

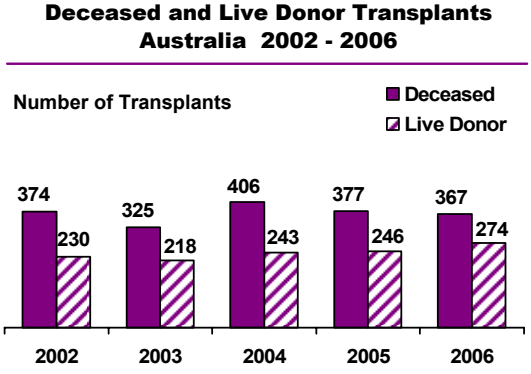
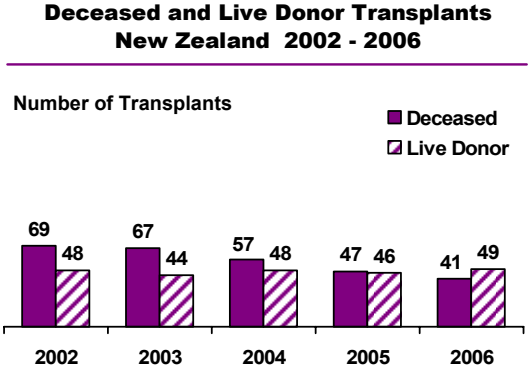


Figure 8.3



TRANSPLANT RATE OF PATIENTS DIALYSED

In Australia the proportion of patients receiving dialysis in 2006, who were transplanted that year was 5.7%, a decrease from 6.0% in 2005 and 6.6% in 2004. A further 73 patients with ESKD received pre-emptive transplantation (transplantation as the first RRT modality); thus transplantation was the mode of RRT for 641 of 11,148 (5.7%) of patients who would have otherwise been managed with dialysis in 2006.

Of all patients in the 15-59 year age group who received dialysis treatment during 2006, 10.9% (527 patients) were transplanted in 2006, similar to 2005, 10.9% (499 patients).

In New Zealand, 3.7% of all dialysed patients were transplanted in 2006, compared to 4.1% in 2005. A further 13 patients with ESKD received pre-emptive transplantation, thus transplantation was the mode of RRT for 90 of 2,395 (3.7%) of patients.

In the 15-59 year age group 5.7% of those on dialysis (73 patients) were transplanted in 2006 (Figures 8.4 and 8.5).

The rate of transplantation in Australia was the highest in the age group 0-4 years (53.3%) and 5-14 years of age (31.4%) and continued to decline with increasing age (Figure 8.6).

As in Australia, the rate of transplantation for New Zealand patients was highest among those less than 14 years old and declined with age (Figure 8.7).

Figure 8.4

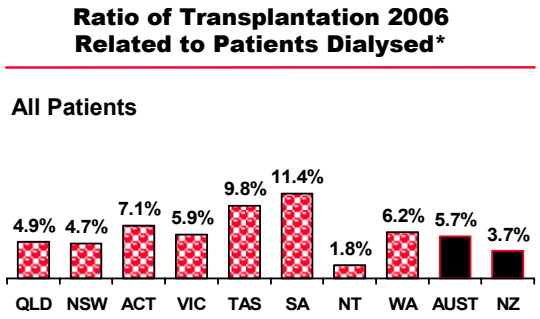


Figure 8.5

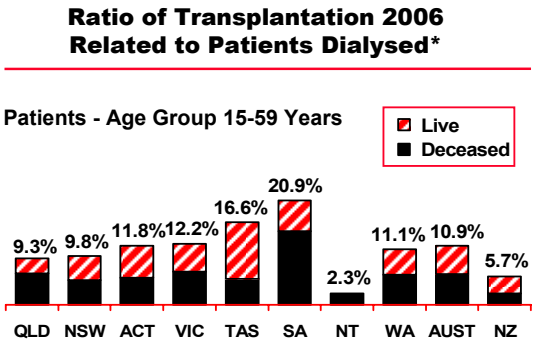


Figure 8.6

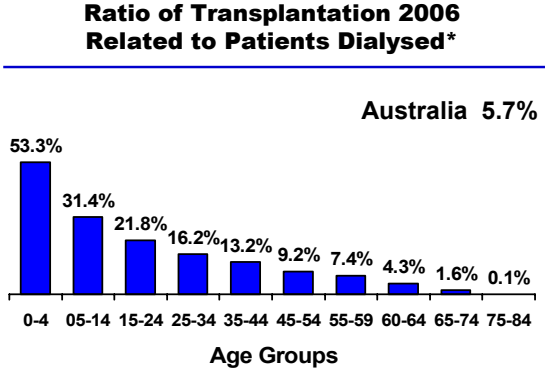
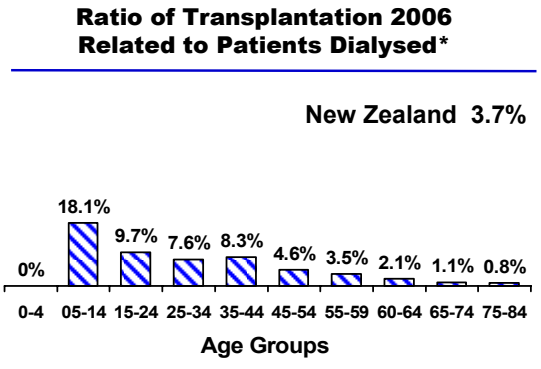


Figure 8.7



* Preemptive transplant patients included

AGE OF RECIPIENTS TRANSPLANTED IN 2006

Figure 8.8

Graft Number and Age of Patients Transplanted 2006

Donor Source	Graft No.	Age Groups 00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	Total
Australia											
Deceased	1	0	3	9	32	73	86	78	24	0	**305**
	2	0	2	2	10	15	9	4	2	0	**44**
	3	0	0	0	2	3	6	3	0	0	**14**
	4	0	0	0	1	2	1	0	0	0	**4**
Live Donor	1	8	5	25	38	46	51	53	18	0	**244**
	2	0	1	2	4	7	9	3	0	0	**26**
	3	0	0	0	0	1	1	1	0	0	**3**
	4	0	0	0	0	0	1	0	0	0	**1**
Total		**8**	**11**	**38**	**87**	**147**	**164**	**142**	**44**	**0**	**641**
New Zealand											
Deceased	1	0	1	4	4	4	12	8	3	1	**37**
	2	0	0	0	2	0	0	0	2	0	**4**
Live Donor	1	0	1	3	5	14	8	10	1	1	**43**
	2	0	0	0	0	3	1	0	0	0	**4**
	3	0	0	0	0	1	1	0	0	0	**2**
Total		**0**	**2**	**7**	**11**	**22**	**22**	**18**	**6**	**2**	**90**

AUSTRALIA

The median age of transplant recipients in 2006 was 46.6 years, compared to 46.1 years in 2005. The age range was 1.9 to 73.9 years (Figures 8.8 and 8.9).

Forty nine percent of recipients were in the 35-54 year age group. Twenty nine percent of recipients in 2006 were over 54 years of age, compared to 26% in 2005.

The transplantation rate per million for each age group and as a percentage of dialysed patients for each age group is shown in Figures 8.6 and 8.9.

NEW ZEALAND

The median age of transplant recipients in 2006 was 47.2 years compared to 48.7 years in 2005. The age range was 7.4 to 79.6 years (Figures 8.8 and 8.10).

Recipients aged between 35 and 54 years comprised 49% of the total. Twenty nine percent of recipients were over 54 years of age in 2006.

Figure 8.9

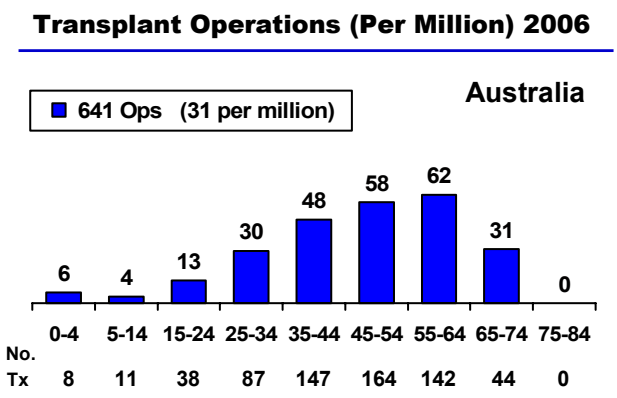
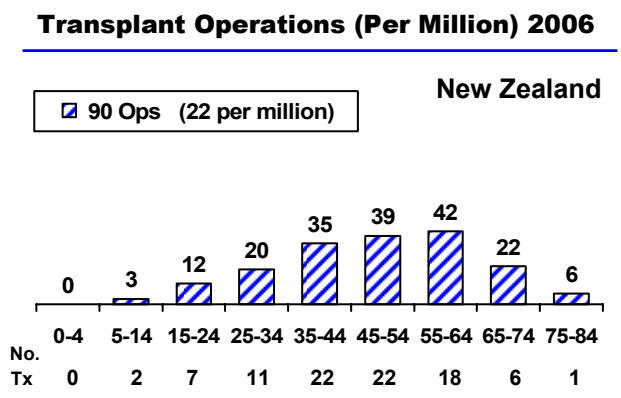


Figure 8.10



ETHNICITY OF TRANSPLANT RECIPIENTS

AUSTRALIA

Figures 8.11 and 8.13.

For the 15-59 year age group in 2006, 13.3% of dialysed Caucasoid patients were transplanted and 10.6% of Asians.

For Australian Aboriginals and Torres Strait Islanders (ATSI), the transplant rate was 2.8% compared to 2.3% in 2005 and 3.3% in 2004. The number of ATSI patients dialysed continues to increase each year.

Figure 8.11 **Australia**

Transplantation Rate - Age Group 15-59 years 1996 - 2006

Year	Caucasoid			Aboriginal and Torres St. Islanders			All Patients		
	Dialysed	Tx	Rate	Dialysed	Tx	Rate	Dialysed	Tx	Rate
1996	2448	358	14.6%	388	8	2.0%	3186	402	12.6%
1997	2527	359	14.2%	440	20	4.5%	3362	429	12.7%
1998	2656	358	13.4%	479	25	5.2%	3554	436	12.2%
1999	2745	323	11.7%	514	19	3.7%	3696	386	10.4%
2000	2865	388	13.5%	541	17	3.1%	3882	441	11.3%
2001	2943	391	13.2%	599	20	3.3%	4047	457	11.2%
2002	2973	443	14.9%	635	16	2.5%	4144	511	12.3%
2003	3012	362	12.0%	680	13	1.9%	4265	421	9.8%
2004	3097	442	14.2%	740	25	3.3%	4449	528	11.8%
2005	3188	417	13.0%	796	19	2.3%	4614	499	10.8%
2006	3290	439	13.3%	835	24	2.8%	4803	527	10.9%

NEW ZEALAND

Figures 8.12 and 8.13.

Amongst the 15-59 year age group, the proportion of Maori and Pacific People who received a renal transplant in 2006 was 1.7% and 1.2% respectively, compared with 12.3% for Caucasoid and 6% for Asian dialysis patients.

Figure 8.12 **New Zealand**

Transplantation Rate - Age Group 15-59 years 1996 - 2006

Year	Caucasoid			Maori			Pacific People			All Patients		
	Dialysed	Tx	Rate	Dialysed	Tx	Rate	Dialysed	Tx	Rate	Dialysed	Tx	Rate
1996	348	58	16.6%	262	7	2.6%	128	7	5.4%	784	79	10.0%
1997	372	73	19.6%	279	9	3.2%	134	3	2.2%	829	91	10.9%
1998	372	60	16.1%	321	14	4.3%	151	7	4.6%	897	85	9.5%
1999	389	67	17.2%	318	16	5.0%	159	8	5.0%	928	98	10.5%
2000	401	68	17.0%	330	10	3.0%	184	4	2.1%	976	86	8.8%
2001	414	64	15.4%	360	13	3.6%	213	5	2.3%	1054	92	8.7%
2002	433	60	13.8%	383	11	2.8%	225	14	6.2%	1108	89	8.0%
2003	432	57	13.1%	407	15	3.6%	227	12	5.2%	1140	92	8.0%
2004	441	57	12.9%	421	9	2.1%	229	11	4.8%	1171	86	7.3%
2005	457	65	14.2%	425	3	0.7%	244	3	1.2%	1197	74	6.1%
2006	461	57	12.3%	463	8	1.7%	250	3	1.2%	1260	73	5.7%

Figure 8.13

New Transplanted Patients 2002 - 2006 Related to Ethnicity

Race	2002	2003	2004	2005	2006
Australia	(604)	(543)	(650)	(623)	(641)
Caucasoid	529 (88%)	472 (87%)	551 (85%)	527 (85%)	538 (85%)
Aboriginal/Torres St. Islanders	17 (3%)	14 (3%)	26 (4%)	22 (4%)	26 (4%)
Asian	45 (7%)	42 (7%)	57 (9%)	58 (9%)	59 (9%)
Other	13 (2%)	15 (3%)	16 (2%)	16 (2%)	18 (3%)
New Zealand	(117)	(111)	(105)	(93)	(90)
Caucasoid	83 (71%)	72 (65%)	72 (69%)	83 (89%)	65 (72%)
Maori	13 (11%)	16 (14%)	12 (11%)	3 (3%)	10 (11%)
Pacific People	15 (13%)	14 (13%)	12 (11%)	4 (4%)	7 (8%)
Asian	5 (4%)	9 (8%)	6 (6%)	3 (4%)	8 (9%)
Other	1 (1%)	-	3 (3%)	-	-

AUSTRALIAN REGIONAL TRANSPLANTATION ACTIVITY 2006

Figure 8.14

Transplants in each Region 2002 - 2006
Number of Operations
(per Million Population per year)

State	2002	2003	2004	2005	2006
Queensland	111 (30)	114 (30)	108 (28)	99 (25)	101 (25)
New South Wales/ACT *	198 (28)	198 (28)	230 (33)	212 (30)	195 (27)
Victoria/Tasmania *	157 (29)	129 (24)	151 (28)	162 (29)	185 (33)
South Australia/NT *	77 (45)	66 (38)	98 (57)	68 (39)	96 (55)
Western Australia	61 (32)	36 (18)	63 (32)	82 (41)	64 (31)
Australia	**604 (31)**	**543 (27)**	**650 (32)**	**623 (31)**	**641 (31)**

* For calculation of population related totals, the populations of these States were summed

Figure 8.15

Transplant Operations 2002 - 2006
Australian Transplant Regions

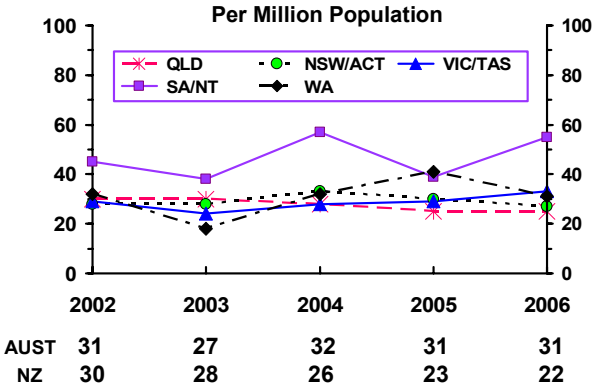
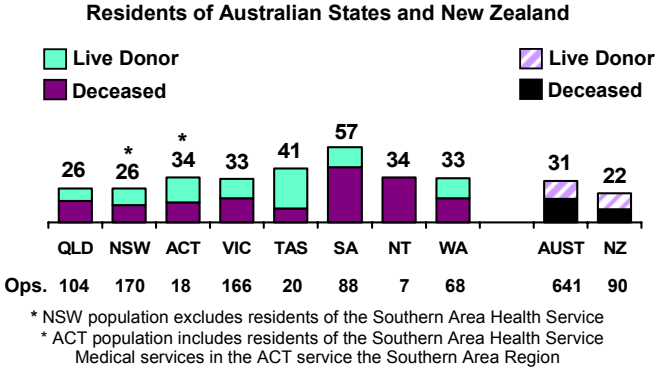


Figure 8.16

Rate of Transplantation 2006
Related to Population (Per Million)



* NSW population excludes residents of the Southern Area Health Service
* ACT population includes residents of the Southern Area Health Service
Medical services in the ACT service the Southern Area Region

The rate of transplantation for each transplant region is shown in Figures 8.14 and 8.15.

Transplants performed for people resident in Tasmania and the Northern Territory patients are included in figures for Victoria and South Australia respectively. These regions share common waiting lists and allocation protocols.

South Australia had the highest transplant rate (55 per million), followed by (33 per million) in the Victoria/Tasmania region in 2006.

The transplant rates for residents of each State and the Northern Territory is shown in Figure 8.16. The highest rate (57 per million) occurred in South Australia, followed by Tasmania (41 per million) and the ACT and Northern Territory (34 per million). The lowest rate (26 per million) was in Queensland and New South Wales.

TRANSPLANT SURVIVAL - PRIMARY DECEASED DONOR GRAFTS

AUSTRALIA

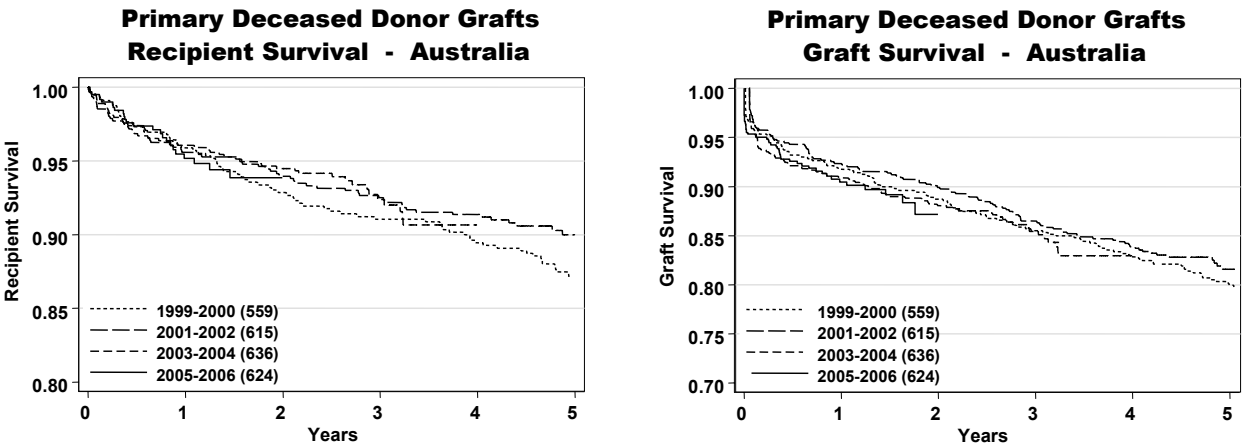
Graft and patient survival for primary deceased donor grafts performed in Australia, calculated by the Kaplan-Meier method, is shown in Figure 8.17. The figures now include graft losses or deaths on the day of transplant. After initial improvement, unadjusted one year patient and graft survival for primary deceased donor grafts in Australia have stabilised in the past four years. Kaplan-Meier graphs illustrating this are shown in Figure 8.18.

Figure 8.17

Primary Deceased Donor - Australia
Recipient and Graft Survival 1991 - 2006
% [95% Confidence Interval]

Year of Transplant	No. of Patients	Survival			
		1 month	6 months	1 year	5 years
Recipient Survival					
1991-1992	655	99 [98, 99]	95 [93, 96]	93 [91, 95]	84 [81, 87]
1993-1994	609	99 [97, 99]	96 [94, 97]	95 [93, 97]	85 [82, 88]
1995-1996	601	99 [98,100]	96 [94, 97]	95 [93, 97]	88 [85, 90]
1997-1998	606	99 [97, 99]	97 [95, 98]	96 [94, 97]	87 [84, 89]
1999-2000	559	99 [98,100]	97 [96, 98]	96 [94, 97]	87 [84, 90]
2001-2002	615	99 [98,100]	97 [96, 98]	96 [94, 97]	90 [87, 92]
2003-2004	636	99 [98,100]	97 [95, 98]	96 [94, 97]	-
2005-2006	624	100 [98,100]	97 [96, 98]	95 [93, 97]	-
Graft Survival					
1991-1992	655	91 [89, 93]	87 [84, 89]	85 [82, 87]	72 [68,75]
1993-1994	609	93 [91, 95]	89 [86, 91]	88 [85, 90]	73 [69,76]
1995-1996	601	95 [92, 96]	90 [88, 92]	89 [86, 91]	78 [74, 81]
1997-1998	606	95 [93, 97]	92 [90, 94]	90 [88, 92]	77 [74, 80]
1999-2000	559	96 [95, 98]	93 [91, 95]	92 [89, 94]	80 [76, 83]
2001-2002	615	96 [94, 97]	94 [92, 96]	92 [90, 94]	82 [78, 85]
2003-2004	636	94 [92, 96]	92 [90, 94]	91 [88, 93]	-
2005-2006	624	95 [93, 97]	93 [90, 94]	90 [88, 93]	-

Figure 8.18



TRANSPLANT SURVIVAL - PRIMARY DECEASED DONOR GRAFTS

NEW ZEALAND

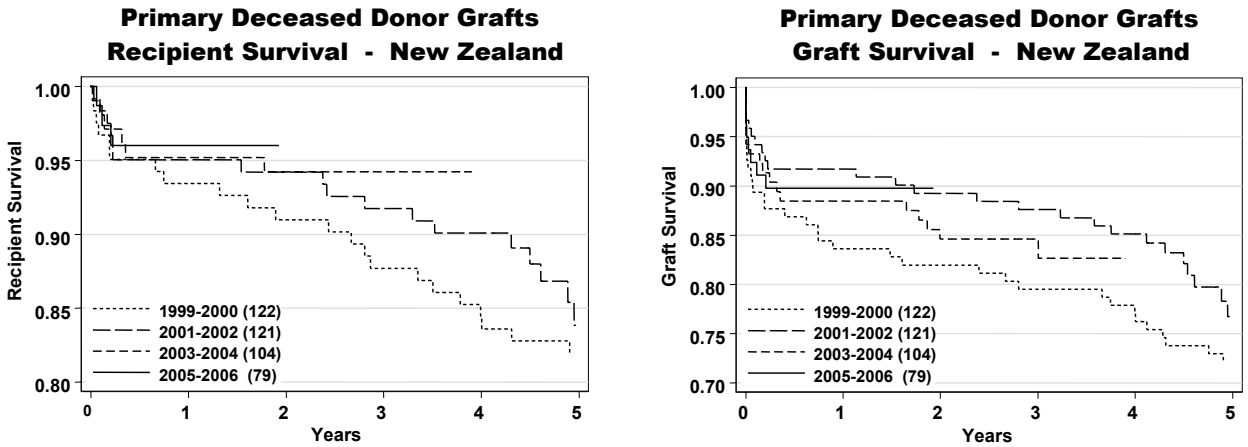
Graft and patient survival for primary deceased donor grafts performed in New Zealand, calculated by the Kaplan-Meier method, is shown in Figure 8.19. The figures now include graft losses or deaths on the day of transplant. Like Australia, the improvement in unadjusted one year patient and graft survival have stabilised in the past four years. Tables illustrating this are shown in Figure 8.19. Figure 8.20 presents these as Kaplan-Meier curves.

Figure 8.19

Primary Deceased Donor - New Zealand
Recipient and Graft Survival 1991 - 2006
% [95% Confidence Interval]

Year of Transplant	No. of Patients	Survival			
		1 month	6 months	1 year	5 years
Recipient Survival					
1991-1992	140	99 [95, 100]	96 [91, 98]	94 [88, 97]	81 [74, 87]
1993-1994	104	96 [90, 99]	88 [80, 93]	85 [77, 91]	78 [68, 85]
1995-1996	126	98 [94, 100]	94 [88, 97]	93 [87, 96]	86 [78, 91]
1997-1998	139	99 [94, 100]	94 [88, 97]	94 [88, 97]	84 [77, 89]
1999-2000	122	97 [92, 99]	95 [89, 98]	93 [87, 97]	82 [74, 88]
2001-2002	121	99 [94, 100]	95 [89, 98]	95 [89, 98]	84 [75, 90]
2003-2004	104	99 [93, 100]	95 [89, 98]	95 [89, 98]	-
2005-2006	79	99 [91, 100]	96 [88, 99]	96 [88, 99]	-
Graft Survival					
1991-1992	140	90 [84, 94]	83 [76, 88]	81 [73, 86]	69 [61, 76]
1993-1994	103	83 [73, 87]	78 [68, 85]	74 [64, 81]	59 [49, 68]
1995-1996	126	91 [85, 95]	88 [81, 93]	84 [76, 89]	72 [64, 79]
1997-1998	139	93 [87, 96]	87 [80, 92]	86 [79, 90]	73 [65, 80]
1999-2000	122	89 [82, 94]	87 [79, 92]	84 [76, 89]	72 [63, 79]
2001-2002	121	95 [89, 98]	92 [85, 95]	92 [85, 95]	77 [67, 84]
2003-2004	104	93 [86, 97]	88 [81, 93]	88 [81, 93]	-
2005-2006	79	92 [84, 97]	90 [81, 95]	90 [81, 95]	-

Figure 8.20



TRANSPLANT SURVIVAL - AUSTRALIA
SECOND AND SUBSEQUENT DECEASED DONOR GRAFTS

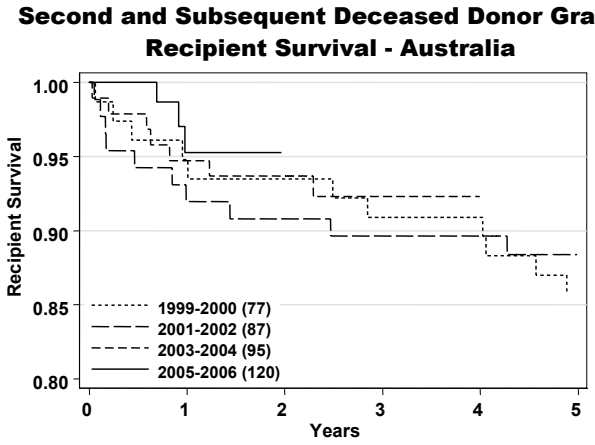
Patient and graft survival for second or subsequent deceased donor grafts in Australia, calculated by the Kaplan-Meier method, is shown in (Figure 8.21). The figures now include graft losses or deaths on the day of transplant. Kaplan-Meier graphs illustrating this are shown in Figure 8.22.

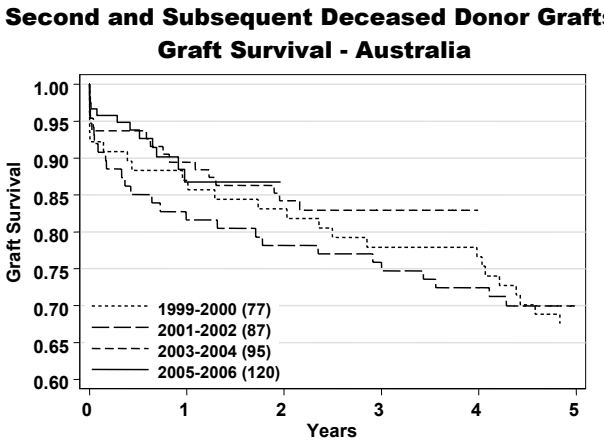
Figure 8.21

Second and Subsequent Deceased Donor - Australia
Recipient and Graft Survival 1991 - 2006
% [95% Confidence Interval]

Year of Transplant	No. of Patients	Survival			
		1 month	6 months	1 year	5 years
Recipient Survival					
1991-1992	144	100 [-, -]	97 [92, 99]	95 [90, 98]	85 [78, 90]
1993-1994	121	98 [94,100]	98 [93, 99]	94 [88, 97]	86 [78, 91]
1995-1996	107	99 [94,100]	97 [92, 99]	97 [92, 99]	86 [78, 91]
1997-1998	109	100 [-, -]	97 [92, 99]	95 [89, 98]	86 [78, 91]
1999-2000	77	99 [91,100]	96 [88, 99]	95 [87, 98]	86 [76, 92]
2001-2002	87	99 [92,100]	94 [87, 98]	92 [84, 96]	88 [79, 94]
2003-2004	95	99 [93,100]	98 [92, 99]	95 [88, 98]	-
2005-2006	120	100 [-,-]	100 [-,-]	95 [86, 98]	-
Graft Survival					
1991-1992	144	84 [77, 89]	79 [72, 85]	78 [70, 84]	63 [55, 70]
1993-1994	121	87 [79, 92]	85 [77, 90]	83 [76, 89]	70 [61, 78]
1995-1996	107	83 [75, 89]	78 [68, 84]	77 [67, 84]	61 [51, 69]
1997-1998	109	93 [86, 96]	89 [81, 94]	84 [76, 90]	73 [64, 81]
1999-2000	77	92 [83, 96]	88 [79, 94]	87 [77, 93]	68 [56, 77]
2001-2002	87	92 [84, 96]	85 [76, 91]	82 [72, 88]	70 [59, 78]
2003-2004	95	94 [86, 97]	94 [86, 97]	89 [81, 94]	-
2005-2006	120	96 [90, 98]	94 [87, 97]	87 [77, 92]	-

Figure 8.22





LIVE DONOR TRANSPLANTS

Figure 8.23

Live Donor Operations as a Proportion (%) of Annual Transplantation 2002 - 2006

Recipient Age Groups	Year of Transplantation				
	2002	2003	2004	2005	2006
00-04 years	80%	78%	100%	50%	100%
05-14 years	50%	50%	59%	52%	55%
15-24 years	54%	62%	64%	70%	71%
25-34 years	56%	44%	40%	48%	48%
35-44 years	31%	38%	39%	42%	37%
45-54 years	30%	34%	35%	34%	38%
55-64 years	33%	33%	28%	31%	40%
65-74 years	30%	37%	31%	19%	41%
75-84 years	0%	100%	0%	100%	0%
All Recipients	38%	40%	38%	39%	43%

Figure 8.24

Percentage Live Donor Grafts - Australia Stratified by Age Group 2002/2006

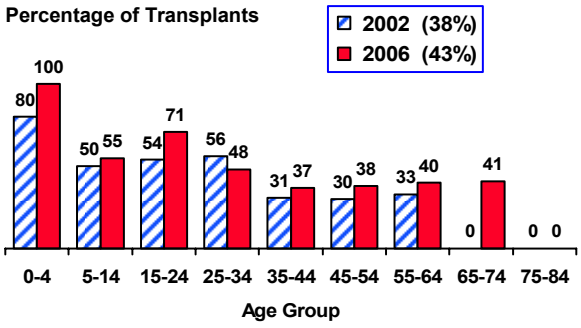
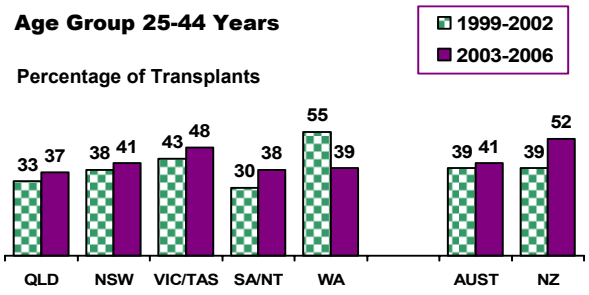


Figure 8.25

Percentage Live Donor Grafts Regions: Australia and New Zealand



AUSTRALIA

Two hundred and seventy four live donor (LD) kidney transplants were performed in 2006 in Australia, representing 43% of all transplant operations. This proportion is the highest ever recorded (Figures 8.2 and 8.23).

The overall number of live donor transplants increased by 11% from 2005, the highest number ever performed.

Figure 8.24 shows the age-related proportion of live donor transplants for the years 2002 and 2006. The overall proportion of live donors increased in all age groups except the 25-34 year group. There were 18 recipients (41%) of live donors in the 65-74 year age group in 2006.

The proportion of live donor transplants for each State and New Zealand for recipients aged 25-44 years is shown for the years 1999-2002 and 2003-2006 in Figure 8.25. There has been an increase in this age group for both countries for the years 2003-2006.

The proportion of genetically unrelated donors was 40% in 2006, similar to 41% in 2005. This was an increase of 10% (10 donors) from last year. Sixty four percent of live unrelated donors were spouses. The number of related donors increased 12% (164 donors) from 146 donors in 2005 (Figures 8.27 and 8.29).

NEW ZEALAND

The rate of live donor transplantation remains similar in New Zealand, but the genetically unrelated donor number increased 50% (21 donors) from 14 donors in 2005. (Figures 8.28 and 8.29).

Fifty four percent of grafts were from a live donor (49% in 2005 and 46% in 2004). Unrelated donors represented 43% of all live donors in 2006. Friends accounted for 48% and 19% were non-directed donors (Figure 8.29).

TIMING OF LIVE DONOR TRANSPLANTS

The timing of live donor transplants is shown in Figure 8.26.

The proportion of all live donor transplants performed "pre-emptively" in Australia was 27%, compared to 33% in 2005. Forty three percent had received dialysis treatment for twelve months or longer prior to a first live donor graft.

The proportion of pre-emptive live donor transplants in New Zealand was 21% in 2006, similar to the previous three years. Fifty one percent were waiting for twelve months or longer post dialysis.

Figure 8.26

Timing of Live Donor Transplantation for Primary Grafts in Relation to Date of Dialysis Start by Year of Transplant 2002 - 2006

		2002	2003	2004	2005	2006
Aust	Pre-dialysis	55 (26%)	50 (25%)	52 (24%)	73 (33%)	65 (27%)
	<1 month post dialysis	5 (2%)	5 (2%)	8 (4%)	5 (2%)	7 (3%)
	1-11.9 months post dialysis	68 (32%)	59 (30%)	62 (28%)	58 (26%)	67 (27%)
	>=12 months post dialysis	83 (39%)	84 (42%)	99 (45%)	84 (38%)	105 (43%)
NZ	Pre-dialysis	12 (27%)	9 (22%)	10 (21%)	10 (22%)	9 (21%)
	<1 month post dialysis	-	-	2 (4%)	1 (2%)	-
	1-11.9 months post dialysis	12 (27%)	15 (38%)	12 (25%)	13 (29%)	12 (28%)
	>=12 months post dialysis	20 (46%)	16 (40%)	24 (50%)	21 (47%)	22 (51%)

Figure 8.27

Age of Live Donors in Australia 1996 - 2006

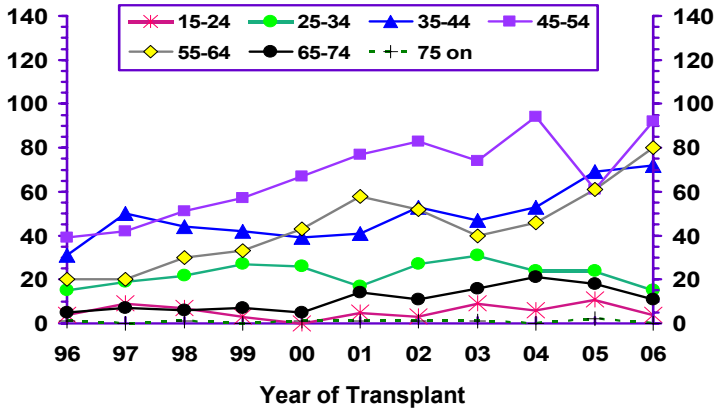


Figure 8.28

Source of Live Donor Kidney Australia 1998 - 2006

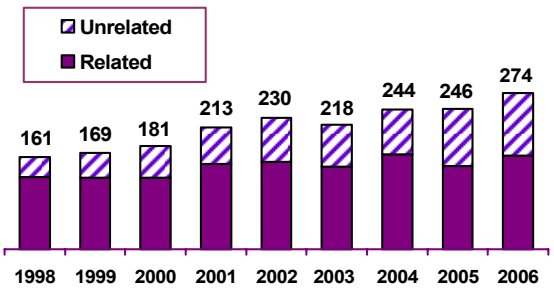


Figure 8.29

Source of Live Donor Kidney New Zealand 1998 - 2006

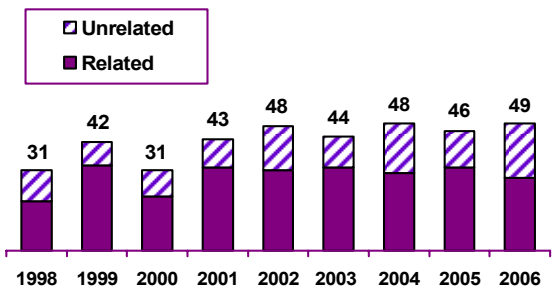


Figure 8.30

Source of Live Donor Kidneys 2002 - 2006

(x = identical twin) (+ = non identical twin)

Source	Australia					New Zealand				
	2002	2003	2004	2005	2006	2002	2003	2004	2005	2006
Total Live Donors	**230**	**218**	**244**	**246**	**274**	**48**	**44**	**48**	**46**	**49**
Related	**(153)**	**(144)**	**(166)**	**(146)**	**(164)**	**(31)**	**(32)**	**(30)**	**(32)**	**(28)**
Mother	47	40	44	39	40	7	13	4	7	5
Father	19	30	24	30	35	6	4	5	3	3
Brother	33	23 (1x)	39	31	25	5	3	6	7	6 (1x)
Sister	37 (1x)	30 (1x)	32 (1+)	26 (1+)	35 (1+)	7	7	9	9 (1x)	6
Offspring	5	10	14	8	15	3	4	3	4	7
Grandfather	-	1	4	1	2	-	-	-	-	-
Grandmother	3	-	-	1	1	-	-	-	-	-
Cousin	4	4	4	5	4	1	-	1	1	1
Nephew	1	2	1	1	-	-	1	-	-	-
Niece	-	2	-	2	1	1	-	-	-	-
Uncle	1	1	3	1	1	-	-	1	-	-
Aunt	3	1	1	1	5	1	-	1	1	-
Unrelated	**(77)**	**(74)**	**(78)**	**(100)**	**(110)**	**(17)**	**(12)**	**(18)**	**(14)**	**(21)**
Wife	31	25	28	37	53	6	2	6	-	5
Husband	18	19	12	24	17	3	6	3	1	-
Mother-in-Law	2	-	-	1	1	-	-	-	-	-
Father-in-Law	-	1	-	3	-	-	-	-	-	-
Adoptive Mother	-	-	-	-	-	1	-	-	-	-
Adoptive Son	-	-	-	1	-	-	-	-	-	-
Adoptive Sister	1	-	-	-	-	-	-	-	-	-
Son-in-Law	-	-	1	1	-	-	-	-	-	-
Stepfather	2	1	1	2	2	-	-	-	-	-
Stepmother	-	1	-	-	-	-	-	-	-	-
Sister-in-Law	-	2	4	3	2	-	-	-	-	1
Brother-in-Law	1	1	1	-	2	-	-	-	1	-
Partner	4	2	3	7	6	-	-	-	1	1
Fiance / Fiancee	-	1	1	-	1	-	-	1	-	-
Friend	11	18	19	14	16	6	4	5	7	10
Aunt	1	-	-	-	-	-	-	-	-	-
Stepsister	1	-	-	-	1	-	-	-	-	-
Stepson	1	1	-	-	-	-	-	-	-	-
Niece	-	-	-	-	-	-	-	-	1	-
Mother's Cousin	-	-	-	-	1	-	-	-	-	-
Ex Spouse	-	-	-	-	1	-	-	-	-	-
Non-Directed	-	-	2	3	2	1	-	3	3	4
Pathological	4	2	6	4	5	-	-	-	-	-

TRANSPLANT SURVIVAL - PRIMARY LIVE DONOR 1991–2006

For primary live donor graft recipients, excellent early survival rates have been evident since 1991 (Figure 8.31).

Parallel improvement in graft survival is also evident. This is reassuring given the increased rates of live donor transplantation and corresponding increase in performing less ideal live donor transplants (particularly from older donors and unrelated donor transplants) (Figures 8.8 and 8.23).

Current patient and graft survival for primary live donor recipients in Australia and New Zealand are similar.

Figure 8.31 **Australia**

Year of Transplant	No. of Patients	% [95% Confidence Interval] Survival			
		1 month	6 months	1 year	5 years
Recipient Survival					
1991-1992	135	99 [95,100]	99 [94,100]	99 [94,100]	86 [79, 91]
1993-1994	160	100 [- , -]	99 [95,100]	98 [94, 99]	94 [89, 97]
1995-1996	186	100 [- , -]	98 [95, 99]	97 [94, 99]	94 [90, 97]
1997-1998	284	100 [- , -]	99 [96, 99]	98 [96, 99]	96 [93, 98]
1999-2000	320	99 [97,100]	98 [96, 99]	98 [96, 99]	94 [91, 96]
2001-2002	410	100 [98,100]	99 [97,100]	99 [97, 99]	95 [92, 97]
2003-2004	418	100 [98,100]	99 [97,100]	99 [97,100]	-
2005-2006	464	100 [98,100]	100 [98,100]	99 [97,100]	-
Graft Survival					
1991-1992	135	96 [90, 98]	93 [88, 96]	92 [86, 95]	76 [68, 83]
1993-1994	160	97 [93, 99]	96 [91, 98]	95 [90, 97]	85 [78, 90]
1995-1996	186	93 [88, 96]	91 [86, 94]	90 [84, 93]	85 [79, 89]
1997-1998	284	98 [96, 99]	97 [94, 98]	96 [93, 98]	87 [83, 91]
1999-2000	320	97 [94, 98]	95 [92, 97]	94 [91, 96]	86 [82, 90]
2001-2002	410	98 [96, 99]	96 [94, 98]	96 [93, 97]	88 (84, 91)
2003-2004	418	99 [97,100]	98 [96, 99]	97 [95, 98]	-
2005-2006	464	98 [97, 99]	97 [95, 98]	97 [95, 98]	-

Figure 8.32 **New Zealand**

Year of Transplant	No. of Patients	% [95% Confidence Interval] Survival			
		1 month	6 months	1 year	5 years
Recipient Survival					
1991-1992	27	100 [- , -]	96 [76, 99]	96 [76, 99]	96 [76, 99]
1993-1994	35	100 [- , -]	100 [- , -]	97 [81,100]	88 [72, 95]
1995-1996	46	100 [- , -]	100 [- , -]	100 [- , -]	91 [78, 97]
1997-1998	57	100 [- , -]	100 [- , -]	100 [- , -]	89 [78, 95]
1999-2000	66	100 [- , -]	100 [- , -]	100 [- , -]	95 [86, 98]
2001-2002	83	100 [- , -]	99 [92,100]	99 [92,100]	93 [84, 97]
2003-2004	88	99 [92,100]	99 [92,100]	98 [91, 99]	-
2005-2006	88	100 [- , -]	98 [91, 99]	96 [88, 99]	-
Graft Survival					
1991-1992	27	96 [76, 99]	93 [74, 98]	93 [74, 98]	81 [61, 92]
1993-1994	35	91 [76, 97]	89 [72, 96]	89 [72, 96]	74 [56, 86]
1995-1996	46	98 [86,100]	98 [86,100]	98 [86,100]	76 [61, 86]
1997-1998	57	96 [87, 99]	96 [87, 99]	95 [85, 98]	72 [58, 82]
1999-2000	66	95 [87, 99]	94 [85, 98]	94 [85, 98]	82 [70, 89]
2001-2002	83	100 [- , -]	99 [92,100]	99 [92,100]	86 [76, 93]
2003-2004	88	97 [90, 99]	95 [88, 98]	95 [88, 98]	-
2005-2006	88	99 [92,100]	96 [89, 99]	95 [87, 98)	-

Figure 8.33

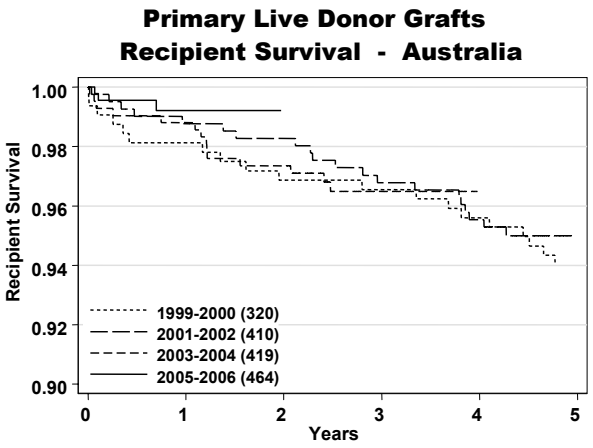


Figure 8.34

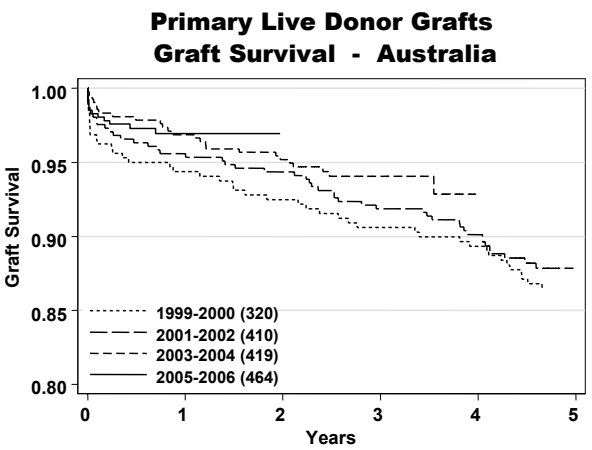


Figure 8.35

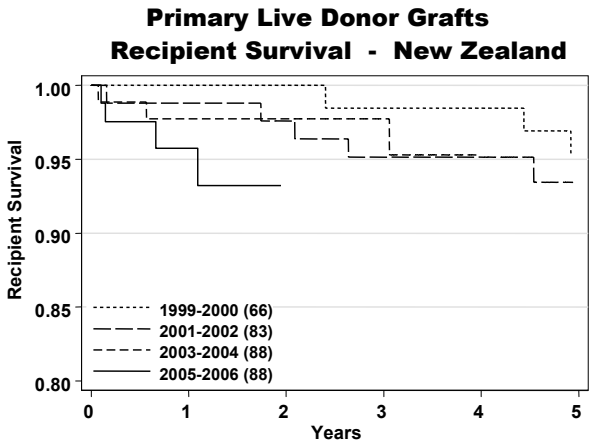
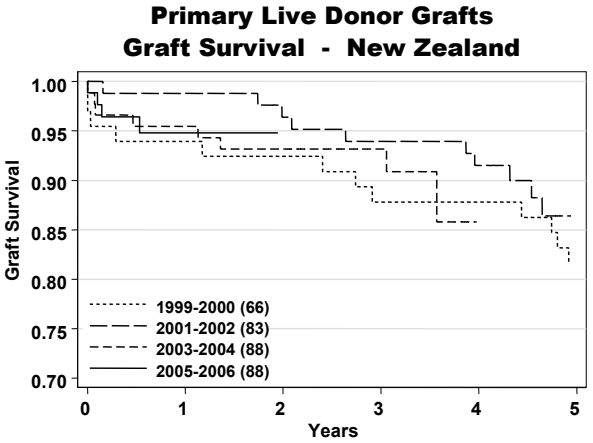


Figure 8.36



FUNCTIONING TRANSPLANTS AT 31ST DECEMBER 2006
TRANSPLANT OPERATIONS 1963 - 2006

AUSTRALIA

There have been 15,987 transplant operations performed on 13,704 patients since 1963. Of these, 6,845 grafts were functioning at 31st December 2006 (332 per million population). Fourteen percent of operations and 12% of functioning grafts were regrafts. Live donor transplants accounted for 20% of operations and 33% of functioning grafts (Figure 8.37). The number of operations performed by each hospital during this period is shown in Appendix I at the end of this Report.

The number of functioning grafts at the end of 2006 is a 5% increase over the previous year. The annual rate of increase has remained steady (Figure 8.39 and 8.40). Eighty eight percent of the functioning grafts were primary, and 67% were from deceased donors. The number of functioning grafts from live donors increased by 10% from 2005 to 2006, similar to the 10% increase in both 2003 and 2004.

The prevalence of functioning grafts in each State is shown in Figures 8.39 and 8.40. South Australia/Northern Territory has the highest prevalence of functioning renal transplants (480 per million). The lowest prevalence was in Queensland (311 per million). Patients with functioning grafts numbered in excess of those dependent on dialysis in South Australia only (Appendix I).

Figure 8.37

Summary of Renal Transplantation Australia 1963 - 2006

		Performed	Functioning*
Deceased Donor	First	10,809	3,974
	Second	1.667	506
	Third	267	81
	Fourth	41	17
	Fifth	2	1
	Total	**12,786**	**4,579**
Live Donor	First	2,895	2,059
	Second	261	175
	Third	37	26
	Fourth	7	6
	Fifth	1	-
	Total	**3,201**	**2,266**
Total		**15,987**	**6,845**

* Lost to follow up not included

The age relationship of functioning transplants as a proportion of patients on renal replacement therapy is shown in Figure 8.45. The proportion depending on live donor grafts is greater in the younger age groups (Figures 8.42 and 8.43).

The modal age group for transplant dependent patients was 45-54 years and the mean and median ages were 49.8 and 51.0 years respectively (Figures 8.44 and 8.45). The modal age group for live donor recipients was 45-54 years and 51% of recipients dependent on live donor grafts were less than 45 years of age.

The majority of recipients with functioning grafts were male (60%). The ethnic origin of recipients was Caucasoid 89%, Asian 7%, Aboriginal and Torres Strait Islanders 2% and Others 2% (Figure 8.47).

The 6,845 grafts functioning at the end of 2006 represent 43% of all kidneys transplanted since 1963. Thirty three percent of grafts were functioning ten or more years and 8% for 20 or more years. There are 90 recipients with grafts functioning 30 years or longer. The longest graft had functioned for 39 years at 31st December, 2006.

NEW ZEALAND

There have been 3,149 operations performed on 2,635 patients since 1965 with 1,253 grafts (303 per million) still functioning at 31st December 2006 (Figure 8.38). Sixteen percent of operations and 11% of functioning grafts were regrafts. Kidneys from live donors accounted for 23% of operations and 36% of functioning grafts.

The number of operations performed by individual hospitals is shown in Appendix I at the end of this Report.

The age relationship and donor source are shown in Figure 8.44. The majority were male (58%) and the racial distribution was Caucasoid 78%, Maori 9%, Pacific People 6% and Asian 7% (Figure 8.47).

The majority (71%) of functioning grafts were in the 35-64 year age group and the mean and median ages were 48.9 and 50.3 years respectively. The modal age group for live donors was 35-44 years (Figure 8.44).

The 1,253 grafts functioning at the end of 2006 represent 40% of all kidneys transplanted since 1965. The longest surviving graft has reached 37 years and 1 month as at 31st December 2006. Ninety eight grafts have been functioning for 20 or more years and fourteen for 30 or more years (Figure 8.49).

Figure 8.38

Summary of Renal Transplantation New Zealand 1965 - 2006

		Performed	Functioning*
Deceased Donor	First	1,976	698
	Second	374	84
	Third	71	16
	Fourth	7	-
	Total	**2,428**	**798**
Live Donor	First	659	421
	Second	56	30
	Third	6	4
	Total	**721**	**455**
Total		**3,149**	**1,253**

* Lost to follow up not included

Figure 8.39

Functioning Transplants
Transplanting Region, Australia and New Zealand
1995 - 2006
(Number Per Million Population)

Year	QLD	NSW/ACT *	VIC/Tas *	SA/NT *	WA	Australia	NZ
1995	813 (249)	1483 (231)	1098 (220)	478 (290)	358 (206)	**4230 (234)**	**783 (213)**
1996	848 (254)	1554 (235)	1161 (231)	515 (311)	363 (206)	**4441 (243)**	**824 (221)**
1997	901 (265)	1643 (249)	1226 (241)	540 (324)	377 (210)	**4687 (253)**	**882 (233)**
1998	943 (274)	1688 (254)	1294 (253)	583 (347)	396 (217)	**4904 (262)**	**936 (245)**
1999	957 (273)	1726 (257)	1336 (259)	622 (368)	432 (234)	**5073 (268)**	**984 (257)**
2000	1004 (282)	1766 (260)	1385 (266)	642 (378)	468 (250)	**5275 (275)**	**1024 (265)**
2001	1062 (293)	1807 (262)	1452 (275)	668 (391)	496 (261)	**5485 (283)**	**1063 (274)**
2002	1107 (298)	1882 (271)	1534 (288)	700 (408)	527 (274)	**5750 (293)**	**1116 (283)**
2003	1147 (302)	1983 (283)	1575 (292)	733 (425)	528 (270)	**5967 (300)**	**1168 (291)**
2004	1181 (304)	2079 (295)	1644 (301)	788 (454)	559 (282)	**6251 (311)**	**1220 (300)**
2005	1219 (308)	2155 (304)	1719 (312)	810 (464)	613 (305)	**6516 (321)**	**1238 (302)**
2006	1261 (311)	2254 (315)	1831 (328)	846 (480)	653 (318)	**6845 (332)**	**1253 (303)**

* For calculation of population related totals, the population of these States were combined
Patients lost to follow up are not included

Figure 8.40

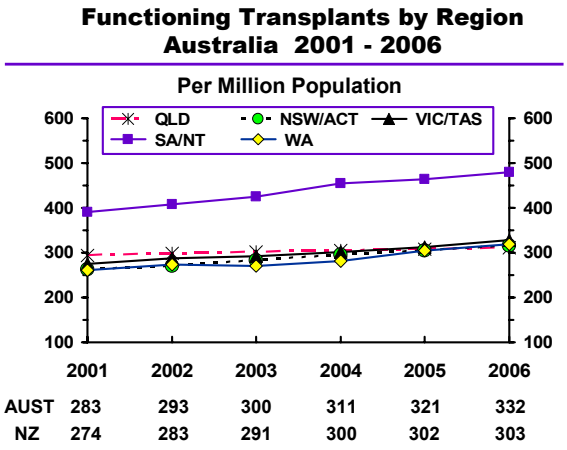


Figure 8.41

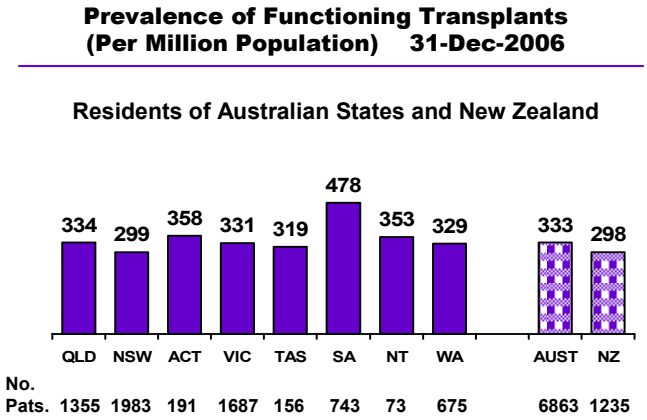


Figure 8.42

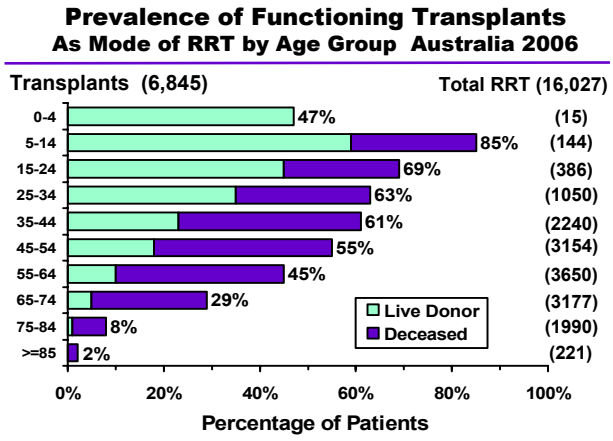


Figure 8.43

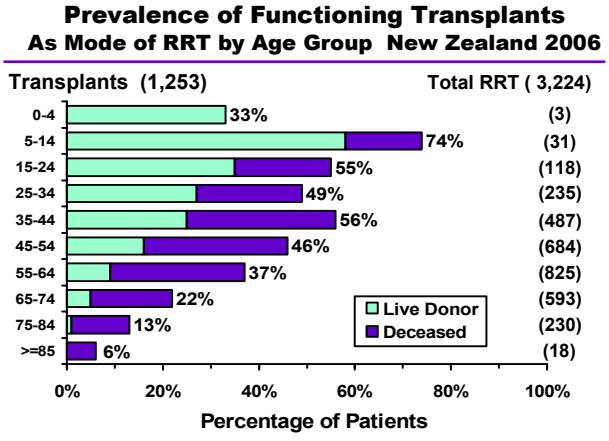
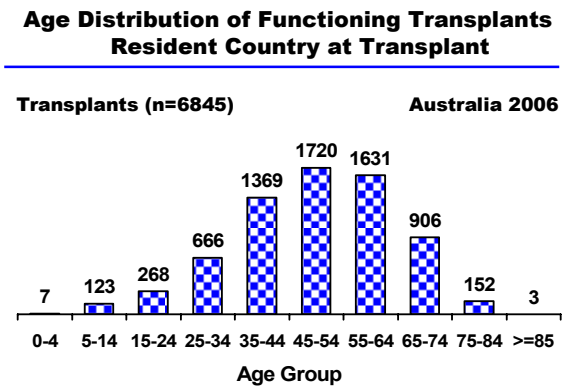


Figure 8.44

Age of All Functioning Transplant Patients
Resident Country at Transplant 31-Dec-2006

Donor Source	Graft No.	Age Groups										Total
		00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	
Australia		**7**	**123**	**268**	**666**	**1369**	**1720**	**1631**	**906**	**152**	**3**	**6845**
Deceased Donor	1	-	32	82	238	702	997	1109	689	122	3	**3974**
	2	-	5	10	47	122	135	126	49	12	-	**506**
	3	-	1	3	9	24	22	19	3	-	-	**81**
	4	-	-	-	2	6	8	-	1	-	-	**17**
	5	-	-	-	-	-	1	-	-	-	-	**1**
	Total	**-**	**38**	**95**	**296**	**854**	**1163**	**1254**	**742**	**134**	**3**	**4579**
Live Donor	1	7	83	163	338	457	489	346	159	17	-	**2059**
	2	-	2	9	30	48	55	25	5	1	-	**175**
	3	-	-	1	1	8	10	6	-	-	-	**26**
	4	-	-	-	1	2	3	-	-	-	-	**6**
	Total	**7**	**85**	**173**	**370**	**515**	**557**	**377**	**164**	**18**	**0**	**2266**
New Zealand		**1**	**23**	**65**	**114**	**271**	**312**	**303**	**133**	**30**	**1**	**1253**
Deceased Donor	1	-	5	21	40	121	172	210	100	28	1	**698**
	2	-	-	3	11	26	23	17	4	-	-	**84**
	3	-	-	-	1	4	8	3	-	-	-	**16**
	Total	**-**	**5**	**24**	**52**	**151**	**203**	**230**	**104**	**28**	**1**	**798**
Live Donor	1	1	18	41	59	103	96	72	29	2	-	**421**
	2	-	-	-	3	15	11	1	-	-	-	**30**
	3	-	-	-	-	2	2	-	-	-	-	**4**
	Total	**1**	**18**	**41**	**62**	**120**	**109**	**73**	**29**	**2**	**-**	**455**

Figure 8.45



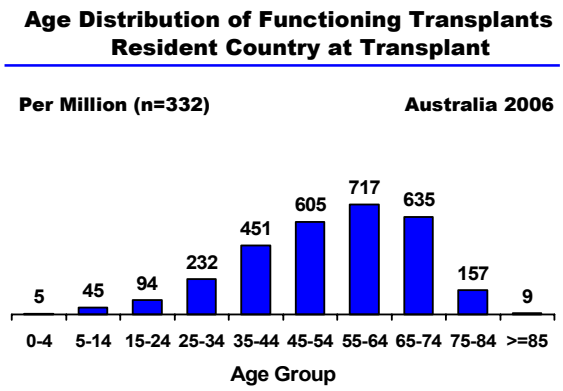
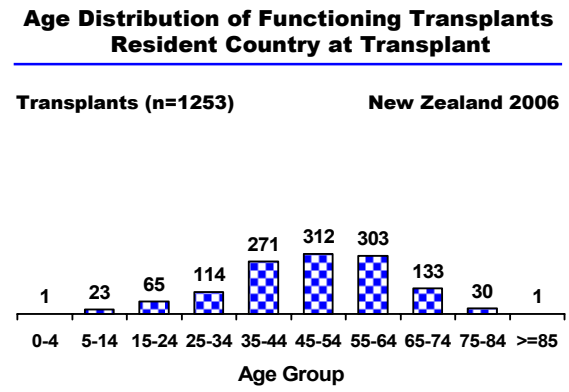


Figure 8.46



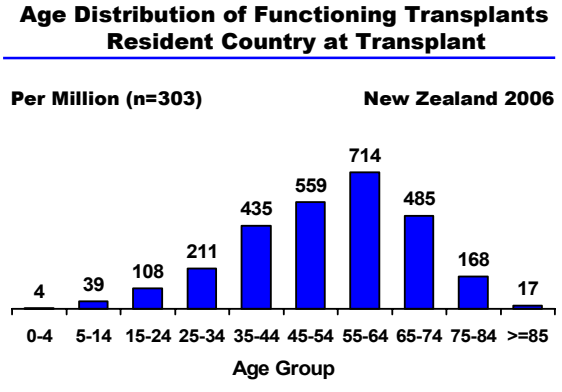


Figure 8.47

Functioning Transplant Patients - Resident Country at Transplant Related to Ethnicity and Age Group 31-Dec-2006

Gender	Racial Origin	Prevalent Age Groups										Total
		00-04	05-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85-94	
Australia		**7**	**123**	**268**	**666**	**1369**	**1720**	**1631**	**906**	**152**	**3**	**6845**
Female	Caucasoid	1	34	100	230	465	573	528	381	76	1	**2389**
	Aboriginal/TSI	-	2	4	4	21	23	7	1	-	-	**62**
	Asian	-	4	9	25	36	73	53	19	2	-	**221**
	Other	-	3	4	5	18	12	10	7	1	-	**60**
	Total	**1**	**43**	**117**	**264**	**540**	**681**	**598**	**408**	**79**	**1**	**2732**
Male	Caucasoid	6	71	135	362	749	908	932	456	71	2	**3692**
	Aboriginal/TSI	-	2	3	3	18	28	23	8	-	-	**85**
	Asian	-	7	9	26	50	82	60	27	2	-	**263**
	Other	-	-	4	11	12	21	18	7	-	-	**73**
	Total	**6**	**80**	**151**	**402**	**829**	**1039**	**1033**	**498**	**73**	**2**	**4113**
New Zealand		**1**	**23**	**65**	**114**	**271**	**312**	**303**	**133**	**30**	**1**	**1253**
Female	Caucasoid	-	10	24	32	75	100	100	50	16	1	**408**
	Maori	-	-	4	8	8	11	7	6	1	-	**45**
	Pacific People	-	1	5	7	10	9	4	2	-	-	**38**
	Asian	-	1	-	2	9	11	7	2	-	-	**32**
	Total	**-**	**12**	**33**	**49**	**102**	**131**	**118**	**60**	**17**	**1**	**523**
Male	Caucasoid	1	8	25	50	146	139	138	51	12	-	**570**
	Maori	-	1	2	3	10	16	22	10	1	-	**65**
	Pacific People	-	2	-	8	4	11	9	5	-	-	**39**
	Asian	-	-	5	4	6	14	14	7	-	-	**50**
	Other	-	-	-	-	3	1	2	-	-	-	**6**
	Total	**1**	**11**	**32**	**65**	**169**	**181**	**185**	**73**	**13**	**-**	**730**

Figure 8.48

Number and Duration of Functioning Grafts
Australia 2006

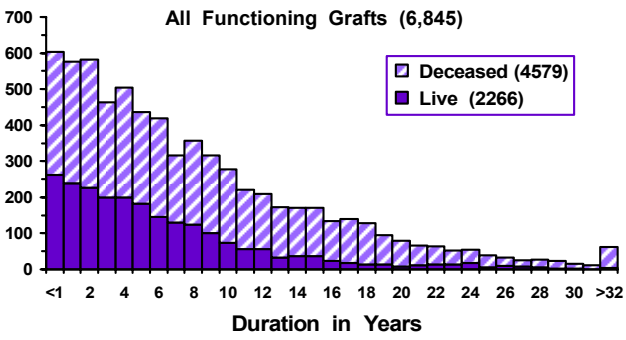
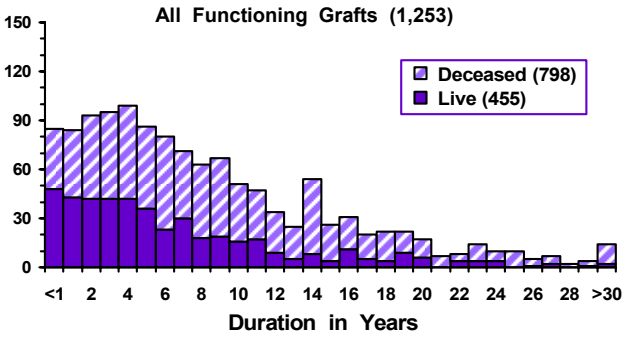


Figure 8.49

Number and Duration of Functioning Grafts
New Zealand 2006



RATES OF GRAFT LOSS

The rates of graft failure in Australia in 2006 decreased from the previous year from 2.7% to 2.4%, while death also decreased from 2.2% to 1.8% of those at risk (Figure 8.50).

The rates of graft failure in New Zealand remained similar, 3.2% to 3.3% in 2006. Death increased only slightly from 2.2% to 2.3% (Figure 8.50).

The cause of graft failure from 1996 to 2006 is shown in Figure 8.51.

Chronic allograft nephropathy and death with function remain the key impediments to long term graft survival.

The importance of chronic allograft nephropathy, recurrence of primary disease and death with function as causes of graft loss after one year is evident in Figure 8.52.

Among the causes of death with functioning graft, cancer was the most common cause.

Figure 8.50

Graft Loss Rate 2000 - 2006

	2000	2001	2002	2003	2004	2005	2006
Australia	(5604)	(5816)	(6089)	(6293)	(6617)	(6874)	(7157)
Death with Function	2.9%	2.6%	2.2%	2.2%	2.1%	2.2%	1.8%
Graft Failure	2.7%	2.7%	2.9%	2.6%	3.1%	2.7%	2.4%
All Losses	5.6%	5.3%	5.1%	4.9%	5.2%	4.9%	4.2%
New Zealand	(1090)	(1134)	(1180)	(1227)	(1273)	(1313)	(1328)
Death with Function	2.5%	2.2%	2.7%	2.2%	2.1%	2.2%	2.3%
Graft Failure	3.4%	3.7%	2.7%	2.5%	1.8%	3.3%	3.2%
All Losses	6.0%	5.9%	5.4%	4.7%	4.0%	5.5%	5.5%

Figure 8.51

Year of Graft Loss Due to Death or Failure 1996 - 2006

Loss	Cause of Failure	1996	199	199	1999	2000	200	200	200	2004	2005	2006	Total
Australia													
Death with Function		113	109	123	117	167	152	137	141	140	155	130	**1484**
Failed	Rejection - Acute	19	8	11	7	9	7	8	3	5	3	7	**87**
	Rejection - Chronic Allograft Nephropathy	87	79	105	107	91	111	108	113	143	130	101	**1175**
	Rejection - Hyperacute	2	1	-	2	1	-	-	-	-	-	1	**7**
	Vascular	13	15	9	16	7	12	16	15	18	13	14	**148**
	Technical Problems	1	3	-	3	4	2	3	3	2	4	6	**31**
	Recurrence Primary Disease	7	19	10	10	15	8	15	12	13	16	23	**148**
	Non Compliance	4	7	6	5	7	7	11	10	8	6	3	**74**
	Other	15	13	15	14	18	15	16	13	19	15	22	**175**
Total		**261**	**254**	**279**	**281**	**319**	**314**	**314**	**310**	**348**	**342**	**307**	**3329**
New Zealand													
Death with Function		26	27	25	23	28	25	32	27	28	29	31	**301**
Failed	Rejection - Acute	3	1	1	4	-	1	1	1	-	2	2	**16**
	Rejection - Chronic Allograft Nephropathy	12	15	19	24	20	31	22	16	15	24	28	**226**
	Rejection - Hyperacute	41	-	-	-	-	-	-	-	1	-	-	**2**
	Vascular	4	5	-	6	8	1	1	1	-	4	-	**30**
	Technical Problems	-	2	-	2	-	2	1	2	-	2	3	**14**
	Recurrence Primary Disease	2	-	3	4	3	2	1	4	2	3	6	**30**
	Non Compliance	1	-	3	-	5	2	3	3	1	1	1	**20**
	Other	6	2	3	1	2	4	3	4	4	8	3	**40**
Total		**55**	**52**	**54**	**64**	**66**	**68**	**64**	**58**	**51**	**73**	**74**	**679**

Figure 8.52

Graft Failures 2002 - 2006

Cause of Failure	Australia			New Zealand		
	Graft Function			Graft Function		
	<1 year	>= 1 year	Anytime	<1 year	>= 1 year	Anytime
Death with functioning Graft						
Cardiac	17 (25.8%)	179 (28.1%)	196 (27.9%)	1 (9.1%)	35 (25.7%)	36 (24.5%)
Vascular	4 (6.1%)	71 (11.1%)	75 (10.7%)	3 (27.3%)	14 (10.3%)	17 (11.6%)
Infection	30 (45.4%)	80 (12.6%)	110 (15.6%)	3 (27.3%)	18 (13.2%)	21 (14.3%)
Social	-	14 (2.2%)	14 (2.0%)	1 (9.1%)	5 (3.7%)	6 (4.1%)
Malignancy	7 (10.6%)	224 (35.2%)	231 (32.9%)	1 (9.1%)	55 (40.4%)	56 (38.1%)
Miscellaneous	8 (12.1%)	69 (10.8%)	77 (11.0%)	2 (18.2%)	9 (6.6%)	11 (7.5%)
Total	**66 (100%)**	**637 (100%)**	**703 (100%)**	**11 (100%)**	**136 (100%)**	**147 (100%)**
Graft Failure						
Rejection - Acute	23 (15.4%)	3 (0.4%)	26 (2.9%)	4 (14.3%)	2 (1.4%)	6 (3.5%)
Rejection - Chronic Allograft	6 (4.0%)	581 (76.8%)	587 (64.8%)	-	103 (72.5%)	103 (60.6%)
Rejection - Hyperacute	1 (0.7%)	-	1 (0.1%)	1 (3.6%)	-	1 (0.6%)
Vascular Rejection	65 (43.6%)	9 (1.2%)	74 (8.2%)	5 (17.9%)	1 (0.7%)	6 (3.5%)
Technical Problems	15 (10.1%)	3 (0.4%)	18 (2.0%)	8 (28.6%)	-	8 (4.7%)
Recurrence of Primary Disease	3 (2.0%)	75 (9.9%)	78 (8.6%)	-	16 (11.3%)	16 (9.4%)
Non Compliance	1 (0.7%)	37 (4.9%)	38 (4.2%)	-	9 (6.3%)	9 (5.3%)
Other	35 (23.5%)	49 (6.5%)	84 (9.3%)	10 (35.7%)	11 (7.7%)	21 (12.4%)
Total	**149 (100%)**	**757 (100%)**	**906 (100%)**	**28 (100%)**	**142 (100%)**	**170 (100%)**

IMMUNOSUPPRESSION

AUSTRALIA

In Australia in 2006 Cyclosporine was used initially in 51% of patients and Tacrolimus in 46%. The proportion of patients initially using Tacrolimus has increased since 2003, so that the two agents are now used initially in similar numbers of transplants, as shown in Figure 8.53.

The number of patients still taking prednisolone two years after transplantation has increased since 2000 and is now 88%, for patients transplanted in 2004. Although only 3% of patients transplanted in 2004 commenced on TOR-inhibitors, by two years later 14% of these patients were taking TOR-inhibitors.

Caution is necessary in the interpretation of small changes in clinical practice with immunosuppressive therapy. A number of large research trials are undertaken in Australia. The drug protocol used in those studies can potentially skew the number of patients taking specific drugs in any given year.

Figure 8.53 **Australia**

Immunosuppressive Therapy - Primary Deceased Donor Graft 2000 - 2006

	Year	Aza	CyA	Tacrol	MMF	Sirol	Everolimus	Pred	MPA	Number of Deceased Donor Grafts
Initial treatment	2000	22 (7%)	208 (67%)	83 (27%)	282 (91%)	9 (3%)	0 (0%)	284 (91%)	0 (0%)	311
	2001	16 (6%)	215 (74%)	65 (22%)	221 (76%)	33 (11%)	1 (<1%)	277 (96%)	0 (0%)	289
	2002	9 (3%)	239 (73%)	81 (25%)	272 (83%)	7 (2%)	22 (7%)	318 (98%)	15 (5%)	326
	2003	8 (3%)	187 (68%)	77 (28%)	190 (69%)	10 (4%)	0 (0%)	258 (94%)	52 (19%)	274
	2004	5 (1%)	213 (59%)	137 (38%)	309 (85%)	10 (3%)	0 (0%)	360 (99%)	24 (7%)	362
	2005	9 (3%)	131 (41%)	175 (55%)	299 (94%)	17 (5%)	0 (0%)	308 (97%)	4 (1%)	319
	2006	0 (0%)	155 (51%)	141 (46%)	259 (85%)	3 (1%)	19 (6%)	295 (97%)	24 (8%)	305
Treatment at 12 months	2000	41 (14%)	164 (56%)	118 (41%)	228 (78%)	10 (3%)	0 (0%)	248 (85%)	0 (0%)	291
	2001	23 (9%)	150 (57%)	102 (39%)	205 (78%)	26 (10%)	1 (<1%)	225 (86%)	1 (<1%)	262
	2002	24 (8%)	160 (52%)	124 (41%)	240 (79%)	14 (5%)	19 (6%)	278 (91%)	11 (4%)	305
	2003	22 (9%)	125 (50%)	103 (41%)	162 (65%)	15 (6%)	0 (0%)	221 (88%)	45 (18%)	250
	2004	23 (7%)	129 (39%)	162 (49%)	235 (72%)	30 (9%)	0 (0%)	304 (93%)	47 (14%)	328
	2005	23 (8%)	84 (29%)	172 (59%)	230 (79%)	29 (10%)	3 (1%)	262 (90%)	21 (7%)	290
Treatment at 24 months	2000	50 (18%)	151 (53%)	117 (41%)	212 (75%)	9 (3%)	0 (0%)	203 (72%)	0 (0%)	283
	2001	31 (12%)	143 (56%)	99 (39%)	190 (74%)	23 (9%)	1 (<1%)	205 (80%)	1 (0%)	257
	2002	22 (7%)	151 (51%)	118 (40%)	230 (78%)	20 (7%)	19 (6%)	247 (84%)	14 (5%)	294
	2003	19 (8%)	105 (44%)	103 (43%)	165 (69%)	19 (8%)	0 (0%)	204 (85%)	40 (17%)	240
	2004	30 (9%)	115 (36%)	155 (49%)	217 (68%)	41 (13%)	4 (1%)	281 (88%)	40 (13%)	318

Aza = Azathioprine
CyA = Cyclosporine
Tacrol = Tacrolimus
MMF = Mycophenolate Mofetil
Sirol = Sirolimus
Pred = Prednisolone
MPA = Mycophenolic Acid (Enteric Coated)

IMMUNOSUPPRESSION

NEW ZEALAND

In New Zealand in 2006, 70% of new transplant patients received Cyclosporine and 30% received Tacrolimus. As shown in Figure 8.54, this constitutes a steady increase in the use of Tacrolimus since 2002. For the first time, no transplants commenced Azathioprine at time of transplantation.

There are very few patients in New Zealand receiving TOR-inhibitors. There has been a dramatic increase in the use of Mycophenolate preparations two years after transplantation. Whereas only 12% of the 2003 cohort remained on Mycophenolate two years post transplant, 67% of the 2004 cohort were still taking Mycophenolate preparations two years later.

Caution is necessary in the interpretation of differences in practice between Australia and New Zealand. The funding of different pharmaceutical agents is quite different in the two countries.

Figure 8.54 **New Zealand**

Immunosuppressive Therapy - Primary Deceased Donor Graft 2000 - 2006

	Year	Aza	CyA	Tacrol	MMF	Sirol	Everolimus	Pred	MPA	Number of Deceased Donor Grafts
Initial treatment	2000	0 (0%)	60 (95%)	3 (5%)	63 (100%)	0 (0%)	0 (0%)	63 (100%)	0 (0%)	63
	2001	0 (0%)	59 (95%)	3 (5%)	62 (100%)	0 (0%)	0 (0%)	62 (100%)	0 (0%)	62
	2002	0 (0%)	57 (97%)	2 (3%)	59 (100%)	0 (0%)	0 (0%)	59 (100%)	0 (0%)	59
	2003	0 (0%)	47 (87%)	7 (13%)	46 (85%)	0 (0%)	0 (0%)	52 (96%)	3 (6%)	54
	2004	0 (0%)	47 (94%)	3 (6%)	49 (91%)	0 (0%)	0 (0%)	50 (100%)	0 (0%)	50
	2005	0 (0%)	32 (76%)	8 (19%)	41 (98%)	0 (0%)	0 (0%)	41 (98%)	0 (0%)	42
	2006	0 (0%)	26 (70%)	11 (30%)	35 (96%)	0 (0%)	2 (5%)	37 (100%)	0 (0%)	37
Treatment at 12 months	2000	22 (39%)	41 (73%)	15 (27%)	34 (61%)	0 (0%)	0 (0%)	54 (96%)	0 (0%)	56
	2001	27 (47%)	45 (79%)	12 (21%)	27 (47%)	0 (0%)	0 (0%)	56 (98%)	0 (0%)	57
	2002	18 (33%)	41 (76%)	13 (24%)	31 (57%)	0 (0%)	0 (0%)	53 (98%)	0 (0%)	54
	2003	15 (33%)	24 (53%)	21 (47%)	22 (49%)	1 (2%)	0 (0%)	42 (93%)	3 (7%)	45
	2004	9 (19%)	30 (64%)	17 (36%)	37 (79%)	0 (0%)	0 (0%)	45 (96%)	0 (0%)	47
	2005	2 (5%)	21 (55%)	16 (42%)	33 (87%)	2 (5%)	1 (3%)	35 (92%)	1 (3%)	38
Treatment at 24 months	2000	50 (91%)	40 (73%)	15 (27%)	3 (5%)	0 (0%)	0 (0%)	48 (87%)	0 (0%)	55
	2001	48 (87%)	39 (71%)	16 (29%)	3 (5%)	0 (0%)	0 (0%)	53 (96%)	0 (0%)	55
	2002	49 (92%)	39 (74%)	14 (26%)	1 (2%)	0 (0%)	0 (0%)	48 (91%)	0 (0%)	53
	2003	34 (79%)	22 (51%)	21 (49%)	3 (7%)	1 (2%)	0 (0%)	40 (93%)	2 (5%)	43
	2004	12 (27%)	27 (60%)	18 (40%)	30 (67%)	0 (0%)	0 (0%)	41 (91%)	0 (0%)	45

Aza = Azathioprine
Cya = Cyclosporine
Tacrol = Tacrolimus
MMF = Mycophenolate Mofetil
Sirol = Sirolimus
Pred = Prednisolone
MPA = Mycophenolic Acid (Enteric Coated)